PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON

MICROSCOPICAL & NATURAL HISTORY

CLUB.

VOLUME IV.

FROM FEBRUARY 10TH, 1892, TO JANUARY 17TH, 1899.

CROYDON:

PRINTED FOR THE CLUB BY WEST, NEWMAN AND CO.,

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PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON

MICROSCOPICAL & NATURAL HISTORY

CLUB.

FEBRUARY 19, 1895, TO JANUARY 21, 1896.

CROYDON:

PRINTED FOR THE CLUB, BY WEST, NEWMAN & CO., HATTON GARDEN, LONDON.

1896.

PROCEEDINGS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1895–96.

Twenty-sixth Annual Meeting,

Held at the Public Hall, Croydon, January 21st, 1896.

W. MURTON HOLMES, President, in the chair.

The statement of accounts for the year 1895 was taken as read, and passed.

The President announced that the following had been nominated as officers of the Club for the ensuing year, and there being no other nominations they were duly elected:—President, Mr. W. Murton Holmes; Hon. Treasurer, Mr. E. B. Sturge; Hon. Secretary, Mr. R. F. Grundy; Librarian, Mr. A. Roods; and Mr. G. W. Moore and Dr. J. M. Hobson members of the Committee to fill the vacancies caused by the retirement of Mr. C. H. Goodman and Mr. J. Weir Brown.

The following is a list of the officers for the year 1896:—

President.—W. MURTON HOLMES.

Vice-Presidents.—JOHN BERNEY, F.R.M.S.; PHILIP CROWLEY, F.Z.S., F.L.S.; HENRY S. EATON, M.A., F.R.Met.Soc.; HENRY T. MENNELL, F.L.S.; HENRY G. THOMPSON, M.D., F.R.M.S., J.P.; EDWARD LOVETT; and H. FRANKLIN PARSONS, M.D., F.G.S.

Treasurer.—EDWARD B. STURGE.

Hon. Secretary.—R. F. GRUNDY.

Librarian.—ALFRED ROODS.

Committee.—J. H. Baldock; H. C. Collyer; J. H. Drage; James Epps, Jun., F.L.S.; H. D. Gower; J. M. Hobson, M.D.; G. W. Moore; N. F. Robarts; and C. H. Burnaby Sparrow.

The President then delivered his Address, at the conclusion of which a hearty vote of thanks was accorded to him for his Address and for his services during the past year.

The President's Address.

Gentlemen,

In accordance with the custom which has prevailed for some years, it is my duty to give an account of the proceedings of the Club during the past twelve months.

It may be as well to remind members, and more especially those who have recently joined us, that the Club was founded in 1870 by Mr. Henry Lee, our first president, so that it has been one of the institutions of Croydon for more than a quarter of a century.

After an existence of six years, during which it was styled The Croydon Microscopical Club, the title was altered to The Croydon Microscopical and Natural History Club. The change was a wise one, as by enlarging our sphere of action a larger number of persons were able to interest themselves in the proceedings, and to bring many interesting subjects before the Club which otherwise would hardly have been admissible.

Considering the depressed condition of everything which has prevailed throughout the country during the last few years, I think I may congratulate the members upon the continued stability of the Club, and in the expectation of a further career of usefulness.

During the past year 28 new members have been elected, but owing to deaths and resignations our number is less by seven than at the beginning of 1895; the total number, including 7 honorary members and 2 associates, being 235, as compared with 242.

It cannot be too frequently impressed upon members that if we are to continue to do good work such as this Club has already accomplished, efforts must be made to induce others to join, so that the inevitable gaps in our ranks may be kept filled up.

Among those we have lost by death must be mentioned the name of Mr Henry Turner, who was one of our oldest members, and who took especial interest in all matters connected with Geology. He contributed several papers to our 'Transactions.'

This seems to be an appropriate place to mention the loss which science has sustained by the death last December of Henry Seebohm, F.R.S., the celebrated ornithologist, who, although not connected with this Club as an honorary member, yet took an interest in it, and in 1886 delivered under its auspices a most interesting lecture on the Migration of Birds, which will be remembered with pleasure by all who heard it.

Our expenditure from the General Fund during 1895 has been £154 9s. 2d., as compared with £179 13s. 11d. in 1894; but, on the other hand, our receipts have been less, and we have a balance only of £10 19s. 10d., as compared with £30 2s. 4d. at the beginning of last year. The deficiency is mainly due to so many subscriptions being in arrear. If members would kindly pay their subscriptions as they become due a great deal of unnecessary trouble would be spared to the Treasurer. The expenses of the Annual Soirée amounted to £45 12s. 11d., as compared with £50 2s. 11d. in the previous year, and a few more tickets were sold, the total being thus reduced to £26 11s. 11d., and the Club is better off by nearly £5.

The payments from the Special Fund account were £2 12s. 10d., as compared with £6 7s. 6d. in 1894, and we have now a balance in hand of £9 2s. 8d.

Reports of Sub-Committees, &c.

The *Meteorological Sub-Committee* has continued its work under the supervision of its Honorary Secretary. The daily rainfall of seventy-three stations in the Club District has been tabulated every month, examined and corrected, and the results printed and issued to the observers, and all members of the Club interested in the question, either before or within a few days after the end of the month succeeding that to which the statistics refer. Short particulars of the weather have also been inserted in every monthly sheet. Three gentlemen interested in the work of the Section contributed a sum of £15 towards the expenses.—F. Campbell-Bayard, *Hon. Sec.*

The Anthropological Section.—This new Section of the Club is under the direction of Mr. Edward Lovett. It has been formed for the purpose of dealing with such subjects as relate in any way with Man, either anthropologically or ethnologically. Mr. Lovett, on behalf of the Section, would be glad to receive any communications relating to flint or stone implements, primitive or obsolete appliances of all kinds, folk-lore, myth, and superstition, &c., especially such as may be connected with the county of Surrey. The members of the Section will be glad to give any information in their power in connection with Anthropological matters; and it is proposed that at least one paper shall be read each session by some member of this Section, and that one excursion take place annually under its direction, besides

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demonstrations at Conversational Meetings. The excursion to Tilgate Forest and the old ironworks of that district was in connection with it, and an evening has been devoted to a practical explanation as to the identification of flint chipped by human agency. All members interested in this subject are requested to communicate with Mr. Lovett.

The *Photographic Section* of the Club has passed through a very fair season, considering the unexplainable depression that most sections of its kind are at present assailed by, and the attendance has not been so well maintained as one would wish to see. A number of excursions were arranged and carried out, and these were not so well attended as is usual.

Technical and conversational meetings and lantern evenings have been held, and several interesting and original papers have been read. A new opaque roller lantern screen has been fixed in the School of Art Room, and is found to be a great improvement on the old one.

Thanks are due to the editors of the 'British Journal of Photography,' 'The Amateur Photographer,' and also 'The Magic Lantern Journal,' for the free copies sent during the past year for the use of members in the reading-room.

At the Soirée this year the sectional exhibit was an excellent one, the whole of the exhibitors adhering to the rule of framing their pictures, some eighty frames being hung, the largest number of frames on record ever shown. A large table in the Small Hall was as usual devoted to some 600 lantern-slides, work of the members; the School of Art Room being devoted to lantern exhibits of members' work during the evening.

The membership of the Section is not quite so good as last year, and it is hoped that Photographic members will do their best during the new year to secure new members, which means by so doing strengthening the Club generally; and any members who contemplate practising photography, and wishing to receive advice, and also receive the benefits of the Section, may obtain them from the Honorary Secretary of the Section, and from whom particulars as to use of dark room and lockers may also be obtained.—HARRY D. GOWER, *Hon. Sec.*

In connection with this subject I will say that the Club is very much indebted to Mr. Baldock for his services on those occasions when the lantern is required, and more especially do we owe him a debt of gratitude for bringing about the exhibition of the splendid series of views of Alpine scenery by Captain Abney last week. As far as my memory serves, this was the most interesting and successful lantern evening we have had.

Geological Sub-Committee.—The Hon. Secretary (Dr. G. J. Hinde) reports that "the Sub-Committee met on the occasion of the Conversational Meeting, when some specimens were shown, and interesting observations communicated by the members present. The Sub-Committee are indebted to Mr. Thomas Walker, M. Inst. C. E., Borough Engineer, for facilities for examining any excavations which are being made by the Corporation in order to take note of the strata exposed. One of the members has made a small beginning by noting the beds in the trenches made for draining the new cemetery on the Mitcham Road."

Botanical Sub-Committee.—The discovery of *Carex fusca*, known to British botanists better by its name of *Carex Buxbaumii*, is one of the most interesting additions to the flora of Great Britain made for many years. This plant was found by our former member, Mr. W. F. Miller, near Arisaig, on the west coast of Scotland. It had previously only been known as a British plant from Lough Neagh, Ireland. It is a satisfaction to us that this interesting discovery should have fallen to the lot of one of our members, who for so many years contributed the record of the dates of the flowering of plants in this neighbourhood, and in many other ways assisted in the botanical work of the Club.—H. T. MENNELL.

The *Microscopical Sub-Committee* held one Conversational Meeting, at which several slides, principally relating to geological subjects, were exhibited and discussed. I cannot but regret that the microscope is not quite so much in favour with our members as formerly. This may be attributed to the fact that "the common objects for the microscope" are all more or less familiar, and so familiarity breeds indifference. It may also be due to the idea that a very large and expensive microscope is necessary, or that high scientific training is indispensable. But this is not so. An inexpensive microscope, and the more simple the better, will teach a beginner things he has hardly hitherto dreamed of, and there is no pleasanter way of spending a spare evening than in examining by its means water from a stagnant pool, or the parts of a flower, or the growth of the crystals of a salt on a slip of glass. It is not necessary that the object should be mounted. That can be done when the observer becomes more accustomed to the use of his instrument. There is no occasion for a microscopist to mourn, like Alexander, because there are no more worlds to conquer. All branches of science are indebted to the microscope. In botany, in zoology, and in geology, it is absolutely indispensable. The very modern science of bacteriology would never have come into being without it, and the medical man finds that his diagnosis may be made with more accuracy when he is able to bring the microscope to his assistance. The members of the Sub-Committee are at all times willing to render assistance, and in the Club Cabinet is a large collection of slides for the use of members.

EXCURSIONS.

Twelve excursions were arranged, and several of them were well attended, and all enjoyable.

May 11th.—The half-day excursion to Kew Gardens was attended by a party of eighteen. Dr. Parsons, who was to have conducted the party, was unavoidably absent. The weather was all that could be wished to make the visit enjoyable. The varied tints of the foliage and the blossoming trees brightened by unclouded sunshine were a pleasing contrast to the stuffiness of London. The party spent some time in the rock garden, where were seen in bloom *Podophyllum emodi,* several species of hellebore, and other ranunculaceous plants, numerous Saxifragas, Primulas, and other spring flowers. In the hothouse the leaves of the *Victoria regia* were not much developed, but there was a good show of orchids. Great interest was taken in the carnivorous plants—Sarracenias and Droseras. After a visit to the greenhouses and fernery, the party separated.

May 25th.—Half-day excursion to Hartfield and Withyham (under the direction of Mr. Roods). Hartfield was reached about three o'clock, and several views of the quaint old village were taken. The route lay through Buckhurst Park, where some good views of the ruins of Old Buckhurst and of the lake were obtained. Withyham Church was visited, and some photographs of the monuments of the Sackville family by Chantrey, Flaxman, and Nollekens, were taken. Withyham Station was left about six. Five members attended.

June 3rd.—On Monday, June 3rd, members and their friends, twenty-three in number, made an excursion to Worth and Tilgate Forest under the direction of Mr. Lovett. Leaving Three Bridges Station, the party followed a beautiful country footpath which leads to Worth, upon arriving at which place a visit was paid to the church and rectory gardens by kind permission of the rector. The church is perhaps one of the finest examples of a Saxon structure now existing. Cruciform, and with pilasters of rough long and short work supporting a stone string course. The windows and chancel arches are very fine, and the carved wood pulpit bears the date 1577 (see Trans., Art. 121). An old gallery of 1610 is also very interesting, and there are many ancient monumental stones both in the church and the churchyard. In the latter stands a remarkable headstone erected to the memory of two men "and Barbara their wife." The walk then lay through the lovely sylvan scenery of Worth and Tilgate Forests, where many botanical and entomological specimens of interest were obtained. Among the former were the water dropwort, the hound's-tongue, columbine, the sweet-scented mountain fern, the lady fern, the twayblade and other orchids, the bugle—blue, pink, and white—and wild garlic; and among the latter, the pearl-bordered fritillary (large and small), the orange tip, the cinnabar moth, and several species of dragonflies. Some pretty "bits" were taken during the day by the members of the Photographic Section of the Club. At the Balcombe end of the walk a halt was made for lunch, and Mr. Lovett gave a brief account of the old Sussex ironworks which formerly occupied this district. The working of iron in this locality is of great antiquity, being traced as far back certainly as the Roman period. The quality of the metal was good, though somewhat brittle, thus resembling the iron of Spain. When the Wealden area was dense forest the trees were used as fuel for the iron furnaces, and it was the exhaustion of these forests which at length terminated the ironworks here and transferred the industry where iron and coal are worked in juxtaposition. Our earliest historical record of the Tilgate ironworks is 1266, and in the 16th century the quaint old belted or banded cannon were founded here, whilst firebacks and irons, rush clips, and other appliances were made in this metal. The present iron railings around St. Paul's Cathedral were also made in this locality of Sussex iron. This industry was at its zenith in the 17th century, but before that, in 1543, it was enacted that "no woodland be converted to pasture," which shows us that the timber was disappearing fast, and in 1581 all new ironworks were stopped, so short was the timber supply becoming. We read, however, that cannon were made at Worth as late as 1788. The earliest of these old guns were made at Buxted by Ralph Hogge in 1540, and one Huggett was also a cannon founder, for we read—"Master Huggett and his man John, they did cast the first cannon." The dying out of the Sussex iron industry was a lingering process, for even now a few small forges exist, and there is still plenty of good iron ore if only fuel in the form of Sub-wealden coal be forthcoming. The last of the big furnaces were blown out at Farnhurst and Ashburnham. Survivals in the shape of names of places still bear witness to the ancient industry in the names of Hammerpond, Hammerwood, Cinderford, Steelforgeland, Hammerden, Cinderbank, &c. Many of the ancient slag-heaps, now covered with trees and wild flowers, were examined and described by Mr. Lovett. The party then returned to Three Bridges Station through another part of the forest full of interest to the naturalist and the photographer.

June 15th.—A half-day excursion to Oxted through Tandridge, past Diana's fountain and the ponds to Godstone. Conducted by Mr. J. H. Baldock. Three members attended.

June 22nd.—Half-day excursion to the Silent Pool, near Guildford. The party, numbering twelve, arrived at Clandon on the S.W.R. about 3.30, and walked through the village over

Clandon Down to Newlands Corner, from whence a most charming view over the surrounding country was obtained, Leith Hill being visible to the left, and Hindhead to the right. Turning down the road to the left, a halt was made at the bottom of Albury Down to examine a small quarry in the Lower Chalk, some of the lower beds of which were very hard, approaching limestone, and yielded several Inocerami, besides Rhynconellas and Terebratulas. About a quarter of a mile further on the Silent Pool was reached. This pool, about a hundred yards long and surrounded by trees, consists of a chalky basin about ten or fifteen feet deep. The water is remarkably clear, and a large quantity of what appeared to be *Vallisneria spiralis* was growing in it, and there were also a large number of lake trout, which were remarkably tame, and evidently accustomed to being fed by visitors. After an enjoyable tea in a cottage garden close by, the party walked through Albury Park to Shere, and thence to Gomshall. It was particularly noticed that roses were very fine, both at the railway stations and in the gardens along the route. Dr. Parsons found *Æcidium crassum* on the leaves of buckthorn, butterfly orchis (*Habenaria chlorantha*), and viper's bugloss. Several photographs were taken during the walk. The houses at Shere and Gomshall are many of them quaintly timbered, and would furnish sufficient material for pictures for a prolonged stay. (Conducted by the President.)

July 6th.—A half-day excursion to Groombridge Place by special permission of the Misses Saint to photograph their fine old house and grounds, and who kindly provided tea for the party; also Groombridge Common and the curious old church. Thence across Rusthall Common, where some very successful photographs of the well-known "Toad Rock" were secured, to Tunbridge Wells, the members refreshing themselves at the "Chalybeate Spring." Ten members attended. Conducted by Mr. J. H. Baldock.

July 20th.—A joint excursion with the Brighton and Sussex Natural History Society to Lewes was planned for July 20th, but the morning proving very wet the attendance of Croydon members was very small, and the Brighton Society was represented only by Mr. J. H. A. Jenner, of Lewes, who kindly acted as guide, and under whose auspices, the weather improving, a very pleasant afternoon was spent. The Castle was first visited. Of this little more remains than the entrance tower with barbican, the ruins of the keep, and some fragments of walls enclosing a yard now used as a bowling-green. The site of the Castle is an important one from a military point of view, commanding as it does the entrance to the Weald from the coast at a contracted point in the valley of the Ouse where it cuts its way through the South Downs. Rooms in the towers of the keep and barbican are used as a museum, and contain a fair collection of local prehistoric, Roman, and mediæval antiquities. The town of Lewes with its steep irregular streets is picturesque, but contains few buildings of interest. The party then walked to the downs on the south-east of the town. These are covered with a characteristic chalk flora, but the vegetation was parched and brown owing to the prolonged drought, and attention was turned to a series of chalk-pits. The chalk here has undergone a slight upheaval in a direction contrary to its general dip in the South Downs (*viz.* southwards from the Weald), so that while the Upper Chalk is exposed in the pits nearer to Lewes, the Lower Chalk is worked in those more to the south, and in one pit both Upper and Lower Chalk are seen; the contrast between the white Upper Chalk, with its regular bands of flints, and the grey Lower Chalk, almost devoid of flints, being very distinct. Some photographs of these sections were taken. In the Upper Chalk only a few fragments of *Inoceramus* were found, but the Lower Chalk yielded other fossils, among them being a large ammonite (*? A. sussexiensis*), of which a fine specimen twelve inches in diameter was obtained. On the return to Lewes a short *détour* was made to visit the brackish marshes by the tidal river Ouse, where several plants characteristic of such localities were found, e.g., *Ranunculus hirsutus*, *Aster Tripolium*, *Zannichellia pedicellata*, and *Enteromorpha intestinalis.* The grayling butterfly and the burnet moth were observed on the chalk downs. (Dr. H. F. Parsons.)

July 27th.—Half-day Photographic excursion to Lingfield (conductor, Mr. Wild). The members who joined this excursion found enough to occupy the comparatively short time at their disposal in the picturesque cottages of this and the adjoining village of Street, and the church. Some time was spent in the interior of the latter, where photographs of the monumental tombs of the Earls of Cobham; and the east end generally, with lectern, on which is an old chained Bible, were obtained. Tea at one of the village inns agreeably closed the afternoon's proceedings.

August 5th.—Whole-day excursion to Lingfield for Holtye Common and Cowden (conductor, W. Murton Holmes). On arriving at Lingfield, the party proceeded to the church, over which they were kindly shown by Mr. Sydney Austin, of Lingfield. This church, which was rebuilt in 1461, contains some fine brasses and monuments to the memory of the Cobham family. There also are exhibited a Bible and two prayer-books in black letter, with chains attached. There are some quaint and finely-timbered houses surrounding the church. St. Peter's Cross was next visited; this was built in 1300, and is still in good preservation. Annexed to this, but of much later date, is the Blockhouse or cage, formerly used for prisoners. Some remains of ferns and other plants were discovered in the Tunbridge Wells Sandstone, in a quarry not far from Lingfield. The Hammer and Furnace Ponds were passed on the way to Holtye Common; these ponds take their name from the iron furnaces formerly existing in this locality. Very good iron was made here, and there is still abundance of iron ore; but owing to the discovery of iron in proximity to the coal-fields in the North of England, smelting has long been discontinued. Heaps of slag are still to be seen. In the Furnace pond the narrow-leaved bulrush (*Typha angustifolia*) was in abundance, and the water not being up to its usual level, in consequence of the dryness of the season, several fine specimens of fresh-water mussel were obtained. From the top of Holtye Common there is an extensive view over Crowborough and Ashdown Forest and the surrounding country. Here was an encampment of 140 boys from a Home at Southwark, and the boys seemed to be thoroughly enjoying themselves with cricket on the Common. Among the plants found were *Ranunculus flammula* (lesser spearwort), *Dianthus armeria* (Deptford pink), *Sedum telephium* (orpine), *Achillea ptarmica* (sneezewort), *Anthemis cotula* (stinking mayweed), *Helosciadium inundatum*, *Angelica sylvestris*, *Silaus pratensis*, *Œnanthe phellandrium*, *Lastrea dilatata* and *L. oreopteris*, *Lycopodium clavatum* (which is a rarity in the South of England) and *Cuscuta epithymum* (dodder), which was parasitic on the following plants:—*Cytisus scoparius*, *Potentilla tormentilla*, *Erica cinerea*, *Calluna vulgaris*, *Hypericum pulchrum*, *Vaccinium myrtillus*, *Solidago virgaurea*. On the way to Cowden Station a visit was paid to the church, where there is some fine timber work.

August 24th.—General half-day excursion to Oxted for Worm's Heath and Warlingham by way of Botley Hill (conductor, Mr. Goodman). Belladonna in fruit found. The party on reaching Warlingham were very kindly entertained at high tea by Mr. and Mrs. Goodman.

Sept. 21st.—On Saturday, Sept. 21st, a visit was paid to Epping Forest, under the guidance of Mr. N. F. Robarts, for the purpose of searching for fungi in that district. Very few members attended. Rail was taken from Fenchurch Street to Loughton, the party being joined at Woodford by a lady member of the Essex Field Club. The route taken through the forest was through Debden Slade to the ancient British earthwork known as Loughton Camp, discovered in 1872 by the late Mr.

B. H. Cooper. Mr. Robarts having explained the investigations carried on in 1882 by the Essex Field Club, the party continued their walk through Little and Great Monk Woods to the Romano-British Camp at Ambresbury Banks, commonly known as Boadicea's Camp, returning towards Chingford by the King's Oak and High Beach. The walk having been rather long for the time available, the party drove from High Beach to Chingford Station, through Fairmead, past Connaught Water and Queen Elizabeth's Lodge. Owing to the long-continued drought, the expedition as regards fungi was a failure, very few specimens being secured, particulars of which have been furnished by Dr. Franklin Parsons as follows; but the beautiful weather made the walk a most enjoyable one. List of fungi found on this occasion :—*Russula emetica*, *R. nigricans*, *R. lutea*, *Lactarius rufus*, *Agaricus phalloides*, *A. spadiceus*, *Hydnum repandum*, *Phallus impudicus*, *Polyporus versicolor*, *Boletus scaber*, *Scleroderma vulgare.*

January 15*th*, 1896.—A party of twenty-one, under the guidance of Mr. Baldock, paid a visit to Brin's Oxygen Factory at Westminster, and were shown over the works by Mr. Murray, the manager. The process for obtaining oxygen is based upon the property possessed by barium monoxide of absorbing another atom of oxygen from the atmosphere when submitted to a high temperature (in practice, 1350° Fahr. is found most convenient). The additional atom is again given off when pressure is reduced, barium monoxide being reformed, and the process can be repeated almost indefinitely. The barium is placed in a series of retorts arranged in a furnace heated by carbon monoxide, and a current of purified air passed through these under a pressure of about ten pounds to the inch, oxygen is absorbed, the nitrogen passing away into the air. The pressure is then reduced, and as the oxygen is given off it is conveyed to a holder, and is then ready to be compressed by a pump into cylinders of various sizes. The process of testing the cylinders was also explained by Mr. Murray.

Evening Meetings.

February 19*th*.—At this meeting the Report of the Meteorological Sub-Committee, prepared by Mr. Francis Campbell-Bayard the Hon. Sec., was presented and read. The full report was printed in the last number of our 'Transactions' (Trans., Art. 120). It was stated that the number of stations had been increased by fourteen, thus making the returns more and more representative. The number of stations of which the records have been tabulated was sixty-six, and the observers number fifty-four, as against fifty-three in the last Report. Although it had been stated by Mr. Symons that the rainfall for the United Kingdom during 1894 was quite an average one, in our own district the year was very wet, and tables were given showing that there was an excess of 2·46 in. at Greenwich, 3·08 in. at Surbiton, and 5·61 in. at Mt. Ararat, Wimbledon. Mr. Bayard drew attention to the comparatively large number of days—eight in number—on which one inch or more fell in twenty-four hours. Fortunately the nature of the ground prevented any disastrous floods which affected so many places in the catchment area of the River Thames.

At the same meeting Dr. Franklin Parsons read "Some further Observations on Earth Temperatures" (Trans., Art. 122). The observations were made as before with thermometers placed in the ground at depths of four feet and one foot. During the three years 1892–94 the highest temperature attained by the four-foot thermometer was 63·5° on August 20th, 1893, and the lowest 38·9° on January 24th, 1892. The highest attained by the one-foot thermometer was 72° on August 19th, 1893, and the lowest 33·8° on January 8th, 1893. The above minima had, however, been exceeded during the memorable frost of February last, when the lowest point reached by the four-foot thermometer was 38·3° on February 19th, 1895, and the lowest by the one-foot thermometer 32·6° on February 18th, 1895. That the one-foot thermometer had not reached 32°, nor become frozen to the tube, during a frost which had then lasted a month with the mean temperature of the air on some days not exceeding 17°, and a minimum of 9° recorded, Dr. Parsons considered was a proof that it can very rarely happen that the ground is frozen at a depth of one foot. Subsequent observations showed the lowest point reached by the four-foot thermometer was 37·4° on March 7th, 1895. The one-foot thermometer was found on February 20th firmly frozen into its tube, and so remained until March 8th, so that observations during this period could not be taken. Diagrams were exhibited showing the curves of the four-foot thermometer during the three years 1892–94, and the general course of the curves was similar. The minimum is reached in the latter part of January or February; but in two of the three years there had been a double minimum, the first in January, and the second about the end of February or in March. From the end of March to the beginning of July there is a rapid and almost continuous ascent; later in July a slight decline, the temperature rising again to its yearly maximum in August.

February 19th.—Dr. Dukes exhibited the curious jumping-bean from Mexico. Perhaps it would be as well to place upon record some of the facts which have been published with regard to this phenomenon. The movements of the so-called bean are due to the larva of a moth (*Carpocapsa saltitans*) living in the capsule of an euphorbiaceous plant (*Sebastiania palmeri*) found in certain cañons near Alamos. The plant exudes a milky juice, used by the Indians for poisoning arrows. As is the case with other Euphorbiacæ, the carpels suddenly dehisce when ripe, but when the larva inhabits one, the parts fail to separate, being kept together by the carpet of silk which the larva spins on the inside. The peculiar jumping motions are thus described by Prof. Riley:—"The full-grown larva by its holding fast to the silken lining by its anal and two hind pair of abdominal pro-legs, which have very strong hooks, then draws back the head and fore body, the thoracic parts swelling and the thoracic legs being withdrawn. The contracted parts being thus suddenly released, the larva vigorously taps the wall of the cell with the head, sometimes thrown from side to side, but more often brought directly down, as in the motion of a woodpecker when tapping for insects. The seed will thus move whenever warmed for several months during the winter, because, as with most tortricid larvæ, this one remains a long time in the larval state after coming to its growth and before pupating."

March 19*th*.—Owing to the inability of Mr. Howard Martin to attend, the paper on "Oysters" announced to be read by him was postponed. Mr. Lovett very kindly gave an interesting lecture on the "Stalk-eyed Crustaceans," which was illustrated by numerous specimens. The sub-order to which these belong is divided into three tribes—the large-tailed, comprising lobsters, crayfish, and prawns; the short-tailed, containing the crabs; and an intermediate form which includes the hermit crabs. They all undergo three stages of development—the egg, larva, and perfect form; but, unlike insects, it is in the latter stage that growth takes place. This necessitates numerous moultings, as the shell does not expand with the creature's growth. Mr. Lovett stated that when nearly full-grown the moults become more infrequent, as instanced by full-grown acorn barnacles being found attached to crab-shells, and as these are slow-growing, some time must have elapsed since the previous moult. Some crustaceans have the curious habit of casting their limbs when frightened. These are renewed in a diminished size at the next moult, but in the course of time attain their full dimensions. Some species lay an enormous number of eggs, the greater number of which form the staple food of fishes, while those species which inhabit burrows, or are otherwise protected, lay comparatively few. Some species inhabit the littoral zone, whilst others are found only in deep water or in the open sea. In the latter case some of the legs are modified into swimming paddles. A few of the more sluggish species protect themselves by encouraging the growth of sponges and algæ upon their shells. The fresh-water crayfish is the only indigenous fresh-water stalk-eyed crustacean. They are abundant in Wiltshire, where they burrow in the calcareous clay-banks of streams. They run at dusk, and it is no uncommon thing to catch 500 or 600 in one evening. Packed in nettles, they may be kept alive for at least three weeks.

April 23rd.—Mr. Ernest Straker gave a lecture, illustrated by photographs, on "Fair Isle Scenes and Fair Isle Folk." This little island, lying between the Orkneys and Shetland, is, with the exception of St. Kilda, the most isolated of the British Isles. There are twenty-two houses on the island, and 230 inhabitants, who are of Norwegian descent, and are all more or less related. The men are fishermen, and their wives and daughters do farm work. Peat is collected on the moors, and brought down by means of ox-carts. The day's work begins about midnight, as the oxen will not work by day. The island is much divided by fiords, and the cliffs, which are very high and precipitous, are penetrated by numerous arches and caverns. Up these cliffs in the summer-time sheep are hauled from boats and left for the season to find their own subsistence. The coal-fish, a species of cod, is extremely abundant, and the catching and drying of these is the principal employment of the islanders. The fishing-boats, ten in number, are small and light, and have the form of the old Viking ships. Sea-birds swarm on all the ledges of the rocks; among these are gulls, terns, puffins, and eider-ducks. Seals of various species and colours are frequently seen. The photographs with which Mr. Straker illustrated his lecture are believed to be the first taken of the island.

May 21st.—Mr. H. C. Collyer read "Some Notes on the Opening of some Tumuli on the South Downs." The excavations were made by the author on the downs near the valley of the Arun. One contained the skeleton of a man about 6 ft. 3 in. in height, the skull being deeply cleft as by a sword cut. The paper will appear in the 'Transactions' (Trans., Art. 123).

September 17th.—Mr. Lovett read a short paper on "The Protective Methods of Certain Larvæ" (Trans., Art. 124), alluding to the irritating hairs, acrid tastes, or menacing attitudes of some species, and the protection derived from mimicry or resemblance to inanimate objects exhibited by others.

The evening was principally devoted to the exhibition of specimens and objects of interest obtained during the recess.

Dr. Parsons exhibited *Nyctalis asterophora*, a parasitic agaric growing upon *Russula adusta*, from Handcross, Sussex; also several specimens of dried plants from Dieppe of species occurring in Britain, and flints collected at Dieppe for exportation to this country for use in pottery.

Mr. Lovett exhibited specimens of pipes; specially noticeable being one from Afghanistan inlaid with lead, as practised both by Kaffirs and North American Indians; also one made by the Eskimo, consisting of two hollow pieces of wood or gutters bound together. Mr. Lovett also showed a support for a fire-drill from Alaska, which is held in the mouth when in use.

Mr. Goodman exhibited a specimen of the Gulf-weed (*Sargassum*). This plant, which is allied to the *Fucus*, is found floating in large quantities in the Atlantic, but it also grows attached to rocks in the West Indies and along the Florida Reef.

The President exhibited Carboniferous Limestone fossils from near Kirkby Lonsdale, in Westmoreland, consisting of corals of several species, *Productus* and other brachiopods, *Bellerophon* and *Euomphalus;* also *Stigmaria* and *Calamites* from Dysart, on the Firth of Forth. The summits of the limestone crags in Westmoreland were described as resembling a flat pavement traversed by fissures, in which a great variety of ferns and other plants grow most luxuriantly. These fissures are produced by the constant percolation of the rain through the joints of the limestone.

October 15*th.*—Mr. Lovett exhibited and described a series of remárkable specimens of Salt deposits obtained by him on a recent visit to the works of the Salt Union at Stoke Prior in Worcestershire. This salt deposit occurs in what is known as the New Red Marl, and is considered to have been caused by the presence of a great inland sea, in those remote geological times, somewhat corresponding with the Salt Lake district of North America. The salt is pumped from a deep well in the form of a saturated saline solution, or brine, with pumps, much in the same way as exists in our ordinary waterworks. The pumps carry it to a tank on a tower, whence it falls into a large open-air reservoir; the density of this volume of brine being so great that to sink in it would be practically impossible. The brine runs from this reservoir to the salt-pans, kept at boiling-point, which evaporates the water, and precipitates the salt: this is raked out and drained into wooden moulds, into blocks, as we see them in the drysalters' shops. When fairly hard, they are turned out and baked in the hot room—temperature about 150°. The finer table salts are carefully ground from these subsequently; the rough granular salt, as exported to India and Australia, is evaporated by a simpler process. The refuse and dirty salt is ground up and sold for agricultural purposes. The latest luxury is known as "Saltunia," a beautifully scented salt of great value for baths.

Mr. Berney exhibited two specimens of *Plusia moneta* taken in his garden last July. This insect was first found in England in 1890, having then been taken at Tunbridge Wells and Purley. The larva feeds upon delphinium and aconite.

Dr. Parsons exhibited the Jerusalem artichoke in flower, a most unusual occurrence in this country, as it requires prolonged hot weather. It is accounted for by the fact that the temperature for September was five degrees above the mean temperature for Greenwich for fifty years. The plant was first introduced into Europe from North America in 1617, and has therefore nothing to do with Jerusalem. The word is a corruption of *girasole*, the Italian name for the sunflower, which it much resembles.

Mr. Stanley's Report of Conference of Delegates at the British Association was read at this meeting.

Report of Conference of Delegates of Local Scientific Societies at the British Association, Ipswich, September, 1895.

The Address of Mr. G. J. Symons, F.R.S., enclosed, gives the direction of general discussion at the first meeting. It will be seen that this Address gives predominance to meteorological work, in which the monthly reports of our Society, drawn up so carefully by Mr. F. Campbell-Bayard, appear to meet the entire requirements of the delegates, as expressed at the meeting. According to the expression of opinion, it would appear that our Society might do something more with collation in phenological work, and for this it appears to me we have very able members. A matter raised in discussion appears to me of great interest. The whole of our Post-tertiary Gravels contain remains of prehistoric animals and the early works of man in flint implements; it would therefore be well in every Gravel district that some small sub-committee should pay attention to the removal of these Gravels. In our district they are rapidly disappearing, and this is general around London, so that the open field of research in this subject will in time be lost. The physical subjects discussed were beyond the province of our Club.

Wm. F. Stanley.

Mr. Stanley exhibited a fine fossil lithistid sponge from the Croydon Gravel. I believe that it has been brought to the notice of the Geological Society.

The President read a paper on "The Fertilization of Flowering Plants" (Trans., Art. 125), describing some of the methods of pollination by the agency of the wind, or by insects. It was stated that in most cases cross-fertilization produced better and stronger offspring than the offspring of self-fertilized flowers. Some of the contrivances for hindering self-fertilization and for facilitating cross-fertilization were described; and in default of cross-fertilization, it was shown that ultimate self-fertilization was ensured. The paper was illustrated by diagrams on the lantern-screen.*

November 19*th.* — Mr. Howard Martin read a paper on "Oysters" (Trans., Art. 126). The paper was illustrated by diagrams, and by several specimens of oyster in various stages of growth; also by photographs showing the method of cultivation.

Dr. Parsons showed a series of fossil oysters, among which were some growing upon a nautilus. The larvæ must have attached themselves during the life of the nautilus, as the shell of the latter had partly grown over them.

December 17*th.*—The President read a short note on some tuber-like growths on the roots of a beech tree in the Sanderstead Road, and explained the manner in which they had probably arisen.

Mr. C. H. Goodman read some interesting "Notes on the House Cricket" (Trans., Art. 127), the result of somewhat prolonged investigation. The paper was illustrated by photographs.

The Twenty-sixth Annual Soirée was held at the Public Hall on November 27th; but, though the attendance was only 513 as compared with 542 in 1894, more tickets were sold, and the total expenses were smaller. The number of microscopes exhibited was somewhat smaller than usual, but there was a great variety in the objects shown, and we were indebted to members of the Royal Microscopical Society, Quekett, Holmesdale, and Redhill Clubs for several interesting objects. Bacteriological cultures were exhibited by Dr. Blaxall and Dr. Hobson. Mr. Crowley exhibited butterflies, including the new and beautiful *Ornithoptera paradisea* from German New Guinea, and birds' eggs; Dr. Parsons, dried plants, fungi, and a basket of flowers from gardens on Park Hill. Owing to the severe weather in the autumn, there were only 72 different kinds, as compared with 138 in 1894. Botanical specimens were also shown by Mr. Mennell and Mr. Salmon. A beautiful collection of stuffed birds was shown by Mr. Thorpe; Mr. J. Chisholm contributed a portion of the late Mr. Henry Lee's collection (the Echinidæ), some horns of African antelopes, walrus tusks, African birds, &c.; insects were shown by Mr. Goodman; British land and fresh-water shells, by Mr.

.* There are many persons who would like to know something of botany, but who yet have neither the time nor inclination to wade through some of the modern text-books, overladen as they are with strings of words derived from the Greek. To these I would recommend a little book recently published, 'The Story of the Plants,' by Grant Allen, which describes the life-history of plants in a scientific manner, but in plain and untechnical language, so that he who runs may read.

Dedham; drawings, by Mr. Chumley; North American Indian and Eskimo objects, by Mr. Lovett,—these consisted of pipes, clubs, an Indian chief's head-dress, Eskimo knives, fish-hooks, and fire-drills; a very interesting collection of objects from Ashanti and New Guinea was exhibited by Mr. Robarts; native lace and other objects from Paraguay, by Mr. Curry; and specimens of the art of Old Japan, by Mr. J. O. Pelton, so that anthropology was well illustrated. Among the other objects which attracted particular attention were the spectra of argon and helium, exhibited by Mr. Stanley; oyster-spat and photographs, by Mr. Howard Martin; polariscopes, by Mr. Murton; spectroscope, by Mr. Newton; original letters from Charles Dickens, Kenny Meadows, and Douglas Jerrold, by Mr. Streeter; and books of autographs, etchings, and drawings of sponge structure, by the President. Photographs and transparencies were exhibited by Messrs. Baldock, Dodd, Epps, Gower, Grundy, Hoole, Maylard, A. Moss, C. Moss, Oakley, Packham, Roods, Sandell, Straker, Underhill, and Wild.

During the evening three exhibitions of lantern-slides were given by various members of the Club, and the Old School of Art Room was filled to overflowing at each demonstration.

The Club as usual is very much indebted to Mr. Crowley for so kindly sending flowers to decorate the platform, and to Mr. Berney and Mr. Grundy for the excellent manner in which the rooms were arranged.

The attendance at the evening meetings has not been so numerous as one could wish, but on five occasions last year ladies were invited to be present, and the room in consequence was much better filled. Surely the time has come when we should do well to follow the example of other societies and admit ladies either as members or associates. It is certain that many take a great interest in Natural History, and would be glad of the opportunity of joining. They have the advantage in many cases of more leisure, they spend a larger portion of their life in Croydon, and have consequently many opportunities for inducing others to join, and so strengthen the Club. I am quite aware that objections have been made on former occasions when a similar proposal has been brought forward, but times have altered, and we now see ladies occupying positions which a few years ago it would have been considered impossible for them to hold. Ladies have always been invited to accompany our excursions, and I am not aware that anyone has found the walk less agreeable in consequence.

In conclusion, let me express the hope that members will bring to the notice of the Club any facts connected with Natural

History that may come under their observation, so that there may be a good supply of papers. A discussion even on subjects of apparently slight interest often brings out facts which are of great importance.

Members elected, 1895.

January 15*th*. — Berry Henry Berry, Highlea, Spencer Road. Charles W. Hehner, Woodside Green, South Norwood. William James McClive, 16, St. John's Grove. Arthur Malden, 5, Chatfield Road. Charles Daniel Olive, Rokeby, The Downs, Wimbledon. Frederick James Pack, 8, High Street. Samuel George Parsons, Vallis Leaze, Raynes Park, Wimbledon. Rev. Henry Arthur Serres, St. John's Lodge, Addiscombe. Arthur Charles Wissenden, 50, Canning Road.

February 19*th*.—William J. Lock, Avondale Road. Frederick Horace Oldershaw Jerram, 40, Longley Road, Tooting. Abraham Moss, 3, High Street, South Norwood. Thomas Charles Castle Saunders, Aberfoyle, Addiscombe Grove.

March 19*th*.—George William Moore, Bryndhurst, Dornton Road. Sydney Hodsoll, 16, Wellesley Road. Gervase E. Newby, F.R.C.S., 61, Lower Addiscombe Road. Henry Rogers, Altamont, Warlingham.

May 21*st*.—Charles James Lawrence Russell, Upton Dene, 56, Coombe Road. Arthur John Weightman, Langdale, Chepstow Rise.

September 17*th*. — Thomas Douglas, Hillmorton, Manor Road, Wallington. Edwin Donn, 10, Aberdeen Road.

October 15*th*. — Rt. Hon. Charles Thomson Ritchie, M.P., 19A, Wetherby Gardens, South Kensington. Alfred Letherby, "Hausa," Inglis Road.

November 19*th*.—George Phillips Botterill, 26, Heathfield Road. J. Watson Slack, 56, Park Lane.

December 17*th*.—Thomas Gaus Ackland, F.I.A., F.S.S., "Avalon," Morland Road. John Waddon Martyn, 74, Wellesley Road. Rev. Richard Kidston Corser, Eastbrook, Park Hill Road.

Exhibits, 1895.

February 19*th*.—W. Murton Holmes, Siliceous Sinter containing *Limnæa* shells and *Chara* fruits. Dr. Dukes, Larva of *Carpocapsa saltitans* in *Sebastiania palmeri* from Mexico (jumping beans).

March 19*th*.—J. H. Drage, Three specimens of the little auk shot in the Orkneys. C. H. Goodman, Insects from Australia. W. Murton Holmes, Marcasite, lava from the bed of the Suez Canal, and a section of the same under the microscope.

April 23*rd*.—J. H. Baldock, A colour disc. W. Murton Holmes, Fossils from the Upper Chalk at Warlingham, and univalve shells.

May 21*st*.—F. Campbell-Bayard, Four parts of 'Excavations at the Roman City of Silchester.' N. Waterall, Platinotype photograph of view at Waddon. H. C. Collyer, Bones and implements found in barrows near Arundel.

September 17*th*.—H. F. Parsons, *Nyctalis asterophora*, a parasitic agaric; dried plants from Dieppe. E. Lovett, Kaffir, Eskimo, and Afghan pipes; a support for a fire-drill from Alaska. C. H. Goodman, Gulf-weed. W. Murton Holmes, Fossils from Carboniferous

Limestone near Kirkby Lonsdale, consisting of corals, *Productus* and other brachiopods, *Bellerophon* and *Euomphalus*, and *Stigmaria, Calamites*, and a fern from the coal-measures; a portion of a Japanese sponge (*Periphragella Elisæ*) under the microscope.

October 15th.—E. Lovett, Specimens of salt deposits from the works of the Salt Union at Stoke Prior. John Berney, *Plusia moneta* taken in his garden in July. H. F. Parsons, Jerusalem artichoke in flower. W. F. Stanley, Fossil sponge from the Croydon Gravel.

November 19th. — H. F. Parsons, Fossil oysters. W. Murton Holmes, Fossil *Radiolaria* from the Lower Culm-measures near Launceston. Howard Martin, Oysters in various stages of growth.

December 17th. — N. F. Robarts, Fossils of *Lima spinosa*, and *Galerites* in flint. W. Murton Holmes, Necklace, probably from New Guinea.

Additions to the Library.

The additions to the Library during 1895 are as follows :—

From Individuals.—Messrs. Whittaker and Jukes Brown: Borings at Culford, Winkfield, Ware, and Cheshunt; Dr. Franklin Parsons: Ordnance Map of Croydon, and book for recording geological sections; C. Leeson Prince: Summary of Meteorological Observations at Crowborough Observatory; W. F. Stanley: The Nebular Theory; Dr. Hinde: Radiolaria in the Lower Culm-measures of Devon and Cornwall; H. D. Gower: The photographic papers as issued; A. Roods: Knowledge, as issued.

From Societies.—Report of the Reading Literary and Scientific Society for 1895; Meteorological Report of the Borough of Southport; Journal of the Malacologic Society of Belgium; Journal of the Quekett Microscopical Club, 1895; Proceedings of the Scottish Microscopical Society; The South-eastern Naturalist; Bulletin of the Geological Institution of the Upsala University; British Association, Report of the Oxford Meeting, 1894, and Report of the Conference of Corresponding Societies, 1895; Journal of the Manchester Geographical Society; Proceedings of the Manchester Microscopical Society, 1894; Transactions of the Eastbourne Natural History Society; Annual Report and Abstracts of Papers of the Brighton and Sussex Natural History and Philosophical Society; Report of the Northamptonshire Natural History Society; Journal of the Royal Microscopical Society; History of the Berwickshire Naturalists' Club; Transactions of the South London Entomological and Natural History Society; Proceedings of the Academy of Natural Science of Philadelphia; Appendix xii. to Report of the Meteorological Council.

Croydon Microscopical and Natural History Club.—Balance-sheet for the Year ending 31st December, 1895.

Receipts.

	£	s.	d.	£	s.	d.
Balance at Bank, January 1st ...				30	2	4
Subscriptions, 1894	0	10	0			
,, 1895	97	10	0			
,, 1896	3	0	0			
				101	0	0
Sale of Soirée Tickets				19	1	0
Donations—F. C.-Bayard, Esq. ...	5	0	0			
,, P. Crowley, Esq. ...	5	0	0			
,, B. Latham, Esq. ...	5	0	0			
,, Capt. Aylesbury ...	0	5	0			
				15	5	0
Sale of Mr. J. H. Drage's Paper ...				0	0	8
				£165	9	0

Payments.

	£	s.	d.	£	s.	d.
Rent of Club Room, 12 months, to 31st July...				10	0	0
Hire of Rooms for Meetings ...				3	10	0
Printing Transactions, 1894 ...				28	15	3
Insurance				1	13	9
Postages				9	8	11
Meteorol. Sub-Committee Printing Rainfall Returns for the months December, 1894, to November, 1895, inclusive				27	11	0
Photographic Sub-Committee, Hire of Room for Lantern Exhibitions	0	10	0			
Rent of Dark Room, 12 months, to 31st July	10	0	0			
Sundry Printing, Postages and Gas	2	7	0			
				12	17	0
Bookbinding				0	6	3
Gratuities				1	6	0
Soirée Expenses				45	12	11
Printing and Stationery				7	19	0
Sundries				0	9	1
Assistant Secretary				5	0	0
Balance (Bank, £10 9s. 10d.; Cash in hand, 10s. 0d.) ...				10	19	10
				£165	9	0

SPECIAL FUND ACCOUNT, 1895.

£210 11s. 8d. CONSOLS.

	£	s.	d.	£	s.	d.		£	s.	d.
Balance from last Account, Jan. 1st				5	1	0	Payments—			
Dividends—January	1	8	0				Plumber's Work, Dark Room	0	9	0
,, April	1	8	0				Photo Section, New Screen	1	5	10
,, July	1	8	0				Altering Fittings for New Screen	0	18	0
,, October...	1	8	0				Balance forward	9	2	8
				5	12	0				
Payments for use of Lockers in Dark Room				1	2	6				
				£11	15	6		£11	15	6

	£	s.	d.
Balance brought down, at Bank	9	2	8
Balance General Account and Cash in hand ...	10	19	10
	£20	2	6

EDWARD B. STURGE, *Treasurer.*

We, the undersigned, having examined the above Accounts and the Vouchers relating thereto, hereby certify that they are correct, according to the Vouchers, and to the Bankers' Pass Book.

C. J. LAWRENCE RUSSELL,
G. W. MOORE, } *Auditors.*

January 6th, 1896.

TRANSACTIONS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1895–96.

121.—Note on the Pulpit in Worth Church.

By H. M. Klaassen, F.G.S.

The Anglo-Saxon church at Worth, near Three Bridges, in Sussex, contains a pulpit which has been an object of interest to me for some length of time, and about which I have corresponded with the Rev. W. W. Skeat, M.A., Professor of Anglo-Saxon in the University of Cambridge, and with persons living in East-friesland, Hanover.

The pulpit is made of wood, and has five panels; in each there is a boldly carved figure, with corresponding inscription beneath, carved in German characters, as under:—

der evangelist Sante Matevs,
der evangelist Sante Marcvs,
ick bin allene dĩ here vnde godt,
der evangelist Sante Lvcas,
der evangelist Sante Joannes.

The third line of the inscription, translated into English, is—

"I am alone thy Lord and God."

Above the panels there are, carved in German letters, the following couplets:—

wol mi levet vnd wi werdẽ	de werth min tho em kamẽ
wordt holden vnd een waninge	vnd min vader bi em makẽ. IOA 14.

werth en levẽ
Anno Dñi 1577.

The upper lines of these couplets should be read in succession, then the lower lines, and the whole be compared with Luther's translation of John xiv. 23. The following is a literal translation of the couplets:—

who me loves and we will	the same will my to him come
word hold and a dwelling	and my father with him make. John 14.

will him love
A.D. 1577.

As the Anglo-Saxon church at Worth is generally considered to be of the first half of the eleventh century, and as the date carved on the pulpit is A.D. 1577, I have made inquiries as to the date when the pulpit was placed in the church, how it was acquired, and have tried to make out in what dialect of the German language its inscriptions are written. The Worth Rectory has a record that "the pulpit was bought by the Rev. G. C. Bethune from Street & Son, antique furniture warehouse, Brewer Street, Golden Square, London, and erected in Worth Church the 29th September, 1841. It originally came from a cathedral in Bavaria, Saxony, Germany." No clue as to its place of origin can be obtained from this, for Bavaria and Saxony are and were separate states.

Those acquainted with Germany will agree with me that the pulpit at Worth is similar to the pulpits of the Protestant churches in the North of Germany. The language of the inscriptions very much resembles a Low German which I spoke when a boy, and which is still spoken in the villages of Eastfriesland, Hanover. I therefore requested a friend in Leer, Province Hanover, Prussia, to find out where in Eastfriesland or along the North Sea coast the Low German coming nearest to that inscribed on the Worth pulpit is spoken at the present day. The reply is that the Low German spoken at the present time at Schwansen is about the same as that carved on the Worth pulpit in 1577. Schwansen is a peninsula on the south-east coast of Schleswig, lying between Eckernfoerde and the mouth of the river Schlei, and was inhabited by the Angles during the first centuries after Christ.

At the time when Luther began to translate the Bible there was no common German language. Every state and district had its own dialect, and over the whole of North Germany Low German was spoken. Among the Low German Bibles in the British Museum, there is one by J. Bugenhagen, a Pomeranian divine, who assisted Luther in translating the Scriptures into the German Kanzleisprache. Dr. Bugenhagen brought out, in 1541, a Low German version of the sacred books under the title 'Biblia: dat ys de gantze hillige Schrifft. Gedruckt dorch Hans Lufft tho Wittemberg D.M.XL.I.' This edition, printed in German characters, has the same rendering of John xiv. 23 as the Worth pulpit; its chapters are not divided into verses, and Worth pulpit only refers its couplets to IOA 14.

122.—Some further Observations on Earth Temperatures.

By H. Franklin Parsons, M.D., F.G.S.

(Read February 19th, 1895.)

Two years ago I read to the Club a paper containing the results of my observations during the previous year (1892) with thermometers placed in the ground at depths of 4 ft. and 1 ft., together with a summary of existing knowledge on the subject of earth temperatures. I now propose to submit some notes on the further observations which I have made since the date of my former paper.

The thermometers remain as before. My observations, which were at first made on Sundays only, owing to my frequent absences from home in the middle of the week, have for the last eighteen months been made as nearly as practicable daily at 9 a.m.

During the three years 1892–94 the highest temperature attained by the 4 ft. thermometer has been 63·5°, on Aug. 20th, 1893, and the lowest 38·9°, on Jan. 24th, 1892. The highest temperature attained at a depth of 1 ft. has been 72·0°, on Aug. 19th, 1893, and the lowest 33·8°, on Jan. 8th, 1893.

The above minima have however been exceeded in the present severe and protracted frost, during which the lowest point reached by the 4 ft. thermometer has been 38·3° to-day* (Feb. 19th, 1895), and the lowest by the 1 ft. thermometer 32·6° yesterday.

That the 1 ft. thermometer has not reached 32°, nor become frozen to the tube after a frost which has lasted a month, and

* *Postscript.*—The lowest temperature reached by the 4 ft. thermometer during the great frost of the first quarter of 1895 was 37·4°, on March 7th. The 1 ft. thermometer was found on Feb. 20th firmly frozen into its tube, and it remained thus fixed until March 8th. The readings during this period could not be taken, but it is probable that they may have gone below 32°.

during which on some days the mean temperature of the air has not exceeded 17°, and a minimum of 9° F. has been recorded, bears out the remark made in my former paper, that it can very rarely happen that the ground is frozen at a depth of one foot.

The curves of the 4 ft. thermometer during the three years 1892–94 are shown in a diagram,* in which the curve for 1892 is represented in blue, for 1893 in red, and for 1894 in black. The 1894 curve is formed of the weekly means of the daily readings instead of single readings weekly, but the difference is almost inappreciable, as it rarely happens that the mean of seven daily readings differs from the reading of the middle day of the seven by more than a tenth of a degree Fahrenheit. In each year the general course of the curve has been similar. The minimum is reached a few weeks after the commencement of the year, in the latter part of January or February; but in two out of the three years there has been a double minimum, the first being attained in January, and the second about the end of February or in March. From the end of March to the beginning of July there is a rapid and almost continuous ascent. Later in July there has been in each year a slight decline, from which the temperature has risen again to its yearly maximum in August; so that there seems to be a tendency to both a double maximum and a double minimum, though it is possible that this might not be borne out by a more extended series of observations. (The Greenwich curve for the mean temperature of the air shows a trace of a double minimum in January.) From August the earth temperature falls steadily to January, the fall being steeper and more regular than the ascent.

In 1892 the lowest temperature attained at 4 ft. depth was 38·8° on Jan. 24th, and again 39·6° on March 13th; and the 4 ft. temperature did not begin to rise rapidly until the middle of May, the spring being cold and backward. The highest point attained was 60·0°, on Aug. 21st. There was a cold October, with a rapid fall of the 4 ft. thermometer, after which the temperature remained stationary for several weeks.

1893 began with a week of intense cold, the thermometer in the shade attaining a minimum of 12°, on Jan. 4th. The temperature at 4 ft. depth sank to a minimum of 39°, on Jan. 22nd. After this, however, milder weather set in, and the spring and summer were very warm and dry. The 4 ft. temperature rose steadily and rapidly, and in several weeks of the spring and summer was 5° or more higher than it had been in corresponding weeks in the year before. The highest temperature attained by the 4 ft. thermometer was 63·5°, on Aug. 20th, 3½° higher than in either the preceding or the following year. Although late autumn was cold, a good deal of the extra heat received in

* Not reproduced.

the warm summer of 1893 seems to have been stored up in the deeper layers of the soil, for the 4 ft. temperature in the following winter—Jan. and Feb., 1894—did not fall so low by 3° as it had done in either of the preceding years. In consequence, perhaps, partly of this underground store of heat the early spring of 1894 was remarkably forward up to the middle of April; but then a cold and wet period set in, marked by a concavity in the curve of ascent of the earth temperature. The highest temperature attained at 4ft. depth was 60·1, on Aug. 8th and 9th. Late autumn was mild, and the curve of 1894 then again rose above those of previous years.

I have spoken of the storage of heat in the deeper layers of the soil, *i.e.* below the 4 ft. level. That such storage takes place is shown by the circumstance that in winter time, when the temperature at 4 ft. depth is higher than the mean temperature of the air, and also than the temperature at 1 ft. depth, daily observations show that a rise in the 1 ft. temperature is followed by a rise in the 4 ft. temperature, even when the latter is already higher than the former. Under such circumstances the 4 ft. temperature marks the fluctuating level of the resultant between the supply of heat from below and the loss of heat at the surface; when the loss is lessened the level of the ground temperature rises, just as the level of the water rises in a well when pumping, though not discontinued, is reduced below the yield of the springs.

Another point shown by daily observations is that the temperature of the ground at 1 ft., and, still more, that at 4 ft. in depth, not only have a less range and fewer fluctuations than the mean daily temperature of the air, but also that in their movements the ground temperatures lag behind the latter. Any notable change in the daily mean temperature of the air is followed one or two days later by a change, similar in direction but less in amount, in the 1 ft. thermometer, and in about four days by a corresponding but still smaller movement of the 4 ft. thermometer.

Daily observations of the 1 ft. and 4 ft. thermometers during the frosts of February, 1894, and of January and February, 1895, have illustrated how the loss of heat in the superficial layers of the soil is retarded by a covering of snow. During the frost of 1894 the ground was unprotected by snow, but during that through which we have been recently passing it has been covered with a layer of loose powdery snow about 3 in. deep; and although the cold period this year has been much more prolonged than that of last year, the fall of the temperature of the ground at 1 ft. and 4 ft. depth has been markedly slower.

To give figures. During the six days of frost (Feb. 17th–22nd, 1894), the mean temperature of the air averaged 8·26° daily below that of the earth at 1 ft. During the six days (Jan. 25th–30th, 1895), the mean temperature of the air averaged 12·18° daily below that of the 1 ft. thermometer, a difference of nearly 4·1° greater than that in 1894. During the same periods the 1 ft. thermometer fell, in 1894, from 41·6° to 35·8°, a fall of 5·8° or 0·94° daily; and, in 1895, from 37° to 34·9°, a fall of 2·1° or 0·35° daily. The fall of the 1 ft. thermometer as compared with the difference between it and the mean daily temperature was, in 1894, 1° fall to 8·6° difference, and, in 1895, 1° fall to 34·8° difference; a ratio not one quarter as great as that of the previous year.

During the same periods the mean daily difference between the temperature of the air and that indicated by the thermometer at 4 ft. depth was 12·3° in 1894, and 17·2° in 1895. Allowing three days for the retardation of movement of the 4 ft. thermometer, it fell, between Feb. 20th and 26th, 1894, from 43·2° to 41·8°, a fall of 1·4°, or 0·23° daily. Between Jan. 28th and Feb. 3rd, 1895, it fell from 41·2° to 40·1°, a fall of 1·1°, or 0·18° daily. The ratio of the fall of the 4 ft. thermometer to the difference between it and the mean temperature of the air was 1° to 52·8° in 1894, and 1° to 95·5° in 1895. Thus the protective effect of the snow against cooling of the ground is, as we might expect, less manifest at a depth of 4 ft. than at that of only 1 ft.

In order to render the comparison with 1894 stricter, I have taken above only the first six days of the present frost; but if we take the whole period from Jan. 25th to the present date for comparison with the six days (Feb. 17th to 22nd, 1894) the figures come out still stronger. During the period of twenty-five days (Jan. 25th to Feb. 18th) the mean temperature of the air fell below that of the 1 ft. thermometer, on an average 10·65° daily. During that period the 1 ft. thermometer fell from 37·6° to 32·6°, a fall of 4·4°, being at the rate of 0·17° daily, or 1° for 62·6 day degrees of difference, against 0·94° daily, or 1° to 8·6° of day difference during the frost of 1894. Allowing, as before, three days for the retardation of the 4 ft. thermometer, it was, from Jan. 28th to Feb. 18th, on an average 16·6° above the mean temperature of the air. During that period it fell from 41·2°, on Jan. 28th, to 38·3° on Feb. 19th, a fall of 2·9°, being at the rate of 0·14° daily, or 1° to 120·3° of day difference, against 0·23° daily, or 1° to 52·8° of difference in 1894.

In these remarks, what I have called the "mean daily temperature" is the mean between the highest and lowest readings of a Six's registering thermometer during the previous twenty-four hours, taken at 9 a.m, daily, and referred to the previous day. It is probably somewhat higher than the true mean, since at this time of year the night is longer than the day.

After reading the earth thermometers, care was of course taken to replace the snow over them to its former depth. During the latter part of the above period of Jan. 28th to Feb. 18th, 1895, the thickness of the layer of snow above the thermometers gradually diminished, and a partial thaw on Feb. 18th caused it to disappear.

123.—Notes on the Opening of some Tumuli on the South Downs.

By H. C. Collyer.

(Read May 21st, 1895.)

In the spring of 1893 my attention was called to a series of barrows, situated on a ridge of the South Downs, near the valley of the Arun; one of them had just been destroyed by the construction of a dew-pond, and a skeleton in perfect preservation was found in it, and, as others had been destroyed before from various causes, I obtained permission to examine the remainder.

The barrows were of two clearly-defined varieties belonging to widely different periods. Those of the earlier date were very large round barrows, formed either of flints or earth, piled on the natural surface of the ground, which showed traces of the fire used to consume the body; and in them were found bronze articles, and urns of coarse pottery usually containing ashes. They are in all probability of Celtic origin, and belong to the period immediately preceding the Roman occupation.

The barrows of this date, which consisted of flints, have been removed during the last few years for the sake of the flints; the outlines only of one or two remain to show their position. The workmen engaged in their removal found in all of them pottery, and in some bronze implements. In most cases the urns were broken to pieces, and the fragments not preserved; but I have obtained one urn and some fragments of a larger one, and also a bronze implement, all of which, I am informed, were so found, and which are on the table.

Two barrows formed of earth still remained, and one of these had never been disturbed until it was opened in the presence of some members of this Club the year before last, when were found pieces of glass and bronze partly fused by heat, a quantity of ashes, and some coarse pottery; the bronze staple of a shield remained intact, and some fragments of glass retained their form sufficiently to show that they were pieces of a glass cup with a handle.

The other round barrow is the largest in the district, and is known as "The Burgh," but it has at some time been dug into at the centre, and the earth thrown roughly out, leaving a great hole. I sunk two pits in the undisturbed edge of the barrow in the hope of finding some secondary interments, but only found a layer of ashes, which covered the surface of the ground on which the tumulus had been thrown up. This contained bones of the ox and pig, which had evidently been the remains of a funeral feast, roasted at the fire which consumed the body.

The principal contents of the barrows had been removed by those who dug into it in the first instance, and it is a matter for regret that it should have been disturbed in the way it was, as from its size this tumulus must have been the memorial of some chieftain of importance.

The disturbance of this and some other barrows must have taken place a long time ago, as the turf over them was from two to three inches thick; and it would be of interest if any of our botanical members could inform us of the rate of growth of turf on a dry exposed situation like the chalk downs.

The barrows of later date are much smaller than the preceding, being shallow mounds about 25 ft. in diameter, with a slight depression in the centre; and, on digging into them, a grave is found excavated in the chalk, in which the body has been laid. They are Anglo-Saxon graves, and eleven all together were dug into; of these only four had not previously been disturbed. One contained the perfect skeleton of a man 6 ft. 3 in. high, with the skull cloven by a sword cut; it lay with the head due south, and no weapons were found with it. Another close by contained the skeleton of an old man, the teeth of which were worn down nearly to the stumps, but not in the least decayed. Under the head was an iron knife, and a bronze pin was on the breast, used apparently to fasten a cloak. Traces of a wooden staff could be seen. The head was to the west. Two others contained the skeletons of women in a much decayed condition. The only ornaments found were a shell armlet and an iron bead. The heads of both were to the west.

A fine barrow of this description, which showed no outward sign of its having been disturbed, was found to have been rifled and carefully restored to its original shape; but part of the skeleton remained, showing that it had belonged to a man of gigantic stature with a very thick skull. A fragment of an iron weapon, probably the point of a spear or dagger, had eluded the search of the former investigators. The turf on this barrow was very thin, so probably it had been opened in recent years.

Six others proved to have been opened before, as they contained only displaced bones; but in three the leg-bones retained their position, showing that the body had been buried with the feet to the north. The graves lay north and south.

An unusually large mound of Anglo-Saxon date was partly opened when the members of the Club were there, when several undisturbed skeletons were found lying head to foot in trenches, with earth and flints piled over them; and in part of the mound which had previously been dug into I found a very large quantity of bones, heaped together in confusion, and have since ascertained that this was done about twenty years ago in digging out rabbits which had burrowed into the mound. All the skeletons found were remarkable for the splendid condition of the teeth, and the stature of the men indicated by the size of the bones. These lay with the heads to the south.

Near the barrows, on a crest of the hill in a prominent position, is a pool of water shaded by a clump of aged hawthorn trees. This pool is stated to be never dry, and is called "Friday's Church." There is a tradition that an altar once stood there, dedicated to St. Friga, and it is supposed that this alludes to Freya or Friga, the Teutonic goddess who presided over springs of water.

Close by is a very large tumulus, about 90 ft. in diameter, which showed no sign of ever having been disturbed, and I went down at the beginning of this month purposely to open it; but after three days' hard digging, trenching it across and sinking down through 5 ft. of clay to the chalk, no trace of any interment could be found; the mound itself consisted of flints and mould resting on the clay, which there forms the summit of the hill, and from its position it may have been a mound thrown up for religious purposes.

I find recorded instances in that district of several similar mounds being excavated in the expectation of their being sepulchral, but no traces of interments were found; and the Rev. E. Cartwright, the continuator of Dallaway's 'History of Sussex,' considers that such mounds were of religious import, and were places of sacrifice; they were all similar in size, and agree in having a sort of platform of flints or puddled clay and chalk in the centre.

Another mound, which I dug into last autumn, had a most carefully prepared floor of clay and chalk mixed, but the only finds were some fragments of coarse pottery resting on it. These fragments of pottery abound in the soil in the neighbourhood of the barrows.

The pool called "Friday's Church" is not a spring, but resembles the dew-ponds used on the downs to collect the rainfall, and which are believed to maintain their level by the condensation of dew; certainly they only dry up in very hot summers. In this case, from the clay soil there can be no leakage, and the shade of the surrounding bushes would prevent much loss from evaporation.

Further along the ridge is a solitary hawthorn called "Friday's

Tree," with two dry water-holes near it. This and the clump by "Friday's Church" are the only trees of any sort on that spur of the downs.

It has been remarked how closely the hawthorn is associated with the settlements of the Anglo-Saxons, as they used it to enclose their households; hence its name (Anglo-Saxon "haigh") is the root-word from which is derived "ham," the termination of so many English place-names, whence "hame" and "home."

The district in question is an unusually secluded one, therefore tradition has been very persistent, and there may be some grounds for the tradition as to the name of this place. As an instance of how such a story may linger: at a village a few miles from there, called Washington, a vague story had always been current amongst the villagers of a great treasure having been buried in the neighbourhood; and about thirty years ago, in ploughing land from which an old barn had been cleared away, there was found a large earthen vessel containing three thousand silver coins of the reigns of Edward the Confessor and Harold, all in good preservation; many of these were sent to the British Museum.

All through England the oldest surviving traditions refer entirely either to the period of the Danish invasions or to the handiwork of the Anglo-Saxons, and, although a neighbourhood may abound with Celtic or Roman remains, no traditions exist with regard to them except to refer them to supernatural agency, or to give them names ascribing them to a later date, as in the case of Cissbury (which is but a short distance from the barrows in question), and of the various Roman stations and roads. The names of some of the rivers can be traced to Celtic origin, and the term generally used for the hill valleys, *i.e.* "coomb," is distinctly Welsh ("cwm") with a different spelling.

So secluded is the district in question even now that there are no roads to some of the farmhouses, they being reached by a trackway over the downs. One of the farms was during the Middle Ages a lepers' settlement, and the track leading to it is still called the "Lepers' Way," and an old cottage at the farm is pointed out as one of their dwellings. In the village church is a lepers' window, through which the sacrament was handed to them. It seems surprising that leprosy should have existed in this country to the extent indicated by these traditions.

The villagers have an idea that a golden calf is buried somewhere on the hills. What can be the basis of this tradition it is difficult to guess; but when the members of this Club were down there the natives all thought we were looking for that golden calf, and made enquiries as to whether it had been found.

The ridge of hill on which the barrows are situated is divided from its continuing ridge by some remarkable banks of earth of considerable height; they do not enclose a definite area like an entrenched camp, but seem to mark a boundary. There is no tradition about them, and they may be Celtic tribal boundaries such as are found in Wiltshire. Across the crest of the ridge the bank is double, with a deep ditch or fosse between the two, and a single bank extends for a long way on either side.

On the next hill is a fine entrenched camp of irregular form, and about one hundred yards in diameter, and within the enclosure are numerous small barrows. On the north-eastern side of the hill are about seventy cup-shaped depressions; the three upper ones next the camp entrance are evidently for storing rain-water, being 63 ft. in diameter and very deep; eight others, about 40 ft. in diameter, might have been used for the same purpose; but the remainder, from 20 ft. to 36 ft. diameter, could not have been so used, as they dip with the slope of the hill. Here is probably the site of a well-preserved British village, such as have been found and described in other chalk districts. Sir R. C. Hoare, in his 'Ancient Wiltshire,' calls similar remains "pond barrows," and considers them to be sites of British habitations. He says:—"I suppose the shallow excavation to be the area of the hut, and the low surrounding vallum the basis on which the superstructure rested, consisting of long-rafters meeting at the top over the centre of the area, like a pile of hop-poles; and these, being strengthened and closed in with boughs and thatch, formed the habitation." The ancient writers state that the Britons sometimes lived in holes in the ground, and that their huts were covered with skins of animals or boughs of trees.

So far as I can ascertain, this particular site has never been described, but a somewhat similar one near Goodwood, which does not now exist, was described by Mr. Saul in 'Notitia Britannica,' and this consisted of fourteen pits. The whole site would doubtless repay investigation, and I hope to be able to get permission to dig there. I am informed that the only attempt made has been the removal of about twenty feet square of turf within the enclosure, where a few Roman coins were found.

The Roman road (Stane Street), traceable from near Dorking through Ockley, and again at Billingshurst and Pulborough, runs in nearly a straight line across the downs on the other side of the Arun valley towards Chichester (Regnum), where, according to the Saxon Chronicle, the South Saxons, under Ælla, landed towards the end of the fifth century (at Cymeus-ora, now Wittering, in 475 A.D.), and in 491 A.D. took and destroyed Pevensey (Anderida). Their line of march must necessarily have been along the open country of the downs, as the Roman roads ran towards the north; the level country between the hills and the sea was intersected by tidal estuaries which are now meadows, and the great forest of the Weald would prevent progress through it. Hence possibly their first settlements were made on the downs; the circumstances of the interments there all seem to indicate that they were made before the introduction of Christianity amongst them.

The village church contains a Saxon arch, and also Roman tiles built into the walls, and it stands just outside an immense wall of earth, which forms a fortified camp by cutting across the neck of a peninsula of high ground jutting into the marshes, which were at one time a tidal estuary, thus making an admirable defensive position. This camp is of Celtic origin; a large canoe found here some years ago is preserved at Lewes Castle, and another still exists under the meadows close by; the end of it can be seen when the adjoining ditch is cleaned out, but it would not be feasible to dig it up, as so doing would spoil the meadows. These canoes are formed out of the trunk of a large tree, in the method adopted by savage races at the present day. The space within the camp is an arable field, and although nothing has been turned up by the plough there, I hope at some time, when the crops are off the ground, to sink a trench near the wall to see if anything of interest can be found there. I am informed that in building a cottage just outside the wall both bones and Roman tiles were turned up.

It will be seen that the net result of exploring this series of barrows is exceedingly small, and I am sorry to have such meagre facts to put before you. The uncertainty as to whether a barrow had been opened before or not adds a decided sporting element to the investigations, but leads to frequent disappointment. There were four or five, however, which had been dug into so roughly that it was obviously not worth while to trouble about them.

124.—The Protective Methods of certain Larvæ.

By Edward Lovett.

(Read September 17th, 1895.)

The larvæ of Lepidoptera are remarkable for the varied methods they possess for their self-preservation. Those that are covered with hair, often of a very powerful urticating nature, have few, if any, enemies, excepting the ichneumon flies. Birds and animals give such larvæ a wide berth. Those larvæ which are borers, and live either in the trunks, stems, leaves, or capsules of trees and plants, also escape to a very great extent from the attacks of outside enemies.

Of the smooth and outside-feeding larvæ, several means of self-preservation are adopted. Some fall from their food-plant suddenly on the slightest alarm, either curled round tightly or extended at full length; others, which live on tall trees, let themselves fall attached to a silken thread, by which they regain their position slowly when the danger is past.

Many of the larvæ of the Sphingidæ hold firmly on to their food-plant, whilst they throw back their head and cephalic segments, frequently waving from side to side, in a menacing attitude. The privet hawk, the eyed hawk, &c., are fair examples of this; whilst the curious larva of the puss moth, *C. vinula*, not only acts in this manner, but has also the power of lashing out with two filaments which are exserted from two tail-like processes, for the purpose, no doubt, of driving off ichneumon flies.

Certain brightly coloured larvæ, such as the cinnabar, are so acrid to the taste that no bird will touch them, nor do they appear to suffer much from the attack of ichneumon flies. Their bright colours are supposed to act as a kind of signal to warn their enemies that they are not good to eat.

The most interesting group, however, of all is that in which the larvæ depend for their protection upon their mimicry, or their resemblance to some inanimate object; and of these the loopers, or Geometrina, are the most remarkable, resembling, as most of them do, the stems and twigs of various trees and plants.

To describe these would be beyond the scope of these notes, but a week or two ago I tried an experiment with one of these, which was not without interest. I was sitting writing in my room when I noticed, on some flowers in a bowl on my table, a bright green geometer larva; I do not know the species, but it was on some nasturtiums, the stems of which it exactly resembled. This larva was holding on by its anal claspers, and waving its body about, apparently searching for its food-plant. I touched it with my finger, and it instantly became rigid; the prolegs were folded forwards close to the body, and the cephalic or head-segments were contracted. It remained in this attitude, exactly resembling a broken stalk of the nasturtium, for a minute and a half, when it very slowly extended its segments, unfolded its prolegs, and slightly waving its head, the waving gradually extending to the whole body, until it once more became very energetic. I again touched it, and instantly it re-assumed the appearance of a stem, remaining precisely in the position it occupied when touched. I now bent the animal's body into various curves, and in most cases it allowed its muscles to follow the deflection of the segments, remaining in the different bends into which I placed it. No amount of irritation seemed to alter its determination to remain for all intents and purposes a twig. The first time I touched the insect it remained feigning death for a minute and a half, but after worrying it as I have described, it remained motionless for nearly five minutes.

125.—The Fertilization of Flowering Plants: some Methods of Pollination.

By W. Murton Holmes.

(Read October 15th, 1895.)

If we examine a complete flower, such as that of the almond, we find it is composed of four whorls of modified leaves, the outer one constituting the calyx, the next in order is the corolla, then come the stamens, and the pistil occupying the centre. The pistil is made up of one or more carpels, containing the ovules, which after fertilization develop into seeds. On the upper part is placed the stigma, an expansion of loose tissue covered with papillæ, or frequently by hairs, generally placed on a kind of stalk called the style. When fully developed the stigma secretes a sugary fluid, which serves to retain the pollen-grains which fall upon it, and subsequently promotes their development. The stamens consist of pollen-sacs or anthers placed at the end of a stalk called the filament.

The whole of these parts are not found in all flowers. In some cases we have flowers consisting of stamens only, or of pistils only, as in the catkins of poplar, willow, oak, and hazel; in others the corolla is absent, and in others there is neither calyx nor corolla.

Pollen-grains are of various sizes and shapes, being globular, oval, or angular, and the surface is frequently ornamented by spines, or pitted and furrowed in an endless variety of ways. In some cases they remain in groups of four, as when first formed, and in most orchids the whole of the contents of the pollen-sacs remain joined together in masses, termed pollinia. When a pollen-grain falls upon the stigma its inner layer protrudes one or more tubes, called pollen-tubes, through the outer coat. This tube continues to grow through the tissue of the stigma and style until it reaches the ovule, which it penetrates, and there fuses with the egg-cell, which afterwards develops into the seed.

In the Gymnosperms, which comprise such plants as firs and larches, there is neither ovary nor stigma, and the pollen is brought directly into contact with the ovule. The observations of Darwin, extending over a period of thirty-seven years, proved that the best offspring is produced when the pollen of one flower is applied to the stigma of another flower, either of the same plant or of the same species. This is called cross-fertilization, and is the rule with the great majority of flowering plants. On the other hand, some plants are so modified as to ensure self-fertilization, as in the violets, where, in addition to the ordinary flowers, there are inconspicuous ones which do not open, but yet produce seed.*

There are many contrivances for hindering or limiting self-fertilization on the one hand, and of facilitating cross-fertilization on the other; or, finally, in default of cross-fertilization, of ensuring ultimate self-fertilization.

Plants may broadly be stated to be either wind-fertilized, which is generally the case in those with inconspicuous flowers, or the pollen is conveyed to other flowers by the agency of insects, which are attracted to them by their bright colours, size, perfume, or by their secretion of honey. As an example of wind-fertilization may be cited the case of the conifers. Here the stamens and the ovules occur on different flowers, and frequently on different plants. The stamens are arranged as little spikes or cones formed of scales, the edges of which are slightly turned back, forming a depression or shallow trough in which the pollen from the stamen immediately above is deposited. When a gust of wind comes the pollen is dispersed in clouds of yellow dust,—sulphur rain as it has been called. Something similar occurs with the yew. Here the connectives of the anther-lobes terminate in a kind of shield with the anthers on the under surface, and, as several are joined together, they form roundish heads. When the weather is at all damp they lock closely together, but under the influence of a warm dry atmosphere the shields contract, allowing the pollen to make its way through the chinks when the branches are shaken by the wind.

Very early in the spring, almost before winter has departed, it is a great pleasure to see once more the drooping catkins of the hazel, and on a closer search the beautiful crimson stigmas of the female flower will be discovered. When the pollen is ripe it is blown away in clouds, some of it falling upon a neighbouring stigma, and when all the pollen is shed the catkin falls off. Most of our forest-trees, such as the oak, beech, ash, chestnut, elm, and walnut, are fertilized in this way, and in these cases the flowers come to maturity before the leaves are fully developed.

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* These generally grow in situations where insects are scarce, as in damp woods, &c.

A striking instance of the temporary storage of pollen occurs in the arrow-grass, a plant growing in marshes and on the margins of ponds. The development of the stigmas precedes that of the stamens by two or three days. During the period that the stigma remains in a receptive condition the anthers remain closed, and only open when the stigma has faded. Underneath each stamen is a deeply concave perianth-leaf. When the anther opens the pollen falls into this receptacle, and in the meantime the perianth-leaf becomes less closely adherent to the axis, so that when a puff of wind comes the pollen is shaken out and dispersed.

Another remarkable case of wind-fertilization occurs in the *Vallisneria spiralis*, a plant growing under still water and often cultivated in aquaria. The female flowers are borne on a long spiral stalk, which is pushed above the surface of the water when the stigma is ripe. The male flowers are produced abundantly, and, becoming detached from the plant, rise to the surface. At first they are closed and globular, but soon open, showing a pair of stamens covered with sticky pollen, projecting obliquely, the sepals forming little boats, which are blown here and there by the wind, until it happens that one of the anthers comes into contact with the stigma of the female flower, and there deposits the pollen. Directly after the adhesion of the pollen the female flower closes and is withdrawn to the bottom by the contraction of the spiral stalk, and there ripens the seed.

The grasses, among which are included wheat, barley, oats, and reeds, are also fertilized by the agency of the wind. Here the anthers swing freely from the flowers at the extremities of their filaments. The anthers open by means of a slit near the bottom, the dry pollen falling into the little cup formed by the recurved portion of the anther-lobe, and as this is blown away by gusts of wind, more pollen takes its place until the whole is discharged, when the anther shrivels and drops off.

In the foregoing cases the wind is said to be the agency whereby fertilization is brought about, but as many insects are great consumers of pollen, it is possible that fertilization may also sometimes be due to them, as they pass from flower to flower, and shake the pollen from the stamens. In all cases of wind-fertilization there is evidently very great waste of pollen, much more being produced than can by any possibility be utilized, the chances being so much against the pollen-grains being deposited on the right spot; but as insects became more and more accustomed to visit flowers, the latter also adapted themselves to this circumstance, becoming more brightly coloured, giving off a fragrant odour, and moreover secreting honey, so as to give a fitting welcome to their insect guests. A further development would be necessary for the shelter of honey from rain, and so lead to its being hidden in tubes and spurs, and only accessible to the visits of particular insects. The lines and markings we find on many corollas all serve as guiding marks to the honey, and they are absent from flowers which open at night. Sprengel, in 1793, was the first to show how much plants are dependent on the visits of insects, and to point out that the forms and colours of flowers are adapted to ensure and profit by those visits. To give an instance, many years ago red clover was introduced into Australia, and for some time did not produce any seed, the humble-bee, which was in the habit of visiting the flowers, not having been introduced with it; but since this insect has become naturalized the red clover flourishes and produces seed in abundance.

The legs of bees are admirably adapted for collecting pollen by means of the brush-like tufts of hair that cover them. The proboscis is also long, and can be inserted into tubular flowers.

There are many contrivances exhibited by flowers to keep away unwelcome visitors, such as the wingless forms of insects, which cannot readily pass to other flowers; among these are viscid glandular hairs, as in species of *Dianthus*, *Silene*, and *Plumbago;* or tufts of hair, as in the periwinkle and cow-wheat; or extreme smoothness of surface, as in many orchids; or the mouth of the flower is contracted or even closed, as in the antirrhinum. Flowers in most cases are accessible to winged insects only, and it is only when a large number of small flowers are grouped together in close proximity that creeping insects find a welcome.

But it will be said that insects visit all kinds of flowers, and will therefore take the pollen from one flower and deposit it on another of a different species. So indeed they do, and when the species are nearly related hybrids are produced; but insects visit flowers of the same species as long as they can, as was observed by Aristotle with respect to the hive-bee more than 2000 years ago. Darwin suggests that the cause of this is that they are probably able to work more quickly, that they have just learned how to stand in the best position on the flower, and how far and in what direction to insert their probosces. One point must be noticed, that bees are sometimes so anxious to save time that they bite a hole through the base of the corolla to save themselves the trouble of inserting their probosces into the opening; but, as Darwin points out, it is chiefly flowers growing in crowded situations that are thus perforated (short-tongued bees).

One of the most frequent methods of securing cross-fertilization is when the stamens and pistils attain their functional activity at different times; the stamens in some cases and the pistils in others. The flowers of *Arum* and *Aristolochia* are examples of the latter, and both are visited by flies and midges. The insects push by fringes of hairs pointing downwards, and thus give easy access to the interior, but once inside they are caught like a mouse in a wire-trap. The stigmas of these flowers are ready to receive pollen on their entrance, and if they have previously visited a similar flower they are covered with pollen, which becomes attached to the stigmas as they crawl over them. After a day or two the stigmas fade, the anthers then ripen and discharge their pollen, covering the imprisoned insects. The hairs which prevented the return of the insects now wither, leaving an opening for them to escape. Other flowers are then visited with the same result.

Some plants, such as the primrose, have two forms of flowers, others have three forms. In one form the stamens are long, and appear at the throat of the corolla, while the style is short. In the other form the style is elongated, so that the stigma projects from the throat of the corolla, and the stamens are short. To ensure fertilization the pollen of one form must be placed on the stigma of the other, and this is brought about by means of insects.

Interchange of position of anthers and stigmas is another contrivance frequently met with. The common pink is an example. The stamens are first developed, and, after shedding their pollen, the stigma begins to grow, and to occupy the same position, projecting beyond the throat of the corolla. An insect that has visited a flower in the early stage must inevitably deposit the pollen on the stigma of the flower when in the later stage.

The grass of Parnassus is another example. Here there are five anthers, each of which in turn occupies the centre of the flower, and after discharging its pollen bends back out of the way. An insect in search of honey alights on the centre of the flower, and is certain to rub its proboscis against the particular anther which has that day set free its pollen, and will thus convey some of it to a flower in which the pistil has developed.

In *Geranium pratense* the anthers open and expose their pollen in turn at the centre of the flower, whilst the stigmas still remain folded together; but as soon as these begin to separate the anthers fall off, and the mature outspread stigmas are surrounded only by the needle-like filaments,

The manner in which insects are sprinkled with pollen when visiting the violet is peculiar. The flower is irregular, and has its mouth directed sideways. The cone of anthers is set over the lowest petal, which is prolonged at the back into a hollow spur containing honey. In this spur is a prolongation of the anthers. In order to suck the honey a bee must push under the cone and run its proboscis along the channel of the spurred petal, where it disturbs the spur of the anthers, and its proboscis is immediately sprinkled with pollen. On its entrance any pollen which the bee may have brought from another flower is deposited on the small lip of the stigma, which then closes, so that pollen from its own flower is prevented from entering when the bee withdraws its proboscis.

Some of the Papilionaceæ, such as the bird's-foot trefoil, have a kind of piston-apparatus. The free end of the keel forms a hollow cone, open at the apex, and closed by the dilated ends of the stamens. When the keel is depressed by a bee alighting upon the flower, the stamens, being fixed, are forced further into the conical cavity, and expel some of the pollen through the orifice on to the under side of the bee, and is again deposited on the stigma of an older flower. In the broom the same effect is produced with explosive effect when the flower is visited by a bee.

In *Salvia* there is a remarkable modification of the stamens. Here the two anthers are separated from each other by a very long connective articulated to a firm erect filament so as to form a lever. When a bee enters the flower it pushes against the short arms of the lever, so that the long upper arms fall and deposit the pollen on the middle of the bee's back. And here let me mention that bees generally visit the lowest flowers on a plant first. In the case of *Salvia* these are first developed, so that the styles in the uppermost flowers are not in a receptive condition as early as the lower; consequently the bee will remove the pollen from the last visited flower of one plant to the lower flower of another where the style occupies such a position as to come into contact with the bee's back, and so becomes fertilized.

The stigmas of *Mimulus* exhibit sensitive movements. When the pollen is deposited by an insect on the lower lip of the stigma, which stands in its way when it enters, the two lips immediately close together like the leaves of a book. When the insect withdraws its proboscis there is no chance of the pollen, which it is taking from the anthers, getting into the interior of the stigma, since the stigma is still shut up, and no longer stands in the way of the insect.

The orchids exhibit great variety in their arrangements for promoting the access of insects.

In *Phalænopsis* the smooth labellum has a little projection which serves as a footstool to the visiting flies. Behind the footstool is the column, the apex of which is occupied by the anther, and whose lower portion is excavated into a stigmatic cavity. Leading into this honey-lined cavity is a circular aperture or window, and projecting into the upper margin of this window is the little pointed rostellum. When a fly desires to abstract honey from the stigmatic cavity it stands on the footstool and puts its head in at the window. In doing so it touches the extremely sticky tip of the rostellum, which sticks to the top of its head—a natural booby-trap. On leaving the flower the fly drags the two pollen-masses which are attached to the rostellum out of the anther, and goes away with them on its head. It now visits another flower, and again alights upon the footstool. Meanwhile the stalk of the two pollen-masses has bent forward, and as the fly puts its head in at the window the pollen-masses are left sticking to the wall of the stigmatic cavity.

The transference of pollen to insects takes place in *Cypripedium*, the lady's slipper, in a manner altogether peculiar. Part of the flower is shaped like a slipper, and its cavity is furnished at the bottom with hairs full of sap, and which also secrete nectar. Certain small bees are in the habit of entering to feast on the hairs. Three ways are open to them: the two small orifices on either side of the column, and the large opening in the middle of the slipper, and in front of the column. They choose the last, and slip under the broad rough stigma to the bottom of the slipper. After a time they wish to escape into the open air again, but that is not so easy. The edges of the large central opening are bent inwards, and so fashioned that the bees cannot climb up them, and the bees have no choice but to make use of the two little exits at the back of the slipper. Even through these escape is not altogether easy, the bees being obliged to squeeze through the narrow opening. The result is that one shoulder brushes against the soft viscid pollen of the anther, which forms the inner border of the orifice. The last act in the story is the entrance of the insect with its shoulder covered with pollen into another *Cypripedium* flower, whose rough stigma is thereupon immediately besmeared with pollen.

Crossing between neighbouring flowers occurs when these are crowded together. In the hemp agrimony there are five florets on each head, which open one after another. Younger and older flowers are therefore always close together. The styles are divided almost half-way down into two long thread-like branches bearing the stigmatic tissue only on their lower portion. The rest of the branch is thickly covered with bristly hairs. The styles are parallel and folded together as long as they are enclosed in the anther-tube, but afterwards elongate and push their way above the anthers, the hairs brushing the pollen from the anther-tube, and it adheres in abundance on the outer side of each branch of the style. The branches soon diverge at a considerable angle, and come in contact with adjacent styles, and when the pollen is detached from the hairs it falls upon the stigmatic tissue.

The stamens of *Veronica* form a convenient resting-place for insects. Here the honey is hidden in the centre of the flower. To reach it the fly is obliged to hold on to the stamens, and so gets covered with pollen, which is deposited on the stigma of the next flower visited.

Some flowers, such as the barberry, have irritable stamens, so that when the lower part of the filaments are touched by insects attracted by honey the anther is caused to strike against them, and cover them with pollen.

Where the period of vegetation is very short, and the weather frequently bad, as in high latitudes or on mountains, such plants that can fertilize themselves will be more sure of ripening their seeds than such that must wait for insects, more especially as under these conditions insects are themselves scarce. A similar condition obtains in the desert. The Rev. G. Henslow, reporting on desert flowers, says that flowers that have been adapted to insects, and therefore endowed with conspicuous and bright-coloured, often irregular corollas, honey, and other details, have to a great extent lost these by a degenerating process.

Although cross-fertilization is aimed at, there are many contrivances to bring about self-fertilization in the case of failure—by the movements of the stamens, by the elongation and bending of the pistil, by the bending back of the style-branches, by the opening and closing of the corolla, by movements of the flower-stalk, or by co-operation of several movements.

In *Senecio viscosus* the style-branches are furnished at the lip with a bundle of collecting-hairs. As the style elongates these hairs sweep the pollen out of the anther-tubes, and leave it in a lump at the top of the tube, whence it may be carried off by insects. Soon afterwards the two style-branches, which have undergone rapid elongation, part asunder, and the pollen, if not already removed by insects, is shaken off, and falls on to the pappus-hairs, where it is caught by the barbs on their surface. The stigmatic tissue on the inner faces of the style-branches, which are now the upper surfaces, are in a position to get dusted with pollen brought by insects from other flowers. Meanwhile an elongation of every part of the flower has taken place, and the flower enters upon its third stage of development. The two style-branches curve down, and bring the stigmatic tissue into contact with the pollen sticking to the pappus-hairs, which now reach above the arms of the style.

In fool's-parsley the pistils are first developed before the corolla is expanded. The stamens are folded at the five corners of the flower-bud, and straighten out when the flower opens, finally bending inwards over the stigmas, on which they let fall their pollen.

The cases that I have brought to your notice will serve as examples of some only of the methods whereby fertilization is brought about. Probably every flower has some method more or less specially adapted to its requirements. We have seen that either cross- or self-fertilization may take place according to circumstances in the same flower, but what perhaps strikes us as most remarkable is the dependence of plants and insects upon each other, proving that there is a very intimate connection between the sciences of Botany and Entomology, and that the study of one must to a certain extent involve the study of the other.

126.—Oysters.

By Howard Martin.

(Read November 19th, 1895.)

To a superficial observer there does not appear to be anything particularly interesting about an oyster, and at first sight he appears to be an inanimate lump of gelatinous matter, leading a life of motionless monotony. But this is not so. They begin life swimming about in the water, pass through a life threatened by many dangers, and are only at last brought to maturity and perfection by constant care and labour. I believe there are forty-eight varieties of oysters described in catalogues of bivalves. But all the European oysters, except the Portuguese rock oyster, are included in the variety *Ostrea edulis*, the Portuguese and American rock being *O. angulata*.

As regards the fish itself, it is contained in an outer skin, called the mantle, closed in a kind of hood or pocket at the extremity nearest the hinge of the shells, but open at the edge. This mantle covers a large gland, in which the eggs are produced; the liver is enclosed in this gland, and the stomach is enclosed in the liver. The heart lies in a little cavity near the centre and nearest to the flat shell. The oyster breathes through four gills within the open edges of the mantle, which are furnished with cilia, which by a waving motion draw a current of water over the gills. The oyster has a mouth furnished with four lips, two on each side of the opening, from which the intestinal canal passes through the stomach and out to the open edge of the mantle.

(A series of diagrams illustrating the anatomy of the oyster and the growth of spat were shown.)

It is curious that the adductor muscle shifts its position with the growth of the shells, which takes place on the open edges and not at the hinge, so as to keep the same position relatively to the centre of the shell.

The oyster is hermaphrodite; its eggs are hatched in the mantle, and ejected fully-developed oyster larvæ or spat—at least that is the case with *Ostrea edulis;* but it appears to be established that the eggs of *O. angulata* are fertilized and hatched in the water after having been emitted. Oysters are unfit for eating and said to be "milky" when the eggs begin to form in the gland, and "white spat" is the name given to embryo oysters before being emitted from the mantle of the parent. Black spat is the perfect larval form of the oyster, having a kind of retractile cushion or pad furnished with cilia used for swimming, and a funnel-shaped collar. At this stage they are emitted from the parent. The eggs, when lying in the mantle, are oval clusters of globular atoms floating in a transparent liquid.

It is said that an oyster occupies about a week in ejecting the whole of its spat; this is done by quickly opening and shutting the shells. Mr. Frank Buckland calculated that an oyster produced from 276,555 to 829,665 spat in a season, and there must therefore be enormous waste of young oyster life to account for the comparative scarcity of oysters. Spat is emitted in May, June, July, and August in British waters, but it is probable that the greater part of spat emitted in those waters, after the early part of July, dies for want of the warm still weather necessary in the first stages of its existence. Spat having been emitted, at once rises, and often floats a considerable distance, *e.g.* young oysters are usually found in the flats outside Whitstable, in the estuary of the Thames, which have floated as spat from the stock of oysters in-shore; and it is said that an oyster-bed outside Shoreham was established by spat from oysters stored in the harbour-beds. It is impossible to say how long the spat floats in freedom, owing to the great difficulty of tracing spat to its final settlement. After a time the spat sinks, possibly from the development of the shells altering its specific gravity, and attaches itself to any clean hard surface with which it comes into contact. The various substances provided for this purpose in oyster fisheries are called "collectors." The attachment is made by the secretion which forms the shells of the oyster, which acts as a kind of cement, and "sets" on to both the shell of the spat and its resting-place.

Floating spat is easily killed by cold: a temperature of 44° is fatal; 65° or 72° is most favourable to its development. Floating spat is exceedingly sensitive to any change of condition round it. It always sinks to the bottom at the sound of thunder, and it is said that a prolonged storm usually kills it. Shrimps and small fish eat large quantities of floating spat. Shrimps, gobies, and young mullet will lie by the parent oysters in the spatting season, and eat the spat as it is emitted. In open beds immense quantities are carried away by tides and currents, or strong winds.

It has been said that spat have no choice as to their place of attachment, but I am very doubtful as to this. I have known cases where spat in enclosed ponds containing tiles, hurdles, and faggots as "collectors," has shown a decided preference for the tiles, and for the under side of the tiles when they were so placed on the bottom of the ponds as to form low pointed arches eight or nine inches in height. (A diagram was shown illustrating further development of spat and attachment to "collectors.")

The shell of the spat and of the mature oyster grows by throwing out glassy calcareous rings on the edges of the shell farthest from the hinge, and by these rings it is said the age of the oyster can be ascertained. The ages of some oysters as shown by these rings would be twelve or fifteen years; the marketable age is three to seven. (Diagram showing position in shell of mature oyster, which is occupied by the valves or shells of the black spat.) The valves of the black spat form the hinge of the mature oyster-shells.

Young oysters in enclosed ponds or similar fisheries, under close cultivation, are detached from the "collectors" when about nine months old, and placed in the "laying ground," where they obtain more food. Here they need protection—(1) because they are very light and liable to be carried away by tides, and (2) because their shells are very weak, and therefore easily opened by crabs, who are fond of eating them. In some fisheries they are placed in small ponds prepared for the purpose between high and low water mark; in others, especially in France, they are placed in ambulances (trays fitted into large boxes with gratings), and moored to suitable places. When spat is thickly attached to the "collectors," and is not artificially removed, the young oysters as they grow shoulder each other into a vertical position, until they break the attachment and free each other; but this hinders their growth and spoils their shape, and therefore their future value.

It is then important that the "collectors" should be of such materials as will allow of the young oyster being removed without injury. In open fisheries in England empty oyster-shells, called "cultch," is the kind of "collector" most in use, and probably the best in those situations. In enclosed ponds hurdles and faggots are very useful "collectors," because the bark is easily peeled off with the young oysters attached; but probably the best "collectors" are flat tiles with a coating of clay and cement. Wire-netting has sometimes been used.

Young oysters over a year are called "brood," and are saleable to be laid down in fisheries, in which oysters grow well but do not breed. It is doubtful if adult oysters will re-attach themselves after they have been once removed, but it is true that an oyster laid on its flat shell will turn itself over.

The principal enemies of the oyster are crabs, five-fingered starfish, dog-whelk or whelk-tingle, according to Frank Buckland a kind of sponge called Cliona, the spat of mussels (this is doubtful), and the blanket-weed; the last two destroy the oysters by smothering them. Sand-storms, a rush of water chilled by melted snow, or a sudden fall of snow, will also destroy the oysters. Thefts of oysters are very common, and watch-boats are necessary in most fisheries.

The food of oysters consists of very minute animal or vegetable organisms. The flavour and quality of oysters are very much affected by food, *e.g.* some oysters at Falmouth are poisonous owing to the copper in the water. If typhoid fever has been caused by oysters, it was possibly due to the dirty water in the tubs (possibly containing typhoid germs), into which the oysters are put after being brought to market. It is extremely improbable that typhoid germs impregnate oysters in the fisheries. Dirt and sewage are extremely bad for oysters, and typhoid germs do not flourish in clean sea-water. The results of experiments made by Professors Hermann and Boyce showed that oysters fed with sugar, or with flour or oatmeal, died; fed with living protozoa or protophyta, lived and throve; that the effects of stagnation of water were very deleterious; but that oysters could tolerate a considerable quantity of sewage, and live for a long time in water opaque with fæcal matter, though typhoid fæcal matter proved more quickly fatal than that from healthy subjects. No increase of the typhoid bacilli could be discovered in the oysters thus exposed to the infection; on the contrary, the bacilli appeared to decrease in the passage along the alimentary canal, and they would not flourish in clean sea-water. The presence of sewage in any quantity in fisheries has often been found to be fatal to oysters, *e. g.* more than one million and a half of oysters were destroyed by sewage in the river Median in 1871. Soil and water have a great influence over the growth and quality of the oyster.

For breeding the parents should be laid in quiet waters with an equable temperature. For fattening or growing oysters, shallow water with a strong current and a certain admixture of fresh water is best. The best soil for growing or fattening is London clay; sand or gravel is bad.

Mr. Buckland calculated the cost of the meat of the oyster per pound as 9s. 4d. for natives and 8s. for "seconds"; they would not therefore pay to eat as nourishment apart from inclination. There are two branches of oyster culture, *viz.* protecting the growing oysters from injury or theft in open waters, and collecting and protecting the spat in enclosed ponds. And oyster fisheries may be divided into four classes, *viz.:* (1) natural beds, usually more or less in the open sea; (2) beds which are partly natural and partly artificial; (3) foreshores on which "collectors" are placed to receive spat washed to them by the tides; (4) enclosed ponds supplied with sea-water by sluices. Oyster fishing on the natural banks consists in dredging up the oysters and taking them to market. This is extremely hard work. On the second class of fisheries dredging is necessary to keep them clean, and they must be kept supplied with "collectors." Oysters will live a long while out of water if laid on their round shells, and if not exposed to frost will travel very well. I believe there are few or none of the fisheries in which floating spat is collected on foreshores in Great Britain; there are many on the west coast of France.

There have been several successful attempts in England to establish oyster fisheries in enclosed ponds. The most important are Hayling Island, Herne Bay, Brading, Lymington, Cowes, and Newtown in the Isle of Wight. The ponds are enclosed with embankments of earth, in which sluices are fixed to allow of the passage of the sea-water. The bottom is formed of chalk or shingle, quite clean. The parent oysters are laid in a broad gangway across the centre of the ponds, and the ponds are fitted up with "collectors." The water is usually about four or five feet in depth.

The probable causes of the present scarcity of oysters are (1) that a succession of cold and windy summers killed the spat, or (2) that the increase of demand so stimulated the greed of the fishermen that they completely dredged away many oyster banks. The second explanation is probably correct, because oysters have been produced and attached to the "collectors" in large numbers when the temperature was by no means above the average, nor the weather in any way specially favourable. On the other hand, oyster-beds have been completely dredged away: one from the Channel south of Brighton; one three miles from the pier at Ramsay, in the Isle of Man; and one off the Dudgeon Lighthouse; and it is said there has been no quantity of Channel oysters since 1849. The great scarcity of the better class of oysters appears to have begun about 1858, and a marked rise in price accompanied the falling off of the supply. In 1855 natives fetched 41s. a bushel, in 1870 £10 2s. a bushel. It seems to be a well-established fact that when once a natural deep-sea oyster-bed has been depopulated it never stocks itself again. Before a close time was legally established oysters were dredged up and sent to market at the time when they contained their eggs, and young oysters were killed before they had spatted at all.

127.—Notes on the House-cricket (Acheta domestica).

By C. H. Goodman.

(Read December 17th, 1895.)

Soon after going to reside at my present house in Warlingham, I became aware, by their obtrusive noise, that house-crickets were also inmates of my dwelling; and, as dead ones were often swept up and brought me for examination, my attention was naturally turned to these insects. I soon found that there were many points on which I could get no information from books, and on which no one I consulted seemed sure. The following notes and illustrations may therefore be of interest, and I hope will elicit further information from those better qualified to speak than myself, as they are very defective in many particulars.

Owing to the unnatural lives led in our kitchens, the date of egg-laying and hatching seems independent of seasons; at all events young ones are found at most times. I hoped, by keeping them in a box and feeding them, to be able to study their metamorphoses. So far, however, I have been quite unsuccessful. They are nocturnal in their habits and are gregarious, and so pugnacious that they will attack and eat cockroaches.

The eggs are white and of an elongated oval shape, measuring $2\frac{1}{2}$ mill. in length. The moults are probably more frequent when young than later on, and they show that the whole skin is cast off, including the cornea of the eyes, the jaws, and antennæ; in the thorax the entire legs down to the claws. The prothorax does not seem to be split by the emergence of the insect. The abdomen would probably include the setæ, but this portion was lost in the example I examined.

Antennæ.—The most noticeable feature of the antennæ in the living insect is their extreme mobility, their supple and flexible character being exhibited in every movement. On examining one of these long filiform organs it is seen to be composed of tube-like joints, 200 in number, of varying length, and clothed with fine hairs directed towards the tip, and with a crown of them round the apex of each joint. At intervals along the antenna will be found small pits or circular depressions, which are probably organs of smell. In the illustration they are magnified 310 diameters. A transverse section of the antenna shows that it is hollow, and lined with a delicate membrane. The basal joint differs entirely from the others, being large and round with flattened sides, and carries on each side at the upper margin a large black bristle in a sloping direction. These I take to be tactile hairs. If we move the antenna of a recently-killed insect with a pin it will be noticed that when raised vertically the base of the large joint forms the hinge, but if laterally, the movement starts from the apex. I can find no trace of ocelli, though there are three conspicuous white marks near where we should expect to find them.

Trophi.—The mouths of all biting insects consist of two pairs of jaws working laterally, and an upper and lower lip. The mandibles, or upper pair, are here seen to be strong biting instruments, and it is interesting to notice that in this case they are unsymmetrical. Nothing seems to come amiss to crickets; they have been seen to drag cockroaches from their holes and devour them, and even eat boots and shoes, or their own dead companions. They also use the mandibles for excavating retreats. Below the mandibles are the maxillæ with their palpi, the labium or lower lip with its labial palpi, and also what are largely developed in the crickets, the galeæ; and, lastly, the paraglossæ, which appear like a third pair of jaws. Connected with the labium is the ligula or tongue. In its natural position this is in the mouth, and forming a hollow fleshy eminence, but when pressed out, as in the illustration, it is seen to be kidney-shaped, with radiating fibres. In common with other biting or mandibulate insects, they are provided with a gizzard, the teeth of which serve to triturate their food.

The prothorax carries the anterior legs, and it is to the tibiæ that our interest is most directed, as here are found the organs of hearing, though this sense is probably partly served by the antennæ as well. Near the middle on the outer side we observe an oval, smooth, glassy disc, while on the inner and opposite side a similar small circular one can be detected. These tympana have enlarged tracheæ and numerous nerves in their immediate neighbourhood, and that this is their office may be inferred from the fact that species without stridulating apparatus are usually also destitute of these tympana.

Elytra.—The mesothorax carries the elytra and intermediate pair of legs. In the female the elytra present no specially noticeable feature. They lie horizontally on the back of the insect, with the outer margin turned down. On turning to the male, however, two or three clear smooth spaces will be seen surrounded by strong nervures. These tympana or drums act as sound-boards, while underneath, about a third from the base, can be traced a ridge of fine teeth running half across the elytron, and then turned upward. These teeth form part of the stridulating apparatus, which is possessed by the male insect only. The broad edges of the teeth are somewhat produced at the angles, and there are all together about 230 in number. When the elytra are at rest they overlap each other, and out of twenty-four mature specimens I examined in ten males and nine females the right rested on the left, in the remaining five females the reverse.

Various explanations have been given of the method of stridulation, but only two are possible: one by the passage of the teeth of the upper elytron, over some one or more irregularities, on the surface of the lower, or by the passage of the teeth of both elytra simultaneously over the nervures of the closed wings, which near the root present a number of hard ridges, like the edges of a closed fan. It is to the first of these methods that probability inclines, for although only one elytron could act at a time, it is to be noted that in some allied species only one file exists, and therefore only one elytron could be used to produce the sound; and as in the insect under notice the right elytron almost always overlies the left, it is not improbable that the right or uppermost file only is used in producing the familiar chirping. In some species there exists in the elytron a very marked ridge exactly in the path of the overworking teeth, and an examination of the house-cricket shows that a portion of the inner margin of the elytron is turned up just at the required spot. During stridulation the legs are motionless; the elytra are slightly raised, and vibrate horizontally so rapidly that the eye cannot follow them. 24,000 vibrations per second are said to be required to produce a sound of the acuteness with which we are familiar.

We now come to the metathorax, with its wings and hind legs. The wings when folded project beyond the body of the insect, and it is owing to the method of folding that the whole of this tribe are called Orthoptera, or the straight-winged. By drawing out the wing the veins can easily be traced radiating in straight lines from the base, a strong nervure alternating with a slighter one, thus facilitating its closing up like a fan. There are also a number of cross nervures at right angles. When flying the creature has an undulatory motion, making long rising curves in the air, and then dropping again. The hind legs are composed of the usual joints, but are much enlarged to increase the power of leaping. The under side of the femur is channelled, and receives the tibia when the leg is quite closed. Both sides of the latter joint, on the hind legs, carry a set of spines directed somewhat downward and outward; while at the apex are a set of large spurs, about nine in number, and which would effectually prevent the feet slipping when a leap was made. The spurs on the anterior and intermediate legs are much reduced in number and length. The last joints are the tarsi, which have at their extremity a pair of strong claws. Immediately below the claws is a raised brown reticulated disc, which I take to be a pulvillus to assist in climbing, as I can find no other structure answering the purpose, and there is no doubt they can easily climb a wall either of smooth wood or still smoother varnished paper. They do not, however, appear to retain their hold to the sides of a glass bottle, for if placed in one, and it is slowly turned round, they either slip down the ascending side, or, if carried up, fall over on their backs.

Setæ.—At the end of the abdomen are a pair of long setæ, tapering processes directed outward and slightly upward, and are well developed even in the early stages. They are beset with long tactile hairs externally, while inside they are hollow, and are lined with a delicate membrane, and if cut while the insect is fresh will be found to be filled with liquid, which is probably blood, and which would serve to nourish the organs they bear. In addition to the before mentioned long tubular hairs of touch there are near the base on the inner side a number of short flattened hairs. These latter form a little group, arranged in irregular rows, increasing in size as they recede from the body. They are nearly erect, and are slightly concavo-convex, the hollow side facing inwards. They are probably scent-organs.

The ovipositor is carried slightly raised. It is rigid at the base, and does not appear to have any capacity for being inserted vertically. It starts from the lower side of the abdomen at the penultimate segment, and is half an inch long. It is divided vertically, and the two halves, which are not united, form, when placed face to face, a complete tube, through which the eggs are passed. A transverse section shows that each half of this tube is in itself unsymmetrical, being composed of two unequal-sized pipes, the free side of each being extended into a thin wing. The larger pipe is the lower one, and between it and the smaller upper one is a distinct dark rod, the nature of which I have been unable to detect. Down each pipe a branch of the tracheæ can be traced. The tip is enlarged, pointed, and quite solid, but the extreme end of each half is divided laterally into two lips which act like fingers, and assist in the deposition of the eggs. The lower one is thin and flat, while the upper one is larger and strengthened with ribs running lengthways. The appearance of the outer integument under a $\frac{1}{4}$ in. shows a rounded tile-like marking or rows of imbricated scales.

This terminates my notes, which I have restricted to the house-cricket, but much light might be shed on its history by a study of allied species, especially some of the exotic forms, in a living, or at all events freshly-killed, condition; and I regret that the circumstances of the case prevent my gaining more information in this manner.

It may appear to some of you that the devotion of much time to the study of so trivial a creature is unworthy of busy men and women, and that the slight information gained is useless, and therefore no compensation for it; but I would remind you of Charles Kingsley's words, when he claimed, even for the most minute natural objects, that they represented "a thought of God," and therefore, being divine, demanded our reverent attention. Furthermore it must be remembered that when the investigation of these things is carried to their furthest extent, either of the most minute or the most stupendous, the mind of man is developed and trained to a fuller appreciation and reverence of even the Creator Himself.

128.—Report of the Meteorological Sub-Committee for 1895.

Prepared by the Hon. Sec., Francis Campbell-Bayard, F.R. Met. Soc.

(Read February 18th, 1896.)

The arrangements for observing the daily rainfall round Croydon have been successfully carried out on the same plan as heretofore, but on a still larger scale than in the year 1894, and with, it is hoped, still greater efficiency. The number of stations in the printed sheet is 73, and there is one station (Chaldon) not in the printed sheet, the observations from which are quite complete, and will be found at the end of this Report. The Sub-Committee are greatly indebted to three of the observers, *viz.* Mr. Harold Smith of Kenley, Mr. James Batten of Bickley, and Mr. Francis Druce of Upper Gatton, for the increase in the number of stations. To the last-mentioned gentleman your Sub-Committee are more especially indebted this year, for he has induced numerous observers on the high ground near Reigate to send their returns to your Sub-Committee, and the value of these returns may be estimated when it is mentioned that amongst these new observers are three who have been observing the rainfall for about twenty-five years. The co-operation of these observers is a striking instance of the value which is attached to the Club's organization.

One station (Epsom College) has had during the year to be eliminated, for owing to a change in the arrangements the observations have become so unsatisfactory as to be almost useless. Though this loss is to be regretted, the district is still adequately represented by the neighbouring station of Banstead.

The monthly sheets contain all the records, with the exception of Chaldon, which have been received by the Sub-Committee, and the stations of which the records have been tabulated number 73 as against 66 in the last Report, and the number of observers is 61 as compared with 54.

Appendix I. to this Report contains the table of daily rainfall issued monthly, and of which a sufficient number have from time to time been pulled for the use of the Club; and Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from Appendix I.

The year 1895 has been a most remarkable one, perhaps the most remarkable one of the present century. The prolonged cold, which we all remember in January and February; the warm June; the remarkable equality of the mean temperatures of July, August, and September; the number of months (four) in which less than one inch of rain fell; the intense heat of Sept. 23rd to 30th; the unusually cold period of Oct. 23rd to 31st; the warm November, with a temperature higher than October, combined with the short rainfall, form a record unique during the present century.

With respect to the rainfall of the year, the smallness of the total fall is remarkable. If we take the Greenwich record for eighty years (1816–95), we find that there are only ten years in which the annual fall was smaller than in 1895, and they are as follows:—

	IN.		IN.
1837	19·11	1858	17·70
1840	16·43	1863	19·66
1847	17·61	1864	16·38
1850	19·53	1878	18·55
1854	19·01	1884	18·05

1895 ...... 19·72 in.

The Greenwich average for the eighty years (1816–95) has been carefully worked up, and is given in the table below. This shows that the deficiency in the rainfall is just $5\frac{1}{4}$ in., a very large amount. The table is as follows:—

GREENWICH.

Month.	Average 80 years	1895	± Average
	IN.	IN.	IN.
January	1·89	1·69	—0·20
February	1·59	0·15	—1·44
March	1·52	1·43	—0·09
April	1·65	1·25	—0·40
May	2·00	0·47	—1·53
June	1·95	0·19	—1·76
July	2·60	3·39	+ 0·79
August	2·33	2·14	—0·19
September	2·30	0·93	—1·37
October	2·82	2·70	—0·12
November	2·37	2·88	+ 0·51
December	1·94	2·50	+ 0·56
Year	24·96	19·72	—5·24

On examining this table it is at once seen that the deficiency arises in the first six months, *viz.* −5·42 in., and that the excess in the second six months is extremely small, *viz.* + 0·18 in. This great deficiency, if continued during the present year, must, if there is a dry summer, give rise to very serious fears as to our water-supply.

It is not proposed to go into the question of the great frost of January and February, which has been exhaustively considered by myself and Mr. Marriott in a paper read before the Royal Meteorological Society on April 17th, 1895, nor of the other phenomena of this very remarkable year, as the notes attached to every monthly sheet give short particulars of the same; but the Sub-Committee desire especially to impress on the members of the Club the slight probability that there is that there will be such another year for a long time to come.

In conclusion, the Sub-Committee desire to express their thanks to the three gentlemen who have so kindly continued their subscriptions to enable the Club to carry on its great work, and also to all the observers for their co-operation in every possible way.

THE RECTORY, CHALDON, SURREY.

Observer—Rev. G. E. BELCHER. Gauge, 5 in. in diameter.
Height of gauge above ground, 1 ft.
Height of station above sea-level, 542 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1.78	0·15	2·08	1·98	0·48	0·61	4·86	2·52	0·38	3·76	5·49	2·88	26·97

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (Highfield)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

issued monthly, and of which a sufficient number have from time to time been pulled for the use of the Club; and Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from Appendix I.

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1854	19·01	1884	18·05

1895 ...... 19·72 in.

The Greenwich average for the eighty years (1816–95) has been carefully worked up, and is given in the table below. This shows that the deficiency in the rainfall is just 5¼ in., a very large amount. The table is as follows:—

GREENWICH.

Month.	Average 80 years	1895	± Average
	IN.	IN.	IN.
January	1·89	1·69	—0·20
February	1·59	0·15	—1·44
March	1·52	1·43	—0·09
April	1·65	1·25	—0·40
May	2·00	0·47	—1·53
June	1·95	0·19	—1·76
July	2·60	3·39	+0·79
August	2·33	2·14	—0·19
September	2·30	0·93	—1·37
October	2·82	2·70	—0·12
November	2·37	2·88	+0·51
December	1·94	2·50	+0·56
Year	24·96	19·72	—5·24

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It is not proposed to go into the question of the great frost of January and February, which has been exhaustively considered by myself and Mr. Marriott in a paper read before the Royal Meteorological Society on April 17th, 1895, nor of the other phenomena of this very remarkable year, as the notes attached to every monthly sheet give short particulars of the same; but the Sub-Committee desire especially to impress on the members of the Club the slight probability that there is that there will be such another year for a long time to come.

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THE RECTORY, CHALDON, SURREY.

Observer—Rev. G. E. BELCHER. Gauge, 5 in. in diameter.
Height of gauge above ground, 1 ft.
Height of station above sea-level, 542 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1.78	0·15	2·08	1·98	0·48	0·61	4·86	2·52	0·38	3·76	5·49	2·88	26·97

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.			IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381	West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
Dorking (Denbies)	J. Beesley	5	0	6	610	West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650	Hayes Common (The Warren)	Miss Akers	5	1	0	296
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300	Keston (Bradfield)	A. Hill	5	1	0	350
Nutfield (The Priory)	J. Moffatt	8	1	2	468	Keston (Tower Fields)	G. Buchanan	8	0	9	351
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440	Farningham Hill	A. J. Waring	5	3	0	300
Upper Gatton	F. Druce	5	1	0	600	Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Merstham (Rockshaw)	W. Gardiner	5	1	0	475	Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Chipstead (Shabden Park)	J. Crerar	5	1	0	550	Bickley (Highfield)	J. Batten	5	1	2	295
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471	Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
Westerham (The Fishponds)	W. Morris	5	1	0	380	South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Knockholt (The Beeches)	W. Morris	5	1	0	785	Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Coulsdon (The Grange)	W. J. Stride	5	1	4	525	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Kenley (Ingleside)	H. Smith	8	1	0	375	Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282	New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216	Esher (Sewage Works)	W. H. Hope	5	1	0	40
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280	West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Oxshott	W. H. Dines	5	1	0	212	Surbiton (Seething Wells)	R. Hack	10	0	6	25
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290	Kingston (Sewage Works)	T. Stevens	5	1	0	25
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488	Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Sutton (Mulgrave Road)	W. Goode	5	5	6	230	Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140	Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
Beddington (Riverside)	S. Rostron	5	1	0	120	West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Waddon (Waddon House)	P. Crowley	5	1	0	156	Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130	Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146	Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Croydon (Duppas House)	Baldwin Latham	8	1	0	158	Eltham (High Street)	W. Morris	5	1	0	245
Croydon (Chatfield Road)	A. Malden	5	1	0	166	Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Croydon (Whitgift School)	A. E. Watson	5	1	0	191	Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202	Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473	Brixton (Acre Lane)	F. Gaster	8	1	0	77
Addington (Park Farm)	W. Whalley	5	1	0	268	Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21
Addington (Pumping Station)	Croydon Corporation	8	1	0	331						

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for January is 1·90 in.* January, 1895.

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	..	·03	·04	·04	·02	·03	·03	·03	·01	·03	·02	·01
2	·06	..	·10	·13	·09	·09	·11	·10	·15	·08	·10	·08	..
3	·04	·10	·04	·02	·02	·01	·06	·01	..	·02	·05	·04	..
4	..	·03	..	·01	..	·01	..	..	·01	·01	..	..	..
5	·02	..	·01	..	·02	·02	..	·02	·03	..	·02	·02	..
6	..	..	·01	..	..	·01	..	·01	..	..	..	..	..
7	..	..	..	·02	·01	·01	..	·01	..	..	..	·01	..
8	·01	..	·01	..	..	..	..	..	·01	..	..	..	..
9	·02	·02	..	..	..	·01	..	..	..	..	..	..	..
10	..	..	..	..	..	·02	..	..	..	..	..	..	..
11	..	..	·01	..	..	..	..	·01	..	..	..	·01	..
12	·20	·24	·15	·33	·27	·20	·24	·04	·18	·25	·31	·15	..
13	·35	·25	·10	·09	·08	·11	·08	·10	·08	·08	·10	·08	·04
14	·12	·18	·16	·18	·13	·13	·18	·14	·15	·18	·14	·12	·31
15	·11	·10	·05	·04	·05	·06	·04	·07	·05	·08	·08	·06	·30
16	·22	·28	·19	·22	·12	·23	·21	·21	·16	·27	·17	·19	·20
17	·02	·04	·01	·02	·02	·02	·03	·01	·01	·01	..	..	..
18	·02	..	·03	·01	·02	·01	·02	·02	·02	·02	·03	·02	·04
19	·52	·48	·46	·49	·50	·50	·46	·54	·54	·52	·50	·55	·50
20	·07	·07	·07	·05	·05	·06	·05	·05	·04	·06	·05	·08	·06
21	..	..	..	..	..	·01	..	..	..	..	..	..	..
22	·24	·15	·11	·22	·26	·21	·20	·16	·23	·22	·21	·12	·09
23	·03	·05	..	·07	·04	·05	·04	·02	·02	·03	..	·04	·14
24	·11	·23	·29	·30	·26	·19	·22	·14	·12	·10	·13	·06	·16
25	·05	..	·06	·05	·05	·04	·06	·03	·06	·02	..	·01	..
26	..	..	..	..	..	..	·05	..	..	..	..	..	..
27	·05	·05	·06	·04	·02	..	..	·03	·05	·02	..	·01	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	..	·01	..	·01	·01	..	·01	·01	..	..	..	..
30	·01	·08	..	·02	·02	·05	·06	·01	·01	..	..	..	..
31	·07	..	·01	·12	·14	·25	·10	·13	·24	·16	..	·09	..
*	2·40	2·35	1·97	2 47	2·22	2·33	2·24	1·90	2·20	2·14	1·92	1·76	1·85
†	2·40	2·35	1·97	2·47	2·22	2·33	2·24	1·90	2·20	2·14	1·92	1·76	1·85

Day of Mo.	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	MONTHLY GAUGE.	·06	..	·01	·02	..	·02	·02	..	..	·02	·02	·01
2		·17	..	·11	·18	..	·03	..	·10	·12	·07	·09	·13
3		..	..	·05	·03	·06	·02	·04	..	·01	·05	·02	·01
4		..	..	..	..	·02	..	·01	..	·01	·01	..	..
5		·03	..	·01	·01	·02	..	..	·02	..	..	..	..
6		..	..	..	·01	..	..	..	..	..	..	..	..
7		..	..	·01	·02	·03	..	·01	..	..	..	..	..
8		..	..	..	·01	·02	..	·01	..	·01	·01	..	·01
9		..	..	..	..	·02	·02	..	..	·01	..	..	..
10		..	..	..	..	..	..	..	..	..	..	..	..
11		..	..	..	..	..	..	..	..	..	..	..	..
12		·20	..	·14	·25	..	·14	·16	·15	·09	·21	·07	·18
13		·14	·29	·12	·11	·34	·18	·18	·14	·14	·12	·06	·07
14		·10	·14	·16	·15	·15	·14	·14	·15	·21	·16	·12	·12
15		·06	·06	·06	·06	·09	·06	·05	·06	·06	·04	·03	·04
16		·15	·18	·21	·22	·18	·18	·15	·20	·29	·25	·22	·23
17		..	..	..	..	..	..	·02	..	..	..	..	..
18		·08	·02	·02	·02	..	·01	·01	..	·02	·01	..	·01
19		·56	·41	·43	·43	·34	·33	·32	·36	·37	·35	·27	·29
20		·05	·04	·05	·05	·04	·07	·08	..	·07	·05	·10	·11
21		..	..	..	..	..	..	..	..	..	..	..	..
22		·17	·12	·20	·22	·05	·15	·15	·19	·19	·19	·15	·20
23		..	..	·02	·08	·06	·02	·02	·02	·03	·04	·03	·05
24		·14	·11	·10	·07	·06	·10	·07	·07	·08	·06	·07	·08
25		..	..	·05	·03	..	·04	·03	·03	·04	·02	..	·01
26		..	..	..	..	..	..	..	..	..	..	..	..
27		..	..	·06	·06	..	·03	·02	·02	·04	..	·03	·03
28		..	..	..	..	..	..	..	..	..	..	..	..
29		..	..	·03	·02	..	..	..	·01	·01	..	..	..
30		..	..	·02	·01	..	..	..	..	..	..	..	..
31		·44	..	·11	·17	..	·06	·03	·05	·11	·13	·09	·11
*	1·75	2·35	1·37	1·97	2·23	1·48	1·60	1·52	1·57	1·91	1·79	1·37	1·69
†	1·75	2·35	1·37	1·97	2·23	1·48	1·60	1·52	1·57	1·91	1·79	1·37	1·69

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld.rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms.F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·03	·02	·02	·02	·02	..	·01	·03	·04	·03	·02	..	·02	·03	·03	..	·05	..	..	·04	·05	·02	..	..	·02
2	·13	·14	·14	·13	·13	·15	·15	·01	·13	·17	·13	·10	·17	·05	·16	·15	·16	·03	·08	·10	·15	·13	·20	·21	..	·01
3	·01	..	·01	·01	·01	·01	·01	..	..	·01	..	·03	..	·13	·01	..	·02	·02	·01	·01	·02	..	·02	·02	·05	·04
4	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	·02	·01	..	·03	..
5	..	..	..	·01	..	·01	..	..	..	..	..	..	·04	..	..	·02	..	·04	..	·02	·02	..	..	..	·06	..
6	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·03	·01	·02	..	..	..	..	..	..	..	..	..
7	·01	·02	·01	·01	·02	·01	..	..	·01	..	..	..	..	..	·01	..	..	·02	..	..	..	..	·01	..	..	..
8	·01	..	·01	·02	..	·03	·01	·01	·02	·02	·01	..	·02	..	·03	·02	·02	·02	..	·04	·05	·04	·01	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	·02	..	..	..	..	..	..	..	..
10	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·09	·09	·20	·18	·15	·20	·19	·14	·06	·12	·05	·10	·07	·06	·07	·08	·13	·12	·12	..	·17	·09	·12	..	·14	·12
13	·06	·06	·11	·07	·04	·07	·05	·08	·06	·06	·07	·06	·13	·09	·05	·06	·05	·05	·02	·16	·05	·05	·07	·20	..	·05
14	·08	·06	·05	·11	·09	·10	·12	·10	·14	·15	·15	·12	·03	·10	·07	·08	·10	·09	·02	·07	·06	·07	·08	·05	·06	·08
15	·04	·02	·04	·04	·03	·03	·04	·10	·04	·03	·04	·03	·07	·06	·02	·04	·04	·04	·05	·02	·03	·05	·02	·02	·07	·01
16	·19	·15	·18	·20	·18	·20	·17	·16	·20	·23	·24	·24	·23	·18	·21	·22	·18	·15	·08	·15	·15	·16	·17	·14	·22	·11
17	..	..	·01	..	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	·01	..	..	·01	..	..	·01
18	·02	..	·01	·02	..	·02	..	·01	·02	·01	·02	..	·03	·02	·02	·03	·01	·02	..	·03	·01	·02	..	..	..	..
19	·29	·25	·30	·31	·28	·32	·30	·30	·33	·38	·39	·42	·40	·34	·37	·05	·37	·33	·26	·31	·31	·31	·33	·32	·30	·44
20	·12	·11	·12	·11	·11	·11	·09	·10	·07	·05	·05	·05	·05	·07	·05	·05	·06	·05	·03	·06	·06	·06	·08	·08	·08	·02
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·18	·18	·20	·21	·19	·16	·19	·19	·15	·23	·21	·02	·19	·14	·12	·17	·16	·20	·18	·22	·20	·11	·18	·12	·20	·17
23	·03	..	·08	·04	·10	·08	·05	·07	·03	·10	·04	·03	·05	..	·09	·11	·06	·02	·04	·04	·05	·08	·10	..	·16	·03
24	·07	·13	·04	·07	·07	·10	·08	·08	·09	·09	·09	·24	·06	·24	·08	·08	·08	·12	·14	·10	·07	·07	·08	·04	·18	·08
25	·01	..	·02	·01	..	·05	·01	·02	·01	·03	..	..	·01	..	·02	·03	·02	..	..	·03	·01	..	·01	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·05	·02	·05	·05	·08	·10	·06	·04	·06	·10	·05	·05	·06	·08	·06	·07	·01	·03	..	·09	·06	·03	·07	..	..	·06
28	..	..	..	..	..	..	..	..	..	..	..	..	..	·05	..	..	..	..	..	..	..	..	..	..	..	..
29	·01	..	..	·01	..	·01	..	..	·01	·01	..	..	..	..	..	·03	..	·03	..	·03	·02	·02	..	..	..	·01
30	..	..	·01	·01	..	·05	·01	..	..	..	..	..	·01	..	·02	..	..	·01	..	..	..	..	·01	..	..	·01
31	·10	·12	·12	·11	..	·20	·11	·20	·08	·16	·10	·10	·15	·16	·20	·22	·03	·35	·21	·23	·21	·21	·14	·24	..	·09
*	1·52	1·38	1·73	1·76	1·50	2·04	1·64	1·62	1·55	1·99	1·68	1·61	1·79	1·81	1·72	1·55	1·52	1·81	1·24	1·72	1·74	1·57	1·74	1·44	1·55	1·37
†	1·52	1·38	1·73	1·76	1·50	2·04	1·64	1·62	1·55	1·99	1·68	1·61	1·79	1·81	1·72	1·55	1·52	1·81	1·24	1·72	1·74	1·57	1·74	1·44	1·55	1·37

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for January is 1·90 in.* January, 1895.

Day of Mo.	Wimbledon (Mt.Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·03	·05	..	·02	..	·01	·02	·01	·02	·01	·04	..	·03	·04	·03	·05	·03	·01	·02	..
2	·05	·10	·07	..	·02	·01	·15	·15	·12	·14	·14	·17	·28	·18	·09	·07	·13	·16	·16	·09	·14
3	·11	·04	·01	..	..	..	·01	·02	..	·02	·03	·01	..	..	·02	·01	·01	..	..	·02	·03
4	·01	·03	..	·04	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
5	..	·02	..	..	..	..	..	..	·03	·01	..	..	..	..	·01	..	·01	..	..	·01	..
6	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	·02	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	·01	..	·01	..
8	..	·03	..	..	·01	..	..	·01	·01	·01	·01	·01	..	..	·02	·01	..	..	..	..	..
9	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	·12	·07	·09	·13	·22	·08	·14	·11	·12	·12	·08	·10	·02	·07	·07	·09	·05	·03	·11	..
13	·10	·10	·07	·19	·17	·10	·12	·09	·07	·04	·05	·05	·12	·02	·06	·03	·04	·03	·02	·05	·04
14	·04	·09	·05	·11	·08	..	·05	·08	·08	·07	·06	..	·05	·05	·06	·04	·06	·05	..	·07	·05
15	·01	·03	·02	·03	·02	·02	·03	·03	·01	·02	·02	·03	·07	·02	·03	·01	·01	·01	·05	·01	..
16	·40	·15	·09	·16	·11	·11	·10	·08	·14	·17	·19	·10	·09	·14	·15	·10	·14	·10	·13	·16	·09
17	..	·03	..	·02	·01	..	·01	·01	·01	·01	·01	·01	..	·01	·01	·01	·02	·01	·02	·01	·02
18	·01	·04	..	..	..	..	·01	·01	·01	·01	..	·01	·02	·01	..	..	..	..	..	·01	..
19	·40	·45	·39	·05	·46	·40	·48	·51	·49	·46	·45	·40	·35	·39	·40	·49	·49	·44	·48	·52	·41
20	..	·05	·04	·02	·05	·05	·03	·03	·04	·03	·03	·02	·11	·03	·05	·01	·01	·01	·01	·01	·02
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·03	·27	·12	·16	·12	·18	·14	·27	·20	·20	·25	·17	·18	·17	·14	·14	·20	·16	·03	·20	·09
23	·30	·10	·02	·03	·03	·04	·03	·04	·07	·12	·09	·05	·11	·08	·03	·06	·06	·07	·07	·12	·05
24	·06	·11	·03	·05	·06	·05	·06	·08	·10	·08	·09	·12	·15	·13	·13	·15	·14	·12	·10	·12	·11
25	..	·02	·02	·02	..	..	·02	·02	·02	·01	..	..	..	·01	·01	·01	·01	..	..	·04	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	·04	·02	·04	·04	·03	·01	·03	·07	·05	·09	·08	·08	·05	·03	·03	·07	·07	·01	·07	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	·01	..	..	..	·01	..	..	..	·01	..	·01	..	..	·02	·01	·01	..	..	..	..
30	..	·01	..	..	·02	..	..	..	·05	..	·01	..	..	..	..	·01	·01	..	..	·10	..
31	·03	·10	·05	·04	·03	·14	·05	·06	·03	·12	·11	·10	·16	·05	·14	·14	·13	·10	·02	·12	..
*	1·57	2·01	1·12	1·06	1·38	1·36	1·40	1·68	1·67	1·72	1·76	1·48	1·87	1·41	1·52	1·43	1·69	1·42	1·14	1·87	1·05
†	1·57	2·01	1·12	1·06	1·38	1·36	1·40	1·68	1·67	1·72	1·76	1·48	1·87	1·41	1·52	1·43	1·69	1·42	1·14	1·87	1·05

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.

(January, 1895.)

The month has, with the exception of a few days between the 12th and 22nd, been very cold, and the rainfall has been below the average. A very unusual thunderstorm occurred throughout the district about 10 a.m. on the 23rd. Colds and coughs have been prevalent, and there have been several cases of imported typhoid. A solar halo was seen at Wallington on 30th, and one with a mock sun at Upper Gatton on 31st. A lunar halo was seen at Upper Gatton on the 9th, and a lunar corona on the 8th. The mean temperature was at Redhill 32·2°, at Kenley 32·8°, at Waddon 33°, at Wallington 33·4°, and at Croydon (Duppas House) 33·7°, and is about 4·5° below the average. There were recorded at Woolwich 18 hours of bright sunshine, and at Wallington 31·7 hours of sunlight, which latter is 7 per cent. below the mean.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (Highfield)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for February is 1·61 in.* **February, 1895.**

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	..	·08	·04	·05	·07	·04	·05	·06	·03	..	·06	..
2	·02	..	·01	·03	·02	·01	..	·01	·01	·01	..	..	..
3	..	..	..	·01	..	..	..	..	..	..	..	..	..
4	·02	..	·01	..	·02	·04	·03	·01	·02	..	..	·02	..
5	·02	..	·01	·02	·03	..	·01	·02	·03	·02	..	·03	..
6	·02	..	·01	..	·02	..	·02	·01	·01	·04	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	·03	..	·02	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·01	..	..	..	..	·01	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	·04	·02	·01	·01	·02	·01	·02	·02	..	..	..
21	·03	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·12	·18	·07	·13	·12	·11	·13	·15	·15	·15	·11	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·02	..	·03	..	·01	..	..	·01	·01	..	·06	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	·01	..	..	..	..	..	..	..	·05	..	..
*	·32	·18	·27	·28	·28	·27	·25	·27	·31	·27	·22	·11	·00
†	2·72	2·53	2·24	2·75	2·50	2·60	2·49	2·17	2·51	2·41	2·14	1·87	1·85

Day of Mo.	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	MONTHLY GAUGE.	·11	·12	·06	·06	·06	·05	·08	·04	·06	·07	·06	·07
2		·02	·02	·01	·03	·01	..	·04	..	·03	·05	·04	..
3		..	..	..	..	..	..	..	·01	..	..	..	..
4		·03	·03	·03	·03	·03	..	..	·01	·01	..	..	..
5		·02	·02	·05	·03	·05	·04	·01	·01	·01	..	·01	·02
6		·04	·05	·02	·02	·02	..	·01	..	·01	·02	..	·01
7		..	..	..	..	..	..	..	..	..	..	..	..
8		..	..	..	..	..	..	..	..	..	..	..	..
9		..	..	..	..	..	..	..	..	..	..	..	..
10		..	..	..	..	..	..	..	..	..	..	..	..
11		..	..	..	..	..	..	..	..	..	..	..	..
12		..	..	..	..	..	..	..	..	..	..	..	..
13		..	..	..	..	..	..	..	..	..	..	..	..
14		..	..	..	..	..	..	..	..	..	..	..	..
15		..	..	..	..	..	..	·01	..	..	..	..	..
16		..	..	..	..	..	..	..	..	..	..	..	..
17		..	..	..	·01	..	..	..	..	..	..	..	..
18		..	..	·01	..	..	..	..	..	..	..	..	..
19		..	..	..	..	..	..	..	..	..	..	..	..
20		·01	·01	..	..	..	..	..	·01	..	..	·01	..
21		..	..	·01	..	..	..	..	·01	..	..	..	..
22		..	..	..	..	..	..	..	..	..	..	..	..
23		..	..	..	..	..	..	..	·01	..	..	..	..
24		·59	·17	·14	·18	·17	·07	·05	·08	·11	·11	·11	·14
25		..	..	·01	..	..	..	..	·01	..	..	..	..
26		·02	..	·01	..	..	..	..	..	..	..	·01	..
27		..	..	..	..	..	..	..	..	..	..	..	..
28		..	..	..	..	..	..	..	·02	..	..	..	..
*	·00	·84	·42	·35	·36	·34	·16	·20	·21	·23	·25	·24	·24
†	1·75	3·19	1·79	2·32	2·59	1·82	1·76	1·72	1·78	2·14	2·04	1·61	1·93

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·08	·09	·08	·08	·08	·05	·08	·07	·08	·18	·06	·23	·06	·09	·07	·05	·13	·06	·03	·11	·09	·08	·08	·08	·08	·08
2	·04	..	·04	·03	·03	·02	·02	·03	·03	·04	·02	·05	·02	·01	..	..	·02	..	..	·03	·03	..	·04	·03	·03	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
4	·02	..	·02	·01	..	·02	·01	·01	·02	·01	·01	·02	..	·01	·04	·05	·01	·05	..	·03	·02	·04	..	·02	·01	..
5	·02	·03	·02	·02	·02	·05	·02	·01	·02	·02	·02	..	..	·03	·04	·05	·03	·07	·04	·04	·02	·04	·01	·02	..	·01
6	..	..	·01	·01	..	·03	..	..	·01	·01	·01	·02	·06	·01	·02	·02	·01	·05	..	·02	·01	·03	..	·01	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·01	..	·01	·01	..	..	..	..	..	·01	..	..	·04	..	·01	..	..	..	..	·01	·01	..	·01	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·01	..	..	..	..	..	..	..	..	..	..	..	..	·05	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·02	..	..	..	..	..	..
24	·11	·15	·12	·12	·13	·13	·12	·12	·12	·19	·14	·22	·18	·11	·22	·17	..	·23	·17	·19	·18	·19	·12	·12	·10	·09
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
26	..	..	·01	..	..	·02	..	·08	·01	..	..	..	..	·01	..	..	..	·01	..	·01	..	..	·01	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·29	·27	·31	·29	·26	·32	·25	·32	·30	·47	·26	·54	·36	·32	·40	·34	·21	·47	·25	·47	·36	·38	·28	·29	·22	·18
†	1·81	1·65	2·04	2·05	1·76	2·36	1·89	1·94	1·85	2·46	1·94	2·15	2·15	2·13	2·12	1·89	1·73	2·28	1·49	2·19	2·10	1·95	2·02	1·73	1·77	1·55

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for February is 1·61 in.* **February, 1895.**

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·05	·08	·03	·05	·05	·06	·05	·08	·08	·07	·09	·14	·07	·09	·06	·05	·06	·01	·03	·02
2	·04	·02	..	·08	..	..	..	..	·02	·03	·03	..	..	..	·03	·01	·01	..	..	·04	..
3	..	..	..	..	·03	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	·03
4	·02	·01	..	..	·01	..	..	..	..	·01	..	·03	..	..	·01	·01	..	..	..	..	..
5	·04	·02	..	..	..	..	..	..	·01	·02	·03	·05	..	·03	·02	·04	·02	·02	..	·02	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·02	·01	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	·01	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·09	·10	·07	·04	·02	·05	·06	·04	·09	·08	·09	·13	·17	·06	·10	·07	·07	·06	·05	·05	·04
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..
26	..	·01	..	..	..	..	..	..	..	·01	..	·02	..	·01	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·31	·23	·15	·18	·11	·10	·12	·11	·20	·24	·22	·32	·31	·17	·27	·20	·15	·14	·06	·16	·09
†	1·88	2·24	1·27	1·24	1·49	1·46	1·52	1·79	1·87	1·96	1·98	1·80	2·18	1·58	1·79	1·63	1·84	1·56	1·20	2·03	1·14

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.) (10 a.m.)

NOTES.

(February, 1895.)

An extremely cold month, in fact one of the coldest months of this century. The rainfall has also been extremely small, in fact the smallest, with the exception of 1891, of any February for the last 17 years. Influenza has been very prevalent, and has given rise to numerous deaths. Solar halos were seen at Upper Gatton and Wallington on the 10th, and at Upper Gatton on the 26th, and a lunar halo was seen there on the 8th. The mean temperature was 27·5° at Redhill and Waddon, 27·9° at Wallington, 28° at Chipstead, 28·1° at Kenley, and 28·5° at Croydon (Duppas House), being about 10° below the February average. There were recorded at Woolwich 31·4 hours of bright sunshine, and at Wallington 64·3 hours of sunlight, which latter is 3 per cent. above the mean.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (Highfield)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for March is 1·54 in.* March, 1895.

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·03	·01	·07	·04	·02	·03	·02	·02	..	..	..	·06
2	·04	..	·03	·04	·02	·03	·03	·03	·03	·04	..	·20	·08
3	·04	·06	·01	·03	·02	·06	·02	·01	..	·02	..	..	..
4	·06	·04	·06	·07	·09	·08	·03	·07	·04	·06	·06	..	..
5	..	..	..	..	..	·06	·08	..	..	·02	..	..	·09
6	·26	·20	·15	·16	·14	·20	·17	·16	·20	·16	·05	..	·23
7	..	..	·02	..	..	..	..	..	..	·01	·03	..	..
8	·15	·18	·10	·08	·06	·10	·08	·07	·02	·09	·06	..	..
9	·18	·17	·19	·17	·12	·16	·16	·16	·17	·17	·04	·39	..
10	..	..	·01	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	·01	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·02	..	..	·01	..	·01	..	·01	..	·01	·01	·01	·02
20	·12	·12	·01	·10	·10	·10	·09	·12	·11	·10	·11	·10	·11
21	..	..	·01	·01	·01	·01	..	..	..	·01	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·18	·10	·10	·13	·10	·13	·10	·21	·12	·10	·04	·10	·13
24	·07	·02	·05	·06	·01	·02	·05	·04	·02	·02	·02	·01	·06
25	·07	·07	·03	·04	·05	·04	·04	·04	·06	·03	·06	·02	·09
26	·51	·44	·41	·27	·31	·36	·31	·32	·40	·44	·45	·41	·27
27	·39	·36	·27	·30	·19	·29	·21	·31	·21	·32	·30	·31	·20
28	·15	·10	·08	·11	·14	·12	·13	·11	·13	·13	·12	·05	·19
29	·06	·25	·16	·18	·17	·17	·17	·17	·23	·27	·25	·17	·20
30	·09	·05	·04	·06	·07	·06	·07	·07	·08	·02	·07	·05	·04
31	..	..	..	..	..	·01	..	..	..	..	..	..	..
*	2·41	2·19	1·76	1·89	1·64	2·04	1·77	1·92	1·84	2·02	1·67	1·82	1·77
†	5·13	4·72	4·00	4·64	4·14	4·64	4·26	4·09	4·35	4·43	3·81	3·69	3·62

Day of Mo.	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1		·06	..	·02	·04	·09	..	·02	·04	·03	·05	·05	·06
2		·02	..	·05	·02	..	·05	·02	·02	·03	·02	·01	·02
3		·01	..	·01	·01	..	..	·02	·01	·01	·02	..	..
4		·10	·13	·04	·03	..	·03	·03	·01	·06	·04	·02	·05
5		..	..	..	·03	..	..	..	·05	..	..	·01	..
6		·17	·14	·12	·13	·16	·11	·09	·18	·15	·11	·19	·20
7		..	..	·01	·01	..	..	..	..	..	..	..	..
8		·03	·09	·08	·08	·11	·04	·02	·09	·10	·04	·02	·03
9		·19	·13	·15	·15	·12	·08	·06	·19	·16	·11	·09	·09
10		..	..	..	..	..	..	..	..	..	..	..	..
11		..	..	..	..	..	..	..	..	..	..	..	..
12		..	..	..	..	..	..	..	..	..	..	..	..
13	MONTHLY GAUGE.	..	..	..	..	..	..	..	..	..	..	..	..
14		..	..	..	..	..	..	..	·01	·01	..	..	..
15		..	..	..	..	..	..	..	..	..	..	..	..
16		..	..	..	..	..	..	..	..	..	..	..	..
17		..	..	..	..	..	..	..	..	..	..	..	..
18		..	..	..	..	..	..	..	..	..	..	..	..
19		·03	..	·01	·01	..	..	·01	·02	..	·02	·01	·02
20		·11	·11	·10	·11	·13	·10	·08	·09	·11	·10	·05	·10
21		·01	..	..	..	..	..	..	·02	..	..	..	..
22		..	..	..	..	..	..	..	..	..	..	..	..
23		·11	·07	·10	·08	·04	·09	·07	·07	·08	·10	·08	·09
24		·05	..	·02	·01	·05	..	..	..	..	..	..	..
25		·03	·04	·03	·03	·04	·09	·07	·07	·07	·06	·04	·04
26		·37	·37	·46	·44	·39	·25	·24	·40	·39	·34	·31	·32
27		·19	·19	·24	·20	·22	·18	·15	·18	·24	·21	·21	·21
28		·04	·08	·15	·15	·12	·06	·05	·10	·11	·09	·10	·11
29		·24	·29	·25	·25	·30	·23	·20	·15	·24	·23	·18	·17
30		·05	·02	·02	·02	·08	·04	·02	·01	·02	·04	·03	·04
31		..	..	..	..	..	..	..	..	..	..	..	..
*	2·00	1·81	1·66	1·86	1·80	1·85	1·35	1·15	1·71	1·81	1·58	1·40	1·55
†	3·75	5·00	3·45	4·18	4·39	3·67	3·11	2·87	3·49	3·95	3·62	3·01	3·48

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for March is 1·54 in.* March, 1895.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·06	·04	·05	·06	·05	·06	·06	·07	·06	·05	·06	·12	·09	·07	..	·06	..	·08	·10	·08	·09	·08	·06	·13	..
2	·02	·02	·03	·01	..	·03	·02	·01	·02	·03	·02	·03	·01	·01	·02	·12	..	·05	·02	·03	·02	·03	·01	..	..	·06
3	..	..	·01	·01	..	·01	..	..	..	..	..	·02	..	·02	·02	..	..	·02	·01	..	..	..	..	..	..	·02
4	·08	·04	·05	·04	·06	·03	·05	·05	·04	·10	·06	·13	·12	·14	·10	·15	..	·02	·01	·12	·18	·14	·08	·07	..	·06
5	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
6	·24	·15	·20	·23	·12	·23	·14	·19	·09	·10	·11	·10	·09	·10	·08	·09	·15	·04	·02	·07	·05	·09	·12	·14	·13	·09
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·03	·03	·05	·03	·02	·03	·03	·02	·04	·04	·05	..	·06	·03	·03	..	..	·01	..	..	..	·02	·01	..	..	..
9	·08	·08	·06	·10	·07	·10	·10	·09	·13	·14	·15	·17	·16	·12	·12	·15	..	·24	·12	·08	·10	·10	·09	·10	·06	·08
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·03	·02	·02	·03	..	·03	·03	·03	·04	..	·03	·03	·02	·04	·13	·04	·03	·05	·05	·08	·05	·04	·04	·03	·04	·03
20	·09	·10	·10	·11	·08	·11	·10	·10	·10	·09	·09	·07	·07	·07	·06	·07	·04	·04	·03	·06	·05	·06	·08	·09	·03	·09
21	·01	·01	·01	..	·03	·01	·01	·05	..	·01	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	·05	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·08	·09	·08	·10	·07	·09	·10	·09	·10	·09	·10	·09	·09	·08	·05	·09	·06	·05	·05	·11	·07	·07	·06	·07	·07	·02
24	..	..	·01	..	..	..	..	..	..	·01	·02	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..
25	·05	·04	·04	·04	·03	·05	·04	·03	·02	·01	·02	·01	·02	·01	·01	..	..	..	..	·01	·01	..	·03	..	·02	·03
26	·30	·23	·32	·29	·25	·27	·31	·29	·34	·29	·39	·39	·37	·33	·43	·27	·32	·27	·25	·29	·27	·28	·25	·19	·25	·21
27	·18	·17	·18	·19	·18	·19	·19	·19	·22	·26	·21	·27	·19	·17	·13	·27	·16	·15	·13	·17	·17	·16	·17	·25	..	·17
28	·10	·06	·12	·11	·07	·10	·14	·11	·13	·14	·14	·10	·12	·14	·09	·13	·10	·06	·09	·16	·12	·13	·07	·07	·08	·04
29	·14	·12	·12	·12	·13	·12	·12	·12	·14	·17	·17	·17	·11	·12	·12	·13	·07	·16	·05	·08	·07	·09	·11	·10	·07	·08
30	·04	·05	·04	·03	·04	·04	·03	·04	·02	·02	·01	·02	·02	·02	..	·01	·01	·06	·06	·08	·04	·04	·04	·03	·03	·02
31	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
*	1·54	1·27	1·48	1·49	1·21	1·49	1·47	1·47	1·50	1·56	1·63	1·66	1·57	1·53	1·46	1·53	1·00	1·22	·97	1·44	1·29	1·34	1·24	1·20	·96	1·00
†	3·35	2·92	3·52	3·54	2·97	3·85	3·36	3·41	3·35	4·02	3·57	3·81	3·72	3·66	3·58	3·42	2·73	3·50	2·46	3·63	3·39	3·29	3·26	2·93	2·73	2·55

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for March is 1·54 in.* **March, 1895.**

Day of Mo.	Wimbledon (Mt.Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·07	·03	·03	·02	..	..	·05	..	·06	·07	..	·08	·08	·07	·08	·11	·07	·05	·05	·04
2	..	·03	·01	·01	·01	·05	·05	·02	·04	·01	·02	..	..	·01	·01	·01	·01	·01	..	·01	..
3	..	·02	·01	·03	·03	..	..	·02	·01	..	..	..	..	..	·01	·01	..	..	..	..	..
4	·09	·08	·02	·02	·04	·05	·05	·05	·05	·04	·05	·07	·11	·03	·05	·08	·13	·13	..	·03	·03
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·11	·14	·11	·07	·16	·15	·16	·17	·11	·06	·09	·11	·11	·13	·13	·09	·13	·11	·15	·13	·12
7	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	·02	..	·02	·03	..	·02	·05	·02	..	..	·01	..	..	..	·02	·01	·01	·01	·02	·03
9	·09	·12	·07	·04	·04	·09	·09	·09	·07	·06	·08	·09	·09	·07	·10	·08	·07	·06	·05	·09	·06
10	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·01	·03	·01	..	..	..	·01	·02	·04	·03	·04	·02	·06	·05	·06	·06	·07	·05	·03	·03	·03
20	·09	·11	·09	·07	·08	·08	·10	·09	·10	·10	·10	·01	·07	·07	·05	·05	·06	·04	·05	·09	·06
21	·02	·01	..	..	..	..	..	..	·01	·01	..	..	..	·01	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·04	·07	·03	..	·02	·04	·04	·04	·05	·05	·06	·08	·10	·06	·06	·06	·06	·04	·03	·04	·03
24	..	..	..	·05	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	·01	..
25	·03	·04	·03	·06	·03	..	·03	·03	·02	·03	·04	·03	..	·04	·01	·02	·03	·02	..	·01	..
26	·18	·22	·20	·24	·31	·25	·30	·36	·26	·20	·25	·23	·19	·25	·27	·29	·27	·22	·29	·37	·32
27	·19	·23	·14	·12	·11	·15	·16	·14	·17	·19	·21	·20	·23	·21	·18	·19	·22	·21	·18	·19	·12
28	·03	·07	·03	..	·02	·02	·05	·08	·06	·05	·05	·06	..	·06	·06	·08	·06	·05	·09	·03	·03
29	·12	·14	·07	·14	·15	·16	·09	·08	·10	·08	·10	·09	·17	·12	·10	·09	·08	·07	·11	·10	·23
30	·04	·06	·03	·02	..	·04	·03	·05	·04	·04	·02	·05	·04	·06	·08	·07	·12	·10	·08	·03	·04
31	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·11	1·46	·88	·98	1·05	1·08	1·18	1·35	1·15	1·01	1·18	1·05	1·28	1·25	1·24	1·28	1·43	1·19	1·12	1·23	1·14
†	2·99	3·70	2·15	2·22	2·54	2·54	2·70	3·14	3·02	2·97	3·16	2·85	3·46	2·83	3·03	2·91	3·27	2·75	2·32	3·26	2·28

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.

(March, 1895.)

The month has been moderately wet, but not cold. The storm on the 24th with thunder and lightning did a good deal of damage in many parts of the district. The influenza epidemic continued, and caused many deaths. The season is quite a month late, owing to last month. Solar halos were seen at Upper Gatton on the 8th, 11th, 16th, 19th, and 28th, the one on the 16th having two mock suns, and at Wallington on the 16th; and lunar halos were seen at Upper Gatton on the 6th and 11th, and at Wallington on the 11th. The mean temperature was at Redhill 41·1°, at Upper Gatton 42°, at Kenley 42·3°, at Waddon 42·7°, at Wallington, 42·9°, and at Croydon (Duppas House), 43·4°, being about 2° above the average. There were recorded at Woolwich 73·5 hrs. of bright sunshine, and at Wallington 112·2 hrs. of sunlight, which latter is the average amount.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (*Meteorological Subcommittee*).

Stations.	Observers.	Size of Gauge. IN.	Height above Ground. FT.	IN.	Height of Statn. ab. Sea-level. FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge. IN.	Height above Ground. FT.	IN.	Height of Statn. ab. Sea-level. FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (Highfield)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for April is 1·70 in.* April, 1895.

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	Reigate Hill Margery H.	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·08	·02	·01	·01	·03	·04	·02	·01	·02	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	·01	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·18	·19	..	·18	·18	·17	·16	·16	·20	·15	·08	·14	·22
7	·08	·08	·11	·03	·02	·03	·02	·01	·02	·02	·05	·11	..
8	·02	..	..	·01	·01	..	..	·01	·01	..	·01	·01	..
9	..	..	..	..	..	..	..	·01	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	·01	·07	·13	..	·10	·16	·07	·10	·08	·02	·04
17	..	·02	·05	·02	·01	·05	·02	·01	..	..	·02	·05	·04
18	·15	·07	·10	·10	·12	·09	·09	·10	·11	·09	·11	·11	·10
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·13	·10	·10	·07	·05	·09	·07	·09	·09	·07	·09	·06	..
21	·03	·02	·08	·02	..	·03	·02	·02	..	·02	·03	·02	·11
22	·35	·25	·11	·17	·14	·20	·16	·21	·17	·21	·15	·15	·07
23	..	..	..	..	..	..	..	..	..	..	..	..	·03
24	·38	·27	·65	·09	·36	·40	·09	·31	·29	·31	·36	·23	·05
25	·44	·40	·12	·65	·47	·26	·61	·50	·50	·44	·47	·46	·20
26	·31	·28	·20	·32	·24	·30	·31	·28	·32	·27	·28	·29	..
27	34	·12	·23	·23	·24	·27	·22	·25	·26	·28	·25	·15	..
28	·02	..	·02	..	..	..	·03	..	..	·01	·01	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
*	2·46	1·88	1·80	1·97	1·98	1·92	1·94	2·14	2·05	1·99	1·99	1·81	·86
†	7·59	6·60	5·80	6·61	6·12	6·56	6·20	6·23	6·40	6·42	5·80	5·50	4·48

Day of Mo.	Knockholt	Warlingham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Beddington
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1		..	..	·01	·01	..	..	..	..	..	..	..	..
2		..	..	·01	..	..	..	..	..	..	..	..	..
3		..	..	·01	·01	·04	..	..	..	..	·02	·01	·01
4		..	..	..	..	..	..	..	..	..	..	..	..
5		..	..	..	..	..	..	..	..	..	..	..	..
6		·17	·11	·10	·10	·08	·10	·09	·10	·11	·08	·07	·07
7		·14	·16	·14	·16	·14	·01	..	·06	·03	·06	·14	·11
8		..	..	..	·01	·02	..	..	·06	..	..	..	..
9		..	..	..	..	..	..	..	..	..	..	..	..
10		..	..	..	..	..	..	..	..	..	..	..	..
11		..	..	..	..	..	..	..	..	..	..	..	..
12		..	..	..	..	..	..	..	..	..	..	..	..
13		..	..	..	..	..	..	..	..	..	..	..	..
14		..	..	..	..	..	..	..	..	..	..	..	..
15		..	..	..	..	..	..	..	..	..	..	..	..
16	MONTHLY GAUGE.	·04	·07	·02	·03	·03	·05	·02	·20	·10	·09	·03	·02
17		·05	·03	·04	·04	·07	·12	·12	·05	·02	·05	·05	·04
18		·12	·10	·10	·10	·11	·05	·04	·08	·08	·07	·07	·09
19		..	..	..	..	..	..	..	..	..	..	..	..
20		·07	·05	·05	·05	·04	·06	·05	·06	..	·05	·04	·04
21		·04	·02	·02	·01	·02	..	..	..	..	..	..	..
22		·15	·13	·16	·15	·14	·15	·12	·20	·29	·20	·15	·15
23		·01	..	..	..	..	..	..	..	..	..	..	..
24		·36	·21	·15	·38	·29	·17	·20	·30	·40	·28	·26	·29
25		·38	·57	·63	·38	·35	·43	·37	·44	·39	·41	·42	·43
26		·24	·22	·16	·17	·12	·21	·17	..	·18	·20	·16	·16
27		·28	·26	·16	·20	·25	·17	·13	·26	·21	·17	·21	·26
28		..	..	·02	..	·02	..	..	..	..	..	..	..
29		..	..	..	..	..	..	..	..	..	..	..	..
30		..	..	..	..	..	..	..	..	..	..	..	..
*	2·00	2·05	1·93	1·78	1·80	1·72	1·52	1·31	1·81	1·81	1·68	1·61	1·67
†	5·75	7·05	5·38	5·96	6·19	5·39	4·63	4·18	5·30	5·76	5·30	4·62	5·15

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·01	..	·01	·01	·01	·01	·01	·01	·01	·01	·01	·02	·01	·01	·03	..	·01	·02	..	·03	·02	·02	·01	..	..	·01
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·07	·08	·06	·06	·05	·05	·07	·07	·09	·10	·10	·10	·11	·09	·09	·12	·11	·11	·05	·13	·10	·09	·07	·05	·06	·16
7	·11	·12	·10	·10	·11	·14	·10	·09	·11	·13	·11	·08	·10	·09	·09	·11	·10	·13	·04	·14	·10	·10	·12	·09	·11	..
8	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·02	·02	·02	·02	·02	·04	·03	·03	·04	·03	·03	·03	·03	·04	·03	·04	·03	·05	·05	·06	·04	..	·02	..	·02	·03
17	·04	·04	·04	·04	·04	·05	·05	·04	·05	·02	·04	·02	·03	·03	·02	·02	·02	·02	·02	·03	·03	·07	·03	..	·05	·04
18	·09	·09	·10	·10	·08	·10	·10	·07	·11	·10	·10	·09	·10	·10	·09	·11	·09	·08	·07	·11	·10	·10	·09	·12	·08	·05
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·05	·05	·04	·04	·04	·04	·04	·04	·05	·05	·04	·03	·03	·04	·03	·03	·03	·03	·02	·03	·02	·03	·04	·03	·02	·06
21	..	..	..	..	..	..	..	..	·01	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·14	·14	·14	·13	·11	·13	·12	·12	·13	·13	·12	·10	·11	·11	·12	·13	·08	·05	·04	·09	·09	·09	·09	·17	·10	·07
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·27	·25	·32	·28	·30	·15	·19	·26	·23	·10	·27	·15	·26	·25	·37	·23	·04	·07	·04	·12	·10	·18	·13	·10	·20	·15
25	·37	·34	·34	·34	·33	·44	·42	·34	·44	·61	·49	·55	·35	·39	·28	·37	·52	·45	·44	·49	·55	·40	·42	·90	·38	·35
26	·14	·16	·14	·14	·14	·11	·15	·14	·14	·19	·18	·17	·18	·14	·13	·15	·15	·25	·14	·15	·14	·14	·15	·14	·16	·15
27	·26	·25	·24	·25	·25	·32	·25	·23	·27	·24	·25	·21	·15	·19	·22	·21	·22	·17	·08	·30	·28	·22	·22	·20	·20	·19
28	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	·01	·01	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·58	1·54	1·55	1·52	1·48	1·59	1·53	1·44	1·68	1·71	1·75	1·55	1·48	1·50	1·50	1·53	1·42	1·43	·99	1·68	1·57	1·44	1·39	1·80	1·38	1·27
†	4·93	4·46	5·07	5·06	4·45	5·44	4·89	4·85	5·03	5·73	5·32	5·36	5·20	5·16	5·08	4·95	4·15	4·93	3·45	5·31	4·96	4·73	4·65	4·73	4·11	3·82

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for April is 1·70 in.* **April, 1895.**

Day of Mo	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·02	..	..	..	..	..	·05	·01	·04	..	..	..	..	..	..	..	..	..	..	..
2	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·01	·03	..	..	..	..	..	·01	·01	·01	·01	·02	·03	·01	·01	·01	·02	·02	..	·01	·02
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·04	·05	·02	..	·03	·03	·02	·07	·03	·04	·05	·05	·04	·04	·05	·02	·02	·02	·04	·03	·01
7	·14	·15	·08	·05	·02	·02	·10	·05	·08	·08	·10	·12	..	·09	·06	·03	·05	·07	·02	·08	·07
8	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·07	·09	·15	·15	·12	·15	·18	·12	·04	·03	·03	·02	·03	·03	·02	·03	·04	·03	..	·04	·04
17	·05	·07	·03	·09	·03	·05	·02	·05	·05	·04	·03	·08	·03	·09	·01	·02	·02	·06	·10	·03	·03
18	·04	·06	..	·04	·02	·03	·03	·03	·04	·06	·07	·09	·09	·08	·10	·08	·07	·05	·06	·05	·04
19	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
20	·06	·08	·05	·03	·05	·05	·06	·06	·06	·04	·04	·05	·04	·04	·02	·02	·02	·02	·03	·05	·05
21	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·06	·10	·05	·09	·08	·07	·10	·10	·08	·08	·09	·08	·07	·07	·07	·05	·06	·03	·04	·07	·07
23	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
24	..	·20	·20	·12	·21	·22	·23	·22	·03	·27	·39	·09	·09	·18	·07	·06	·19	·21	·34	·07	·12
25	·60	·43	·30	·29	·36	·37	·43	·37	·49	·38	·36	·55	·51	·41	·41	·35	·45	·42	·31	·53	·36
26	·14	·17	·11	·16	·22	·12	·15	·19	·14	·19	·20	·29	·22	·24	·15	·23	·20	·17	·18	·19	·20
27	·22	·22	·11	·14	·33	·25	·18	·24	·25	·20	·22	·20	·35	·31	·20	·12	·11	·11	·23	·31	·39
28	..	·02	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·44	1·70	1·10	1·16	1·47	1·37	1·50	1·57	1·33	1·47	1·59	1·64	1·50	1·60	1·17	1·02	1·25	1·21	1·35	1·46	1·41
†	4·43	5·40	3·25	3·38	4·01	3·91	4·20	4·71	4·35	4·44	4·75	4·49	4·96	4·43	4·20	3·93	4·52	3·96	3·67	4·72	3·69

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.

(April, 1895.)

The month has been warm, but somewhat deficient in rainfall and sunshine. A few flakes of snow fell on the 4th. The cuckoo was heard at Upper Gatton on the 10th, and a swallow seen there on the 11th, and a nightingale was heard at Warlingham on the 17th. A thunderstorm occurred on the 17th. Solar halos were seen at Upper Gatton on the 20th, 23rd, 24th, and 30th, and lunar ones on the 5th and 30th. The mean temperature of the month was at Upper Gatton 46·6°, at Waddon 47·4°, at Chipstead 47·5°, at Wallington 48·1°, and at Croydon (Duppas House), 49°, and is about 2° above the average. The rainfall is between a quarter and a half inch below the average. There were recorded at Woolwich 96½ hours of bright sunshine, and at Wallington 130 hours of sunlight, which latter is 6 per cent. below the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (Highfield)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	..	·06	·04	·06	..	·05	·05	·05	·05	·04	·04	..		·06	..	·04	·04	..	·06	·05	·05	..	·05	·03	·03
2	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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12	..	..	·01	..	·02	·01	·02	·01	·02	·02	·01	·04	·05		·04	·06	·04	·04	·09	·05	·03	·11	·08	·03	·05	·05
13	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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15	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..	..	..	..	..
17	·15	·20	·20	·20	·16	·19	·21	·26	·16	·22	·17	·13	·14		·18	·17	·18	·17	·16	·15	·12	·17	·10	·18	·18	·15
18	..	·02	·02	·01	..	·01	·01	·01	·01	·01	·01	..	..		·01	·02	·01	·01	·02	·02	·01	·02	·08	·01	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	·01	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
23	·16	·15	·02	·14	·11	·07	·14	·06	·06	·03	·01	..	·04		·21	..	·04	..	·10	·13	·37	·03	..	·03	·02	·04
24	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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30	·06	·05	·12	·16	·16	·18	·17	·20	·09	·18	·16	·25	..		·30	·17	·13	·16	·18	·05	·02	·08	..	·09	·22	·12
31	·02	..	·05	..	..	·04	..	·02	·07	·01	·01	..	·02		·01	..	·01	·01	·03	·06	·02	·03	..	..	·04	..
*	·46	·42	·48	·55	·51	·50	·60	·62	·46	·52	·41	·46	·25	·50	·81	·42	·46	·43	·58	·52	·62	·49	·26	·39	·54	·39
†	8·05	7·02	6·28	7·16	6·63	7·06	6·80	6·85	6·86	6·94	6·21	5·96	4·73	6·25	7·86	5·80	6·42	6·62	5·97	5·15	4·80	5·79	6·02	5·69	5·16	5·54

† The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld.rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms.F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·03	·04	·03	·03	·03	·03	·03	·04	·04	·05	·05	·05	·06	·05	·06	·03	·04	..	·06	·04	·06	·03	·03	·03	·05
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·07	·09	·06	·07	·11	·09	·07	·10	·08	·06	·07	·06	·05	·08	·05	·06	·04	·05	·12	·19	·15	·16	·08	·08	·07	·05
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·16	·16	·18	·17	·16	·17	·17	·15	·17	·18	·19	·20	·16	·18	·18	·17	·13	·14	·11	·19	·14	·15	·18	·17	·15	·14
18	·01	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·02	·02	·02	·02	·03	·03	·02	·01	·25	·72	·56	·77	·49	·49	·50	·54	·21	·02	·03	·28	·20	·38	·41	·18	..	·03
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·12	·12	·12	·12	·11	·13	·21	·18	·21	·13	·11	·04	·03	·04	·01	..	..	·01	..	..	..	..	·12	·18	·10	·26
31	..	..	..	..	..	..	..	..	·01	..	·06	·05	·04	·03	·01	..	..	..	..	..	..	..	·05	·03	..	·04
*	·41	·42	·42	·42	·44	·46	·51	·48	·76	1·13	1·04	1·17	·82	·88	·80	·83	·41	·26	·26	·72	·53	·75	·87	·67	·35	·57
†	5·34	4·88	5·49	5·48	4·89	5·90	5·40	5·33	5·79	6·86	6·36	6·53	6·02	6·04	5·88	5·78	4·56	5·19	3·71	6·03	5·49	5·48	5·52	5·40	4·46	4·39

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for May is 2·04 in.* **May, 1895.**

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·07	·05	·06	·05	·04	·08	·06	·03	·04	·04	..	·04	·04	·03	·03	·04	·03	·03	·04	·04
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·04	·05	·04	·07	·05	·05	·05	·05	·06	·07	·06	·05	·06	·06	·07	·07	·05	·04	·05	·05	·03
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·14	·16	..	·08	..	·11	·12	·11	·10	·14	·15	·11	·18	·14	·15	·12	·13	·11	·10	·13	·12
18	..	·03	..	·01	..	·01	·02	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	·03	·04	..	..	·04	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·08	·10	·03	·25	·33	·08	·05	·09	..	·10	·07	·19	·31	·19	·09	·09	·19	·20	·24	·05	·01
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·07	·14	·03	·02	·02	·04	·02	·02	·25	·10	·09	·15	·05	·14	..	·01	·04	·06	·11	·07	·08
31	..	·01	·11	·03	·01	·10	·11	·15	..	..	..	·08	..	·06	·02	..	·02	·01	·07	..	..
*	·40	·59	·30	·52	·46	·47	·45	·50	·44	·45	·43	·58	·64	·63	·36	·32	·47	·45	·60	·34	·28
†	4·83	5·99	3·55	3·90	4·47	4·38	4·65	5·21	4·79	4·89	5·18	5·07	5·60	5·06	4·56	4·25	4·99	4·41	4·27	5·06	3·97

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.) (10 a.m.)

NOTES.

(May, 1895.)

The month has been exceedingly dry. In the eighty years ending this May at Greenwich there have only been seven years, including this one, in which the rainfall in May has been smaller or equal to this May. The rainfall has been about 1·50 in. below the average. Slight snow occurred throughout the district on the 17th. The 30th will be remembered as the hottest day in May for many years past. Solar halos were seen at Croydon on the 10th, 11th, 12th, and 14th. The mean temperature of the month was at Waddon 54·4°, at Wallington 55·2°, at Croydon (Duppas House) 55·5°, and at Chipstead 56°, and is about 3° above the average. There were recorded at Wallington 251 hours of sunlight, which is 9 per cent. above the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (*Meteorological Subcommittee*).

STATIONS.	OBSERVERS.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.	STATIONS.	OBSERVERS.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.			IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381	West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
Dorking (Denbies)	J. Beesley	5	0	6	610	West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650	Hayes Common (The Warren)	Miss Akers	5	1	0	296
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300	Keston (Bradfield)	A. Hill	5	1	0	350
Nutfield (The Priory)	J. Moffatt	8	1	2	468	Keston (Tower Fields)	G. Buchanan	8	0	9	351
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440	Farningham Hill	A. J. Waring	5	3	0	300
Upper Gatton	F. Druce	5	1	0	600	Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Merstham (Rockshaw)	W. Gardiner	5	1	0	475	Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Chipstead (Shabden Park)	J. Crerar	5	1	0	550	Bickley (Highfield)	J. Batten	5	1	2	295
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471	Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
Westerham (The Fishponds)	W. Morris	5	1	0	380	South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Knockholt (The Beeches)	W. Morris	5	1	0	785	Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Coulsdon (The Grange)	W. J. Stride	5	1	4	525	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Kenley (Ingleside)	H. Smith	8	1	0	375	Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282	New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216	Esher (Sewage Works)	W. H. Hope	5	1	0	40
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280	West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Oxshott	W. H. Dines	5	1	0	212	Surbiton (Seething Wells)	R. Hack	10	0	6	25
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290	Kingston (Sewage Works)	T. Stevens	5	1	0	25
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488	Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Sutton (Mulgrave Road)	W. Goode	5	5	6	230	Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140	Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
Beddington (Riverside)	S. Rostron	5	1	0	120	West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Waddon (Waddon House)	P. Crowley	5	1	0	156	Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130	Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146	Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Croydon (Duppas House)	Baldwin Latham	8	1	0	158	Eltham (High Street)	W. Morris	5	1	0	245
Croydon (Chatfield Road)	A. Malden	5	1	0	166	Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Croydon (Whitgift School)	A. E. Watson	5	1	0	191	Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202	Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473	Brixton (Acre Lane)	F. Gaster	8	1	0	77
Addington (Park Farm)	W. Whalley	5	1	0	268	Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21
Addington (Pumping Station)	Croydon Corporation	8	1	0	331						

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for June is 2·00 in.* **June, 1895.**

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·02	..	·06	..	·02	·05	·02	·03	·02	·01	..	..	MONTHLY GAUGE.	·02	·03	·01	..	·03	·02	..	..	..	·02	..	..
2	..	..	..	·08	..	..	..	..	..	..	..	·02	..		..	..	..	..	..	..	·01	..	..	..	..	..
3	·02	..	·02	..	·34	·06	·06	·06	·24	·06	·31	·08	·20		·09	·54	·46	·61	·31	..	..	·05	·13	·03	·01	·03
4	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..	..	..	..	..	..	..
5	·01	·02	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·02	·01	..	..	..	..	..	..
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12	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
13	·04	..	..	..	·01	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
14	·14	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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17	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
18	..	·12	·08	·03	·03	·07	·06	·07	·04	·07	·05	·04	..		·04	·07	·07	·08	·10	·17	·15	·02	·09	·13	·09	·08
19	..	..	..	·04	·01	·01	·01	..	..	·01	..	..	..		·02	·02	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
21	·08	·10	·09	·08	·07	·09	·07	·09	·06	·08	·04	·04	..		·06	·07	·07	·07	·05	·05	·04	·03	..	·04	·04	·03
22	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
24	..	·02	..	..	..	·01	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	·07	·01	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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28	·05	·05	·02	·01	·01	·02	·01	·02	·01	·03	..	·01	·02		·01	·01	·01	·02	..	·04	·02	..	·02	·03	·01	·01
29	·05	·04	·02	·04	·02	·04	·04	·05	·02	·02	·01	·01	..		·03	·03	·02	·02	·02	·01	..	·08	·02	·02	·01	·01
30	..	..	·02	·04	·02	·07	·07	·20	·03	·10	·02	·04	·04		·04	·04	·04	·03	·06	..	..	·03	..	..	·02	·06
*	·42	·37	·25	·38	·51	·39	·37	·52	·43	·39	·44	·24	·26	·05	·31	·81	·69	·85	·62	·30	·22	·32	·33	·31	·20	·25
†	8·47	7·39	6·53	7·54	7·14	7·45	7·17	7·37	7·29	7·33	6·65	6·20	4·99	6·30	8·17	6·61	7·11	7·47	6·59	5·45	5·02	6·11	6·35	6·00	5·36	5·79

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfd. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm Wickhm.C.	W. Wickhm Layhms. F.
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	·01	·01	·09	..	·04	·03
2	..	..	..	·01	..	..	..	..	..	·03	·01	..	..
3	·05	·06	·10	·10	·07	·13	·33	·20	·48	·13	·10	·05	·05
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
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9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·03	·02	·02	·03	·02	·03	·02	·01	·03	·04	·02	·04	·01
12	..	..	..	..	..	..	..	..	..	..	..	..	·01
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·08	·09	·08	·08	·08	·09	·08	·08	·07	·04	·07	·07	..
19	..	..	..	..	..	..	..	..	·01	·05	·01	·03	·04
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·04	·04	·04	·03	·04	·03	·02	·02	·04	·02	·05	·03	·04
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·01	·01	·02	·02	·01	·03	·01	·01	·03	..	..	..	..
29	·01	·01	·01	·01	..	·01	·02	..	·02	..	·01	..	..
30	·08	·10	·07	·07	·06	·08	·05	·06	·03	..	·02	·02	·05
*	·30	·33	·34	·35	·28	·40	·53	·39	·72	·40	·29	·28	·23
†	5·64	5·21	5·83	5·83	5·17	6·30	5·93	5·72	6·51	7·26	6·65	6·81	6·25

Day of Mo.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·03	..	·03	·03	·03	·04	·01	·02	·04	·01	..	·01
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·04	·07	·06	·16	·23	·05	·08	·06	·08	·17	·40	..	·02
4	·01	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·04	..	·04	·03	·03	·01	·04	..	·04	·01	..	·01	·01
12	..	..	..	..	·02	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·07	·03	·02	..	..	..	·05	·05	·05	·08	·08	·09	·17
19	·02	·02	·02	..	·01	..	·03	·01	·03	..	..	..	·03
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·03	·03	·03	..	·01	..	·02	·01	·01	·01	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·01	..	..	..	..	..	·01	..	..	..	·01	..	·03
29	·01	·01	..	..	..	..	·01	..	..	..	·01	..	·01
30	·03	·02	·02	·01	·01	..	·03	·02	..	..	·04	..	..
*	·31	·21	·19	·23	·34	·09	·31	·16	·23	·31	·55	·10	·28
†	6·35	6·09	5·97	4·79	5·53	3·80	6·34	5·65	5·71	5·83	5·95	4·56	4·67

* The figures in this row give the totals for the month.   † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for June is 2·00 in.* **June, 1895.**

Day of Mo.	Wimbledon (Mt.Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	·03	..	·01	..	·01	..	·01	..	·01	·02	·03	..	·03	·03	·02	·01	..	·01	·01	·01
2	..	·02	..	..	..	..	..	..	..	..	·01	·01	..	..	..	·03	..	..	..	..	..
3	·01	·03	..	..	..	..	·01	·02	·03	·02	·02	·02	·42	·01	·01	·03	·02	..	..	·01	·02
4	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·01	·03	·02	..	..	·01	·02	·02	·02	·03	·03	·04	..	·03	·02	·03	·02	·01	·02	·02	·02
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·18	·18	·19	·17	·14	·20	·22	·18	·16	·14	·11	·11	·04	·10	·06	·07	·09	·08	·10	·12	·13
19	..	·03	..	..	..	..	..	..	..	..	..	..	·08	..	·01	..	..	..	..	·03	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	·01	..	·01	·02	·01	..	..	..	..	..	·01	·01	·01	..	..	..	·02
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	·01	·02	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·02	·04	..	·04	·03	·02	·03	·03	..	·02	·03	·03	·02	·02	..	·01	·02	·01	·02	..	·01
29	·01	·02	·02	..	..	..	..	..	·01	·01	·01	·01	·01	·01	..	..	·01	..	..	·01	..
30	..	..	..	..	..	·01	·02	·02	..	..	·01	·06	·04	·06	·01	·02	·01	·01	·03	..	..
*	·24	·39	·23	·22	·19	·27	·31	·33	·23	·23	·24	·31	·61	·26	·16	·22	·19	·11	·18	·20	·21
†	5·07	6·38	3·78	4·12	4·66	4·65	4·96	5·54	5·02	5·12	5·42	5·38	6·21	5·32	4·72	4·47	5·18	4·52	4·45	5·26	4·18

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.

(June, 1895.)

Another exceedingly dry month. At Greenwich since 1814, the date of the commencement of meteorological observations, there has been no June with such a small rainfall as this present June. The month has been warm owing to the hot days, though the nights have been somewhat cold. Frost is reported from Redhill on the 14th and 15th, potatoes being cut. Solar halos were seen at Upper Gatton on seven days, and at Wallington on one day. At Upper Gatton there was a thunderstorm on the 3rd, and lightning on the 26th. The mean temperature of the month was at Upper Gatton 58·9°, at Wallington and Waddon 60·1°, at Kenley (Ingleside) 60·2°, at Croydon (Duppas House) 60·8°, and at Chipstead 61°, and is about 1·5° above the average. There were recorded at Wallington 225½ hours of sunlight, which is 4 per cent. above the average.

F. Campbell-Bayard,

… AND NATURAL HISTORY CLUB (*Meteorological Subcommittee*).

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (Highfield)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for July is 2·58 in.* **July, 1895.**

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·57	·50	·23	·25	·18	·22	·20	·22	·24	·23	·20	·16	·11
2	1·29	·83	·63	1·46	1·33	1·18	1·24	·83	1·06	·40	·50	·44	1·09
3	..	..	·02	·02	·03	·02	·03	·03	·04	·01	·02	..	..
4	·05	·09	·10	·04	·01	·13	·05	·03	·04	·05	·03	·01	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	·01	·01	..	·02	..	·01	·03	..	·01	·01	·01
11	·07	·08	·10	·10	·08	·05	·08	·10	·07	·11	·11	·08	·14
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	·01	..	..	..	..	..	..	..	..	..	..
18	·89	·78	·45	·36	·34	·45	·35	·40	·40	·40	·33	·26	·17
19	·43	·42	·48	·22	·41	·46	·17	·35	·31	·38	·44	·45	·35
20	·30	·28	·22	·36	·11	·92	·37	·38	·24	·34	·15	·08	·09
21	·84	·73	1·07	1·18	1·03	·62	1·18	1·17	1·14	1·25	1·00	·78	1·16
22	·04	·07	·06	·01	·01	·03	·02	·04	·15	·12	·04	..	..
23	·39	·28	·33	·31	·29	·32	·28	·36	·31	·32	·35	·41	·39
24	·05	..	·02	·01	·01	·02	·01	·01	·01	·01	·02	·01	..
25	·01	·03	·03	..	..	·01	·02	·02	..	·02	..	..	·05
26	·02	..	·02	..	·02	·01	·02	·02	·03	·01	·05	·01	..
27	·73	·68	·77	·90	·90	·93	·96	·97	·90	·79	·76	·86	·83
28	·18	·15	·22	·20	·13	·16	·23	·22	·11	·25	·16	·06	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·02	..	..	·01	..	·01	·01	·01	..	·01	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	5·88	4·92	4·77	5·44	4·88	5·56	5·22	5·22	5·08	4·70	4·17	3·62	4·39
†	14·35	12·31	11·30	12·98	12·02	13·01	12·39	12·59	12·37	12·03	10·82	9·82	9·38

Day of Mo.	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	MONTHLY GAUGE.	·23	·13	·17	·13	·17	·35	·25	RETURN UNRELIABLE.	·24	·21	·20	·21
2		·35	·20	·16	·16	·08	·07	·03		·09	·05	·04	·04
3		..	..	..	..	..	..	..		..	..	..	..
4		·02	·04	·04	·03	·04	·07	·07		·11	·22	·07	·04
5		..	..	..	..	..	..	..		..	..	..	..
6		..	..	..	..	..	..	..		..	..	..	..
7		..	..	..	..	..	..	..		..	..	..	..
8		..	..	..	..	..	..	..		..	..	..	..
9		..	..	..	..	..	..	..		..	..	..	..
10		..	..	·01	..	..	..	..		..	..	..	..
11		·17	·11	·14	·13	·18	·10	·10		·13	·13	·26	·35
12		..	..	..	..	..	..	..		..	..	..	..
13		..	..	..	..	..	..	..		..	..	..	..
14		..	..	..	..	..	..	..		..	..	..	..
15		..	..	..	..	..	..	..		..	..	..	..
16		..	..	..	..	..	..	..		..	..	..	..
17		·01	..	..	·01	..	..	..		·04	..	·01	·01
18		·28	·39	·38	·34	·40	·76	·72		·44	·49	·43	·41
19		·42	·22	·36	·41	·38	·23	·15		·31	·19	·19	·18
20		·15	·28	·69	·11	·14	·51	·20		·25	·19	·21	·21
21		1·13	1·21	·53	1·20	·89	·67	1·03		·95	1·04	1·01	1·06
22		·06	·07	·05	·04	·03	·05	·04		·10	·01	..	..
23		·33	·24	·28	·27	·26	·22	·23		·25	·23	·20	·21
24		·04	..	·02	·01	·05	·04	·04		..	·01	..	·01
25		..	·02	..	·01	..	·01	..		..	..	..	..
26		·05	·04	·02	·02	·02	..	..		·01	..	..	..
27		·86	·84	·79	·85	·73	·65	·61		·69	·67	·67	·66
28		·28	·18	·18	·19	·24	·22	·21		·23	·23	·18	·20
29		..	..	..	..	..	..	..		..	..	..	..
30		..	..	..	..	..	..	..		..	..	..	..
31		..	..	..	..	..	..	..		..	..	..	..
*	4·15	4·38	3·97	3·82	3·91	3·61	3·95	3·68		3·84	3·67	3·47	3·59
†	10·45	12·55	10·58	10·93	11·38	10·20	9·40	8·70		10·19	9·67	8·83	9·38

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms. F.
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·20	·20	·20	·19	·16	·18	·24	·22	·15	·30	·25	·26	·22
2	·03	·05	·04	·04	·04	·04	·05	·04	·04	·11	·06	·03	·09
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·04	·03	·03	·02	·02	·03	·02	·01	·01	..	·01	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·35	·25	·30	·28	·24	·28	·28	·22	·31	·31	·30	·33	·28
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·01	..	..	..	..	..	..	·01	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·01	..	·01	..	..	..	..	..	·01	..	..	..	..
18	·34	·34	·36	·32	·34	·32	·28	·27	·26	·25	·22	·19	·17
19	·23	·18	·35	·20	·17	·21	·18	·18	·22	·16	·25	·18	·14
20	·16	·16	·34	·22	·18	·21	·18	·16	·23	·38	·29	·30	·28
21	1·20	1·15	1·06	1·15	1·24	1·12	1·04	1·11	1·00	1·05	1·10	1·20	1·16
22	·01	..	..	·01	..	..	..	·01	·01	·03	·01	..	·01
23	·21	·20	·22	·21	·21	·21	·22	·21	·23	·25	·26	·26	·23
24	·02	·03	·02	·01	·02	·02	·01	·02	..	·01	..	..	..
25	..	..	..	·01	..	..	..	..	·02	..	..	..	·01
26	..	..	..	..	..	..	..	..	·01	·02	·03	·03	·01
27	·67	·68	·76	·67	·72	·70	·73	·70	·77	·81	·83	·92	·92
28	·21	·20	·16	·22	·17	·24	·19	·18	·26	·34	·26	·45	·30
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	3·69	3·47	3·85	3·55	3·49	3·56	3·42	3·34	3·53	4·02	3·87	4·15	3·82
†	9·33	8·68	9·68	9·38	8·66	9·86	9·35	9·06	10·04	11·28	10·52	10·96	10·07

Day of Mo.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·20	·20	·21	·10	·10	·03	·19	·17	·20	·19	·15	·11	·39
2	·03	·03	·05	·03	·04	·02	·06	·05	·04	·02	·03	·02	·02
3	..	..	..	..	..	..	·01	·01	..	..	..	..	..
4	·01	..	..	..	·01	·05	·02	·02	·02	·01	·02	·03	·10
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	·01	..	..
11	·26	·23	·27	·21	·20	·12	·27	·24	·28	·23	·24	·23	·25
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	·01	..	..	·01	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	·01	..	·02	..
18	·16	·16	·18	·16	·25	·23	·22	·18	·16	·21	·24	·19	·61
19	·17	·11	·06	·05	·11	·08	·14	·11	·11	·11	·14	·13	·21
20	·23	·22	·34	·31	·18	·15	·25	·19	·24	·15	·46	·50	·19
21	1·10	·98	1·01	1·12	·96	·71	1·09	1·33	1·04	1·14	·83	·90	1·01
22	..	..	·01	..	·11	·04	·11	·07	·04	·10	·10	..	·14
23	·21	·20	·22	·21	·23	·20	·23	·22	·20	·21	·21	·23	·36
24	..	..	..	..	..	·01	..	..	·01	·01	·02	..	·10
25	·10	·01	·01	·01	..	..	·01	·01	·02	·01	..	·01	·02
26	·30	·01	·01	·01	..	..	·01	·02	·02	..	..	..	..
27	·81	·89	·79	·79	·76	·66	·82	·80	·76	·70	·67	·63	·63
28	·33	·25	·25	·16	·23	·30	·23	·26	·28	·26	·20	·18	·18
29	..	..	..	..	..	..	..	..	·01	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	3·91	3·29	3·41	3·16	3·18	2·60	3·67	3·68	3·37	3·37	3·32	3·18	4·21
†	10·26	9·38	9·38	7·95	8·71	6·40	10·01	9·33	9·08	9·20	9·27	7·74	8·88

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for July is 2·58 in.* **July, 1895.**

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·30	·35	·29	·23	·37	·25	·28	·30	·14	·17	·11	·08	·15	·07	·14	·15	·17	·15	·07	·17	·21
2	·01	·03	..	·02	·02	..	·02	..	·03	·05	·03	·03	·03	·05	·01	·02	·07	·04	·05	·06	..
3	..	..	..	·03	·01	..	..	..	..	..	..	..	..	·02	..	..	..	..	·01	..	..
4	·30	·43	·15	·10	·22	·22	·25	·21	·14	·05	·06	·08	·05	·06	·07	·13	·04	·07	·14	·13	·08
5	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·30	·25	·20	·07	·13	·18	·20	·21	·14	·18	·25	·18	·19	·18	·12	·11	·13	·11	·11	·14	·10
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·01	·01	·01	..	..	..	·01	·01	..	·01	·01	..	..	·01	..	·01	·01	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	·02	·01	..	·01	..	..	..	·01	..	..	·01	..
18	·64	·64	·96	·75	·98	·86	·87	·83	·60	·45	·35	·26	·23	·25	·20	·20	·21	·17	·23	·45	·40
19	·10	·20	·24	·26	·17	·28	·27	·28	·16	·18	·12	·05	·08	·13	·07	·08	·15	·09	·14	·17	·08
20	·39	·32	·29	·25	·21	·34	·96	·36	·15	·15	·28	·29	·23	·16	·17	·12	·14	·17	·10	·21	·35
21	1·00	·92	1·07	1·02	·95	1·04	·50	·82	1·10	·97	1·20	·74	·93	1·06	1·08	1·32	·94	·97	1·10	1·23	1·35
22	·20	·17	·09	·04	·05	·01	·16	·17	·09	·14	·28	·31	·28	·12	·02	·04	·03	·02	·04	·06	·02
23	·36	·38	·30	·31	·41	·32	·42	·43	·47	·39	·40	·36	·37	·37	·32	·49	·44	·41	·43	·45	·43
24	..	·10	·09	·10	..	·09	·10	..	..	·03	·10	..	·01	·02	·01	·13	·02	..	·12	·01	..
25	·10	·09	..	·01	·01	..	..	..	·05	·13	..	·12	·14	·08	·01	..	·12	·12	..	·08	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·65	·65	·64	·52	·65	·58	·69	·68	·63	·65	·69	·70	·75	·68	·73	·98	·76	·68	·68	·65	·58
28	·23	·22	·27	·18	·21	·21	·20	·24	·16	·20	·24	·27	·30	·25	·37	·37	·15	·21	·19	·21	·11
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	4·59	4·77	4·60	3·90	4·39	4·38	4·93	4·54	3·86	3·78	4·13	3·47	3·75	3·51	3·32	4·15	3·39	3·21	3·41	4·03	3·71
†	9·66	11·15	8·38	8·02	9·05	9·03	9·89	10·08	8·88	8·90	9·55	8·85	9·96	8·83	8·04	8·62	8·57	7·73	7·86	9·29	7·89

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.

(July, 1895.)

The month has been fairly warm, and also somewhat wet. The rainfall is about ¾ in. above the average. Solar halos were seen at Upper Gatton on the 9th and 20th, and thunderstorms occurred there on the 2nd and 21st, whilst thunder was heard on the 22nd, and lightning seen on the 26th. Thunder was heard at Nutfield on the 2nd, 19th, and 27th, and there was a thunderstorm at Beckenham on the 21st. The mean temperature of the month was at Upper Gatton 60·8°, at Wallington 61·9°, at Waddon 62·5°, and at Croydon (Duppas House) 62·8°, and is about ½° above the average. There were recorded at Wallington 170·9 hours of sunlight, which is 7 per cent. below the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB (*Meteorological Subcommittee*).

Stations.	Observers.	Size of Gauge. IN.	Height above Ground. FT.	Height above Ground. IN.	Height of Statn. ab. Sea-level. FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	C. J. Gardiner	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge. IN.	Height above Ground. FT.	Height above Ground. IN.	Height of Statn. ab. Sea-level. FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (The High Field)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for August is 2·31 in.* August, 1895.

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	Reigate Hill Margery H.	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·12	·09	·09	·05	·06	·10	·08	·08	·09	·08	·11	·09	·07
2	·19	·10	·10	·05	·03	·07	·09	·11	·03	·12	·03	..	·02
3	·52	·40	·46	·50	·45	·46	·40	·50	·52	·45	·45	·68	·68
4	..	·02	·09	..	..	..	·04	·04	..	·15	·03	..	·06
5	·18	·15	·19	·12	·12	·10	·09	·11	·11	·10	·12	·14	·15
6	·29	·05	·06	·08	·08	·10	·06	·04	·06	·05	·07	..	·13
7	·02	·05	·01	·15	·17	·04	·01	·01	·14	..	·02	·01	..
8	·33	·27	·34	·35	·37	·38	·39	·39	·36	·32	·34	·30	·70
9	·02	..	·01	·01	·01	·01	·01	·01	·01	..	..	·01	·03
10	·31	·38	·57	·47	·44	·62	·41	·50	·52	·52	·42	·55	·57
11	·15	·24	·09	·08	·04	·04	·05	·05	·10	·03	·05	·02	·02
12	·12	·13	·11	·19	·40	·10	·12	·08	·12	·07	·11	·13	·87
13	·41	·38	·20	·17	·33	·15	·20	·15	·23	·24	·26	·28	·13
14	·03	·03	·02	·02	·02	·04	·03	·01	·01	·01	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	·01	..	..	..	..	..
21	·29	·14	·10	·01	..	·01	·01	·08	·01	·08	·02	..	..
22	·25	·21	·17	·53	·32	·25	·35	·22	·26	·23	·20	·18	·03
23	..	·02	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·22	·18	·20	·15	·20	·22	·15	·21	·17	·22	·21	·15	·15
26	·10	·06	·07	·10	·07	·05	·08	·04	·06	·04	·06	·03	·05
27	·01	·02	·02	·04	·01	·01	·04	·01	·02	·01	·03	..	..
28	..	..	..	..	..	..	..	·01	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	3·56	2·92	2·90	3·07	3·12	2·75	2·61	2·66	2·82	2·72	2·53	2·57	3·66
†	17·91	15·23	14·20	16·05	15·14	15·76	15·00	15·25	15·19	14·75	13·35	12·39	13·04

Day of Mo.	Knockholt	Warlingham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Beddington
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	MONTHLY GAUGE.	·14	·10	·09	·09	·07	·02	..	RETURN UNRELIABLE.	..	·02	·01	·02
2		·03	·07	·10	·08	·09	·18	·07		·15	·12	·06	·05
3		·41	·36	·30	·31	·27	·36	·30		·36	·31	·32	·32
4		·14	·11	·04	·04	·03	·19	·13		..	·04	·04	·04
5		·15	·14	·08	·09	·07	·13	·11		·16	·15	·05	·06
6		·01	·04	·02	·03	·03	·03	·02		..	·04	·04	·08
7		..	..	..	..	·04	..	..		..	·01	..	..
8		·37	·27	·23	·24	·18	·20	·21		·22	·18	·18	·20
9		·02	..	·01	·01	·02	·01	·01		..	..	..	..
10		·46	·34	·38	·37	·45	·53	·72		·64	·61	·73	·63
11		·10	·04	·02	·06	·10	·02	·03		..	·02	·08	·10
12		·10	·07	·08	·08	·07	·10	·12		·40	·10	·19	·22
13		·27	·17	·26	·24	·22	·39	·40		·20	·33	·26	·26
14		·03	..	..	..	..	·01	·02		..	..	..	..
15		..	..	..	..	..	..	..		..	..	..	..
16		..	..	..	..	..	..	..		..	..	..	..
17		..	..	..	..	..	..	..		..	..	..	..
18		..	..	..	..	..	..	..		..	..	..	..
19		..	..	..	..	..	..	..		..	..	..	..
20		..	..	..	..	..	..	..		..	..	..	..
21		·03	·04	·07	·05	·10	·23	·25		..	·05	·01	·06
22		·09	·30	·24	·22	·24	·51	·61		·31	·20	·34	·14
23		·02	..	..	·01	..	·02	·02		..	·03	·02	·02
24		..	..	..	..	..	..	..		..	..	..	..
25		·13	·15	·19	·18	·16	·20	·20		·19	·21	·19	·18
26		·05	·04	·02	·03	·03	·02	·01		..	·02	·02	·02
27		·02	·01	·01	..	..	..	..		..	..	..	..
28		..	..	..	..	..	..	..		..	..	..	..
29		..	..	..	..	..	..	..		..	..	..	..
30		..	..	..	..	..	..	..		..	..	..	..
31		..	..	..	..	..	..	..		..	..	..	..
*	3·83	2·57	2·25	2·14	2·13	2·17	3·15	3·23		2·63	2·44	2·54	2·40
†	14·28	15·12	12·83	13·07	13·51	12·37	12·55	11·93		12·82	12·11	11·37	11·78

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·03	·04	·03	..	·03	·03	·02	·06	·05	·07
2	·09	·05	·07	·10	·07	·07	·11	·07	·06	·05	·05
3	·28	·32	·32	·29	·30	·29	·29	·28	·25	·25	·24
4	·09	·05	·07	·09	·05	·07	·14	·06	·10	·22	·05
5	·05	·08	·07	·05	·08	·06	·04	·06	·04	·06	·05
6	·07	·12	·10	·10	·11	·10	·09	·09	·06	·04	·04
7	..	..	..	..	..	..	..	..	..	·01	·01
8	·18	·23	·20	·18	·23	·20	·19	·28	·21	·20	·20
9	..	..	·01	·01	..	..	·01	..	·01	·01	·01
10	·54	·60	·52	·48	·54	·46	·42	·39	·35	·37	·33
11	·24	·09	·07	·07	·07	·19	·06	·05	·05	·07	·06
12	·08	·24	·28	·24	·27	·10	·20	·22	·11	·06	·05
13	·23	·35	·28	·22	·36	·28	·21	·27	·28	·30	·27
14	..	..	·01	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..
21	·09	·10	·12	·09	·09	·08	·03	·01	·02	..	..
22	·14	·14	·16	·17	·16	·20	·21	·22	·16	·25	·21
23	·04	·03	·04	·04	·01	·04	·05	·02	·01	..	..
24	..	..	..	..	..	..	..	..	..	..	..
25	·18	·20	·20	·18	·18	·19	·19	·18	·18	·15	·16
26	·02	·04	·01	·02	·02	·01	·02	·01	·02	·05	·02
27	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..
*	2·35	2·67	2·57	2·36	2·54	2·37	2·29	2·23	1·97	2·14	1·82
†	11·68	11·35	12·25	11·74	11·20	12·23	11·64	11·29	12·01	13·42	12·34

Day of Mo.	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·08	·03	·04	·04	·05	·04	·64	·03	·01	·03	·01	..	..	·01
2	·01	·05	..	..	·03	·01	..	..	·03	·03	·02	·04	·08	·09	·14
3	·22	·35	·18	·31	·29	·60	·43	·65	·24	·17	·18	·29	·29	·32	·36
4	·25	·05	·29	·04	·11	·20	·10	·17	·10	·11	·19	·11	·03	·02	·19
5	·04	·06	·02	·06	·03	·04	·05	·03	·06	·04	·03	·08	·09	·10	·06
6	·06	·02	·07	·04	·03	·05	·05	·36	·15	·09	·09	·11	·10	·20	·03
7	..	·01	..	·01	..	·01	·06	..	·06	·02	·07	..	·01	..	·07
8	·20	·16	·18	·10	·15	·15	·14	·20	·24	·26	·18	·33	·29	·29	·33
9	..	·01	..	·01	..	·01	·01	..	·02	..	·02	·01	..	..	·01
10	·37	·38	·39	·36	·40	·32	·38	·28	·37	·36	·28	·30	·38	·66	·47
11	·03	·01	·05	·01	·01	..	..	..	·03	·03	·04	·02	·04	·03	..
12	·08	·09	·07	·07	·08	·15	·36	·13	·09	·07	·08	·15	..	·23	·10
13	·31	·27	·27	·18	·18	·14	·05	·11	·30	·39	·26	·28	·61	·35	·32
14	..	..	..	..	..	..	..	..	..	·01	·01	..	·01	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·06
22	·09	·03	·07	·02	·02	·05	·04	·03	·11	·02	·03	·19	·20	·22	·22
23	..	..	..	..	..	..	..	..	·03	·03	..	·01	·01	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·20	·16	·16	·13	·16	·13	·11	·12	·18	·14	·15	·14	·19	·19	·21
26	·01	·03	·01	·02	..	·02	·01	..	..	·01	·02	·01	·01	..	·02
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·92	1·76	1·79	1·4[illegible]	1·[illegible]	1·93	1·83	2·72	2·04	1·79	1·68	2·08	2·34	2·72	2·60
†	12·88	11 83	12·05	10·78	10·91	9·88	10·54	9·12	12·05	11·12	10·76	11·28	11·61	10·46	11·48

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for August is 2·31 in.* August, 1895.

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	·01	..	·02	..	·02	·05	..	·01	·01	·01	..	·02	·01	..	·01	·01	..	..	..	..
2	·10	·14	·03	·20	·03	·15	·24	·12	·08	·05	·06	·05	·03	·10	·04	·04	·04	·02	·06	·10	·06
3	·40	·38	·44	·35	·43	·48	·56	·45	·30	·29	·29	·38	·55	·36	·22	·38	·32	·29	·32	·26	·27
4	·15	·13	·09	·21	·12	·14	·25	·32	·08	·14	·10	·11	·06	·13	·06	·03	·08	·08	·11	·24	·24
5	·06	·07	·04	·06	·04	·04	·05	·04	·04	·07	·07	·10	·08	·07	·07	·10	·08	·06	·04	·05	·03
6	·20	·31	·32	·15	·07	·22	·08	·02	·02	·03	·07	·02	·05	·03	·10	·21	·11	·07	·03	·05	·10
7	·05	·04	..	·02	·08	..	·25	·03	·02	·05	..	·06	·03	..	·03	·47	·21	·14	·03	·02	·38
8	·35	·37	·34	·26	·25	·24	·30	·21	·29	·30	·34	·32	·38	·32	·26	·24	·25	·24	·26	·24	·17
9	·01	·03	..	·03	·06	..	·02	·07	·02	·01	·01	·02	..	·01	..	..	·01	..	..	·01	·02
10	·60	·63	·59	·41	·24	·59	·51	·22	·31	·63	·61	·52	·45	·50	·41	·39	·34	·38	·45	·57	·41
11	·01	·03	..	·03	..	·01	·02	·02	·01	·01	·01	·07	..	·06	·05	·01	·06	·08	..	·01	..
12	·09	·10	·10	·19	·17	·20	·16	·13	·10	·09	·20	·21	·10	·19	·09	·15	·14	·15	·16	·10	·10
13	·26	·27	·30	·29	·09	·30	·53	·16	·28	·46	·25	·18	·21	·21	·26	·14	·14	·12	·17	·81	·17
14	..	..	..	·02	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	..	..	·01	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·04	·12	..	·12	·27	·29	·37	·27	·07	·05	·06	·03	·04	·01	..	·01	·01	..	·05	·02	·04
22	·40	·24	·30	·67	·47	·88	1·10	1·39	·17	·14	·16	·15	·14	·15	·03	·07	·18	·14	·08	·19	·25
23	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·23	·25	·21	·12	·19	·19	·24	·25	·11	·19	·20	·12	·19	·16	·14	·14	·15	·12	·12	·13	·12
26	·01	·03	..	·02	..	..	·01	·03	·01	·02	·01	·04	..	·01	..	..	..	..	..	·03	..
27	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	2·99	3·15	2·76	3·18	2·50	3·75	4·74	3·75	1·92	2·54	2·45	2·39	2·33	2·32	1·76	2·40	2·14	1·89	1·88	2·84	2·36
†	12·65	14·30	11·14	11·20	11·55	12·78	14·63	13·83	10·80	11·44	12·00	11·24	12·29	11·15	9·80	11·02	10·71	9·62	9·74	12·13	10·25

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.) (10 a.m.)

NOTES.
(August, 1895.)

The first thirteen days were very unsettled, but after that, with the exception of the four days between the 21st and 26th, the rest of the month was fine. The thunderstorms on the 10th and 22nd were very severe, the latter more particularly in the Thames Valley. Apples are very plentiful, but pears are scarce. The month has been a healthy one. Solar halos were observed at Upper Gatton on the 1st, 10th, 17th, and 25th, and at Wallington also on the 25th. The rainfall is slightly above the average. The mean temperature of the month is at Upper Gatton 59·9°, at Wallington 61·9°, at Waddon 62·4°, at Croydon (Duppas House) 62·7°, and at Chipstead 63·2°, and is about 1° above the average. There were recorded at Wallington 214·6 hrs. of sunlight, which is 3 per cent. above the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.			IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381	West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
Dorking (Denbies)	J. Beesley	5	0	6	610	West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650	Hayes Common (The Warren)	Miss Akers	5	1	0	296
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300	Keston (Bradfield)	A. Hill	5	1	0	350
Nutfield (The Priory)	J. Moffatt	8	1	2	468	Keston (Tower Fields)	G. Buchanan	8	0	9	351
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440	Farningham Hill	A. J. Waring	5	3	0	300
Upper Gatton	F. Druce	5	1	0	600	Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Merstham (Rockshaw)	W. Gardiner	5	1	0	475	Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Chipstead (Shabden Park)	J. Crerar	5	1	0	550	Bickley (The High Field)	J. Batten	5	1	2	295
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471	Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
Westerham (The Fishponds)	W. Morris	5	1	0	380	South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Knockholt (The Beeches)	W. Morris	5	1	0	785	Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Coulsdon (The Grange)	W. J. Stride	5	1	4	525	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Kenley (Ingleside)	H. Smith	8	1	0	375	Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282	New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216	Esher (Sewage Works)	W. H. Hope	5	1	0	40
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280	West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Oxshott	W. H. Dines	5	1	0	212	Surbiton (Seething Wells)	R. Hack	10	0	6	25
Epsom (Epsom College)	A. M. Hale	8	1	0	290	Kingston (Sewage Works)	T. Stevens	5	1	0	25
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488	Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Sutton (Mulgrave Road)	W. Goode	5	5	6	230	Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140	Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
Beddington (Riverside)	S. Rostron	5	1	0	120	West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Waddon (Waddon House)	P. Crowley	5	1	0	156	Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130	Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146	Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Croydon (Duppas House)	Baldwin Latham	8	1	0	158	Eltham (High Street)	W. Morris	5	1	0	245
Croydon (Chatfield Road)	A. Malden	5	1	0	166	Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Croydon (Whitgift School)	A. E. Watson	5	1	0	191	Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202	Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473	Brixton (Acre Lane)	F. Gaster	8	1	0	77
Addington (Park Farm)	W. Whalley	5	1	0	268	Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21
Addington (Pumping Station)	Croydon Corporation	8	1	0	331						

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for September is 2·38 in.* September, 1895.

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
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2	..	..	·01	·01	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	·01	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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5	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
6	·58	·45	·62	·29	·24	·43	·30	·42	·26	·70	·20	·25	·40		·42	·41	·40	·43	·60	·47	·43	·57	·36	·30	·28	·33
7	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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10	·18	·14	·25	·18	·16	·18	·15	·20	·15	·22	·18	·15	·06		·20	·20	·12	·17	·21	·02	·08	·11	·15	·12	·13	·13
11	..	..	..	..	·02	..	..	..	..	·02	..	..	..		..	..	..	..	..	..	..	..	..	·02	·01	·01
12	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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15	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	·01	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·02	..	..	..	..	..	..	..
19	..	·02	·01	..	·01	·01	..	·03	·01	·03	·02	·01	..		·05	·04	·03	·03	·04	·04	·02	·02	..	·02	·02	·01
20	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	·01	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	·01	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
24	·19	·08	·03	·01	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	·06	·08	·02	..	..	..	..
25	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
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28	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	·02	..	·01	..	..	..		..	..	..	·01	..	..	·01	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	·01	..	..	..	..	..	..	..	..	..
*	·95	·69	·92	·49	·43	·62	·45	·75	·42	·99	·40	·41	·46	·62	·67	·65	·56	·64	·87	·59	·66	·72	·51	·46	·44	·48
†	18·86	15·92	15·12	16·54	15·57	16·38	15·45	16·00	15·61	15·74	13·75	12·80	13·50	14·90	15·79	13·48	13·63	14·15	13·24	13·14	12·59	...	13·33	12·57	11·81	12·26

* [illegible] the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
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4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·34	·35	·39	·36	·38	·37	·36	·34	·35	·40	·47	·57	·60	·47	·72	·65	·58	·61	·75	·63	·40	·45	·37	·39	·49	·70
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·15	·15	·14	·15	·11	·16	·17	·16	·31	·19	·17	·17	·19	·16	·15	·16	·15	·10	·19	·27	·24	·21	·19	·17	·11	·09
11	..	..	·01	·01	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	..	..	·02
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·01	..	..	..	..	·01	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
19	·02	..	·01	·01	..	·01	·01	·01	·03	·02	·02	·03	·03	·02	·04	·02	·03	·05	·02	·02	·02	·02	..	·03	·01	·02
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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27	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	·01	·01	..	·01	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·52	·50	·55	·53	·49	·59	·58	·51	·74	·61	·67	·77	·82	·65	·92	·83	·76	·76	·96	·92	·66	·71	·56	·60	·61	·85
†	12·20	11·85	12·80	12·27	11·69	12·82	12·22	11·80	12·75	14·03	13·01	13·65	12·65	12·70	11·70	11·74	10·64	11·30	10·08	12·97	11·78	11·47	11·84	12·21	11·07	12·33

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for September is 2·38 in.* **September, 1895.**

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmth.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
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3	..	·02	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·71	·86	·76	·89	1·22	·73	1·24	1·33	·63	·60	·76	·74	·63	·74	·66	·96	·82	·80	·73	·85	1·13
7	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
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9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·09	·12	·06	·02	·02	·05	·03	·05	·07	·09	·07	·11	·17	·08	·15	·10	·07	·08	·08	·08	·09
11	·01	..	..	..	..	..	..	·01	..	·02	·02	·03	..	..	·01	·01	·01	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	·03	..	·01	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
19	·01	·04	·02	·01	·02	..	·01	·02	·02	·03	·01	·03	·02	·02	·03	·03	·03	..	·01	·02	·04
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·01	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·01	..	·03	·07	·07	·05	·05	·05	·01	..	..	..	..	..	..	..	..	..	..	..	..
25	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·91	1·13	·87	1·00	1·33	·83	1·34	1·46	·76	·74	·87	·91	·82	·84	·85	1·10	·93	·88	·82	·95	1·26
†	13·56	15·43	12·01	12·20	12·88	13·61	15·97	15·29	11·56	12·18	12·87	12·15	13·11	11·99	10·65	12·12	11·64	10·50	10·56	13·08	11·51

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.) (10 a.m.)

NOTES.

(September, 1895.)

The month has been a most remarkable one both in rainfall and temperature. It is the fourth month of this year in which, with very few exceptions, less than an inch of rain has fallen. The temperature of the seven days 23–30 was marvellous, and exceeds, in the maximum and mean temperature, that for corresponding days in any year since 1841. The maximum on the 24th varied from 87·7° at Waddon to 80° at Redhill. The thunderstorm on the morning of the 7th was felt throughout the district. The mean temperature was at Redhill 60·2°, at Upper Gatton and Wallington 62°, at Croydon (Whitgift) 62·2°, at Croydon (Duppas House) 62·6°, and at Waddon 63·8°. There were recorded at Wallington 223·6 hrs. of sunlight, which is 15 per cent. above the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.			IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall......	5	1	0	381	West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
Dorking (Denbies)..............	J. Beesley	5	0	6	610	West Wickham (Layham's Farm).	W. Ashcroft	5	1	0	500
Walton Heath (The Hermitage)..	S. Bostock	5	1	2	650	Hayes Common (The Warren) ..	Miss Akers	5	1	0	296
Redhill (Oxford Road)	W. H. Tyndall........	8	1	0	300	Keston (Bradfield)	A. Hill	5	1	0	350
Nutfield (The Priory)	J. Moffatt	8	1	2	468	Keston (Tower Fields)..........	G. Buchanan	8	0	9	351
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Reigate Hill (Nutwood Lodge)..	H. E. Gurney	5	1	0	440	Farningham Hill	A. J. Waring	5	3	0	300
Upper Gatton	F. Druce	5	1	0	600	Wilmington (Kent Water Co.)....	W. Morris	5	1	0	25
Merstham (Rockshaw)..........	W. Gardiner..........	5	1	0	475	Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Chipstead (Shabden Park)	J. Crerar	5	1	0	550	Bickley (The High Field)	J. Batten	5	1	2	295
Caterham (Metropol. Asylum) ..	G. S. Elliott, M.D.	5	1	0	610	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe .	5	0	9	240
Marden Park (Birchwood House)..	Mrs. F. Rutley	5	1	0	471	Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
Westerham (The Fishponds)	W. Morris	5	1	0	380	South Norwood (Apsley Road) ..	W. H. Cullis..........	5	1	0	125
Knockholt (The Beeches)........	W. Morris	5	1	0	785	Thornton Heath (Thornton Road).	A. Wright	8	0	10	120
Warlingham (The Vicarage)	Rev. F. R. Marriott....	5	1	0	614	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Coulsdon (The Grange)	W. J. Stride	5	1	4	525	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Kenley (Ingleside)	H. Smith	8	1	0	375	Raynes Park (Pumping Station)..	C. H. Cooper	5	1	0	47
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282	New Malden (Sewage Works)	T. V. H. Davison......	5	1	0	45
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216	Esher (Sewage Works)..........	W. H. Hope	5	1	0	40
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart. ..	5	1	0	280	West Molesey (Chelsea W. Co.)..	R. Hack..............	5	1	0	32
Oxshott	W. H. Dines..........	5	1	0	212	Surbiton (Seething Wells)	R. Hack..............	10	0	6	25
Epsom (Epsom College)	A. M. Hale	8	1	0	290	Kingston (Sewage Works)	T. Stevens............	5	1	0	25
Banstead (The Larches)	Rev. C. J. Taylor......	8	1	0	488	Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Sutton (Mulgrave Road)	W. Goode	5	5	6	230	Wandsworth Com. (Patten Road).	F. J. Brodie	5	1	0	100
Wallington (Maldon Road)	F. Campbell-Bayard ..	5	4	1	140	Streatham (Woodfield Avenue)...	F. Jordan	5	1	0	120
Beddington (Riverside)	S. Rostron	5	1	0	120	West Norwood (Thornlaw Road)..	W. Marriott	8	1	0	220
Waddon (Waddon House)	P. Crowley	5	1	0	156	Forest Hill (Dartmouth Road) ...	Mrs. Behrens	5	1	0	220
Croydon (Brimstone Barn)	Croydon Corporation ..	5	1	0	130	Forest Hill (The Nurseries)	James Carter & Co.....	6	0	6	76
Croydon (Waddon New Road)....	Croydon Corporation ..	5	1	0	146	Forest Hill (S. & V. Water Co.)..	J. W. Restler	5	1	0	344
Croydon (Duppas House)	Baldwin Latham	8	1	0	158	Eltham (High Street)	W. Morris............	5	1	0	245
Croydon (Chatfield Road)	A. Malden............	5	1	0	166	Woolwich (Powis Street)........	J. G. Waller..........	5	30	0	65
Croydon (Whitgift School)	A. E. Watson	5	1	0	191	Greenwich (Royal Observatory)..	Astronomer Royal	8	0	5	155
Croydon (Park Hill Rise)	H. F. Parsons, M.D. ..	5	1	0	250	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202	Nunhead (S. & V. Water Co.)....	J. W. Restler	5	4	0	176
Addington Hills (The Reservoir)..	Croydon Corporation ..	8	0	9	473	Brixton (Acre Lane)	F. Gaster	8	1	0	77
Addington (Park Farm)	W. Whalley	5	1	0	268	Battersea (S. & V. Water Co.) ...	J. W. Restler	5	3	0	21
Addington (Pumping Station)....	Croydon Corporation ..	8	1	0	331						

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for October is 2·75 in.* October, 1895.

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·27	·31	·23	·18	·21	·24	·22	·19	·27	·24	·24	·18	·23	·18	·20	·18	·18	·13	·15	·25	·19
2	..	·05	..	·03	..	..	·03	·02	·01	·02	·01	..	..	·01	..	·02	·01	..	·01	..	..
3	·12	·13	·09	·11	·13	·15	·08	·11	·06	·11	·09	·10	·10	·08	·08	·04	·11	·08	·08	·10	·08
4	·09	·10	·06	·13	·10	·09	·08	·11	·09	·13	·16	·26	·10	·09	·07	·20	·05	·07	·07	·07	·07
5	·75	·70	·80	·60	·93	·58	1·28	1·26	1·24	·86	·82	·59	·92	1·05	·94	1·38	1·00	·98	·89	1·01	1·20
6	·39	·20	·20	·23	·21	·22	·02	·08	·19	·18	·20	·25	·19	·20	·17	·17	·18	·23	·25	·32	·11
7	·05	·08	·09	·18	·15	·14	·15	·13	·12	·14	·15	·15	·08	·16	·25	·24	·19	·16	·15	·15	·11
8	·15	·15	·20	·22	·32	·18	·25	·23	·18	·28	·23	·19	·14	·17	·16	·15	·18	·13	·15	·34	·25
9	·04	·05	·03	·04	·04	·03	·03	·04	·04	·04	·04	·03	·05	·04	·04	·03	·03	·02	·02	·02	·02
10	..	·02	..	..	..	..	..	·01	..	..	..	·01	..	..	·01	..	..	..	..	..	..
11	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·14	·19	·20	·21	·17	·21	·16	·20	·16	·16	·18	·19	·18	·17	·12	·15	·15	·13	·12	·12	·20
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·13	·14	·13	·11	·05	·14	·12	·06	·13	·09	·12	·07	·11	·13	·09	·15	·13	·13	·13	·11	·13
22	·43	·40	·50	·30	·32	·40	·43	·36	·36	·40	·45	·41	·41	·36	·37	·31	·32	·31	·32	·39	·18
23	·02	..	·02	·01	..	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..
24	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
28	·05	·08	..	·01	..	..	·01	·02	·04	·05	·02	·02	..	·01	·01	·01	·01	..	·01	·05	·02
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·03	·04	·02	·04	·02	·03	·03	·02	·02	·03	·03	·07	·04	·03	·03	·01	·02	·01	·02	·01	·01
31	·13	·15	·17	·18	·10	·17	·18	·13	·15	·16	·16	·12	·20	·16	·13	·12	·14	·12	·12	·06	·11
*	2·82	2·81	2·74	2·59	2·75	2·58	3·02	2·97	3·06	2·90	2·90	2·64	2·75	2·86	2·67	3·16	2·70	2·50	2·49	3·00	2·68
†	16·38	18·24	14·75	14·79	15·63	16·19	18·99	18·26	14·62	15·08	15·77	14·79	15·86	14·85	13·32	15·28	14·34	13·00	13·05	16·08	14·19

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.) (10 a.m.)

NOTES.

(October, 1895.)

The month has been cold, sunless, and rather wet, though the rainfall has been below the average. Owing to the cold, the lovely autumn tints have been conspicuous by their absence. The last eight days were unusually cold, and such a prolonged cold period has not been known for very many years. Snow fell generally throughout the district on the 28th. Solar and lunar halos and lightening were observed on several days. The mean temperature is about 2° below the average, and was at Redhill and Kenley (Ingleside) 45·2°, at Chipstead 45·3°, at Waddon 45·7°, at Wallington 46·2°, at Croydon (Whitgift) 46·5°, at Upper Gatton 47·2°, and at Croydon (Duppas House) 48·1°. There were recorded at Wallington 67·8 hours of sunlight, which is 15 per cent. below the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	A. M. Hale	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (The High Field)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for November is 2·37 in.* **November, 1895.**

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
3	·07	·07	·04	·07	·10	·03	·11	·04	·04	·06	·05	·05	·05	·03	·07	·10	·05	·04	·04	·05	·02
4	·34	·35	·56	·26	·32	·41	·54	·41	·32	·29	·32	·32	·27	·25	·17	·20	·26	·25	·23	·25	·23
5	·15	·17	·12	·17	·21	·15	·15	·18	·15	·10	·16	·16	·20	·15	·16	·13	·11	·11	·09	·15	·10
6	·16	·18	·17	·15	·18	·16	·22	·20	·17	·15	·15	·20	·04	·14	·12	·13	·13	·13	·14	·12	·15
7	·20	·22	·18	·19	·15	·15	·22	·17	·15	·16	·18	·08	·24	·13	·16	·14	·13	·10	·10	·16	·12
8	·46	·46	·46	·22	·40	·40	·42	·38	·47	·39	·41	·40	·49	·40	·45	·46	·39	·39	·38	·46	·35
9	·01	·03	..	·02	..	..	..	·01	·01	..	..	·01	..	·01	·01	·01	·01	..	..	..	..
10	·31	·35	·22	·21	·40	·38	·32	·30	·30	·18	·38	·31	·37	·36	·38	·20	·29	·26	·27	·29	·18
11	·13	·15	·11	·10	·15	·12	·12	·23	·11	·12	·22	·26	·36	·11	·36	·30	·19	·16	·14	·10	·07
12	·06	·08	·02	·04	·04	·04	·01	·03	·06	·06	·07	·10	·13	·10	·11	·10	·09	·09	·04	·07	·04
13	..	..	..	..	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·05	·04	·03	·02	·05	·02	·04	·07	·11	·07	·05	·07	·06	·08	·05	·06	·08	·07	·07	·10	·05
15	·36	·31	·21	·31	·37	·30	·33	·34	·28	·28	·30	·25	·32	·26	·26	·16	·21	·19	·15	·25	·21
16	..	·02	..	..	..	..	..	·02	..	·01	..	·02	..	·01	..	..	·01	..	..	·01	..
17	·01	·01	..	..	..	..	·04	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·02	·01	·02	·03	·01	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	·02	·01	·01	..	..	..	..
22	·24	·25	·21	·19	·17	·20	·22	·19	·21	·23	·23	·08	·05	·25	·25	·23	·21	·21	·21	·22	·19
23	·03	·05	·04	·07	·06	·04	·12	·09	·02	·02	·02	·21	·26	·04	·05	·06	·05	·05	·03	·01	·01
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·08	..	..	..	..	..
27	·07	·08	·03	·04	·08	·02	·04	·04	·08	·09	·07	·13	·14	·14	·07	·01	·11	·09	·14	·03	·05
28	·70	·70	·70	·58	·57	·60	·64	·64	·62	·67	·50	·33	·35	·36	·35	·43	·32	·30	·35	·54	·50
29	·17	·21	·21	·22	·25	·23	·12	·20	·24	·17	·17	·20	·21	·20	·25	·16	·22	·17	·20	·19	·15
30	..	·01	..	..	..	..	..	..	·01	·01	..	·01	·04	·01	..	..	..	..	..	·01	..
*	3·52	3·76	3·32	2·88	3·53	3·26	3·70	3·58	3·35	3·06	3·31	3·19	3·58	3·05	3·29	2·97	2·88	2·61	2·58	3·01	2·42
†	19·90	22·00	18·07	17·67	19·16	19·45	22·69	21·84	17·97	18·14	19·08	17·98	19·44	17·90	16·61	18·25	17·22	15·61	15·63	19·09	16·61

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.
(November, 1895.)

The month has been warm, wet, and stormy, with lightening and hail generally throughout the district on the 11th. It is the warmest November in the last ten years. Slight snow fell throughout the district on the 23rd. An aurora was seen at Wallington on the 9th, and also on the 11th; and a solar halo at Upper Gatton on the 6th. The mean temperature is about 3° above the November average, and was at Kenley (Ingleside) 46·7°, at Waddon 46·9°, at Wallington 47°, at Croydon (Whitgift) 47·2°, at Croydon (Duppas House) 47·6°, and at Chipstead 47·8°. There were recorded at Wallington 42·7 hours of sunlight, which is 3 per cent. below the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	A. M. Hale	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (The High Field)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for November is 2·37 in.* November, 1895.

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
3	·07	·07	·04	·07	·10	·03	·11	·04	·04	·06	·05	·05	·05	·03	·07	·10	·05	·04	·04	·05	·02
4	·34	·35	·56	·26	·32	·41	·54	·41	·32	·29	·32	·32	·27	·25	·17	·20	·26	·25	·23	·25	·23
5	·15	·17	·12	·17	·21	·15	·15	·18	·15	·10	·16	·16	·20	·15	·16	·13	·11	·11	·09	·15	·10
6	·16	·18	·17	·15	·18	·16	·22	·20	·17	·15	·15	·20	·04	·14	·12	·13	·13	·13	·14	·12	·15
7	·20	·22	·18	·19	·15	·15	·22	·17	·15	·16	·18	·08	·24	·13	·16	·14	·13	·10	·10	·16	·12
8	·46	·46	·46	·22	·40	·40	·42	·38	·47	·39	·41	·40	·49	·40	·45	·46	·39	·39	·38	·46	·35
9	·01	·03	..	·02	..	..	..	·01	·01	..	..	·01	..	·01	·01	·01	·01	..	..	..	..
10	·31	·35	·22	·21	·40	·38	·32	·30	·30	·18	·38	·31	·37	·36	·38	·20	·29	·26	·27	·29	·18
11	·13	·15	·11	·10	·15	·12	·12	·23	·11	·12	·22	·26	·36	·11	·36	·30	·19	·16	·14	·10	·07
12	·06	·08	·02	·04	·04	·04	·01	·03	·06	·06	·07	·10	·13	·10	·11	·10	·09	·09	·04	·07	·04
13	..	..	..	..	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·05	·04	·03	·02	·05	·02	·04	·07	·11	·07	·05	·07	·06	·08	·05	·06	·08	·07	·07	·10	·05
15	·36	·31	·21	·31	·37	·30	·33	·34	·28	·28	·30	·25	·32	·26	·26	·16	·21	·19	·15	·25	·21
16	..	·02	..	..	..	..	..	·02	..	·01	..	·02	..	·01	..	..	·01	..	..	·01	..
17	·01	·01	..	..	..	..	·04	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·02	·01	·02	·03	·01	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	·02	·01	·01	..	..	..	..
22	·24	·25	·21	·19	·17	·20	·22	·19	·21	·23	·23	·08	·05	·25	·25	·23	·21	·21	·21	·22	·19
23	·03	·05	·04	·07	·06	·04	·12	·09	·02	·02	·02	·21	·26	·04	·05	·06	·05	·05	·03	·01	·01
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·08	..	..	..	..	..
27	·07	·08	·03	·04	·08	·02	·04	·04	·08	·09	·07	·13	·14	·14	·07	·01	·11	·09	·14	·03	·05
28	·70	·70	·70	·58	·57	·60	·64	·64	·62	·67	·50	·33	·35	·36	·35	·43	·32	·30	·35	·54	·50
29	·17	·21	·21	·22	·25	·23	·12	·20	·24	·17	·17	·20	·21	·20	·25	·16	·22	·17	·20	·19	·15
30	..	·01	..	..	..	..	..	..	·01	·01	..	·01	·04	·01	..	..	..	..	..	·01	..
*	3·52	3·76	3·32	2·88	3·53	3·26	3·70	3·58	3·35	3·06	3·31	3·19	3·58	3·05	3·29	2·97	2·88	2·61	2·58	3·01	2·42
†	19·90	22·00	18·07	17·67	19·16	19·45	22·69	21·84	17·97	18·14	19·08	17·98	19·44	17·90	16·61	18·25	17·22	15·61	15·63	19·09	16·61

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.

(November, 1895.)

The month has been warm, wet, and stormy, with lightening and hail generally throughout the district on the 11th. It is the warmest November in the last ten years. Slight snow fell throughout the district on the 23rd. An aurora was seen at Wallington on the 9th, and also on the 11th; and a solar halo at Upper Gatton on the 6th. The mean temperature is about 3° above the November average, and was at Kenley (Ingleside) 46·7°, at Waddon 46·9°, at Wallington 47°, at Croydon (Whitgift) 47·2°, at Croydon (Duppas House) 47·6°, and at Chipstead 47·8°. There were recorded at Wallington 42·7 hours of sunlight, which is 3 per cent. below the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Epsom (Epsom College)	A. M. Hale	8	1	0	290
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddcn House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corpcration	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm)	W. Ashcroft	5	1	0	500
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (The High Field)	J. Batten	5	1	2	295
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	W. H. Hope	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	Mrs. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Woolwich (Powis Street)	J. G. Waller	5	30	0	65
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for December is 1·93 in.* **December, 1895.**

Day of Mo.	Abinger	Dorking	Walton Heath	Redhill	Nutfield	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Chipstead	Caterham	Marden Park	Westerham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	·02	..	·01	·02	..	·02	..	..	..	·01	..
2	..	..	·01	·01	·03	..	..	..	·01	..	..	..	..
3	·04	..	..	..	·01	..	..	..	·01	·01	..	..	·03
4	·06	·10	·09	·12	·10	·10	·10	·07	·09	·09	·07	·02	·13
5	·13	·07	·07	·05	·07	·08	·08	·06	·07	·06	·08	·01	·07
6	·05	·02	·03	·11	·04	·04	·09	·02	·04	·03	·12	..	·03
7	..	..	..	..	..	..	..	·02	..	..	..	..	..
8	..	·02	·06	·06	·09	·04	·05	·04	·08	·03	·08	·06	..
9	..	..	·04	·05	·02	·03	·03	·03	·03	·04	·04	·04	..
10	..	..	..	..	..	·01	·09	·01	..	..	..	..	..
11	·11	·75	·09	·10	·09	·10	..	·10	·10	·09	·09	·02	·13
12	..	·45	·62	·38	·32	·42	·35	·40	·35	·42	·40	·26	·20
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·32	·47	·60	·43	·38	·47	·41	·46	·42	·44	·45	·37	·34
15	·42	·15	·10	·11	·10	·07	·09	·09	·12	·12	·11	..	·09
16	·30	·55	·57	·58	·56	·63	·57	·62	·59	·74	·55	·85	·70
17	..	·02	·01	..	..	..	·01	..	..	..	·01	·07	·05
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	·01	·01	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	·04	..	..	..	..	..	..	..
24	·40	·35	·40	·28	·32	·18	·21	·26	·29	·30	·34	·14	·30
25	..	..	·02	..	·01	..	·01	·02	·01	·01	·03	..	..
26	..	·16	·17	·13	·11	·15	·11	·13	·10	·14	·11	·07	·15
27	..	..	..	..	·01	..	·01	..	..	..	..	..	..
28	·04	·15	·24	·19	·15	·20	·18	·30	·23	·22	·23	..	·14
29	·30	·21	·40	·25	·25	·25	·26	·34	·35	·35	·36	·47	·33
30	·03	·03	·05	·05	·03	·08	·05	·03	·04	·03	·05	·02	..
31	..	..	·02	..	..	..	·01	·01	·01	..	..	..	..
*	2·20	3·50	3·61	2·90	2·70	2·92	2·72	3·03	2·94	3·12	3·12	2·36	2·69
†	30·75	28·34	28·88	28·23	26·54	29·25	26·91	28·43	27·34	28·03	26·04	22·42	24·65

Day of Mo.	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Purley (Tudor C.)	Ashtead	Oxshott	Epsom	Banstead	Sutton	Wallington	Bedding-ton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1		..	..	·01	..	..	..	..		..	..	..	..
2		·01	·02	·01	·01	·03	..	·01		..	..	..	..
3		..	..	..	..	·03	·02	..		..	·01	..	..
4		·08	·06	·08	·07	·05	·09	·07		..	·08	·07	·08
5		·07	·05	·07	·08	·06	·06	·04		·15	·04	·05	·05
6		·02	..	·02	·03	..	·05	·02		..	·02	·03	·02
7		..	..	·01	..	·02	..	·02		..	..	..	·01
8		..	·03	·01	·01	·04	..	..		..	..	..	..
9		..	·04	·05	·06	·12	·05	·04		..	·06	·06	·06
10		..	..	..	..	..	..	..		..	..	..	..
11		·27	·11	·09	·11	·13	·04	·08		·24	·06	·08	·07
12		·32	·31	·45	·41	·32	·29	·23		·34	·26	·28	·29
13		..	..	..	..	..	..	..		..	..	..	..
14		·39	·40	·41	·40	·36	·43	·38		·43	·33	·31	·37
15		·17	·12	·12	·15	·14	·10	·08		·12	·09	·09	·10
16	MONTHLY GAUGE.	·83	·57	·60	·61	·56	·27	·25	RECORD CEASED.	·70	·56	·52	·49
17		..	..	..	..	·02	·01	..		..	..	..	..
18		..	..	·01	..	·02	..	..		..	..	..	..
19		..	..	..	..	..	..	..		..	..	..	..
20		..	..	..	..	..	..	·01		..	..	..	..
21		..	..	..	..	..	..	..		..	..	..	..
22		..	..	..	..	..	·01	..		..	..	..	..
23		..	..	..	..	..	..	..		..	..	..	..
24		·42	·21	·28	·31	·35	·33	·35		·26	·25	·26	·41
25		·03	..	·01	·02	·16	·01	·01		..	·01	..	·01
26		·08	·13	·13	·13	·14	·11	·10		·29	·19	·11	·10
27		..	..	..	..	..	..	..		..	..	..	..
28		·27	·11	·15	·14	·11	·11	·08		·14	·10	·09	·10
29		·32	·28	·33	·37	·33	·33	·30		·35	·32	·30	·30
30		·06	·04	·05	·01	·34	·04	·02		·03	·04	·04	·03
31		..	..	..	..	..	..	..		..	..	..	..
*	3·07	3·34	2·48	2·89	2·92	3·23	2·35	2·09		3·05	2·42	2·29	2·49
†	26·73	28·31	23·73	24·92	25·37	24·24	22·44	21·17		24·73	21·69	20·75	21·59

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Wilmington	Chislehurst	Bickley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	·01	..	..	..	·01	..	..	·01	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..
2	..	..	..	·01	..	..	..	..	·01	..	..	..	..	·01	·01	·03	..	..	..	..	..	..	·01	·01	..	..
3	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	·02	..	..	..	..
4	·07	·08	·06	·06	·06	·06	·08	·06	·07	·08	·06	·07	·07	·05	·04	..	·02	·03	·01	·08	·06	·03	·05	·05	..	·09
5	·05	·05	·05	·04	·05	·05	·06	·06	·06	·05	·06	·05	·04	·07	·05	·11	·04	·03	·07	·06	·04	·03	·05	·04	·09	·04
6	·02	·02	·01	·01	·02	·02	·01	·02	..	·05	·01	·01	..	·02	·03	·03	·02	·02	·03	·04	·02	·04	·03	·02	..	·02
7	..	..	·02	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
8	..	..	..	..	..	..	·01	..	..	..	..	·01	..	·01	·01	..	..	..	..	..	..	..	..	·01	..	..
9	·06	·05	·05	·06	·05	·06	·05	·05	·08	·07	·06	·06	·05	..	·05	·05	·04	·05	·04	·06	·04	·04	·04	·04	·05	..
10	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·08	·06	·07	·09	..	·09	·09	·07	·09	·15	·15	·19	·15	·20	·19	·18	·10	·15	·12	·11	·09	·10	·07	·08	·08	·14
12	·29	·24	·28	·29	·32	·33	·33	·31	·34	·37	·41	·42	·30	·31	·27	·37	·34	·29	·26	·35	·31	·25	·29	·36	·25	·35
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·31	·24	·30	·30	·31	·32	·31	·31	·32	·32	·32	·31	·28	·29	·26	·29	·26	·22	·24	·29	·28	·27	·29	·31	·30	·33
15	·09	·08	·08	·09	·08	·09	·09	·08	·11	·14	·14	·13	·10	·11	·10	·12	·11	·07	·04	·08	·08	·10	·08	·08	·25	·08
16	·43	·35	·44	·45	·42	·47	·48	·45	·61	·74	·80	·85	·85	·72	·65	·67	·34	·89	·51	·53	·52	·57	·53	·44	·21	·34
17	·01	..	..	·01	..	..	·01	·01	·01	·02	·01	·04	·03	·04	·03	·04	·02	..	·01	·04	·03	·04	·03	·02	..	·01
18	..	..	·01	..	·01	·01	·01	·01	..	·02	..	·02	..	·03	·02	·02	..	..	..	..	..	..	·04	·01	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·39	·34	·35	·33	·28	·24	·26	·24	·29	·49	·37	·36	·31	·33	·39	·47	·32	·31	·38	·30	·45	·37	·42	·33	·24	..
25	·01	·02	·05	·01	·03	·05	·01	·01	·01	·01	·01	·01	·07	·01	·03	·02	·02	·01	·02	..	·02	·03	·02	·01	·02	·01
26	·10	·09	·06	·11	·08	·09	·11	·11	·13	·14	·12	·13	·10	·15	·15	·18	·14	·14	·15	·20	·15	·15	·15	·12	·08	·16
27	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·02	..	..	..	..	·01	..	..
28	·10	·09	·09	·10	·10	·10	·10	·10	·10	·10	·10	·09	·10	·10	·09	·12	·11	·14	·13	·15	·13	·12	·13	·13	·12	·14
29	·30	·26	·30	·29	·28	·27	·29	·28	·30	·25	·31	·29	·29	·26	·24	·27	·23	·24	·26	·29	·27	·26	·28	·27	·27	·25
30	·03	·04	·03	·04	·04	·06	·04	·03	·05	·12	·04	·03	·05	·04	·04	·04	·03	·03	·06	·04	·03	·04	·04	·03	·02	·05
31	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	·02	..	..	..	..	·01	..	..	..	..	..
*	2·35	2·01	2·25	2·31	2·14	2·31	2·34	2·21	2·61	3·12	2·98	3·07	2·79	2·77	2·68	3·03	2·14	2·63	2·35	2·62	2·53	2·46	2·55	2·37	1·98	2·02
†	21·02	20·28	21·42	21·12	20·11	21·95	21·22	20·30	22·27	24·57	23·67	24·42	23·20	22·29	21·17	22·88	19·86	20·04	17·69	22·92	20·73	20·00	20·49	20·55	18·90	20·34

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 75 years (1816–90) mean at Greenwich for December is 1·93 in.* **December, 1895.**

Day of Mo.	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
2	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..
3	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
4	·09	·10	·06	·10	·09	·09	·10	·08	·07	·07	·11	·06	·06	·08	·05	·02	·03	·03	·03	·07	·04
5	·03	·06	·02	·05	·04	·03	·03	·03	·03	·03	·04	·04	..	·03	·08	·05	·10	·08	·02	·02	·01
6	·02	·05	·03	·04	·04	·02	·04	·05	·03	·03	·04	·04	..	·02	·05	·04	·05	·05	·03	·03	·03
7	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·01	·02	..	·01	·01	..	..	·02	·02	·02	..	·04	..	·01	..	..	·01	..	..	·01	..
9	·08	·07	·05	·07	·06	·05	·07	·04	·06	·04	·05	·01	·05	·05	·06	·02	·03	·03	·03	·06	·03
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·09	·11	·08	·05	·12	·06	·10	·09	·12	·10	·12	·11	·34	·09	·08	·06	·05	·06	·08	·08	·06
12	·31	·38	·24	·27	·40	·21	·38	·37	·30	·24	·28	·25	·07	·29	·25	·26	·25	·20	·16	·26	·23
13	..	·01	..	·01	..	..	..	..	·10	..	..	..	..	..	..	..	..	..	..	..	..
14	·33	·37	·38	·40	·35	·24	·40	·32	·35	·30	·35	·34	·28	·33	·28	·37	·38	·33	·29	·35	·30
15	·08	·11	·07	·08	·05	·05	·07	·06	·09	·09	·08	·10	·09	·15	·08	·06	·08	·07	·08	·10	·07
16	·27	·33	·21	·22	·19	·09	·26	·17	·34	·34	·34	·41	·54	·42	·43	·36	·41	·42	·44	·36	·30
17	..	·02	..	·02	·01	..	..	·01	·01	·02	·02	·02	..	·01	·02	..	·01	·01	·02	..	·01
18	..	..	..	..	..	..	..	..	·01	·02	·03	·03	..	·02	..	..	..	·01	·03	·03	·01
19	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·23	·25	·28	·31	·35	·16	·36	·30	·28	·27	·27	·29	·32	·21	·33	·28	·35	·30	·29	·25	·15
25	..	·02	..	·02	..	..	..	·02	·04	·02	·01	·03	·10	..	·02	·03	·01	..	..	·03	..
26	·15	·15	·10	·08	·09	·06	·07	·08	·12	·10	·09	·11	..	·07	·16	·18	·22	·19	·11	·10	·05
27	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
28	·13	·14	·11	·12	·13	·06	·15	·17	·16	·14	·14	·13	..	·13	·14	·15	·17	·14	·13	·16	·14
29	·27	·28	·33	·30	·30	·22	·33	·27	·28	·27	·30	·27	..	·29	·30	·28	·30	·27	·28	·27	·28
30	·05	·06	·02	·04	·04	..	·03	·03	·07	·06	·05	·07	·44	·06	·06	·08	·03	·05	·02	·06	·04
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	2·15	2·58	1·98	2·21	2·28	1·34	2·39	2·11	2·48	2·16	2·32	2·36	2·29	2·27	2·39	2·25	2·50	2·24	2·04	2·24	1·75
†	22·05	24·58	20·05	19·88	21·44	20·79	25·08	23·95	20·45	20·30	21·40	20·34	21·73	20·17	19·00	20·50	19·72	17·85	17·67	21·33	18·36

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Rd.)(10 a.m.)

NOTES.
(December, 1895.)

The month may be described as a warm, wet, and sunless one. There has been an absence of severe frosts and heavy snow. Slight snow fell throughout the district on the 7th, 25th, and 26th. Solar halos were seen at Upper Gatton on the 1st and 10th, and at Croydon on the 14th. A very fine rainbow was seen at Nutfield on the 6th. The mean temperature of the month is about 4° above the December average, and was at Chipstead 39°, at Waddon 39·4°, at Kenley (Ingleside) and Upper Gatton 39·9°, at Wallington 40°, at Croydon (Duppas House) 40·2°, and at Croydon (Whitgift) 40·4°. There were recorded at Wallington 24·1 hours of sunlight, which is 7 per cent. below the average.

F. Campbell-Bayard,
F.R.M.S., *Hon. Sec.*

APPENDIX II.

FALLS OF 1·00 IN. AND UPWARDS.

JULY 21ST.—Battersea, 1·35 in.; Bickley, 1·33 in.; Woolwich, 1·32 in.; Chipstead, 1·25 in.; Croydon (Chatfield Road), 1·24 in.; Brixton, 1·23 in.; Coulsdon, 1·21 in.; Kenley (Hazelea), Waddon, West Wickham (Wickham Court), and West Norwood, 1·20 in.; Redhill and Reigate Hill (Nutwood Lodge), 1·18 in.; Upper Gatton, 1·17 in.; Westerham and West Wickham (Layham's Farm), 1·16 in.; Croydon (Brimstone Barn and Duppas House), 1·15 in.; Merstham and Beckenham, 1·14 in.; Warlingham, 1·13 in.; Croydon (Whitgift), and Orpington, 1·12 in.; Croydon (Lower Addiscombe Road), 1·11 in.; Addington (Pumping Station), Hayes Common, Wandsworth Common, and Nunhead, 1·10 in.; Chislehurst, 1·09 in.; Eltham, 1·08 in.; Walton Heath and New Malden, 1·07 in.; Beddington, Croydon (Waddon New Road), and Forest Hill (Southwark and Vauxhall Water Company), 1·06 in.; Addington (Park Farm), 1·05 in.; Sutton, Croydon (Park Hill), Bromley Common, and Surbiton, 1·04 in.; Nutfield and Oxshott, 1·03 in.; Esher, 1·02 in.; Wallington, Keston (Tower Fields), and Wimbledon (Sewage Works), 1·01 in.; Caterham, Addington Hills, and Wimbledon (Mt. Ararat), 1·00 in.

AUGUST 22ND.—Richmond, 1·39 in.; Kingston, 1·10 in.

SEPTEMBER 6TH.—Richmond, 1·33 in.; Kingston, 1·24 in.; West Molesey, 1·22 in.; Battersea, 1·13 in.

OCTOBER 5TH.—Woolwich, 1·38 in.; Kingston, 1·28 in.; Richmond, 1·26 in.; Wandsworth Common, 1·24 in.; Battersea, 1·20 in.; Forest Hill (Southwark and Vauxhall Water Company), 1·05 in.; Wimbledon (Sewage Works), 1·02 in.; Brixton, 1·01 in.; Greenwich, 1·00 in.

NOVEMBER 15TH.—Walton Heath, 1·28 in.; Abinger, 1·01 in.

CONTENTS.

PROCEEDINGS.

TRANSACTIONS.

Croydon Microscopical and Natural History Club.

OFFICERS FOR 1896.

President.—W. Murton Holmes.

Vice-Presidents.—John Berney, F.R.M.S.; Philip Crowley, F.L.S., F.Z.S.; Henry S. Eaton, M.A., F.R.Met.Soc.; Henry T. Mennell, F.L.S.; Henry G. Thompson, M.D., F.R.M.S., J.P.; Edward Lovett; and H. Franklin Parsons, M.D., F.G.S.

Treasurer.—Edward B. Sturge.

Librarian.—Alfred Roods.

Committee.—J. H. Baldock; H. C. Collyer; J. H. Drage; James Epps, Jun., F.L.S.; H. D. Gower; J. M. Hobson, M.D.; G. W. Moore; N. F. Robarts; and C. H. Burnaby Sparrow.

Hon. Secretary.—R. F. Grundy (*112, Lower Addiscombe Road, Croydon*), to whom all communications may be addressed.

PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON MICROSCOPICAL & NATURAL HISTORY CLUB.

FEBRUARY 18, 1896, TO JANUARY 19, 1897.

CROYDON:

PRINTED FOR THE CLUB, BY WEST, NEWMAN & CO., HATTON GARDEN, LONDON.

1897.

PROCEEDINGS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1896–97.

Twenty-seventh Annual Meeting,

Held at the Public Hall, Croydon, January 19th, 1897.

W. MURTON HOLMES, President, in the chair.

The statement of accounts for the year 1896 was approved.

The President announced that the following had been nominated as officers of the Club for the ensuing year, and there being no other nominations they were duly elected:—President, J. M. Hobson, M.D.; Hon. Treasurer, Mr. E. B. Sturge; Hon. Secretary, Mr. R. F. Grundy; Librarian, Mr. A. Roods; and Mr. E. J. Platts and Dr. G. E. Newby members of the Committee to fill the vacancies caused by the retirement of Mr. H. D. Gower and Dr. Hobson.

The following is a list of the officers for the year 1897:—

President.—J. M. HOBSON, M.D.

Vice-Presidents.—JOHN BERNEY, F.R.M.S.; PHILIP CROWLEY, F.Z.S., F.L.S.; HENRY S. EATON, M.A., F.R.Met.Soc.; HENRY T. MENNELL, F.L.S.; HENRY G. THOMPSON, M.D., F.R.M.S., J.P.; EDWARD LOVETT; H. FRANKLIN PARSONS, M.D., F.G.S.; and W. MURTON HOLMES.

Treasurer.—EDWARD B. STURGE.

Hon. Secretary.—R. F. GRUNDY.

Librarian.—ALFRED ROODS.

Committee.—J. H. Baldock; H. C. Collyer; J. H. Drage; James Epps, Jun., F.L.S.; G. W. Moore; G. E. Newby, F.R.C.S.; E. J. Platts; N. F. Robarts, F.G.S.; and C. H. Burnaby Sparrow.

Botanical Sub-Committee.—James Epps, F.L.S., Norfolk House, Beulah Hill, Upper Norwood; A. Fitzgerald, 93, Addiscombe Road; W. Ingrams, Whitgift Schools, Church Road; H. T. Mennell, F.L.S. (Hon. Sec.), Park Hill Rise; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; Ernest Straker, Wallington.

Geological Sub-Committee.—George Hinde, Ph.D., F.R.S., F.G.S. (Hon. Sec.), Avondale Road; J. M. Hobson, M.D., 65, Lower Addiscombe Road; G. W. Moore, Bryndhurst, Dornton Road; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; N. F. Robarts, F.G.S., Abingdon, Addiscombe Grove; Thos. Walker, C.E., Warrington Road; Wm. Whitaker, F.R.S., F.G.S., Campden Road.

Meteorological Sub-Committee.—F. C. Bayard, LL.M. (Hon. Sec.), Wallington; Thos. Cushing, F.R.A.S., Chepstow Road; Baldwin Latham, C.E., Duppas House, Croydon.

Microscopical Sub-Committee.—Rev. R. K. Corser, 57, Park Hill Road; T. A. Dukes, M.B., B.Sc., 16, Wellesley Road; H. Greenway, Ashburton Road; E. Lovett, West Burton, Outram Road; W. Murton Holmes (Hon. Sec.), Glenside, St. Peter's Road; G. W. Moore, Bryndhurst, Dornton Road; E. B. Sturge, The Waldrons.

Photographic Sub-Committee.—J. H. Baldock, F.C.S. (Lanternist and Recorder), St. Leonard's Road; H. D. Gower (Hon. Sec.), 55, Benson Road; C. Moss, Hetherley, Coombe Road; E. J. Platts, St. Leonard's Road; Alfred Roods, 67, Thornhill Road; C. H. Burnaby Sparrow, 1, Chepstow Road.

Zoological Sub-Committee.—John Berney, F.R.M.S. (Hon. Sec.), Chatsworth Road; Philip Crowley, F.L.S., F.Z.S., Waddon; John Henry Drage, Tamworth Road, Croydon; C. H. Goodman, Bryn Cottage, Whyteleaf, Surrey; H. Lee, St. John's Grove; R. McLachlan, F.R.S., F.L.S., 23, Clarendon Road, Lewisham.

Anthropological Sub-Committee.—H. C. Collyer, Beddington; E. Lovett (Hon. Sec.), West Burton, Outram Road; N. F. Robarts, F.G.S., Abingdon, Addiscombe Grove; J. Watson Slack, 56, Park Lane; H. G. Thompson, M.D., 86, Lower Addiscombe Road.

It was resolved at the meeting that the rules should be altered so as to make ladies eligible for membership of the Club.

The President then delivered his annual Address, describing the operations of the Club during the past year, at the conclusion of which a hearty vote of thanks was passed to him for the Address and his services as President during the past year.

The President's Address.

Gentlemen,

The custom of embodying in an address an account both of our work and recreations as a Club during the preceding year has this advantage, inasmuch as it gathers up into one whole the various items which have interested and instructed different members, making the many littles appear of some importance, just as the tiny rivulets trickling down a mountain side combine to form a stream. On the other hand, it has the disadvantage of making it exceedingly difficult when we have reached our Twenty-seventh Annual Meeting to say anything that has not a family likeness to what has been said on other occasions, and I therefore must crave your indulgence this evening while I recapitulate the events which have taken place.

The number of members on our roll remains the same as last year, *viz.* 227. We have lost 24 members by death or resignation from various causes, and 24 new members have been elected.

Among those we have lost by death must be mentioned Sir Joseph Prestwich, the eminent geologist, who was elected an honorary member in 1879. He died on June 23rd, 1896, and had studied geology from an early age, and for some years was in business in the city. He published an important work on geology in 1888.

The late Archbishop of Canterbury was also at one time on our list; but, I believe, took no particular interest in the Club.

As will be seen from the balance-sheet that has been issued to you, the expenditure from the General Fund has been £151 5s. 7d. as compared with £154 9s. 2d. last year, and although every care has been exercised, it has slightly exceeded our income, and there is now a balance at the bank of £6 0s. 9d., compared with £10 19s. 10d. at the beginning of last year, but there are no liabilities outstanding. The expenses of the Soirée were £2 11s. 2d. more, and the amount realized by the sale of tickets £1 6s. 6d. less than 1895, and there is also a difference of £1 10s. for the hire of the room for meetings. One of the most costly items of our expenditure is that for the Meteorological Sub-Committee, towards which four gentlemen very handsomely contribute £15 5s.; but even then the cost to the Club is £14 12s. 6d. After carrying on the work so well for so many years, it would be a very great pity to have to discontinue it. What we really want is an addition of another forty members,—members who will take a real interest in our proceedings, not only by attending the meetings, in itself a good thing, but also by contributing communications, no matter how short, or by bringing objects of interest, even if only to ask questions about them. In a large town like Croydon there must always be something to bring forward. New roads are being made, drains are daily being relaid, so that anyone with a taste for geology will be sure to find something. Gardens are also plentiful, and the growth of plants in them always has some point of interest, without the necessity of going farther afield. Then again the cyclists ought to be able to do something for us in remoter parts of the county. I know of one man who has got together a large collection of chalk fossils by visiting the various chalk-pits during his leisure time, and I have seen others in rather large numbers who contrive to collect rather a large geological deposit on their backs.

The balance for the Special Fund Account is more satisfactory, being £13 0s. 8d. as compared with £9 2s. 8d. last year.

The attendance at the Conversational Meetings of the various sections is not at all what could be wished. With the exception of the Anthropological Section last January, when Mr. Lovett exhibited and described a number of stone implements, the gathering has not usually exceeded three or four, and on one occasion it was limited to two. If these meetings are to be continued, it is necessary that we should reconsider in what manner they can best be carried out, and I would suggest that a small committee be formed for the purpose.

Reports of Sub-Committees.

The *Meteorological Sub-Committee* has continued its work under the supervision of its Honorary Secretary. The daily rainfall of seventy-eight stations in the Club District has been tabulated every month, examined and corrected, and the results printed and issued to the observers, and all members of the Club interested in the question, either before or within a few days after the end of the month succeeding that to which the statistics refer. Short particulars of the weather have also been inserted in every monthly sheet. The Sub-Committee regret to record the loss of four stations during the year, one of them owing to the observer's death, but are happy to inform the Club that new observers have come forward to supply these vacancies. Three gentlemen interested in the work of the Section contributed the sum of £15 towards the expenses, and one other gentleman has subscribed 5s. for the returns.—F. Campbell-Bayard, *Hon. Sec.*

Report of the Anthropological Section.—During the year several objects of interest connected with this subject have been exhibited and described, and a paper was read upon "Superstition," especially in relation to the wearing of charms and amulets, by Mr. Edward Lovett, the Honorary Secretary of the Section; who has also made records and collected specimens in illustration of folk-lore and myth.

It is to be hoped that members of the Club generally will assist in preserving, as far as possible, records and objects connected with the past. In these days of rapid change and fresh notions, the interesting links between the past and the present are very apt to become lost, with the result that the origins of many of our modern sayings, customs, and even appliances, are not capable of being traced at all.

The Anthropological Section of the Club is making it its business to preserve, as far as possible, all that survives bearing upon the origin and evolution of these things, known only to us in their recent garb, more especially those of our own county.

No more interesting subject than a collection of folk-lore specimens could well be found to furnish some of the cases in that museum of the future which has so long been the dream of members of this Club.—EDWARD LOVETT, *Hon. Sec.*

Photographic Sub-Committee.—Despite the tranquillity that at present prevails in the photographic world, the Section still continues to absorb a large amount of individual interest; the attendance of the meetings devoted to the Section have not been so well attended as one might wish.

Meetings and lantern evenings have taken place during the year.

Thanks are due to the editors of 'The British Journal of Photography,' 'The Amateur Photographer,' and also 'The Magic Lantern Journal,' for the free copies sent during the past year for the use of members in the reading-room.

A number of excursions were arranged and carried out, but the attendance on many occasions was very limited.

At the Soirée this year the sectional exhibit well maintained its standard of excellency, frames numbering nearly one hundred being hung, comprising all well known processes, and several new printing methods. A large table in the Small Hall was as usual devoted to an excellent exhibit of lantern-slides and transparencies, the work of members; three lantern exhibitions of members' slides taking place during the evening in the Old School of Art Room. In a room at end of corridor an interesting demonstration of the X Rays was given by Messrs. Watson & Sons; also Messrs. Thorn & Hoddle exhibiting the Acetylene Gas in the Small Hall: both these exhibits professing themselves valuable adjuncts to photography in the future.

The membership of the Section continues about the same. Several lockers are now vacant, and any member who wishes to retain one for the coming year may do so by kindly advising the Honorary Secretary.—HARRY D. GOWER, *Hon. Sec.*

Since the above Report was received, Mr. Gower has again written to me lamenting the apathy of the members of the Photographic Section in not attending the meetings. As he truly observes, "it ought not to be expected that the committee can work independently of the sectional members"; and if there is not a better attendance and more interest taken in the demonstrations, it must become a question whether we are justified or not in going to the expense of the dark room. I have already suggested that a committee should take the other sections into consideration, and probably the addition of some photographic members to it would be of considerable service.

Dr. Hinde has called my attention to a paper by Mr. W. W. Watts in the 'Geological Magazine' for January, 1897, in which he speaks of the ready help given by the Croydon Microscopical Society in supplying photographs of geological phenomena. Coming at this time it ought to act as an incentive to photographers to make fresh efforts, for our district is by no means fully worked out. In a very short time what are now open spaces will be built over, and it would be interesting to have a record of what they were like before the incursion of bricks and mortar.

Another thing that photographers might take up with advantage would be the architectural details of old buildings which would be of great value, such as windows and doorways of churches, and the ironwork on doors, &c.

Mr. H. T. Mennell writes:—

"There is nothing to report from the Botanical Sub-Committee, except that Mr. C. E. Salmon has found *Ranunculus intermedius* on Holmwood Common, and that Mr. Ernest S. Salmon reports *Euphrasia Kerneri* from Reigate, the plant having been submitted to and so named by Mr. Townsend, the great authority on this difficult genus."

Mr. Berney writes:—

"I have not heard from our members of any matter worth embodying in your Report. Personally I have little to say, as I did very little work in entomology last season. I can only mention that I captured in my garden nine *Plusia moneta*, making, with the two captured the previous season, eleven in all."

The presence of this moth in Croydon is very interesting, and if the rate of increase is maintained, we shall before long have it fairly common; but the market value of specimens will then be very much diminished, to the grief of the collectors of earlier examples.

I may here mention the loss that zoology has sustained by the death of Lord Lilford on June 17th, 1896. His lordship was one of the chief ornithologists of his day, and did an immense deal in promoting the study of bird life, notably in preventing the keepers from ruthlessly destroying birds of prey on his estate, an example which I hope may be largely followed. His name will be especially familiar to visitors to the bird gallery of the Natural History Museum, to which he presented many valuable specimens. He had also probably the finest existing collection of birds at Lilford Park.

Speaking for the *Microscopical Sub-Committee*, I have to report the addition to the Club microscope of a one-inch and quarter-inch object glasses. These will be of great service to members who wish to exhibit at our meetings, and I trust that good use will be made of them.

Geological Sub-Committee.—The interest of the members in geological matters was considerably stimulated by the visit during the summer to the Gas Works, where the Lower Tertiary Woolwich and Reading Beds, abounding in characteristic fossils, had been exposed in the excavations for a new gasometer. The same beds have also been observed by Dr. Franklin Parsons in sewerage excavations near Thornton Heath. The late discoveries of mammalian remains in the gravels near Croydon have also had the effect of calling attention to the great changes in the fauna of the district within a comparatively recent geological period. At the present time the sections opened for the new lines of railway south of Croydon afford good opportunities of studying the geological structure of the country.—Dr. G. J. HINDE, *Hon. Sec.*

Several papers on geological subjects have been read during the year, and it is satisfactory to find that interest in this section is still unabated.

We were unable to get anyone to attend as delegate at the meeting of the British Association at Liverpool this year.

EXCURSIONS.

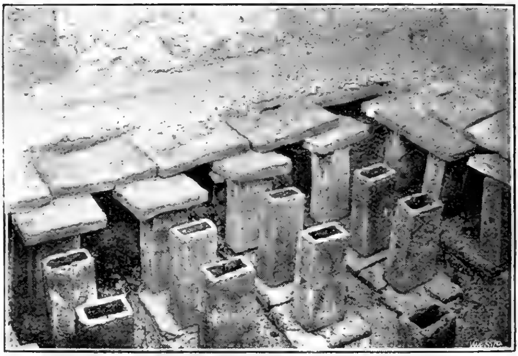
April 25th.—Several members of this Club spent a very pleasant afternoon at the Zoo, conducted by Mr. Philip Crowley. By the courtesy of the Zoological Society, free admission was granted to members of the Club, Mr. Crowley providing passes for the friends who accompanied them. Dr. Beddard addressed the members of the Geological Association the same afternoon on "The Living Forms of Elephants and Rhinoceroses," and arrangements were made for our Club to hear his remarks. Referring to the longevity of the elephant, he stated that one entered in the stud-book of the Indian Civil Service in 1702 was living in 1868, and might be still alive. Sperm whales were said to attain the age of five hundred years, but without reliable data. Among the principal animals observed at the Gardens may be mentioned Speke's antelope from South Africa (the only living specimen in Europe), and the klipspringer, which is also the first example possessed by the Society. The king penguin from the Macquarie Islands is also new to the gardens. It still has its covering of down although fifteen months old, and as yet does not attempt to feed itself. Two species of *Apteryx* are now in the collection, and appear to do well in confinement. Of rare

British birds there are two fine smews in the western aviary, and three pratincoles in the insect house. (J. H. Drage.)

May 2nd.—Photographic excursion to Chipstead, conducted by Mr. E. J. Platts. Mr. R. Saunders, of Chipstead, kindly invited the members to take tea with him.

May 9th.—An excursion, conducted by Mr. Baldock, and attended by some twenty members, proceeded to the beautiful gardens at Wallington, by the kind permission of Mr. Smee. These gardens are well known in connection with the book entitled 'My Garden,' published and profusely illustrated by the late Mr. Alfred Smee, who was assisted by his son, the present owner. The party was conducted through all the principal houses, and explanations given of some of the most interesting plants, ferns, orchids, &c., after which the visitors were left to roam about and admire the many and peculiar beauties to be found there, among them an artesian well, which supplied much of the water, with which the place abounds, and which had never been known to run dry. The weather was dull and windy, nevertheless some fairly good photographs, *in memoriam*, were obtained. (J. H. Baldock.)

May 25th.—On Whit Monday a whole-day excursion was made, under the guidance of Dr. Parsons, to West Hoathly, and was well attended, being favoured by fine weather. Arriving at West Hoathly Station about eleven, the party walked through woods and meadows to Gravetye, the residence of Mr. W. Robinson, the well-known writer on horticulture. Gravetye is a picturesque Elizabethan mansion, built by a Sussex ironmaster of the sixteenth century, and standing in a garden stocked with interesting herbaceous plants and shrubs. The surrounding fields are also planted with various kinds of narcissus and other bulbs, which flower among the grass. After inspecting the gardens, the party went on to Rockhurst. In the grounds of this estate is a noteworthy line of rocks, forming an escarpment on the edge of a steep wooded valley. The rock is a thick-bedded massive sandstone, the Lower Tunbridge Wells Sandstone, belonging to the Wealden series, resting on a somewhat softer layer. By weathering and widening of the joints some of the masses have become more or less completely detached; the most remarkable of these masses, called, from its shape, "Great upon Little," is a cubical mass of rock, fifteen feet high and sixty feet in circumference, poised upon a narrow portion or stalk only twenty feet in circumference. This narrow base consists of a softer bed of sandstone, the more rapid weathering of which, as compared with the harder rock above, has given the mass its stalked form.



THE ROMAN VILLA AT DARENTH.

By the kind permission of the Editor of the 'Amateur Photographer,' who has granted the use of the blocks, we are able to present to the members reproductions of the admirable photographs taken by Mr. J. H. Baldock on the occasion of the visit of the Club to Darenth on July 4th, 1896. The description of the interesting Roman remains seen there will be found in the Address of the President, Mr. W. Murton Holmes, in the last Part of the 'Proceedings' (1896–97), page cxvii.

In the shady clefts of the rock were found the filmy fern *Hymenophyllum tunbridgense*, the interesting moss *Tetraphis pellucida*, and some Hepatics. The scenery is wild and picturesque, reminding the visitor rather of Wales or Scotland than of the south-east of England.* From the rocks some of the party walked to Grange Road Station, and others returned to West Hoathly to tea. West Hoathly village stands on the ridge of the Weald, commanding extensive views, to the north towards East Grinstead, and to the south towards Lewes. The beauty of the scenery was somewhat marred owing to the oak trees being completely stripped of their foliage by caterpillars of *Tortrix viridana* living in swarms on the branches, and spinning thick silken cords descending to the ground.

June 6th.—General excursion to Warlingham. Starting from Sanderstead Station, the party of eighteen walked along the road to Sanderstead Church, thence through the village, and turning off to the left through King's Wood, for which permission had been kindly granted by Mr. Wallis, to Warlingham Church, which was shown by Mr. Goodman. The weather was delightful, with a pleasant breeze. No particular finds were recorded, but the guelder rose was in full bloom, and excited the admiration of many who had not before seen it. The party was afterwards most hospitably entertained by Mr. and Mrs. Goodman at Warlingham.

June 27th.—Photographic excursion to Staines and Chertsey, conducted by Mr. J. G. Lincoln. Twelve members attended, and met Mr. Lincoln at Staines, from whence three boats, kindly provided by that gentleman, proceeded down the river to Chertsey. Arriving at Penton Hook Lock, the party landed for the purpose of taking photographs while the boats passed through the lock. These things being accomplished, the party proceeded to Chertsey ferry, where they were met by Mrs. Lincoln, who had very kindly provided tea, and all sat down on the grass at the water's edge to enjoy the hospitality thus extended to them. After tea the boats proceeded to Chertsey Lock, where the party finally landed, and some more photographs were secured. Some snap-shots were also taken from the boats as they proceeded down the river, and at last Staines was once more reached, after one of the most pleasant afternoons it was possible to spend, hearty thanks being accorded to Mr. and Mrs. Lincoln. (J. H. Baldock.)

July 4th.—A party of fifteen, conducted by the President, visited the remains of the old Roman villa at Darenth, Kent.

* The party were indebted to Mr. Stenning for permission to visit the rocks on a day when they are not ordinarily open to the public.

This is situated about a mile from the Farningham Road Station, L. C. D. R., and is close by the old Roman road connecting Rochester and London. The excavation was first commenced in 1894 after a burial of probably 1500 years, although the site is marked on old ordnance maps. Crossing the field close to the station, the party proceeded by the high road as far as the mill-pond, through which the river Darent flows. Here several interesting botanical specimens were obtained by means of wading by an adventurous and enthusiastic member of the party. Among the plants found was the flowering rush, by no means a common plant. The path then skirted the banks of the river until the villa was reached. The remains are the most extensive yet discovered in England, and it is supposed that the villa was the residence of a high military officer of the Roman army of occupation. From east to west is an unbroken line of rooms and other enclosed places extending for four hundred and fifty feet. In front of these to the south is a corridor of the same length. Beyond the corridor are two courts ninety-two and ninety-one feet long and seventy-eight feet wide respectively. Along the east and west sides of these courts a series of rooms extend for some distance. The centre of the house was occupied by the cold rooms for summer use. Three of these are paved with red tesseræ, the remainder with concrete and tiles. Some of the walls were adorned with distemper painting, but the colours have now almost disappeared. The winter rooms are at the south-east corner, and the floors of the heated chambers were suspended in various ways. One was laid on piles of flat tiles, two others were supported on flue-tiles, and a fourth on blocks of chalk in rows about six inches apart. Flue-pipes still remain in the walls. The doorways of one or two of the rooms had been blocked in Saxon times with herring-bone work. The baths are situated at the west of the summer rooms, the largest being forty feet long and ten feet wide, and the walls are still four feet high. This was reached by four steps plastered and rounded at the edges, but at some time during the Roman occupation a wall had been built across it. Two small baths, about seven feet square, connected with rooms probably used for dressing, adjoin. There are several tanks at the north angle, originally fitted with leaden pipes, a portion of one still remaining. These communicate with a water channel, discharging into a drain. At the southern and western extremities of the courtyards are the remains of stables and outhouses, the walls of which appear to extend into the field beyond. To prevent inundations, a wall three hundred and forty feet in length had been erected between the river and the courts. The foundations of the villa are now from four to five feet below the surface. Numerous antiquities have been found, such as coins, ornaments, knives, fragments of pottery and glass, and bones of various animals. The foundations of a small temple have also been discovered close by. From the fact that the walls of the adjacent church of Darenth contain many Roman tiles, it is supposed that the materials from the ruins of the villa were used in the construction of this edifice. Among the plants found on this excursion were *Alisma plantago*, *Butomus umbellatus*, *Potamogeton densus*, *P. perfoliatus*, *Veronica anagallis*, *Mercurialis annua*, *Œnanthe crocata*, *Helosciadium nodiflorum* (very large specimens). Some successful photographs were also taken, and are of great interest.

July 18*th*.—General excursion to Oxted, conducted by the President. This was attended by six members, who first visited the sand-pit at Oxted, walking up the hill to the lime works in the Lower Chalk, where some fossils were obtained from one of the workmen, among these being *Holaster subglobosus*, *Discoidea cylindrica*, teeth of *Lamna*, *Ptychodus*, and *Notidanus microdon*. The party then walked up the hill and along the ridge, returning to Croydon from Woldingham Station. The plants found were *Pimpinella magna*, belladonna (very plentiful near the lime works), *Trifolium arvense*, *Chlora perfoliata*, bullace in fruit, *Epilobium angustifolium*.

July 25*th*.—Half-day photographic excursion to Horley, conducted by Mr. Roods.

August 4*th*.—Fifteen members and friends of this Club made an excursion to Chilworth, under the direction of Mr. Edward Lovett. Through the introduction of Mr. Don, a member of the Society, the party was shown over the gunpowder and cordite works by Captain Bouvier, who met them at Chilworth Station, and entertained them at his house. The first department of the factory visited was that for testing the strength of the powder as shown by the velocity of the projectile discharged. The method is as follows :—In a small shed is a steel framework for carrying the gun to be used (and any kind of gun can be used); at a distance of fifty metres is a small target. The gun and the target are connected with magnetic instruments situated in an office to the rear of the testing range. The instrument in this office consists of two magnets,—one holding up a long bar coated with a soft leaden case, the other supporting a short bar acting upon a spring knife. The former is connected with the muzzle of the gun, and the latter with the target. The *modus operandi* is as follows :—The gun is loaded with a cartridge the powder of which is to be tested, the electric current is applied, and the two bars suspended to the magnets. The wire of the long bar is fixed across the muzzle of the gun, which upon discharge breaks, causing the bar to fall. As soon as the bullet strikes the target, the second current is broken by the shock, and the second bar drops, liberating a spring, which causes a small knife to strike the first bar in falling, making a small mark in it. The distance between this mark and a predetermined point on the bar is then measured by a finely graduated scale, and upon this basis the velocity of the projectile can be correctly calculated. The shots fired for the benefit of the members recorded a muzzle velocity of about 1400 feet per second, varying from this according to the kind of powder used. The party was then shown through the mixing, kneading, pressing, and grinding sheds, finishing with the sheds in which cordite was manufactured. After this a series of experiments took place in the furnace shed to show the remarkable difference between the explosive smoky powder of ordinary use, the slow-burning prism powder of our eighty-ton guns, and the apparently peaceful and harmless way in which cordite burns, in the open, giving off no smoke or residuum. The courteous manner of Captain Bouvier, and his entertaining description of the various processes, were much appreciated by the visitors.

The members of the Club then visited Great Tangley Manor, by kind permission of Mr. Wickham Flower. This old moated house dates back to about 1487, and was added to in the following century. It is a magnificent example of that period, and the interior has been judiciously preserved in keeping with its age. There is a charming covered approach to the house, red-tiled and oak-beamed, and the moat is crossed by quaint bridges. Old timbered gables and diamond-paned windows add an old-world beauty to the manor; upon one of the panes is scratched "john Evelyn, 1641." The old lawns, terraces, and gardens are lovely, the most beautiful part perhaps being the heath and lily garden, the Alpine garden, and the lake; the latter, as well as the moat, having large clumps of most beautiful aquatic plants.

Some of the members then paid a visit to Black-Heath, whilst the rest returned to Croydon.

(The evening proved to be very wet.)

August 15*th*.—Photographic excursion to Nutfield and Bletchingley. Conductor, Mr. A. Roods.

September 12*th*.—Supposed to be a fungus-hunt on Keston Common, but owing to a chapter of accidents no member attended, one lady visitor going to the common by herself. I have not heard whether she made a large collection of fungi on that occasion or not.

EVENING MEETINGS.

February 18*th.*—Mr. F. Campbell-Bayard read the Report of the Meteorological Sub-Committee for 1895. The stations of which records have been tabulated number seventy-three as against sixty-six in the last Report, and the number of observers is sixty-one as compared with fifty-four. The year 1895 was probably the most remarkable one of the century. The prolonged cold in January and February, the warm June, the remarkable equality of the mean temperatures of July, August, and September, the number of months (four) in which less than one inch of rain fell, the intense heat of September 23rd to 30th, the unusually cold period of October 23rd to 31st, the warm November with a temperature higher than October, combined with the short rainfall, form a record unique during the present century.

Dr. Franklin Parsons read "Some Geological Notes on a Recent Sewer Section at Park Hill Rise" (Trans., Art. 129). The beds exposed commence with the London Clay and end about the middle of the Woolwich and Reading series. In a sandy bed belonging to the Oldhaven series numerous fossil shells, chiefly fragmentary, were found.

Mr. Lovett exhibited an apparatus used as a clock from the North Philippines. It consisted of twelve pieces of wood suspended horizontally on a cord, and the time was shown by the position of an indicator placed every hour.

The President exhibited specimens of so-called Sola pith, the stem of an Indian plant used in the manufacture of pith helmets, and also some radiolaria dredged by the 'Challenger' from a depth of 2425 fathoms.

March 17*th.*—Mr. Edward Lovett read a paper on "Superstition and Myth," in special reference to charms and amulets. He said that trinkets were first worn as a protection from the evil eye, but now only serve as ornaments. In the same way a model of the eye was in common use amongst the ancient Egyptians, and numbers of these are found in the folds of the mummy-cloths. A ladle from Vancouver Island was exhibited, on which was a representation of the thunder bird with the eye occupying nearly the whole of the head. Among the Maoris the origin of many of their designs is the human face with a prominent eye made of mother of pearl. Mr. Lovett gave a history of the crescent, tracing it from Isis, the Egyptian Diana, who is represented as wearing a crescent. He conjectured that the ornament on King Prempeh's headdress was intended for a crescent. The crescent was used as an amulet by soldiers, and it occurs at the present day on the trappings of horses. The horse-shoe is considered a lucky symbol, and it was thought that its origin could be traced to the crescent. Feathers worn as plumes were originally charms. It is still common in some districts to have what are known as thunder-bolts in the house as a protection from lightning. Iron pyrites, belemnites, stone celts, flint arrowheads, encrinite stems, and ammonites are among the objects so designated. Beads were also charms, and stones with natural perforations were hung at the bed's head as a protection from nightmare. The lecture was illustrated by a large collection of rare and curious examples, and was listened to with much pleasure by a large audience. A discussion followed in which Dr. Parsons, Mr. Robarts, Mr. Slack, and the President took part. In connection with this subject the President exhibited some ordeal beans from West Africa, and a specimen of the *Amphisbæna* from South America.

Mr. Slack exhibited some gold ore, and also an agate with concentric markings.

April 28*th.*—The President read a paper on "Some Forms of Silica" (Trans., Art. 130). Messrs. Berney, Hinde, Moore, Robarts, and the President exhibited beautiful specimens in illustration of the paper.

Mr. Straker exhibited some mediæval shoes with pointed toes found in an excavation near the old Carmelite Monastery at Whitefriars; also an earthenware pilgrim's bottle in perfect condition, and bones of the horse, wild boar, fallow deer, sheep, and oxen from the same spot.

May 12*th.*—In lieu of the ordinary meeting, a party of members and friends, to the number of forty, paid a visit to the gas works at Waddon, on the invitation of Mr. J. W. Helps, who kindly showed the party round the works, and thoroughly explained the process of manufacture. Great interest was taken in the operation of clearing and recharging the retorts, in which the coal is subjected to destructive distillation. These retorts are twenty feet long, with openings at each end, and are charged with six cwt. of coal every six hours. Two systems of heating them are at present in use, but the improved or regenerative system is being more extensively adopted. The consumption of fuel by this method is reduced from twenty-five per cent. to eleven or twelve per cent. After a prolonged inspection of the various processes for the purification of the gas, the party adjourned to the club-room, where they were most hospitably entertained with light refreshments by Mr. Helps, who afterwards gave a short account of the manufacture of illuminating gas, illustrating his lecture by means of diagrams and drawings. The construction of the new gasometer, capable of holding three million cubic feet of gas, and the largest out of London, was much admired. Numerous fossil oysters and other shells (*Melania* and *Cyrena*) belonging to the Woolwich Beds, similar to those found at Park Hill, were obtained from the earth excavated when making the reservoir for the gasometer. After a hearty vote of thanks to Mr. Helps for a most interesting and instructive evening, and for his hospitality, the party separated.

September 15*th.*—This being the first meeting of the season, there was no regular paper, but the evening was devoted to the exhibition and description of objects obtained during the vacation.

Mr. Douglas exhibited some beautiful specimens of galena, iron pyrites, and calcite, and described some chert containing radiolaria from the southern uplands of Scotland (Trans., Art. 131). This chert, formerly supposed to be of inorganic origin, was proved a few years ago by our member, Dr. Hinde, to be made up almost entirely of these protozoa.

Mr. Waddon Martyn exhibited some nodules of a ferruginous mineral obtained in the north of Cornwall. The nodules vary very much in size and are very abundant, constantly weathering out of the cliff face.

Mr. Robarts exhibited a larva of the goat moth and a number of flint implements from Cisbury. Mr. Lovett stated that Cisbury was one of the places where these implements were roughly blocked out to be sent somewhere else to be finished off.

Mr. C. Hehner exhibited water stones from Chili. These consist of agate containing water and a bubble of carbon dioxide. Similar stones are found in Victoria. Some calculi consisting of ammonio-magnesian phosphate from the stomach of a horse were also exhibited by Mr. Hehner.

Dr. Parsons exhibited a large series of fungi, including a mushroom one foot in diameter. Owing to the wet season, fungi had been remarkably abundant during the past year. Dr. Parsons stated that four and a half inches of rain had fallen since the first of the month.

Mr. Mennell showed an egg of the rock ptarmigan taken by him in the Val de Bagne.

Mr. Lovett exhibited specimens of prism powder and cordite obtained on the recent visit of the Club to the Chilworth powder works.

A specimen of an oyster in a silicified condition from Norfolk was exhibited by Mr. G. W. Moore.

The President exhibited a series of Silurian fossils obtained by him in Shropshire, consisting of corals, trilobites, brachiopods, crinoids, and molluscs of various species.

October 20*th*.—Dr. Franklin Parsons exhibited some Pholas borings in hard lias rock. These molluscs bury themselves in the rock, but as to the precise manner in which they are enabled to excavate their domiciles there is some difference of opinion, whether by the motion of the shell, which is very fragile, or by an acid secretion. Limpets are also able to excavate shallow depressions on rock, a specimen of which was shown.

The President exhibited a series of fossils from the Carboniferous Limestone of Derbyshire, consisting of several species of *Producta*, *Spirifera*, and other brachiopods, molluscs, and corals.

Mr. E. W. Johnson read a very interesting paper on "The Solar Eclipse of August 9th, 1896." To see an eclipse of the sun, we must place ourselves in the line of the moon's shadow as it speeds across the earth's surface, and as nearly as possible in the centre of the shadow. In this case the shadow commenced in the North Sea about two hundred miles to the north of Scotland, and entered Norway a little to the south of Bodö. The line of totality, after crossing some inaccessible mountains, emerged from Norway at Vadsö, then crossed Nova Zembla and Siberia and the northern parts of Japan, finally disappearing in the Pacific Ocean at a point in 180° longitude and 20° north latitude, after a mighty journey of 10,000 miles. The "Norse King" left Tilbury on July 25th, having on board the official members of the permanent eclipse committee of the Royal Society and the Royal Astronomical Society, besides many members of the British Astronomical Association. As is well known, the actual observation of the eclipse was marred by cloudy weather, but in spite of that the observers were repaid for their trouble. Mr. Johnson described the effect of the sudden darkness on the surrounding landscape and upon birds and animals. Altogether it was most impressive.

Mr. Keatley Moore, who also accompanied the expedition, added some interesting remarks.

November 17*th*.—Dr. G. J. Hinde, F.R.S., read a paper on "The Valley Gravels in the Neighbourhood of Croydon," which will be published in our 'Transactions' (Trans., Art. 132).

Dr. Parsons exhibited ammonites and other fossils from the Gault at Folkestone.

December 15*th*.—Mr. H. F. Robarts, F.G.S., read a paper on "Mammalian Remains recently discovered near Purley." These consisted principally of tusks and teeth of mammoth and rhinoceros. The paper will be printed in the 'Transactions' (Trans., Art. 133).

The President drew attention to the very unusual number of wood pigeons frequenting the neighbourhood of Croham Hurst this year, attracted in all probability by the abundance of acorns. He exhibited specimens of the glass rope and birds'-nest sponges and microscopic drawings of their minute structure.

Twenty-seventh Annual Soirée.

The attendance at the Soirée, which was held on November 25th, was 523 as compared with 513 last year. A larger number would probably have attended, but there were several counter-attractions in Croydon the same evening. As it was, the Public Hall was well filled, and everyone seemed to have spent a pleasant evening. The most popular exhibition was the demonstration of the Röntgen rays, conducted by Messrs. Watson & Sons, of High Holborn, who on this occasion used their new penetrator-tubes, and the largest fluorescent screen yet constructed, measuring fifteen inches by twelve inches.

Another novelty was the acetylene gas generator, exhibited by Messrs. Thorne & Hoddle, which also attracted considerable attention. Acetylene is a gas composed of carbon and hydrogen (C_2H_2). It was first discovered by Davy in 1836. The first patent was taken out for its production in 1890 by Mr. T. L. Willson, of New York, who discovered that when a mixture of powdered lime and coke dust is introduced into a specially constructed furnace the mixture melts down into practically pure calcium carbide (CaC_2). When this substance is brought into contact with water an interchange of constituents takes place, the two atoms of hydrogen in water combining with two of carbon in the carbide to form acetylene, while the oxygen of the water combines with the calcium:

$$CaC_2 + H_2O = C_2H_2 + CaO.$$

Acetylene when burned gives a flame of great brilliancy, emitting a light greater than that given by any known gas, its illuminating value (calculated on the consumption of five cubic feet per hour) being, according to Prof. Lewes, no less than 240 candles, or about fifteen times the value of ordinary 16-candle coal gas. Several fatal accidents have occurred from the use of the compressed gas, so that considerable care is required in its use. It has also been stated that the illuminating power diminishes on being kept.

Mr. Philip Crowley exhibited a large collection of birds' eggs, including the gigantic fossil one of *Æpyornis maximus* from Madagascar, and a series of nests, each containing the egg of a cuckoo, showing a great variation both in size and colour. Specimens of the young of Bewick's swan from Nova Zembla were shown by Mr. Henry Pearson; an adult female of the same species, shot in the Isle of Wight, and the buffle-headed duck and smew, by Mr. J. H. Drage; and British birds, by Mr. Thorpe. Fossils were exhibited by the President, Dr. Parsons, and by Mr. N. F. Robarts. Objects connected with superstition and myth were shown by Mr. Lovett; native bead ornaments and weapons from South Africa, by Mr. D. M. Brown; flint implements and rubbings of brasses, by Mr. Robarts; Japanese objects, by Mr. John Pelton; an album containing a sketch of Hancock's steam omnibus, by Mr. Sturge; polariscope, by Mr. Murton; Corean royal procession, painted by a native artist, by Dr. Baldock; an album of chromo-lithographs, with their progressive combinations up to the complete picture, by Mr. A. Couchman; and an illuminated address, by Mr. G. W. Moore. A beautiful collection of dried British plants was shown by Mr. C. R. B. Ritchie; fungi, from Croydon and the neighbourhood, by Dr. Parsons; also flowers grown in the open air from Addiscombe and Park Hill to the number of ninety-three, as compared with seventy-two last year; and mosses and pictures of orchids, by Mr. E. M. Holmes. Some beautiful specimens of galena, pyrites, and other minerals were exhibited by Mr. Douglas; a valuable collection of coins, by Mr. Rogerson; water-colour sketches, by Miss Cook; shells, by Mr. Dedham; corals, madrepores, and ancient pottery, by Mr. H. W. Perry; cases of insects, by Mr. Goodman; letters from Mr. Quekett, by Mr. Streeter; shadowgraphs and micrographs, by Mr. Russell; specimens of Roman pavement and lava, by Mr. Waterall; a case illustrating oyster culture, by Mr. Chisholm; and a collection of foraminifera containing upwards of two hundred species, by the President.

The Photographic Section was well represented in the corridor, and an account has already been given in the Report of the Photographic Sub-Committee.

It now only remains for me to express my sincere thanks for the uniform kindness that I have received from the members of this Club during my term of office, and for the kind assistance and support which the Treasurer and Committee have given me. In particular I would thank our indefatigable Secretary, Mr. Grundy, for the ready help which he was at all times willing to give. His devotion to the interests of the Club cannot be too highly acknowledged.

Members elected, 1896.

January 21*st.*—Edmund Joseph Platts, Haslemere, St. Leonard's Road. George Simpson Valentine Wills, Croham Road. James George Ingram, Bagbie House, Haling Park Road.

February 18*th.*—Charles William Link, Eversley, 14, Chichester

Road. Thomas George Hayward, Thornville, Addiscombe Grove. E. R. Shore, 28, Wellesley Road.

March 17*th.*—Sydney Churcher Hovenden, Oaklands, Haling Park Road.

April 21*st.*—Henry Ernest Hurst, Kalcoorlie Lodge, South Norwood Hill. John Kidd, St. Mary's, 381, London Road.

September 15*th.*—G. E. Becker, Doringcourt, Addiscombe Grove. Ernest Warton Johnson, 50, Birdhurst Road.

October 20*th.*—Reginald Thomas Webster, Aberdeen Lodge, Havelock Road. Frederick Link, 43, Park Hill Road. Herbert Allen Broad, 85, Lansdowne Gardens.

November 17*th.*—Henry Charles Smart, 29, Cherry Orchard Road. George Henry Hunt, Leecroft, St. Peter's Road. Fred Stokes, 49, Saxon Road, Selhurst. Alexander John Hogg, 134, Birchanger Road, South Norwood. Henry Keatley Moore, Chipstead, Chepstow Rise.

December 15*th.*—G. F. Brown, 252, Whitehorse Lane, South Norwood. Frederic James Townend, Alverley, Park Hill Rise. Henry Carter, 71, Birdhurst Rise. J. S. Cunnington, 18, Clyde Road, Addiscombe. Herbert Henry Shore, 28, Wellesley Road. William Whitaker, F.R.S., F.G.S., Freda, Campden Road.

Additions to the Library.

The additions to the Library during the year 1896 are as follows :—

From Individuals.—Arthur Bennett : Notes on the Potamogetons of the Herbarium Boissier, Records of Scottish Plants for 1894, Notes on British Plants, Report of the Botanical Exchange Club for 1894, Eleventh Annual Report of the Watson Botanical Exchange Club, Index perfectus ad Carol. Linnaei Species Plantarum, Notes on the British Characeæ, Contributions towards a Flora of the Outer Hebrides, Carex fusca (Allioni) in Scotland ; Ernest Straker : Van Heurck's Diatomaceæ, translated by Wynne E. Baxter ; H. D. Gower : The photographic papers as issued ; A. Roods : Knowledge, as issued.

From Societies.—Royal Microscopical Society : Journal, 1896 ; British Association : Report of Ipswich Meeting, 1895–96 ; Academy of Natural Science, Philadelphia : Proceedings, 1895 ; Belgian Microscopical Society : Journal and Proceedings ; Brighton and Sussex Natural History Society : Abstracts of Papers and Library Catalogue ; Oldham Microscopical and Field Club : Journal and Reports ; Manchester Geographical Society : Journal, 1895 ; Eastbourne Natural History Society : Transactions, 1894–95 ; Holmesdale Natural History Club : Proceedings, 1893–1895 ; Quekett Microscopical Club : Journal, 1896 ; South London Entomological and Natural History Society : Proceedings, 1895 ; South-eastern Naturalist, vol. i. part 5, vol. viii. and vol. ix. parts 1 to 6 ; Borough of Southport : Meteorological Report, 1895 ; Manchester Microscopical Society : Transactions, 1895 ; Berwickshire Naturalists' Club : History, vol. xv. ; Reading Literary and Scientific Society : Report and Proceedings, 1896 ; The Geological Institute of the University of Upsala : Journal, vol. ii. part 2.

From Proprietors.—La Revue Hebdomadaire ; Science Siftings.

Croydon Microscopical and Natural History Club.—Balance-sheet for the Year ending 31st December, 1896.

Receipts.

	£	s.	d.	£	s.	d.
Balance at Bank, January 1st ...				10	19	10
Subscriptions, 1894	0	10	0			
,, 1895	7	0	0			
,, 1896	97	0	0			
,, 1897	8	10	0			
				113	0	0
Sale of Soirée Tickets				17	13	6
Donations—F. C.-Bayard, Esq. ...	5	0	0			
,, P. Crowley, Esq. ...	5	0	0			
,, B. Latham, Esq. ...	5	0	0			
,, Capt. Aylesbury ...	0	5	0			
				15	5	0
Sale of Professor Morris's 'Geology of Croydon'				0	8	0
				£157	6	4

Payments.

	£	s.	d.	£	s.	d.
Rent of Club Room, 12 months, to 31st July...				10	0	0
Hire of Rooms for Meetings ...				5	0	0
Printing Transactions				19	12	0
Insurance				1	13	9
Postages				9	2	11
Meteorol. Sub-Committee Printing Rainfall Returns for the months December, 1895, to November, 1896, inclusive				29	17	6
Photographic Sub-Committee, Hire of Rooms for Lantern Exhibitions	1	10	0			
Rent of Dark Room, 12 months, to 31st July	10	0	0			
Sundry Printing, Postages and Gas	2	10	0			
				14	0	0
Gratuities				1	6	0
Soirée Expenses				48	4	1
Printing and Stationery				7	4	9
Sundries				0	4	7
Assistant Secretary				5	0	0
Balance at Bank				6	0	9
				£157	6	4

SPECIAL FUND ACCOUNT, 1896.

£210 11s. 8d. CONSOLS.

	£ s. d.	£ s. d.		£ s. d.
Balance from last Account, Jan. 1st		9 2 8	Payments—	
Dividends—January	1 8 0		Objectives to Club Microscope	2 14 0
" April	1 8 0		Balance forward	13 0 8
" July	1 8 0			
" October...	1 8 0			
		5 12 0		
Received for use of Lockers in Dark Room		1 0 0		
		£15 14 8		£15 14 8

1897.	£ s. d.
Balance brought down	13 0 8
General Account	6 0 9
	£19 1 5

EDWARD B. STURGE, *Treasurer.*

We, the undersigned, having examined the above Accounts and the Vouchers relating thereto, hereby certify that they are correct, according to the Vouchers, and to the Bankers' Pass Book.

GEORGE J. HINDE, } *Auditors.*
H. M. KLAASSEN, }

January 4th, 1897.

RULES OF THE CLUB.

Title and Objects of the Club.

The Club shall be called "The Croydon Microscopical and Natural History Club," and shall have for its objects the mutual help of its Members in the study of Microscopy, Natural History, and Photography; the investigation of the Meteorology, Geology, Botany, and Zoology in the neighbourhood of Croydon, in the County of Surrey; and the dissemination amongst its Members of information on the subjects of Microscopy and Natural History.

Management of the Club.

1.—The business of the Club shall be conducted by a Committee (four to form a quorum), consisting of a President, Vice-Presidents (to consist of all past Presidents), a Treasurer, an Honorary Secretary, a Librarian, and nine other Members.

2.—The Officers of the Club shall be elected at the General Annual Meeting. The President shall not hold office more than two years in succession. Of the nine Members of the Committee two shall retire each year, and shall not be eligible for re-election that year. The retiring Members shall be, (*a*) the one who has attended the smallest number of Committee Meetings during the past year; (*b*) the one who has served upon the Committee the longest. The remaining seven shall retain office without re-election. If two or more Members have attended an equal number of Committee Meetings, that Member shall retire who has served the longest. If two or more Members have served an equal length of time, that Member shall retire who has attended the Committee least often during the past year.

Membership.

1.—Both ladies and gentlemen shall be eligible for Membership of the Club.

2.—Every candidate for Membership shall be proposed by two or more Members, one of whom at least shall have a personal knowledge of the candidate, and who shall sign a certificate in recommendation of him or her. The certificate shall be read from the chair, and the candidate therein recommended balloted for at the following meeting. One black ball in five to exclude.

3.—The Annual Subscription shall be 10*s.*, payable in advance on the 1st of January (or on election, if previous to November), and no person shall be entitled to the privileges of the Club until his or her Subscription shall have been paid.

4.—Distinguished persons may be elected Honorary Members of the Club; such Honorary Members shall not be subject to any of the expenses of the Club, and shall have no vote in its affairs.

5.—In order to encourage the study of Microscopy and Natural History amongst mechanics, &c., residing in the district, individuals of that class may be admitted as Associates, provided they shall first communicate some original information or observation on Microscopy or Natural History, or exhibit such specimens as shall, by their merit, satisfy the Committee. Such Associates shall enjoy the privileges of Honorary Members.

6.—No Member shall be considered to have withdrawn from the Club until he or she shall have paid all arrears, and given a written notice to the Secretary of his or her intention to resign; and any Member more than one year in arrear may be struck off unless special cause to contrary be shown to the Committee.

7.—If it shall be thought desirable to expel any Member from the Club, the same shall be done by a resolution of the Committee, which shall be read at the next ordinary meeting; and at the following meeting a ballot shall take place with respect to the proposition, and if two-thirds of the Members present shall vote for such Member's expulsion, he or she shall no longer be considered a Member.

8.—Any Member may introduce a visitor at an ordinary meeting, who shall enter his or her name, with that of the Member by whom he or she is introduced, in a book kept for that purpose.

Ordinary Meetings.

1.—The ordinary meetings of the Club shall be held on the third Tuesday in every month (excepting the months of June, July, and August), at seven o'clock in the evening; the chair to be taken at eight precisely, or at such other time as the Committee may appoint.

2.—The ordinary course of proceedings shall be as follows:—

I.—The minutes of the previous meeting shall be read and submitted for approval as being correct.

II.—The names of candidates for membership shall be read, and the ballot for election of Members shall take place.

III.—Scientific communications shall be read and discussed; after which the chair shall be vacated, and the meeting shall resolve itself into a conversazione, to terminate at ten o'clock.

3.—In the absence of the President, the Members present at any ordinary meeting shall elect a Chairman for that evening.

4.—No Paper shall be read which has not received the sanction of the Committee; and, whenever it is possible, early notices of the subject of the Papers to be read shall be given by the Secretary to the Members. No Paper shall exceed twenty minutes in the actual reading, unless by the special permission of the Chairman.

5.—In addition to the above ordinary meetings, others, for conversation and the exhibition of Microscopical objects and Natural History specimens, and for the borrowing and exchanging of books, shall be held on the last Wednesday in each month throughout the year, at eight o'clock in the evening.

6.—Photographic meetings shall be held on the first Friday in each month throughout the year, at eight o'clock in the evening.

Business Meetings and Election of Officers.

1.—The accounts of the Club shall be audited by two Members appointed at the ordinary meeting in December. No Member of the Committee shall be eligible as an Auditor.

2.—At the same meeting, notice of the Annual Meeting in January shall be given from the chair.

3.—An Annual Meeting of the Club shall be held, in place of the ordinary meeting, on the third Tuesday evening in January, at eight o'clock, when the election of Officers for the year ensuing shall take place, and the Balance-sheet, duly signed by the Auditors, shall be read; after which the President shall deliver his Address, including a review of the proceedings of the Club during the past year.

4.—The Officers of the Club shall be nominated in writing, and such nominations shall be sent to the Secretary seven clear days before the Annual Meeting. In the event of the number of nomination exceeding the number of Officers to be elected, a printed list of the nominations shall be circulated at the Annual Meeting, and the Members present shall vote by ballot by striking out the names of those for whom they do not desire to vote, and placing the lists in an urn upon the table. Scrutineers shall be appointed at the meeting, and the votes shall be counted during the course of the meeting.

5.—No permanent alteration in the Rules shall be made except at one of the monthly meetings of the Club, and notice of any proposed alteration or addition must be given at or before the preceding ordinary meeting.

Library.

1.—Applications for the loan of books or microscopical slides to be made to the Hon. Librarian at any "ordinary" or "conversational" meeting of the Club, the borrower to sign a receipt, which will be cancelled on the return of the work borrowed.

2.—No Member may have more than one work at a time.

3.—No work may be retained longer than one month, but the same work may be again borrowed provided there be no other applicant for it. Any Member not complying with this rule will incur a fine of 1*s.* for each month after the first that the work is retained.

4.—The borrower shall make good all damage which any book, &c., may receive while under his or her charge; such damage to be assessed by the General Committee.

5.—Books marked "R" (reference) and unbound pamphlets are not to be removed from the reading-room.

6.—No Member will be entitled to the privileges of the Library who has not paid such fines as he or she may have incurred.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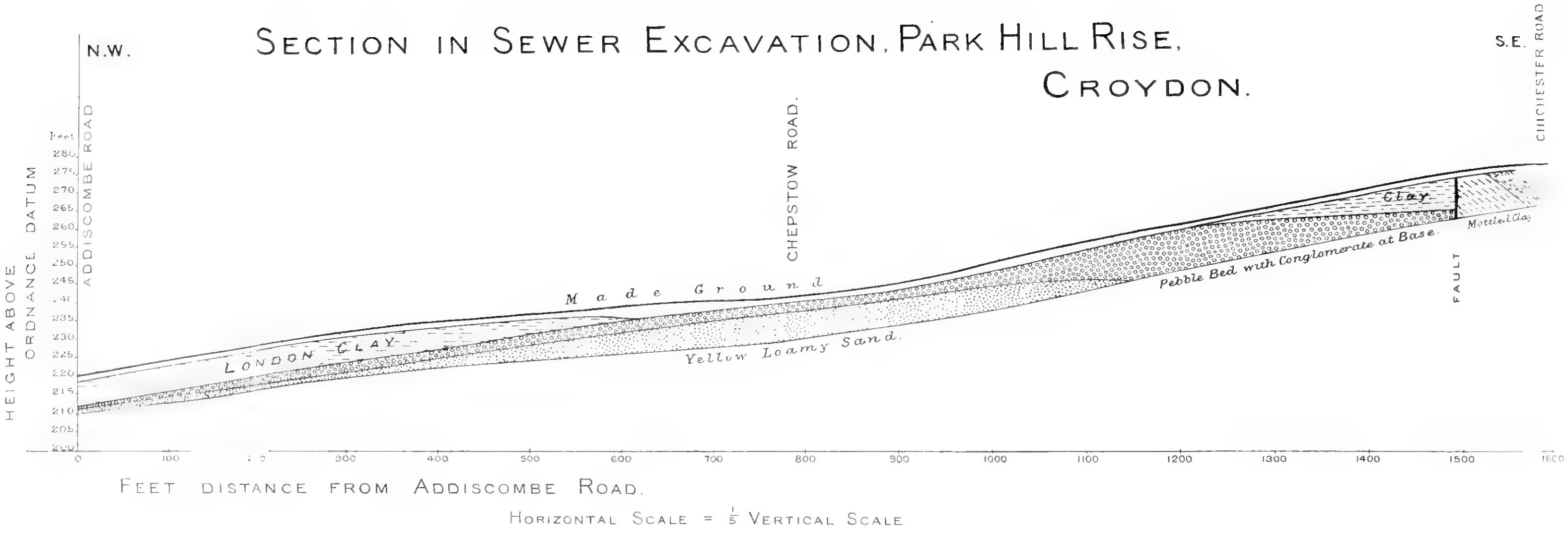

To illustrate paper by Dr H F Parsons

TRANSACTIONS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1896–97.

129.—Geological Notes on a Recent Sewer Section at Park Hill Rise, Croydon.

By H. Franklin Parsons, M.D., F.G.S.

(Read February 18th, 1896.)

In the autumn of 1895 the relaying, at an increased depth, of the sewer in Park Hill Rise, Croydon, afforded an opportunity for some observations of the strata in the neighbourhood of the classic section in the Park Hill cutting of the Woodside and South Croydon Railway, so well described by our member, Mr. H. M. Klaassen, in the Proceedings of the Geologists' Association, vol. viii. No. 4.

Park Hill Rise is a road leading out of the Addiscombe Road (or Upper Addiscombe Road) on its south side, about 700 yards east of East Croydon railway station, and an equal distance west of the point where that road crosses the cutting of the Woodside and South Croydon Railway. From the junction with Addiscombe Road its direction is south for about 70 yards, and then nearly south-east; and it is joined on the south-west side by the Chepstow Road at a point about 240 yards distant, and by the Chichester Road at one about 550 yards distant, from the Addiscombe Road. Beyond Chichester Road, Park Hill Rise is laid out as far as a point where it crosses the tunnel of the Woodside and South Croydon Railway (the southern tunnel in Mr. Klaassen's section); but the new sewer was not laid beyond the junction of the Chichester Road. The section to be described in this paper therefore does not intersect Mr. Klaassen's, but ends at a point about 150 yards short of it; and its direction is at an angle of about 66° to Mr. Klaassen's section, the course of which is from north-north-east to south-south-west.

The level of the surface of the ground at the junction of Park Hill Rise with Addiscombe Road is 220 ft. O.D. From a section, for the use of which I am indebted to Mr. Thos. Walker, C.E., borough engineer, I find that at the junction of Chepstow Road the surface level is 238 ft. 6 in., the gradient up to this point being a nearly uniform one of 1 in 40. Shortly beyond Chepstow Road the hill becomes steeper, and at the junction of Chichester Road the level of the road surface is 274 ft. O.D., the average gradient between the Chepstow and Chichester Roads being 1 in 24.

The beds exposed in laying the new sewer in Park Hill Rise commence with the London Clay (the highest in geological order, though met with, owing to the dip of the strata, only in the lower part of the Rise), and they end about the middle of the Woolwich and Reading series; whereas Mr. Klaassen's section embraces the strata from the Oldhaven beds (now renamed Blackheath beds by the Geological Survey) to the chalk. The former section therefore occupies a higher geological position than the latter, and the reason for this is two-fold: first, that the sewer trench is not so deep as the railway-cutting; and, second, that it lies more to the north-west, the direction in which the strata dip, and was not carried so far to the south or south-east, the direction in which they crop out on the surface.

The new sewer was laid at a depth varying from 9 to 12 ft., the depth of the previous one having been from 6 to 10 ft. The excavations were dug partly in the "made ground" of the old sewer trench, but being wider and deeper, they extended into the virgin soil at the side and bottom. They consisted of a series of shafts, each about 12 ft. long, connected by short tunnels of equal length. The sides were timbered, and the excavations were filled in successively as soon as the new sewer had been laid. This mode of operation did not give so clear and connected a view of the strata as did the open sides of the railway cutting, and I cannot pretend to describe the geological features with the same minute and careful detail as Mr. Klaassen.

In the different excavations the road metal and "hard core" were from 6 to 18 inches in thickness, beneath which was in most places a variable amount of "made ground," thickest a little below the Chepstow Road, where a hollow in the natural surface appears to have been filled up, and, again, higher up the hill, in the site of a former brickfield.

A. *London Clay.*—At the junction of Park Hill Rise with the Addiscombe Road the London Clay was reached at a depth of 18 in., and had a thickness of about 9 ft. to its base. At the top it was very stiff, and of a uniform yellow brown colour, but as its base was approached it became gradually more and more sandy and laminated, with partings of rusty-coloured sand. No fossils were observed in it, nor any selenite nor septaria, though septaria were found in making a small excavation in my garden at a spot about 150 ft. south-west of the junction of Park Hill Rise and Addiscombe Road, and some 20 ft. higher.

As we proceed in a south-east direction up Park Hill Rise the London Clay thins out from below upwards, owing to its base rising more rapidly than the slope of the surface, and it ceases somewhere about 60 yards north-west of the Chepstow Road, though the exact boundary is difficult to ascertain, owing to the ground having been artificially raised with clay, probably dug from the foundations of neighbouring houses. The base of the London Clay rises from a level of 210 ft. O. D. at the Addiscombe Road to one of about 231 ft. 6 in. at its termination, or 21 ft. 6 in. in about 580 ft., nearly 1 in 27.

B. *Pebble bed.*—The base of the London Clay rests on a layer of pebble gravel; presumably belonging to the Blackheath (or Oldhaven) beds. At the junction of Park Hill Rise with the Addiscombe Road this pebble bed was only 4 in. thick, but it contained some very large pebbles. In ascending the Rise, however, the pebble bed increased in thickness; thus, at the point where the London Clay ended it was about 18 in. thick, at the Chepstow Road 2 ft. thick, and thence it increased more rapidly in thickness until about 300 ft. from the Chichester Road it attained a maximum exposed thickness of 11 ft., the bottom of the trench being still in the pebble bed. Beyond this point, however, the thickness of the pebble bed exposed in the trench became less, owing to its sinking beneath a capping of clay, to be afterwards referred to, and finally, about 25 yards from the Chichester Road, the pebble bed was abruptly cut off by a fault. (A similar pebble bed reappears, however, in the railway cutting further on, though I am not sure that it occupies the same geological position.)

It will be observed that the steeper slope of the hill between the Chepstow and Chichester Roads coincides with the increased development and surface outcrop of the pebble gravel; so that Park Hill owes its elevation, partly at least, to its being, like Croham Hurst, Shirley Hills, Hayes Common, and other eminences in this neighbourhood, on a bank of pebbles accumulated near the shore of the Tertiary sea; the pebble capping forming a protection against denudation.*

The pebbles contained in this gravel are black flints, all much rounded by the action of water. In the lower part of the Rise,

* At the site of the reservoir on Shirley Hills the pebble bed has been proved to be at least 50 ft. thick.

and even somewhat beyond Chepstow Road, the bed consisted of incoherent gravel and sand, some of the pebbles, as already said, being very large, up to 9 by 5 in.; and it was here devoid of fossils. But higher up the Rise, where the pebble bed attained a greater thickness, the lower part of it was compacted by calcareous matter into a conglomerate bed, which at one place attained a thickness of 5 ft. This calcareous matter was doubtless derived from shells; chiefly the large round oyster (*Ostrea bellovacina*), of which many blocks of conglomerate were full. In some blocks the shell matter had been more or less completely dissolved away, leaving only impressions or casts with a thin layer of shell substance adhering. Masses of brown calcareous sandstone, enclosing a few scattered pebbles, were also met with, containing the same oyster and a few other fossils. The oysters evidently lived on the pebble bank, as is shown by the unworn condition of the shells, and by their having often attached themselves to the pebbles; and therefore the view that the oyster-bed was suddenly destroyed by an irruption of pebbles can hardly be correct, though the gradual accumulation of pebbles seems to have been inimical to the oysters, for none are found in the higher part of the bed.

C. *Sand.*—Below the pebble bed in the lower part of Park Hill Rise is a bed of light yellowish loamy sand, containing harder lumps of a ferruginous colour, and thin laminated bands of blue plastic clay. No fossils were found in it. This sandy bed was just reached in the bottom of the trench at the Addiscombe Road end; it attained its maximum exposed thickness near the Chepstow Road, where it occupied the greater part of the depth of the trench; but higher up the hill it disappeared in the bottom of the trench beneath the thickened pebble bed. This bed may be classified as Oldhaven, and it may correspond with the yellow and grey sand with non-continuous partings of impure pipe-clay found beneath the pebble bed at Shirley, as described by Mr. Klaassen in 1890 in the Proceedings of the Geologists' Association, vol. xi. No. 8.

D. *Clay.*—In the upper part of Park Hill Rise the pebble bed is overlaid by a bed of brownish loamy clay, increasing in thickness towards the south-east, so that the pebble bed was met with in the sewer trench at greater and greater depths. This clay bed had been much disturbed by brickmaking operations, broken bricks and a plank edged with hoop-iron, such as is used for wheeling on, were found embedded in it. The Ordnance Survey map, made 1863, shows a brickfield at this spot, and I am told that the houses in this part of Park Hill Rise were built with bricks made there. A crystal of selenite was shown me by a workman, which was said to have been found in this clay, but I do not know in what position. No fossils were seen in it. The age of this clay seems doubtful; from its position above the pebble bed it cannot belong to the Woolwich series: it might be an outlier of the London Clay, though it does not resemble that bed as met with in the lower part of Park Hill Rise; and it may perhaps be a later superficial bed derived from the denudation of the mottled clay of the Woolwich beds, which is exposed on higher ground to the south.

E. *Fault.*—The beds which have been described are abruptly terminated near the top of Park Hill Rise by a fault, on the other side of which a different set of beds is met with. This fault runs transversely to the road, about 33 yards from Chichester Road, and exactly opposite the south-east end of the house called Chichester Lodge; its position was clearly seen in the bottom of the trench, and was also conspicuous by the difference of material in the heaps of stuff thrown out; but its exact direction and slope were not ascertained. The upthrow is on the south-east side, and its amount is evidently considerable, but could not be measured, as no one bed could be recognized as occurring on both sides of the fault. On the north-west side of the fault the beds have a moderate slope (about $2\frac{1}{2}°$) to the north-west; but on the south-east side the beds dip at a high angle (20°) to the south-east, contrary to their general slope. From this I infer that this fault corresponds with the northernmost of the two faults shown in Mr. Klaassen's section of the railway-cutting; the position of which fault, as there shown, would be some 300 yards to the east-north-east of the point where the fault crosses Park Hill Rise.

F. *Mottled Clay.*—The bed next met with on the further side of the fault, and which is thrown up by it into juxtaposition with the pebble bed, is the oldest bed which was exposed in the excavations. It consisted of a mottled clay, with veins of sand, and was very brightly coloured; the clay being yellow, pink, and greenish blue, while the sand veins were deep yellow or ferruginous brown, rendering the stratification very distinct. As before stated, it had a high dip to the south-east. In the lowermost part of this bed dark blue stiff clay predominated, containing *Cyrena* and ill-preserved leaves; while the upper part consisted chiefly of mottled clay intermixed with yellow sand, but it contained lenticular masses of blue clay crowded with *Cyrena*.

This bed doubtless belongs to the Woolwich series, and probably corresponds to the beds *e* and *f* in Mr. Klaassen's section; but whereas in the railway cutting blue fossiliferous clay rested on mottled clay devoid of fossils, in Park Hill Rise the blue clay was found below the mottled clay. No distinct line of demarcation following the dip of the strata was to be observed between the blue and the mottled clay, and it seemed rather as if the latter were the more superficial layers of the clay which had changed colour owing to a process of weathering and unequal oxidation of the contained iron and manganese.

The outcrop of this clay on the surface had a breadth of only 11 yards, and its exposed thickness was about 23 ft.

G. *Shelly Sand.*—The last bed met with in the course of the excavation rested upon the mottled clay, and was of a sandy nature, varying from a coarse shelly sand containing numerous small rounded pebbles—in fact, almost a pebble gravel—to a yellow loamy sand with partings of blue clay, not unlike the sand met with below the pebble bed in the lower part of Park Hill Rise, except that while the latter contained no fossils, this bed was full of shells, chiefly fragmentary, though some very well preserved specimens of the round oyster (*Ostrea bellovacina*) were met with, this being the most abundant species. There were also a few specimens of the long oyster (*Ostrea tenera*), and of *Cyrena* and *Melania*, and some fragments of oyster were covered with *Serpula.*

This bed may, I think, be classed as Oldhaven, and probably if the section had been prolonged to the south-east it would have been found to pass under the pebble gravel, which is exposed in the railway cutting a little further on in that direction, though it does not exactly resemble the beds found immediately under the pebble gravel, either in the lower part of Park Hill Rise, or in the railway cutting. The difficulty in correlating the beds exposed in the two sections is partly due to their having been cut across in different directions, but especially to their variable character, corresponding beds undergoing great changes in character and thickness in a short distance. This variability is accounted for by their having been formed on the shifting shore of a shallow sea or estuary.

Postscript, February, 1897.

Since this paper was read, some other excavations in the neighbourhood have given further opportunities for studying the relations of the beds.

The clay bed D in the paper I now believe to be probably an outlier of the London Clay, which owes its preservation from denudation to its having been let down by the fault described. In a trench for the drain of the house Chichester Lodge, next on the north-west side of the position of the fault, this clay bed, where undisturbed, was 6 ft. thick above the pebble gravel, and was a dense brown clay, quite of the usual character of the London Clay. Mr. Whitaker also tells me that he has seen the London Clay exposed in a corresponding position in a sewer trench in Chepstow Rise, a road about 220 yards west of this point. The occurrence of selenite in the bed D also points to its being London Clay.

The pebble bed was found in drain trenches in Park Hill Rise to be 2 ft. in thickness at a point 126 yards north-west of Chepstow Road, and 4 ft. thick about 88 yards south-east of that road.

In a sewer trench in Addiscombe Road, about 200 yards west of the point where it is crossed by the Woodside and Selsdon Road Railway, a yellow sand with thin partings of clay was met with, similar to the bed C in Park Hill Rise; this was capped with a thin layer of gravel. Just east of the same railway bridge, a sand-pit has been opened in 1896, which exposes a fine section 15 ft. or more thick of the same yellow sand with clay partings. In the top soil above this sand are numerous rounded pebbles, obviously derived from the Oldhaven pebble bed, which would seem formerly to have been present above the yellow sand in this locality, as it is in Park Hill Rise. On the other hand, in the railway cutting between the two tunnels the pebble bed, containing shelly conglomerate exactly similar to that met with in Park Hill Rise, is situated below the yellow sand, as shown in Mr. Klaassen's section. I can only account for the different position of the pebble bed in the different places by supposing that, notwithstanding the exact similarity of lithological characters and fossil contents, there are really two distinct pebble beds, one above and one below the yellow sand, and marking different episodes in the deposition of the Oldhaven beds in this locality.

In the laying of the sewer in Chichester Road the shelly sand G was found to extend only a short distance westward from the junction with Park Hill Rise; the remainder of the trench as far as Chepstow Rise being in mottled clay with shelly and sandy layers, similar to the bed F in the Park Hill Rise section. No sign of the fault was seen; probably it lies further to the north.

130.—Some Forms of Silica.

By W. Murton Holmes.

(Read April 28th, 1896.)

Silica, the oxide of a non-metallic element called silicon, is the most abundant and widely distributed substance in the mineral kingdom, and either alone or in combination with other substances forms more than one-half of the known crust of the earth.

As a rock-forming agent silica takes the part of an acid, hence it is frequently called silicic acid; and in combination with various bases, such as alumina, potash, soda, magnesia, &c., forms a large series of important minerals.

It is, however, about silica in the uncombined state that I propose to offer a few remarks now.

In the free state it occurs most abundantly in the crystalline condition as represented by quartz, and is one of the principal constituents of granite and gneiss. Less abundantly it occurs in a semi-crystalline state as flint and chalcedony; and it also occurs in a colloid or amorphous state, containing from five to twelve per cent. of water, forming the varieties of opal.

In the crystalline condition silica is insoluble in water at ordinary temperatures and pressures; but in the hydrous condition it is to a certain extent soluble in water, and the presence of alkaline carbonates materially increases the solubility. When, however, it is exposed to the combined action of pressure and heat, the quantity dissolved is much larger.

Such conditions obtain in the geysers of Iceland and of the Yellowstone Park in the United States, and the quantity of silica held in solution by the water as it issues from these has been found to be 5·097 in 10,000 parts.* On being discharged from a geyser, the water forms a series of pools, in the neighbourhood of which a certain amount of vegetation, particularly of algæ, is able to exist, and it is by the action of these organisms, rather than by simple cooling and evaporation, that the dissolved silica is precipitated upon surrounding objects, forming what is known as a sinter. In this way shells and other objects become imbedded, as in the specimen exhibited. One of the sinter-beds in the Iceland geyser region is said to be two leagues long, a quarter of a league wide, and a hundred feet thick. Enormous beds of similar material have been deposited in the Yellowstone Park geyser region.

If to a solution of silicate of soda a little hydrochloric acid be added, the acid will combine with the soda, setting free the silica in a gelatinous condition, hence the term colloid applied to the non-crystalline form.

In much the same way living protoplasm has frequently the property of being able to separate silica from solution, and in many cases of setting it free and absorbing it from earthy silicates, such as clay, either held in suspension in

* These geysers are springs which at certain intervals throw up large volumes of boiling water. The water underground, under the pressure of a long column of water, attains a temperature higher than that of ordinary boiling water; but when the elastic pressure becomes strong enough to overcome the pressure of the superincumbent column, the water is ejected with considerable violence.

water, or forming part of the mould into which roots of plants penetrate.

Grasses and equisetums contain a large quantity of silica deposited in their tissues, which has all been obtained from the soil by the rootlets of the plants, principally by decomposing silicates of alumina and potash, such as clay and felspar. One has only to cut the rind of a common cane to be conscious that there is something there harder than ordinary bark or woody tissue. It also exists to such an extent in wheat-straw that, when it is burnt, the ashes, of which it is the principal constituent, retain the form of the unburned straw. Another member of the grass family, the bamboo, sometimes secretes a substance known as tabasheer. This is found in the knots of the bamboo, and occurs as a porcelain-like substance in a thin saucer-like layer. Valuable medicinal properties have been attributed to it, but that is probably because it is not easy to procure. It contains about ninety per cent. of silica, with water, potassium, iron, and calcium in indefinite proportions. It may be considered as vegetable opal.

Diatoms are vegetable organisms which also secrete a very large quantity of silica in their cell-walls. From the variety and beauty of the markings which many of these exhibit, they are favourite objects with microscopists. They are minute algæ found both in fresh and salt water, and their remains on the site of lakes, or on the sea-floor, form extensive accumulations. These beds are of considerable geological importance. There is a deposit now in course of formation in the Yellowstone Park many square miles in area, and often attaining a thickness of six feet. At Richmond, Virginia, beds of fossil diatoms occur thirty or forty feet thick. The forms found in this deposit are very beautiful, and have long been known.

These infusorial earths, as they are sometimes called, have many useful applications. Thus, they are bad conductors of heat, and are used to form a coating for steam-pipes. They are also used to absorb nitro-glycerine in the manufacture of dynamite, and for filtering. Some varieties are known in commerce as tripoli, and are used for polishing metals. Kieselguhr is another name frequently applied to the purer varieties.

Nor is the property of absorbing silica confined to vegetable organisms, for there are minute animals known as radiolaria, which occur in countless myriads floating in the sea, and their remains are deposited on the sea-floor over large areas, forming radiolarian ooze. They consist of a tiny mass of protoplasm, which secretes an exquisitely beautiful siliceous shell or test. They obtain their food by protruding portions of their protoplasmic substance a considerable distance into the surrounding water. Their fossil remains occur plentifully in the rocks of

Barbadoes and many other localities, and many palæozoic rocks have now been proved to owe their origin to radiolaria. Our fellow-member, Dr. Hinde, has discovered their existence in many rocks not previously believed to be of organic origin, and he frequently receives fresh specimens from all parts of the globe.

Sponges, again, are silica producers. With the exception of two groups all the members of this large family have siliceous spicules in greater or less abundance. Some of these spicules are of comparatively large size, while others are very minute. These spicules are found in some parts of the ocean-bed in large quantities, and their fossil remains form a considerable part of the greensand formation. In the recent condition, the larger spicules very much resemble spun glass. They are flexible, and possess considerable elasticity.

The silica in all these organisms, when comparatively recent, is in the hydrous or colloid condition, chemically resembling opal. Examined under the microscope, they give no reaction with polarized light. In the older fossil deposits a change has taken place, and the organisms, though outwardly retaining their original form, have undergone a physical change. They have lost water and become crystalline, so that they affect a ray of polarized light.

This organic silica is frequently dissolved and re-deposited in another form. The sea-bottom forming what has been called "modern chalk" contains, in addition to numerous calcareous organisms, a certain amount of silica diffused through it. In the true chalk all the silica is found collected into layers or nodular masses of flint. The question is, how are these formed? I think in all probability some organisms, such as an echinus, a sponge, or a mollusc, when in a state of incipient decomposition, set free a small quantity of silica from solution, which was deposited, and so, particle by particle, the original calcareous shell was replaced by one of silica; or the mass of siliceous spicules of the sponge became gradually embedded in a mass of jelly-like silica,—for when once a mass of silica had become isolated, the tendency would be for more to collect round it, just as crystals of alum will grow from a solution, until the greater part of the silica in the surrounding ooze had been collected together. That the silica must have been in a gelatinous condition at one time is certain, for we often find hollow flints enclosing portions of the sea-bottom. It is in these cavities that one finds the smaller kinds of chalk fossils best preserved. In the course of time the colloid silica would be altered into the semi-crystalline condition of flint by giving up some of its water of combination. Flints differ from other varieties of silica, inasmuch as they break with a conchoidal or shell-like fracture, and have sharp cutting edges.

There are several varieties of the mineral known as opal. The most valued kind exhibits a rich play of colours, due to iridescence. They all contain from five to twelve per cent. of water of hydration. Opal is probably the early stage of such minerals as chalcedony, onyx, agate, and carnelian, which were formed by the infiltration of silica into cavities or fissures in rocks.

Chalcedony occurs in several varieties. The structure exhibits radiating crystals resembling fibres. Chrysoprase is an apple-green variety; carnelian, a bright red; sard, a brownish red; agate is variegated; mocha stone and moss agate are chalcedony with dendritic or moss-like markings disseminated through them; onyx is an agate with colours arranged in horizontal layers; cat's-eye is a chalcedony with a peculiar lustre, due to the inclusion of filaments of asbestos; jasper is another variety.

Quartz is silica in the crystalline condition. The crystals belong to the rhombohedral system, and occur in six-sided prisms with pyramidal ends. Rock-crystal is the purest variety, and it is to this form that the term crystal was first applied. It is also known as pebble, and is used for making spectacles and other optical instruments. Some of the varieties rank among the precious stones. Amethyst is quartz coloured purple by manganese, and is not uncommon, although crystals suitable for cutting are scarcer. Cairngorm is a brown or yellow variety found in Scotland, and is much used in Scotch jewellery. Quartz approaches the precious gems in its amount of hardness.* When fused by the intense heat of the oxy-hydrogen blowpipe, it may be drawn out into fine flexible elastic threads. Heated in a current of steam it undergoes partial sublimation. Fine crystals are often found accompanying mineral veins, and also lining cavities of rocks, or replacing other minerals. It is by no means uncommon to find cavities in flints lined with small glistening crystals of quartz. These must have been formed subsequently to the upheaval from the sea-bottom. The growth of large crystals most probably took place with extreme slowness from aqueous solution. Crystals frequently contain cavities with various fluids, such as water, liquefied carbon dioxide, and hydrocarbons such as naphtha. They often attain a large size. There are some in the Natural History Museum about a yard high and a foot in diameter. I was shown a very perfect small crystal the other day from the Pitch Lake, in Trinidad. It was perfectly clear, and each end was terminated by six-sided pyramids. It had been formed in contact with pitch, instead of hard rock, and consequently had grown uniformly in every direction.

Vein quartz is of a milky-white colour, and occurs in large masses not showing definite crystals. It is found filling veins,

* It scratches glass easily.

sometimes many yards broad, in crystalline and fragmentary rocks. Gold is found associated with this variety.

Granite consists of a granular crystalline mixture of quartz, felspar, and mica in varying proportions. Gneiss has a similar composition, but has a stratified appearance from the mica being in layers. These rocks are of igneous origin, and the constituent minerals have separately crystallized from the molten mass during slow cooling.

In the sandstones we find the ruins of older rocks. The quartz grains of which they are composed are more or less firmly cemented together by various substances. When the cementing material is silica, the grains are often so firmly fixed in the matrix that a fracture passes through the individual grains instead of between them. Such a rock is quartzite.

A silicious conglomerate is precisely similar in character to a sandstone, but the granules are large and usually rounded. Carnarvon Castle is built of a siliceous conglomerate similar to the piece exhibited, which was picked up on the shores of the Menai Straits.

There are several slides of fossil wood exhibited. Under the microscope the cell-structure is perfect. The wood from Croydon was found imbedded in a flint. The wood must have floated about on the sea of the Cretaceous period for some time, as it was bored in several places by teredos. On sinking to the bottom, the woody structure was gradually replaced by silica, and finally embedded in a crust of the same material.

Silica is very largely used in glass-making, and in the manufacture of china, either in the form of ground flints or of pure sand.

I must no longer trespass upon your patience. There are several other siliceous minerals to be met with, but it will be found that they can be classed under the head of one of the foregoing varieties. The dividing lines are by no means always sharply defined, one form passing into another, even in the same specimen.

131.—Notes on a Visit to the Southern Highlands of Scotland.

Mr. T. Douglas exhibited specimens of chert containing radiolaria from Crawford, Lanarkshire, N.B., in the Southern Highlands. The chert outcrops on the upper part of the Castle Hill, at Crawford. Mr. Douglas was informed by an Edinburgh geologist that the underlying basis of most of the hills in the neighbourhood was trap, and that superimposed on this were certain Silurian rocks of the Llandeilo series, *viz.* mudstones, then the chert bearing radiolaria, and higher up black shale containing graptolites. The specimens exhibited were submitted to Dr. Hinde, who examined and classified the radiolaria of the South of Scotland chert, and is therefore the leading authority on the subject. He finds that they contain radiolaria. Dr. Hinde's paper entitled "Notes on Radiolaria from the Lower Palæozoic Rocks (Llandeilo-Caradoc) of the South of Scotland" * was shown, together with a microscopical section, also belonging to Dr. Hinde, showing radiolaria from Broughton, in Peebleshire, about fifteen or eighteen miles in a northerly direction from Crawford.

The mining villages of Leadhills and Wanlochhead lie a few miles from Crawford, and a collection of lead ore (galena), heavy spar (sulphate of barium), nodular pyrites, calcite, carbonate of copper, &c., from Leadhills was shown.

Alluvial gold is found in these districts, and at one time was extensively worked. In 1578 the Scottish Government granted a concession to an Englishman, Bevis Bulmer, to work the gold-mines in Scotland, and he had as many as three hundred men engaged in obtaining it near Leadhills. In three years he washed out gold to the value of £100,000 in this district.

132.—Notes on the Gravels of Croydon and its Neighbourhood.

By George Jennings Hinde, Ph.D., F.R.S.

(Read November 17th, 1896.) †

A considerable portion of the town of Croydon is built on a deposit of gravel which forms part of a wide sheet extending to the north over the flat areas of Waddon, Beddington, and Mitcham, and, with a more contracted course, along the valley of the Wandle to the Thames at Wandsworth. To the south of Croydon the same gravel occupies the valley of the Brighton Road, Smitham Bottom, the lower portions of the Caterham Valley and of the other valleys from the south and south-west which open into Smitham Bottom at the Red Lion Green, Coulsdon, just below the Cane Hill Asylum. No detailed notice of these gravels appears to have been published, and as near Croydon they are in process of being further covered up by

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* 'Annals and Magazine of Natural History' for July, 1890.

† Subsequently revised and added to.—G. J. H., March, 1897.

buildings or removed for the repair of roads, it has seemed to me opportune to bring before the Club some notes on their characters.

The history and origin of these gravels are so closely connected with the formation of the valleys and the geological nature of the country in the drainage area of the Wandle basin, that a short preliminary sketch of the geology and present physical configuration of the district is necessary to understand them.

The southern boundary of the present drainage area of the Wandle is the well-known escarpment of the Chalk overlooking the east and west valley in which Oxted, Godstone, and Merstham are situated. To the east it begins on the high ground of Botley Hill, near Woldingham, and follows the general summit of the escarpment westwards to near Walton Heath, a distance of about eleven miles. The eastern line of the watershed extends from Botley Hill to the north-west in the same general direction as the high road over Worms Heath and through Warlingham to Sanderstead, but somewhat to the west of the road itself. From Sanderstead the line continues to the Addington Hills, Shirley, and more to the north along the ridge of Upper Norwood, and thence through Streatham and Upper Tooting to the Thames. On the west side, the line of watershed passes over the high ground of Walton Heath in a north-easterly direction, near to Walton-on-the-Hill, Banstead Newton, and Burgh Heath, then more easterly to near Banstead and Woodmansterne, and the west side of the valley of the Wandle at Carshalton, and northerly through Morden and Wimbledon to the Thames.

As the result of the convergence northwards of the east and west lines of watershed, the Wandle basin, just to the south of Croydon, is not more than about five miles in width, or less than half that of its southern border. A line drawn through the south end of Croydon roughly divides the drainage area of the Wandle into a southern portion, mainly underlaid by chalk, and a northern, underlaid by Lower Tertiary beds and London Clay. In the southern portion the Upper Chalk forms a plateau-like surface, elevated from 600–868 ft. above Ordnance datum * on the southern margin of the escarpment, and gradually sloping northwards to levels of 500–550 ft. above Ordnance datum at Banstead, Coulsdon, and Sanderstead. At Riddlesdown the plateau is 400 ft., and at the Russell Hill, on the opposite side of the valley, 362 ft. Nearer Croydon, owing to the northerly dip of the chalk, the levels are still lower, and at South Croydon the chalk disappears below the surface, and is replaced to the north by Tertiary beds.

This comparatively high sloping plateau is not entirely of

* The elevations given in this paper are taken from the 6-inch maps of the Ordnance Survey.

chalk, for there are on it in places small patches of sand, loam, and pebble beds of the Lower Tertiary series, the fragmentary remains of strata which formerly extended quite over the chalk in our area. The Tertiary pebble beds, known as the Blackheath or Oldhaven beds of Whitaker, are of considerable importance in relation to the valley gravels, to which they have largely contributed. These Tertiary sand and pebble beds occur principally on the higher portions of the plateau south of Caterham, at Worms Heath, also at Croham Hurst, Addington Hills, and in places on the western line of watershed, near Walton-on-the-Hill, and Burgh Heath.

Even where not covered by Tertiary beds the surface of the chalk plateau in our area is overlaid generally by a comparatively thin layer or crust of the Clay-with-flints of Whitaker. This consists of a matrix of red clay (brown, near the surface) in which unworn chalk flints, Tertiary pebbles, and very frequently pieces of iron sandstone and chert, are embedded. From the erosion of this deposit the valley gravels have derived much of their flint constituents, and, most probably, all the chert and ironstone fragments which they contain.

The most striking physical feature which the chalk plateau of our area exhibits in common with the rest of the North Downs is the system of comparatively narrow *dry* valleys with which the plateau is now deeply furrowed, and nowhere along the whole course of the North Downs are these peculiar valleys and the gravels of their lower portions better shown than in the district south of Croydon. A short account of these valleys by the late Mr. John Flower has already appeared in the 'Transactions' of the Club (1878–1881, p. 72). Most of them begin near to the summit of the chalk plateau on the south, and some extend in the form of a pass or gap quite through the escarpment and look down into the transverse valley of the Gault below, others take their rise on the high level plateau of the western line of the watershed. In our district these dry valleys converge in a generally northerly course towards Croydon, and unite in the main valley of Smitham Bottom, which is continued through Croydon, and opens into the wide flat area of Beddington, Waddon, and Mitcham, on the western side of which is the channel of the present stream of the Wandle. It is along Smitham Bottom that the great mass of the gravels brought down the main valleys from the erosion of the chalk plateau has been carried and spread out over the area of what is now Croydon and the flat tracts to the north of it.

Leaving out of account the Bourne, which at irregular intervals, several years apart, flows down the lower part of the Caterham valley and Smitham Bottom for short periods, the valleys in the chalk area to the south of Croydon are all dry;

that is, they have no streams or currents of water flowing down them. Very little surface erosion is now taking place on the slopes of these dry chalk valleys, for the rain, however heavy it may fall, is at once practically all absorbed by the chalk, and none is left to form streams or transport the gravels which now cover the lower portion of the valleys. Even when the Bourne is flowing, as at the present time, its current is insufficient to effect any appreciable erosion, or move the gravels down the very gradual incline of the present valley.

Passing now to a consideration of the gravels in the respective valleys of the chalk, the most important on the eastern side of the drainage area is that in which Caterham is situated. This valley extends through the chalk escarpment at a pass, about 560 ft. O.D., overlooking Godstone, in the valley of the Gault, 260 ft. below. On either side of the pass, the chalk hills are at levels of 700–750 ft. A tributary valley starts from near the edge of the escarpment at the south end of Marden Park at a level of 623 ft., and reinforced by other valleys coming from the high ground (850 ft. above O.D.) near Woldingham, it joins with the main Caterham valley at Marden Lodge at a level of 347 ft. Near the junction of the two valleys gravel appears to be present, judging from the stony character of the lower slopes, but there are no sections shown, and the Bourne also here makes its first appearance in the valley. Below Marden Park the Caterham valley continues without any important tributary till it joins the Smitham Bottom valley at Foxley Hatch, close to Purley Station, at 213 ft. above O.D. Its length is about five and a half miles, or reckoning from the head of its longest tributary, six and a half miles.

At Whiteleaf, gravels are worked at the bottom of this valley on the east side of the main road to Caterham, at levels of 310 ft. Sections show a thickness of 10 to 15 ft. resting on an uneven surface of white chalk. The gravel consists of an agglomeration of tightly packed stones with a few boulders, in a brownish-grey, marly matrix of the same character from top to bottom, and without any traces of stratification. The coarser materials are, for the most part, of blunted, subangular chalk flints, but little worn, with the usual flint sponges and echinoderms. Tertiary flint-pebbles are fairly common, as also flattened and rounded fragments of iron sandstone; one piece of this measured $7 \times 5 \times 2$ in. Besides these, rounded and elongate boulders of pebble-conglomerate of various sizes are not uncommon; the rounded from 6 to 12 in. in diameter, the elongate specimens in one instance $14 \times 10 \times 6$ in., in another $17 \times 14 \times 7$ in., and the face of a third still firmly embedded in the gravel was 23×13 in. The pebbles in some of these boulders are cemented by ferruginous material, in others the cement is apparently siliceous; the surface of the boulders is smooth and rounded, and the originally rounded pebbles are worn flat by attrition. The finer portions of these gravels consist of small rounded pebbles of chalk and flint, and a chalky mud which contained Foraminifera, *Inoceramus* prisms, and Coccoliths. After repeated search I failed to find any pieces of chert or molluscan shells in the gravels.

At the time of my visit last November, pieces of elephant bones were exposed in one of the pits, and other bones and teeth obtained during the last year were lent to me by Mr. J. J. Springall, of Whiteleaf, for determination. These have been examined by my friend, Mr. A. Smith Woodward, F.G.S., of the British Museum (Natural History), who reports on them as follows:—

1. *Elephas primigenius*, Blumenbach (mammoth). Distal end of tibia of the left side, fragments of other limb bones, and portions of the pelvis. (Mr. Springall had also two very perfect molars of this species; the larger of the two had a grinding surface $7 \times 3\frac{1}{2}$ in., and a height of 7 in. The smaller is a back tooth, with only a small grinding surface at the anterior end.)

2. *Rhinoceros leptorhinus*, R. Owen. A perfect upper molar, No. 3 of the left side, and a small premolar, No. 2 of the same side.

3. *Equus caballus*, Linnæus (horse). Tibia.

4. *Bos primigenius*, Bojanus (large fossil ox). Portion of metacarpus.

5. *Rangifer tarandus*, Linn. (reindeer). Basal portion of antler, of the large form common to the Thames valley deposits.

The bones are in a fair state of preservation; when first extracted they are sufficiently soft to be readily cut with a knife, but they become firmer when dry. The teeth are not at all rubbed or worn; the mammoth teeth when dry have a whitish tint like those from the elephant bed at Brighton.

Between Whiteleaf and Purley, I have only observed gravels in the bottom of the Caterham valley at Kenley where a roadway leads up to Little Roke. The section showed from above: 3 ft. of brown loam with coarse, slightly-worn flints scattered through it, and, below, 2 ft. of greyish partially stratified gravel of rough unworn and subangular flints, Tertiary pebbles, and small boulders of conglomerate, with smaller pebbles and grains of chalk; and beneath this an uneven surface of chalk. There is an embayment on the west side of the valley at this place occupied by a ridge, 30 to 40 ft. in height, apparently consisting of gravel overlaid by brown loam, on which at the present time some very ancient pollard oaks are growing.

At the junction of the Caterham with the main valley of Smitham Bottom near Purley Station, there is a comparatively wide opening underlaid by gravel. At the cross-roads at Foxley Hatch a pit was lately opened to a depth of 6 ft. in a coarse flint gravel, in which were several boulders of conglomerate similar to those already mentioned from Whiteleaf. Two of these measured 30 × 24 × 17 in. and 23 × 17 × 12 in. respectively. In all probability these have been brought down the Caterham valley, for none has been observed in the main valley south of the junction, whilst they are not uncommon lower down the valley nearer Croydon.

We now come to the best known of the dry chalk valleys in our area,—that along which the main road and the railway to Merstham and Brighton are carried. It may properly be named the Hooley valley, from the village of this name situated in it. The head of this valley is a pass or gap, 439 ft. above O.D., at Harpsoak Cottage, a short distance north of Merstham in the Gault valley below, which is here at a level of 264 ft., or 175 ft. below the head of the Hooley valley. The summit of the chalk plateau on the east side of the gap is 624 ft. above O.D., and it is here capped by clay-with-flints, containing, besides the usual flints and pebbles, numerous pieces of iron sandstone, and in some places, at slightly lower levels of 560–580 ft., many fragments of Lower Greensand chert.

The only gravelly materials now exposed in the upper portions of the Hooley valley are those of the railway-cuttings between Hooley House (330 ft.) and the north end of the tunnel (413 ft.). A close examination of the beds is only practicable in a few places; they are from 5 to 15 ft. in thickness, and even more where pockets or pipes of gravel are let down into the chalk. The gravels rest on a very uneven surface of chalk, and appear to consist of a red clay containing the same flinty materials and fragments of iron sandstone, and, rarely, pieces of chert, as those in the clay-with-flints of the plateau above. In some of the pocket-like depressions there are lenticular beds of loam or sandy loam.

The late Sir J. Prestwich * has referred to the ironstone and the chert in the gravel of this valley as a proof that the valley itself formerly extended more to the south, to the Lower Greensand area, from which these materials have been derived, but the occurrence of these same materials on the summit of the plateau directly bordering the valley shows that they must have been brought into our drainage area before this valley was formed, and that probably they have found their way into the gravels from the erosion of the plateau clay-with-flints, and not direct from the Lower Greensand rocks to the south.

The length of the Hooley valley from the summit pass at

* 'Quart. Journ. Geol. Soc.,' vol. xlvi., 1890, p. 171.

Harpsoak Cottage to the Smitham Bottom at the Red Lion Green, Coulsdon, is three and a quarter miles, and its fall in this distance is 184 ft. There is an extensive deposit of gravel in the open area where it connects with Smitham Bottom, but most of this appears to have been brought down the Chipstead valley, referred to below.

A well-marked dry valley coming down on the east side of Farthing Downs from the high plateau near Chaldon connects with the Hooley valley near the Coulsdon railway-station. At the foot of the valley, in the road immediately below the railway-crossing, a strong spring or bourne is now issuing, at a level of 260 ft. above O.D., and the water runs down into the gravel-pits below.

More important than the Hooley valley in regard to the amount of gravel in its lower reaches is the Chipstead valley, the upper branches of which take their rise in the high grounds of the watershed plateau near Banstead, Burgh Heath, Tadworth Court, Banstead Heath, and Walton Heath, at levels between 500 and 600 ft., and, running in a north-easterly direction for a distance of about six miles, connect with Smitham Bottom at the Red Lion Green at the level of 255 ft. above O.D.

On the watershed plateau at Burgh Heath, and near Walton-on-the-Hill, there are some outliers of Tertiary beds, and these are in places covered by a deposit of gravel at levels of 560–580 ft. above O.D., from which some of the constituents of the valley gravels may have been derived. Pits are at present opened in these gravels on the open heath between Walton-on-the-Hill and Dowding Castle, showing a section of 10 to 12 ft. in depth. The gravel consists of large well-rolled flints, Tertiary flint-pebbles, and numerous blunted fragments of the yellow porous chert from the Lower Greensand, from 1 in. in diameter to pieces measuring $7 \times 3 \times 3$ in.; these stones are embedded in a matrix of reddish sandy loam without stratification, and in places there are layers of the loam free from stones. The gravels in one part of the pit rested on a greenish yellow sand, probably Tertiary. The character and position of these gravels on the watershed at so high a level show that they belong to the deposits classed by the late Sir J. Prestwich * as "Southern Drift," and they occupy a higher level at this place than anywhere else in Surrey mentioned by Prestwich. So far as I am aware, no other deposit of Southern Drift gravel is known within the Wandle drainage area, except that described by Sir J. Prestwich † on the summit of Westow Hill, Upper Norwood, at heights of 360–380 ft. above O.D.

* 'Quart. Journ. Geol. Soc.,' vol. xlvi., 1890, p. 155.

† *Loc. cit.* p. 159.

This high-level Southern Drift contrasts strongly with the valley gravels of the lower levels in the well-rolled condition of the larger flints, the large proportion of Tertiary flint-pebbles, the abundance of chert fragments from the Lower Greensand, and negatively in the absence of angular or subangular flints and the great rarity of pieces of iron sandstone.

The slopes of the chalk valleys leading down from the watershed plateau to Smitham Bottom are covered with angular and subangular flints and Tertiary pebbles, in part derived from the clay-with-flints of the plateau above, in part direct from the chalk, and these materials form beds of rough gravel 3 to 4 ft. in thickness in the valley of Hogden Bottom. Lower down the Chipstead Bottom they have been worked at Stagbury, and still more extensively from the cross-roads at Banstead Park, 317 ft. above O.D., to the junction with the Smitham Bottom at the Red Lion Green, Coulsdon, 255 ft. The flat bottom of this valley for a distance of one and three-quarter miles is covered by gravel to a depth of 4 or 5 ft. In the upper 2 ft. the stones are embedded in a brown loam, evidently washed from the chalk slopes on either side; in the lower portion the gravel consists of angular and subangular flints, green-coated flints, Tertiary pebbles, iron sandstone, and, very rarely, pieces of chert in a more sandy matrix. In some places between the gravel and the chalk beneath there is a thin bed of quartz sand, with rolled pebbles and grains of chalk, prisms of *Inoceramus* shell, and Foraminifera washed from the chalk. These Chipstead Bottom gravels are now largely worked for the roads, and in a few years they will be all removed.

From the Red Lion Green, Coulsdon, 255 ft. above O.D., to the north end of Haling Park, South Croydon, 163 ft., a distance of nearly four miles, the main valley of Smitham Bottom and the Brighton Road has been covered by a fairly thick sheet of gravel of a similar character to that just mentioned in the Chipstead valley. In this distance, on the east side, the Caterham valley and some shorter valleys from Sanderstead and Selsdon join the main valley; and on the west side, only an inconspicuous valley at Foxley Hatch.

In pits lately opened by the side of the Brighton Road, the gravel at the bottom of the valley is from 8 to 10 ft. in thickness. On the west side of this part of the main valley the chalk slopes are somewhat abrupt and they have no gravel over them, though traces of a former coating of gravel have been preserved in pockets or pipes in the chalk, one of which is at present exposed in the Avondale Road, at a level of 210 ft. On the east side of the valley, however, the chalk slopes are more gradual, and they are overlaid by gravel to heights of 40 or 50 ft. above the bottom of the valley. A good section of these higher valley gravels is at present shown in a field by the north side of the Sanderstead Road, now being laid out for building, at a level of about 210 ft. The gravel is in places 15 ft. in thickness, and it rests on an uneven surface of chalk. It is reddish, coarse, quite unstratified, of unworn and subangular flints, Tertiary pebbles, a few fragments of iron sandstone, and, rarely, pieces of chert and flattened ovoid quartzite pebbles from the Blackheath beds, with occasionally, boulders of pebble conglomerate, which are tightly packed in a matrix of sandy loam. In the upper portion of the section there is a bed of brown loam from 1 to 2 ft. in thickness, and here and there some thin layers of fine chalk rubble. This gravel closely resembles that of the bottom of the valley, and is probably continuous with this latter.

The boulders or blocks of conglomerate found in this Sanderstead Road pit, and more numerously in the gravels of the Brighton Road immediately below, deserve some further notice, since in this district masses of stone larger than the detached flint nodules from the chalk, from 6 to 12 in. in diameter, are of rare occurrence in gravels, and they do not appear to have been mentioned hitherto. The boulders are portions of the Blackheath Tertiary beds, in which the flint-pebbles are cemented either by a ferruginous or siliceous cement; and they occur as fairly well-rounded blocks up to 12 in. in diameter, or as irregular masses with the angles rounded off and their surfaces smooth and even, the rounded flint-pebbles having been worn level with the cement by the attrition to which they have been subjected. One of the larger boulders, which I have myself seen in the gravel-pit, measured $20 \times 17 \times 12$ in., but blocks of much larger size, in all probability derived from the gravels, may be noticed against water-troughs in the Brighton Road. The lighter coloured boulders, in which the cement is siliceous, resemble in character the Hertfordshire conglomerate. I do not know of any beds of similarly cemented rock in the Blackheath deposits yet remaining in our area. They have evidently travelled some distance to produce their worn smooth surfaces, and it must have required a current of water of considerable volume and force to transport them down valleys of such slight fall as those in which they now occur.

So far we have been considering the gravels in the dry and comparatively narrow valleys in the chalk district to the south of Croydon; at the south end of the town the Chalk dips beneath the surface, and is succeeded northwards by the Lower Tertiary beds and the thick mass of the London Clay. This change is markedly reflected in the configuration of the surface. Instead of the narrow valleys, which result from the resistant nature of the chalk to subaerial erosion, the more readily denuded Tertiary beds have been excavated so as to form a wide shallow depression, in which a large part of Croydon is built, and which northwards includes Waddon, Beddington, and Mitcham Common to the Thames valley. This depression has been partially filled by an extensive sheet of gravel which has been carried into it from the chalk district to the south.

On the eastern slopes of the Tertiary beds, within the bounds of Croydon, there is a well-marked upper terrace of gravel, at levels of 180–200 ft. above O.D., or from 40 to 50 ft. above the valley of Old Town below. Starting from St. Peter's Church, South Croydon, it continues northwards along St. Peter's Road, Park Lane, Katherine Street, to the High Street, George Street, Dingwall Road, to St. James's Road. An excellent section of this upper terrace gravel is shown in the Fairfield, near the East Croydon railway-station. On the north side, nearly parallel with George Street, the following beds are shown:—

Cultivated earth passing into a yellowish sandy loam filled with Tertiary flint-pebbles and a few unworn flints, 3 to 4 ft.

Brownish or yellowish-brown loam or clay with a few pebbles and unworn flints, 3 to 5 ft.

Reddish flint gravel, for the most part without stratification, but in one or two places with thin beds of smaller pebbles, and lenticular layers of brown loam, 10 to 12 ft. The flints range from unworn to well-rounded nodules, and Tertiary pebbles. The only foreign materials noticed were pieces of iron sandstone. The gravel rests on Lower Tertiary beds.

About three-quarters of a mile more to the north, in the Gloucester Road, at 178 ft. above O.D., a section now being worked showed above 2 to 3 ft. of brown clay or loam containing a few pebbles, and beneath this 12 ft. of reddish gravel of the same character as that in the Fairfield, but with a larger proportion of Tertiary flint-pebbles.

Further northwards, near the Thornton Heath railway-station, at 145 ft. level, gravels have been worked over a large area to the north of the Brigstock Road. The section showed the following beds:—Cultivated earth and brownish loam with a few small pebbles, 2 ft. Reddish non-stratified flint-gravel, like that in the Fairfield, 7 to 10 ft.

The gravel rests on London Clay. From the gravel at this place the late Mr. John Flower * stated that he obtained a molar tooth and some pieces of bone of elephant.

Similar gravels to those above mentioned also occur at intermediate levels between the upper terrace and the bottom of the valley, and they may be traced from South Croydon through High Street, North End, London Road, to Broadgreen, at levels of 150–160 ft. above O.D., and beyond this they connect with the gravels of Thornton Heath. I have not been able to ascertain

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* 'Proc. Croydon Micro. and Nat. Hist. Club, 1878–1881,' p. liii.

the depth of the gravel in the bottom of the valley at Old Town, where the levels are 139–150 ft., but in the Corporation wells in Surrey Street 11 ft. of gravel and sand were passed through. On the west side of the valley, gravels are present on the slopes of Duppas Hill, at about the same level as the upper terrace on the east side.

In the wide flat areas to the west and north-west of Croydon similar gravels are met with. At the Croydon Gas Works, Waddon Marsh Lane, they are 7 ft. in thickness, and at the New Cemetery, by the site of the Mitcham Road, the drainage trenches showed, above, 2 ft. of cultivated soil and light-coloured sandy loam, and, below this, 7 ft. of coarse gravel resting on dark blue London Clay. The gravels mainly consisted of slightly worn flints, some 8 in. in diameter, and flint-pebbles. Thin beds of light-coloured sand are in places intercalated in the gravel.

From the surface of Mitcham Common the gravels have now been almost entirely removed, but more to the north they underlie Mitcham itself, and they have been extensively worked in pits between the railway-station and the church. The section in the railway pit, at a level of 60 ft. above O. D., shows above: 1 ft. to 1 ft. 6 in. of cultivated sandy soil, and below this from 7 to 10 ft. of partially stratified gravels with impersistent layers of shingle and sand 6 in. to 1 ft. in thickness. These beds rest on London Clay. The gravel is composed chiefly of blunted subangular flints, not of large size, with green-coated flints, flint fragments, and Tertiary flint-pebbles. The sand is light coloured, with green glauconite grains, and with small calcareous pellets, probably Foraminifera, washed from the chalk. In the larger proportion of sand and in the stratification of the beds, the gravels contrast with those of higher levels nearer Croydon. Both chert and iron sandstone are apparently absent.

In 1889 some mammalian remains were discovered in these pits, which were subsequently presented to the British Museum by the railway company, through Mr. Perry. Mr. A. Smith Woodward, F.G.S., has kindly supplied me with the following report on these remains *:—

"1. *Elephas primigenius.* One shaft of femur and some fragments of tusk.

"2. *Rhinoceros* sp. Two fragments of teeth.

"3. *Equus caballus.* Portion of mandible, cannon bone, &c., of moderate size.

"4. *Rangifer tarandus.* Imperfect antler fixed to portion of frontal bone, of the large variety usual in the Thames valley.

* Since this paper was sent to press, Mr. Baldwin Latham, C.E., F.G.S., has informed me that several years since elephant's tusks were found in a sewer trench in the road to Morden, about a quarter of a mile from the river Wandle, at a point about north-east of the Morden Rectory. The tusks were embedded in a pocket of wet sandy loam overlying the London Clay.

"5. Small bovine bones. Three fragmentary metatarsals, one metacarpal, one astragalus, and one fragment of the right mandibular ramus, showing pm. 4. These are much smaller than the corresponding bones of *Bos primigenius*, and precisely similar to those from later deposits commonly ascribed to *Bos longifrons*. Whether or not they truly belong to this latter species cannot be determined in the absence of the skull; but if they are of this form, the discovery is interesting as proving for the first time the association of *B. longifrons* with the British Pleistocene Mammalia. Prof. Boyd Dawkins believes that the small ox in question was first introduced into this country by the Neolithic peoples, and he regards the Mitcham bones as belonging to a small bison. They seem to me, however, to be too slender for the latter, and the problem must be left for solution by further discoveries."

From another gravel-pit at Mitcham, the basal fragment of a deer's horn was lately obtained by Mr. Joseph Hall, of Croydon, which has been determined by Mr. Smith Woodward as belonging to the roebuck, *Capreolus capræa*.

I may here also refer to some teeth from the drift gravel at Scarbrook Hill, Croydon, and from gravels at the Brighton Road exhibited and described to the Club some years since by the late Dr. Carpenter.* Through the kindness of Mrs. Carpenter, I have been enabled to submit these teeth to my friend Mr. Smith Woodward, and he has determined that those from Scarbrook Hill belong to the horse, but they are recent and not fossil specimens, and the worn ruminant teeth from the Brighton Road gravels belong to *Bos primigenius*.

My observations on the gravels of the Wandle valley do not extend further north than the pits at Mitcham, which are about four miles from the Thames at Wandsworth, and 60 ft. above O.D. The absence of materials foreign to the Wandle drainage basin in these gravels tends to prove that at this place there has been no intermixture with the gravels of the main Thames valley.

The gravels referred to above are nearly entirely composed of flint materials, the fragments of other kinds of rock form but a very insignificant proportion of the total mass. These flint materials have, in the first instance, all been derived from the flint nodules in the Upper Chalk, but only some have come directly into the gravels from the chalk; a good proportion of them have formed part of other formations, and from these they have found their way into the gravels. We can distinguish the following:—(1). Flint nodules of various sizes, some fresh and hardly at all worn, others subangular and more or less rounded. These have come either directly from the erosion of the chalk of

* 'Proc. Croydon Micro. and Nat. Hist. Club, 1878–1881,' p. li.

the plateau and valley slopes, or from the clay-with-flints, and they have been blunted and rounded in the transport down the valleys to their present position in the gravels. (2). Flints of a similar irregular form to those just mentioned, but of a brownish umber tint on the exterior, and brownish or grey within. These brown flints are considered to have been derived from high-level plateau gravels, where they have been long exposed to meteoric influences. They can be recognized in nearly all the valley gravels. (3). Flint fossils. For the most part they are silicified casts of sponges and sea-urchins which have been washed out of the chalk. (4). Flint pebbles. These are smooth, well-rounded, dark or brownish, the greater number about an inch in diameter, but a few reach to 4 or 5 in. across. They have been derived from the Lower Tertiary Blackheath beds, and are the products of an extensive erosion of the chalk, probably in the present Wealden area, during early Tertiary times. They are very abundant in the gravels. The conglomerate boulders which have been mentioned are from the same beds. (5). Green-coated flints. These are irregularly-shaped flint nodules, with a thick surface rind of a dark sage-green tint. They come from a stratum between the base of the Tertiary Thanet sand and the Chalk.

The quartz-sand with the loamy and clayey materials which form the matrix of the valley gravels are probably derived from the erosion of Lower Tertiary beds; some of the clay and loam, however, may be an insoluble residue of the chalk.

Of the foreign materials in the valley gravels, *i.e.* derived from rocks not occurring in our drainage area, may be mentioned:—

(A). Light brownish flattened pebbles of quartzite from 3 to 7 in. across. I have traced these as pebbles to the Tertiary Blackheath beds, but the rocks from which they come originally are not at present known. They are of rare occurrence both in the Tertiary beds and in the gravels.

(B). Flattened and rounded fragments of iron sandstone. These are of coarse or fine quartz-sand cemented by iron. Their origin is not fully certain. They have been attributed to Tertiary beds,* of which the softer portions have altogether disappeared, and some of the fragments are evidently post-cretaceous, as they contain pebbles of flint cemented with the sand. The iron sandstone of the Folkestone division of the Lower Greensand is also indistinguishable from these fragments. The pieces of iron sandstone are freely distributed in the valley gravels, and they are likewise very abundant on the surface of the chalk plateau in the clay-with-flints, and it is from this deposit that they have found their way into the valley gravels. Some of the fragments

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* Prestwich, 'Quart. Journ. Geol. Soc.,' vol. xiv., 1858, p. 323.

distributed over the plateau are of fairly large size, and apparently but little rolled.

(C). Rounded fragments of yellow, porous chert rock, made up of sponge spicules and their hollow casts. There can be hardly any doubt that these have been derived primarily from the siliceous sponge-rocks of the Hythe division of the Lower Greensand, like those of the higher portions of the Lower Greensand ridge between Sevenoaks and Hindhead. These cherty fragments are sparingly distributed over the high chalk plateau in connection with the clay-with-flints, and they are numerous in the older plateau gravels, as in those of the watershed near Walton-on-the-Hill, and from these sources they have passed into the valley gravels, where, however, they are but seldom met with. This chert rock, and probably the iron sand as well, has been brought from the outcrops of the Lower Greensand to the south and dispersed over the chalk plateau at a period anterior to the formation of the present valleys.

I have not met with any fragments or pebbles of white quartz or quartzite (beyond those from the Blackheath beds), or of any older rocks, either on the plateau or in the valley gravels of the Wandle area, and this negative feature markedly distinguishes them from the gravels of Wimbledon Common and Combe Wood, Kingston Hill.

It has long been evident to geologists that climatal forces like those now prevailing are insufficient to have caused the erosion of the dry valleys of the chalk and the transport of the large masses of gravel with which the lower part of the valleys and the flat areas to the north of our district are now covered, and various explanations have been proposed to account for these phenomena. It has been supposed that at the time they were formed there was an excessive rainfall, some ten times the amount of that which now occurs, but there is no evidence from other quarters to support this hypothesis, and it may be doubted whether even a rainfall of the extent imagined would have sufficed to erode these valleys.

A more probable explanation is that brought forward by Mr. Clement Reid, F.G.S.,* who considers that during the Ice Age, when glaciers reached to the edge of the Thames valley on the north of London, the climate was sufficiently rigorous to have caused the surface beds of the chalk to be permanently frozen, and that in this condition the rains during the summer months, with the water from the melting snow, would erode the chalk surface as if it were a non-porous rock, and thus the valleys would be excavated, and the harder flints transported to the lower levels.

* 'Quart. Journ. Geol. Soc.,' vol. xliii., 1887, p. 364.

The character and mode of deposition of the valley gravels indicate the action of strong currents of water, such as might be produced from melting snows, and considering that the reindeer and the mammoth then inhabited this part of England, there seems ground for believing that there might be such an accumulation of snow and ice on the chalk plateau as to furnish by their melting sufficient transport force to carry down and along our valleys the coarse flints and boulders which occur in the gravels. There is no evidence of any glacial action in the valley gravels, for in no instance are the stones and boulders scratched or striated; at the same time it is quite possible that ice may have assisted in the removal of some of the larger blocks.

The formation of the valleys and the gravels appears to have been carried out entirely by subaerial action; there is nothing to indicate any submergence and subsequent upheaval either during or since their formation, as suggested by Sir J. Prestwich.* The local character of the gravels in our district has an important bearing on this point, for they contain only those materials which are known to have been present within the Wandle drainage area before the valleys began to be excavated in the chalk plateau.

133.—On the Occurrence of Mammalian Remains near Purley.

By N. F. Robarts, F.G.S.

(Read December 15th, 1896.)

In July last my attention was called by my friend Mr. H. Reynolds to the presence of some mammalian remains in a cutting being made upon the new railway running from Purley up the Chipstead valley to Banstead and Epsom.

The cutting is situated on the south side of the Kenley valley, about three hundred yards from Purley station, where the new line diverges to the east of the Brighton line after passing the bridge across the road to Caterham.

The level of the line is about 40 ft. above the bottom of Smitham Bottom, or about 260 ft. above Ordnance Datum.

The accompanying diagram represents the section on the east side of the cutting as I saw it at the end of July.

Commencing at the top of the section, we have—

1. Humus, 1 ft.
2. Brick earth with unrolled flints and fragments of chalk, 6 ft.

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* 'Quart. Journ. Geol. Soc.,' vol. xlviii., 1892, p. 341.

3. Small pebbles with a little sand, forming a very dry loose bed, 1 ft. 6 in. to 2 ft. 6 in.

4. Clay bands, 4 in.

5. Chalk rubble, mixed with pebbles and small subangular flints, 1 ft. 6 in. to 3 ft.

6. Brick earth with a few flints, 3 ft. to 4 ft.; the total depth at that point being 10 ft. to 11 ft.

From the alternations in the deposits it is evident that the conditions of deposition varied considerably, the pebbly bed, No. 3, having been deposited in swift running water, whilst the presence of a considerable number of flints in the brick earth points to a muddy flood rather than a slow deposition of sediment. A glance at the map will show that this deposit is just at the junction of the Kenley valley with Smitham Bottom, so that it must have been almost exactly where the stream from the smaller valley fell into that of the larger.

As shown in section No. 2, taken east-north-east and west-south-west across the main valley, the deposit lying at a considerable height above the bottom of the valley, a very considerable amount of denudation must have taken place after the beds in question had been deposited.

A very considerable number of bones have been found, but they are very fragmentary, and have not yet been identified; but all or almost all have been taken from the lowest bed of brick earth, No. 6 in the section. The principal specimens are—

1. Tusk of *Elephas primigenius.*
2. Horn of *Bos primigenius* (?).
3. Molar of *Elephas primigenius.*
4. Ditto. ditto.

And what, I believe, is tibia of some species of *Elephas.*

The latter was almost perfect when found, but, having unfortunately to be removed in very wet weather, it was found impossible to preserve it, the bone, when *in situ*, being very spongy and friable. The portions preserved, however, show that it was in remarkably good condition, having suffered little or no damage during deposition. From its appearance associated with flints in the brick earth, it is very evident that it was deposited in a very strong rush of flood water, whilst the clean pebble bed overlying it also giving evidence of a very rapid stream, we may, I think, infer that the streams of the period when the deposit took place were large and rapid, or the rainfall exceedingly heavy.

The colour of the bones, especially of the tusk, is remarkably light, whether from having been washed out of deposits of chalk gravels, such as the bones exhibited by Dr. Hinde at our last meeting, I cannot say, but the very perfect condition suggests that the remains in question were primary deposits, whilst the bones were fresh, and not derived from any gravels.

In view of the very early position of the deposit in regard to the contour of the valley, and the interesting paper of Dr. Hinde at our last meeting referring to the mammalian remains discovered in the gravels of the Kenley valley, it would seem, if I am correct as to the deposition of the bones whilst in a fresh state, to give us some clue to the rate of denudation of the chalk valley of Smitham Bottom, if we can approximately fix upon the date when the species in question existed. I may mention that although the flints in the strata exposed have been carefully examined, no traces of worked flints have been discovered.

As the cutting is not yet quite completed, it is to be hoped some further remains may be found.

In conclusion, I must thank Mr. Reynolds, to whose protection and preservation of the remains we are so much indebted, and who, I hope, may be allowed to retain them by those who have any title to them till he can present them to the Croydon museum of the future.

134.—Report of the Meteorological Sub-Committee for 1896.

Prepared by the Hon. Sec., Francis Campbell-Bayard, F.R.Met.Soc.

(Read February 16th, 1897.)

The arrangements for observing the daily rainfall round Croydon have been successfully carried out on the same plan as heretofore, but on a still larger scale, and with, it is hoped, still greater efficiency. The number of stations in the printed sheet is 78, and there are two stations (Woburn Road, Croydon, and Hatherly Road, Sidcup) not in the printed sheet, the observations of which are quite complete, and will be found at the end of this Report. The Sub-Committee are greatly indebted to three of the observers, namely, Miss Brodie-Hall, of Abinger, Mr. James Batten, of Bickley, and Mr. Francis Druce, of Upper Gatton, for the increase in the number of stations.

Three stations, Kenley (Ingleside), West Wickham (Layham's Farm), and Woolwich, have come to an end owing to the removal of the observers, and one, Kenley (Hazelea), through the death of the observer, Major Carr-Dyer. With reference to this last station, the Club will be pleased to hear that the observations have been recommenced by the late observer's widow. The gaps caused by the three vacancies have been filled up for the present year.

The monthly sheets contain all the records, with the exception of Woburn Road, Croydon, and Sidcup, which have been received by the Sub-Committee, and the stations of which the records have been tabulated number 78 as against 73 in the last Report, and the number of observers is 66 as compared with 61.

A.—*Greenwich Average* 80 *Yrs.* (1816–95).

	Average	1896	± Average
	IN.	IN.	IN.
Jan.	1·89	0·64	− 1·25
Feb.	1·59	0·37	− 1·22
March	1·52	2·99	+ 1·47
April	1·65	0·55	− 1·10
May	2·00	0·27	− 1·73
June	1·95	1·95	......
July	2·60	1·05	− 1·55
Aug.	2·33	2·29	− 0·04
Sept.	2·30	5·32	+ 3·02
Oct.	2·82	2·80	− 0·02
Nov.	2·37	1·19	− 1·18
Dec.	1·94	3·05	+ 1·11
Year	24·96	22·47	− 2·49

B.—*Greenwich Average* 40 *Yrs.* (1856–95).

	Average	1896	± Average
	IN.	IN.	IN.
Jan.	1·98	0·64	− 1·34
Feb.	1·43	0·37	− 1·06
March	1·44	2·99	+ 1·55
April	1·61	0·55	− 1·06
May	1·94	0·27	− 1·67
June	2·04	1·95	− 0·09
July	2·42	1·05	− 1·37
Aug.	2·30	2·29	− 0·01
Sept.	2·18	5·32	+ 3·14
Oct.	2·75	2·80	+ 0·05
Nov.	2·19	1·19	− 1·00
Dec.	1·94	3·05	+ 1·11
Year	24·22	22·47	− 1·75

C.—*Surbiton Average* 40 *Yrs.* (1856–95).

	Average	1896	± Average
	IN.	IN.	IN.
Jan.	2·04	0·45	− 1·59
Feb.	1·47	0·14	− 1·33
March	1·44	2·44	+ 1·00
April	1·64	0·48	− 1·16
May	1·92	0·26	− 1·66
June	2·08	2·35	+ 0·27
July	2·37	1·42	− 0·95
Aug.	2·43	2·51	+ 0·08
Sept.	2·21	7·12	+ 4·91
Oct.	2·81	2·62	− 0·19
Nov.	2·16	1·34	− 0·82
Dec.	1·85	3·47	+ 1·62
Year	24·42	24·60	+ 0·18

D.—*Mt. Ararat, Wim., Av.* 40 *Yrs.* (1856–95).

	Average	1896	± Average
	IN.	IN.	IN.
Jan.	1·79	0·67	− 1·12
Feb.	1·38	0·30	− 1·08
March	1·33	2·96	+ 1·63
April	1·64	0·62	− 1·02
May	1·92	0·17	− 1·75
June	2·08	1·68	− 0·40
July	2·49	1·33	− 1·16
Aug.	2·31	2·95	+ 0·64
Sept.	2·28	5·85	+ 3·57
Oct.	2·88	3·05	+ 0·17
Nov.	2·19	1·35	− 0·84
Dec.	1·77	2·89	+ 1·12
Year	24·06	23·82	− 0·24

Appendix I. to this Report contains a list of the observers, with particulars relating to the stations and gauges, and also the monthly tables of daily rainfall, of which a sufficient number have from time to time been pulled for the use of the Club; and Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from the monthly tables in Appendix I.

The year has been a very remarkable one. The very dry months in the first half of the year, the exceedingly wet September, so wet that another such is not recorded in this district, and the dry November, form a curious record; and in order to show the remarkable features, tables A, B, C, and D have been constructed.

Tables A and B refer to Greenwich. Table A shows that the rainfall of 1896 is 2·49 in. below the 80 years' average (1816–95); and table B that it is 1·75 in. below the 40 years' average (1856–95).

Tables B, C, and D refer to Greenwich, Surbiton, and Mt. Ararat, Wimbledon, the only stations in the printed list having a 40 years' average (1856–95). This shows with respect to 1896 a deficiency of 1·75 in. at Greenwich, an excess of 0·18 in. at Surbiton, and a deficiency of 0·24 in. at Mt. Ararat, Wimbledon.

These tables, when carefully examined, are very instructive. It will be noticed that tables A and B agree fairly well, with the exception that in table A the difference of 1896 from the average is ¾ in. more than in table B.

When, however, we compare tables B, C, and D together, we cannot help being struck with the fact that whilst table B shows a deficiency as respects 1896 of 1¾ in., table C actually shows an excess of nearly ¼ in., whilst table D shows a deficiency of ¼ in. It is difficult to account for this, but it possibly arises from the configuration of the land; Greenwich and Wimbledon lying to the north of the range of hills bordering on the river Thames, whilst Surbiton lies more to the westward, owing to the river bending towards the south. Should this attempted explanation prove correct, it may possibly supply a reason for explaining many anomalies in the distribution of rain.

It is not proposed to go into minute particulars of the distribution of the rainfall of the district of this remarkable year, as the monthly notes give full accounts thereof; but it may not be amiss to remind the members of the Club that this present year now beginning is the tenth year of this organization, and that it will soon be necessary to take in hand a very much more exhaustive report, and to produce a map of the district showing the contour lines of elevation, and also the distribution of rain in relation thereto. To do this a series of at least ten years' observations is necessary, and it is desirable that, for the purpose of comparison, the decade 1891–1900 should be taken.

The Sub-Committee would draw attention to the large number of days—twelve—on which an inch or more rain fell, and also to the very unusual fact that out of this number no less than five occurred in September, and also to the very large amounts that fell on the 1st of that month. It is singular that on the 2nd September, 1889, at Wilmington, there was the largest fall that has occurred in the district during the continuance of this organization, *viz.* 3·90 in., whilst the next highest fall is at Keston (Tower Fields) on the 1st September, 1896, *viz.* 2·62 in.

The earthquake on December 17th does not seem to have been greatly noticed. The only observers who seem to have felt anything are Mr. Baldwin Latham, of Croydon, and Mr. Francis Druce, of Upper Gatton.

In conclusion, the Sub-Committee desire to express their thanks to the three gentlemen who have so kindly continued their subscriptions to enable the Club to carry on its great work, the value of which may be gathered from the many notices and favourable reviews in the scientific papers of this country and abroad, and also to the very cordial co-operation of the observers, without whose assistance such a work could never be successful.

Woburn Road, Croydon.

Observer—M. L. Craven. Gauge, 5 in. in diameter.
Height of gauge above ground, 13 in.
Height of station above sea-level, 178 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
0·66	0·37	3·59	1·03	0·22	2·21	1·74	2·41	7·16	3·77	1·74	3·78	28·68

Hatherly Road, Sidcup.

Observer—Dr. Lionel Burrell. Gauge, 5 in. in diameter.
Height of gauge above ground, 14 in.
Height of station above sea-level, 160 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
0·68	0·35	3·09	0·63	0·27	2·96	1·55	1·92	5·13	3·00	1·46	2·93	23·97

APPENDIX I.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB

(Meteorological Sub-Committee.)

STATIONS.	OBSERVERS.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Hall)	The Lord Farrer	8	2	0	320
Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
Dorking (Denbies)	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate (The Briars)	Mrs. Barclay	5	1	0	430
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)	W. Gardiner	5	1	0	475
Harp's Oak Cottage	R. C. Grant	5	1	0	454
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Chaldon (The Rectory)	Rev. G. E. Belcher	5	1	0	542
Caterham (Metropol. Asylum)	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)	W. Morris	5	1	0	785
Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Ingleside)	H. Smith	8	1	0	375
Kenley (Hazelea)	F. C. S. Dyer	5	1	0	282
Kenley (The Cottage)	J. B. Snell	5	1	0	294
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
Oxshott	W. H. Dines	5	1	0	212
Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Maldén	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)..	Croydon Corporation ..	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)....	Croydon Corporation ..	8	1	0	331
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
West Wickham (Layham's Farm).	W. Ashcroft	5	1	0	500
Hayes Common (The Warren) ..	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)..........	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Wilmington (Kent Water Co.)....	W. Morris............	5	1	0	25
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Bickley (The High Field)	J. Batten	5	1	2	295
Bromley (The Palace)	Coles Child	5	1	0	187
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe .	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road) ..	W. H. Cullis..........	5	1	0	125
Thornton Heath (Thornton Road).	A. Wright............	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)..	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison......	5	1	0	45
Esher (Sewage Works)..........	A. J. Henderson	5	1	0	40
West Molesey (Chelsea W. Co.)..	R. Hack..............	5	1	0	32
Surbiton (Seething Wells)	R. Hack..............	10	0	6	25
Kingston (Sewage Works)	T. Stevens............	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Wandsworth Com. (Patten Road).	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)...	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)..	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road) ...	L. W. F. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.....	6	0	6	76
Forest Hill (S. & V. Water Co.)..	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris............	5	1	0	245
Woolwich (Powis Street)........	J. G. Waller..........	5	30	0	65
Greenwich (Royal Observatory)..	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)......	W. Morris............	5	1	0	20
Nunhead (S. & V. Water Co.)....	J. W. Restler	5	4	0	176
Brixton (Acre Lane)............	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.) ...	J. W. Restler	5	3	0	21

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Kenley (The Cottage) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(January, 1896.)

The month has been remarkably warm and dry, with very little sun or wind. The barometer has been exceedingly high. It stood at 9 a.m. on the 30th, when reduced to 32° F., and sea-level, at Upper Gatton 30·934 in., at Wallington 30·920 in., at Croydon (Whitgift) 30·918 in., and at Redhill 30·860 in., and is probably the highest in this century. Slight snow fell on the 7th and 10th at most places in the district. At Croydon (Park Hill) the winter aconite flowered on the 15th, and the yellow crocus on the 28th. A solar halo was seen at Upper Gatton on the 13th. There has been a good deal of sickness about the district, including isolated cases of diphtheria, scarlet fever, and measles. The rainfall is about one-third of the average. The mean temperature is about $3\frac{1}{2}$° above the average, and was at Croydon (Whitgift) 40·8°, at Croydon (Duppas House) 40·6°, at Wallington 40·3°, at Redhill 39·9°, at Waddon 39·8°, at Kenley (Ingleside) 39·5°, at Upper Gatton 39·4°, and at Chipstead 38·4°. At Wallington the amount of sunlight registered was 13.7 hours, which is 13 per cent. below the January average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* January, 1896.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	..	·02	·06	·03	·03	..	·02	·03	·03	·04	·05	·03	·05	·05	·03	·09		..	..	·01	·01	·01	..	·01	·02
2	..	..	..	·02	·01	..	·02	·01	..	·01	..	..	..	..	..	·01	..		·04	..	·02	..	..	..	..	..
3	..	·04	..	·01	..	·01	·04	..	..	..	..	..	·01	..	..	..	..		·01	..	..	..	..	..	..	..
4	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	·02	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
6	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
7	..	..	..	·02	..	..	..	..	..	..	·01	·01	·01	..	..	..	..		..	..	·01	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..		..	..	..	·01	·01	..	..	..
9	..	..	..	..	..	..	·02	·01	..	..	..	..	..	..	..	..	..		..	..	..	..	..	·02	..	..
10	..	..	·04	·02	..	..	..	·01	·01	·02	·01	·01	·03	·01	·05	·01	..		·06	·05	·03	·04	·03	·04	·05	·05
11	·03	..	·04	·02	..	·01	..	·01	..	·01	..	·01	·02	·02	..	·01	·03		·03	..	·02	·02	·02	·04	..	..
12	·04	·12	·12	·04	·03	·04	·03	..	·03	·02	..	·02	·03	·03	·05	·01	·04		·03	·03	·03	·03	·02	·02	..	·02
13	·12	·12	·06	·15	·11	·10	·07	·10	·08	·09	·12	·10	·10	·11	·13	·10	·06		·04	·07	·06	·06	·06	·07	·10	·03
14	·06	·05	·07	·10	·09	·11	·08	·07	·08	·08	·12	·09	·08	·10	·12	·10	·14	MONTHLY GAUGE.	·16	·07	·08	·08	·08	·08	·05	·05
15	·05	·03	..	·15	·13	·09	·13	·08	·10	·05	·06	·05	·05	·04	·05	·02	..		·03	·04	·02	·03	·02	·06	·05	·04
16	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	·02	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
19	..	..	..	·02	·01	·01	·01	·02	·02	·01	·01	·01	·01	·01	..	..	..		·02	..	..	·01	·01	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	·02	..	..	..	..	..
21	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..	·01	..		..	..	..	..	..	..	..	..
23	..	·05	..	·02	·02	·02	·02	·02	·02	·01	·01	·01	·02	·01	..	·01	..		·02	..	..	..	..	..	..	·01
24	·18	·15	·23	·34	·16	·14	·24	·19	·17	·23	·21	·25	·21	·29	·30	·22	·27		·05	·16	·18	·17	·17	·12	·13	·09
25	·14	·19	·22	·26	·21	·16	·10	·20	·11	·22	·25	·23	·20	·20	·29	·18	·37		·47	·12	·21	·20	·21	·14	·16	·17
26	·01	..	..	·04	..	..	..	·02	..	·01	..	·01	·01	·01	..	·01	..		..	..	..	..	·01	..	..	..
27	·18	·16	·18	·20	·18	·17	·18	·20	·19	·21	·19	·23	·19	·20	·22	·15	·17		·23	·18	·20	·20	·20	·17	·10	·08
28	..	..	..	·02	..	..	..	..	..	..	..	..	·02	..	..	..	..		..	..	..	..	·01	..	..	..
29	..	..	..	·02	..	..	..	·02	·01	·01	..	·01	..	·01	..	..	..		..	..	·01	..	·01	..	..	..
30	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	·01	..	..	..	..	..
31	..	..	..	·01		..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	·01	..
*	·84	·91	·98	1·57	·98	·90	·94	·99	·85	1·01	1·03	1·09	1·02	1·10	1·26	·88	1·17	1·27	1·19	·72	·91	·86	·87	·80	·66	·56
†	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1896.**

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad.Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·02	·01	·02	·02	·02	·01	·03	·01	·02	·02	·02
2	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	·01
7	·01	..	..	..	..	..	..	..	..	..	·01	..
8	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	·01	..	..	..	..
10	·05	·05	·04	·04	·04	..	·05	·04	·04	·05	·04	·04
11	..	·02	·02	·02	·02	·06	·01	·02	·03	·02	·02	·02
12	·06	·02	·02	·02	·02	..	·02	·02	..	·02	·02	·02
13	·05	·04	·02	·03	·03	·04	·03	·03	·03	·03	·04	·03
14	..	·08	·06	·06	·06	·06	·06	·06	·05	·06	·06	·05
15	·04	·03	·02	·01	·02	..	·01	·01	·02	·01	·02	·02
16	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..
20	·02	·01	..	..	..	..	..	·01	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	·01	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..
24	·13	·09	·09	·11	·11	·09	·10	·10	·09	·11	·12	·11
25	·19	·17	·14	·15	·14	·15	·12	·14	·13	·15	·15	·14
26	..	..	..	..	..	..	..	..	..	..	..	..
27	·16	·12	·12	·13	·13	·13	·12	·13	·13	·13	·14	·13
28	·01	..	..	..	..	..	..	..	..	..	..	..
29	..	·01	·01	·01	·01	..	..	·01	·01	·01	..	·01
30	..	..	..	..	..	..	..	..	..	..	·01	..
31	..	..	..	..	..	..	..	..	..	..	·01	..
*	·76	·66	·55	·60	·61	·55	·53	·61	·54	·61	·66	·60
†	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms.F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·01	..	·01	·01	·02	·01	·02	·01	..	·02	·04	·03	·04
2	..	..	·02	..	..	..	..	·01	..	..	..	..	..	·01
3	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
7	·01	..	..	..	..	·02	·01	·01	..	..	..	..	..	..
8	..	..	..	·01	..	·01	·01	·02	·02	..	..	·02	..	·02
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·04	·05	·03	·03	..	·03	·04	·03	·01	·01	·02	·04	·04	·03
11	·03	·02	·01	·01	·04	·02	..	·02	·03	·02	..	·03	..	·02
12	·03	·02	·02	·02	·03	·03	·03	·02	·01	·01	..	·03	·04	·02
13	·03	·04	·04	·03	·04	·04	·03	·04	·03	·03	·03	·05	·03	·03
14	·06	·07	·06	·06	·06	·06	·06	·09	·05	·03	..	·07	·07	·07
15	·02	·02	·01	·02	·01	·03	·01	·03	·01	·05	·04	·05	·03	·02
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	·01	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	·15	..	..	..	..	..	..	..	..	..	..	..	..
24	·12	..	·15	·10	·10	·12	·10	·14	·10	·07	·10	·13	·12	·12
25	·15	·18	·18	·17	·21	·14	·10	·15	·12	·10	·07	·12	·12	·13
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·16	·19	·19	·17	·17	·15	·14	·15	·12	·15	·14	·14	·11	·12
28	..	·03	·01	..	..	..	..	·02	·02	..	..	..	..	·01
29	..	..	·01	..	..	·03	..	..	..	..	..	..	..	..
30	·02	..	..	..	·01	·01	..	..	..	..	..	..	·01	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·71	·78	·74	·63	·68	·72	·54	·76	·53	·47	·42	·72	·61	·64
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·04	·03	·02	·01	·04	·05	·04	·02	..	..	·01	·04	·04	·04	·04	·05	·05	·04	·02	·01	·02	·01	·01	·03	·02
2	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·01	·01	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
8	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·02	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·03	·04	·05	·04	·08	·09	·10	·09	·08	·06	·07	·08	·06	·10	·07	·07	·07	·06	·05	·04	·03	·05	·05	·06	·08	·05
11	·03	·03	·01	..	·01	·01	·03	..	·02	·02	..	..	·01	·01	·03	·02	·02	·03	·01	·04	·02	·01	·01	..	..	..
12	·02	·03	·03	..	·03	·03	·04	·02	·04	·01	·01	·02	·03	·03	·03	·03	·04	..	·03	·02	..	·01	·02	·03	·03	·03
13	·03	·03	·03	·03	·06	·05	·06	·05	·05	·08	·04	·07	·08	·06	·06	·06	·06	..	·06	·05	·05	·06	·05	·04	·08	·04
14	·07	·06	·04	·03	·08	·07	·09	·05	·07	·06	·05	·10	·08	·07	·06	·07	·09	·15	·08	·04	·04	·05	·04	·04	·06	·05
15	·02	·03	·04	..	·03	·01	·02	·03	·05	·05	·02	·02	·03	·02	·03	·04	·05	·03	·08	·07	·05	·06	·05	·05	·05	·05
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	·01	·02	·03	..	·03	·01	·01	·03	..	·02	·01	..	·01	..	·01	..	..	·01	..	..	·01	·02
24	·10	·10	·09	..	·10	·08	·10	·06	·10	·08	·09	·10	·11	·13	·09	·12	·12	·04	·14	·13	·12	·13	·11	·10	·14	·08
25	·10	·12	·11	·22	·17	·15	·17	·12	·19	·13	·11	·16	·17	·17	·17	·19	·21	·12	·16	·12	·13	·13	·12	·09	·17	·10
26	..	..	·01	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	·01	..
27	·10	·11	·12	·12	·12	·11	·16	·10	·07	·07	·05	·09	·10	·13	·12	·12	·13	·10	·12	·10	·10	·11	·10	·10	·12	·10
28	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..
29	..	·01	·01	..	..	·01	..	..	..	..	..	..	·01	·01	·02	·01	..	..	·01	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·57	·61	·57	·46	·70	·67	·87	·56	·74	·57	·45	·68	·72	·82	·75	·77	·87	·60	·80	·65	·55	·64	·56	·52	·79	·54
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Kenley (The Cottage) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(February, 1896.)

The month has been mild, calm, and dry, with a rainfall of about one-fourth of the average. The barometer has again been exceedingly high, and in the last eleven Februaries it has only been exceeded once, *viz.* in February, 1891. Slight snow fell on the 26th in many parts of the district, and lightning was seen at Nutfield on the 20th. Vegetation, in spite of the warmth, does not seem to have advanced much. Colds have been very prevalent, and very often of the influenza type. The mean temperature is variable, being above the average in some places, as in Croydon and the neighbourhood, and below it elsewhere, and was at Croydon (Whitgift) 40·5°, at Croydon (Duppas House) 40·3°, at Wallington 39·7°, at Kenley (Ingleside) 39·3°, at Waddon 39·2°, at Chipstead 38·7°, and at Upper Gatton 36·8°. Solar halos were seen at Upper Gatton on the 3rd and 27th. There were recorded at Upper Gatton 68·1 hours of bright sunshine, and at Wallington 49·9 hours of sunlight, which latter is 5 per cent. below the February average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	·01	..	..	..	..	..	..	..	..	..
3	..	..	..	·01	..	..	..	..	..	..	..	..	..
4	..	..	..	·02	..	..	..	..	..	..	..	..	·01
5	..	..	..	·01	·01	..	..	..	·01	..	..	..	..
6	..	..	..	·01	..	..	..	..	..	..	..	·01	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·11	·14	·11	·15	·09	·09	·08	·09	·08	·10	·12	·10	·09
9	..	..	..	·03	·02	·01	..	·01	·02	·01	..	·01	·02
10	..	..	..	·01	..	·01	..	..	..	..	..	..	..
11	..	..	..	·01	..	..	..	..	..	..	..	..	..
12	·06	·07	·05	·06	·05	·04	·06	·07	·05	·06	·06	·06	·06
13	..	..	..	·01	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	·01	..	..	..	..	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	·02	..	..	..	..	..	..	..	..	..
19	·07	·06	·06	·13	·07	·07	·10	·12	·07	·09	·06	·07	·10
20	·05	·06	·07	·08	·05	·04	·04	·06	·05	·06	·04	·06	·06
21	·06	..	·06	·05	·04	·04	·02	·04	·04	·04	·05	·05	·05
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·03	·02	·02	·02	..	..	..	·01	·01	·01	..	·01	·01
28	·01	·04	..	·02	·03	·03	·02	..	·03	·02	·02	·03	·03
29	·01	..	..	·03	·03	·03	·02	·04	·03	·03	·02	·03	·02
*	·40	·39	·37	·68	·39	·36	·34	·45	·39	·42	·37	·43	·46
†	1·24	1·30	1·35	2·25	1·37	1·26	1·28	1·44	1·24	1·43	1·40	1·52	1·48

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..		..	..	..	..	..	..	..	..
2	..	..	..	..		..	..	..	..	..	..	..	..
3	..	..	..	..		..	..	..	..	..	..	..	..
4	..	..	..	..		..	..	..	..	..	..	..	·02
5	·01	..	·01	..		..	..	·01	..	·01	·02	..	..
6	..	..	..	..		..	..	..	..	..	..	..	..
7	..	..	..	..		..	..	..	·02	..	..	..	..
8	·11	·13	·08	·09		·14	·07	·08	·08	·06	·05	·12	·10
9	..	..	..	..		..	..	·01	·01	·03	·02	·03	·02
10	..	..	..	..		..	..	..	..	·01	..	..	..
11	..	..	..	..		..	..	·01	..	..	..	..	..
12	·06	·08	·05	·04		·07	·05	·05	·05	·05	·08	·06	·05
13	..	..	..	..		..	..	..	..	·02	..	..	..
14	..	..	..	..		..	..	..	·01	..	..	..	..
15	..	..	..	..	MONTHLY GAUGE.	..	..	..	·03	..	·03	..	..
16	..	..	..	..		..	..	..	..	..	..	..	..
17	..	..	..	..		..	..	..	..	..	..	..	..
18	..	..	..	..		..	..	..	..	..	..	..	..
19	·06	·05	·04	·06		·05	·04	·03	·04	·05	·06	·03	·02
20	·07	·06	·06	·10		..	·05	·06	·07	·06	·07	·05	·04
21	·03	·05	·03	·07		·11	·03	·04	·05	·05	·06	·02	·02
22	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..		..	..	..	..	..	..	..	..
26	..	..	..	..		..	..	..	..	..	..	..	..
27	..	..	..	·02		..	..	..	·01	·01	..	·02	·02
28	·02	..	..	·03		..	..	·02	·01	·01	·02	..	..
29	·02	·04	..	·07		·02	..	·02	·02	·02	..	·01	·02
*	·38	·41	·27	·48	·56	·39	·24	·33	·40	·38	·41	·34	·31
†	1·48	1·67	1·15	1·65	1·83	1·58	·96	1·24	1·26	1·25	1·21	1·00	·87

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Wilmington	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
4	·03	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..
5	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·10	·10	·08	·09	·09	·10	·11	·10	·09	·08	·10	·10	·10	·10	·08	·10	·10	·09	·09	·09	·08	·06	·07	·11	·08	·10
9	·03	·03	·02	·02	·03	·02	..	·02	·02	·03	·03	·02	·03	·02	·01	·01	·01	·03	·01	·02	..	·02	..	..	·01	·01
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·06	·04	·03	·03	·03	·04	·04	·04	·03	·03	·04	·03	·04	·06	·03	·03	·02	·04	·04	·04	·03	·02	·02	·04	·03	·04
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·10	·05	·04	·03	·03	..	·02	·02	·01	·02	·01	·01	·03	·01	·02	·01	·01	·02	·01	·01	·01	·02	..	..	·01	·01
20	·07	·04	·05	·05	·05	·06	·04	·04	·05	·05	·04	·04	·05	·03	·04	·03	·07	·04	·06	·06	·08	·04	·01	·09	·06	·04
21	·05	·05	·04	·05	·05	·06	·05	·05	·07	·11	·08	·07	·07	·06	·05	·03	·05	·07	·06	·06	·06	·08	·11	·09	·07	·06
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	·01	..	·01	·01	..	·01	..	..	·01	·01	·01	·01	..	·01	·03	..	·01	·01	·01	..	..	..	·02	·01	·01
28	·03	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	·01	·01	·02	·02	·02	·09	·02	·02	·03	·03	·03	·04	·05	·04	·03	·04	·05	·03	·05	·03	·05	·07	·06	·04	·05
*	·47	·34	·27	·30	·32	·30	·36	·31	·29	·37	·35	·31	·39	·33	·28	·27	·30	·37	·33	·36	·29	·29	·28	·41	·32	·32
†	1·23	1·00	·82	·90	·93	·85	·89	·92	·83	·98	1·01	·91	1·10	1·11	1·02	·90	·98	1·09	·87	1·12	·82	·76	·70	1·13	·93	·96

* The figures in this row give the totals for the month.   † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt.Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	·01	..	·02	..	..	..	..	..	..
5	..	..	..	..	..	·01	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·08	·09	·10	·10	·10	·10	·13	·07	·07	·08	·07	·10	·13
9	·02	·02	·01	..	..	·03	·04	·02	·02	..	·01	..	·01
10	..	..	..	..	·01	·01	·02	..	..	..	..	..	..
11	..	..	..	..	..	..	·01	..	..	..	..	..	..
12	·04	·04	·04	·03	·03	·02	·05	·03	·02	..	..	·03	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	·01
15	·01	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·01	..	·01	·02	·01	·01	·03	..	·03	·05	..	·01	·01
20	·05	·03	·05	·04	·04	·06	·07	·05	·06	·09	·05	·08	·11
21	·07	·07	·08	·06	·05	·04	·06	..	·02	..	..	·02	·03
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	·01	·01	..	·01	..	·02	..	·02	·03	..	·01	·01
28	·02	..	..	..	·01	..	·03	..	·01	·01	·01	..	·01
29	·03	·03	·07	·05	..	·02	·03	..	·01	..	..	·05	·03
*	·33	·29	·37	·30	·27	·30	·51	·17	·26	·26	·14	·30	·35
†	·90	·90	·94	·76	·97	·97	1·38	·73	1·00	·83	·59	·98	1·07

Day of Mo.	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	·01	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·13	·11	·12	·12	·11	·13	·11	·10	·11	·09	·08	·11	·08
9	·02	·02	·03	..	..	·03	·01	·02	..	·01	·01	·02	..
10	..	·01	..	..	..	·01	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	·01	..
12	·03	·02	..	·05	·05	·04	·02	·01	·03	·02	·02	·02	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·01	·02	·01	..	..	..	..	..	·04	..	..	·02	..
20	·04	·05	·07	·04	·02	·03	·08	·03	·04	·02	·02	·02	·03
21	·10	·07	·10	·09	·01	·07	·07	·11	·08	·07	·06	·14	·07
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·01	·01	..	..	..	·01	·01	..	·01	..	..	·01	..
28	·01	·01	·01	·01	·02	·01	..	·01	·01	..	..	..	..
29	·02	·03	·06	·04	·11	·03	·05	·05	·05	·03	·04	·04	·04
*	·37	·35	·40	·35	·32	·37	·35	·33	·37	·24	·23	·39	·22
†	1·19	1·10	1·17	1·22	·92	1·17	1·00	·88	1·01	·80	·75	1·18	·76

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Kenley (The Cottage) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(March, 1896.)

The month has been warm and very wet. It is the wettest March since 1862, and in the Greenwich record commencing with 1816 there are only eight Marches wetter than March, 1896. There was a thunderstorm on the 3rd with lightning, hail, and snow, and lightning was also seen on the 22nd. Vegetation has progressed rapidly. A solar halo with two mock suns and supernumerary circles was seen at Upper Gatton on the 5th, and also one with one mock sun at the same place on the 10th ; and lunar halos were seen at Epsom on the 23rd and 27th. As might be expected, the month has been rather an unhealthy one, colds being very prevalent. The mean temperature of the month is about 4° above the March average, and was at Upper Gatton 47·7°, at Croydon (Duppas House) and Wallington 46·3°, at Croydon (Whitgift) and Waddon 46°, at Kenley (Ingleside) 45·5°, and at Chipstead 44·4°. There were recorded at Upper Gatton 62·2 hours of bright sunshine, and at Wallington 62·4 hours of sunlight, which latter is 16 per cent. below the March mean of the ten years 1886–95.

Mr. Mennell, of Croydon, kindly supplies the following botanical notes. On the 14th the almond, apricot, and lesser celandine (*Ranunculus Ficaria*) were in full bloom ; and on the 23rd there were in full bloom the wood anemone, the barren strawberry (*Potentilla Fragariastrum*), the dandelion, the coltsfoot, the tuberous moschatel (*Adoxa Moschatellina*), the dog mercury, the white and red dead-nettles, and the larch.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·06	·06	·07	·07	·05	·04	·06	·07	·06	·09	·07	·06
2	·25	·25	·33	·58	·30	·26	·30	·25	·31	·32	·31	·32	·33
3	·03	·10	·03	·03	·05	..	·01	·02	·07	·02	·03	·03	·03
4	·12	..	·10	·12	·07	·07	·04	·06	·08	·08	·09	·11	·12
5	..	..	..	·01	·01	·02	·01	·01	·02	·01	·02	·02	·02
6	..	..	..	·01	·01	·01	..	..	..	..	·01	·01	..
7	·43	·45	·40	·52	·47	·48	·46	·50	·46	·45	·49	·49	·43
8	·01	..	..	·01	·01	..	..	..	..	..	..	..	·01
9	·23	·26	·22	·29	·23	·23	·21	·28	·23	·23	·23	·23	·24
10	..	·06	..	·02	·02	·01	·09	·01	·02	·01	·01	·01	·01
11	·06	..	·05	·09	·07	·08	·13	·08	·07	·07	·09	·07	·08
12	..	..	..	·01	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	·01	..
14	..	..	·03	·04	·04	·03	·04	·01	·02	·01	·10	·04	·02
15	·12	·12	·12	·12	·05	·05	·08	·10	·05	·09	·07	·07	·07
16	..	·03	·02	·02	·06	·03	·10	·02	·03	·02	·02	·03	·01
17	·70	·79	·65	·86	·52	·89	·54	·66	·54	·69	·66	·71	·69
18	·20	·17	·23	·33	·38	·24	·26	·24	·29	·24	·26	·25	·25
19	·01	..	..	·01	·01	..	..	·01	·01	·01	·01	·02	·02
20	·94	1·07	·85	1·17	·68	·52	·68	·77	·62	·73	·60	·69	·74
21	·06	·07	·08	·09	·10	·07	·07	·07	·09	·07	·07	·10	·08
22	..	·06	..	·01	..	..	..	..	..	..	..	..	·05
23	·05	..	·08	·07	·05	·09	·05	·05	·05	·04	·09	·05	·07
24	..	..	..	·04	..	..	..	·03	..	·03	..	·02	·07
25	·08	·06	·07	·10	·14	·12	·11	·09	·10	·08	·12	·11	·14
26	·06	·10	·09	·13	·11	·12	·07	·08	·08	·09	·10	·12	·11
27	·10	..	·11	·11	..	·06	·09	·10	·10	·11	·02	·11	·04
28	·05	·14	·03	·05	·10	·04	·09	·01	..	·02	·12	·03	·12
29	·08	·09	·08	·13	·13	·08	·07	·10	·13	·11	·10	·12	..
30	·02	..	..	·01	..	..	..	..	·02	..	·01	·01	·02
31	·05	·09	·03	·03	·02	·02	·01	·02	..	·02	·03	·03	..
*	3·69	3·97	3·66	5·08	3·70	3·57	3·55	3·63	3·46	3·61	3·75	3·88	3·83
†	4·93	5·27	5·01	7·33	5·07	4·83	4·83	5·07	4·70	5·04	5·15	5·40	5·31

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·09	·08	..	MONTHLY GAUGE.	·13	·08	·08	·08	·07	·07	·03	·07
2	·33	·35	·25	·13		·28	·20	·15	·33	·35	·28	·39	·30
3	·03	..	·01	·24		·03	·02	·28	·07	·06	·09	·06	·07
4	·11	·17	·08	·02		·15	·13	·11	·12	·11	·14	·10	·11
5	·02	·03	..	·02		..	·03	·02	·02	..	·03	..	·01
6	·01	·02	..	·01		..	..	..	..	·01	·02	..	..
7	·48	·48	·27	·49		·51	·45	·48	·48	·47	·48	·43	·38
8	·14	..	..	..		..	·01	·01	·01	·01	..	..	..
9	·09	·23	·10	·23		·20	·19	·18	·19	·18	·19	·18	·17
10	..	..	·01	..		·01	..	..	·01	..	·02	..	..
11	·07	·09	·05	·02		·06	·06	·05	·06	·04	·05	·05	·05
12	..	..	..	..		..	..	..	..	..	..	..	..
13	·02	..	..	..		..	..	·01	..	..	..	·01	·01
14	·03	·08	..	..		·07	·08	·13	·09	·08	·04	·11	·15
15	·08	..	·09	·06		·05	·03	·05	·05	·05	·05	·05	·04
16	·02	..	·01	..		·05	·01	·02	·01	·02	·02	·07	·05
17	·85	·80	·49	·46		·69	·68	·68	·70	·71	·62	·45	·53
18	·22	·28	·27	·50		·38	·30	·34	·35	·33	·40	·33	·32
19	·02	·03	·01	..		·03	·02	..	·02	·01	·03	·02	·02
20	·68	·64	·39	·40		·53	·60	·66	·64	·64	·48	·39	·32
21	·02	·08	·07	·11		·15	·09	·09	·09	·08	·08	·03	·03
22	·01	..	..	..		..	..	..	..	..	..	..	..
23	·03	·10	·07	..		·08	·05	·05	·06	·05	..	·04	·03
24	..	·01	·02	·07		·03	·02	·04	·03	·02	..	·01	·02
25	·12	·10	·05	·03		·09	·06	·05	·05	·02	..	·01	·01
26	·13	·13	·08	·15		·16	·08	·13	·15	·12	·07	·06	·04
27	..	·11	..	..		·08	·07	·07	·11	..	·12	..	·10
28	·19	·14	·09	·30		·18	·12	·17	·16	·22	·13	·15	·03
29	·09	·08	·07	·03		·06	·08	·07	·08	·07	·08	·04	·06
30	..	·01	..	..		..	..	·01	..	..	..	·02	..
31	·05	·03	·02	..		·05	·03	·03	·04	·02	·06	·02	·02
*	3·89	4·08	2·58	3·27	3·88	4·05	3·49	3·96	4·00	3·74	3·55	3·05	2·94
†	5·37	5·75	3·73	4·92	5·71	5·63	4·45	5·20	5·26	4·99	4·76	4·05	3·81

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·09	·07	·08	·08	·08	·09	..	·07	·08	·09	·09
2	·31	·33	·33	·34	·33	·32	·30	·32	·27	·35	·37
3	·08	·04	·04	·04	·05	·05	·05	·04	·05	·05	·06
4	·11	·16	·18	·19	·18	·29	·17	·17	·29	·20	·18
5	·02	·01	..	·01	·01	..	·01	·01	..	..	·01
6	..	..	..	..	·01	..	..	..	..	..	..
7	·48	·46	·46	·47	·44	·45	·44	·42	·45	·46	·47
8	..	..	..	..	..	..	..	..	..	..	..
9	·21	·18	·21	·22	·21	·25	·23	·22	·24	·30	·25
10	..	..	..	..	..	..	..	..	..	..	..
11	·07	·05	·03	·03	·04	..	·03	·02	·02	·03	·02
12	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..
14	·05	·02	·02	·01	·02	·05	·02	·01	·03	·03	·02
15	·06	·04	·03	·03	·02	·03	·02	·02	·02	·02	·03
16	..	·06	·04	·06	·04	..	·05	·03	..	·05	·04
17	·68	·60	·56	·60	·56	·65	·64	·57	·58	·61	·59
18	·33	·36	·38	·36	·36	·28	·34	·34	·35	·36	·37
19	·02	·02	·01	·02	·02	..	·02	·01	·01	·02	·01
20	·65	·38	·33	·33	·32	·28	·32	·31	·26	·31	·31
21	·05	·03	·02	·03	·03	·03	·02	·04	·03	·05	·05
22	..	..	..	..	..	..	..	..	..	..	..
23	·04	·04	·03	·02	·02	·02	..	·02	..	·03	·10
24	·06	·02	·02	·03	·04	·04	·05	·03	·02	·06	·02
25	·03	·01	·01	·01	·02	..	·02	·01	·01	·02	·01
26	·10	·09	·09	·10	·09	·11	·09	·09	·08	·11	·10
27	·10	·10	·08	·08	·09	..	·06	·06	·07	·05	·08
28	·08	·14	·13	·17	·14	·20	·10	·12	·17	·16	·15
29	·09	·06	·08	·07	·07	·08	..	·06	·07	·08	·05
30	..	..	..	..	..	..	..	..	..	..	..
31	·02	·02	·02	·03	·03	·03	·11	·02	·03	·02	·02
*	3·73	3·29	3·18	3·33	3·22	3·25	3·09	3·01	3·13	3·46	3·40
†	4·96	4·29	4·00	4·23	4·15	4·10	3·98	3·93	3·96	4·44	4·41

Day of Mo.	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms.F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Wilmington	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·09	·09	·09	·09	·08	·07	·09	·07	·08	·07	·05	·06	·10	·08	·08
2	·31	·38	·36	·38	·42	·31	·39	·27	·40	·39	·35	·31	·34	·33	·28
3	·04	·08	·19	·10	·10	·06	·07	·05	·08	·06	·11	·05	·08	·04	·04
4	·19	·16	·18	·17	·18	·28	·18	·16	·15	·20	·20	·13	·15	·14	·15
5	·01	·01	..	..	..	..	·02	·01	..	..	..	·01	..	..	..
6	..	..	·02	..	..	..	·02	..	·02	·02	·06	·02	·04	·02	·02
7	·45	·47	·47	·48	·52	·42	·45	·38	·47	·45	·41	·40	·51	·47	·47
8	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..
9	·24	·24	·27	·21	·27	·21	·25	·21	·39	·23	·21	·21	·28	·25	·25
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·02	·03	·02	·02	·02	·02	·03	·03	·03	·02	·06	·03	·10	·04	·05
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·03	·02	·02	·01	·01	·02	·03	·02	·03	·06	·07	..	·12	·05	·05
15	·02	·03	·01	·04	·02	·02	·03	·02	·02	·02	·01	·04	·02	·01	·01
16	·04	..	·02	·01	..	..	..	·01	·01	..	..	·01	·04	·04	·06
17	·55	·60	·42	·58	·58	·53	·51	·38	·49	·54	·30	·43	·48	·54	·54
18	·34	·38	·56	·36	·43	·44	·41	·50	·45	·50	·71	·52	·46	·45	·41
19	·01	·01	..	·01	..	..	..	·01	·01	·01	..	·01	..	..	..
20	·29	·38	·40	·50	·40	·40	·33	·34	·40	·35	·32	·18	·27	·25	·25
21	·04	·06	·07	·05	·04	·07	·05	·05	·06	·06	·06	·01	·03	·02	·04
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·02	·06	·08	·07	·10	·07	·07	·07	·07	·10	·07	·11	·07	·05	·05
24	·06	·03	·06	·05	·06	·07	·07	·05	·06	·12	·04	·08	·10	·03	·06
25	·01	·02	·04	·05	·04	..	·03	·04	·05	·03	·05	·01	·02	·02	..
26	·09	·11	·14	·14	·11	·12	·11	·10	·14	·11	·07	·09	·11	·08	·10
27	·07	·10	..	·07	·03	..	·07	·01	·09	..	..	·08	·07	·03	..
28	·15	·15	·28	·17	·21	·22	·14	·22	·16	·27	·19	·17	·23	·24	·26
29	·06	·04	·03	·05	·02	..	·02	·02	·02	..	·03	·01	..	..	·01
30	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..
31	·02	·04	·03	·03	·02	·02	·03	·04	·03	·02	·02	·01	·05	·02	..
*	3·15	3·49	3·77	3·64	3·66	3·35	3·40	3·06	3·71	3·66	3·39	2·98	3·67	3·20	3·18
†	4·06	4·59	4·88	4·66	4·56	4·33	4·49	3·93	4·83	4·48	4·15	3·68	4·80	4·13	4·14

* The figures in this row give the totals for the month.   † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·07	·05	·03	·08	·07	·08	·05	·06	·05	·04	·02	·04
2	·32	·26	·07	·24	·30	·28	·32	·32	·45	·31	·41	·46	·27
3	·05	·04	·04	..	·03	·06	·08	·03	·05	·07	·05	·08	·06
4	·15	·20	·19	·20	·17	·19	·22	·19	·15	·18	·11	·21	·18
5	·02	·01	..	..	..	..	·02	..	·02	·01	..	·01	·01
6	·01	·02	..	..	·02	..	·01	..	..	..	..	..	·02
7	·42	·45	·46	·43	·45	·47	·50	·44	·44	·40	·30	·46	·40
8	·01	·01	·01	..	·01	..	·02	..	·01	..	..	..	..
9	·22	·24	·23	·20	·22	·24	·25	·22	·14	·14	·10	·22	·23
10	..	..	·03	..	..	..	..	..	·01	..	..	..	..
11	·04	·04	..	..	..	·02	·04	·02	·05	·04	·02	·01	·03
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	·03	..	..	..	..	..	·01
14	·05	·07	·04	..	..	·02	·05	·07	·01	..	·04	..	·02
15	·02	·01	·02	·07	·04	·02	·04	·02	·04	·05	·02	·03	·03
16	·01	·04	·05	·03	..	·01	·05	·02	·03	·05	..	·01	·02
17	·46	·58	·56	·52	·48	·45	·52	·56	·58	·64	·49	·63	·62
18	·45	·38	·36	·36	·31	·41	·40	·42	·28	·34	·19	·38	·31
19	·02	·01	..	·02	·01	..	·03	·02	·01	·01	·01	·01	·02
20	·25	·21	·21	·23	·29	·33	·37	·36	·36	·40	·27	·40	·37
21	·04	·03	·03	..	·04	·03	·06	·02	·03	·02	·02	·03	·04
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·06	·03	·04	..	·03	·03	·05	·03	·06	·06	·01	·03	·09
24	·06	·07	·08	..	..	..	..	..	..	..	·03	..	..
25	·04	·01	·01	·05	..	..	·02	..	·02	..	..	·01	·01
26	·09	·08	·07	·07	·07	·08	·10	·06	·07	·06	·09	·08	·06
27	·06	·06	..	..	·07	·02	·05	..	·12	·12	·13	·15	·14
28	·19	·21	·24	·17	·15	·18	·13	·14	·06	·10	·08	·04	·11
29	·04	·03	·06	·10	·02	·04	·06	·03	·02	·02	·03	·02	·02
30	..	..	..	..	·01	..	..	..	·02	..	..	..	·01
31	·03	·03	..	..	..	·01	·03	·02	·02	·02	..	·01	·01
*	3·18	3·19	2·85	2·72	2·80	2·96	3·53	3·04	3·11	3·09	2·44	3·30	3·13
†	4·08	4·09	3·79	3·48	3·77	3·93	4·91	3·77	4·11	3·92	3·03	4·28	4·20

Day of Mo.	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S. & V. W. C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·08	·09	·09	·09	..	·08	·08	·06	·06	·06	..	·08	·03
2	·43	·28	·23	·17	·28	·20	·20	·22	·25	·24	·21	·35	·30
3	·07	·05	·03	·04	·05	·03	·02	·04	·05	·04	·03	·07	·03
4	·22	·19	·20	·17	·19	·18	·19	·21	·18	·18	·15	·18	·11
5	·01	·01	..	..	..	·01	·02	..	·01	..	..	·01	..
6	·01	·01	·02	·11	·04	·08	·03	..	·01	·02	..	·06	·01
7	·44	·44	·54	·40	·50	·48	·46	·45	·46	·42	·41	·47	·37
8	..	..	..	..	..	·01	..	..	..	..	..	·01	..
9	·26	·22	·24	·27	·29	·28	·23	·22	·23	·20	·20	·25	·20
10	·01	..	..	..	·03	·01	..	..	·01	..	..	..	..
11	·03	·03	·04	·06	..	·05	·08	·06	·09	·08	·05	·05	·02
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·02	·01	..	·04	·08	·04	·03	·05	·03	·01	·05	·05	·04
15	·02	·02	·02	·02	..	·02	·02	·02	·01	·01	..	·02	..
16	·03	·01	·02	·03	..	·02	·04	·01	·01	·01	..	·03	·03
17	·50	·50	·58	·53	·55	·55	·51	·50	·54	·52	·51	·44	·45
18	·36	·32	·32	·36	·45	·36	·40	·35	·36	·35	·30	·41	·31
19	·01	·02	·02	·02	·02	·02	·01	..	·01	·01	·01	·01	..
20	·31	·20	·25	·21	·06	·22	·17	·17	·22	·20	·19	·30	·26
21	·04	·03	·03	·03	·14	·03	·03	·04	·02	·02	·01	·03	·03
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·03	·03	·02	..	..	·02	·06	·05	·01	·01	·01	·02	·01
24	..	·07	·04	·05	..	·03	·07	·05	·06	·04	..	..	..
25	..	·01	..	..	·07	..	·01	..	..	..	..	..	..
26	·08	·08	·09	·10	·03	·09	·09	·10	·09	·08	·08	·08	·05
27	·07	·09	·07	·02	..	·06	·04	·03	·05	·06	·04	..	·05
28	·14	·09	·14	·20	·30	·16	·23	·24	·21	·17	·14	·18	·12
29	·04	·04	·06	·04	..	·04	..	·01	·01	·01	·02	·05	·02
30	·01	·01	..	..	..	..	..	..	..	..	..	..	..
31	·01	·02	·02	·03	..	·03	·01	·01	·01	·01	·01	·01	..
*	3·23	2·87	3·07	2·99	3·08	3·10	3·03	2·89	2·99	2·75	2·42	3·16	2·44
†	4·42	3·97	4·24	4·21	4·00	4·27	4·03	3·77	4·00	3·55	3·17	4·34	3·20

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(April, 1896.)

The month has been fairly warm, with sunshine below the average. It is the third month of the present year in which, over a great part of the district, the rainfall has been below 1·00 in. There has been much sickness about, including cases of measles and influenza. Solar halos were seen at Croydon on the 11th and 17th, and at Upper Gatton on seven days; and a lunar halo occurred at Croydon on the 17th, and at Upper Gatton on the 21st. It was remarkably dark at Warlingham and Nutfield between 2 p.m. and 3 p.m. on the 5th. Vegetation has progressed rapidly, but the want of rain is much felt. The mean temperature of the month is about 1·5° above the average, and was at Wallington 48·9°, at Croydon (Duppas House) 48·8°, at Chipstead and Croydon (Whitgift) 48·6°, at Kenley (Ingleside) and Waddon 47·9°, and at Upper Gatton 47·1°. There were recorded at Upper Gatton 115·3 hours of bright sunshine, and at Wallington 124·1 hours of sunlight, which latter is 14 per cent. below the April mean of the ten years 1886–95.

Mr. Mennell, of Croydon, and other correspondents, kindly supply the following notes:—The purple and white lilacs were in bloom at Croydon on the 25th, and the hawthorn and horse chestnut on the 29th, and the oak has put out its leaves and flowers, but not the ash, during the last days of the month. A sand martin was seen at Croydon on the 12th; the cuckoo was heard at Upper Gatton on the 14th, at Warlingham on the 15th, and at Nutfield on the 17th; and the nightingale at Croydon on the 19th, and at Upper Gatton on the 23rd; the swallow was seen at Nutfield on the 18th, at Croydon on the 19th, and at Upper Gatton on the 24th. Hail fell at Addington Hills and Ashtead on the 29th, and lightning was seen at Abinger and Redhill on the 30th.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	·05	·03	·05	..	·03	·03	·03	..	·02	·03	·01	·01	·02	·03	·04	·11		·04	·02	..	·02	·01	..	·03	·02
2	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
3	..	..	..	·01	..	..	..	..	..	..	..	..	..	·07	..	..	..		..	..	..	..	..	..	..	..
4	·18	·20	·23	·40	·30	·35	·33	·35	·33	·33	·39	·33	·30	·33	·40	·27	·12		·35	·32	·29	·34	·31	·30	·15	·14
5	·01	..	..	·04	·01	..	·11	·02	·01	·02	·03	·02	·02	·02	·03	·01	·27		·04	·02	·01	..	·02	·08	..	..
6	..	..	..	·01	..	·02	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·02	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
10	·05	·02	·09	·09	..	·03	·08	·09	·02	·10	·12	·13	·18	·52	·16	·10	·06		·14	·10	·12	·14	·10	..	·09	·10
11	·04	·05	..	·03	·11	·07	..	·02	·04	·01	·02	·02	·02	..	·03	..	·12		·01	·03	..	·02	·04	·15	·01	..
12	·09	·08	..	·07	·09	·10	·10	·05	·10	·08	·08	·05	·06	·08	·08	..	·09		·06	·09	·03	·04	·02	·06	·04	·08
13	·13	·11	·10	·12	·09	·10	·11	·13	·11	·10	·03	·10	·11	·12	·09	·13	..		·11	·08	·10	·09	·09	·11	·16	·11
14	·08	·07	·07	·17	·15	·09	·14	·10	·10	·09	·14	·07	·07	·05	·07	·04	·04		·04	·05	·06	·09	·08	·10	·11	·15
15	·02	·03	..	·01	..	..	..	·11	·01	·01	..	·01	..	·01	..	..	..	MONTHLY GAUGE.	..	..	..	·01	..	·03	..	..
16	·10	·09	·10	·10	·08	·08	·10	·09	·09	·08	·11	·08	·10	·09	·10	·07	·17		·10	·06	·06	·07	·06	·07	·03	·05
17	·03	..	..	·01	..	..	..	..	·01	..	..	·01	·01	..	..	..	..		..	..	..	..	..	·03	·02	..
18	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	·01	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
28	..	..	..	..	·02	·02	..	..	·01	..	..	..	..	..	..	..	·08		..	..	..	..	..	·03	..	..
29	..	..	..	·01	..	..	..	..	·01	·03	·02	·01	·01	·01	·02	..	·03		..	..	·03	·03	·04	..	·05	·05
30	..	..	..	·03	·01	..	..	..	..	..	..	..	..	..	..	·01	..		..	..	..	..	·01	..	..	..
*	·75	·73	·62	1·16	·88	·90	1·00	·99	·84	·87	·97	·84	·89	1·32	1·01	·67	1·09	·80	·89	·77	·70	·88	·78	·96	·69	·70
†	5·68	6·00	5·63	8·49	5·95	5·73	5·83	6·06	5·54	5·91	6·12	6·24	6·20	6·69	6·76	4·40	6·01	6·51	6·52	5·22	5·90	6·14	5·77	5·72	4·74	4·51

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad.Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms.F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Wilmington	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	..	..	..	..	..	..	·01	..	·01	·02	·01	·03	..	..	·03	·07	·04	·10	·10	·07	·04	·02	·05	·02	·06
2	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·27	·20	·21	·23	·25	·24	·26	·23	·24	·26	·25	·24	·25	·27	·26	·38	·30	·27	·29	·30	·23	·21	·15	·20	·24	·24
5	·02	·01	·01	·01	·01	·02	·01	..	..	·01	·02	·01	·03	·03	·06	·02	·03	·02	·04	·04	·02	·02	·01	·08	·02	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
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9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·12	·15	·19	·12	·13	·12	·12	·10	·13	·07	·10	·13	·13	·09	·17	·13	·07	·15	..	·12	·06	·19	·12	·20	·18	..
11	·02	·02	·03	·03	·04	·10	·06	·07	·07	·13	·10	·10	·08	·21	·09	·08	·13	·11	·10	·08	·12	·02	·01	·09	·08	·26
12	·04	·04	·04	·03	..	·04	·03	·03	·05	·05	·06	·06	·06	·04	·04	·04	·01	·07	·04	·07	·02	·06	·07	·03	·04	·06
13	·13	·10	·09	·08	·12	·09	·10	·07	·08	·09	·09	·08	·09	·05	·10	·06	·04	·06	·05	·06	·03	·01	..	·05	·04	..
14	·07	·08	·08	·09	·08	·09	·06	·07	·08	·06	·06	·07	·07	·09	·06	·06	·09	·07	·07	·07	·06	·06	·05	·08	·05	·12
15	..	·01	..	..	·01	..	·01	..	..	·02	·01	·01	·01	..	·01	..	..	·01	..	·01	..	..	·01	·01	..	..
16	·07	·06	·05	·06	·06	·07	·05	·05	..	·06	·06	·06	·06	·06	·05	·06	·06	·07	·05	·06	·05	·05	..	·05	·05	·06
17	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
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25	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..
29	..	·01	·01	·01	..	·03	·02	·01	·04	·02	·03	·04	·02	·02	·01	·02	..	·03	..	·02	..	..	·02	·09	·03	·05
30	..	..	..	..	..	..	..	..	..	·02	·03	·03	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·76	·68	·71	·66	·71	·80	·72	·64	·69	·80	·83	·84	·86	·87	·85	·88	·80	·91	·76	·93	·67	·67	·48	·93	·75	·85
†	5·72	4·97	4·71	4·89	4·86	4·90	4·70	4·57	4·65	5·24	5·24	4·90	5·45	5·75	5·51	5·44	5·13	5·40	4·69	5·76	5·15	4·82	4·16	5·73	4·88	4·99

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	·01	·03	·02	..	..	..	·02	·03	·02	·01	..	·02	..	..	..	..	..	·01	·03	GAUGE DESTROYED.	·01	·01	..	·02	..
2	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	·01	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
4	·25	·18	·22	·21	·12	·13	·14	·10	·07	·06	·08	·09	·07	·13	·14	·19	·17	·14	·16	·18		·14	·12	·11	·12	·09
5	·03	·02	·02	..	·01	·01	·03	..	·01	..	..	..	·01	·01	·03	·01	·02	..	·01	·02		·01	·01	..	·02	·01
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
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10	·12	·12	·12	·14	·09	·11	·15	·23	·13	·17	·13	·17	·15	·14	·14	·14	·15	·10	·16	·23		·12	·13	·09	·05	·09
11	·11	·17	·07	·09	·05	·02	·04	·01	·02	·03	·01	·01	·01	·07	·05	·10	·10	·04	·08	·02		·02	·02	·01	·09	·04
12	·04	·04	..	..	·07	·03	·06	·02	·04	·06	·03	·03	·06	·07	·04	·06	·07	·05	·07	·06		·09	·06	·04	·06	·04
13	·05	·07	·12	·11	·08	·09	·12	·11	·09	·10	·08	·13	·11	·08	·09	·08	·09	·15	·06	·03		·04	·04	·07	·06	·07
14	·06	·07	·07	·07	·10	·11	·13	·10	·10	·12	·08	·10	·13	·13	·10	·06	·06	·09	·05	·06		·06	·06	·05	·10	·05
15	..	·01	..	..	·01	..	·02	..	·01	..	..	..	·02	·02	·02	..	·02	·03	·02	·01		·01	..	·01	..	..
16	·06	·06	·06	·05	·07	·06	·07	·04	·04	·05	·03	·06	·07	·07	·05	·06	·07	·11	·06	·03		·04	·04	·03	·05	·03
17	..	..	..	..	..	..	·03	..	..	..	..	..	·01	·01	·01	..	..	..	..	..		..	..	..	·01	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
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28	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	·01	..	·02	·01		..	..	·01	..	..
29	·02	·07	·02	·02	·06	·06	·07	·02	·10	·03	·03	·02	·03	·01	·05	·05	·05	..	·03	..		·01	..	..	·02	..
30	..	..	·02	·02	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..		..	..	..	..	..
*	·80	·82	·78	·73	·67	·62	·86	·65	·64	·64	·48	·61	·70	·75	·74	·76	·81	·71	·73	·68		·55	·49	·42	·62	·42
†	4·88	4·91	4·57	4·21	4·44	4·55	5·77	4·42	4·75	4·56	3·51	4·89	4·90	5·17	4·71	5·00	5·02	4·71	5·00	4·71		4·55	4·04	3·59	4·96	3·62

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(May, 1896.)

The month has probably been the driest May of the present century. Since the commencement of the Greenwich record in 1814, there has been no such dry May. It is also the fourth month of the present year in which, with but few exceptions, the rainfall has been below one inch. The want of rain is becoming a very serious matter, and has resulted in the practical failure of the hay crop, and in a plague of caterpillars in many parts of the district. Evaporation has been extremely active, no less than 3·22 in. having evaporated at Duppas House, Croydon. Solar halos were seen at Upper Gatton on the 5th, 24th, and 29th, and a lunar halo also on the 24th. Thunder was heard at most stations throughout the district on the 20th. The mean temperature of the month is about 1° above the average, and was at Chipstead 54·8°, at Croydon (Duppas House) 54·3°, at Wallington 53·8°, at Croydon (Whitgift) 53·7°, at Waddon 53·3°, and at Upper Gatton 52°. There were recorded at Upper Gatton 208·4 hours of bright sunshine, and at Wallington 199·6 hours of sunlight, which latter is 1 per cent. below the May mean of the ten years 1886–95.

The following notes have been supplied by observers:—The swift was first seen at Croydon on the 9th; and at Warlingham the lilac bloomed on the 11th, the chestnut on the 13th, and the laburnum on the 20th.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Day of M.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..	..	..
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21	·24	..	·19	·18	·11	·15	·14	·15	·10	·15	·14	·14	·15	·14	·03	·12	·07		·12	·14	·13	·14	·13	·16	·16	·16
22	·11	..	·06	·08	·06	·03	·04	·03	·05	·02	·02	·01	·01	·01	·04	·04	·16		·06	..	·01	·03	·02	·03	·03	·03
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31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
*	·38	..	·25	·34	·26	·25	·27	·26	·25	·26	·17	·19	·21	·17	·09	·17	·28	·21	·22	·14	·16	·21	·17	·19	·31	·34
†	6·06	6·00	5·88	8·83	6·21	5·98	6·10	6·32	5·79	6·17	6·29	6·43	6·41	6·86	6·85	4·57	6·29	6·72	6·74	5·36	6·06	6·35	5·94	5·91	5·05	4·85

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
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16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	·02	..	..	..	..	..	..	..	·01	..	..	..	..	·04	·01	·01	..	..	..	..	..	..
20	·06	·01	·02	..	·02	..	·01	·01	..	·01	·03	·03	·04	·07	·05	..	·03	..	·02	·05	·03	·02	·04	·10	·06	·04
21	·13	·13	·13	·13	·13	·12	·12	·12	·13	·14	·13	·13	·13	·14	·13	·15	·12	·12	·12	·13	·13	·13	·13	·17	·13	·13
22	..	·02	..	·01	·02	·02	·02	·01	·03	·04	·03	·03	·04	·05	·04	·03	·03	·03	..	·02	·04	·03	·03	·05	·03	..
23	..	..	..	..	..	..	..	..	..	..	..	..	·01	·03	·02	·03	·03	·04	·02	·05	·07	·04	·02	·09	·05	·07
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·19	·16	·15	·14	·19	·14	·15	·14	·16	·19	·19	·19	·24	·29	·24	·21	·21	·23	·17	·26	·27	·25	·22	·41	·27	·24
†	5·91	5·13	4·86	5·03	5·05	5·04	4·85	4·71	4·81	5·43	5·43	5·09	5·69	6·04	5·75	5·65	5·34	5·63	4·86	6·02	5·42	5·07	4·38	6·14	5·15	5·23

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	GAUGE DESTROYED.	·01	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
18	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
19	·01	..	·01	..	·02	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..		·01	..	..	..	..
20	·02	·12	·04	..	·01	·01	·02	·02	·11	·15	·12	·06	·02	·01	·05	·05	..	..	..	·04		·05	·03	·02	·01	..
21	·17	·05	·13	·13	·13	·14	·15	·13	·16	·17	·12	·15	·15	·13	·14	·13	·13	·07	·13	·13		·13	·11	·11	·12	·11
22	·02	..	·03	·02	·01	·02	·03	·02	·03	·01	·02	·02	·02	·01	·03	·03	·04	·08	·03	·06		·04	·01	·02	·03	·01
23	·06	·02	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	·07		·03	·01	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
*	·28	·21	·23	·15	·17	·17	·21	·17	·30	·33	·26	·23	·19	·15	·23	·22	·17	·15	·17	·30		·27	·16	·15	·16	·12
†	5·16	5·12	4·80	4·36	4·61	4·72	5·98	4·59	5·05	4·89	3·77	5·12	5·09	5·32	4·94	5·22	5·19	4·86	5·17	5·01		4·82	4·20	3·74	5·12	3·74

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(June, 1896.)

The month has been rather wet, but the air has been dry and warm. Taking the Greenwich rainfall average as a standard, the rainfall of the district would seem to be an average one for June. The totals, however, for the six months are very remarkable. One would hardly credit the fact, but for these daily returns, that in the short distance of about twenty-five miles due south the rainfall at Walton Heath should be 12·41 in., which is just about two and a half times as much as Battersea, which is only 5·10 in. Thunderstorms occurred on the 4th and 24th in most parts of the district, and that on the 24th gave rise to some damage, a cottage in Linkfield Lane, Redhill, being struck by lightning, and a tree, the Californian redwood (*Sequoia sempervirens*), being struck at Nutfield Priory. Colds, sore throats, whooping cough, and measles have been somewhat prevalent. Hay began to be cut generally at the beginning of the month. At Warlingham on the 16th a grass thermometer burst when exposed to the sun, though it registered up to 130°. Solar halos were seen at Upper Gatton on the 4th, 8th, 12th, and 13th, and lunar ones on the 14th and 16th. The temperature of the month is about 3° above the average, and was at Chipstead 64·9°, at Waddon 64·2°, at Croydon (Duppas House) 63·3°, at Kenley (Ingleside) 62·8°, at Croydon (Whitgift) 62·5°, at Wallington 62·4°, and at Upper Gatton 59·9°. There were recorded at Upper Gatton 194·4 hours of bright sunshine, and at Wallington 211·4 hours of sunlight, which latter is 1 per cent. above the June average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* **June, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	·02	·02	·02	..	·01	·02	·01	·02	·02	·02
3	·08	..	..	..	..	..	..	..	..	..	·01	·02	..
4	·08	·41	·10	·11	·07	·11	·09	·06	·07	·07	·11	·08	·06
5	..	..	·03	·01	·01	..	·02	·02	..	..	..	·01	·01
6	·12	..	·08	·28	·06	·10	·13	·07	·05	·04	·05	·11	·13
7	·24	·50	·30	·31	·26	·28	·22	·35	·31	·28	·38	·30	·27
8	..	·02	..	..	..	..	..	..	..	·01	·02	·01	·02
9	·43	·46	·45	·71	·45	·45	·56	·69	·60	·53	·54	·50	·48
10	1·55	1·46	1·07	1·17	1·04	1·00	1·14	1·10	1·04	1·05	1·11	·99	·96
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·13	·23	·20	·15	·19	·16	·23	·17	·15	·17	·15	·17	·14
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·13	·16	·02	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·83	·93	·70	·78	·46	·90	·38	·40	·25	·34	·26	·40	·84
25	·08	·05	·06	·02	..	·03	·02	·01	..	·01	·02	..	·01
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	·01	..	..	..	..
28	..	..	..	·02	..	..	..	..	..	·04	·03	·05	·10
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·02	..	..	..	·02	·03	·02	·01	·02	·02	·03	·02	·04
*	3·69	4·22	3·01	3·58	2·58	3·08	2·81	2·89	2·52	2·57	2·73	2·68	3·08
†	9·75	10·22	8·89	12·41	8·79	9·06	8·91	9·21	8·31	8·74	9·02	9·11	9·49

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..		..	..	..	..	..	..	..	..
2	..	·01	·01	..		·01	·02	·02	·02	·02	..	..	·02
3	·08	·02	..	..		·02	..	..	..	..	..	·02	..
4	·10	·04	·10	·33		·11	·07	·09	·08	·08	·10	·12	·17
5	..	..	..	..		..	..	..	·01	..	..	·03	·03
6	·24	·08	·08	·15		·08	·08	·08	·09	·10	·08	·07	·07
7	·20	·22	·20	·55		·24	·21	·21	·18	·18	·19	·23	·18
8	·02	·02	·02	..		·02	·02	..	·01	·02	·02	..	..
9	·60	·57	·52	·52		·68	·54	·47	·49	·46	·48	·35	·31
10	1·02	1·02	·54	1·51		1·05	·98	·90	1·03	·96	1·02	·64	·68
11	..	..	..	..		..	..	..	·02	..	..	..	..
12	..	..	..	..		..	..	..	..	..	..	..	..
13	..	..	..	..		..	..	..	..	..	..	..	..
14	..	..	..	..		..	..	..	..	..	..	..	..
15	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
16	..	..	..	..		..	..	..	..	..	..	..	..
17	·17	·20	·05	·10		·13	·11	·09	·09	·10	·09	·07	·07
18	..	..	..	..		..	..	..	..	..	..	..	..
19	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..	..		..	..	..	·02	..	..	..	..
22	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..		..	..	..	..	..	..	..	..
24	·37	·42	·74	2·20		·93	·77	·66	·70	·70	·56	·47	·57
25	..	·02	..	..		..	..	..	..	..	..	·17	·08
26	..	..	..	..		..	..	..	..	..	..	..	..
27	..	..	..	..		..	..	..	..	..	..	..	..
28	·14	·01	..	..		..	..	·01	..	..	·03	·05	·04
29	..	..	..	..		..	..	..	..	..	..	..	..
30	·04	·03	·08	·03		·09	·12	·09	·10	·10	·06	·08	·07
*	2·98	2·66	2·34	5·39	4·56	3·36	2·92	2·62	2·84	2·72	2·63	2·30	2·29
†	9·84	9·51	6·91	11·68	11·28	10·10	8·28	8·68	9·19	8·66	8·54	7·35	7·14

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·02	·01	·03	·02	·03	..	·02	·02	·01	·02	·01	..	·01	..	·01	..	..	·01	..	..	..	·01	..	·01	..	..
3	..	..	·04	·11	·09	·13	·08	·10	·03	·24	·24	·08	..	·01	·01	..	·02	·01	·01	·02	·04	·05	·02	·07	..	..
4	·09	·05	·19	·07	·06	·06	·05	·05	·06	·08	·11	·12	·07	·09	·10	·11	·15	·14	·18	·19	·21	·19	·20	·21	·20	·17
5	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·10	·06	·07	·04	·04	·04	·04	·03	·03	·02	·04	·04	·07	·04	·06	·03	·05	·05	·05	·05	·03	·03	·03	·06	·03	·03
7	·41	·31	·34	·25	·18	·22	·22	·21	·20	·24	·19	·18	·20	·26	·23	·32	·32	·30	·37	·39	·63	·35	·27	·42	·29	·29
8	·02	·01	·01	..	·01	..	..	..	·01	..	·01	·01	·01	..	..	..	..	·01	·02	·01	·01	..	..	..	..	..
9	·48	·39	·41	·41	·42	·42	·45	·41	·44	·46	·43	·40	·59	·49	·52	·56	·50	·50	·54	·60	·57	·65	·58	·60	·55	·55
10	·96	·82	·76	·80	·86	·82	·78	·82	·78	·84	·83	·78	·95	1·17	1·08	1·40	1·21	1·23	1·34	1·43	1·35	1·76	1·58	1·33	1·35	1·15
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·10	·06	·05	·05	·04	·04	·05	·05	·04	·06	·06	·06	·06	·10	·10	·08	·07	·07	·05	·05	·02	·03	·01	·05	·05	·05
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·03	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	·01	·01	·01	·01	·01	·01	·02	·03	..	..	..	..	..	..	·02	..	·01	·01	·01	..	·01	..	..
24	·80	·21	·18	·17	·32	·25	·38	·38	·24	·37	·22	·21	1·08	2·30	1·42	1·63	1·25	·92	·87	·67	·85	·73	·77	·62	·54	·65
25	·04	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·01	·01	·02	·34	·30	·13	·16	·13	·05	·07	·03	·02	·05	·01	·06	..	..	..	..	..	·03	·04	·03	·02	·01	·06
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
30	·12	·10	·09	·09	·08	..	..	·08	·05	·04	·06	·06	·10	..	·08	·09	·07	·05	·07	·05	·05	·03	·02	·04	·02	·04
*	3·15	2·08	2·20	2·36	2·44	2·12	2·24	2·29	1·95	2·46	2·26	1·97	3·19	4·47	3·67	4·22	3·64	3·31	3·50	3·48	3·80	3·88	3·51	3·44	3·04	2·99
†	9·06	7·21	7·06	7·39	7·49	7·16	7·09	7·00	6·76	7·89	7·69	7·06	8·88	10·51	9·42	9·87	8·98	8·94	8·36	9·50	9·22	8·95	7·89	9·58	8·19	8·22

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
2	..	·01	..	..	·03	·01	·03	..	·02	..	..	·02	·02	·01	·01	·01	..	..	..	..		..	..	..	..	..
3	·02	·03	·10	·07	..	..	..	·02	·03	·02	..	..	·01	..	·01	·03	..	..	·01	..		·01	..	·01	·01	·01
4	·20	·10	·10	·05	·09	·05	·07	·08	·14	·18	·50	·12	·10	·09	·10	·17	·11	·14	·10	·18		·17	·10	·10	·15	·10
5	..	·03	..	..	·01	·01	·03	..	·02	·06	·06	·04	·04	..	·01	..	..	..	..	..		..	..	..	..	..
6	·04	·04	·01	·02	·06	·09	·10	·06	·07	·08	·13	·19	·05	·12	·03	·04	·05	·05	·04	·01		·04	·02	·03	..	·03
7	·29	·20	·24	·20	·34	·23	·32	·18	·21	·34	·19	·15	·22	·24	·25	·18	·17	·06	·17	·26		·27	·19	·17	·28	·22
8	·02	·01	..	·01	..	..	·02	·02	·02	·02	·01	·01	·02	..	·01	..	..	..	..	..		..	..	..	..	..
9	·49	·45	·43	·35	·29	·30	·31	·31	·22	·20	·26	·27	·31	·32	·40	·49	·42	·38	·37	·45		·36	·34	·31	·31	·21
10	1·22	·92	·78	·80	·52	·63	·62	·80	·44	·50	·52	·54	·47	·52	·55	·69	·85	1·21	·88	1·09		·81	·93	·76	·53	·43
11	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	GAUGE DESTROYED.	..	..	..	..	..
17	·03	·03	·05	·03	·04	·07	·08	·09	·05	·06	·05	·06	·08	·05	·03	·05	·07	·02	·05	·04		·04	·01	·04	·06	·04
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
23	..	·01	..	..	·02	·04	·05	..	..	·03	·01	·03	·05	·04	·10	·03	·03	..	·02	..		·04	·03	·03	·04	·04
24	·96	·20	·15	·20	·15	·22	·31	·35	·63	·54	·43	·28	·21	·16	·15	·18	·15	·18	·24	·35		·14	·09	·13	·13	·19
25	..	..	..	..	..	·01	·03	·09	·05	·14	·13	·19	·20	..	..	..	..	..	..	..		..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
28	·10	·03	·05	·05	·04	..	·02	·05	..	..	·01	·10	..	·07	·06	·07	·02	..	..	·05		·03	..	..	·06	·06
29	..	..	..	..	..	..	·01	..	·07	..	..	..	..	..	..	·02	..	..	..	..		..	..	..	..	..
30	·03	·01	·02	·03	·01	·02	·05	·02	·03	·03	·05	·02	·04	·02	·02	·02	·02	..	·02	·03		·04	·03	·02	·04	·03
*	3·40	2·07	1·93	1·81	1·60	1·68	2·06	2·07	2·01	2·20	2·35	2·02	1·82	1·64	1·73	1·98	1·89	2·04	1·90	2·46		1·95	1·74	1·60	1·61	1·36
†	8·56	7·19	6·73	6·17	6·21	6·40	8·04	6·66	7·06	7·09	6·12	7·14	6·91	6·96	6·67	7·20	7·08	6·90	7·07	7·47		6·77	5·94	5·34	6·73	5·10

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(July, 1896.)

The month has been warm, and, for July, very dry. It is the driest July since 1885. The want of rain is beginning to be much felt. At Nutfield a well 85 ft. deep with two headings of 50 ft. is pumped dry every day, and does not gather much over 1000 gallons in the twenty-four hours. At Croydon (Park Hill) the maximum temperature has been over 80° on ten days, and over 70° on twenty-four days. The dry weather has been favourable for the harvest, which is very early. A thunderstorm was fairly general throughout the district on the 15th, and at Croydon a house near Waddon Bridge was struck by lightning, and a boy on Duppas Hill was stunned. At Upper Gatton solar halos were seen on eight days, and a solar corona on the 20th, and a lunar halo on the 24th. The temperature of the month is about 1·5° above the average, and was at Croydon (Duppas House) 64·7°, at Waddon and Wallington 64°, at Upper Gatton, Kenley (Ingleside), and Croydon (Whitgift) 63·9°, and at Chipstead 62·8°. There were recorded at Upper Gatton 209·5 hours of bright sunshine, and at Wallington 226·5 hours of sunlight, which latter is 7 per cent. above the July average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* **July, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·10	·08	·05	·01	·01	..	·03	·01	·02	·02	·02	·03
2	..	·01	..	·01	·02	..	·01	·01	..	..	·01	..	·01
3	·13	·12	·12	·15	·11	·11	·15	·11	·12	·11	·10	·12	·12
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	·04	..	..	..	·01	·01	·01	·01	·02	·01
8	..	..	..	·01	..	..	..	..	..	..	..	..	..
9	..	..	..	·01	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·26	..	·23	·02	·11	·12	·06	·04	·11	·17	·15	·45	·19
16	·35	·44	·34	·54	·33	·30	·35	·41	·36	·46	·44	·44	·53
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	·06	..	..	..	..	..	..	..	·01
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·41	·70	·47	·75	·46	·35	·53	·49	·41	·38	·30	·34	·33
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	·02	..	·03	·03	·08	..	·01	·02	·01	·11	·02	..
30	·14	·15	·12	·52	·37	·20	·45	·58	·61	·63	1·08	·57	·52
31	..	..	·04	·01	·01	..	..	·01	·06	·01	·02	·06	·03
*	1·39	1·54	1·40	2·14	1·51	1·17	1·55	1·70	1·71	1·80	2·24	2·04	1·78
†	11·14	11·76	10·29	14·55	10·30	10·23	10·46	10·91	10·02	10·54	11·26	11·15	11·27

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·03	..	·08		..	·03	·02	..	·01	..	·05	·04
2	·03	..	·01	..		..	·01	..	..	..	..	..	..
3	·15	·10	·03	·10		·10	·11	·12	·11	·11	·14	·13	·12
4	..	..	..	..		..	..	..	..	..	..	..	..
5	..	..	..	..		..	..	..	..	..	..	..	..
6	..	..	..	..		..	..	..	..	..	..	..	..
7	..	..	..	..		·01	..	·02	·01	·01	·03	·01	·02
8	..	..	..	..		..	..	..	..	..	..	..	..
9	..	..	..	..		..	..	..	..	..	·01	..	..
10	..	..	..	..		..	..	..	..	..	..	..	..
11	..	..	..	..		..	..	..	..	..	..	..	..
12	..	..	..	..		..	..	..	..	..	..	..	..
13	..	..	..	..		..	..	..	..	..	..	..	..
14	..	..	..	..		..	..	..	..	..	..	..	..
15	·27	·37	1·15	·24		·93	·36	·56	·71	·62	·92	·21	·16
16	·48	·54	·30	·50	MONTHLY GAUGE.	·43	·46	·39	·40	·42	·36	·30	·28
17	..	..	..	..		..	·02	..	..	..	..	..	..
18	..	..	..	..		..	..	..	..	..	..	..	..
19	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	·02		..	..	..	..	..	..	..	..
25	..	..	..	..		..	..	·01	..	..	..	..	..
26	·32	·30	·16	·48		·28	·26	·28	·31	·31	·28	·40	·36
27	..	..	..	..		..	..	..	·01	..	..	..	..
28	..	..	..	..		..	..	..	..	..	..	..	..
29	·05	·10	·03	..		·08	·01	..	..	..	..	..	..
30	·68	·63	·73	·25		·97	·66	·76	·82	·77	·84	·40	·35
31	·02	·03	..	·03		·04	·02	..	..	·04	·03	·06	·08
*	2·00	2·10	2·41	1·70	2·16	2·84	1·94	2·16	2·37	2·29	2·61	1·56	1·41
†	11·84	11·61	9·32	13·38	13·44	12·94	10·22	10·84	11·56	10·95	11·15	8·91	8·55

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·03	·03	·02	·02	·08	·09	·01	·03	·04	·06	·04	·04	·20	·04	·24	·22	·12	·13	·10	·12	·21	·22	·13	·12	·15
2	·02	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..
3	·11	·11	·10	·09	·09	·10	·09	·08	·10	·09	·10	·09	·09	·12	·15	·10	·09	·10	·08	·11	·10	·07	·05	·13	·10	·12
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	·02	·03	·03	·03	·03	·03	·04	·03	·10	·04	·03	..	·01	..	·02	..	..	..	..	·02	..	..	·02	·02
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·02	·01	·16	·51	·62	·38	·38	·40	·34	·51	·60	·58	·60	·20	·27	·05	·40	·05	·21	·34	·18	·09	·01	·10	·13	·05
16	·47	·30	·34	·29	·28	·27	·26	·28	·26	·28	·25	·23	·27	·34	·34	·40	·36	·26	·38	·32	·35	·38	·24	·26	·19	·20
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·80	·62	·46	·41	·39	·41	·40	·38	·40	·39	·31	·31	·25	·24	·24	·25	·23	·14	·22	·32	·46	·43	·26	·54	·34	·25
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·02	·02	..	..	·02	..	·12	..	..
30	·50	·66	·59	·60	·63	·50	·61	·63	·66	·67	·68	·65	·78	·73	·80	1·14	1·14	1·17	1·17	1·20	1·40	1·21	·66	·90	·81	·75
31	·03	·01	..	..	·01	..	..	..	..	..	..	..	·01	·27	·02	·01	..	·02	·04	·02	·03	·03	..	..	..	..
*	2·01	1·74	1·70	1·95	2·07	1·77	1·87	1·81	1·83	2·01	2·10	1·94	2·08	2·10	1·87	2·19	2·47	1·89	2·25	2·41	2·65	2·46	1·44	2·18	1·71	1·54
†	11·07	8·95	8·76	9·34	9·56	8·93	8·96	8·81	8·59	9·90	9·79	9·00	10·96	12·61	11·29	12·06	11·45	10·83	10·61	11·91	11·87	11·41	9·33	11·76	9·90	9·76

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·11	·10	·09	..	·03	·06	·06	·02	·03	·02	·03	·06	·13	·03	·03	·07	·13	·20	·17	·15		·06	·05	·09	·04	·01
2	..	·01	..	..	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
3	·11	·11	·13	·12	·13	·13	·15	·06	·09	·08	·09	·12	·11	·12	·13	·15	·12	·14	·12	·09		·11	·09	·08	·10	·09
4	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
7	..	·02	·11	·02	·01	·02	·05	..	..	..	..	..	..	·03	·02	·01	·02	·03	·01	·01		·03	..	·01	·01	·03
8	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·12		..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
15	·06	·03	·54	·20	..	..	·01	·05	·52	·82	·47	·28	·19	..	·05	·11	·02	..	·01	·10		·14	·16	·01	·01	..
16	·24	·13	·19	·30	·14	·19	·22	·18	·13	·10	·20	·12	·08	·12	·15	·21	·15	·13	·14	·08	GAUGE DESTROYED.	·07	..	·11	·11	·08
17	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..		..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
19	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
25	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
26	·25	·21	·38	·43	·52	·47	·52	·36	·42	·62	·30	·38	·42	·52	·46	·48	·27	·33	·30	·58		·26	·23	·30	·54	·50
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
28	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
29	·01	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..		..	..	..	..	..
30	·95	·63	·72	·61	·41	·45	·50	·55	·34	·32	·33	·36	·32	·39	·65	·49	·42	·48	·38	·50		·38	·33	·34	·35	·36
31	·02	..	·02	..	..	·01	·01	..	·02	·01	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
*	1·78	1·24	2·18	1·68	1·24	1·33	1·56	1·22	1·58	1·97	1·42	1·32	1·27	1·21	1·49	1·53	1·13	1·31	1·13	1·63		1·05	·86	·94	1·16	1·07
†	10·34	8·43	8·91	7·85	7·45	7·73	9·60	7·88	8·64	9·06	7·54	8·46	8·18	8·17	8·16	8·73	8·21	8·21	8·20	9·10		7·82	6·80	6·28	7·89	6·17

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(August, 1896.)

The month has been rather cool, but with an average rainfall, if the long record at Greenwich fairly represents the district. At Croydon (Park Hill) the maximum temperature has not once reached 80°, and has been over 70° on only three days, and below 60° on two days; the nights there have also been cool, the minimum being below 50° on no less than nineteen nights. Thunderstorms seem to have been prevalent throughout the district, but they have been very local. Potato disease seems prevalent. At Upper Gatton solar halos were seen on the 7th and 28th, and a lunar one on the 23rd. The temperature of the month is about 2·5° below the average, and was at Chipstead 60·5°, at Croydon (Duppas House) 59·5°, at Wallington 59·1°, at Croydon (Whitgift) 58·9°, at Waddon and Redhill 58·5°, and at Upper Gatton 57°. There were recorded at Upper Gatton 128 hours of bright sunshine, and at Wallington 128·8 hours of sunlight, which latter is 14 per cent. below the August average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall.

The 80 years (1816–95) mean at Greenwich for August is 2·33 in.

August, 1896.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·01	..	..	..	..	..	..	..	..	..	..	·01	..
3	·02	..	·04	·03	·06	·01	·10	..	·08	·04	·10	·04	·03
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·13	·32	·15	·15	·19	·25	·13	·02	·13	·16	·22	·26	·09
9	·13	·07	·15	·20	·14	·17	·12	·12	·11	·15	·16	·15	·17
10	·13	·03	·04	·16	·28	·18	·20	·10	·27	·23	·30	·20	·26
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·09	·07	·08	·12	·15	·13	·25	·10	·10	·11	·13	·12	·09
14	·02	·04	..	·06	·03	·03	..	..	·02	..	..	·02	·01
15	·03	..	..	..	·03	..	·09	·02	..	·02	·01	·03	·05
16	..	..	..	..	·07	..	·12	..	..	..	..	..	..
17	·10	·15	·13	·25	..	·11	..	·01	·10	·10	·02	·10	·14
18	·06	·03	·05	..	·14	·10	·10	·19	·10	·07	·17	·07	·06
19	·12	·09	·13	·12	·09	·06	·10	..	·09	·10	·06	·10	·11
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·32	·33	·29	·35	·40	·42	·36	·36	·40	·39	·36	·42	·44
22	..	..	..	..	..	..	·29	·04	..	..	..	..	..
23	·20	·13	·10	·20	·32	·29	·25	·18	·27	·11	·30	·15	·19
24	·25	·25	·23	·15	·21	·19	·12	·24	·24	·21	·25	·20	·18
25	·18	·18	·45	·41	·23	·21	·18	·19	·15	·17	·11	·26	·17
26	·33	·21	·20	·10	·10	·11	·12	·11	·09	·09	·10	·10	·08
27	..	..	..	..	·01	..	..	..	..	..	·02	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·27	·12	·03	·14	..	·05	..	·01	·02	·06	·04	·05	·04
31	·12	·16	·15	·17	·19	·13	·20	·21	·15	·14	·17	·15	·23
*	2·51	2·18	2·22	2·61	2·64	2·44	2·73	1·90	2·32	2·15	2·52	2·43	2·34
†	13·65	13·94	12·51	17·16	12·94	12·67	13·19	12·81	12·34	12·69	13·78	13·58	13·61

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	..	..		..	..		..	..	·04	..	..
2	..	·02	..	..		..	..		·03	·04	·05	..	..
3	·03	..	..	..		..	..		·05	·03	·03	·06	..
4	..	..	..	..		..	..		..	·04	..	..	..
5	..	..	..	..		..	..		..	..	..	..	..
6	..	..	..	..		..	..		..	..	..	..	..
7	·27	..	..	..		..	..		..	..	..	..	..
8	·05	·16	·09	·70		·20	·09		·13	·12	·21	·30	·47
9	·17	·22	·17	·04		·22	·21		·25	·22	·24	·21	·15
10	·38	·45	·26	·14		·35	·26		·39	·39	·11	·04	·05
11	..	..	..	..		..	..		..	..	..	..	..
12	..	..	..	..		..	..		..	..	..	..	..
13	·13	·11	..	·10		..	·14		·07	·03	·06	·03	·02
14	..	·02	·07	·04		·07	..		..	·04	..	·02	·03
15	·01	..	..	..		..	..		..	..	..	..	..
16	..	..	..	..	MONTHLY GAUGE.	..	..	RECORD CEASED.	..	..	..	..	..
17	·15	·11	·06	..		·06	·12		·14	·08	·14	·20	·18
18	·02	·06	..	·13		·18	·07		·06	·10	·08	·04	·07
19	·05	·05	·08	·12		·08	·09		·05	·04	·06	·23	·25
20	..	..	..	..		..	..		..	..	..	..	..
21	·43	·48	·38	·29		·48	·42		·41	·40	·38	·34	·36
22	·06	·02	·01	..		..	..		·01	..	·03	..	..
23	·24	·30	·24	·15		·27	·27		·25	·23	·15	·12	·08
24	·20	·22	·15	·24		·15	·16		·13	·12	·12	·12	·12
25	·27	·34	·07	·16		·15	·17		·08	·07	·10	·29	·22
26	·11	·13	·01	·13		·09	·09		·10	·07	·09	·27	·23
27	..	·01	..	..		·02	..		·01	..	..	..	·01
28	..	..	..	..		..	..		..	..	..	..	..
29	..	..	..	..		..	..		..	..	..	..	..
30	·08	·05	·02	..		·05	·03		·02	..	·06	·04	·01
31	·15	·18	·27	·20		·29	·31		·33	·31	·34	·41	·72
*	2·81	2·93	1·88	2·44	2·23	2·66	2·43		2·51	2·33	2·29	2·72	2·97
†	14·65	14·54	11·20	15·82	15·67	15·60	12·65		14·07	13·28	13·44	11·63	11·52

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	·02	..	..
2	..	·02	·01	·02	·03	..	·02	·01	·01	·02	..	..	·01	..	..	..	·03	..	..	..	..	..	..	..	..	..
3	·04	·03	·02	·02	·02	·02	·02	·02	·01	·01	..	·02	·02	·03	·02	..	..	·02	·02	·02	·02	·01	..	·04	·03	·03
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·20	·20	·23	·21	·20	·21	·22	·20	·23	·25	·19	·21	·28	·16	·15	·19	·10	·16	·15	·16	·27	·40	·42	·39	·40	·27
9	·18	·19	·19	·25	·26	·22	·24	·22	·27	·24	·22	·25	·25	·22	·18	·33	·22	·22	·23	·26	·17	·15	·14	·36	·27	·26
10	·06	·01	·03	·03	·05	·03	·06	·04	·04	·07	·06	·07	·19	·19	·22	·34	·16	·24	·24	·09	·13	·63	·08	·02	·03	·05
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	..	..	..	..	..	..	..
13	·05	·05	·04	·05	·06	·04	·07	·06	·05	·04	·06	·03	·09	·08	·09	·10	·08	·04	·08	·10	·06	·02	..	·02	..	·02
14	·02	·01	·02	·01	·02	·02	·02	·01	·03	·03	·01	·02	·01	·04	..	..	..	..	..	·02	..	·02	·02	·04	·03	·05
15	·07	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	·02	·07	·07	·07	·04	..	..	·01	·03	·07
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·16	·18	·16	·17	·20	·15	·20	·15	·17	·15	·13	·14	·14	·08	·13	·11	·12	·12	·12	·12	·13	·03	·08	·11	·10	·10
18	·08	·03	·06	·05	·02	·05	·02	·06	·03	·05	·06	·06	·08	·14	·06	·06	·08	·07	·07	·06	·05	·09	·05	·05	·03	·04
19	·14	·13	·10	·10	·09	·10	·09	·07	·08	·08	·07	·08	·06	·06	·05	·08	·09	·09	·13	·17	·16	·15	·18	·49	·35	·14
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·45	·44	·30	·25	·24	·21	·24	·24	·25	·26	·24	·22	·27	·27	·25	·30	·23	·25	·27	·24	·23	·26	·14	·27	·26	·24
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01
23	·75	·15	·11	·17	·23	·22	·30	·31	·29	·25	·25	·29	·32	·23	·17	·13	·13	·19	·13	·16	·20	·08	·25	·03	·05	·27
24	·15	·16	·16	·23	·20	·25	·24	·21	·28	·26	·26	·26	·15	·15	·12	·17	·11	·27	·13	·21	·21	·15	·09	·39	·36	·36
25	·09	·08	·08	·08	·06	·07	·08	·07	·08	·09	·07	·08	·08	·07	·05	·05	·05	·08	·06	·07	·04	·15	·16	·19	·19	·16
26	·18	·12	·11	·14	·13	·12	·12	·13	·09	·14	·07	·09	·14	·10	·11	·07	·08	·08	·08	·06	·05	·01	·04	·03	·02	·04
27	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	·01	..	·01	·01	..	·01	..	·01	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·08	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·05	·06	·02	·01	·02	..	..	..	..	·01	·02	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	·33	·35	·34	·33	·31	·31	·30	·29	·28	·29	·29	·25	·35	·26	·25	·25	·22	·22	·22	·20	·20	·20	·14	·28	·19	·45
*	3·08	2·22	1·98	2·12	2·14	2·02	2·24	2·09	2·19	2·24	2·00	2·08	2·44	2·11	1·86	2·21	1·73	2·15	2·01	2·02	1·96	2·36	1·79	2·76	2·34	2·56
†	14·15	11·17	10·74	11·46	11·70	10·95	11·20	10·90	10·78	12·14	11·79	11·08	13·40	14·72	13·15	14·27	13·18	12·98	12·62	13·93	13·83	13·77	11·12	14·52	12·24	12·32

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	·02	..	..	..	..	..	·02
2	..	..	·01	..	..	·02	·03	..	..	..	..	..
3	·03	·02	·02	·02	·03	..	·05	·02	·03	·04	·03	·03
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	·02	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	·03	·06	..	..
8	·25	·30	·29	·30	·92	·93	·95	·49	..	..	·38	·33
9	·25	·29	·30	·26	·22	·16	·19	·20	·12	·28	·14	·28
10	·03	·17	·07	·02	·06	·05	·05	·06	·15	·12	·02	·12
11	..	·01	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	·03	·01	..	..	·02	·01	·02	·01	·03	..	·02	·02
14	·04	·03	·07	·02	..	..	·06	·04	..	·03	·02	·03
15	·08	..	..	..	..	·03	·02	..	·03	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..
17	·10	·13	·15	·21	·21	·22	·24	·23	·22	·22	·24	·25
18	·06	·04	..	..	·05	·06	·05	·03	·05	·02	·04	·03
19	·22	·12	·10	·11	·20	·13	·13	·15	·23	·19	·12	·18
20	..	·01	..	..	..	..	..	..	..	..	..	..
21	·22	·21	·29	·23	·24	·35	·38	·59	·19	·25	·32	·48
22	·02	..	..	..	..	..	·01	..	·01	..	..	·04
23	·21	·20	·28	·22	·12	·11	·13	·08	·12	·17	·41	·04
24	·27	·33	·41	·42	·13	·17	·21	·19	·18	·10	·15	·20
25	·09	·16	·11	·09	·49	·31	·25	·11	·13	·21	·03	·21
26	·05	·14	·06	·05	·05	·05	·05	·04	·05	·08	·04	·06
27	·01	..	..	..	..	..	·02	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	·02	..	·05	·08	·03	·03	·06	·17
31	·27	·21	·22	·25	·16	·33	·30	·39	·54	·90	·49	·35
*	2·23	2·38	2·38	2·22	2·92	2·95	3·19	2·75	2·14	2·70	2·51	2·84
†	12·57	10·81	11·29	10·07	10·37	10·68	12·79	10·63	10·78	11·76	10·05	11·30

Day of Mo.	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	·01		·01	..	..	·01	..
2	·01	..	·02	·02	..	..	..	..		..	..	..	·01	..
3	..	·03	·03	·02	·02	·02	·03	..		·01	..	·02	·01	..
4	..	..	..	..	..	..	..	..		..	..	..	..	..
5	..	..	..	..	..	..	..	..		..	..	..	..	..
6	..	..	..	..	..	..	..	..		..	..	..	..	..
7	·04	..	..	..	..	..	..	..		..	..	..	..	..
8	·03	·75	·74	·42	·55	·34	·37	·31		·34	·29	·29	·47	·06
9	·29	·23	·28	·25	·33	·40	·32	·32		·44	·35	·26	·34	·15
10	·13	·07	·04	·05	·06	·04	·06	·19		·09	·08	·07	·07	·12
11	..	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	..	..	..		..	..	..	..	..
13	..	·02	·02	·01	..	·05	..	..		..	..	..	..	..
14	·05	·05	·02	·03	·05	..	·04	·05		·03	·04	·07	·09	..
15	..	..	..	..	..	..	..	..		·03	·03	..	..	..
16	..	..	..	..	..	·03	..	..		..	..	..	..	..
17	·15	·16	·22	·25	·19	·23	·16	·14	RECORD CEASED.	·13	·08	·16	·12	·10
18	·05	·04	·03	·05	·04	·02	·05	·13		·04	·02	·01	·06	·02
19	·14	·22	·13	·15	·19	·20	·21	·27		·18	·15	·15	·15	·16
20	..	..	..	..	..	..	..	..		..	..	..	..	..
21	·32	·27	·26	·28	·23	·25	·24	·19		·21	·18	·21	·26	·25
22	·02	..	·12	·02	..	..	·01	..		·01	·01	..	..	..
23	·04	·12	·11	·12	·03	·07	·05	·03		·06	·02	·03	·10	·06
24	·08	·12	·17	·20	·23	·18	·15	·19		·14	·13	·11	·12	·11
25	·09	·15	·35	·36	·38	·41	·56	·30		·33	·31	·28	·20	·10
26	·04	·04	·06	·03	·03	..	·01	..		..	..	..	·02	..
27	..	..	..	..	..	..	..	..		..	..	..	..	..
28	..	..	..	..	..	..	..	..		..	..	..	..	..
29	..	..	..	..	..	..	..	..		..	..	..	..	..
30	·08	..	..	..	..	..	..	..		..	..	..	..	..
31	·47	·26	·24	·25	·21	·26	·21	·19		·24	·22	·21	·25	·28
*	2·03	2·53	2·84	2·51	2·54	2·50	2·47	2·32		2·29	1·91	1·87	2·28	1·41
†	10·21	10·70	11·00	11·24	10·75	10·71	10·67	11·42		10·11	8·71	8·15	10·17	7·58

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(September, 1896.)

The month has been an exceedingly wet one. There is no such wet September in the long record at Greenwich, and Mr. Baldwin Latham reports that it is the wettest September recorded in 207 years in this part of the country. The fall on the 1st is especially noticeable, ranging as it does from 2·62 in. at Tower Fields, Keston, to ·01 in. at Eltham. There was a slight frost on the grass on the 20th in some parts of the district. Thunderstorms occurred on the 1st, 5th, 8th, and 12th in many parts of the district, and a very heavy gale on the 22nd and 23rd. Solar halos were seen at Upper Gatton on the 8th, 11th, and 21st, and at Nutfield on the 28th. The mean temperature is about the average for September, and was at Wallington 57·7°, at Croydon (Duppas House) 57·5°, at Croydon (Whitgift) 57·3°, at Waddon 56·4°, at Chipstead 55·9°, and at Upper Gatton 53·1°. There were recorded at Upper Gatton 71·5 hours of bright sunshine, and at Wallington 94·5 hours of sunlight, which latter is 18 per cent. below the average for September of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	1·88	2·28	1·63	1·07	1·79	1·43	2·27	2·25	2·33	1·87	2·51	2·16	·75
2	·25	·32	·58	·35	·17	·14	·23	·24	·15	·18	·11	·14	·20
3	·17	·20	·12	·20	·06	·13	·14	·20	·05	·17	·07	·09	·12
4	·51	·52	·52	1·40	·98	·71	1·10	1·06	·95	·82	·45	·80	·75
5	·03	..	..	·04	·01	·02	..	·02	..	·01	·02	·01	·01
6	..	..	..	·01	·01	·01	..	..	·01	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·35	·24	·05	·06	·09	·12	·09	·10	·09	·08	·30	·11	·11
9	·12	·13	·05	·75	·13	·33	·27	·31	·07	·24	·28	·19	·23
10	·58	·54	·50	·60	·72	·55	·64	·57	·77	·64	·74	·84	1·19
11	·03	·12	·13	·40	·22	·25	·18	·17	·19	·14	·30	·16	·18
12	·85	·85	·85	·60	·72	·72	·75	·85	·97	·88	·78	·81	·86
13	·27	·25	·27	·20	·42	·61	·41	·38	·41	·53	·47	·41	·56
14	·02	..	·02	·04	·03	·03	·04	·03	·03	·02	·03	·03	·04
15	·22	·19	·20	·26	·15	·16	·14	·18	·10	·21	·16	·20	·17
16	·01	·02	..	·02	..	·01	..	·01	·01	·02	·01	·03	·05
17	·25	·22	·27	·31	·19	·21	·18	·20	·20	·25	·21	·26	·21
18	·12	·21	·08	·08	·08	·13	·05	·07	·06	·05	·05	·06	·05
19	·05	·06	·04	·04	·03	·03	·05	·06	·05	·02	·02	·01	..
20	·37	·14	·05	·06	·09	·05	·05	·02	·03	·01	..	..	·03
21	·35	·34	·32	·32	·34	·41	·30	·38	·30	·31	·48	·33	·31
22	·31	·35	·33	·42	·26	·22	·30	·12	·27	·31	·28	·30	·24
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	1·05	1·01	1·06	·30	·84	·83	·91	·92	·83	·87	·87	·85	·81
25	·05	·04	·07	·30	·19	·19	·15	·15	·20	·22	·15	·15	·11
26	·06	·08	·05	·10	·05	·05	·06	·05	·05	·05	·05	·05	·03
27	·08	·11	·12	·15	·13	·11	·10	·10	·11	·12	·15	·14	·10
28	·02	..	..	·01	·01	·01	..	..	·01	·05	·09	·06	·11
29	..	..	..	..	·01	·01	..	..	..	..	·01	·01	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
*	8·00	8·22	7·31	8·09	7·72	7·47	8·41	8·44	8·24	8·07	8·59	8·20	7·22
†	21·65	22·16	19·82	25·25	20·66	20·14	21·60	21·25	20·58	20·76	22·37	21·78	20·83

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	2·35	2·01	2·18	·92	MONTHLY GAUGE.	2·09	1·30	RECORD CEASED.	1·43	1·36	1·48	1·70	1·39
2	·16	·22	·19	·03		·21	·15		·20	·19	·17	·52	·61
3	·21	·12	·07	·23		·12	·10		·09	·04	·06	·08	·08
4	·31	·50	·46	·29		·50	·40		·60	·61	·64	·80	·71
5	..	·02	·01	·06		·01	..		·02	·02	..	·06	·14
6	..	..	..	..		..	..		·01	..	·04	..	..
7	..	..	..	..		..	..		..	..	·01	..	..
8	·50	·30	·20	·26		·28	·30		·25	·25	·20	·07	·11
9	·12	·22	·15	·04		·22	·13		·20	·11	·15	·15	·06
10	1·20	·92	·54	·81		·92	·84		·74	·78	·93	·65	·66
11	·16	·24	·18	·26		·23	·11		·13	·13	·18	·16	·18
12	·73	·65	·74	·94		·72	·58		·68	·75	·58	·60	·98
13	·39	·49	·38	·09		·47	·33		·30	·20	·34	·35	·18
14	·03	·04	·02	·04		·05	·03		·03	·10	·03	..	..
15	·19	·20	·12	..		·18	·19		·19	·22	·19	·18	·15
16	·02	·02	·01	·18		·02	..		·02	·01	·09	·17	·20
17	·27	·30	·18	·26		·27	·18		·22	·20	·15	·15	·16
18	·07	·08	·05	..		·08	·05		·06	·05	·13	·19	·17
19	·01	..	..	..		..	..		..	..	..	..	..
20	..	..	·02	..		·01	·04		·01	·01	..	·03	·02
21	·42	·52	·45	·35		·52	·30		·38	·38	·32	·32	·28
22	·27	·31	·18	·24		·21	·22		·25	·27	·14	·17	·18
23	..	..	..	..		..	..		..	..	..	..	..
24	·84	·92	·62	·86		·79	·71		·95	·91	·76	·82	·76
25	·11	·13	·03	·25		·12	·11		·12	·11	·14	·07	·10
26	·04	·06	·01	·12		·02	·02		·11	·02	·05	·04	·03
27	·14	·12	·07	·10		·11	·08		·02	·10	·12	·11	·09
28	..	·08	·02	..		·07	·09		·11	·08	·06	·09	·07
29	·01	·01	..	..		..	..		·08	·01	·03	..	..
30	..	..	..	..		..	..		..	..	·03	..	..
*	8·55	8·48	6·88	6·33	6·13	8·22	6·26		7·20	6·91	7·02	7·48	7·31
†	23·20	23·02	18·08	22·15	21·80	23·82	18·91		21·27	20·19	20·46	19·11	18·83

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	1·70	·83	1·75	1·67	1·72	1·29	1·61	1·64	1·00	1·60	1·49	1·45	1·66
2	·30	·10	·19	·20	·19	·21	·22	·25	·32	·29	·23	·21	·25
3	·10	·07	·06	·06	·10	·08	·14	·06	·08	·10	·06	·06	·06
4	·87	1·65	·50	·76	·67	·75	·64	·67	·64	·64	·61	·60	·50
5	·03	·03	·01	·01	·02	..	·02	·01	..	·02	·06	·06	·06
6	..	·01	..	..	..	..	·01	..	·03	·01	..	..	..
7	..	·01	..	..	·01	..	..	..	·02	·02	·01	·01	..
8	·08	·20	·23	·22	·23	·21	·18	·19	·21	·21	·17	·14	·15
9	·25	·12	·07	·15	·14	·10	·14	·11	·11	·15	·06	·07	·12
10	1·84	1·02	·66	·69	·59	·71	·69	·67	·60	·83	·80	·61	·77
11	·22	·15	·15	·12	·11	·14	·11	·12	·13	·11	·12	·12	·16
12	·59	·61	·72	·79	·75	·76	·64	·65	·68	·65	·55	·06	·57
13	·26	·17	·44	·37	·30	·28	·36	·36	·33	·38	·25	·60	·21
14	·02	·01	..	..	·01	..	·01	·01	..	..	·01	·01	·02
15	·21	·15	·12	·13	·13	·12	·13	·15	·13	·15	·18	·18	·18
16	·03	·30	·28	·21	·20	·20	·22	·18	·15	·22	·18	·14	·22
17	·15	·15	·15	·15	·14	·14	·14	·14	·14	·13	·15	·15	·16
18	·09	·24	·23	·26	·24	·17	·26	·24	·14	·27	·29	·16	·24
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	·01	·02	·02	·01	·01	·02	·02	..	·03
21	·33	·27	·28	·29	·30	·28	·28	·27	·27	·29	·29	·29	·34
22	·24	·18	·20	·20	·19	·16	·19	·20	·19	·22	·20	·20	·19
23	..	..	..	..	..	..	..	..	..	..	..	·01	..
24	·94	·97	·91	·92	·86	·89	·85	·83	·85	·92	·83	·81	·93
25	·02	·09	·08	·11	·12	·11	·12	·12	·13	·17	·17	·18	·17
26	·08	·03	·02	·02	·02	·02	·02	·01	·02	·02	·02	·02	·02
27	·13	·08	·08	·08	·08	·08	·08	·07	·07	·09	·08	·10	·09
28	·10	·04	·07	·06	·05	·03	·06	·04	·02	·03	·03	·03	·04
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	·01	..	..	..
*	8·58	7·48	7·20	7·47	7·18	6·75	7·14	7·00	6·27	7·55	6·86	6·27	7·14
†	22·73	18·65	17·94	18·93	18·88	17·70	18·34	17·90	17·05	19·69	18·65	17·35	20·54

Day of Mo.	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Wilmington	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	2·22	2·03	2·12	2·39	1·76	2·54	2·62	1·96	1·39	·11	·70	·33	·09
2	·14	·15	·07	·06	·07	·07	·06	·01	..	..	·03	·02	·08
3	·03	·04	·03	·03	·04	·03	·04	·03	·03	·03	·07	·03	·03
4	·46	·40	·42	·34	·43	·43	·43	·45	1·03	1·16	·65	·60	·59
5	·03	..	·03	·02	·04	·02	·06	·04	·10	·12	·08	·05	·05
6	..	·01	..	·01	·01	·01	·01	..	·02	..	·02	..	..
7	..	..	..	..	..	..	..	..	·01	..	·06	·02	..
8	·22	·26	·28	·21	·22	·15	·25	·38	·25	·27	·19	·25	·18
9	·10	·12	·14	·12	·11	·11	·10	·03	·03	·02	·11	·06	·08
10	·77	·71	·75	·69	·59	·68	·55	·78	·95	·88	·59	·50	·70
11	·16	·16	·16	·17	·15	·15	·15	·15	·14	·13	·18	·13	·14
12	·66	·68	·76	·52	·64	·49	·49	·65	·42	·47	·41	·52	·50
13	·29	·35	·34	·39	·26	·33	·44	·38	·12	·11	·42	·25	·21
14	·02	·02	·01	·03	·02	·01	·01	·02	·01	..	·01	..	..
15	·19	·17	·21	·20	·18	·15	·16	·03	·14	·15	·20	·17	·15
16	·23	·05	·24	·05	·28	·16	·21	·30	·21	·25	·09	·07	·05
17	·21	·19	·19	·18	·15	·17	·11	·15	·11	·10	·14	·14	·14
18	·21	·09	·22	·07	·18	·14	·20	·19	·07	·16	·20	·14	·15
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·03	..	·03	..	..	·01	..	..	..	·16	·03	..	..
21	·34	·36	·41	·36	·34	·05	·32	·28	·23	·26	·27	·30	·27
22	·22	·23	·20	·24	·17	·17	·19	·22	·18	·12	·17	·17	·18
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·95	1·03	·95	·80	·90	·92	1·00	·96	·80	·76	·77	·87	·82
25	·24	·17	·20	·17	·19	·20	·23	·28	·22	·15	·28	·25	·22
26	·02	·01	·01	·02	·02	·01	..	·01	·01	..	..	..	·01
27	·12	·10	·11	·10	·10	·10	·11	·13	·09	·06	·11	·09	·10
28	·06	·05	·05	·05	·05	·05	·07	·06	·02	..	·01	..	·01
29	..	..	..	..	..	..	..	..	·01	..	..	..	..
30	..	·01	..	..	..	..	..	..	·01	..	..	..	..
*	7·92	7·39	7·93	7·22	6·90	7·15	7·81	7·49	6·60	5·47	5·79	4·96	4·75
†	22·64	20·54	22·20	20·40	19·88	19·77	21·74	21·32	20·37	16·59	20·31	17·20	17·07

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·87	·63	·66	·50	·69	·75	·75	·78	·32	·19	·40	·45
2	·04	·13	·17	·32	·30	·26	·30	·54	·78	·78	·51	·55
3	·05	·06	·06	·06	·07	·06	·13	·08	·09	·08	·07	·18
4	·50	·54	·55	·67	·56	·66	·64	1·40	·58	·77	1·43	1·25
5	·04	·03	·06	·03	·10	·19	·30	·58	·20	·13	·30	·46
6	..	·01	..	..	..	..	·01	..	..	..	..	..
7	·04	·01	·01	..	..	..	..	..	..	..	..	..
8	·24	·46	·11	·18	·29	·25	·32	·27	·11	·24	·33	·30
9	·06	·03	·06	·02	·14	·12	·15	·36	·08	·11	·36	·37
10	·65	·59	·77	·75	·52	·57	·55	·68	·66	·56	·66	·61
11	·13	·12	·07	·11	·07	·10	·10	·16	·09	·10	·08	·08
12	·46	·44	·43	·52	·53	·57	·67	1·27	·82	·72	1·04	1·12
13	·28	·18	·28	·47	·29	·29	·36	·22	·16	·21	·23	·17
14	·02	..	·01	..	..	..	·03	..	·01	..	..	..
15	·16	·13	·14	·11	·04	·07	·07	·06	·05	·04	·05	·05
16	·14	·16	·08	·14	·18	·30	·21	·13	·15	·21	·10	·22
17	·11	·06	·10	·07	·09	·11	·12	·12	·13	·09	·08	·11
18	·33	·08	·09	·07	·08	·06	·05	·03	·02	·10	·02	·09
19	..	..	..	..	..	·01	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..
21	·30	·27	·28	·25	·26	·31	·30	·31	·28	·31	·33	·36
22	·08	·16	·17	·17	·15	·17	·20	·16	·18	·27	·18	·26
23	..	..	..	..	..	..	·02	..	..	..	..	..
24	·85	·75	·75	·69	·57	·66	·68	·66	·70	·66	·70	·72
25	·19	·19	·22	·17	·12	·10	·10	..	·04	·03	·06	·09
26	·02	·01	·01	·03	·02	·04	·04	·09	·04	·03	·03	·03
27	·09	·09	·09	·09	·10	·15	·12	·13	·10	·10	·12	·15
28	..	..	·02	..	·03	·05	·10	·04	·03	·08	·04	·11
29	..	..	..	..	..	..	·01	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	·01
*	5·65	5·15	5·19	5·42	5·20	5·85	6·33	8·07	5·62	5·81	7·12	7·74
†	18·22	15·96	16·48	15·49	15·57	16·53	19·12	18·70	16·40	17·57	17·17	19·04

Day of Mo.	Richmond	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·13	·92	·70	·35	·09	·06	·07	·01		·10	·07	·12	·57	1·15
2	·40	·37	·36	·28	·14	·14	·14	·02		·04	·07	·13	·36	·32
3	·06	·09	·12	·10	·08	·06	·07	·04		·06	·04	·05	·05	·05
4	·81	·65	·62	·73	·57	·62	·57	·63		·65	·56	·52	·61	·55
5	·23	·10	·05	·07	·10	·06	·15	·08		·20	·16	·09	·06	·08
6	..	..	·01	·01	..	..	·01	·02		·01	..	·01	·01	..
7	..	..	·01	..	..	..	..	·01		..	..	..	..	..
8	·17	·32	·35	·15	·48	·36	·40	·18		·17	·13	·26	·21	·33
9	·14	·15	·08	·05	·02	·02	·02	·09		·04	·01	·01	..	·02
10	·49	·70	·70	·77	·69	·79	·66	·63		1·09	·71	·52	·63	·52
11	·06	·11	·10	·07	·09	·03	·08	·13		·09	·07	·06	·08	·05
12	·88	·59	·38	·48	·35	·56	·50	·41		·57	·43	·63	·42	·47
13	·21	·47	·34	·41	·69	·25	·58	·21		·23	·42	·31	·36	·38
14	·02	·01	·02	·01	..	·02	·01	·01		·01	..	·02	..	..
15	·04	·04	·06	·07	·10	·20	·08	·11	RECORD CEASED.	·04	·03	·01	·03	·03
16	·23	·23	·22	·26	·38	·28	·39	·37		·26	·25	·21	·18	·10
17	·14	·15	·12	·11	·05	·10	·12	·09		·12	·08	·07	·14	·08
18	..	·10	·10	·08	·08	·03	·09	·07		·11	·09	·10	·11	·01
19	..	..	..	..	..	·01	..	..		..	..	..	..	..
20	·02	..	·33	..	..	..	·01	·03		·02	..	..	·01	..
21	·30	·33	·18	·33	·30	·32	·32	·30		·31	·29	·40	·36	·28
22	·18	·26	·10	·19	·29	·16	·18	·17		·20	·15	·14	·23	·16
23	..	..	..	..	..	..	..	..		..	..	..	..	..
24	·69	·66	·66	·79	·67	·64	·65	·66		·68	·63	·59	·57	·50
25	·09	·15	·16	·25	·23	·20	·23	·21		·18	·15	·18	·21	·20
26	·06	·03	·03	·03	·03	·07	·02	·01		·01	·01	·02	·01	·01
27	·12	·13	·10	·11	·13	·14	·11	·08		·13	·11	·06	·10	·10
28	..	·01	·02	·01	·01	·02	..	..		..	..	..	..	..
29	..	..	·01	·01	..	..	..	..		..	..	..	..	..
30	..	..	..	..	..	..	..	..		..	..	..	..	..
*	5·47	6·57	5·93	5·72	5·57	5·14	5·46	4·57		5·32	4·46	4·51	5·31	5·39
†	15·68	17·27	16·93	16·96	16·32	15·85	16·13	15·99		15·43	13·17	12·66	15·48	12·97

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(October, 1896.)

The month has been cold, and also rather wet, but not more than usual for October if we may take the long average at Greenwich as fairly representing the district. The month has been rather an unhealthy one, there being a good deal of sickness about, including cases of scarlet fever and influenza. Garden produce has been plentiful and good. Thunderstorms have been rather numerous, but, with the exception of one on the 25th, they were very local. The lightning on the 25th struck a chestnut tree about 250 yards from Abinger Hall, partially destroying it. There were several frosty nights towards the end of the month. Solar halos were seen at Croydon (Whitgift) and Upper Gatton on the 1st, and at the latter place also on the 9th and 28th. At Nutfield there was an exceedingly dark day on the 15th; and the last flight of swallows left there on the 30th. The mean temperature of the month is about 3° below the average, and was at Chipstead 47·1°, at Croydon (Duppas House) 46·5°, at Croydon (Whitgift) and Wallington 46·3°, at Upper Gatton 46·2°, and at Waddon 45·9°. There were recorded at Upper Gatton 86·2 hours of bright sunshine, and at Wallington 67·8 hours of sunlight, which latter is 10 per cent. below the October average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1896.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..		..	..	..	..	..
2	..	·03	·05	..	·02	·03	..	·03	·03	·05	·05	·06	·03	·06	·06	·03	..		·04	·03		·04	·03	..	·03	·01
3	·06	·06	·05	·11	·04	·04	·09	·10	·03	·03	·04	·03	·03	·08	·04	·06	·05		·10	·02		·02	·02	·14	..	..
4	·25	·30	·26	·35	·35	·35	·28	·20	·33	·29	·38	·30	·23	·27	·37	·14	·38		·26	·21		·24	·26	·05	·05	·11
5	·06	·08	·07	·05	·04	·06	·05	·04	·03	·05	·03	·06	·02	·07	·06	·04	·04		·06	·04		·04	·04	·04	·02	·04
6	1·00	1·07	·95	1·55	1·03	1·08	·88	1·00	·95	1·04	1·05	1·03	·96	1·04	1·02	·63	1·04		·98	·80		1·05	1·05	·65	·81	·60
7	·16	·18	·17	·23	·18	·16	·18	·18	·17	·18	·17	·18	·15	·15	·18	·14	·14		·15	·13		·14	·14	·14	·20	·18
8	·04	·07	·06	·07	·09	·11	·10	·07	·07	·05	·09	·06	·03	·07	·08	·09	·02		·14	·05		·09	·10	·06	..	·01
9	·02	..	·02	·06	·08	·11	·03	·03	·06	·02	·07	·04	..	·14	·07	·05	·04		·05	·06		·08	·07	·05	·01	·01
10	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..		..	..		..	·01	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	·05		..	..		..	..	..	..	..
12	·65	·77	·55	·83	·65	·67	·59	·60	·61	·60	·57	·55	·52	·55	·55	·35	·45		·56	·51		·52	·51	·56	·48	·49
13	·41	·45	·40	·77	·43	·56	·45	·48	·43	·50	·51	·44	·53	·50	·52	·52	·65		·60	·51		·59	·58	·66	·30	·28
14	·23	·27	·20	·55	·28	·27	·28	·30	·30	·37	·35	·35	·39	·42	·42	·39	·18		·40	·36		·36	·36	·42	·21	·21
15	·39	·35	·30	·32	·27	·37	·32	·29	·28	·30	·42	·26	·23	·33	·40	·26	·16	MONTHLY GAUGE.	·41	·22	RECORD CEASED.	·19	·19	·20	·15	·14
16	·23	·22	·15	·35	·23	·23	·20	·21	·22	·21	·21	·19	·19	·22	·22	·15	·29		·13	·21		·19	·20	·18	·08	·09
17	·09	·10	·08	·11	·06	·05	·07	·06	·06	·06	·07	·08	·10	·11	·11	·08	·12		·10	·13		·09	·09	·08	·05	·04
18	·02	·06	..	·04	·01	·02	·02	·02	·01	·01	·01	·02	..	·04	..	..	·03		..	·02		·02	·03	·05	..	..
19	·07	·10	·11	·18	·14	·12	·15	·16	·15	·15	·15	·14	·17	·12	·18	·16	·22		·16	·13		·07	·12	·17	·13	·12
20	..	..	..	·04	·01	·01	·03	·02	·01	..	·01	·01	·01	..	·02	·02	·03		·03	·01		·02	·02	·05	·01	·01
21	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..		..	..	·03	..	..
22	..	..	..	·04	..	..	..	·01	..	..	..	..	..	..	..	..	..		·01	..		..	·01	..	..	..
23	..	..	·02	·02	..	..	..	·01	..	·01	·01	..	..	·02	..	..	..		..	..		..	..	..	..	..
24	·21	·26	·20	·21	·28	·30	·27	·23	·26	·24	·27	·27	·21	·28	·32	·25	·40		·20	·20		·20	·20	·21	·30	·33
25	·09	·16	·08	·10	·03	·04	·05	·04	·07	·05	·06	·07	·05	·06	·10	·06	·03		·12	·03		·04	·04	·07	·05	·03
26	·17	·06	·14	·16	·20	·26	·18	·15	·17	·14	·19	·18	·14	·18	·19	·17	·17		·16	·15		·14	·14	·11	·08	·05
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..		..	..		..	·01	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..		·01	·01	·03	..	..
29	·01	..	..	·03	·01	..	..	·01	·01	·01	..	·01	·01	·03	..	·03	·05		·04	..		·02	·02	..	..	..
30	·01	..	..	·06	·04	·03	·05	·05	·05	·05	·09	·06	·05	·07	·11	·08	·04		·09	·08		·07	·06	·07	..	..
31	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..		·01	·01	..	..	·01
*	4·17	4·59	3·86	6·24	4·47	4·87	4·27	4·31	4·30	4·41	4·80	4·39	4·06	4·83	5·02	3·71	4·58	5·56	4·79	3·90		4·24	4·32	4·02	2·96	2·76
†	25·82	26·75	23·68	31·49	25·13	25·01	25·87	25·56	24·88	25·17	27·17	26·17	24·89	28·03	28·04	21·79	26·73	27·36	28·61	22·81		25·51	24·51	24·48	22·07	21·59

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld.rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad.Rd.)	Addington Hills
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·04	·02	·01	·01	·01	..	·01	·01	·01	·01	..	..	·02
3	·02	..	..	..	·01	..	·02	..	..	..	·01	..	·02
4	·24	·13	·16	·15	·16	·14	·13	·16	·13	·16	·15	·15	·17
5	·04	·08	·29	·16	·15	·18	·14	·14	·09	·15	·14	·13	·23
6	·93	·68	·71	·75	·71	·46	·75	·70	·65	·74	·75	·75	·86
7	·13	·14	·12	·13	·13	·12	·13	·13	·14	·14	·13	·14	·12
8	·01	..	..	·01	·03	·02	·02	·02	·01	·03	·04	·03	·08
9	·02	·02	..	..	·01	..	·01	·01	..	·02	·01	..	·08
10	..	..	..	..	..	·01	..	..	..	..	..	·01	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·62	·56	·53	·52	·50	·32	·53	·52	·51	·54	·50	·44	·46
13	·44	·15	·44	·46	·46	·35	·49	·49	·48	·50	·52	·49	·58
14	·28	·45	·25	·26	·25	·25	·27	·26	·25	·27	·27	·25	·32
15	·24	·15	·15	·14	·15	·15	·16	·15	·14	·18	·14	·15	·14
16	·13	·08	·09	·11	·07	·10	·08	·09	·10	·11	·09	·10	·14
17	·10	·07	·08	·08	·07	·08	·07	·06	·06	·07	·07	·07	·08
18	..	..	..	..	..	..	..	·01	..	..	·01	..	·03
19	·15	·18	·17	·15	·15	·15	·15	·15	·15	·18	·16	·17	·20
20	..	·01	·02	·02	·04	·05	·04	·04	·06	·06	·06	·05	·05
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	·01	·01	..	..	..	..	..	..	..	..	·01	·01
23	..	..	..	..	..	..	..	..	..	·01	..	..	..
24	·27	·30	·27	·28	·24	·23	·24	·24	·25	·26	·23	·26	·24
25	·03	·04	·05	·06	·06	·07	·06	·05	·09	·06	·06	·06	·05
26	·08	·08	·10	·10	·10	·09	·10	·10	·09	·10	·08	·10	·11
27	..	..	..	..	..	..	..	..	..	..	..	·01	..
28	..	..	..	..	..	..	..	..	..	..	..	·01	..
29	..	..	..	..	..	..	..	·01	..	..	..	·01	·01
30	..	..	..	..	·01	·01	·01	..	..	..	..	..	·02
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	3·77	3·15	3·45	3·39	3·31	2·78	3·41	3·34	3·21	3·59	3·42	3·39	4·02
†	26·50	21·80	21·39	22·32	22·19	20·48	21·75	21·24	20·26	23·28	22·07	20·74	24·56

Day of Mo.	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	W.Wickhm Layhms.F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	RECORD CEASED.	..	..	..	..	..	..	..	..	..
2	·02	·02	..		·02	·01	·02	..	·01	..	·03	·02	..
3	·01	·01	·02		·01	·01	·01	·01	..	·01	·01	..	·02
4	·23	·24	·21		·18	·01	·23	·28	·01	·10	·15	·14	·15
5	·23	·06	·17		·19	·15	·13	·07	·26	·03	·05	·04	·05
6	1·08	1·06	1·02		·94	·87	1·09	1·06	·82	·69	·78	·77	·72
7	·13	·12	·12		·17	·11	·11	·18	·11	·10	·13	·12	·12
8	·06	·10	·05		·07	·10	·11	·03	·02	·02	·07	·02	·04
9	·06	·03	·02		·03	..	·02	·02	..	..	·02	·01	·02
10	..	..	..		..	..	..	..	·01	..	..	..	..
11	·01	..	..		..	·01	..	..	..	·01	..	..	..
12	·46	·44	·55		·49	·45	·46	·32	·32	·29	·40	·48	·46
13	·58	·51	·59		·55	·55	·55	·56	·64	·48	·53	·57	·60
14	·33	·30	·37		·29	·31	·46	·32	·29	·17	·27	·24	·25
15	·15	·17	·17		·16	·20	·25	·22	·13	·13	·15	·09	·10
16	·13	·13	·18		·14	·16	·22	·11	·24	·11	·16	·10	·12
17	·08	·07	·06		·08	·05	·06	·09	·06	·06	·08	·06	·06
18	..	·02	..		·02	·03	·05	..	..	·01	·04	·02	·02
19	·18	·20	·27		·25	·21	·22	·22	·20	·16	·24	·22	·22
20	·08	·04	·03		·07	·08	·07	·11	·08	·06	·08	·06	·06
21	..	..	..		·01	..	..	·01	·03	..	..	..	..
22	..	..	..		..	..	..	..	·01	..	..	..	..
23	..	..	..		·01	..	..	..	..	..	..	..	..
24	·27	·26	·30		·21	·22	·26	·26	·22	·16	·24	·28	·27
25	·13	·03	·03		·04	·03	·03	·05	·06	·05	·05	·04	·05
26	·04	·13	·15		·12	·12	·13	·07	·11	·05	·15	·12	·11
27	..	..	..		..	..	·01	..	..	..	..	..	..
28	..	..	..		·02	..	..	..	..	..	..	..	..
29	..	·01	..		..	..	..	..	..	..	..	..	..
30	·04	·06	·05		·04	·05	..	·07	·08	·01	·01	..	..
31	..	..	..		..	..	..	..	..	..	..	..	..
*	4·30	4·01	4·36		4·11	3·73	4·49	4·06	3·71	2·70	3·64	3·40	3·44
†	26·94	24·55	26·56		23·99	23·50	26·23	25·38	24·08	19·29	23·95	20·60	20·51

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	·01	·01	..	·03	·03	·03	·02	·02	·02	..	·02	·04
3	·02	·01	·01	..	·01	·02	·02	·01	·03	·02	·03	·02	·02
4	·13	·09	·11	·11	·09	·10	·10	·08	·08	·09	·08	·10	·09
5	·05	·06	·06	·12	·08	·08	·05	·05	·04	·08	·03	·08	·05
6	·78	·60	·50	·41	·50	·57	·56	·58	·53	·57	·60	·65	·56
7	·11	·15	·15	·14	·20	·29	·22	·22	·18	·19	·20	·21	·21
8	·06	·02	·02	..	..	..	·01	..	..	..	..	..	..
9	·03	·04	·01	..	·01	·01	·03	..	·02	..	..	..	..
10	·02	·01	..	..	..	..	..	..	·02	·02	·03	·03	·02
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·41	·44	·53	·54	·52	·57	·57	·60	·39	·30	·51	·53	·39
13	·49	·53	·51	·50	·45	·45	·43	·47	·35	·50	·38	·49	·49
14	·24	·21	·20	·25	·16	·18	·19	·15	·11	·11	·14	·13	·13
15	·13	·12	·12	·15	·06	·08	·09	·05	·07	·09	·08	·09	·08
16	·12	·10	·10	·09	·03	·06	·06	·04	·05	·04	·06	·03	·06
17	·07	·07	·06	·05	·09	·10	·10	·06	·07	·10	·05	·09	·05
18	·03	..	..	..	·01	·01	·01	..	·03	..	..	·03	·06
19	·23	·21	·22	·10	·13	·13	·13	·14	·11	·15	·12	·11	·10
20	·07	·04	·03	·09	·02	·02	·03	..	·02	..	..	·01	·01
21	..	..	..	..	·01	..	·01	..	..	..	..	..	..
22	..	..	..	..	..	·01	·01	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	·02	·02	..	·01	..
24	·21	·22	·22	·23	·21	·24	·27	·24	·18	·22	·25	·32	·17
25	·04	·10	·10	·05	·02	·02	·14	·03	·06	·03	·03	..	·03
26	·13	·09	·03	·06	·06	·07	·10	·06	·03	..	·03	·03	·01
27	..	..	..	..	·01	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	·01	·01	..	..	..	..	..	..	..
30	·03	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	3·40	3·12	2·99	2·89	2·71	3·05	3·16	2·80	2·41	2·55	2·62	2·98	2·57
†	21·62	19·08	19·47	18·38	18·28	19·58	22·28	21·50	18·81	20·12	19·79	22·02	18·25

Day of Mo.	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..		..	..	..	..	..
2	·04	·05	·03	..	..	·04	·02		·02	·02	·01	·03	·02
3	·02	·02	·02	..	·04	·01	·01		·01	..	..	·01	·02
4	·10	·09	·13	·16	·17	·10	·11		·08	·06	·04	·08	·08
5	·08	·08	·05	·04	·04	·05	·03		·05	·05	·04	·07	·01
6	·65	·58	·58	·54	·56	·58	·53		·56	·53	·43	·60	·42
7	·21	·21	·21	·23	·20	·12	·21		·28	·24	·21	·20	·18
8	..	·01	..	·01	..	..	·05		·01	..	..	..	..
9	..	..	..	·02	..	·01	·01		·02	·01	..	..	..
10	..	..	..	..	..	..	·02		..	..	..	..	..
11	..	·01	..	..	..	..	·03		..	..	..	..	..
12	·56	·45	·48	·43	·23	·44	·44		·45	·46	·37	·62	·58
13	·50	·36	·41	·41	·75	·43	·50		·43	·44	·44	·49	·38
14	·13	·17	·16	·15	·18	·14	·15		·09	·08	·09	·14	·09
15	·05	·08	·10	·11	·14	·11	·09		·10	·10	·07	·07	·03
16	·04	·05	·06	·07	·06	·06	·10	RECORD CEASED.	·06	·04	·03	·06	·02
17	·06	·07	·10	·10	·08	·08	·08		·06	·06	·04	·06	·05
18	·01	..	..	..	..	..	·01		..	..	..	..	..
19	·13	·11	·12	·18	·11	·17	·17		·15	·15	·13	·10	·11
20	·04	..	·02	·04	·15	·03	·08		·04	·04	·03	·03	·03
21	·01	·05	..	..	..	..	..		..	..	..	..	..
22	·02	..	..	..	..	..	..		..	..	..	..	·01
23	..	·02	..	..	..	..	..		..	..	..	..	..
24	·31	·21	·33	·25	·26	·27	·20		·29	·26	·18	·30	·20
25	·03	·03	·02	·02	·06	·03	·07		·03	·03	·01	·02	·03
26	·03	·03	·04	·07	·03	·07	·10		·07	·06	·04	·03	·02
27	..	..	..	..	..	..	..		..	..	..	..	..
28	..	..	..	..	..	·01	..		..	..	..	..	..
29	..	·01	..	..	..	..	..		..	..	..	..	..
30	..	..	..	..	..	..	..		..	..	..	..	..
31	..	..	..	..	..	..	..		..	..	..	..	..
*	3·02	2·69	2·86	2·83	3·06	2·75	3·01		2·80	2·63	2·16	2·91	2·28
†	20·29	19·62	19·82	19·15	18·91	18·88	19·00		18·23	15·80	14·82	18·39	15·25

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(November, 1896.)

The month has been cold and dry, and is the coldest November in the past eleven years. On the 30th and on December 1st children were sliding on the ponds at Warlingham. Fogs and frosts have been numerous. There has been a great deal of sickness, including many cases of influenza. At Croydon (Park Hill) the maximum temperature did not reach 50° on any day, and was below 40° on four days; and the minimum temperature was below 40° on twenty-eight days. Lightning was seen on the 1st at Nutfield and Upper Gatton. A solar halo was observed at Croydon (Whitgift) and Upper Gatton on the 12th, and a lunar halo at Croydon (Whitgift) on the 16th, and a lunar corona with bright colours at Upper Gatton on the 20th. At Upper Gatton on the 29th a beautiful meteor was seen at 9.3 p.m.; it was of a bright violet colour with a brilliant trail, and was visible for 3″ in the S.S.W. travelling towards N.W. The mean temperature of the month is about 3° below the average, and was at Croydon (Duppas House) 40·5°, at Croydon (Whitgift) 40·3°, at Wallington 40·2°, at Redhill and Waddon 39·5°, at Chipstead 38·8°, and at Upper Gatton 36·5°. There were recorded at Upper Gatton 76·8 hours of bright sunshine, and at Hayes Common 64·2 hours, and Wallington 48·3 hours of sunlight; the amount at Wallington being the mean for November of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·13	·12	·13	·16	·08	·09	·11	·11	·09	·13	·12	·13	·13	·20	·20	·19	·09		·18	·17			·17	·20	·15	·14
2	·07	·05	·09	·12	·10	·09	·05	·07	·10	·08	·10	·09	·09	·09	·14	·12	..		·20	·11			·12	·06	·06	·04
3	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..		..	..			·01	..	..	..
4	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..			..	·01	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			·01	..	..	..
6	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
7	·87	·82	·70	·80	·70	·58	·61	·65	·66	·66	·57	·64	·68	·63	·62	·42	·49		·60	·55			·58	·58	·75	·75
8	·05	..	·04	·02	·04	·04	·01	·02	·03	·02	·04	·01	·02	·02	·04	·01	·07		·03	..			·03	·03	·02	·02
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
10	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
11	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
13	·13	·15	·18	·22	·19	·14	·22	·23	·21	·21	·18	·20	·19	·23	·23	·17	·18		·22	·21			·24	·23	·17	·22
14	·50	·42	·48	·50	·37	·29	·34	·33	·37	·37	·33	·39	·42	·37	·37	·36	·27		·39	·39			·47	·40	·29	·22
15	·14	..	·10	·13	·12	·11	·12	·11	·11	·12	·10	·10	·10	·13	·16	·11	·17	MONTHLY GAUGE.	·15	·10	RECORD CEASED.	OBSERVER DEAD.	·11	·12	..	·10
16	..	..	..	..	·02	·02	..	..	..	..	..	·01	..	..	·02	..	..		..	..			·01	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
18	·05	·03	·03	·05	..	·03	·03	·03	·03	·03	·03	·02	·03	·03	·04	..	..		·04	..			·03	·04	·03	·03
19	..	·02	·02	·03	·07	·04	·04	·03	·04	·03	·03	·02	·02	·02	·06	..	·07		·03	·03			·03	·03	·02	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	·03	..	..
21	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	·01
22	..	..	..	·03	..	·01	..	·01	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
25	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
27	..	·04	·04	·07	·06	·06	..	·05	·06	·07	·07	·06	·06	·08	·06	..	..		·08	..			·08	·08	·02	·02
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			·01	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..			..	..	..	..
*	1·94	1·66	1·81	2·16	1·76	1·50	1·53	1·67	1·70	1·72	1·57	1·67	1·74	1·81	1·94	1·38	1·34	1·55	1·92	1·56			1·90	1·81	1·51	1·55
†	27·76	28·41	25·49	33·65	26·89	26·51	27·40	27·23	26·58	26·89	28·74	27·84	26·63	29·84	29·98	23·17	28·07	28·91	30·53	24·37			26·41	26·29	23·58	23·14

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·20	·15	·15	·21	·15	·15	·14	·15	·17	·17	·17	·17
2	·06	·05	·06	·05	·05	·05	·05	·05	·05	·05	·05	·05
3	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	·01	..	..	..	·01
7	·71	·63	·60	·59	·58	·50	·53	·56	·58	·57	·58	·56
8	..	·02	·02	·02	·02	·02	·06	·01	·03	·06	·02	·02
9	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	·01	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	·26	·18	·22	·21	·24	·21	·22	·23	·21	·24	·23	·21
14	·46	·40	·32	·36	·35	·33	·36	·34	·31	·37	·35	·32
15	·11	·10	·10	·10	·09	·10	·09	·09	·10	·10	·11	·12
16	..	·01	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	·03	·02	·02	·03	·03	·03	·03	·02	·03	·03	·03	·03
19	·03	·01	·01	·01	·02	..	·02	·02	·01	·02	·01	·02
20	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	·01	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..
27	..	·03	·03	·04	·04	·04	·04	·03	·03	·01	·04	·04
28	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..
*	1·86	1·60	1·53	1·62	1·58	1·43	1·54	1·52	1·52	1·62	1·59	1·55
†	28·36	23·40	22·92	23·94	23·77	21·91	23·29	22·76	21·78	24·90	23·66	22·29

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Wilming-ton	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·19	·18	·19	·29	RECORD CEASED.	·20	·22	·27	·22	·15	·11	·21	·17	·17
2	·05	·14	·08	·09		·09	·09	..	·13	·15	·05	·08	·05	·06
3	..	·01	..	..		..	..	..	..	..	..	..	..	..
4	·01	..	·01	..		..	..	..	..	..	..	..	..	..
5	·01	..	..	..		..	..	..	..	..	..	..	..	..
6	..	..	..	..		..	..	..	..	..	..	..	..	..
7	·57	·62	·60	·65		·51	·53	·60	·48	·50	·46	·53	·58	·60
8	·02	·03	·01	·02		·04	·03	·04	..	..	..	·04	·04	·03
9	..	..	·01	..		..	..	..	..	..	·01	..	..	..
10	..	..	..	..		·01	..	..	..	..	..	..	..	..
11	..	..	..	..		..	..	..	..	..	..	..	..	..
12	..	..	..	..		·01	..	..	..	..	..	..	..	..
13	·20	·20	·18	·18		·16	·22	·23	·22	·23	·20	·25	·25	·23
14	·41	·45	·48	·45		·41	·43	·44	·42	·33	·22	·30	·31	·30
15	·12	·15	·13	·14		·15	·15	·17	·12	·10	·08	·15	·11	·13
16	..	..	..	..		·01	..	..	·01	..	..	..	..	..
17	..	..	..	..		..	..	..	..	..	..	..	..	..
18	·04	·03	·03	·02		..	·02	·02	..	·03	·02	..	·03	·03
19	·02	·02	·02	·02		·06	·02	..	·03	·02	·01	·03	·02	·03
20	..	..	..	..		..	..	·01	..	..	..	..	..	..
21	..	..	..	..		..	..	..	..	..	..	..	..	..
22	..	..	..	..		·02	..	·01	..	·01	..	..	·01	..
23	..	..	..	..		..	..	..	..	..	..	..	..	..
24	..	..	..	..		..	..	..	..	..	..	..	..	..
25	..	..	..	..		..	..	..	..	..	..	..	..	..
26	..	..	..	..		..	..	..	..	..	..	..	..	..
27	·05	·10	·06	·07		·09	·08	·07	·05	·04	·04	·08	·06	..
28	..	..	..	..		..	..	..	..	..	..	..	..	..
29	..	..	..	..		..	..	..	..	..	..	..	..	..
30	..	..	..	..		..	..	..	..	..	..	..	..	..
*	1·72	1·93	1·80	1·93		1·76	1·79	1·86	1·68	1·56	1·20	1·67	1·63	1·58
†	26·28	28·87	26·35	28·49		25·75	25·29	28·09	27·06	25·64	20·49	25·62	22·23	22·09

* The figures in this row give the totals for the month.   † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1896.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·18	·18	·18	·20	·11	·13	·15	·15	·09	·08	·13	·15	·06
2	·07	·05	·06	·08	·04	·06	·07	·06	·03	·03	·05	·03	·02
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	·01	..	..	..	..	..	..	..	..
7	·56	·70	·53	·50	·46	·60	·62	·65	·56	·53	·64	·66	·49
8	·04	·02	·02	·07	·01	..	·05	·07	·03	·03	·02	..	·01
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	·01	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·18	·20	·19	·07	·16	·19	·20	·24	·16	·14	·19	·17	·20
14	·33	·36	·28	·40	·14	·18	·18	·18	·11	·19	·18	·20	·19
15	·14	·15	·13	·10	·10	·11	·13	·11	·02	·12	·11	·12	·11
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·02	·02	·04	·02	·02	..	·04	·02	·03	·03	·01	·03	·03
19	·03	·02	·02	..	·02	·05	·03	·01	·02	..	·01	·01	·02
20	..	..	..	..	·01	..	·01	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·08	·03	·02	·04	..	·02	·03	..	..	..	..	..	·01
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·63	1·73	1·47	1·48	1·08	1·35	1·51	1·49	1·05	1·15	1·34	1·37	1·14
†	23·25	20·81	20·94	19·86	19·36	20·93	23·79	22·99	19·86	21·27	21·13	23·39	19·39

Day of Mo.	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·12	·16	·20	·19	·11	·17	·17		·12	·12	·14	·12	·09
2	·05	·07	·07	·08	·19	·08	·07		·03	·03	·04	·06	·03
3	..	·01	..	..	..	..	..		..	..	..	..	..
4	..	..	..	..	..	..	..		..	..	..	..	..
5	..	..	..	..	..	..	..		..	..	..	..	..
6	..	..	..	..	..	..	..		..	..	..	..	..
7	·44	·43	·60	·48	·55	·49	·50		·48	·44	·40	·43	·40
8	·05	·02	·02	·03	..	·03	·05		..	·02	·01	·04	..
9	..	·01	..	..	..	..	..		..	..	..	..	..
10	..	..	..	..	..	..	..		..	..	..	..	..
11	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	·01	..		..	..	..	..	..
13	·18	·18	·17	·22	·09	·18	·20		·18	·16	·14	·13	·20
14	·14	·17	·20	·16	·31	·18	·19		·18	·15	·16	·18	·16
15	·14	·14	·15	·15	·11	·15	·10		·11	·12	·14	·13	·10
16	..	·01	..	..	..	..	..	RECORD CEASED.	..	..	..	..	..
17	..	..	..	..	..	..	..		..	..	..	..	..
18	·03	·03	·02	·03	..	·04	·03		·03	·02	·02	·03	·02
19	·02	·03	·03	·02	..	·02	·02		·04	·03	·02	·03	·03
20	..	..	..	..	..	..	..		..	..	..	..	..
21	..	..	..	..	..	..	..		..	..	..	..	..
22	..	..	..	..	..	·01	..		..	..	..	..	..
23	..	..	..	..	..	..	..		..	..	..	..	..
24	..	..	..	..	..	..	..		..	..	..	..	..
25	..	..	..	..	..	..	..		..	..	..	..	..
26	..	..	..	..	..	..	..		..	..	..	..	..
27	..	·01	·02	·04	..	·03	·02		·02	·01	..	..	..
28	..	..	..	..	..	..	..		..	..	..	..	..
29	..	..	..	..	..	..	..		..	..	..	..	..
30	..	..	..	..	..	..	..		..	..	..	..	..
*	1·17	1·27	1·48	1·40	1·36	1·39	1·35		1·19	1·10	1·07	1·15	1·03
†	21·46	20·89	21·30	20·55	20·27	20·27	20·35		19·42	16·90	15·89	19·54	16·28

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(December, 1896.)

The month has been a wet one, with a rainfall, if we may take the long average at Greenwich as fairly representing the district, of about an inch and a quarter above the average. The month has been warm and sunless. Fogs have been very prevalent, that on the 16th at Wallington, and on the 21st at Sidcup, being especially bad. Snow fell throughout the district on the 19th, 20th, and 21st, and at some places on the 15th as well; at Merstham the snow, on the 20th, one inch in depth yielded ·08 in. of water. The month has been very unhealthy, influenza being very prevalent. At Croydon (Park Hill) the maximum temperature was 50° and upwards on four days, and 40° and upwards on twenty-one days. Lightning was seen at Upper Gatton on the 4th, and hail fell there on the 5th. A solar halo was seen at Nutfield on the 4th, and one at Upper Gatton on the 13th. At Upper Gatton a brilliant meteor was seen at 7.54 p.m. on the 18th, emitting bright sparks, followed shortly afterwards by a loud explosion; it was visible for 3″, and was first seen in the E.S.E. travelling N.E. The mean temperature of the month is about the average, and was at Croydon (Whitgift) 40·1°, at Wallington 39·7°, at Croydon (Duppas House) 39·3°, at Waddon 38·8°, at Chipstead 37·9°, and at Upper Gatton 36°. There were recorded at Hayes Common 26·7 hours, and Wallington 23·3 hours of sunlight, which latter amount is 6 per cent. below the December mean of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* December, 1896.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·17	·15	·13	·15	·10	·09	·13	..	·11	·12	·10	·11	·12
2	·43	·41	·43	·50	·48	·48	·56	·61	·47	·47	·47	·48	·38
3	·15	·18	·18	·15	·12	·07	·06	·13	·12	·10	·09	·11	·12
4	1·10	·83	·88	·90	·75	·59	·76	·78	·62	·67	·70	·70	·71
5	·61	·52	·50	·40	·30	·24	·38	·40	·26	·30	·32	·31	·31
6	·13	·10	·08	·10	·11	·06	·03	·04	·10	·09	·10	·08	·09
7	..	·01	..	..	..	..	..	..	..	..	..	..	..
8	·11	·10	·13	·10	·06	·03	·06	·06	·06	·05	·05	·06	·08
9	·03	·03	·05	·08	·05	·05	·04	·05	·07	·08	·10	·09	·08
10	·21	·14	·21	·30	·14	·13	·14	·17	·14	·16	·15	·16	·20
11	·02	·03	·02	·05	·02	·02	·02	·02	·02	·02	·02	·02	·13
12	·23	·21	·24	·25	·17	·15	·16	·17	·16	·17	·18	·18	·24
13	·65	·60	·45	·46	·46	·42	·45	·46	·42	·40	·48	·40	·38
14	·08	·07	·05	·06	·05	·06	·07	·05	·05	·04	·07	·04	·04
15	·02	..	..	·05	·01	·01	..	..	·01	·01	·01	·01	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	·01	..	·01	·01
20	·06	·04	·07	·10	·08	·06	·11	·10	·08	·09	·08	·08	·09
21	·01	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·46	·47	·38	·45	·39	·43	·37	·37	·38	·41	·49	·42	·49
25	..	·03	..	..	..	..	..	..	·01	..	..	..	..
26	·08	·06	·10	·15	·13	·13	·10	·10	·11	·14	·15	·15	·12
27	·30	·29	·34	·45	·15	·17	·23	·29	·16	·22	·20	·22	·25
28	·12	·17	·14	·30	·30	·17	·21	·19	·28	·23	·20	·22	·20
29	·01	·02	·02	·06	·01	·01	·02	·01	·01	·02	·02	·01	·01
30	·13	·18	·13	..	·14	·09	·12	·09	·12	·17	·14	·18	·14
31	·11	·10	·08	·10	·09	·11	·10	·08	·09	·10	..	·11	·11
*	5·22	4·74	4·61	5·16	4·11	3·57	4·12	4·17	3·85	4·07	4·12	4·15	4·31
†	32·98	33·15	30·10	38·81	31·00	30·08	31·52	31·40	30·43	30·96	32·86	31·99	30·94

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Warling-ham	Coulsdon	Kenley (Ingleside)	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·12	·05	·12	MONTHLY GAUGE.	·11	·09	RECORD CEASED.	RECORD CEASED.	·07	·08	·20	·20
2	·42	·45	·29	·42		·40	·27			·33	·32	·36	·32
3	·09	·09	·23	·06		·08	·07			·09	·10	·15	·11
4	·70	·67	·74	·51		·69	·46			·80	·89	·93	·82
5	·38	·34	·18	·30		·32	·24			·33	·30	·37	·32
6	·04	·13	·03	·06		·07	·08			·11	·08	·08	·05
7	..	·01	·05	..		·02	..			..	·02	..	..
8	·06	·07	·07	·05		·06	·05			·08	·06	·07	·05
9	·10	·10	·08	·07		·11	·06			·08	·07	·06	·03
10	·17	·12	·04	·14		·15	·15			·18	·08	·07	·05
11	·02	..	..	·04		·02	·03			·05	·07	·03	..
12	·18	·21	·20	·18		·25	·22			·25	·21	·17	·15
13	·45	·45	·47	·32		·47	·30			·40	·39	·30	·26
14	·06	·10	·05	..		·08	·05			·05	·06	·06	·07
15	..	·01	..	..		·01	..			..	·02	·01	·01
16	..	..	..	..		..	..			·03	·01	..	..
17	..	..	..	..		..	..			..	..	..	..
18	..	..	..	..		..	..			..	..	..	..
19	..	..	..	..		·02	..			..	·03	·02	·02
20	·11	·15	·10	..		·11	..			·08	·05	·02	·04
21	..	..	..	..		..	..			·01	..	·03	·01
22	..	..	..	..		..	..			..	..	..	..
23	..	..	..	..		..	..			..	..	..	..
24	·48	·49	·31	·51		·55	·63			·55	·40	·20	·20
25	·03	..	..	..		..	..			..	·02	..	..
26	·15	·21	·04	·19		·15	·10			·12	·11	·10	·08
27	·31	·20	·12	..		·31	·20			·18	·19	·16	·13
28	..	·27	·20	·12		·15	·20			·25	·17	·11	·09
29	·03	·05	·01	..		·01	·03			·01	·03	·01	..
30	·17	·21	·06	·09		·18	·10			·12	·07	·08	·07
31	·12	·12	·09	·09		·14	·10			·11	·10	·09	·09
*	4·17	4·57	3·41	3·27	4·15	4·46	3·43			4·28	3·93	3·68	3·17
†	34·01	34·55	26·58	31·34	33·06	34·99	27·80			30·69	30·22	27·26	26·31

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·17	·14	·09	·10	·10	·10	·10	·10	·12	·10	·09	·10	·07
2	·35	·32	·32	·34	·32	·30	·35	·33	·37	·36	·35	·37	·34
3	·17	·16	·12	·10	·08	·06	·07	·06	·06	·07	·06	·06	·08
4	·82	·77	·75	·77	·70	·64	·75	·73	·65	·75	·71	·66	·77
5	·36	·28	·25	·24	·24	·22	·22	·23	·22	·25	·25	·22	·25
6	·10	·09	·05	·07	·06	·08	·08	·07	·06	·08	·07	·07	·08
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·10	·07	·05	·05	·04	·05	·04	·04	·04	·05	·05	·05	·07
9	·09	·05	·05	·06	·06	·06	·05	·05	·05	·06	·07	·07	·08
10	·19	·07	·07	·09	·08	·05	·08	·08	·05	·08	·06	·08	·11
11	·05	·02	·02	·03	·03	·03	·02	·03	·02	·03	·03	·02	·05
12	·25	·22	·20	·22	·19	·18	·18	·19	·17	·20	·18	·18	·20
13	·37	·38	·36	·34	·33	·34	·38	·36	·36	·38	·39	·39	·33
14	·06	·05	·04	·03	·03	·03	·02	·03	·03	·04	·03	·02	·04
15	..	·01	..	..	·01	..	..	..	..	..	..	·01	·01
16	·02	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	·01	..	..	·01	..	..	·01	..	·02
20	·10	·06	·06	·06	·06	·08	·07	·06	·06	·03	·06	..	·09
21	..	..	..	..	·01	..	..	..	..	·02	..	·05	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·45	·45	·38	·37	·35	·33	·35	·34	·31	·34	·31	·32	·30
25	..	..	..	..	..	..	·12	..	..	·03	..	..	..
26	·12	·12	·11	·13	·13	·15	·01	·13	·14	·12	·14	·10	·14
27	·25	·17	·18	·19	·18	·18	·21	·18	·16	·23	·18	·20	·19
28	·13	·09	·12	·14	·14	·12	·07	·13	·12	·12	·13	·14	·16
29	..	..	..	..	..	·01	..	..	..	..	..	..	·01
30	·09	·06	·07	·08	·08	·08	·06	·06	·06	·07	·07	·08	·13
31	·13	·10	·08	·08	·08	·07	·07	·07	·07	·08	·07	·05	·07
*	4·37	3·68	3·37	3·49	3·31	3·16	3·30	3·28	3·12	3·49	3·31	3·24	3·59
†	32·73	27·08	26·29	27·43	27·08	25·07	26·59	26·04	24·90	28·39	26·97	25·53	29·87

Day of Mo.	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	W. Wickhm Layhms. F.	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Wilmington	Chislehurst	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	·07	·05	RECORD CEASED.	·06	·05	·07	·04	·02	·02	·10	·12	·15
2	·34	·34	·40		·35	·29	·34	·33	·30	·44	·47	·49	·45
3	·10	·09	·09		·07	·07	·07	·05	·03	·06	·05	·05	·06
4	·73	·73	·77		·73	·80	·77	·68	·60	·46	·61	·64	·59
5	·23	·24	·26		·24	·28	·28	·25	·22	·14	·19	·18	·20
6	·13	·10	·10		·11	·06	·12	·14	·09	·07	·09	·11	·08
7	..	..	..		·01	·01	·01	..	·01	..	..	..	..
8	·06	·10	·06		·07	·05	·07	·04	·04	·02	·04	·04	·03
9	·11	·10	·09		..	·06	·11	·09	·08	·07	·10	·07	·08
10	·12	·15	·10		·09	·10	·13	·10	·08	·02	·05	·05	·04
11	·07	·07	·05		·07	·05	·08	·04	·04	·05	·05	·04	·04
12	·27	·25	·27		·23	·25	·27	·29	·26	·15	·21	·18	·16
13	·39	·41	·45		·38	·38	·46	·48	·45	·43	·39	·44	·37
14	·06	·03	·03		·04	·04	·02	·01	·03	·01	·02	·02	·03
15	..	..	..		·02	..	·01	..	..	..	..	·01	..
16	·01	..	..		..	..	..	..	..	..	..	..	..
17	..	..	..		..	..	..	..	..	..	..	..	..
18	..	..	..		..	..	..	..	..	..	..	..	..
19	..	..	..		·01	·07	..	..	..	..	..	..	..
20	·08	·08	·03		·08	·10	·10	·08	·11	·07	·11	·10	·09
21	·03	..	..		..	·01	·02	·01	·01	·01	..	·01	..
22	..	..	..		·03	..	..	..	..	..	..	..	..
23	..	..	..		..	..	..	..	..	..	..	..	..
24	·33	·37	·38		·26	·26	·28	·25	·20	·14	·24	·18	·23
25	..	..	..		..	..	..	..	..	..	·01	..	..
26	·29	·13	·27		·16	·05	..	·13	·10	·11	·14	·14	·15
27	·06	·22	..		·18	·20	·34	·18	·12	·10	·15	·10	·10
28	·22	·18	·21		·17	·15	·27	·17	·16	·06	·12	·15	·15
29	·01	·01	..		·01	·02	·01	·01	..	..	..	..	..
30	·12	·11	·10		·13	·07	·14	·10	·07	·05	·09	·07	·07
31	·04	·09	·07		·06	·07	·09	·11	·10	·05	·12	·08	·09
*	3·86	3·87	3·78		3·56	3·49	4·06	3·58	3·12	2·53	3·35	3·27	3·16
†	32·73	30·22	32·27		29·31	28·78	32·15	30·64	28·76	23·02	28·97	25·50	25·25

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1896.**

Day of Mo	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·08	·16	·06	..	·21	·21	·21	·32	·38	·45	·32	·38
2	·38	·48	·50	·57	·45	·44	·46	·51	·43	·47	·42	·48
3	·06	·06	·06	·08	·07	·09	·11	·08	·10	·09	·08	·09
4	·58	·59	·62	·65	·46	·50	·62	·62	·65	·65	·66	·64
5	·22	·19	·25	·23	·17	·20	·24	·24	·24	·17	·24	·29
6	·10	·07	..	·03	·03	·02	·07	·04	·06	·05	·15	..
7	..	..	..	..	..	..	..	..	..	..	..	..
8	·05	·03	·05	·03	..	·01	·04	..	·04	·02	·03	·01
9	·07	·05	·04	·09	·04	·04	·07	·02	·03	·03	·03	·04
10	·06	·03	·03	..	·02	·03	·05	·01	·06	·07	·05	·08
11	·07	·04	·05	..	·01	·01	·03	..	·02	..	..	·01
12	·20	·18	·14	·17	·11	·11	·15	·12	·11	·12	·14	·15
13	·35	·36	·38	·32	·33	·32	·35	·33	·30	·30	·33	·35
14	·03	·03	·03	..	·03	·04	·05	·06	·05	·03	·04	·05
15	..	..	·01	..	·01	..	·02	..	..	..	·01	·01
16	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	·01	..	..	·01	..	·02
20	·10	·09	..	..	·04	·06	·06	·03	·03	·03	·03	·03
21	..	·01	..	..	·01	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	·01	..	..	..	..	..	..	..
24	·22	·23	·30	·40	·31	·36	·41	·45	·32	·39	·42	·46
25	..	..	..	..	·01	..	·02	..	·05	..	..	..
26	·24	·14	·13	·12	·17	·16	·17	·12	·08	·12	·13	·16
27	·14	·13	·13	·15	·15	·14	·23	·16	·18	·19	·22	·24
28	·13	·12	·12	·16	·09	·07	·08	·08	·08	·09	·06	·05
29	..	..	·01	..	..	·01	·02	..	·01	..	..	·01
30	·09	·07	..	·03	·06	·04	·09	·05	·06	·04	·06	·06
31	·09	·08	·10	·06	·03	·03	·08	·04	·05	·03	·05	·03
*	3·26	3·14	3·01	3·09	2·82	2·89	3·64	3·28	3·33	3·35	3·47	3·64
†	26·51	23·95	23·95	22·95	22·18	23·82	27·43	26·27	23·19	24·62	24·60	27·03

Day of Mo	Richmond	Wandswth Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Woolwich	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·35	·26	·24	·20	·20	·30	·16	·18		·21	·19	·23	·29	·22
2	·55	·56	·46	·50	·49	·55	·48	·52		·67	·59	·57	·55	·58
3	·09	·12	·08	..	·06	·10	·05	·05		·05	·04	·05	·10	·09
4	·55	·60	·41	·54	·42	·41	·31	·41		·49	·40	·41	·57	·45
5	·21	·22	·16	·16	·16	·16	·12	·03		·13	·10	·11	·15	·15
6	·02	·01	·04	·04	·06	·13	·16	·06		·04	·04	·04	·06	..
7	..	·01	·01	·01	..	..	·01	·03		·01	..	..	..	..
8	·02	·01	·02	·03	·02	..	·02	·02		·02	·01	·02	·01	..
9	·04	·04	·05	·06	·06	·06	·06	·08		·06	·05	·03	·05	·02
10	·07	·03	·04	·04	·04	·05	·03	·03		·03	·02	..	·03	·02
11	·01	·01	·01	·02	·03	..	·02	·02		·02	·01	·01	·01	..
12	·14	·12	·08	·11	·11	·14	·12	·15		·13	·11	·10	·11	·12
13	·36	·35	·32	·36	·32	·37	·25	·41		·36	·28	·32	·35	·27
14	·04	·03	·03	·03	·04	·06	·02	·02		·03	·03	·02	·02	·03
15	·01	..	·01	·01	·01	..	..	..		..	..	..	·01	..
16	..	..	·01	..	..	..	..	..	RECORD CEASED.	..	..	..	..	..
17	..	..	..	..	..	..	..	..		..	..	..	..	..
18	..	..	..	..	..	..	..	..		..	..	..	..	..
19	·01	..	..	·01	·06	..	·01	..		·01	..	..	..	..
20	·03	·04	·06	·08	·04	·08	·07	·09		·05	·05	·04	·04	·03
21	..	·01	·01	·01	..	..	..	·01		·01	..	..	·02	..
22	..	..	..	..	..	..	..	..		..	..	..	..	..
23	..	..	..	..	..	..	·01	..		..	..	..	..	..
24	·38	·34	·27	·26	·26	·23	·27	·23		·30	·29	·28	·30	·31
25	..	..	·01	..	·05	..	·01	..		·01	..	..	..	..
26	·16	·18	·17	·17	·10	·13	·19	·12		·10	·11	·10	·14	·12
27	·21	·17	·13	·15	·13	..	·14	·12		·16	·13	·14	·12	·13
28	·09	·12	·10	·13	·10	·23	·13	·08		·07	·08	·07	·15	·11
29	..	..	·01	..	..	..	·01	..		..	..	..	..	..
30	·05	·07	·05	·05	..	..	·07	·05		·04	·04	·03	·05	·03
31	·04	·06	·04	·05	·12	·13	·08	·08		·05	·06	·04	·05	·03
*	3·43	3·36	2·82	3·02	2·88	3·13	2·80	2·79		3·05	2·63	2·61	3·18	2·71
†	22·82	24·82	23·71	24·32	23·43	23·40	23·07	23·14		22·47	19·53	18·50	22·72	18·99

* The figures in this row give the totals for the month. † The totals from January 1st.

APPENDIX II.

Falls of 1·00 in. and upwards.

March 20th.—Walton Heath, 1·17 in.; Abinger (The Rectory), 1·07 in.

June 10th.—Farningham Hill, 1·76 in.; Wilmington, 1·58 in.; Abinger (The Hall), 1·55 in.; Westerham, 1·51 in.; Abinger (The Rectory), 1·46 in.; Keston (Tower Fields), 1·43 in.; West Wickham (Wickham Court), 1·40 in.; Orpington and Bickley, 1·35 in.; Keston (Bradfield), 1·34 in.; Chislehurst, 1·33 in.; Hayes Common, 1·23 in.; Bromley Common, 1·22 in.; West Wickham (Layham's Farm) and Forest Hill (The Nurseries), 1·21 in.; Walton Heath and Addington (Park Farm), 1·17 in.; Bromley, 1·15 in.; Reigate, 1·14 in.; Merstham, 1·11 in.; Reigate Hill (Margery Hall), 1·10 in.; Eltham, 1·09 in.; Addington (Pumping Station), 1·08 in,; Dorking (Denbies), 1·07 in.; Upper Gatton and Warlingham, 1·05 in.; Redhill and Reigate Hill (Nutwood Lodge), 1·04 in.; Kenley (Hazelea), 1·03 in.; Chaldon, Caterham, and Purley (Tudor Cottages), 1·02 in.; and Nutfield, 1·00 in.

June 24th.—Addington (Park Farm), 2·30 in.; Westerham, 2·20 in.; West Wickham (Wickham Court), 1·63 in.; Addington (Pumping Station), 1·42 in.; West Wickham (Layham's Farm), 1·25 in.; and Addington Hills, 1·08 in.

July 15th.—Marden Park, 1·15 in.

July 30th.—Orpington, 1·40 in.; Farningham Hill, 1·21 in.; Keston (Tower Fields), 1·20 in.; Hayes Common and Keston (Bradfield), 1·17 in.; West Wickham (Wickham Court and Layham's Farm), 1·14 in.; and Merstham, 1·08 in.

September 1st.—Keston (Tower Fields), 2·62 in.; Keston (Bradfield), 2·54 in.; Merstham, 2·51 in.; West Wickham (Layham's Farm), 2·39 in.; Chaldon, 2·35 in.; Reigate Hill (Nutwood Lodge), 2·33 in.; Abinger (The Rectory), 2·28 in.; Reigate, 2·27 in.; Reigate Hill (Margery Hall), 2·25 in.; Addington (Park Farm), 2·22 in.; Marden Park, 2·18 in.; Harp's Oak Cottage, 2·16 in.; West Wickham (Wickham Court), 2·12 in.; Warlingham, 2·09 in.; Addington (Pumping Station), 2·03 in.; Caterham, 2·01 in.; Orpington, 1·96 in.; Abinger (The Hall), 1·88 in.; Upper Gatton, 1·87 in.; Redhill, 1·79 in.; Hayes Common, 1·76 in.; Wallington, 1·75 in.; Waddon, 1·72 in.; Ashtead and Banstead, 1·70 in.; Beddington, 1·67 in.; Addington Hills, 1·66 in.; Croydon (Duppas House), 1·64 in.; Dorking (Denbies), 1·63 in.; Croydon (Waddon New Road), 1·61 in.; Croydon (Whitgift), 1·60 in.; Croydon (Park

Hill), 1·49 in.; Purley (Tudor Cottages), 1·48 in.; Croydon (Lower Addiscombe Road), 1·45 in.; Nutfield and Kenley (Hazelea), 1·43 in.; Oxshott and Farningham Hill, 1·39 in.; Kenley (The Cottage), 1·36 in.; Coulsdon, 1·30 in.; Croydon (Brimstone Barn), 1·29 in.; Walton Heath, 1·07 in.; and Croydon (Chatfield Road), 1·00 in.

September 4th.—Sutton, 1·65 in.; Surbiton, 1·43 in.; Walton Heath and New Malden, 1·40 in.; Kingston, 1·25 in.; Wilmington, 1·16 in.; Reigate, 1·10 in.; Reigate Hill (Margery Hall), 1·06 in.; and Farningham Hill, 1·03 in.

September 10th.—Banstead, 1·84 in.; Chaldon, 1·20 in.; Chipstead, 1·19 in.; Greenwich, 1·09 in.; and Sutton, 1·02 in.

September 12th.—New Malden, 1·27 in.; Kingston, 1·12 in.; and Surbiton, 1·04 in.

September 24th.—Dorking (Denbies), 1·06 in.; Abinger (The Hall), 1·05 in.; Addington (Pumping Station), 1·03 in.; Abinger (The Rectory), 1·01 in.; and Keston (Tower Fields), 1·00 in.

October 6th.—Walton Heath, 1·55 in.; Keston (Tower Fields), 1·09 in.; Nutfield and Addington (Park Farm), 1·08 in.; Abinger (The Rectory), 1·07 in.; Addington (Pumping Station) and Orpington, 1·06 in.; Merstham and Kenley (Hazelea and The Cottage), 1·05 in.; Upper Gatton, Chaldon, and Westerham, 1·04 in.; Redhill and Harp's Oak Cottage, 1·03 in.; Caterham and West Wickham (Wickham Court), 1·02 in.; and Abinger (The Hall) and Reigate Hill (Margery Hall), 1·00 in.

December 4th.—Abinger (The Hall), 1·10 in.

CONTENTS.

PROCEEDINGS.

TRANSACTIONS.

Croydon Microscopical and Natural History Club.

OFFICERS FOR 1897.

President.—J. M. HOBSON, M.D.

Vice-Presidents. — JOHN BERNEY, F.R.M.S.; PHILIP CROWLEY, F.L.S., F.Z.S.; HENRY S. EATON, M.A., F.R.Met.Soc.; HENRY T. MENNELL, F.L.S.; HENRY G. THOMPSON, M.D., F.R.M.S., J.P.; EDWARD LOVETT; H. FRANKLIN PARSONS, M.D., F.G.S.; and W. MURTON HOLMES.

Treasurer.—EDWARD B. STURGE.

Librarian.—ALFRED ROODS.

Committee. — J. H. BALDOCK; H. C. COLLYER; J. H. DRAGE; JAMES EPPS, Jun., F.L.S.; G. W. MOORE; G. E. NEWBY, F.R.C.S.; E. J. PLATTS; N. F. ROBARTS; and C. H. BURNABY SPARROW.

Hon. Secretary. — R. F. GRUNDY (*112, Lower Addiscombe Road, Croydon*), to whom all communications may be addressed.

PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON

MICROSCOPICAL & NATURAL HISTORY

CLUB.

FEBRUARY 16, 1897, TO JANUARY 17, 1898.

CROYDON:

PRINTED FOR THE CLUB, BY WEST, NEWMAN & CO., HATTON GARDEN, LONDON.

1898.

PROCEEDINGS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1897—98.

Twenty-eighth Annual Meeting,

Held at the Public Hall, Croydon, January 18th, 1898.

Dr. J. M. Hobson, President, in the chair.

The statement of accounts for the year 1897 was approved.

The President announced that the following had been nominated as officers of the Club for the ensuing year, and there being no other nominations they were duly elected :—President, J. M. Hobson, M.D., B.Sc.; Hon. Treasurer, Mr. F. J. Townend; Hon. Secretary, Mr. R. F. Grundy; Librarian, Mr. A. Roods; and Mr. Wm. Whitaker, F.R.S., F.G.S., and Mr. H. D. Gower members of the Committee to fill the vacancies caused by the retirement of Mr. H. C. Collyer and Mr. C. H. Burnaby Sparrow.

The following is a list of the officers for the year 1898 :—

President.—J. M. Hobson, M.D., B.Sc.

Vice-Presidents.—John Berney, F.R.M.S.; Philip Crowley, F.Z.S., F.L.S.; Henry S. Eaton, M.A., F.R.Met.Soc.; Henry T. Mennell, F.L.S.; Henry G. Thompson, M.D., J.P., &c.; Edward Lovett; H. Franklin Parsons, M.D., F.G.S.; and W. Murton Holmes.

Treasurer. — F. J. Townend (Alverley, Park Hill Rise, Croydon).

Librarian.—Alfred Roods.

Committee.—J. H. Baldock, F.C.S.; J. H. Drage; James Epps, Jun., F.L.S.; H. D. Gower; G. W. Moore; G. E. Newby, F.R.C.S.; E. J. Platts; N. F. Robarts, F.G.S.; and W. Whitaker, F.R.S., F.G.S.

Hon. Secretary.—R. F. Grundy (112, Lower Addiscombe Road, Croydon).

Botanical Sub-Committee. — Arthur Bennett, F.L.S., High Street, Croydon; J. Edmund Clark, B.A., B.Sc., 64, Clyde Road; James Epps, F.L.S., Norfolk House, Beulah Hill, Upper Norwood; A. Fitzgerald, 93, Addiscombe Road; W. Ingrams, Whitgift Schools, Church Road; H. T. Mennell, F.L.S. (Hon. Sec.), Park Hill Rise; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; Ernest Straker, Wallington.

Geological Sub-Committee.—George Hinde, Ph.D., F.G.S., F.R.S., Avondale Road; J. M. Hobson, M.D., B.Sc., 1, Morland Road; G. W. Moore, Bryndhurst, Dornton Road; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; N. F. Robarts, F.G.S. (Hon. Sec.), Abingdon, Addiscombe Grove; Thos. Walker, C.E., Warrington Road; Wm. Whitaker, F.R.S., Campden Road.

Meteorological Sub-Committee.—F. C.-Bayard, LL.M. (Hon. Sec.), Wallington; J. Edmund Clark, B.A., B.Sc., 64, Clyde Road; Thos. Cushing, F.R.A.S., Chepstow Road; Baldwin Latham, C.E., Duppas House, Croydon.

Microscopical Sub-Committee.—Rev. R. K. Corser, 57, Park Hill Road; T. A. Dukes, M.B., B.Sc., 16, Wellesley Road; E. Lovett, West Burton, Outram Road; W. Murton Holmes (Hon. Sec.), Glenside, St. Peter's Road; G. W. Moore, Bryndhurst, Dornton Road.

Photographic Sub-Committee.—J. H. Baldock, F.C.S. (Lanternist and Recorder), St. Leonard's Road; H. D. Gower (Hon. Sec.), 55, Benson Road; E. J. Platts, St. Leonard's Road; Alfred Roods, 67, Thornhill Road; C. J. L. Russell, 56, Coombe Road; A. J. Weightman, Langdale, Chepstow Rise.

Zoological Sub-Committee.—John Berney, F.R.M.S. (Hon. Sec.), Chatsworth Road; Philip Crowley, F.L.S., F.Z.S., Waddon; John Henry Drage, Tamworth Road, Croydon; C. H. Goodman, Bryn Cottage, Whyteleaf, Surrey; H. Lee, St. John's Grove; R. McLachlan, F.R.S., F.L.S., 23, Clarendon Road, Lewisham.

Anthropological Sub-Committee.—H. C. Collyer, Beddington; E. Lovett (Hon. Sec.), West Burton, Outram Road; N. F. Robarts, F.G.S., Abingdon, Addiscombe Grove; J. Watson Slack, 56, Park Lane; H. G. Thompson, M.D., 86, Lower Addiscombe Road.

Museum Sub-Committee.—J. M. Hobson, M.D., B.Sc. (Hon. Sec.), 1, Morland Road; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; Edward Lovett, Ashburton Road; J. H. Drage, Tamworth Road; Henry T. Mennell, F.L.S., 31, Park Hill Rise.

The President then delivered his annual Address, describing the operations of the Club during the past year, at the conclusion of which a hearty vote of thanks was passed to him for the Address and his services as President during the past year.

The President's Address.

Ladies and Gentlemen,

It comes to my turn as the latest of your Presidents to pass in review the work of this Club during the twenty-eighth year of its existence.

It is not my good fortune to have no deaths to record, for two members have passed away—Major F. C. S. Dyer and J. W. Justican. The total number of members on our roll is 237. There have been 32 new members elected, and 15 old members have resigned, showing a gain of 15 members. Thirteen ladies have joined our ranks since our resolution admitting ladies to our membership. One lady has become a regular contributor to the Photographic Album, and two or three ladies exhibited at the Annual Soirée, notably Miss Gladys Parsons, whose diligence brought together a valuable collection of shells of land and freshwater *Gasteropoda.* This little lady, though *une fille du régiment,* is not yet strictly speaking a member. I trust that in the coming year our lady members will be less backward in contributing to the work of our Society.

Balance-sheet.—It is an untoward fact that the balance on the General Account comes out on the wrong side this year. I am not aware if this has occurred before; it has certainly not occurred since January 7th, 1894, when the balance to the good was £59.

Now, I am departing somewhat from the practice of my predecessors in reviewing the year's work, for I am going to recall the various events in continuous chronological order. I do this because it has occurred to me that by making our doings once more, as it were, pass in regular procession before us, I may be able to infuse into my Address something of the warmth and colour of an active year.

The first meeting of all was in *January,* when an Anthropological Conversational Meeting was held under the direction of Mr. Lovett.

February 16*th,* 1897.—This was the first occasion on which I had the honour to preside over your deliberations. On this occasion Mr. Mennell showed some remarkably fine specimens of fluorspar crystals from Weardale.

Mr. Campbell-Bayard then read the Report of the Meteorological Sub-Committee for 1896. The number of stations in this very wide district, which extends south of the Thames from the Darenth in the east to the Mole in the west, increased from seventy-three to seventy-eight, and the number of observers from sixty-one to sixty-six. The rainfall for the year showed mainly a deficiency, being 1·75 in. *below* the average of forty years at Greenwich; but at Surbiton it was 0·18 in. *above* the average. September was a remarkably wet month, the very unusual proportion of five out of twelve days in which one inch or more fell occurring in that month. At Greenwich the fall for September was 3·14 in. above the forty years' average; at Wimbledon 3·57 in., and at Surbiton as much as 4·91 in. above the average. Places like Greenwich and Wimbledon lie to the north of the range of hills bordering the River Thames, while Surbiton lies to the west of them. This might possibly account for the excessive rainfall in the latter place. The excellent work of the Society in this direction had been favourably commented upon in many scientific papers in this country and abroad.

The next paper was by Dr. Franklin Parsons on "The Times of Appearance of Early Spring Flowers." This paper is printed in our 'Transactions' (Article 135).

An interesting discussion followed each paper.

A Conversational Meeting was held on *February* 24*th*, when Mr. Moore opened a conversation on Shingle Beaches, and several interesting points were discussed.

On *March* 16*th* a general Evening Meeting was held. Messrs. Epps, Jun., Mennell, and Lovett showed interesting objects of Japanese manufacture, amongst which were some metallic mirrors—brought, I think, by Mr. Lovett—in which you could see the object from the other side. Mr. Collyer showed a flint implement, and Mr. Sturge a coral rescued from a dust-heap. The event of the evening was Mr. Pelton's paper on "Japanese Lacquer, its History, Manufacture, and Decoration." This paper is printed in our 'Transactions' (Article 136).

On *March* 24*th* was a Conversational Meeting, when Dr. Parsons gave a valuable demonstration on Mosses.

On *April* 10*th* our first excursion took place. We went to the Hunterian Museum under the guidance of Dr. Franklin Parsons. Several wax models illustrating human anatomy were explained. We also inspected the vast collections illustrating the osteology of man and animals, as well as specimens of sponges, crustaceans, &c.; and ascending to the galleries, we examined wax models of the torpedo and its electrical apparatus, and also various specimens preserved in spirit illustrating the anatomy of internal organs.

On *April* 13*th*, at a general meeting, several members made observations on the rising of the Bourne water. I will give you further details on this subject when I read you Dr. Hinde's report.

Mr. Lovett then gave an address on the use of wooden tallies, a survival of a primitive appliance for reckoning. This was, strictly speaking, a demonstration, as the author did not write anything, though I hope he may be induced to do so, *with illustrations*, for our 'Transactions,' which would be otherwise incomplete. Our English word "tally" is derived from the French *tailler*, to cut, and *taillé*, a cut, and has, moreover, this special interest, that it has retained the fuller sound of the letter "l," which in modern French has been liquefied almost to disappearance. "Bill" is also derived from *bille*, a piece of wood. Without the actual object or a picture before one's eyes, it is not easy to follow a description. Suffice it to say that the tally consists of a piece of wood, out of which a small piece has been cut lengthwise in such a manner that when replaced in its original position it forms with its parent a complete rod or stick, and that when a score is recorded, a notch is cut across both pieces simultaneously. As each party to the transaction keeps his portion, no more notches can be cut by either till the two pieces are fitted together, otherwise they would not *tally*. By diligent search Mr. Lovett found tallies still in very general use in hop-gardens in Worcestershire, and in at least one garden in Kent, where, however, their use is rapidly dying out. He also found them to be in common use in certain bakers' shops in Brittany.

The next event was a half-day excursion to East Horsley and Sheere under the conduct of Mr. Baldock. I was not able to go, so I will let Mr. Baldock himself speak:—

"*May* 1*st*.—An excursion to East and West Horsley and Sheere. The day turned out beautifully fine. There was rather more than the usual attendance of members, and some excellent photographs were obtained, including some of the Old Church at West Horsley, and some of the lovely country and woodland passed through between there and Sheere, from which place the members returned by train to Croydon."

This excursion was followed by one on *May* 15*th* to Godstone and neighbourhood under the conduct of Mr. Platts, who has very kindly, at my request, furnished the following notes:—

"Excursion to Godstone, May 15th, 1897.—The party of eighteen members and friends left East Croydon at 3.30 p.m. for Woldingham. We walked through Marden Park, and thence by the Roman road, through the wood, to Rook's Nest, where we enjoyed the kind hospitality of the Hon. P. C. and Mrs. Glyn; and we were afterwards shown some of the curiosities contained in the house, notably a large bedstead made entirely of ivory and silver, taken from one of the Maharajas of India, as also a cabinet containing a fine collection of stick and leaf insects belonging to the family *Phasmidæ*. The party was then conducted by Mrs. Glyn through the extensive grounds to the American garden, and a very delightful excursion was brought to a close by a walk to Oxted, whence train was taken to Croydon at 7.45 p.m. A *Thecla rubi* was captured by Mr. Holmes, and many varieties of *Orchis* were observed in the woods."

Instead of the usual indoor meeting, a visit was paid on *May 29th* to South Norwood Sewage Farm. After reading a short paper on the theory of sewage purification as carried out on the farm ('Transactions,' Article 137), wherein I gave some results of bacteriological experiments which I had made with the sewage and with the effluent respectively, I conducted the party—a very small one—over the farm, beginning with the settling tanks and ending with the effluent; and with the help of Mr. Walker, Borough Engineer, I explained the practical workings. At the present time the whole of the purification of sewage at this farm is effected by passing the fluid, after screening, by gravitation through plots of growing rye grass. The subsoil at a very little distance from the surface being dense clay, little or no downward filtration can occur. Yet the effluent is on the whole a satisfactory one, tested both chemically and bacteriologically. My own observations of the latter kind go to show that at least ninety per cent. of the organisms are removed. It is proposed shortly to try experimentally a biological purification on this farm as carried out at Sutton.

We now come to the usual pause in general meetings, and find that until September 21st our activities were confined to excursions combining recreation with field work.

On Whit-Monday, *June 7th*, Dr. Franklin Parsons conducted the members to West Hoathly and Balcombe. The following is the report of the excursion contributed to the local press by Dr. Parsons:—

"A well attended excursion of this Club took place on Whit-Monday, through the beautiful Weald of Sussex, from West Hoathly to Balcombe. Arriving at West Hoathly Station at 11 o'clock, a steep ascent brought the party to the picturesque village of West Hoathly, which stands on a narrow and lofty ridge, commanding fine views northwards over the Medway valley, and southwards over that of the Sussex Ouse. A halt was made to examine the church, which contains some Norman work, a fine oak chancel roof, and some cast-iron memorial slabs—relics of the old Sussex iron industry. The route thence lay up and down a succession of ridges divided by steep wooded and rocky valleys, the bottoms of which were occupied by ponds, probably constructed to furnish water power to the old iron-works. At Philpotts, a large quarry exhibited an interesting section showing the junction of the Lower Tunbridge Wells Sandstone with the overlying East Grinstead Clay. The former bed is a massive sandstone, traversed by veins of spar; in its upper part is a bed of conglomerate, a consolidated pebble beach containing pebbles of dark quartzite derived from some rock far older than any exposed on the surface in this part of England. In this bed also some bones and teeth of reptiles and fishes were found. Above the conglomerate is a sandy layer showing distinct ripple marks formed on an old shore. In another quarry, by Wakehurst, many freshwater shells and other fossils were found in the Upper Tunbridge Wells Sandstone."

On *June 26th* there was an excursion to Weybridge, starting from Chertsey Bridge and going down the Thames to Walton Bridge. The conductor was Mr. Lincoln. The results were rather disappointing, as only three members turned up, and the photographic results were small. Mr. Lincoln writes:—"My object in suggesting an excursion into that neighbourhood was that it gave the Club an opportunity of getting a class of picture different to that which is obtainable near Croydon; but I find from experience that river pictures are apt to be disappointing, unless a good deal of time and trouble are spent on them." The distance in this case appears to have militated against the success of the expedition.

On *July 10th*, a Saturday afternoon excursion was conducted by Mr. Goodman. A fair number of members and friends took train to Coulsdon Station, where we were met by Mr. Goodman. The route taken was over Farthing Down on the north side of which *Spiræa filipendula* was growing in small clumps in fair abundance and in flower. As Mr. Mennell has pointed out to me, *S. filipendula*, which is a distinctly chalk species, must not be confounded with *S. ulmaria*, the meadow-sweet, which, as everyone knows, is a moisture-loving plant. We then descended a valley, and, ascending again, made our way to Coulsdon, visiting the church, of which some photographs were taken, and so on into the Caterham Valley, from whence we again ascended to Mr. Goodman's residence at Warlingham. Here we were hospitably entertained by Mr. and Mrs. Goodman, and afterwards inspected their garden, where is a fine marsh garden, supplied, as it appears, by bath-water. We subsequently returned to Croydon by way of Upper Warlingham Station.

Of *July* 24*th*, Mr. J. H. Baldock, the conductor, writes: "The excursion was to Oxted and neighbourhood. In spite of the fine sunny day and the beauty of that neighbourhood, only three members, including the conductor, turned up. One can but remember with regret the time when twenty to twenty-five men and some twelve to fourteen cameras put in an appearance."

On *August* 2*nd*, Bank Holiday, Mr. Lovett conducted a party to Holmwood, Leith Hill, Holmbury, and Gomshall. I regret that I have not been able to obtain any account of this excursion.

Mr. G. W. Moore has kindly sent me the following account of the fungus hunt which he conducted on September 18th:—

"*September* 18*th*.—Excursion to Crockham Hill and The Squerries, Westerham (fungus hunt). Conductor, G. W. Moore. On this occasion, the weather being very threatening, only four members presented themselves, including fortunately Mr. Holmes and Dr. Parsons. A start was made at once from Oxted Station at about 3.45 p.m., and a route taken across some fields, in which were found a large quantity of the corn marigold, *Chrysanthemum segetum*, and in a hollow by the stream running from near Limpsfield Church some fine specimens of the butterbur. In the stream, the course of which is thought by some to have been artificially altered, several specimens of the freshwater limpet were found adhering to flints. The party followed the stream to the road, which passes Limpsfield Church, then turned up through the village as far as a sand escarpment of the Lower Greensand, where some curiously contorted iron bands were noticed. Shortly after this it began raining heavily, but after sheltering for a short time the party continued on over Limpsfield Common, past the Salt Box, to Chart Common, finding on the way several specimens of fungi, chiefly consisting of *Boletus* (*? edulis*), *Lactarius*, *Cantharellus*, and *Russula*. The rain by this time had evidently set in for the evening, and the excursion had to be abandoned, so four half-drowned naturalists made the best of their way back to Oxted."

On *September* 21*st*, the first of the renewed evening meetings was held. As is usual, no paper was read, members being supposed to bring up the spoils of their summer holidays for inspection and discussion. On this occasion Mr. Murton Holmes brought carboniferous, oolitic, and chalk fossils; Mr. Brown, chalk fossils; Mr. Hogg, fossils from Boulder Clay and flint implements; Mr. Lovett, tallies from South Holland, Germany, and Austria; Dr. Phillips, a nest of the rose-cutter bee (*Megachile centuncularis*) found in newspaper; and Dr. Parsons, fungi from Kent Hatch, found in the excursion on September 18th, and ferns.

On *September* 29*th* the Conversational Meeting was held in the dark room, under the auspices of the Geological Section, and was fairly well attended. Your President read some notes on the geology of the Isle of Wight, illustrated by lantern-slides, Mr. Underhill kindly operating. He showed also some samples of stones—flint and Upper and Lower Greensand stone—from the gravels at Bembridge and St. Helen's, on the opposite sides of the sea-end of Brading Harbour. The large size of some of these stones, over a foot in length, indicates a carrying power far greater than the present little river Yar. An interesting conversation, in which Mr. Whitaker and Dr. Parsons took part, ensued, during which some interesting facts on the course of rivers and on denudation were elucidated.

On *October* 19*th*, at a general meeting, Mr. Epps, Jun., showed the fruit of the guava (*Psidium pyriferum*) and a cluster of mushrooms; and Mr. Holmes, fossils from the Upper Chalk. Mr. Hogg then read his paper on "Flint Implements found at Addington," which appears in our 'Transactions' (Article 138).

On *October* 27*th* a Conversational Meeting was held, at which Mr. Murton Holmes exhibited and explained a number of microscopical slides. Further notice of this meeting will be made in Mr. Holmes's sectional report.

On *November* 16*th* Mr. Murton Holmes showed a viper of unusual length caught in Scotland, and also flint implements found at St. Augustine's Church. An exceedingly interesting paper was then read by Mr. James Epps, Jun., on "The Cacao Plant, *Theobroma cacao*," from which the cocoa of commerce is obtained. This paper is printed in our 'Transactions' (Article 139), and by the kindness of the author is admirably illustrated. At the conclusion of the paper a very hearty vote of thanks was moved to Mr. Epps, which was carried unanimously.

Report of Annual Soirée.

The twenty-eighth Annual Soirée of this Club was held at the Public Hall on Wednesday evening, and as usual proved a great success. There was a large collection of microscopes, several members of the Royal, Quekett, Holmesdale, Redhill, and other clubs augmenting the exhibits of the local members, and demonstrations were given of several recent scientific novelties.

The collection of flowers gathered on the 24th November in the neighbourhood of Park Hill, and shown by Dr. H. F. Parsons, numbered one hundred and sixty-eight species and varieties, the presence of dahlias in the group showing the mildness of the season. This gentleman also had a collection of British lichens and fungi, and Miss Gladys Parsons a series of British land and freshwater shells. Mr. Edward Lovett had a very interesting display of "fish hooks," obtained from all parts of the world, showing their evolution from the stone age to the present day. Mr. H. C. Collyer exhibited some early sixteenth century leather bottles or costrells; some leather measures, dated 1649, with shields and arms, and a pair of very curious leather wine bottles, which were attached to the saddle in early times; also some very fine tinder-boxes of beautiful design and workmanship.

Mr. W. Whitaker had specimens of rock, obtained more than 1100 feet below the surface, from the trial boring at Weeley, Essex, the work having been done by "diamond-boring." Dr. Hobson showed fossils from the eocene and oligocene beds, and Mr. G. F. Brown a series found in chalk. Mr. C. E. Salmon's botanical collection afforded much interest, as did also the cases of beetles of Mr. C. H. Goodman. Mr. C. Thorpe showed some excellent examples of taxidermy, a group of terns, and another of British woodpeckers, being much admired, as well as two splendid specimens of the chough, and numerous other exhibits, particularly the small antelope from Somaliland, which, it is said, has never before been "mounted" in its entirety, its skin being so difficult to preserve.

The display of photos by the members of the Photographic Section which hung in the corridor demand more than passing mention, as there were some excellent examples of recent work. The portrait bust of Mr. H. D. Gower, Honorary Secretary of the Section, by Mr. D. A. Tonelli, occupied a central position and called forth high praise, both as to the excellent likeness and quality of the work. Surrounding this was a series of enlargements of snapshots taken by Mr. Ernest Straker on his recent visit to Fair Isle, showing some of the birds and seals found on this exposed rock, midway between the Orkney and Shetland Isles. The group of "Puffins," obtained after much labour, leaves nothing to be desired, and those of the seals, which are so difficult to approach, are full of interest. Mr. Sandell showed a series of photographs of his usual fine quality, and excellent exhibits were made by the members, Mrs. Groves, Messrs. Baldock, Coldwells, Collyer, Crowley, East, Epps, Gower, Hobson, Hoole, Lincoln, Moss, and Platts. The "selected" portfolio pictures were also shown, the members gaining this distinction being Messrs. East, J. Epps, Jun., Gower, and Hoole.

In the Small Hall was a fine display of exotic butterflies and beetles from the collection of Mr. P. Crowley, and some ripe citrons grown at Waddon House. The silk-producing moths afforded much interest, as did the delicate little nests of various species of humming birds, and that of the red-plumed bird of paradise (*Paradisea raggiana*), the single egg shown being the only one yet obtained of this beautiful bird. The curious nest of the trap-door spider was also shown, and eggs of this insect, under the microscope. Mr. Dedman had a series of British shells, freshwater and marine; Mr. H. M. Klaassen, a graphoscope, mosses and lichens, and some very quaint and well-executed heads carved in the white portion of dried horse-chestnuts by Mrs. Hubbard. Some models of Indian cooking utensils were shown by Mr. Henig, and Japanese pictures of the Impeyan pheasant and partridge by Mr. Epps, Jun., the actual feathers of the birds being used to form the pictures. Mr. J. Henry Drage exhibited a large collection of British marine Algæ, beautifully mounted, and retaining much of the brilliant colouring peculiar to these delicate growths of the sea. Mr. L. Casella showed and described the new patent Bridges-Lee Photo-Theodolite, and Mr. J. H. Baldock a "Krömsköp," which Mr. Ives has been many years perfecting. It shows a picture in natural colour, obtained by taking three negatives through three different coloured glasses. Positives are made from these, and exhibited through glasses of the same three colours as were used to take the negatives.

Mr. Newby gave a demonstration of the X-rays, and Mr. L. M. Waterhouse, of Birdhurst Road, gave an interesting exhibition of electro-static and electro-magnetic phenomena, with apparatus of his own construction. These experiments included electrical discharges in high vacua, statical discharges through tubes, revolving vacuum tubes, microphone, rotating electro-magnets, &c. The apparatus shown included electrical instruments for testing and general work, and a number of tiny incandescent lamps were connected up to demonstrate electric lighting. Mr. Waterhouse also exhibited a watch which is absolutely non-magnetic, being unaffected by the strongest dynamo.

A table in the Small Hall was devoted to lantern slides, displaying much good work by members of the Club, and in the old School of Art there were several shows given during the evening, alternating with the cinematograph, furnished by Messrs. Noakes and Norman, of Greenwich, Mr. Norman giving the demonstration himself, the Royal Artillery in Jubilee procession and the snowballing incident being much applauded, as indeed their excellence deserved.

The stage was adorned with flowers and foliage plants from Mr. P. Crowley's conservatories, and Mr. H. M. Carter sent some water-colour sketches, which were hung in the Large Hall. A good selection of music was given during the evening, and altogether the members may be congratulated on so satisfactory an issue.—*From 'Croydon Advertiser.'*

At the general meeting on *December 21st* Dr. Franklin Parsons exhibited some fine specimens of ammonites, hamites, &c., obtained by him from the gault at Folkestone.

Mr. J. Watson Slack moved, and Mr. Whitaker seconded, a resolution expressing the opinion that the contemplated removal of the Whitgift Hospital would be a deplorable mistake, and praying the Croydon County Council to consider other steps to mitigate the difficulties of traffic at the spot in question, and thereby save a most valuable piece of ancient architecture. The resolution received the warm support of the President, Mr. Baldwin Latham, and other members present, and on being put to the vote was carried unanimously in a well-attended meeting. It was also resolved to send an offer of co-operation, on behalf of the Club, to other societies having the preservation of ancient buildings at heart.

The President then called upon Mr. Whitaker, F.R.S., late of the Geological Survey, to read his paper on a "Drift Deposit with Bones at Carshalton." The plot of land acquired for the disposal of sewage at Carshalton, though mapped by the Geological Survey as London Clay, had unexpectedly—and fortunately for the District Council—been found to consist superficially of sand, with bands of loam running through it. This was the drift (or loose deposit carried down by streams and spread over the original surface of the ground), and was of a character differing from that generally found in the neighbourhood, though when traced nearer to the Wandle the usual gravelly structure was found. There had been several excavations cutting through these sandy beds down into the London Clay beneath. Under fifteen feet was found a broken up, muddy deposit, such as at one time might have formed the bottom of a pond. In this deposit the bones to be described were found. Mr. Whitaker eulogised the public spirit of the Carshalton authorities in carefully preserving all the remains discovered. Mr. Newton, F.R.S., of Jermyn Street Museum, then described the bones in detail. The most important of these was the skull of a rhinoceros, a two-horned species, probably that known as the woolly rhinoceros (*R. tichorhinus*). There were also fore and hind bones and a rib of this beast. There were found, in addition, a small portion of an elephant's tusk—probably a mammoth's—and a number of horses' bones. An interesting discussion ensued, in which several members took part.

This ends my record of events; the several Sub-Committees must now speak for themselves.

Botanical Sub-Committee.

I have no report to make this year of any official proceedings on their part.

It is, however, worth recording that the rare *Carex strigosa* was found in considerable abundance on the occasion of the Whit-Monday excursion in the neighbourhood of West Hoathly. This plant is specially a Sussex plant, and has only once been recorded from Surrey.

The rarest of our local plants—*Teucrium botrys*—has been in great abundance this year in its locality near Addington, and, we are glad to know, has reappeared in considerable abundance this year in its only other British locality at Box Hill, where it had of late years been apparently dying out.—Signed, H. T. Mennell.

Geological Sub-Committee.

The only matters calling for notice in connection with the Geological Sub-Committee are the fresh discoveries of mammalian remains in the gravels round Croydon, and more particularly that of the rhinoceros' skull found at Carshalton, and described to the Club by Mr. E. T. Newton, F.R.S., and Mr. W. Whitaker, F.R.S.; and the flow of the Bourne in the Caterham Valley during the months of March, April, and May, 1897. Unfortunately I have no record of its first appearance, but during March the stream gradually worked its way down the valley, and on the 26th it passed through the culvert beneath the railway embankment at Purley Station. The surface flow continued without any noticeable diminution of volume to about the 10th April, when it reached the junction of the Godstone and Brighton Roads, and did not apparently extend beyond this point nearer Croydon. On May 7th the stream no longer flowed through the railway culvert at Purley; on the 16th there was still a fairly strong current in the valley opposite Little Roke; but on the 23rd the channel was quite dried up throughout.

Should any of our members be able to furnish any details of the volume of water or other particulars of this Bourne outflow, it would be very desirable to have them recorded in our 'Transactions.'—Signed, G. Hinde.

Microscopical Sub-Committee.

The Microscopical Sub-Committee held one Conversational Meeting during the year, which was fairly well attended. Vegetable anatomy was the subject for discussion, and numerous slides illustrating various structures were exhibited by the Honorary Secretary of the Section.

Members are reminded that there is a large number of microscopical slides in the Club cabinet which can be borrowed under the same regulations as books from the library, and the Club microscope is also available for exhibiting objects at any of the meetings.—Signed, W. Murton Holmes.

Photographic Sub-Committee.

The Photographic Section has again passed through rather a quiet year, and it is very difficult to point to any particular cause for this. Counter attractions may have a great deal to do with it, as well as lack of interesting matter photographically, the past year being singularly deficient of anything of a particularly startling nature. The meetings might have been considerably better attended.

Meetings and lantern evenings have taken place during the year. The Club being now affiliated to the Royal Photographic Society, who issue a series of lectures of photographic interest, the Section has availed itself of them during the past year at the rate of one per month, and the supply will continue well into the new year and following autumn.

Thanks are due to the editors of 'The British Journal of Photography,' 'The Amateur Photographer,' and also 'The Magic Lantern Journal,' for free copies sent during the past year for the use of members in the reading-room. It may also be mentioned that the editor of 'The Photographic News' has kindly undertaken to supply a copy in the coming year.

The excursions this year were perhaps hardly better attended than usual, and in some few instances the number was very limited.

During the spring of the year a small loan collection of photographs, organized by Mr. Horsley-Hinton, editor of the 'Amateur Photographer,' was arranged by several of the Sectional Committees, who acted as guarantors against any loss or expense which might have been entailed, and although the attendance during the two days' exhibition was limited, the tickets taken up by the Committee and members not only paid all expenses, but resulted in a surplus of £2 16*s.* 8*d.* being handed over to the Honorary Treasurer.

The 'Portfolio,' which was suggested by Mr. C. Moss and started at the beginning of the year, is so far very successful, and the contributors are gradually increasing. Thanks are due to Mr. Grundy for presenting the Section with two excellent portfolios for the purpose. The first batch of prints were sent out in April last, and fresh batches of prints have been issued each month (excepting July and August, owing to holidays); the result has been that eighty-one pictures have passed through the members' hands for criticism, and it may be mentioned that any fresh member who takes up photography, and would like to join, can obtain all the desired information from the Honorary Secretary of the Section.

The Club lantern has undergone a slight alteration through the kindness of Mr. Baldock, the Honorary Lanternist, who, at his own expense, has had a much-needed new front tube fitted, to take a lens of better definition, thereby improving the projective power of the instrument.

The Soirée this year was well maintained as far as the sectional exhibit went, some ninety frames being hung in the corridor, and over four hundred lantern-slides upon a large table in the Small Hall. Lantern exhibitions were held in the Old School of Art Room during the evening, alternating with an excellent exhibition of animated photographs by Messrs. Noakes and Norman, of Greenwich. The Krömsköp was exhibited in the Small Hall by Mr. J. H. Baldock, and the Bridges-Lee Photo-Theodolite by Mr. L. Casella, an instrument worthy of careful study and examination. The room at the end of the corridor was given up to an exhibition of X-rays by Dr. Newby, and Mr. L. M. Waterhouse exhibited fine examples of electro and magnetic displays.

The membership of the Section continues the same; and in conclusion it may be said that there is room for a great deal of good work to be done in the district, coupled with the help of the other sections; the improvements, changes, and alterations that are going on give ample scope for making records of what will, in a few years' time, exist only in the memories of our older members who are left to us.—Signed, Harry D. Gower.

Anthropological Sub-Committee.

I have nothing to report on my Section. I have made one or two communications to the Club on my subjects, and am still collecting notes and specimens; but my request for information to be sent me by any member who meets with anything of anthropological interest has not met with any results.—Signed, Edward Lovett.

Zoological Sub-Committee.

I am sorry that I have not anything to report, nothing unusual having occurred; of the rare *Plusia moneta* I captured two last July, making thirteen altogether taken by me in my garden during the years 1896, 1897, and 1898.—Signed, John Berney.

Museum Sub-Committee.

This was appointed not by a general meeting of members but by the Committee, and consisted of the President, Dr. Franklin Parsons, and Messrs. Mennell, Lovett, and Drage. Several meetings have been held, and the Croydon County Council approached on the subject. After considerable demur, the Council have consented to allow two cases to be placed in the new Braithwaite Hall, subject to the following stipulations:—

(1). The cases are to be provided and the contents arranged and kept in order by the Club.

(2). The cases are to be removed by the Club if and when the Libraries Committee require.

(3). They are not to be more than two feet deep, and are to be of a pattern to be approved by the Libraries Committee.

The trustees of the special furnishing fund having been approached and no objection having been raised by them, the Committee made the following recommendations:—

(1). That a sum not exceeding £25 be now withdrawn from the Special Fund for the purpose of purchasing museum cabinets.

(2). That a standing Sub-Committee, to be called the "Museum Sub-Committee," be appointed at this and each subsequent Annual Meeting.

(3). That the duties of such Sub-Committee be to take charge of all museum cases and specimens belonging to this Club, and to collect, arrange, and take charge of specimens illustrative of the fauna, flora, geology, and antiquities of the district.—Signed, J. M. Hobson.

Members Elected, 1897.

January 19th. — Arthur William Harrison, M.D., Winsley, 94, Brighton Road. Samuel H. Slade, Goodrington, Birdhurst Rise. William Dawson Ainger, Ebury, Moreton Road. Martin Luther Moss, 23, Park Hill Rise.

February 16th.—Ernest Heber Laudel Jones, 11, Rosehill Road, Wandsworth. Edward Cristall, 1, St. Leonard's Road, Croydon. William Augustus Howard, 60, Clyde Road. Arthur Percy Allan, M.B., B.S., Abbotsford, Croham Road.

March 16th.—Miss Mabel Perronet Bisson, 13, Selby Road, Anerley. Mrs. Mary Marks Groves, 2, Canning Road. Miss Georgina Wills, Southwood, Croham Road. Miss Annie Margaret Epps, Norfolk House, Beulah Hill, Upper Norwood. Miss Alice Mabel Bonus, 8, Dingwall Road. Miss Agatha F. Bonus, 8, Dingwall Road. Miss Georgina Hay, 8, Dingwall Road.

April 13th.—Alfred Tarver, Polruan, Stuart Road, Thornton Heath. Walter Catt, 3, Coombe Street. Arthur Bennett, F.L.S., High Street. Mrs. Louisa Anne Parsons, 4, Park Hill Rise.

May 29th.—Miss Fanny Alice Waterall, Grove Cottage, Addiscombe Grove.

September 21st.—Moses Jackson, J.P., 139, Lower Addiscombe Road. Alfred Ford, Ashburton Lodge, Ashburton Road.

October 19th. — Arthur George Green, 24, Canning Road. J. Dighton, Grosvenor Road, Pimlico.

November 16th.—Miss Edith A. L. Kemp, Fern Bank, Addiscombe Road. William Alexander Weightman, Langdale, Chepstow Rise. Miss Elizabeth F. Klaassen, Aberfeldy, Campden Road. Rudolf Petri, Hazeltryst, Havelock Road.

December 21st.—Miss F. Kate Aldrich, 14, Tavistock Road. Edmund Goddard, Canning Road. James Edmund Clark, B.A., B.Sc., 64, Clyde Road. Miss Catherine Ward,

Exhibits.

February 16th.—H. T. Mennell: Crystals of fluorspar.

March 16th.—James Epps, Jun.: Five Japanese cake dishes and Japanese medicine box. H. T. Mennell: Japanese porcelain. Edward Lovett: Japanese bronze mirrors, carved pipe-case, pipes, and tobacco pouches. J. O. Pelton: Japanese works of art. H. C. Collyer: Flint knife found at Beddington. E. B. Sturge: Coral found in a Croydon rubbish-heap.

April 13th.—Edward Lovett: Tallies.

September 21st.—W. Murton Holmes: Carboniferous, oolitic, and chalk fossils from Whyteleaf and Purley. Edward Lovett: Tallies from South Holland, Germany, and Vienna. A. J. Hogg: Fossils from Great Boulder Clay from Lowestoft, and flint implements from Addington and other localities. J. W. Phillips, M.D.: Nest of a rose-cutter bee found in newspaper. H. F. Parsons, M.D.: Fungi from Kent Hatch, and ferns—*Hymenophyllum Wilsoni*, *H. tunbridgense*, and *Lycopodium inundatum*.

October 19th.—J. Epps, Jun.: Fruit of the guava (*Psidium pyriferum*) and a cluster of mushrooms. W. Murton Holmes: Upper Chalk fossils. A. J. Hogg: Flint implements.

November 16th.—J. Epps, Jun.: Cacao plant.

December 21st.—H. F. Parsons: Fossils from Gault at Folkestone.

Croydon Microscopical and Natural History Club.—Balance-sheet for the Year ending 31st December, 1897.

Receipts.

	£ s. d.	£ s. d.
Balance at Bank, January 1st ...		6 0 9
Subscriptions, 1892	0 10 0	
,, 1893	0 10 0	
,, 1894	1 0 0	
,, 1895	1 10 0	
,, 1896	8 0 0	
,, 1897	96 10 0	
,, 1898	4 10 0	
		112 10 0
Sale of Soirée Tickets		10 17 6
Donations—A. Hill, Esq.	0 10 0	
,, F. C.-Bayard, Esq. ...	5 0 0	
,, P. Crowley, Esq. ...	5 0 0	
,, B. Latham, Esq. ...	7 10 0	
,, Capt. Aylesbury ...	0 5 0	
		18 5 0
Sale of Professor Morris's 'Geology of Croydon'	0 1 0	
Sale of Transactions—Mr. Drage's Paper, &c.	0 9 6	
		0 10 6
Balance		10 17 5
		£159 1 2

Payments.

	£ s. d.	£ s. d.
Rent of Club Room to 31st July		10 0 0
Hire of Rooms for Meetings ...		4 0 0
Printing Transactions		25 10 6
Fire Insurance		1 13 9
Stationery and Postage		8 7 0
Meteorological Sub-Committee, Printing Rainfall Returns from December, 1896, to November, 1897, inclusive		29 16 6
Photographic Sub-Committee—		
Rent of Dark Room, 12 months, to 31st July	10 0 0	
Hire of Room for Lantern Exhibitions	1 0 0	
Gas for same, and sundry Petty Expenses	4 19 2	
Printing, Postages, &c. ...	1 18 10	
		17 18 0
Soirée Expenses		44 14 4
Gratuities		1 6 0
Circulars and Stationery		10 3 0
Sundries		0 12 1
Assistant Secretary		5 0 0
		£159 1 2
January 1st, 1898, Balance, being a deficit		£10 17 5

SPECIAL FUND ACCOUNT, 1897.

£210 11s. 8d. CONSOLS.

	£	s.	d.		£	s.	d.
Balance from last Account, January 1st	13	0	8	Repairs to Cases of Fossils	1	13	10
Dividend, January	1	8	0	Rackwork for Lantern	0	16	8
,, April	1	8	0	Balance	20	1	4
,, July	1	8	0				
,, October	1	8	0				
Receipts for Hire of Lockers	1	2	6				
Proceeds of Photographic Exhibition	2	16	8				
	£22	11	10		£22	11	10
				Balance, January 1st, 1898	£20	1	4

	£	s.	d.		£	s.	d.
1898.				1898.			
Balance at Special Account	20	1	4	Deficiency on General Account	10	17	5
				Cash at Bank	6	19	1
				Cash in hands of Secretary and Treasurer ...	2	4	10
	£20	1	4		£20	1	4

We, the undersigned, having examined the above Accounts and the Vouchers relating thereto, hereby certify that they are correct, according to the Vouchers, and the Bankers' Pass Book.

F. J. TOWNEND, *Acting Treasurer.*

REG. T. WEBSTER, } *Auditors.*
H. M. KLAASSEN, }

January 3rd, 1898.

TRANSACTIONS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1897–98.

135.—On the Times of Flowering of Early Spring Flowers.

By H. Franklin Parsons, M.D., F.G.S.

(Read February 16th, 1897.)

To the lover of a garden the hardy flowers of early spring are especially attractive, not only for their modest beauty and intrinsic interest, but also as harbingers after the long dreary winter of sunny hours to come. Hence it has been my pleasure for some years past to cultivate as many early spring flowering plants as I could, and to watch for and record year by year the dates of their appearance in blossom. Later in the season, when the appearance of a new flower has lost much of its novelty, the keeping of the record has, I am sorry to say, been neglected.

Of the early flowers of our gardens, some are British plants, more or less modified by cultivation; most of the old favourites are European, though many attractive bulbous plants of more recent introduction come from Western Asia, e.g. *Chionodoxa Luciliæ, Scilla sibirica,* and *Puschkinia libanotica.* Not a few are natives of mountain and northern localities, where they flower later in the year than with us, coming out immediately after the melting of the snow. Many are in their wild state natives of woods, where they find shelter from the sharp frosts and keen winds of spring; while, blooming before the trees come into leaf, they are not shaded from the sun's rays as they would be if they bloomed later in the year. Here they often grow in great masses, carpeting the ground, as we see with our wood anemones, primroses, and bluebells; and, following this hint of nature, the early bulbous plants may with advantage be planted under trees and shrubs in the garden to fill with beauty spaces which would otherwise be bare.

Almost all of the earliest spring flowers come up from bulbous or fleshy roots—I do not use the word root in the strict botanical sense—so that their early development takes place with the aid of materials formed and stored up during the previous season, and prepared by processes taking place during the autumn and winter months. Of spring flowers a larger proportion are blue or purple, and a smaller proportion red, than of the flowers occurring later in the year.

The following remarks as to dates of flowering refer only to my own garden, which is not a particularly early one, being on a cold clay soil, and having a slope to the north and east, though for a suburban garden it gets a fair amount of sun. In a warm situation the times of flowering might be a fortnight earlier.

The New Year, when it comes in, finds in my garden a few winter-blooming flowers which have appeared in December, such as the Christmas rose, the sweet-scented butterbur (*Nardosmia fragrans*), and the yellow winter-flowering jasmine; as well as, if December has been mild, a few lingering survivors from summer and autumn.

Of the flowers of the New Year, the first is the winter aconite (*Eranthis hiemalis*), of which the golden cups and green frills have during each of the past five years appeared in January, the average date being Jan. 17th. The flowers of the Mediterranean heath (*Erica carnea*) are usually fully developed in January. The primrose is generally in flower before the end of January, but the garden primrose is more or less modified by cultivation, and not infrequently flowers in autumn, or even in a mild December. The common snowdrop (*Galanthus nivalis*) is another flower of January, its average date of appearance being Jan. 26th. The more recently introduced species, *G. plicatus* and *G. Elwesii*, are rather later, about the middle of February. The hardy *Cyclamen coum*, with its crimson flowers, is out in most seasons early in February. During February many early bulbous plants are in flower, as the early snowflake (*Leucojum vernum*), several species of crocus, *Iris reticulata*, *Bulbocodium vernum*, the tiny *Narcissus minimus*, and *Scilla bifolia*, with its panicles of deep blue flowers, to my mind more beautiful than the larger sky-blue flowers of the better-known *Scilla sibirica*, which flowers about three weeks later. *Anemone blanda* and *A. hepatica* also bloom in February. Of the spring flowering species of crocus, the earliest with me is the common yellow *Crocus aureus*, which precedes by more than a week the "cloth of gold," *Crocus stellaris* and *C. Imperati*, which are reputed to be especially early blooming kinds. There are of course several species of crocus which bloom in autumn, and I have one (*Crocus hiemalis*) which blooms in December.

During March, besides several other species of bulbous plants, the violet, periwinkle, several species of *Primula*, and the early Saxifrages come into flower. Of the latter, the earliest with me has been *Saxifraga oppositifolia*, then *Burseriana*, *luteo-purpurea*, and *sancta*. Towards the end of the month several flowering shrubs come out, as *Forsythia viridissima*, with its yellow flowers appearing before the leaves, the almond, and red currant (*Ribes sanguineum*); also the plum, pear, and other fruit trees. During April many more species of plants come into flower, and the rock-garden is at its best in May, when also the mass of the flowering shrubs are in bloom. But the borders have lost their gaiety when the early flowering bulbs are over, and do not resume it again until well into the summer.

The time of flowering of any particular plant or species varies of course with the character of the particular season; it may be earlier or later by a month, six weeks, or even more. Thus such hardy species as *Scilla bifolia*, *Cyclamen coum*, and *Crocus aureus* were six weeks later in the severe spring of 1895 than in 1896. Of the four years (1893–1896), 1893 might be called an average season, 1894 and 1896 were early, and 1895, from the latter part of January, very backward.

The following are the meteorological characters of the early part of the four years:—

1893.—December, 1892, had been cold, the mean temperature at Greenwich being 36·9°, or 2·3° below the average. The four-feet earth thermometer on Jan. 1st stood at 42°. January began with a period of frost, which lasted till the 18th; but the latter part of the month was milder. February had alternating mild and cold periods, with a spell of frost in the last week. March was mild, except a short period of frost in the middle, and the beginning of April was very warm. The mean temperature of the first quarter at Greenwich was 40·9°.

1894.—In December, 1893, the mean temperature at Greenwich was 40·6°, or 1·6° above the average. On Jan. 1st, 1894, my four-feet thermometer stood at 43·6°. The first week of January was a period of intense frost, but it thawed on the 9th, and the rest of the month was mild. February was mild, except for a period of frost (18th–23rd). March also was fairly mild. The mean temperature at Greenwich during the first quarter of 1894 was 41·4°.

1895.—December, 1894, was mild, the mean temperature at Greenwich being 42·2°, or 3·2° above the average. The four-feet thermometer on Jan. 1st, 1895, marked 44·2°. The first fortnight of January was frosty; then came a week or so of mild weather till Jan. 22nd, on which day was a heavy fall of snow, followed by a period of intense frost, which lasted unbroken to Feb. 18th, and with intermissions to the end of the first week in March. The last half of March was mild. The mean temperature of the quarter at Greenwich was only 35·2°.

1896.—In December, 1895, the mean temperature at Greenwich was 40·2°, or 1·2° above the average. The four-feet thermometer at the beginning of January, 1896, stood at 44·5°. The weather during January and February was mild, dull, and dry; in March also mild and dull, but wet. The only period of consecutive frost was for a few days towards the end of February. The mean temperature of the quarter at Greenwich was 42·2°.

There is thus, as every one knows, a general correspondence between the meteorology of the season and the time of appearance of flowers; vegetation being forward in the mild first quarters of 1894 and 1896, and backward in the intensely cold season of 1895. I have tried, but without much success, to trace the connection more in detail.

We may assume that the bringing of a plant into flower needs that it should have received a certain aggregate amount of energy in the shape of heat, either in the form of the sun's rays, or of temperature of air, earth, and rainfall. We may also take it that each plant requires, in order that its vital processes may go on, a certain degree of temperature, different no doubt in different species; but at least above 32° Fahr. in phanerogamous plants, at any rate. In the case of hardy plants, we may reckon degrees of temperature below the freezing point as *nil*, not as negative, *i.e.* growth is suspended, but not undone. For the sake of uniformity, I have taken the starting point as Jan. 1st, though doubtless in the earliest blooming plants the processes of growth which culminate in flower have been active before that date. On the basis of the above assumptions I have reckoned for some twenty species, of which I have the date of flowering recorded in each of the four years 1893–96—A, the aggregate degrees of maximum daily temperature above 32° Fahr.; B, the aggregate degrees of mean daily temperature above 32° Fahr.; and C, the aggregate hours of sunshine recorded at Greenwich in each year between Jan. 1st and the coming of each species into flower; noting also the earth temperatures at four feet and at one foot deep. But, though I have spent a good deal of time, I have not discovered any close numerical relation between the date of flowering and either of these factors. To some extent apparently sunshine and air temperature may take the place of one another. One may see the snowdrop or winter aconite come into flower under the influence of bright sunshine when the air temperature in the shade scarcely reaches above the freezing point; and, on the other hand, flowers will come out in mild cloudy weather in the absence of sunshine. We know how wide the crocus opens in bright sunshine, but it will open equally wide if brought into a warm room with only artificial light.

As we should have expected, the amount of sunlight before each plant came into flower was much greater in 1895, when with bright frosty weather the ground was covered with snow, than in the mild cloudy season of 1896. But it is difficult to understand why in 1893—which, as I have said, was neither a particularly early nor backward season, and which was preceded by a cold December—the amounts both of day temperature and of sunshine necessary to bring the plants in question into flower should have been as a rule markedly less than either in the mild first quarters of 1894 and 1896, or in the cold one of 1895.

136.—Japanese Lacquer: its History, Manufacture, and Decoration.

By John O. Pelton.

(Read March 16th, 1897.)

The prominence given to Japan during the last thirty years may be due to many causes, but undoubtedly the quality which mainly riveted the attention of the Western world was the glorious revelation of artistic genius which astonished and delighted all beholders. Although Japan had been accessible to navigators and to a limited number of Dutch traders for centuries, so little was really known regarding the inner life of her inhabitants that Sir Rutherford Alcock, the first British Plenipotentiary Extraordinary, who, in 1859, entered upon his duties, described them as "a people grotesque and savage." It was not long, however, before this feeling changed into one of the most ardent admiration and appreciation.

No record exists of the birth of the lacquer industry in Japan. Tradition states that even before the Christian era an officer was appointed by the imperial court to superintend its manufacture; there are pieces now existing in Japan said to date from the third century. I can, however, state with certainty that the industry is at least 1300 years old, as in the Nihonji, the ancient Chronicles of Japan, lacquer is mentioned in the year 567 in such a manner as to convey the impression that it had existed some time before that date; well authenticated pieces dating from the seventh and eighth centuries are preserved in the royal treasury at Nara.

Up to the end of the twelfth century the head-quarters of the lacquer industry were at Kioto, the residence of the Emperor; but about that time the powerful influence of the Shoguns diverted much talent to their own capital, Kamakura, which remained for many years a centre of artistic production, although its lacquer never reached the same pitch of excellence as that of Kioto. During the stormy period which marked the rule of the Hojo family of Shoguns the art languished, but revived under the Ashikaga family, who came into power in 1335. Under the Shogun Yoshimasa the art of lacquering was much encouraged, and we find mention of one Monnyu, who produced carved red-and-black lacquer of great excellence. From this period (1500) to the accession of the greatest of the Shoguns, Tokugawa Iyeyasu, lacquer-working declined owing to the almost constant wars which prevailed through the whole of the sixteenth century. Iyeyasu, however, inaugurated a period of peace, which extended from his accession (1603) until times within the memory of many here present. Magnificent specimens of lacquer work, mostly in the form of furniture and shrines, were produced in the early part of the seventeenth century. But it was at the end of the seventeenth and the early part of the eighteenth century that lacquer work is considered to have reached its greatest perfection.

The lacquer work of that period is known as Joken Makiye, Joken being the posthumous name of the Tokugawa Shogun, who ruled from 1681 to 1708. This period saw the rise of most of the great schools; Koyetsu, Korin, Kajikawa, Koma, Shunsho, and Ritsuo are names familiar to all collectors.

All through the eighteenth and well into the present century lacquer showed little sign of decadence; none of the modern expedients to shorten the period of manufacture were then practised. It was the gigantic demand which followed the Revolution of 1868, when art prostituted itself to the capricious demands of commerce, which caused the Japanese to abandon their old traditions and methods. So rapid was the decadence that Japanese lacquer bid fair to become a by-word, but within the last few years the Government, awakening to the fact that the wonderful progress and appreciation of Japan among the western nations is largely owing to her magnificent artistic record, has taken steps to revive in some measure the ancient glory of her arts, and by liberal purchases is preventing the *chefs-d'œuvre* of her great artists from leaving the country of their origin. As the nineteenth century advanced fine lacquer work was produced more and more rarely, the art reaching its lowest level about the time of the opening of the ports, and the appearance of lacquer work at the European exhibitions. A demand for Japanese lacquer was suddenly created, and a vast amount was made to supply the demand; but as one of the essential elements for good lacquer is time, it was obviously impossible for commercial purposes to fulfil this condition. The evil effect soon became manifest, for as the knowledge of fine lacquer spread and examples of old work came to hand, this inferior but often very showy modern work was discredited. Men like Zeshin, who died as recently as 1891, have proved that fine lacquer work can still be produced, but the majority of the fine pieces of to-day are distinctly inferior to the best of the old work. Although properly belonging to the decoration of lacquer, I must at this point draw your attention to the varieties of lacquer. They are very numerous, but I need only speak of the principal ones. The kind most in evidence is nashiji, or avanturine lacquer, so called from its resemblance to avanturine Venetian glass; the Japanese word "nashiji" signifies pear-rind (this fruit in Japan resembles our golden-russet apple). Nashiji is freely employed in the interior of boxes, cabinets, &c. In such cases no decoration is, as a rule, added; but in exterior work it is very unusual to find a surface, unless it is the bottom of a box, without added ornament; sometimes a mottled or clouded appearance is given to it. Nashiji is composed of gold, silver, or baser metals, but the powders vary in fineness. All these variations have their distinguishing names. These powders may be lightly sprinkled on or laid on thickly, assuming, as the French say, a crushed barley-sugar appearance. Fine old nashiji, in which gold in liberal quantities was employed, is justly prized. Much modern work is prepared from tin, to which some pigment, such as gamboge, is added to give it the appearance of gold. After the metal has been laid on it is covered with coatings of transparent lacquer, which in fine pieces may amount to a dozen.

Three other kinds of lacquer demand attention, *viz.* togidashi, hira makiyé, and taka makiyé. These, with nashiji, which is really a variety of togidashi, practically cover the whole field. They are frequently combined in one piece. Roughly speaking they may be distinguished as follows:—Togidashi is lacquer with a perfectly smooth polished surface, the designs not projecting above the groundwork; hira makiyé is lacquer where the designs are in low relief; taka makiyé is lacquer where the designs are in bold relief. It is difficult to draw the line between the two latter; pieces in which togidashi is alone employed are frequently found, and among them are included some of the finest specimens of Japanese art; hira makiyé is seldom used alone, but is more generally accompanied by either togidashi, or taka makiyé, or both; taka makiyé is seldom, if ever, found alone.

The oldest lacquer which the ordinary collector may expect to meet with will date from the fifteenth century—probably figures somewhat rudely carved, but thickly lacquered, originally black, but now brown from the fact of the substratum of red lacquer showing through the black surface. There are also some old perfume boxes that may be met with, their rims heavily cased in pewter. These boxes and the figures are usually described as Kamakura lacquer. The earliest evidence of any great artistic merit is found in the work of Honnami Koyetsu, one of the most skilful of the early masters; his designs, though somewhat rough, are bold and well conceived, and reveal a decorative genius of the highest order. From this master the great Korin undoubtedly derived much of his inspiration.

Korin was perhaps the most eminent, and certainly the most original, of the great masters. I must confess that his style is not altogether my idea of perfection in lacquer; his designs, bold even to audacity, seem somewhat out of place in such a delicate material. But when we hear the superlative admiration with which his works are viewed by the most competent authorities, and with what avidity desirable specimens are acquired, it is well to avoid too hasty a judgment upon them. The vigour of his designs, in which he frequently uses mother-of-pearl and pewter, the rich satisfying hue of his gold, and the decorative power he employed so effectually, have gained for his works a unique place in the estimation of connoisseurs. His style, however, though apparently simple, is difficult to imitate; hence in the hands of his followers it soon fell into disrepute, and no real effort seems to have been made to revive it until the present century, when works were produced which have often been acquired as genuine Korins.

Contemporary with Korin arose a galaxy of masters whose names are immortalised in their sumptuous works; the schools of Korin, Ritsuo, Shunsho, Koma, and Kajikawa, and others, all named after their respective founders, rivalled each other in beauty of workmanship and artistic power. I am fortunate in possessing specimens of the best work of some of these great schools—works, I think, which justify the glowing eulogy of the accomplished French student, Louis Gonse, "that works in lacquer are the most perfect objects which ever issued from the hands of man."

Another master who displayed great originality was Ritsuo, who lived from 1662–1746. His authentic works are rare. He inlaid some of his finest pieces with pottery made to imitate shells, &c., so true to nature that they would easily deceive the careless observer. In many cases lacquer played but a subordinate part, the groundwork being simply the grain of the natural wood, the soft parts being rubbed slightly away, leaving the hard grain in relief. The effect is very fine. His signature, which is frequently forged, was generally accompanied by his seal in pottery; sometimes the seal would appear without the signature.

The work of the Shunsho school, which excelled in togidashi lacquer, is highly esteemed. The founder of the school, Yamamoto Shunsho, lived in the late seventeenth and early eighteenth centuries. It is difficult to convey by mere description the excellence of a choice specimen of this artist's work; the silkiness and mirror-like brilliancy of its surface, the richness of the gold, and the delicacy of execution are simply marvellous. His famous pupil, Nagahide, maintained the highest tradition of the school, but his works are unfortunately scarce. Marcus Huish describes Shunsho's work as the *ne plus ultra* of mechanical perfection. Another distinguished lacquerer, Shoami, also excelled in togidashi, and there is little to choose between his work and that of the Shunshos.

The school of Koma has produced some of the very choicest specimens of lacquer. It was originally founded in the early seventeenth century, but languished somewhat until it was revived a century later by the celebrated Koma Kwansai. This school, in common with others, attained its zenith about the latter period.

The Kajikawas are perhaps the best known of all the great lacquerers of Japan. Ernest Hart states that their work is "rarely other than good," but unfortunately a lot of very inferior work bears their signature; this, however, must not be allowed to detract from the supreme excellence of their finest efforts. The first Kajikawa, in the particular style he favoured, is, I think, without a rival; in fine specimens his giobu nashiji will glisten like gems. He also inlaid some of his work with gold and silver, a comparatively easy operation in metal work where the hammer can be used, but in lacquer it requires the most delicate manipulation. One peculiarity of his which deserves special notice is working the eddies of water and the hairy tails of animals into the form of the single, double, and treble mitsu tomoye, an heraldic badge formed of three comma-shaped figures arranged in a circle. The difficulty of such an operation with an intractable medium like lacquer is extreme. The later Kajikawas produced very fine work all through the last century, but so far as I can see they never rivalled the founder of the school.

I have mentioned only the names of the best known lacquerers, those with whom the student in Japanese art must be familiar. There are many others, such as Soyetsu and Jokasai, who have produced work of the highest quality, but it is no light task to read through a list of Japanese artists; so for your sake and my own I refrain.

The manufacture of lacquer will be found described in several works, but all these have originated in a parliamentary blue-book by Consul Quin, where it is set forth at length. Mr. Gilbertson, the possessor of a splendid collection and a recognised authority on the subject, writes as follows:—"I suspect that there are great varieties in the modes of manufacture. Probably every eminent master had his own peculiar method of producing certain effects. Usually I find a certain order of processes recorded in the text-books, without apparently the least suspicion that they apply only to certain classes of articles. I have dissected various specimens of lacquer, with the result of discovering that these descriptions were altogether inapplicable to Inro,* and I believe also to many other sorts of lacquer. I learned, moreover, that there is a great difference in the treatment of objects of the same class by different makers; in fact, all the descriptions of the art ot lacquering can do no more than give a general idea of the processes employed."

In order to properly describe the subjects that appear in lacquer decoration, I must travel lightly over nearly the whole field of Japanese decorative art; an art inspired by the song of the poet as much as by the genius of the artist. The legends and folk-lore with which Japanese art is so amply illustrated appear far more frequently in metal work and carvings than in lacquer; flowers and trees, views of famous places, symbolical combinations, the meaning of which is in many cases obscure, form the majority of the decorations on lacquered objects. These combinations are especially interesting. Perhaps the most frequent is the sho-chiku-bai, the plum, the bamboo, and the pine—fragrant, green, and everlasting, emblems of longevity. With these are often associated the tailed tortoise and the crane, emblems of long life and happiness.

The bamboo again figures in conjunction with the tiger, considered by the Japanese to be the king of beasts; in such cases the bamboo is usually bending before the dreaded typhoon, while the tiger in terror crouches between the lofty stalks. The meaning is plain: the king of beasts is powerless before the powers of nature. Then we see the sparrow fluttering amid the trembling leaves of the bamboo, both birds and leaves, the poet would teach us, being of a gentle timid nature. The martin in its swift wavy flight is associated with the waving willow. The sturdy pine tree is considered the emblem of strength, and when covered with snow of vigorous old age. The cherry tree drops its lovely blossoms like a fall of snow; so when in winter the snow comes, the poet likens it to blossoms from some fair land

* Inro, a nest of small boxes, slung from the belt, for holding medicines, &c.

where reigns eternal spring; or the white blossoms floating down some sparkling stream are likened to the bright spring-tide of life, and the end is typified by the mountain torrent whirling down the autumn-tinted maple leaves with resistless power.

The flowers most frequently met with are the chrysanthemum, peony, wistaria, iris, lily, hydrangea, carnation, convolvulus, and water-lily; while trees are mainly represented by the *Paulonia imperialis*, plum, fir, and palm. The stately bamboo perhaps holds the most prominent position on account of its almost universal utility and the symbolic value attached to it.

Of all flowers introduced into ornamentation, the chrysanthemum is unquestionably the favourite. The Japanese name for this flower is the "kiku." In works of art it figures very largely, sometimes conventionally, sometimes naturally. In high-class objects made for the court the flower in a conventional form is disposed as a powdering; in this form it is used as one of the imperial crests, although the origin of this crest is a much debated point. The chrysanthemum is considered emblematical of happiness.

Next in importance comes the peony, emblem of regal power, often associated with the lion and the mythical Ho-ho bird.

The wistaria, with its long pointed racemes, is a great favourite. Japanese literature is rich in witty and charming stanzas written in honour of the "fuji," in which it is alluded to as the emblem of youth and spring.

The iris is a very general favourite with the Japanese artist, doubtless on account of its stately and graceful habit; the purple and white varieties are often shown in contrast.

The lotus has long been held in veneration by the Japanese. Springing from the muddy waters, its pure white blossom is emblematical of the ransomed soul rising upwards to the divine light. The figures of Buddha and other saints appear seated on the flowers or leaves of the lotus.

Much more could be said in connection with the artistic treatment of flowers, but I must now pass on to notice the trees, which appear in lacquer as frequently as flowers.

First in rank, as the grandest of all trees of Japan, comes the "kiri" (*Pawlonia imperialis*), which is one of the most magnificent vegetable productions of Japan. The "kiri" frequently appears in art work, both naturally or conventionally rendered. In the latter form, under the name of the "kiri mon," it forms one of the imperial crests of Japan.

There is no tree so frequently represented in Japanese art as the plum ("ume"), and its flowers are especial favourites. The "ume" is found in all departments of Japanese art. In blue-and-white porcelain it constantly appears. The so-called hawthorn pattern, now so popular, is simply the blossom of the "ume." It is frequently portrayed in lacquer, where it may be recognised by its peculiarly angular and spiky habit.

The fir tree appears in Japanese art in its natural habit of growing. In almost all cases it is introduced by the Japanese artist as the emblem of long life and prosperity, and as such it is frequently associated with bamboo, crane, and tortoise, all of which are accepted emblems of longevity and happiness.

The bamboo, emblem of uprightness and usefulness, is much used by artists for ornamental purposes. For narrow upright spaces nothing can be more artistic; a few jointed stems with an occasional leaf or two, and with a deftly drawn bird in flight, make one of those compositions which the mind will ever associate with the nature-loving and painstaking artists of Japan.

The animal kingdom is well represented in Japanese art, but in lacquer not so frequently as the vegetable. Their best efforts are with birds and fishes; with animals, monkeys excepted, they are not uniformly successful. The favourite bird is the crane, of which there is more than one variety; they are considered sacred, and their slaughter is forbidden. From its supposed long life it is considered emblematical of longevity, and the white crane of purity. Nothing can exceed the skilful rendering of the bird in Japanese art. Falcons, eagles, ducks, peacocks, geese, and fowls are all portrayed more or less in lacquer; it is seldom indeed that the artist fails to depict them in realistic forms.

Of quadrupeds, the horse, fox, badger, and monkey are perhaps the most frequent; while others, such as oxen, deer, bears, dogs, rabbits, cats, rats, &c., although to be found depicted in lacquered objects, are more generally found in carvings, metal work, &c. Many of these animals, more particularly the fox and the badger, figure in fairy tales and folk-lore, endowed as a rule with human attributes.

The Japanese are proud of the belief that they were originally a race of fishermen; they invariably accompany their presents with a piece of dried fish. Their extensive seaboard yields a great variety of fish, crustaceans, and marine animals, but, although they are frequently depicted in Japanese art, I do not find them much in evidence in lacquer.

In the delineation of mythical animals and birds, the Japanese artists show to great advantage. In birds, the "ho-ho" with its gorgeous plumage occupies the premier position. I do not find it frequently in lacquer, and therefore give it but a brief notice. The same remark applies to the dragon, kylin, and the conventional lion, for the best examples of which, especially the former, the metal work must be studied. Unrestrained by the necessity of copying nature, the Japanese artists can in this singular creation allow their imaginations free play, and to this, I think, can be attributed their almost unvarying success. The weakest point in Japanese art is perhaps the human figure. I think, however, failures in this direction are more apparent than real. Rigid rules, against which there was no appeal, compelled the artists to delineate it according to rules which had been observed for ages; but when about a century ago the popular schools, which took their inspiration direct from nature, arose, the human figure was treated (not perhaps according to our idea, as they prefer the grotesque rather than the elevated side of our nature) in a manner that the most correct anatomist might approve. Such efforts, however, are almost exclusively confined to carvings and paintings.

It is impossible to say which branch of Japanese art is likely to prove most attractive to a collector. Lacquer, metal work, netsukes, or ceramics, all have their characteristic excellences; in all the Japanese are intensely original. Lacquer ware charms us by its sumptuous beauty, and the poetical inspiration of its decoration. Metal work is often as rich in symbolism, while the religion, the legends, the folk-lore, the history, and even the nursery tales of the country, find in it more ample expression; but for puns and puzzles, jokes and riddles, humour and pathos, history and classic lore, the wood and ivory carvings known as netsukes are unrivalled. To whatever branch, however, attention may be directed it is important to remember the advice tendered by the gifted Frenchman, Monsieur Bing:—"They alone can pretend to fathom the depth of feeling and beauty in an alien art who resolutely determine to scrutinise it from the point of view of an inhabitant of the place of its birth. This is a primary condition. If submission to it be refused —if it be intended to refer all manifestations of art, whatever they may be, to a common measure—that which the centuries have fashioned specially for the use of Western culture—it were better to omit entirely the study of what has been created away from ourselves."

137.—Notes on Sewage Purification as carried out at South Norwood Irrigation Farm.

By J. M. Hobson, M.D., B.Sc., President.

(Read May 29th, 1897.)

The purification of sewage by application to land is full of interest not only to the sanitarian, but to the naturalist. I now propose merely to sketch in broad outlines the operations, both mechanical and biological, which go on in this very fine sample, though on a comparatively small scale, of an efficient sewage farm. I am indebted to Mr. Thomas Walker, the Borough Engineer, who is also one of our members, and to Mr. Figg, the farm manager, for several data.

On this farm the process is entirely one of surface irrigation, after removal of the coarser material by settling and screening. Mr. Walker has estimated that, on an average, 80 per cent. of the bulk of sewage water reaches the effluent, the remainder being absorbed by the soil and growing crops. There is about ten inches of soil upon brick clay. Under-drainage, which is so often essential in permeable subsoils, has hardly any existence here.

In 1890 the sewers discharged, on an average, half a million gallons per diem, not counting storm waters, from a population of 15,500; while for purifying this about one hundred acres were available, or about one acre to 150 inhabitants. Bailey Denton, in his 'Sanitary Engineering,' gives one acre per hundred of population as the normal area. But the "proof of the pudding is in the eating," and we may safely claim a good effluent on this farm. [In May, 1897, the estimated proportion was 174 per acre, but a large addition to the farm has recently been made, and is being utilised for irrigation.] Weekly chemical tests are made of the effluent.

I am not aware that anyone applied the bacteriological test to this particular farm before I did so in 1894. The bacteriological examination that I have attempted so far consists of two separate processes. The first is an enumeration of the organisms in measured quantities of screened sewage and of effluent, respectively; the second is an isolation of specific organisms in the screened sewage and in the effluent. Both processes are full of interest, but my work up to the present has been very far from complete.

I will not here go into the details of either process, but will, as I have already indicated, give you the outlines of each.

Enumeration.—The sample taken is conveyed to the laboratory as soon as possible, surrounded preferably with ice till the moment that the process begins. A measured quantity is then taken and diluted with a measured quantity of sterilised distilled water, thoroughly mixed, and then a measured quantity of the diluted matter added to a tube of melted (of course sterilised) nutrient gelatine, then mixed thoroughly by a peculiar kind of oscillation, and the whole mass poured out on to a *Petri's plate*, and instantly covered up. When the gelatine has set, the plate is placed in an incubator, and kept there at the constant temperature of 20° C. (68° F.) for two or three days, for "colonies" to form. These colonies appear as little beads in the transparent gelatine. By general agreement each colony counts as one organism, *i.e.* an organic unit without any reference to specific identity. The counting then begins. A black card ruled off into small squares of equal area is placed beneath the plate of colonies; these squares are numbered. One counts generally with the help of a low magnifier the number of colonies in a square, and notes down the number on a correspondingly marked white paper. The total number in the several squares gives the number of organisms in the quantity of sample taken. In a crowded plate the enumeration is laborious, and in practice one does not count all the squares, but takes an average of several, and multiplies that by the number of squares covered by the plate. I will now give you the results of some of my countings :—

Experiment No. 6.—Date, April 3rd, 1894. Time, noon. Material, screened sewage. Average of two plates, 3,257,000 per cubic centimetre.

Experiment No. 7.—Date, April 3rd, 1894. Time, noon. Material, effluent. Average number, 364,000 per cubic centimetre. Note that the effluent contained something over 10 per cent. of the number of organisms that the sewage contained; but as Mr. Figg tells me that he reckons the water takes two hours to get to the effluent, this number corresponds to the sewage of about 10 a.m. Possibly the 2 p.m. effluent would have given more organisms, as Mr. Figg says the sewage is generally thickest about noon.

Experiment No. 8.—Date, April 4th, 1894. Time, 8.40 a.m. Material, sewage. Average of three plates, 1,269,000 per cubic centimetre.

Experiment No. 10.—Date, April 9th, 1894. Time, 10.15 p.m. Material, sewage. Average of three plates, 3,297,000 per cubic centimetre.

Experiment No. 12.—Date, April 13th, 1894. Time, 1 p.m. Material, sewage. Average of three plates, 11,000,000. I cannot explain this jump up. There had been no rain since the 2nd. The temperature had, however, been abnormally high, the maximum reached during the previous seven days being 76° F. After this some rain fell, and the number of organisms still further rose on the 16th to 72,000,000. The effluent on the same day and at the same hour also showed an increase to 476,400. It will be noted, however, that the increase of the effluent organisms was not at all commensurate with those of the sewage. From this date till the end of the month the mean temperature remaining high (about 50° F.), and rain falling at intervals, the numbers showed still further increase; but I will not give them, as the plates were so crowded, and the gelatine became so liquid through abundance of organisms known as "liquefiers," that countings were not reliable.

I will now advert to the second section of my observations, namely, the isolation and separate cultivation of specific organisms. Plates as before are used, and gelatine inoculated with a small quantity of the material. Individual colonies are selected for observation and secondary inoculations made from them. By this means pure cultures are obtained, and various media again inoculated from these. The behaviour of the growths on the various media under lower (20° C.) and higher (37° C.) temperatures are observed, and microscopic slides made.

From the sewage I succeeded in isolating twenty species, *viz.* thirteen bacilli, five micrococci, and two sarcinæ. I was able to diagnose the majority of these, but the rest were unnamed.

From the effluent I also isolated ten bacilli, two micrococci, and two sarcinæ. One of the micrococci (*M. ureæ*) was also found in the sewage. It is doubtful if the other micrococcus and the sarcinæ were identical with those found in the sewage. The bacilli were all distinct, so far as I could make out. It is a noticeable fact also that whereas most of the organisms of the sewage would grow at 37° C., several of those of the effluent would not grow at that temperature.

I found the *Bacillus coli communis* in the sewage, but did not isolate it from the effluent. So far as my observations go, this seems important, as sanitarians regard its presence in drinking water as evidence of sewage pollution. It would appear as if the bacterial flora of the sewage had been stopped and a fresh flora from the soil added. Still, my observations are very limited, and should be regarded in the light of an initiatory attempt.

It would be extremely interesting to have a sufficient number of observations to be able to trace the effects of heat and rainfall upon the bacterial population of the sewers.

138.—The Flint Implements of Addington.

By Alexander J. Hogg.

(Read October 19th, 1897.)

By flint implements we understand weapons or tools fashioned of flint by the hand of man, and adapted for any specific purpose. In districts where flint did not exist, or was not easily obtainable, implements were frequently made from other kinds of stone. Implements of granite have been found in Jersey; of limestone in Leigh Woods, above Clifton; and of slate on the Welsh mountains; while in the Wealden area they are not uncommonly made from Kentish rag, or the dense and intractable ironstone of the Lower Greensand.

It was formerly supposed that the shapes of these implements were for the most part accidental, or that they were the work of savage men who simply broke a stone into fragments and selected those most suitable for the purpose of the moment. This may have been the origin of what became afterwards an art; but among the oldest known implements are many forms which resemble each other, and notwithstanding their rude workmanship we can trace in them the types of tools used at much later periods, and even the prototypes of the workman's tools of the present day.

The long ages which passed before the earlier races of mankind found out how to work in metals were formerly inadequately divided into the palæolithic, or older Stone age, and the neolithic or newer Stone age; the former including the ruder and less worked implements, and the latter those finely chipped and ground or polished.

To these the researches of Mr. Benjamin Harrison, of Ightham, have added the eolithic series—so easily distinguished by their warm red-brown colour, like the rust of iron; and Mr. Worthington Smith has drawn attention to a mesolithic series, intermediate in age between the palæolithic and the neolithic, but not of very clearly defined characteristics. At the present time these implements may be said to be divided into three classes—palæolithic, mesolithic, and neolithic. The first of these include the eolithic or plateau implements, so plainly marked off by their almost uniform brown tint; but of the rest it cannot be said that there is any clear dividing line between them.

In the British Museum those of massive form and rough workmanship, or boldly flaked, are classed as palæolithic, and are well represented by numerous examples; those of lighter make, including the finely chipped and the polished specimens, form the neolithic class, of which the National Collection contains so splendid and valuable a series. In this country then there are the two generally accepted divisions of that great stretch of prehistoric time known as the Stone age.

In France this epoch has been divided into two periods—the archæolithic and the neolithic; the first comprising all from the age of the mammoth to that of the reindeer, when implements were sometimes finely chipped; and the second only dating from the time when implements were sometimes ground or polished.

The age of stone was succeeded by the so-called age of Bronze, but implements of that metal must have always been very costly in comparison with those of stone; and it is probable that flint implements and arms were in general use until the introduction of iron, for bronze tools, as well as weapons, are excessively rare, although that metal is much less liable to decomposition than iron. In this country celts were occasionally made of tin, and in America weapons are found of native unsmelted copper merely hammered into the shapes required. In fact, stone implements and arms continued to be made through the whole period usually spoken of as the Bronze age, and until the discovery of the method of working iron supplied implements of the new metal so rapidly and cheaply that it was more easy to procure iron wares by barter than to manufacture them of stone; but this of course applies only to the implements of the finest make.

The Bronze age was therefore concomitant with that of Stone, and we know that the use of stone weapons continued far into the Iron age; for it is matter of history that many of the Saxon soldiers who fought with the Norman invaders at the battle of Hastings were armed with spears headed with flint.

In the same manner the subdivisions of the Stone age also run one into the other, many forms of implements being common to all periods; but there are certain general characters by which each of the subdivisions may be recognized, and brought into regular chronological sequence.

What is really remarkable is that tools of the same forms were in use throughout the immense length of time from the eolithic (I had almost said eocene) period down to the latest neolithic times, showing that the wants of the many races that rose and died out during those thousands of years were practically unchanged. The forms of the implements continue, but the diminution in their size and weight show that the latest races inhabiting this country were veritable pigmies compared with the men of the eolithic age. This is well instanced by a comparison between the implements of the puny neoliths of the Shirley Hills and those of the eolithic people which are found on the elevated plateau of the chalk, or in the most ancient valley gravels.

A systematic study of the remains of the Stone age can be carried out under very favourable conditions in the district around Addington. Within a radius of about two miles from that village the several geological formations from the chalk to the London clay come to the surface, including a large breadth of the Oldhaven and Blackheath beds. This causes considerable diversity of soil, and the elevation above sea-level varies from about 100 to 600 feet and upwards. By this combination of causes the implements have been exposed to different climatic and other influences, which have not only acted upon their surfaces, but have likewise affected their distribution by transporting many to lower levels.

The age of the implements found on the surface ranges from the earliest eolithic to the latest neolithic periods, but there are no signs of the district ever having been visited by the race who fabricated the finely chipped flints of the north of England.

The sites of several factories at which implements were made in large quantities are also comprised within the area, and afford interesting evidence of the occupation of these stations for lengthened periods; even in one instance down to Roman times as evidenced by remains of pottery tiles and other objects.

I first became aware of the existence of implements at Addington about twenty years ago, through one of my daughters finding a couple of rude arrow-heads in a field. She had recognized these as such from their likeness to some that I had received a short time before from Dorsetshire. Stimulated by this find, I made search on my own account, and soon met with numerous examples of what were apparently worked flints, although of a bewildering variety of form and condition of surface.

Having accumulated some thousands of these, my next task was to endeavour to bring order out of chaos, by arranging the heaps in groups showing a general similarity. This was followed by separating from each group all duplicate implements, and these were laid aside, until meeting with a third of like form I considered that the type in each case was established, Continuing to work on this plan, many types were by degrees evolved, and after trying several systems of arrangement which I need not now weary you by relating, I had finally the pleasure of seeing a representative series, containing many forms not to be found in the public collections to which I have had access, and at the same time so classified, that, although I have since collected flints from more than a hundred other localities far distant from each other, there is no difficulty in assigning each example to its proper division.

Our Addington implements are the tools and weapons of the everyday life of the inhabitants of this district long before history began, when a man carried his life in his hand as he hunted in the primeval forests, and must always have been prepared with his weapons either for attack or for defence.

Various methods of manufacture were adopted by the different stone-using races which successively occupied this part of Europe. The earliest peoples seem to have taken a stone and roughly knocked it into shape by a number of blows with another stone; others, by a few blows only, produced from a block the implement or tool they required ready for use. The bulbs of percussion which are of so much assistance to young collectors in deciding doubtful cases are to be found in only three of the six divisions represented here.

The implements which I have brought to-night are few in number, and have been selected to give an idea of what our district produces, and at the same time to show the arrangement which I have adopted.

The spears and arrows are the most numerous, so they require little explanation. These are succeeded by the hatchets, in about a dozen varieties, some apparently intended for purposes of war and some for carpenters' work. A small selection of scrapers follows. There are also some of the multifarious shapes assumed by the saw, which played so important a part in cutting the shafts for the arrows and the spears, and doubtless for many other purposes for which nowadays we make use of knives.

There are also some twenty typical tools, the uses of which must be matter of conjecture; space and time would not admit of a larger selection. In addition to these, adzes, mauls, hammers, sling-stones, wedges, chisels, gouges, daggers, borers, rimers, pounders for crushing corn, and many others, are found in this district, but are not represented here.

Owing to their great weight, the ponderous weapons of the older races are almost unrepresented, and perhaps it is as well that on this occasion they should be so; for it is hard for the nineteenth-century man to believe that he is descended from ancestors with sufficiently powerful frames to be capable of wielding the largest eolithic implements found in the older gravels or on the chalk plateau.

The divisions into which these implements are separated are six in number, and in naming them for my own convenience I have followed as far as possible the terms already well known, though using some of them in a more restricted sense in order to avoid confusion.

The first is the *eolithic*, so named by Mr. John Allen Browne, and these, with my second or *archæolithic* series, constitute the plateau implements of Sir Joseph Prestwich, first made known through the enthusiastic researches of Mr. Benjamin Harrison. These two divisions vary in colour from deep chocolate down to a pale yellow or cream colour, and have no bulbs of percussion, even in the smallest specimens.

For the third division, I have retained the old name of *palæolithic;* these are of a dull creamy white, the deteriorated surface is rough to the touch, and percussion bulbs are almost wholly absent; the forms are very simple, and secondary work is uncommon.

The fourth or *mesolithic* division holds a middle place between the palæolithic and the neolithic; it consists of well chipped and frequently elegant implements of a smooth surface, white, bluish white, or grey in colour, sometimes porcelainous, and never so much deteriorated as to be rough to the touch. Percussion bulbs in this division are frequent.

The fifth division, which I have called *proto-neolithic*, as being next preceding the neolithic, consists of implements differing in style and in method of fabrication both from those that preceded and those that followed their epoch. Their colour is usually black or grey, with blotches or streaks of opaque white. They are frequently shaped from pieces of tabular flint, are roughly made, and never exhibit bulbs of percussion.

The neolithic hardly needs to be characterised. The surface of the implements has not undergone much change, the normal colours of the flints being preserved. In the older examples white streaks or cloudy spots have made their appearance, and bulbs of percussion are frequently met with.

These divisions will be found to harmonise with the geological changes that have produced the features of the country around, and the different classes are proper to certain zones of elevation. For instance, the *eolithic* are rarely found on the surface below 450 ft., the *mesolithic* below 350 ft., or the *proto-neolithic* below 300 ft.; while the neolithic occur at all elevations. So far as I have yet been able to observe, these figures will apply to the whole of the London Basin, and as the age of any gravel is the age of the newest implement it contains, this arrangement will at least provide a means of arriving at the relative ages of beds in cases where other methods are not available, and to unite together more closely the sciences of archæology and geology.

My object has been to introduce to your notice some of the implements that are to be found within the limits of a moderate walk, and to show that the materials for the study of prehistoric archæology are, in this part of the country, within the reach of all whose tastes tend in that direction.

Through the kindness of Mr. Whitaker, I am enabled to exhibit on the table this beautiful example of the implements found in the gravel-beds of St. Acheul, in the department of the Somme, in South-eastern France. This has been worked by the detachment of a great number of large flakes to a sharp flat point, like a spear, while, being thinned off to an edge at the butt-end, it could also be used, if mounted, as an axe; making on the whole a formidable weapon well adapted for an attack on the gigantic mammoth, whose bones occur in gravels of the same age, and have been found associated with similar implements.

139.—The Cacao Plant.

By James Epps, Jun.

(Read November 16th, 1897.)

It was on the 31st of July, 1498, that Columbus first sighted the island of Trinidad. This was not his first voyage to the New World, but his third, he having made his grand discovery in the year 1492, when he landed at San Salvador, one of the Bahama group of islands. As his ship approached the island the Three Sisters (peaks of Moruga), which are united at the base, prompted the great discoverer to call the island Trinidad, the formation of the hills suggesting to him the Trinity. The stout-hearted navigator must have begun to lose heart, for on the day of the discovery he had been becalmed a week, and things were indeed looking serious. "The air was like a furnace; the tar melted; the seams of the ship yawned; the salt meat became putrid; the wheat was parched as if by fire; the hoops shrank from the wine and water casks, some of which leaked and others burst; while the heat in the holds of the vessels was so suffocating that no one could remain below a sufficient time to prevent the damage that was taking place."

About ninety years after the visit of Columbus the Spanish took possession of the island, and in the course of time formed several towns, making St. Joseph their capital, following out their usual custom of establishing the chief town a little way inland, as a precautionary measure in case of invasion; it may also be noticed that they made it a practice to name places after favourite saints.

Not very long after the Spanish appropriation, Sir Walter Raleigh, who was cruising about his ill-starred "El Dorado" expedition, vainly seeking for gold which he was not destined to discover, but which has since been abundantly found on the adjacent mainland, coasted along the Trinidad shore, attacked and burnt St. Joseph, and took upon himself, perhaps unwarrantably, the task of punishing the new rulers for their inhumanity to the Indians.

In 1780 a French gentleman, M. de St. Laurent, residing in Grenada, while paying a visit to Trinidad, was charmed with the fertility of the soil, which compared most favourably with that of the island he knew. He made representations to the Government, proposed a scheme, which was approved, and the result was the passing of a Cedilla, which led to the migration, in 1783, of a flock of foreign agriculturists, chiefly French, but with a goodly sprinkling of coloured people from the neighbouring islands. Thus in a very short space of time, and by the wit and foresight of a stranger, the resources of the colony developed, and the population increased. In the same eventful year of the Cedilla (1783) Port of Spain became the capital, and St. Joseph began to decline.

The last of the Spanish governors, Don Joseph Chacon, who was much respected, and liberal-minded, amiable, and an honourable man, was appointed by the Spanish Government to carry out the scheme of M. de St. Laurent, and he did it with such promptitude that in the course of a year or two from the passing of the Cedilla the population had increased from 1000 to 12,000. Numbers of French refugees from Martinique, Guadeloupe, and St. Domingo settled in Trinidad, so that the latter became a French colony in all but name.

At length, in 1797, England, being then at variance with Spain, sent an expedition, under Sir Ralph Abercrombie and Rear-Admiral Harvey, to capture the island. Don Chacon, finding himself outnumbered, surrendered without an engagement, and ever since Trinidad has been a British colony. The unfortunate governor was tried before the Spanish Tribune in Madrid for deserting his post, and was banished, dying a few years after of a broken heart.

Although Trinidad sends us some of the very finest qualities of cacao, the cocoa tree is a native of Tropical America, and is to be found mostly, in its wild state, on the land adjacent to the Great Amazon River, and near to the Equator.

The *cultivation* of cocoa, however, is mostly to be found in Ecuador and Venezuela, on the mainland, and in the islands of the West Indies; by the English in Trinidad and Grenada, the French in Martinique and Guadeloupe, and the Spanish in Cuba.

Although cocoa was not known in the Old World before the discovery of the New, it was at an early date introduced into the Philippine Islands by the Spanish, and by the Dutch into Java, and within the last thirty years into Ceylon by the English.

The first knowledge Europe had of the cocoa plant was through Columbus, who, finding it was a favourite drink of the Indians, took home some of the fruit to Spain with him. The Spanish were not slow to appreciate its excellent qualities, and soon introduced it into Spain. For years no other nation but the Spanish had any hand in the cultivation; they appear thoroughly to have understood it and appreciated its virtues. Sir Hans Sloane remarks that when the Spanish went first to Mexico cacao-nuts went for current money. When Cortez sent to Charles V. the principal products of the New World, he did not omit cacao as the most healthy of the beverages which Spain obtained by its conquests.

It was probably more than a century after the introduction into Europe before the English became acquainted with it. The first mention we have of cocoa in England is an advertisement in the 'Public Advertiser' of Tuesday, June 16th, 1657. This notice reads:—"In Bishopsgate Street, Queen's Head Alley, at a Frenchman's house, an excellent West Indian drink called chocolate is to be sold, where you may have it at any time, and also unmade, at reasonable rates."

In the time of Charles II. (1660) the beverage was much esteemed, and a book published at that time by Dr. Stubbes attributes many virtues to it. The book also gives us an insight into the price of the commodity at that time, for the readers of the 'Indian Nectar, or a Discourse concerning Chocolata,' are invited to buy their cocoa from one, Mortimer, who lived in Smithfield, and sold the best kind at 6s. 8d. per lb., and common sorts half that price.

The drink became exceedingly popular in the eighteenth century, and the sign of the 'Cocoa Tree' was seen everywhere. The high price charged was against it, however, and it was soon outstripped by both tea and coffee.

The cacao, or cocoa of commerce, is the seed of a small evergreen tree—the *Theobroma Cacao*. The name was conferred upon it by Linnæus, from the Greek words "Theos," god, and "Broma," food—or food of the gods—and belongs to the order Sterculiaceæ; it grows from twelve to twenty-five feet in height.

An ideal spot on which to found a cacao plantation is a well-sheltered vale running up to an elevation of not more than one thousand feet; the soil should be one possessing requisite depth of surface soil, and one moderately rich, consisting of loose clay, or clay with an admixture of a fair proportion of sand and lime, and one thing absolutely necessary for the well-being of the cacao tree is shade.

When planting an estate the first thing to be done is to cut down the brushwood and clear the ground, and when this has been done holes at regular distances are made, into which are dropped the ripe seeds; or young plants, raised in nurseries, are brought out and carefully planted. This operation requires the greatest care, as the slightest damage done to the roots in moving them is certain death to the plant. It is usual now, on my plantation, to plant the seeds in short lengths of bamboo stems, so that when the time comes for the removal of the young plants from the nurseries the bamboo-pots are taken up and transplanted, with the young plants in them, intact. This I have found a perfect safeguard against any damage to the young root.

At the same time as the cacao-seeds are planted the small shade-plants have to be put in, in order to protect them for a few months, such as the cassava, castor-oil, red-pepper, &c.; farther off are planted bananas and plantains, one between each cocoa plant—these will give requisite shade for two or three years; and lastly there come the permanent shade-trees at distances, say, from thirty to forty feet, which at the end of three years will provide all the necessary shade. These permanent shade-trees are the "Immortelle," or "Madre de Cacao" (*Erythrina umbrosa*). See first Plate.

The leaves of the cacao tree, as you see, are large, smooth, glossy, thin, and of a bright green colour. They droop gracefully from the trees, and are about eight to twelve inches long (I have gathered them from my trees, grown in this country, even larger than this), and are about six to eight inches broad, with pointed ends.

The tree bears fruits more or less all the year round, so that buds, flowers, and fruit are found in all stages at the same time on the same tree. The flowers have short stalks, and grow directly from the trunk and main branches, as you will see by the photos which I will pass round (see second and third Plates); but not from the young formed wood nor intermixed with the foliage. The flowers usually grow in bunches, and are very small considering the size of the tree. The flowers are a creamy white colour, somewhat resembling the flower of the lime (*Tilia europæa*).

The fruit or pod resembles a short thick cucumber (see fourth Plate), containing from twenty to forty seeds enclosed in a white mucilaginous pulp. A fine quality vinegar can be made from this pulp. The pods during their growth assume most beautiful colours, varying in shade from a rich golden yellow to pink. The chief or main crops are two in each year, namely, June and December.

The pods are gathered by means of a cocoa-hook (see fifth Plate); this instrument is made of a shape to be used either by a push, a pull, or by a side cut, and when kept well sharp and affixed to a light bamboo-rod serves admirably for collecting the pods from the higher branches of the trees. Care must be used in order that the "cushion," or point where the cocoa-pod is borne, is not damaged, as the tree presents a succession of flowers and fruit at or near the same point each season. Only skilled hands can be used for this work. The pods, after being released from the tree, fall to the ground, and are gathered into heaps by men and women. One pod is then placed in the open left hand, and the operator, with his right hand, brings down a cutlass (see fifth Plate) on the upturned side of the pod, taking care not to allow the tool to go through the shell to injure the beans. The seeds contained within the pods are then scraped out with the fingers, and placed in baskets, and are carried away to the curing-house. (See sixth Plate.)

Curing has been, and is, done in many ways. In high-class qualities of cocoa fermentation is necessary, although in some countries the beans are only sun-dried, fetching in the market a much lower price. In some countries they are cured and then washed. As the two latter processes involve no special care, we will pass on to the critical process of fermentation, or curing, as it is carried out in the preparation of the finest cocoas of Trinidad.

The fresh cacao-seeds, when taken from the pods, as previously mentioned, are covered by a copious pulp, and possibly the first impulse of a grower would be to remove this pulp by washing and drying the beans as quickly as possible. This, however, would not result in a good quality of cocoa. It is true that the pulp must be removed, but washing is not the best process; and apart from this, there are other considerations to be thought of. The fresh bean, if tasted, will be found to be of a somewhat bitter taste, and of a pale crimson colour. Both these characters have to be altered before the beans are fit for market.

The best method for this purpose is evidently the one now generally adopted. The sweating process is this:—The beans brought from the field are placed either in barrels, oblong boxes, or in a close room, where they are packed closely together, covered with plantain leaves, and left hermetically closed for a period extending from four to seven days. While thus shut up a process of fermentation, fed by the saccharine matter in the pulp, takes place, which raises the temperature of the mass to about 140° F.; it must not be allowed to go above this. When the sweating process has been carried on for the requisite number of days, it will be noticed, on opening the house and taking off the coverings, that a warm odorous steam arises from the mass, which is one of the natural results of fermentation. The cocoa itself is also quite hot, and the pulpy matter around the seeds has lost its rather slimy consistence, and is capable of being easily removed.

In this state the cocoa is turned out and spread on trays. It is first of all carefully picked over by women, who separate the beans and free them from trash, tripe, or any foreign substances.

A number of women are then employed for one or two hours in rubbing them with their hands and cleaning them as thoroughly as possible from any remaining gummy or mucilaginous matter.

They are then spread out in the drying house and frequently turned until dry, and are then packed in bags for the market.

Some twenty years ago most of the Trinidad marks came into the market clayed; this was done by rubbing the cocoa, when taken from the sweating house, with a red or yellow clay, and was supposed to assist the keeping qualities of the beans. Clayed cocoa from Trinidad is now the exception. Cocoa from Caraccas is now one of the few clayed varieties.

A great difference of opinion exists as to what chemical changes take place during fermentation, and at present I think nothing definite is known. The fermentation of cocoa may be looked upon as essentially alcoholic, the sugar of the pulp becoming converted into alcohol and carbonic acid.

The various names under which the varieties of the *Theobroma Cacao* are known do not constitute species, but must be merely considered as varieties of one original species.

These varieties probably owe their origin to seed variation, together with the influence of soil and climate. The classification of Mr. Morris, Director of the Public Gardens and Plantations in Jamaica, was based upon the nomenclature of the best estates in Trinidad, and has stood the test of ten years.

He makes two classes—

Class I.—Criollo;
Class II.—Forastero;

and he gives the Calabacillo as a variety of the Forastero.

If we interpret the words Criollo Cacao as native cocoa, Forastero as foreign, and Calabacillo as Calabash cocoa, we shall have a better definition of the terms.

The Calabacillo is so named from the fruits resembling those of the Calabash tree (*Crescentia Cujete*).

The Forastero variety appears to be the most robust, and the best producer, but in the generality of plantations are, however, so mixed a character that it is difficult to separate the one kind from another; this is a great pity, as it would well pay planters, when planting their estates, were they to keep the varieties apart. This mixture of varieties has chiefly been brought about by the contract system, which is this:—A man obtains so many acres of Government virgin land; he has no ready money to pay for labour, or trees to plant the same, so gives the estate over to contractors. These are men that undertake to plant so many cocoa trees on the estate, and it is these men who put in any varieties of cocoa they can most easily and cheaply obtain; after five or six years the trees begin to bear fruits, and the original owner comes forward and pays the contractor so much for each tree in bearing—say, from twenty-five to fifty cents per tree, the contractor having had the use of the land for the time for growing between the young cocoa plants many other crops.

The yield of a mature cocoa tree varies considerably. A good cocoa tree in a good soil yields from fifty to several hundred pods per year. The average well-cultivated trees at seven years old should bear about eighty to a hundred, and it takes about eleven pods to yield one pound of cured cocoa, so that one tree may be looked upon as yielding about eight pounds of cured cocoa in one year. A young tree is not allowed to bear until it is three years old.

The diseases of the cacao tree are fortunately not numerous. Perhaps the most common disease is one known as canker; this is chiefly caused by the plants being planted in poor and undrained ground. There is also a disease that attacks the pods in extremely dry weather, caused by a fungus; this is known under the name of black rot, on account of the pods turning black when attacked. Pods will also turn black and drop in extremely wet weather.

The greatest enemies that the Trinidad planters have to contend with are the parasol or umbrella ant (*Œcodonia Cephalotes*), and also the cacao beetle (*Steirastoma histrionica*); another species is the *Steirastroma depressa.*

Mr. Hart, in his work on Cacao, says:—"The most troublesome vegetable parasite is a species of *Loranthus*, a plant resembling our mistletoe, which, being a true parasite, does considerable harm to the cacao trees; it is always cut away from the tree on being seen. Several orchids are also found growing on the branches of the cacao trees; also two species of *Cuscuta* or Dodder, but these are chiefly epiphytical growths, and do little or no harm. The squirrel is also a great enemy of the cacao planter; not that he damages the trees, but causes sad havoc amongst the ripe pods; he, unfortunately, is not satisfied with taking one pod and finishing it, but will attack and spoil hundreds. He prefers the Criollo variety, owing to the greater sweetness of the pulp, in preference to the Forastero variety."

Cocoa, as we have already noticed, came into use in England about the year 1662. I have here a very valuable book, to which I have already drawn attention—Dr. Stubbes, 'The Indian Nectar, or a Discourse concerning Chocolata.' This is a duplicate copy sold by the British Museum in 1831. It is published by J. C. for Andrew Cook, at the sign of the Great Dragon, in St. Paul's Churchyard, in 1662, and with your permission I will read a few extracts from it, in order that you may see how chocolate was first introduced into London, and what in those days it consisted of.

Dr. Stubbes, in the preface of his work, writing to his learned friend Dr. Thomas Willis, says (I may say that Dr. Stubbes is just about to start for Jamaica):—"I have set down the ways of Ledesma and Zacchias, and the way by which the Chocolata is commonly made, and I have left in the hands of an honest though poor man, Richard Mortimer, in Sun Alley, in East Smithfield, both my common Chocolata receipt and that other of Chocolata Royal, both which are fitted for the use of such as are in health, or not of a very weak stomach, being made up with mild spices of Jamaica, and such as may securely be used by the most healthy. They who would have particular Chocolata may have recourse to him, and rely upon his honesty to prepare them carefully, according to my method, which, though infinitely laborious, he is resolved to follow. I chose him because I found him, of all others, tractable to observe my directions, and to make what experiments I pleased; he lived in Spain many years, and is as skillful as honest. He will attend on any physician of note, to receive his directions, and also to inform him (if he would vary from my ways by any addition) what may be added, and what quantity to each proportion of Chocolata. Because that Richard Mortimer lives so far off, I have appointed that his Chocolata of both sorts shall be sold at Captain Beckford's, at the Custom-House-Key; the best Chocolata, called Chocolata Royal, will cost six shillings and sixpence each pound, weighing about thirteen ounces, or somewhat more; the ordinary Chocolata, weighing about fifteen ounces each pound, will cost three shillings and eightpence. And in the same place they may be furnished with the best Cacao nuts which I could yet ever see in London; and also with Jamaica pepper."

"And now I come to speak of the present ways of making Chocolata. I shall represent those ways which are authenticated by Physicians—To every hundred nuts of Cacao are put two cods of Chili, called long Red Pepper, one handful of Anise seeds, and Crejaelas and two of the flowers called Mecasnobill, one Vaynilla, or instead thereof (if the party be costive) six Alexandrian Roses, beaten to powder, two drachms of Cinnamon, twelve Almonds, and as many Hazel Nuts, half a pound of sugar, and as much Achiote as would colour it."

Another receipt is—"Take twelve pounds of Cacao nuts, finely powdered; of Cinnamon, finely powdered, one pound, half a pound of Anise seed, six Vaynillas, finely powdered; of Maize, three pounds; one pound of Aienzoli (or half-a-pound of sweet almonds) bruised and well beaten; of Achiote half an ounce; of sugar four pounds."

Out of these he bids us frame a mass. Besides these prescripts, other receipts put in other ingredients, with a great variety and difference one from the other; some put in a proportion of black pepper, some of long pepper, some retain that of Chili or long red pepper. Cinnamon, cloves, almonds, hazel nuts, vaynillas, musk, amber-grise, orange-flower water are things usually put in or omitted; as also nutmeg, lemon and citron peel, cardamoms, fennel seeds, chemical oil of nutmeg and cinnamon, and the most delicate spice called Jamaica pepper; and achiote, too, is sometimes left out or changed for santals, according to the device of the chocolata maker.

In the common chocolata sold so cheap there is not anything but eight ounces of the nuts prepared and powdered, seven ounces of sugar, and one ounce of spice; that is, half an ounce of cinnamon, two drachms of Jamaica pepper or other pepper, and as much of cloves, nutmeg, and lemon peel; some colour it with achiote; some decline to do so; some put into each pound, to make it extraordinary, six grains of red pepper or chilies. I may say that the Indians made their chocolate of the cacao beans, mixed with maize-flour and honey, and this specimen of chocolate is one made about thirty years ago in Venezuela, from an old Indian receipt.

The following extract is from 'The Complete Dictionary of Arts and Sciences,' published in 1764:—"Chocolate in commerce, a kind of paste, or cake prepared of certain drugs, the basis of which is the Cacao nut. The Indians, in their first making of chocolate, used to roast the Cacao in earthen pots and, having afterwards cleared it of the husks, and bruised it between two stones, they made it into cakes with their hands. The Spaniards improved this method. When the cacao is properly roasted and well cleansed, they pound it in an iron mortar, to reduce it into a coarse mass, which they afterwards grind or levigate on a stone, under which a charcoal fire is kept, till it be of the utmost fineness; when the paste is sufficiently ground, it is put quite hot into tin moulds, in which it congeals in a very little time. Complaints are made that the Spaniards mix with the cacao too great a quantity of cloves and cinnamon, besides other drugs without number, as musk, ambergris, &c. The grocers of Paris use few or none of these ingredients, but only choose the best nuts (which are called Caraccas, from the place where they are produced), the freshest vanilla, and the finest sugar, but seldom any cloves. Among the English the chocolate is made of the simple cacao, excepting that sometimes sugar and sometimes vanilla is added." So much for the old way of making chocolate.

Cocoa beans are imported into this country in bags averaging in weight about $1\frac{3}{4}$ cwt. each. The first operation carried out by the manufacturer is the blending of the numerous varieties and qualities of cocoa; this requires great care and judgment. This being done, the cocoa beans are placed in revolving iron cylinders over a bright coke or charcoal fire and roasted. After coming from the cylinders they are allowed to cool, and are then passed through mills in order to break them up; they are then allowed to fall in front of a strong fan, which blows away the light shell, leaving the nib. The nibs are then passed through revolving stone mills, slightly warmed; the result is a rich brown liquid of about the consistence of golden syrup. This liquid cocoa is now ready for any special variety of cocoa that the manufacturer may wish to make. For chocolate this liquid is mixed with pure loaf sugar only, but, if required, is flavoured with vanilla or any flavouring substance desired.

For prepared or soluble cocoas, the cocoa butter or natural oil is allowed to remain, and this liquid cocoa is mixed with loaf sugar and West Indian arrowroot; the sugar and arrowroot, if mixed in the proper proportions, thoroughly incorporates the oil, which is one of the most nutritious parts of the cacao bean, and makes a delightful drink. Again, the liquid cocoa may be put into bags and then placed in hydraulic presses, by which the cocoa butter or oil is extracted; the remaining portion forming a fine dry powder, which is sold as pure cocoa under the name of essences, extracts, &c., but very erroneously so, as it can hardly be considered pure when all the nourishment of the bean has been extracted. Cocoa, before the extraction of the oil, may be compared to new milk; but cocoa after the extraction of the oil is like milk after the removal of the cream.

Some persons prefer cocoa nibs; the great drawback to this form of cocoa is the trouble and time required in making a beverage from them; they having to be boiled for several hours, and on cooling the oil solidifies, and by some persons is removed. In Ireland a favourite beverage is the cocoa shells only; these are put into a teapot, and infused in the same way as tea. This beverage is not very palatable, I may say.

Cocoa, in the form of nibs, contains in every hundred parts—

50	parts	Cacao butter.
20	,,	Albumenoids.
13	,,	Starch, sugar, &c.
4	,,	Salts.
2	,,	Theobromine.
11	,,	Other substances.

The cocoa butter, which forms about half the substance of the nib, is a hard fatty material, which when clarified is of a dead white colour. Its melting point is low, about 100° F. A peculiarity about this fat is that it never becomes rancid; this makes it most valuable, and places it first on the list of the fatty class of our carbonaceous or heat-giving foods. The albumenoids constitute about twenty per cent. of the nib; these are classed among the nitrogenous principles of food, and their presence renders cocoa one of the richest flesh-formers we have. The starch, gum, and sugar form about thirteen per cent. of the whole, and, like the cocoa butter, belong to the non-azotised principles. The alkaloid of cocoa is theobromine, a specimen of which I have extracted from the finest cocoa; it represents about two per cent. of the bean. This alkaloid is very similar in its physiological effects to theine, the active principle of tea, and caffeine, the active principle of coffee, from which it differs but slightly in chemical composition.

$$\text{Theobromine } C_7H_8N_4O_2.$$

$$\left.\begin{array}{l}\text{Theine} \quad . \quad . \\ \text{Caffeine} \; . \quad .\end{array}\right\} C_8H_{10}N_4O_2$$

Theobromine is a gentle nerve-stimulant and waste of tissue preventer, similar to theine and caffeine. Analysts have not at present given us the percentage of volatile oil, which imparts the delightful odour to the cacao bean; but it exists in small quantities, and is only brought out during the roasting of the bean.

I think at this point it would not be out of place to draw attention to three other plants which sometimes lead to confusion with the cocoa; they are:—The coco-nut (*Cocos nucifera*) of the fruiterer, which yields coco-nut fibre, and the albumen of the seed, which yields a pale straw-coloured oil (coco-nut oil); this palm thrives in tropical countries along the sea-shore. The kola (*Sterculia acuminata*), which is grown in Africa; these nuts, when ground, are often mixed with chocolate and sold as kola-chocolate or kola-paste. And the coca (*Erythroxylon coca*), which are the leaves of a plant largely grown in Peru; these yield the most highly-valued alkaloid "cocaine."

In conclusion, I should like to draw your attention to the wonderful increase in the consumption of cocoa in this country during the last ten years:—

	Lb.	Increase.
1888 . .	18,227,017	——
1889 . .	18,464,164	237,147 lb.
1890 . .	20,224,175	1,760,011
1891 . .	21,601,825	1,377,650
1892 . .	20,797,283	D. 804,542
1893 . .	20,874,995	77,712
1894 . .	22,440,820	1,565,825
1895 . .	24,484,502	2,043,682
1896 . .	24,523,428	38,926

Cacao Plantation, showing Bananas and the Madre de Cacao as shade trees.

CACAO TREE—IN BLOSSOM.

GROWING AT NORFOLK HOUSE, BEULAH HILL, UPPER NORWOOD.

CACAO TREE—IN FRUIT.

CACAO PODS.

COCOA HOOK. CUTLASS.

Removing the Beans from the Pods.

140.—Report of the Meteorological Sub-Committee for 1897.

Prepared by the Hon. Sec., Francis Campbell-Bayard, P.R.Met.Soc.

(Read February 15th, 1898.)

The arrangements for observing the daily rainfall round Croydon have been successfully carried out on the same plan as before, and with, it is hoped, the same efficiency. The number of stations in the printed sheet is 81, and there are two stations (Hartswood, Buckland, and Newlands Park, Sydenham) not in the printed sheet, the observations of which are quite complete, and will be found at the end of this Report.

Six stations, Marden Park, Croydon (Chatfield Road), Croydon (Lower Addiscombe Road), Hayes, Chislehurst, and Forest Hill (Nurseries), have come to an end owing to the discontinuance of the observations, and one, Keston (Tower Fields), through the death of the observer, Mr. George Buchanan. This is a much larger number of vacancies than has occurred in any previous year, and it is a matter for regret that there are only four new observers.

The monthly sheets contain all the records, with the exception of Buckland and Sydenham, which have been received by the Sub-Committee, and the stations of which the records have been tabulated and printed number 81 as against 78 in the last Report, and the number of observers is 68 as compared with 66.

Appendix I. to this Report contains a list of the observers, with particulars relating to the stations and gauges, and also the monthly tables of daily rainfall, of which a sufficient number have from time to time been pulled for the use of the Club; and Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from the monthly tables of Appendix I.

This year, like 1896, has been a remarkable one. The wet March and the dry October form a curious contrast.

In order to show the principal features of the rainfall of 1897, Tables A, B, C, and D have been constructed on the same lines as the four tables in the last Report.

A.—*Greenwich Average* 80 *Yrs.* (1816–95).

	Average	1897	± Average
	IN.	IN.	IN.
Jan.	1·89	1·73	− 0·16
Feb.	1·59	2·24	+ 0·65
March	1·52	3·40	+ 1·88
April	1·65	1·54	− 0·11
May	2·00	1·45	− 0·55
June	1·95	1·73	− 0·22
July	2·60	0·73	− 1·87
Aug.	2·33	2·86	+ 0·53
Sept.	2·30	2·70	+ 0·40
Oct.	2·82	0·48	− 2·34
Nov.	2·37	1·07	− 1·30
Dec.	1·94	2·15	+ 0·21
Year	24·96	22·08	− 2·88

B.—*Greenwich Average* 40 *Yrs.* (1856–95).

	Average	1897	± Average
	IN.	IN.	IN.
Jan.	1·98	1·73	− 0·25
Feb.	1·43	2·24	+ 0·81
March	1·44	3·40	+ 1·96
April	1·61	1·54	− 0·07
May	1·94	1·45	− 0·49
June	2·04	1·73	− 0·31
July	2·42	0·73	− 1·69
Aug.	2·30	2·86	+ 0·56
Sept.	2·18	2·70	+ 0·52
Oct.	2·75	0·48	− 2·27
Nov.	2·19	1·07	− 1·12
Dec.	1·94	2·15	+ 0·21
Year	24·22	22·08	− 2·14

C.—*Surbiton Average* 40 *Yrs.* (1856–95).

	Average	1897	± Average
	IN.	IN.	IN.
Jan.	2·04	1·96	− 0·08
Feb.	1·47	2·01	+ 0·54
March	1·44	3·73	+ 2·29
April	1·64	1·89	+ 0·25
May	1·92	1·24	− 0·68
June	2·08	3·89	+ 1·81
July	2·37	1·03	− 1·34
Aug.	2·43	2·83	+ 0·40
Sept.	2·21	2·12	− 0·09
Oct.	2·81	0·46	− 2·35
Nov.	2·16	0·94	− 1·22
Dec.	1·85	2·33	+ 0·48
Year	24·42	24·43	+ 0·01

D.—*Mt. Ararat, Wim., Av.* 40 *Yrs.* (1856–95).

	Average	1897	± Average
	IN.	IN.	IN.
Jan.	1·79	1·96	+ 0·17
Feb.	1·38	1·98	+ 0·60
March	1·33	3·32	+ 1·99
April	1·64	1·61	− 0·03
May	1·92	1·08	− 0·84
June	2·08	2·92	+ 0·84
July	2·49	1·02	− 1·47
Aug.	2·31	3·23	+ 0·92
Sept.	2·28	2·72	+ 0·44
Oct.	2·88	0·55	− 2·33
Nov.	2·19	1·29	− 0·90
Dec.	1·77	2·42	+ 0·65
Year	24·06	24·10	+ 0·04

Tables A and B refer to Greenwich. Table A shows that the rainfall of 1897 is 2·88 in. below the 80 years' average (1816–95); whilst table B shows that it is 2·14 in. below the 40 years' average (1856–95). The difference between these two amounts is 0·74 in., exactly the difference of last year. This result is somewhat startling, for it seems to show that the average of the 40 years (1816–55) is 0·74 in. higher than the average of the 40 years (1856–95), which is not the case. The average for the 40 years (1816–55) is 25·71 in., and the difference between the mean of this 40 years and of the 40 years (1856–95) is 1·49 in., exactly double the difference between the means of the 80 and 40 years in tables A and B. These large differences would certainly seem to show that we have not yet got a true mean for Greenwich.

When, however, we cast our eyes over tables B, C, and D, which refer respectively to Greenwich, Surbiton, and Mt. Ararat, Wimbledon, a great change is at once seen. The great deficiency of 2·14 in. at Greenwich disappears in the case of Surbiton and Mt. Ararat, Wimbledon, and instead thereof we have a slight excess. This excess arose in a great measure owing to a thunderstorm with heavy rain, on June 24th, over the western part of the district.

In Appendix II. the falls of rain of 1·00 in. and over are set out, and the large fall on June 24th in the western part of the district is specially noticeable. I cannot help thinking that, as stated in last year's Report, the configuration of the land has a good deal to do with it.

The Sub-Committee would draw attention again to the number of days—eleven in all—on which an inch or more rain fell, and also to the singular fact that during last year and this year there has been only one such fall at Greenwich. As is well known, great alterations have been made at Greenwich, and the portion allotted to meteorological observations is now greatly restricted; so much so that I cannot but think that the character of the observations has not been improved thereby.

In conclusion, the Sub-Committee desire to express their thanks to the three gentlemen who have so kindly continued their subscriptions to enable the Club to carry on its great work, and also to the very cordial co-operation of the observers, without whose assistance such a work could never be successful.

Harkwood, Buckland, Surrey.

Observer—Ralph W. Clutton. Gauge 5 in. in diameter.

Height of gauge above ground, $12\frac{1}{2}$ in.
Height of station above sea-level, 174 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN. 1·96	IN. 2·90	IN. 4·30	IN. 1·66	IN. 1·47	IN. 1·52	IN. 1·34	IN. 2·78	IN. 2·12	IN. 0·58	IN. 1·16	IN. 3·77	IN. 25·56

Elmfield, Newlands Park, Sydenham, Kent.

Observer—Dr. O. Jepson. Gauge 5 in. in diameter.

Height of gauge above ground, 1 ft.
Height of station above sea-level, 136 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN. 1·57	IN. 1·95	IN. 3·52	IN. 1·18	IN. 1·41	IN. 3·45	IN. 1·18	IN. 2·53	IN. 2·89	IN. 0·58	IN. 1·13	IN. 2·46	IN. 23·85

APPENDIX I.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB

(Meteorological Sub-Committee.)

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Abinger (The Hall)	The Lord Farrer	8	2	0	320
Abinger (The Rectory)	Miss Brodie-Hall......	5	1	0	381
Dorking (Denbies)...............	J. Beesley	5	0	6	610
Walton Heath (The Hermitage)..	S. Bostock	5	1	2	650
Redhill (Oxford Road)...........	W. H. Tyndall.........	8	1	0	300
Nutfield (The Priory)	J. Moffatt	8	1	2	468
Reigate (The Briars)	Mrs. Barclay..........	5	1	0	430
Reigate Hill (Margery Hall)	W. F. Taylor	5	2	0	756
Reigate Hill (Nutwood Lodge)..	H. E. Gurney	5	1	0	440
Upper Gatton	F. Druce	5	1	0	600
Merstham (Rockshaw)..........	W. Gardiner..........	5	1	0	475
Harp's Oak Cottage	R. C. Grant	5	1	0	454
Chipstead (Shabden Park)	J. Crerar	5	1	0	550
Chaldon (The Rectory)	Rev. G. E. Belcher	5	1	0	542
Caterham (Metropol. Asylum) ..	G. S. Elliott, M.D.	5	1	0	610
Marden Park (Birchwood House)..	Mrs. F. Rutley	5	1	0	471
Westerham (The Fishponds)	W. Morris	5	1	0	380
Knockholt (The Beeches)........	W. Morris	5	1	0	785
Sevenoaks (St. Johns Hill)......	W. W. Wagstaffe	5	1	10	380
Warlingham (The Vicarage)	Rev. F. R. Marriott....	5	1	0	614
Coulsdon (The Grange)	W. J. Stride	5	1	4	525
Kenley (Hazelea)	Mrs. Carr-Dyer	5	1	0	282
Kenley (The Cottage)	J. B. Snell	5	1	0	294
Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart. ..	5	1	0	280
Oxshott	W. H. Dines..........	5	1	0	212
Banstead (The Larches)	Rev. C. J. Taylor......	8	1	0	488
Sutton (Mulgrave Road)	W. Goode	5	5	6	230
Wallington (Maldon Road)......	F. Campbell-Bayard ..	5	4	1	140
Beddington (Riverside)	S. Rostron	5	1	0	120
Waddon (Waddon House)	P. Crowley	5	1	0	156
Croydon (Brimstone Barn)	Croydon Corporation ..	5	1	0	130
Croydon (Waddon New Road)....	Croydon Corporation ..	5	1	0	146
Croydon (Duppas House)	Baldwin Latham	8	1	0	158
Croydon (Chatfield Road)	A. Malden............	5	1	0	166
Croydon (Whitgift School)	A. E. Watson	5	1	0	191
Croydon (Woburn Road)........	M. L. Craven	5	1	1	178

Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
		IN.	FT.	IN.	FT.
Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
Croydon (Lower Addiscombe Rd.)	E. Mawley	8	0	9	202
Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
Addington (Park Farm)	W. Whalley	5	1	0	268
Addington (Pumping Station)	Croydon Corporation	8	1	0	331
West Wickham (Wickham Court)	Sir J. F. Lennard, Bart.	5	1	2	300
Hayes (Baston Manor)	Capt. A. Torrens	5	1	0	327
Hayes Common (The Warren)	Miss Akers	5	1	0	296
Keston (Bradfield)	A. Hill	5	1	0	350
Keston (Tower Fields)	G. Buchanan	8	0	9	351
Orpington (Kent Water Co.)	W. Morris	5	1	0	220
Farningham Hill	A. J. Waring	5	3	0	300
Chislehurst (The Oaks)	Miss Dalton	5	0	11	325
Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
Dartford (West Hill House)	Lieut.-Col. C. N. Kidd	5	1	3	100
Sidcup (Hatherly Road)	Lionel Burrell, M.D.	5	1	2	160
Bickley (The High Field)	J. Batten	5	1	2	295
Bromley (The Palace)	Coles Child	5	1	0	187
Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
Beckenham (Cedars Road)	H. Dolling-Smith	5	1	0	105
South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
Thornton Heath (Thornton Road)	A. Wright	8	0	10	120
Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
Esher (Sewage Works)	A. J. Henderson	5	1	0	40
West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
Surbiton (Seething Wells)	R. Hack	10	0	6	25
Kingston (Sewage Works)	T. Stevens	5	1	0	25
Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
Putney Heath (The Reservoirs)	R. Hack	5	1	0	180
Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
West Norwood (Thornlaw Road)	W. Marriott	8	1	0	220
Forest Hill (Dartmouth Road)	L. W. F. Behrens	5	1	0	220
Forest Hill (The Nurseries)	James Carter & Co.	6	0	6	76
Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
Eltham (High Street)	W. Morris	5	1	0	245
Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
Deptford (Kent Water Co.)	W. Morris	5	1	0	20
Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
Brixton (Acre Lane)	F. Gaster	8	1	0	77
Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	·02	..	·03	..	·01	..	..	·01	..	·10	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·14	·12	·09	·15	·08	·12	·12	·11	·07	·13	·15	·13	·12
5	·06	·10	·06	·10	·11	·07	·06	·08	·13	·09	·07	·09	·11
6	·26	·22	·25	·25	·22	·20	·23	·23	·20	·23	·21	·22	·24
7	·50	·42	·38	·36	·28	·33	·30	·30	·23	·30	·31	·28	·30
8	·57	·54	·55	·65	·52	·48	·54	·52	·52	·57	·51	·52	·57
9	·03	·03	·03	·02	·02	·04	·02	·04	·03	·02	·02	·02	·02
10	·13	·12	·05	·04	·03	·04	·03	·03	·02	·03	·04	·04	·03
11	·02	..	..	..	·01	·01	·02	·01	..	·01	·01	..	·01
12	..	..	..	·02	..	..	..	·01	·01	..	..	·01	..
13	·08	·05	·08	·05	·10	·07	·13	·08	·10	·09	·11	·09	·07
14	·01	·01	..	..	·01	·01	..	..	·01	..	·01	..	..
15	..	..	..	·02	·01	..	..	..	..	·01	·01	..	·01
16	·14	·10	·15	·20	·11	·11	·09	·08	·14	·14	·12	·13	·17
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	·01	..	..	..
19	·10	·12	·06	·12	·05	·04	·06	·05	·04	·07	·07	·07	·07
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·03	..	..	·08	·05	·06	·05	·10	·05	·06	·04	·04	·05
22	·10	·22	·18	·10	·08	·10	·06	·02	·06	·06	·05	·03	·06
23	·09	·03	·04	·05	·06	·03	·06	·04	·03	·06	·02	·01	·03
24	..	..	..	·01	·01	·02	..	..	..	·01	·01	·02	·01
25	·02	..	..	·02	·02	·02	·01	·04	·03	·01	..	..	·01
26	..	..	..	..	..	..	..	·01	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	·01	..
28	·05	·06	·04	·03	·03	·02	·04	·04	·03	·03	..	·01	·01
29	·17	·17	·10	·10	·08	·06	·10	·07	·08	·08	·06	·07	·09
30	·13	·15	·10	·12	·09	·11	·10	·08	·07	·12	·12	·10	·10
31	·33	·33	·24	·33	·29	·27	·25	·26	·24	·26	·26	·26	·28
*	2·96	2·81	2·40	2·85	2·26	2·22	2·27	2·20	2·10	2·39	2·30	2·15	2·36
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	·01	..		..	..	..	·01	·01	..	..	..
2	·01	·01	..	..		..	..	..	·02	·02	·02	..	·01
3	..	..	..	..		..	..	..	..	..	·05	·02	..
4	·19	·15	·08	·11		·13	·17	·12	·15	·07	·09	·08	·07
5	..	·10	·11	·09		·06	·05	·08	·05	·10	·10	·05	·04
6	·22	·23	·16	·16		·21	·18	·13	·18	·18	·18	·21	·18
7	·30	·33	·18	·25		·37	·34	·28	·29	·25	·25	·30	·28
8	·62	·62	·50	·06		·45	·66	·58	·62	·66	·72	·50	·50
9	·03	·04	·03	..		·02	·03	·03	·03	·03	·09	·05	·03
10	·03	·04	·06	·06		·06	·07	·03	·05	·05	·03	·07	·10
11	·01	·02	·01	..		·01	·02	·01	·01	·01	·02	·01	..
12	·01	..	..	..		..	..	..	..	..	..	..	..
13	·12	·12	·08	·06		·06	..	·08	·10	·10	·09	·02	·03
14	·02	·02	·01	..		·02	..	..	..	..	..	..	..
15	..	·04	..	·02		..	..	..	..	..	..	..	..
16	·17	·22	..	..	MONTHLY GAUGE.	·21	·32	..	·01	·18	·24	·12	·11
17	..	..	..	·04		..	..	..	..	..	..	..	..
18	..	..	..	..		..	..	..	..	..	..	..	..
19	·08	·10	·26	·11		..	·03	..	·23	·08	·09	·07	·06
20	..	..	..	..		..	·01	..	..	..	..	..	..
21	·02	·08	..	..		·08	·11	..	·04	·01	·06	..	·02
22	·04	·22	..	..		·17	·02	..	·09	..	·05	·06	·07
23	·02	·10	·08	..		·50	·11	..	·06	..	·07	..	·02
24	..	..	..	..		..	·02	..	·02	..	..	..	..
25	..	·07	..	..		·04	·05	..	·03	..	..	..	·02
26	..	..	..	..		..	..	..	..	..	..	..	..
27	..	..	..	..		..	..	..	..	..	..	..	..
28	·04	..	..	..		..	·08	..	..	..	..	·06	·07
29	·08	..	..	·09		·04	..	·20	·10	·19	·11	·09	·07
30	·10	·11	·12	..		·12	·11	·17	·09	·10	·13	..	·08
31	·28	·30	·24	·30		·20	·24	·11	·25	·20	·20	·25	·13
*	2·39	2·92	1·93	1·35	2·81	2·75	2·62	1·82	2·43	2·24	2·59	1·96	1·89
†	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·02	·02	·01	..	·02	..	..	·02	·01	·01	·01	·01	..
3	..	..	..	·01	..	..	..	..	..	..	..	..	..
4	·11	·07	·06	·05	·06	..	·10	·04	·05	·05	·02	·04	·06
5	·08	·08	·06	·07	·07	·11	·02	·07	·05	·07	·10	·07	·06
6	·19	·14	·13	·12	·12	·11	·11	·12	·10	·13	·13	·11	·10
7	·27	·26	·26	·27	·29	·25	·32	·26	·30	·27	·28	·29	·28
8	·58	·64	·62	·60	·58	·50	·56	·58	·68	·57	·69	·61	·58
9	·02	·02	·02	·01	·02	·03	·02	·01	·02	·03	·03	·03	·03
10	·03	·03	·04	·06	·06	·06	·06	·07	·07	·07	·08	·06	·06
11	·02	..	..	..	·01	..	..	..	..	..	·01	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·05	·04	·03	·04	·04	·02	·04	·04	·03	·05	·04	·05	..
14	..	·03	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	·01	..	..	..	..	..	..	..	..
16	·17	·08	·10	·11	·08	·11	·12	·13	·15	·11	·16	·12	·11
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·08	·05	·04	·05	·04	..	·03	·04	·04	·07	·04	·04	·03
20	..	·01	·01	..	..	..	..	·01	..	·01	..	..	..
21	·06	·01	·03	·03	·03	·07	·01	·04	·04	·02	·05	·05	..
22	·07	·03	·03	·03	·02	·04	·07	·03	·06	·10	·07	·03	·12
23	·03	..	·01	·02	·01	·02	·02	·02	·06	·15	·15	·03	·03
24	..	..	·01	..	..	..	·01	·01	·03	·01	..	·01	..
25	·06	..	·01	·02	·02	·02	·01	·01	·02	·05	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	·01	..	..	..
29	·13	·09	·06	·07	·06	·05	·06	·05	·04	·08	·07	·05	·07
30	·12	·10	·07	·06	·05	·05	·05	·05	·04	·05	·07	·06	·05
31	·21	·19	·18	·17	·18	·15	·16	·17	·16	·18	·17	·15	·18
*	2·30	1·89	1·78	1·79	1·77	1·59	1·77	1·77	1·95	2·09	2·17	1·81	1·76
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·01	..	..	·08	..	..	..	..	..	..	..	..
2	·02	..	·01	·01	..	·02	·01	·01	..	·01	..	·01	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·06	·02	·08	·06	·08	·06	·03	·06	·06	·03	·04	·05	·04
5	·08	·14	·09	·08	·08	·08	·11	·09	·08	·07	·06	·02	·06
6	·13	·14	·13	·12	·13	·12	·14	·13	·15	·12	·10	·07	·08
7	·27	·22	·27	·27	·28	·27	·29	·30	·30	·25	·29	·22	·25
8	·60	·67	·55	·60	·62	·55	·68	·57	·53	·48	·64	·45	·53
9	·04	·06	·04	·06	·07	·06	·07	·06	·03	·03	·08	·03	·03
10	·08	·06	·06	·05	..	·05	·04	·04	·03	·06	·05	·04	..
11	·01	·01	·01	..	..	·01	·02	·01	..	·02	·02	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	·04
13	·06	·10	·10	·10	·15	·10	·09	·10	·01	·05	·08	·04	·06
14	..	..	..	..	..	·01	..	..	·02	..	..	..	..
15	..	..	..	..	..	..	·01	·01	..	·02	..	..	..
16	·08	·10	·15	·05	·07	·15	·16	·17	·15	·20	·20	·14	·15
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	·01	..	..	..	..
19	·05	·06	·06	..	..	·05	·06	·05	·05	·05	·04	·03	·02
20	..	..	..	..	..	..	·01	..	..	..	..	..	..
21	·04	·08	·04	..	..	·04	·04	..	·05	·05	·06	·02	·08
22	·03	·05	·01	..	..	·02	·03	·07	·02	·06	·05	·05	·12
23	..	·04	..	·10	..	·03	·07	·06	·05	·13	·06	·03	·05
24	..	·01	·01	..	·45	·05	·02	·04	..	..	·01	..	..
25	·01	·04	·01	..	..	..	·01	..	..	..	·03	..	..
26	..	..	..	·01	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	·01	..	..	..	..	·01	..	..	..	..	..	..
29	·07	·07	·09	·09	..	·07	·07	·07	·07	·05	·04	·04	·05
30	·09	·10	·09	·01	·10	·08	·11	·09	·07	·06	·06	·03	·03
31	·18	·15	·18	·08	·11	·17	·20	·14	·15	·12	·18	·17	·15
*	1·90	2·14	1·98	1·69	2·22	1·99	2·28	2·07	1·83	1·86	2·09	1·44	1·74
†	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..
2	·02	..	..	..	·01	..	·02	·01	·02	·02	·02	·01	..	..	..	·02	·01	·01	·01	·02	·01	..	·01	..	·01	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·03	·04	·05	·04	·03	·05	·07	·09	·06	·12	·09	·09	·10	·10	·17	·09	·10	·11	·11	·08	·09	·06	·08	·03	·08	·06
5	·07	·06	·06	·08	·07	·06	·06	·07	·10	·09	·09	·09	·11	·08	·06	·09	·08	·11	·05	·08	·08	..	·09	·08	·08	·09
6	·07	·08	·07	·10	·09	·09	·11	·01	·08	·11	·09	·14	·13	·09	·10	·14	·12	·13	·09	·08	·06	..	·06	·07	·06	·05
7	·25	·29	·25	·27	·30	·31	·29	·25	·25	·26	·34	·27	·29	·26	·32	·29	·24	·27	·29	·26	·28	·50	·21	·25	·25	·22
8	·54	·61	·58	·49	·58	·62	·55	·62	·71	·67	·75	·54	·61	·63	·63	·67	·64	·66	·66	·68	·60	·57	·54	·57	·58	·61
9	·12	·05	·66	·06	·04	·04	·02	·05	·07	·10	·04	·01	·01	·02	·05	·02	·08	·05	·03	·02	·04	·10	·02	·06	·02	·02
10	·07	·04	·04	·04	·05	·06	·08	·06	·04	·07	·03	·05	·04	·03	·03	·04	·05	·08	·10	·08	·06	·02	·06	·05	·05	·04
11	·01	·01	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·04	·06	·07	·09	·04	·04	·04	·02	·03	·04	·03	·03	·03	·03	·03	·02	·02	·01	·02	·03	·03	·02	·03	·05	·01	·01
14	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·02	·02	..	·01	..	·01	..
15	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·16	·16	·08	·02	·12	·14	·11	·09	·15	·16	·11	·09	·13	·13	·13	·12	·08	·11	·16	·16	·20	..	·17	·16	·16	·15
17	..	..	..	..	..	..	·07	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
19	·03	·04	·04	·18	·03	·03	..	·02	·03	·05	·02	..	·03	·03	·02	·02	·02	·02	·03	·04	·02	·10	·03	·02	·03	·01
20	·01	..	..	..	..	..	..	·01	..	·02	..	·03	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
21	·03	·04	·03	·05	·05	..	..	·01	..	·04	·02	·01	·02	·02	·03	·04	·02	·01	·05	·03	..	..	·03	·03	·02	·04
22	·04	·07	·08	·02	·07	·15	·14	·03	..	·09	·10	·05	·17	·17	·10	·16	·17	·10	·07	·05	·03	..	·04	·03	·06	·05
23	·03	·05	·15	·02	·03	·17	·08	·04	·14	·05	..	..	..	·02	..	·01	·01	·04	·04	·05	·11	..	·02	·02	·04	·02
24	..	·02	..	..	·04	..	..	·01	..	·01	..	..	..	..	..	..	..	..	·03	·01	..	..	..	·01	·01	..
25	·02	·03	..	..	..	·02	..	·02	..	·02	..	·02	·04	·01	..	·02	·02	·04	·02	·01	..	..	·01	..	·03	·02
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	·02	·03	·04	·05	..	·04	·02	..	..	..	..	..	..	..	..	..	..
29	·04	·04	·10	·06	·04	·04	..	·03	·06	·06	·04	..	·04	·08	·05	·04	·03	·03	·05	·04	·03	·02	·04	·03	·03	·02
30	·05	·05	·06	·11	·04	..	..	..	·05	·05	·02	·05	·05	·03	·03	·04	·05	·04	·05	·04	·02	..	·03	·04	·03	·02
31	·19	·16	·16	·09	·17	·17	·15	·18	·17	·20	·24	·24	·21	·23	·12	·18	·22	·22	·20	·19	·03	..	·18	·15	·17	·17
*	1·82	1·90	1·88	1·72	1·80	2·00	1·81	1·64	1·96	2·26	2·06	1·77	2·06	1·96	1·95	2·03	1·96	2·04	2·07	1·97	1·71	1·41	1·67	1·68	1·73	1·60
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	..	..
2	..	·01	..
3	..	..	..
4	·07	·07	·07
5	·07	·15	·11
6	·06	·08	·08
7	·24	·23	·25
8	·68	·74	·41
9	..	·05	·04
10	·06	·08	·05
11	..	..	..
12	..	..	..
13	·01	·01	·01
14	·01	..	..
15	..	..	..
16	..	·11	..
17	..	..	..
18	..	..	·03
19	·05	..	..
20	..	·01	..
21	..	·04	..
22	..	·06	..
23	..	·03	..
24	..	..	..
25	..	·04	..
26	..	..	..
27	..	..	..
28	..	..	..
29	·03	·04	·05
30	..	·04	·02
31	·24	·21	·17
*	1·52	2·00	1·29
†	..	..	..

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(January, 1897.)

The month has been cold, sunless, and unhealthy. Influenza has been very prevalent, and mumps and scarlet fever have occurred at Nutfield, and chicken-pox at Wallington. From the 16th onwards there were numerous snow showers accompanied by high winds, so that the readings of most gauges are somewhat doubtful, as the snow was swept over the stations. Taking it as a rule, outdoor employment has not been interfered with. A solar halo was seen at Upper Gatton on the 29th, and a lunar one on the 15th. The mean temperature of the month is about 1·5° below the average, and was at Croydon (Whitgift) 35·7°, at Croydon (Duppas House) 35·5°, at Wallington 35·3°, at Redhill 35·2°, at Waddon 34·9°, at Upper Gatton 33·9°, and at Chipstead 33·7°. The rainfall is somewhat below the average, but not more than a quarter of an inch. There were registered at Upper Gatton 36·6 hours of bright sunshine, and at Hayes Common 25·1 hours, and Wallington 26·5 hours of sunlight, which latter is 8 per cent. below the January average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·56	·50	·48	·53	·44	·45	·50	·51	·42	·46	·47	·48	·41
2	·40	·46	·46	·50	·52	·51	·46	·43	·54	·42	·40	·40	·40
3	·04	·04	·07	·16	·11	·09	·12	·15	·10	·16	·11	·17	·14
4	·83	·75	·70	·83	·41	·47	·56	·63	·43	·61	·59	·57	·60
5	·42	·36	·42	·35	·47	·30	·41	·39	·46	·36	·32	·35	·45
6	·01	..	..	..	..	..	·01	·01	·01	·01	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·13	·12	·12	·15	·09	·07	·08	·11	·08	·14	·15	·15	·18
9	·02	..	..	·02	·01	·01	·01	·01	·02	·01	·01	·01	·01
10	·17	·13	·18	·25	·22	·21	·24	·22	·20	·22	·21	·22	·19
11	·02	·04	·02	·02	·03	·02	..	·02	·03	·01	·02	·02	·03
12	·01	..	..	·01	..	..	..	..	..	..	..	..	..
13	·15	·14	·10	·05	·07	·06	·07	·01	·05	·02	·03	·03	·03
14	·01	..	..	·02	..	..	..	·01	..	..	..	..	·01
15	·02	·11	·04	·02	..	·01	·02	·01	·01	·02	·01	·02	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	·01	..	..	..	·01	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	·01	..
19	·24	·30	·21	·38	·13	·15	·16	·18	·10	·22	·19	·22	·26
20	·07	..	·10	·05	·21	·14	·16	·16	·23	·15	·19	·16	·12
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	·01	..	..	..	..	..
28	·27	·23	·27	·20	·13	·12	·12	·14	·12	·13	·14	·15	·18
*	3·37	3·19	3·17	3·54	2·84	2·62	2·92	3·00	2·80	2·94	2·84	2·96	3·02
†	6·33	6·00	5·57	6·39	5·10	4·84	5·19	5·20	4·90	5·33	5·14	5·11	5·38

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·53	·40	·36	·50		·45	·47	·58	·39	·37	·42	·39	·38
2	·36	·46	·32	·46		·37	·24	·40	·38	·41	·41	·35	·39
3	·15	·11	·10	..		·05	·10	·09	·10	·09	·09	·13	·10
4	·77	·55	·42	·50		·53	·65	·45	·45	·42	·48	·72	·45
5	·22	·36	·35	·35		·29	·29	·26	·39	·43	·29	·11	·26
6	..	·02	..	..		·01	..	..	·01	..	..	..	..
7	..	..	..	..		..	..	..	..	..	..	..	..
8	·15	·14	·10	·10		·11	·13	·12	·08	·11	·07	·05	·05
9	·01	·02	·01	·03		..	..	·02	·01	..	·03	·02	..
10	·18	·19	·18	·14		·11	·14	·18	·17	·19	·18	·21	·22
11	·01	·04	·02	·03		·02	·07	·03	·02	·02	·10	·04	·03
12	..	..	..	..		..	..	..	..	..	..	..	..
13	·02	·03	·01	..	MONTHLY GAUGE.	·02	·03	·01	·02	·02	..	·02	·03
14	..	..	..	..		..	..	..	·01	..	..	..	..
15	·01	·03	..	..		..	·02	..	·01	·02	·05	·01	..
16	..	..	..	..		..	..	..	..	..	..	..	..
17	..	..	..	..		..	..	..	·01	..	·02	..	..
18	..	..	..	..		..	..	..	..	..	·01	..	..
19	·29	·25	·22	·11		·14	·17	·17	·14	·12	·16	·15	·14
20	·06	·13	·07	·26		·11	·10	·09	·13	·14	·09	·10	·07
21	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..		..	..	..	..	·01	..	..	..
23	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..		..	..	..	..	..	..	..	..
26	..	..	..	..		..	..	..	..	..	..	..	..
27	·02	·02	..	..		..	..	..	·02	..	..	·01	..
28	·14	·15	·12	·08		·08	·16	·14	·16	·16	·10	·13	·10
*	2·92	2·90	2·28	2·56	2·55	2·29	2·57	2·54	2·50	2·51	2·50	2·44	2·22
†	5·31	5·82	4·21	3·91	5·36	5·04	5·19	4·36	4·93	4·75	5·09	4·40	4·11

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·42	·37	·36	·37	·39	·35	·44	·38	·39	·39	·38	·40	·39
2	·37	·37	·38	·37	·37	·38	·35	·38	·39	·40	·43	·38	·37
3	·12	·12	·12	·12	·12	·10	·11	·12	·10	·12	·08	·12	·10
4	·55	·42	·33	·32	·33	·29	·43	·31	·29	·33	·31	·30	·28
5	·38	·32	·29	·27	·37	·21	·18	·27	·25	·29	·31	·30	·26
6	..	..	..	..	..	..	·01	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·11	·07	·06	·06	·06	·04	·05	·06	·05	·06	·06	·06	·06
9	·03	·01	·01	·01	·01	..	·01	·01	·01	·02	·01	·01	·01
10	·22	·17	·17	·16	·16	·16	·14	·16	·16	·17	·18	·16	·16
11	·02	·03	·02	·02	·01	·02	·03	·02	·03	·03	·04	·04	·03
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·03	·03	·03	·03	·03	·03	·02	·02	·02	·03	·03	·02	·02
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·03	·02	·02	·01	·01	..	..	·01	·01	·01	·01	·01	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	·01	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·22	·17	·15	·15	·14	·15	·16	·13	·12	·14	·11	·12	·12
20	·10	·07	·06	·06	·06	·06	·04	·06	·04	·06	·10	·06	·06
21	..	..	..	..	..	..	..	..	..	..	·01	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·22	·16	·10	·11	·10	·08	·09	·10	·08	·10	·11	·10	·10
*	2·82	2·33	2·10	2·06	2·16	1·87	2·06	2·04	1·94	2·15	2·17	2·08	1·97
†	5·12	4·22	3·88	3·85	3·93	3·46	3·83	3·81	3·89	4·24	4·34	3·89	3·73

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W.Wickhm. Wickhm.C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·42	·42	·40	·60	·66	·41	·39	·38	·39	·40	·45	·45	·45
2	·36	·42	·37	·43	·36	·40	·43	·42	·38	·41	·44	·44	·49
3	·14	·14	·10	·12	·13	·12	·10	·12	·11	·08	·08	·06	·05
4	·33	·30	·36	·36	·30	·28	·29	·27	·30	·28	·26	·18	·26
5	·35	·39	·38	·35	·30	·33	·42	·36	·35	·25	·27	·25	·23
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·07	·08	·07	·06	·08	·07	·09	·08	·05	·08	·06	·04	·04
9	·02	·02	·01	·01	..	·02	·01	·02	·02	·02	·02	·01	·02
10	·17	·17	·16	·15	·17	·15	·13	·18	·14	·20	·19	·18	·19
11	·03	·05	·03	·03	..	·03	·03	·03	·03	·02	·05	·02	·04
12	..	..	..	..	..	·01	..	..	·01	·01	..	..	..
13	·03	·03	·03	·03	·05	·02	·02	·02	·02	·01	·02	·04	·06
14	..	..	·01	..	..	..	..	..	..	..	..	..	..
15	·01	·01	·01	..	..	..	..	·01	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	·01	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·14	·09	·12	·10	·14	·11	·11	·10	·06	·05	·09	·06	·08
20	·09	·15	·10	·11	·08	·09	·07	·09	·07	·08	·07	·05	·07
21	..	..	..	..	..	·01	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	·01	·01	·01	..	·01	..	..	..
28	·12	·13	·15	·13	·05	·11	·05	·12	·10	·08	·10	·05	·08
*	2·28	2·40	2·30	2·48	2·32	2·18	2·15	2·21	2·03	2·00	2·10	1·83	2·06
†	4·18	4·54	4·28	4·17	4·54	4·17	4·43	4·28	3·86	3·86	4·19	3·27	3·80

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·38	·46	·42	·40	·41	·39	·31	·37	·36	·40	·40	·32	·34	·33
2	·48	·42	·39	·39	·39	·39	·43	·44	·44	·42	·46	·34	·39	·36
3	·06	·06	·07	·08	·06	·07	·20	·07	·06	·09	·08	·11	·08	·08
4	·26	·27	·29	·26	·28	·30	·18	·37	·34	·39	·46	·41	·43	·36
5	·27	·26	·26	·26	·25	·28	·22	·19	·22	·22	·15	·25	·27	·24
6	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·05	·04	·06	·06	·05	·05	..	·05	·05	·07	·05	·08	·07	·09
9	·02	·01	·02	·03	·01	·01	..	..	..	·01	..	..	..	..
10	·17	·17	·16	·14	·15	·16	·18	·16	·16	·19	·18	·19	·20	·19
11	·06	·04	·04	·02	·04	·04	..	·03	·04	·04	·02	·02	·02	..
12	..	..	..	..	..	..	..	..	..	·02	..	·01	..	..
13	·04	·02	·03	·03	·03	·03	·03	·01	·03	·04	·03	·03	·03	·06
14	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..
15	·01	..	·01	..	..	·01	..	·01	·01	·03	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·08	·10	·10	·09	·11	·07	·15	·16	·15	·17	·15	·19	·19	·16
20	·06	·07	·10	·08	·06	·09	·05	·07	·06	·07	·05	·07	·06	·06
21	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·02	..	..	..	..	..	..	..	..	..	..	·03	..	..
28	·08	·08	·10	·08	·08	·07	·08	·03	·05	·07	·05	·07	·08	·08
*	2·05	2·00	2·05	1·92	1·92	1·96	1·83	1·96	1·98	2·25	2·08	2·13	2·16	2·01
†	3·87	3·90	3·93	3·64	3·72	3·96	3·64	3·60	3·94	4·51	4·14	3·90	4·22	3·97

Day of Mo.	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·42	·41	·39	·40	·38	·39	·39	OBSERVER ILL.	·35	·41	·45	·39
2	·43	·44	·44	·47	·40	·42	·41		·41	·47	·44	·43
3	·06	·07	·08	·07	·08	·07	·06		·05	·05	·06	·05
4	·52	·55	·45	·43	·38	·36	·34		·35	·35	·44	·36
5	·15	·27	·24	·26	·19	·20	·21		·20	·27	·27	·25
6	..	..	·01	..	·01	..	..		..	..	..	..
7	..	..	..	..	..	..	..		..	..	..	..
8	·07	·07	·08	·07	·05	·04	·06		·06	·05	·06	·06
9	..	..	..	·01	·01	·02	·02		·02	·02	·03	·02
10	·17	·16	·16	·17	·16	·18	·18		·17	·17	·18	·16
11	·01	·05	·03	·04	·04	·04	·05		·02	·03	·02	·02
12	..	..	..	..	..	..	..		..	·01	..	..
13	·03	·03	·03	·03	·03	·03	·04		·04	·06	·06	·07
14	..	..	..	..	·01	..	..		·01	..	..	..
15	..	·01	·01	·01	·03	·01	·02		·01	·02	·01	·01
16	..	..	..	..	..	..	..		..	..	..	..
17	..	..	..	..	..	..	..		..	..	..	..
18	·04	..	..	..	..	..	..		..	..	..	..
19	·16	·18	·17	·17	·17	·16	·15		·15	·08	·11	·10
20	·04	·05	·07	·08	·07	·07	·08		·08	·07	·05	·05
21	..	..	..	..	..	..	..		..	..	..	..
22	..	..	..	..	..	..	..		..	..	..	..
23	..	..	..	..	..	..	..		..	..	..	..
24	..	..	..	..	·01	..	..		..	..	..	..
25	..	..	..	..	..	..	..		..	..	..	..
26	..	..	..	..	..	..	..		..	..	..	..
27	..	..	..	..	..	..	..		..	..	..	..
28	·08	·08	·05	·04	·07	·07	·07		·07	·06	·06	·05
*	2·18	2·37	2·21	2·25	2·09	2·06	2·08		1·99	2·12	2·24	2·02
†	4·13	4·40	4·17	4·29	4·16	4·03	3·79		3·66	3·80	3·97	3·62

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	·39	·39	·30
2	·44	·47	·40
3	·06	·06	·05
4	·36	·41	·40
5	·24	·30	·23
6	..	..	..
7	..	..	..
8	·06	·06	·07
9	·02	·02	..
10	·18	·18	·15
11	·03	·03	..
12	..	..	..
13	·05	·07	·07
14	..	..	..
15	..	·02	..
16	..	..	..
17	..	..	..
18	..	..	..
19	·11	·12	·11
20	·03	·09	·03
21	..	..	..
22	..	..	..
23	..	..	..
24	..	..	..
25	..	..	..
26	..	..	..
27	..	..	..
28	·05	·05	·03
*	2·02	2·27	1·84
†	3·54	4·27	3·13

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(February, 1897.)

The month has been a wet, and very warm and sunless one. It is the wettest February since 1893, and by far the warmest one in the past twelve years. Rheumatism and sciatica have been rather prevalent, and influenza also about Sevenoaks and Nutfield. A dense fog occurred in many parts of the district on the 14th, and a very fine lunar halo was seen at various places on the 16th. At Nutfield the first bee was seen on the 9th, the first wasp on the 14th, and rooks returned to their nests on the 10th. The rainfall of the month is, if we may take the Greenwich average, nearly three-quarters of an inch above the mean for February. The mean temperature of the month is about 4·5° above the average, and was at Croydon (Duppas House) 43·6°, at Wallington 43·5°, at Croydon (Whitgift) 43·3°, at Waddon 43·1°, at Redhill 42·8°, at Chipstead 42·3°, and at Upper Gatton 41·5°. There were registered at Upper Gatton 30 hours of bright sunshine, and at Hayes Common 42·2 hours, and Wallington 32·5 hours of sunlight, which latter is 11 per cent. below the February average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·49	·56	·47	·55	·63	·60	·60	·55	·60	·68	·57	·60	·44	·62	·67	·46	·90		·66	·50	·48	·48	·48	·39	·35	·35
2	·95	·85	1·02	1·22	·78	·59	·70	·84	·68	·72	·73	·77	·82	·75	·75	·47	·67		·70	·63	·73	·86	·82	·68	·88	·70
3	·13	·15	·13	·25	·15	·10	·10	·06	·14	·07	·12	·14	·05	·14	·12	·07	·05		·11	·11	·05	·13	·08	·15	·13	·12
4	·18	·16	·22	·12	·13	·08	·11	·14	·13	·11	·10	·10	·15	·11	·07	·07	·21		·10	·15	·15	·18	·18	·13	·15	·15
5	..	·06	·05	·08	·05	·04	·05	·04	·04	·01	·02	·01	·02	·02	..	..	·03		..	..	·02	·02	·02	..	·04	·02
6	·08	·05	·04	·08	·16	·10	·19	·16	·17	·17	·15	·16	·16	·14	·12	·05	..		..	·07	·14	·14	·13	·16	·02	·02
7	..	..	..	·01	..	..	..	..	..	·01	..	·01	·01	..	..	..	..		..	..	..	·01	·01	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
9	·20	·24	·20	·26	·22	·22	·22	·25	·26	·28	·29	·30	·27	·27	·27	·22	·28		·24	·23	·24	·21	·20	·17	·20	·18
10	·06	·02	·05	·04	·03	·04	·03	·04	·04	·03	·03	·04	·02	·04	·05	·09	·03		·13	·03	..	·02	·02	·02	..	..
11	·56	·48	·45	·46	·36	·28	·36	·40	·34	·37	·38	·38	·41	·34	·35	·26	·35		·36	·42	·37	·41	·40	·40	·43	·32
12	·04	·06	·13	..	·06	·03	·02	·02	·02	·03	·01	·06	·05	·03	·05	..	·01		..	·04	·05	·02	·03	·02	·01	·01
13	·40	·26	·38	·34	·15	·14	·09	·10	·15	·13	·15	·12	·16	·17	·10	..	..		..	·02	·12	·06	·05	·11	·45	·38
14	·35	·32	·30	·30	·37	·37	·37	·37	·34	·35	·37	·39	·40	·30	·35	·30	·25		·29	·25	·30	·34	·34	·27	·25	·20
15	·44	·38	·39	·30	·21	·22	·24	·28	·20	·27	·26	·27	·30	·23	·28	..	·21		·28	·33	·27	·32	·27	·28	·21	·23
16	·10	·17	·15	·09	·23	·12	·12	·11	·18	·10	·15	·15	·12	·14	·17	·34	·30	MONTHLY GAUGE.	·22	·28	·17	·19	·25	·11	·10	·07
17	·51	·56	·49	·67	·50	·48	·45	·49	·47	·45	·53	·47	·46	·56	·51	·39	·41		·56	·40	·40	·43	·44	·32	·38	·33
18	·10	·15	·09	..	·09	·06	·10	·11	·12	·13	·09	·14	·13	·07	·15	·04	·12		·18	·08	·11	·16	·15	·14	..	·20
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	·01	·01	..	..	·01	·01	·01	·01	·01	·01	..	·01	..	·01	..	..	..		..	..	..	..	..	..	..	..
21	·07	·08	·09	·12	·12	·11	·11	·11	·12	·09	·11	·09	·07	·08	·08	·06	·08		·04	·07	·06	·06	·06	·06	·05	·05
22	..	..	..	..	·01	..	..	..	·01	..	·01	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	·02	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	·02	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..	..	..
27	·03	·03	·05	·05	·05	·05	·05	·07	·06	·08	·07	·08	·09	·08	·10	·04	·05		·06	·07	·06	·07	·06	·06	·08	·05
28	·10	·08	·11	..	·07	·06	·06	·07	·09	·10	·08	·10	·08	·10	·10	·02	..		·06	..	·06	·05	·05	·07	·05	·06
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..	..	..
31	·86	·10	·57	·65	·27	·27	·34	·40	·33	·38	·37	·39	·38	·44	·41	·23	·33		·36	·66	·43	·48	·47	·60	·17	·50
*	5·66	4·77	5·38	5·59	4·65	3·97	4·32	4·62	4·50	4·57	4·59	4·78	4·59	4·64	4·70	3·11	4·28	5·20	4·35	4·34	4·21	4·66	4·51	4·18	4·25	3·94
†	11·99	10·77	10·95	11·98	9·75	8·81	9·51	9·82	9·40	9·90	9·73	9·89	9·97	9·95	10·52	7·32	8·19	10·56	9·39	9·53	8·57	9·59	9·26	9·27	8·65	8·05

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld.rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm. Wickhm.C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·45	·35	·35	·33	·34	·35	·35	·35	·31	·36	·39	·38	·37	·42	·45	·49	·50	·52	·41	·45	·45	·43	·54	·46	·42	·43
2	·93	·90	·89	·89	·79	·46	·84	·81	·72	·87	·85	·80	·83	·86	·87	·89	·96	·93	·95	·85	1·01	·93	·74	·80	·70	·69
3	·08	·10	·14	·12	·09	·12	·11	·09	·11	·12	·12	·12	·10	·08	·17	·15	·11	·14	·15	·03	·12	·13	·10	·13	·13	·14
4	·20	·15	·16	·15	·14	·11	·13	·14	·12	·16	·15	·12	·12	·14	·14	·15	·12	·13	·13	·12	·14	·14	·10	·11	·07	·07
5	·03	·01	..	..	..	..	·01	..	..	..	..	..	..	·01	..	·01	..	..	..	..	·01	..	..	..	..	..
6	·12	·14	·11	·25	·27	·28	·20	·18	·18	·16	·16	·15	·15	·11	·09	·06	·04	..	·05	·02	·01	..	..	..	..	..
7	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	·22	·17	·15	·16	·16	·17	·15	·15	·16	·17	·19	·15	·16	·16	·20	·21	·20	·21	·18	·11	·18	·26	·20	·22	·19	·22
10	·02	·01	·01	·02	·02	·04	·03	·02	·05	·04	·04	·03	·04	·01	·04	·02	·04	..	·02	·03	..	..	·03	·08	·01	..
11	·47	·39	·36	·38	·32	·34	·35	·34	·32	·37	·37	·36	·31	·41	·36	·41	·38	·40	·35	·37	·40	·38	·35	·33	·24	·24
12	..	..	..	..	·01	..	..	..	·01	..	·01	·01	·02	..	·02	·01	·01	·05	·04	·03	·03	·02	..	..	..	..
13	·13	·15	·08	·03	·02	·01	·01	·01	..	·02	·01	..	·01	·01	..	..	..	..	·01	..	·01	..	..	..	·03	..
14	·35	·35	·28	·28	·26	·22	·26	·27	·25	·25	·28	·26	·25	·28	·31	·33	·35	·30	·29	·29	·26	·25	·29	·26	·17	·24
15	·36	·28	·24	·23	·21	·20	·24	·22	·18	·25	·21	·22	·23	·26	·21	·29	·32	·25	·26	·21	·22	·32	·21	·24	·18	·14
16	·13	·08	·11	·10	·08	·08	·07	·11	·09	·11	·16	·11	·11	·20	·24	·20	·18	·16	·17	·19	·22	·23	·24	·14	·10	·12
17	·50	·32	·37	·38	·34	·30	·35	·34	·32	·35	·34	·32	·35	·35	·35	·42	·41	·46	·34	·29	·38	·35	·32	·26	·20	·22
18	·15	·15	·16	·14	·16	·15	·16	·16	·13	·17	·14	·16	·13	·15	·18	·17	·17	·17	·16	·10	·17	·15	·15	·13	·10	·16
19	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·08	·05	·04	·04	·05	·05	·04	·04	·06	·05	·08	·05	·07	·05	·04	·04	·03	..	·04	·04	·04	..	·06	·08	·04	..
22	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·08	·07	·06	·06	·06	·06	·02	·07	·06	·07	·08	·07	·07	·08	·08	·06	·07	·12	·08	·08	·07	·06	·10	·12	·08	·10
28	·08	·07	·07	·05	·05	·05	·08	·04	·04	·06	·05	·05	·05	·04	·05	·04	·04	·06	·05	·03	..	·03	·03	·06	·04	·06
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	·54	·44	·58	·64	·60	·60	·68	·62	·62	·65	·64	·62	·59	·53	·50	·51	·61	·68	·72	·63	·80	·55	·62	·74	·48	·48
*	4·92	4·18	4·16	4·25	3·98	3·59	4·08	3·96	3·73	4·23	4·28	3·98	3·96	4·16	4·30	4·46	4·54	4·58	4·40	3·87	4·52	4·23	4·08	4·16	3·18	3·31
†	10·04	8·40	8·04	8·10	7·91	7·05	7·91	7·77	7·62	8·47	8·62	7·87	7·69	8·34	8·84	8·74	8·71	9·12	8·57	8·30	8·80	8·09	7·94	8·35	6·45	7·11

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·46	·44	·40	·40	·34	·36	·30	·15	·35	·37	·42	·39
2	·68	·89	·71	·80	·69	·69	·81	·52	·53	·70	·62	·60
3	·16	·11	·12	·09	·12	·10	·08	·12	·09	·14	·11	·15
4	·08	·08	·08	·09	·11	·09	·14	·07	·07	·10	·12	·09
5	..	..	..	..	..	..	..	..	..	·02	..	·01
6	..	..	·03	..	·12	..	·22	·22	·11	·12	·03	·01
7	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..
9	·22	·19	·19	·12	·20	·43	·19	·20	·20	·23	·30	·19
10	·03	·07	·07	·07	·11	..	..	·02	·09	·14	·06	·04
11	·31	·32	·31	·34	·28	·30	·32	·13	·19	·25	·12	·28
12	..	·01	·03	·02	·02	·01	..	·01	..	·02	..	..
13	..	..	..	..	..	·01	·02	·03	·05	·09	·23	·22
14	·27	·25	·25	·24	·22	·42	·23	·29	·27	·32	·27	·21
15	·17	·15	·18	·16	·19	·08	·22	·15	·17	·20	·17	·22
16	·14	·12	·17	·15	·11	..	·08	·05	·06	·07	·03	·11
17	·23	·23	·25	·28	·25	·26	·30	·24	·19	·32	·18	·21
18	·13	·11	·12	·16	·12	·10	·09	·24	·21	·22	·17	·18
19	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	·01	..	..	·02	·01	·02	..	..
21	·05	·06	·07	·06	·08	..	·07	·07	·09	·11	·06	·05
22	..	..	..	..	..	..	..	..	..	·02	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..
27	·09	·07	·09	·07	·07	·11	·07	·07	·07	·09	·06	·07
28	·07	·05	·05	·03	·05	·04	·04	·08	·06	·10	·09	·10
29	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	·02	..	..
31	·49	·68	·65	·66	·65	·65	·71	·39	·51	·54	·55	·45
*	3·58	3·83	3·77	3·74	3·74	3·65	3·89	3·07	3·32	4·21	3·59	3·58
†	7·45	7·73	7·70	7·38	7·46	7·61	7·53	6·67	7·26	8·72	7·73	7·48

Day of Mo.	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·36	·37	·40	·35	·35	·35	·35	·38	·33		·33	·31	·33	·31
2	·64	·68	·67	·60	·57	·62	·62	·66	·47		·50	·57	·53	·44
3	·09	·11	·11	·10	·09	·11	·10	·13	·10		·08	·11	·09	·10
4	·10	·10	·09	·10	·07	·07	·07	·07	·08		·07	·05	·05	·05
5	·02	..	·01	·01	..	..	·01	..	..		..	..	·01	..
6	·01	·02	·02	·02	·11	·24	·13	·18	·16		·17	..	·07	·10
7	..	..	..	..	..	·01	..	..	..		..	..	..	..
8	..	..	..	..	..	..	·03	..	..		..	..	..	..
9	·19	·20	·22	·21	·19	·23	·22	·23	·23		·22	·20	·20	·18
10	·12	·04	·12	·01	·01	..	·01	·03	..		·01	..	·01	..
11	·30	·24	·26	·22	·19	·20	·22	·22	·26		·21	·27	·25	·20
12	·01	..	..	·03	·02	·04	·02	·02	·03		·03	..	·02	·01
13	·16	·19	·28	·25	·05	·06	·01	·01	..		..	..	..	..
14	·21	·21	·23	·25	·27	·31	·25	·23	·21		·20	·26	·21	·19
15	·19	·27	·26	·19	·16	·16	·16	·16	·18		·16	·14	·19	·16
16	·07	·05	·08	·12	·06	·06	·07	·09	·05	OBSERVER ILL.	·07	·10	·05	·05
17	·30	·20	·40	·41	·34	·20	·28	·24	·25		·22	·28	·28	·23
18	·22	·14	·02	·10	·12	·28	·14	·24	·23		·29	·29	·24	·28
19	..	..	..	..	..	..	..	..	..		..	..	..	..
20	..	..	..	·01	..	·01	·01	..	..		·01	..	..	..
21	·06	·06	·10	·08	·08	·08	·07	·09	·10		·06	·04	·05	·05
22	..	..	..	..	·01	..	·01	..	..		..	..	..	..
23	..	..	..	..	..	..	..	..	..		..	..	..	..
24	..	..	..	..	..	..	..	..	..		..	..	..	..
25	..	..	..	..	..	..	..	..	..		..	..	..	..
26	..	..	..	·01	..	..	..	..	..		..	..	..	..
27	·07	·07	·11	·10	·08	·08	·08	·09	·10		·08	·07	·09	·07
28	·10	·13	·07	·13	·11	·11	·06	·08	·06		·11	·06	·10	·10
29	..	..	..	..	..	..	..	..	..		..	..	..	..
30	..	..	..	..	..	..	..	..	..		..	..	..	..
31	·57	·65	·62	·45	·34	·42	·35	·58	·60		·57	·46	·63	·64
*	3·79	3·73	4·07	3·75	3·22	3·64	3·27	3·73	3·44		3·39	3·21	3·40	3·16
†	8·01	7·70	8·20	8·15	7·39	7·93	7·43	7·76	7·23		7·05	7·01	7·37	6·78

* The figures in this row give the totals for the month. † The totals from January 1st.

March, 1897.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	·32	·37	·28
2	·43	·57	·45
3	·05	·10	·07
4	·04	06	·05
5	..	..	..
6	·14	·17	·15
7	..	..	..
8	..	..	..
9	·20	·21	·20
10	..	..	·02
11	·21	·22	·15
12	..	·03	·03
13	·02	·03	·02
14	·21	·28	·25
15	·15	·14	·13
16	·05	·07	·03
17	·38	·25	·16
18	·05	·27	·12
19	..	..	..
20	..	..	..
21	·04	·07	·05
22	..	..	..
23	..	..	..
24	..	..	..
25	..	..	..
26	..	..	·02
27	·09	·08	·07
28	·08	·12	·10
29	..	..	..
30	..	..	..
31	·55	·48	·60
*	3·01	3·52	2·95
†	6·55	7·79	6·08

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(March, 1897.)

The month has been a very wet and warm one, with about an average amount of sunshine. It is at Greenwich the wettest March since March, 1862, and in the whole of the Greenwich record there are only five months of March which are wetter than that of the present year. There has been a great deal of illness about. The winds have been mostly from south-west, and at Warlingham there were only three days on which wind from an easterly direction was recorded. Snow and hail fell on several days throughout the district. The rainfall is about two and a half inches above the average for March. At Park Hill, Croydon, the maximum thermometer was above 50° on thirteen days and above 40° on every day, and the minimum thermometer was above 40° on thirteen nights. The mean temperature of the month is about 3·5° above the average for March, and was at Croydon (Duppas House) and Wallington 45·5°, at Waddon 45·3°, at Croydon (Whitgift) 45·1°, at Chipstead 43·5°, and at Upper Gatton 43·3°. There were recorded at Upper Gatton 93·2 hours of bright sunshine, and at Hayes Common 135·3 hours, and Wallington 125 hours of sunlight, which latter is one per cent. above the March average for the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	Reigate Hill Margery H.	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·08	·06	·15	·09	·04	·10	·07	·09	·08	·10	·05	·04	·04	·15	·03	·17		·07	·19	·06	·09	·13	·17	·04	·05
2	·04	·07	·03	..	·02	·02	·05	·04	·03	·02	·02	·03	·01	·04	·03	·01	..		·01	..	·01	·01	..	·02	·01	..
3	·15	·13	·10	·05	·07	·06	·05	·06	·04	·04	·07	·05	·04	·07	..	·02	·03		·02	·04	·02	..	·04	..	..	·02
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
6	·13	·14	·10	·13	·09	·10	·10	·10	·08	·08	·11	·08	·10	·10	·12	·10	·14		·17	..	·09	·10	·10	·08	·07	·07
7	·12	·10	·12	·07	·08	·12	·10	·10	·05	·05	·04	·04	·04	·03	·06	·02	·04		·09	·04	·04	·04	·04	·06	·20	·28
8	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·01	..	..	..
9	·09	·11	·09	·10	·07	·09	·06	·09	·07	·09	·15	·13	·12	·13	·13	·05	·12		·08	·11	·10	·09	·08	·08	·06	·06
10	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
11	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	·01	·01	..	..
12	·04	·04	·03	·02	·02	·01	..	·03	·02	·01	·02	·01	·02	·01	·03	·02	·02		·01	·02	..	·01	·01	·01	·02	·01
13	·10	·15	·10	·15	·06	·08	·08	·13	·05	·10	·10	·09	·09	·12	·15	·08	·04		·10	·08	·06	·08	·06	·06	·05	·04
14	..	..	..	..	..	·02	·01	·02	..	·01	·01	·02	·01	..	·02	..	..	MONTHLY GAUGE.	..	·02	..	..	·03	..	..	·01
15	·03	·03	·07	·01	·08	·02	·01	·02	·06	..	..	..	·01	·08	..	..	..		..	..	..	·01	·01	..	..	..
16	·32	·25	·33	·31	·31	·31	·29	·33	·26	·32	·28	·31	·25	·28	·30	·15	·31		·22	·26	·20	·22	·20	·17	·20	·18
17	·03	·04	·07	·02	·07	·07	·05	·06	·06	·05	·07	·06	·03	·03	·08	..	·09		·07	·05	..	·03	..	·03	..	·02
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..		..	..	..	..	·01	·02	..	..
19	·10	·10	·12	·20	·20	·18	·20	·26	·20	·19	·16	·16	·15	·16	·16	·11	·23		·19	·21	·10	·21	·20	·25	·17	·12
20	·01	..	..	..	..	..	·01	·03	..	..	·01	·01	..	..	..	..	..		·01	·04	·01	·01	·01	·02	..	..
21	·03	·04	·06	·05	·09	·07	·09	·11	·10	·10	·08	·10	·06	·09	·09	·04	·06		·04	·05	·05	·06	·07	·08	·03	·02
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02		..	..	..	..	..	..	..	..
27	..	..	·27	·21	·16	·21	·25	·29	·19	·18	·20	·21	·21	·05	·29	·18	·10		·08	·14	·16	·24	·23	·19	·30	·25
28	·18	·22	·13	·40	·13	·10	·14	·26	·20	·20	·28	·17	·19	·35	·19	·08	·06		·08	·13	·13	·13	·13	·09	·08	·07
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·01	..	..	..
30	·20	·21	·19	·20	·17	·16	·17	·19	·17	·19	·16	·18	·14	·16	·15	·05	·10		·09	·16	·14	·15	·13	·15	·17	·17
*	1·62	1·73	1·87	2·10	1·71	1·66	1·76	2·20	1·67	1·71	1·86	1·70	1·51	1·74	1·95	·96	1·53	1·37	1·33	1·54	1·17	1·49	1·51	1·49	1·40	1·37
†	13·61	12·50	12·82	14·08	11·46	10·47	11·27	12·02	11·07	11·61	11·59	11·59	11·48	11·69	12·47	8·28	9·72	11·93	10·72	11·07	9·74	11·08	10·77	10·76	10·05	9·42

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·07	·08	·09	·05	·09	·05	·08	·10	·10	·11	·07	·08	·05	·11	·06	·07	·09	·09	·10		·08	·16	·08	·06	·06
2	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..	..		..	..	..	..	..
3	·05	·02	·01	..	·01	..	·01	·01	..	..	·01	·01	..	..	..	..	·01	..	·01	..		..	·02	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
6	·10	·08	·09	·09	·07	·07	·06	·05	·05	·07	·07	·07	·06	·08	·08	·09	·08	·10	·08	·08		·02	·06	·12	·12	·15
7	·10	·14	·10	·09	·08	·10	·08	·07	·08	·09	·11	·05	·08	·04	·05	·03	·05	..	·07	·05		·14	·05	·08	·16	·22
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·02	..
9	·13	·10	·06	·11	·12	·11	·10	·11	·07	·10	·09	·09	·09	·09	·11	·09	·08	·18	·09	·08		·07	·10	·10	·08	·06
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
12	·02	·01	..	·01	·02	..	·01	·01	..	·02	·01	·02	·01	·01	..	·01	..	..	·02	·01		..	·01	·02	·01	..
13	·08	·04	·03	·03	·03	·04	·03	·02	·02	·04	·03	·03	·04	·05	·02	·08	·04	·12	·05	·03		·05	·03	·04	·01	..
14	..	..	..	..	·01	..	..	·01	..	..	·01	·01	..	..	·02	·01	·02	..	·02	·02		·02	·02	·01	·01	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	·01		..	·01	..	·01	..
16	·28	·18	·17	·17	·18	·18	·17	·18	·16	·19	·20	·18	·19	·17	·16	·18	·19	·18	·18	·04	OBSERVER ILL.	·15	·19	·25	·18	·22
17	·03	·02	·02	·01	·02	·02	·02	·01	·02	·02	·03	·03	·03	·03	·02	..	·02	..	·04	·03		·04	·01	·03	·03	·04
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
19	·15	·20	·24	·23	·21	·20	·20	·21	·20	·23	·23	·22	·20	·24	·24	·28	·22	·22	·19	·08		·14	·19	·20	·21	·23
20	..	..	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..	..	..	..
21	·03	·03	·05	·08	·10	·15	·12	·12	·11	·13	·15	·12	·15	·10	·09	·06	·10	·12	·10	·10		·05	·05	·15	·04	·06
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
27	·13	·19	·14	·16	·18	·15	·18	·18	·16	·18	·17	·11	·12	·10	·06	·08	·05	..	·05	·05		·06	·10	·08	·06	..
28	·16	·06	·05	·05	·05	·05	·04	·04	·05	·04	·06	·05	·05	·05	·07	·08	·06	·11	·06	·05		·04	·06	·05	·03	·09
29	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..	..	..	..
30	·16	·16	·18	·19	·19	·18	·18	·18	·17	·19	·21	·19	·12	·16	·17	·16	·20	·19	·19	·15		·13	·15	·15	·10	·11
*	1·52	1·30	1·22	1·31	1·33	1·35	1·25	1·28	1·19	1·40	1·51	1·25	1·22	1·18	1·20	1·23	1·19	1·31	1·24	·88		·99	1·21	1·36	1·13	1·24
†	11·56	9·70	9·26	9·41	9·24	8·40	9·16	9·05	8·81	9·87	10·13	9·12	8·91	9·52	10·04	9·97	9·90	10·43	9·81	9·18		9·08	9·15	9·71	7·58	8·35

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt.Ararat)	Raynes Park	New Malden	Esher	West Molesey
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·14	·07	·11	·08	·08	·08	·08	·05	·06	·09	·07	·04	·02
2	..	..	..	..	..	..	..	..	..	·01	..	..	..
3	..	..	·01	·02	..	..	..	..	..	·01	..	·01	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·13	·06	·05	·08	·11	·08	·10	·19	·16	·17	·15	·15	·17
7	·13	·05	·06	·05	·04	·05	·10	·16	·13	·13	·15	·33	·18
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	·09	·08	·09	·09	·09	·07	..	·11	·06	·09	·06	·06	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·02	..	·02	·02	·02	..	..	·01	..	·02	·02	·04	·02
13	·04	·02	·03	·04	·03	..	·03	·04	·06	·06	·02	·06	·05
14	..	..	·01	..	·01	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	·03	·04	..	..	..	..
16	·22	·21	·20	·20	·18	·20	·16	·21	·19	·22	·17	·20	·21
17	·02	·02	·04	·03	·02	·03	·03	·04	·03	·03	..	·03	·02
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·21	·16	·15	·16	·16	·17	·18	·16	·20	·21	·27	·13	·15
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·10	·13	·13	·11	·15	·10	·16	·13	·05	·07	·03	·02	·04
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·05	·06	·08	..	·06	·10	·28	·68	·40	·37	1·02	·30	·21
28	·03	·04	·07	·06	·06	·06	·05	·03	·05	·05	·32	·06	·09
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·13	·13	·16	·16	·15	·15	·17	·16	·18	·20	·20	·22	·21
*	1·31	1·03	1·21	1·10	1·16	1·09	1·34	2·00	1·61	1·73	2·48	1·64	1·37
†	8·76	8·76	8·91	8·48	8·62	8·70	8·87	8·67	8·87	10·45	10·21	9·12	9·38

Day of Mo.	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·03	·04	·03	·04	·10	·06	·05	·02	·04	·07	·03	·04
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	·01	..	..	..	..	..	..	..	..	·03	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·17	·10	·20	·24	·19	·10	·15	·14	·13	·16	·16	·21	·18
7	·16	·30	·18	·22	·15	·12	·10	·08	·07	·06	·12	·23	·15
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	·10	·08	·05	·10	·08	·08	·08	·07	..	·07	·08	·08	·07
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	·01	..	..	..	..
12	·02	·01	·03	·02	·01	·01	·03	·02	·02	·01	..	·01	..
13	·06	·06	·05	·04	·05	·02	·05	·05	·04	·05	·03	·04	·04
14	..	..	·01	..	·01	·02	..	..	..	·01	..	..	..
15	..	·03	·04	·01	·04	·02	·03	·02	·02	·02	·02	·01	·02
16	·18	·23	·15	·19	·22	·20	·25	·22	·20	·26	·24	·23	·17
17	·02	·02	·05	·03	·02	·05	·03	·02	·03	·02	·04	·04	·04
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·15	·24	·13	·14	·14	·14	·16	·18	·16	·18	·21	·18	·16
20	..	..	..	..	..	..	·01	·02	·02	·02	·01	·02	·01
21	..	·03	·05	·19	·24	·12	·23	·11	·12	·09	·12	·10	·06
22	..	..	..	..	..	..	..	..	·02	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·73	·60	·27	·37	·55	1·62	·35	·12	·01	·16	·05	·07	·04
28	·04	·04	·19	·09	·15	·05	·06	·03	·10	·04	·02	·15	·09
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·22	·25	·22	·22	·21	·12	·15	·13	·15	·15	·12	·14	·12
*	1·89	2·03	1·66	1·89	2·10	2·77	1·72	1·26	1·12	1·34	1·32	1·54	1·19
†	9·59	10·23	9·81	9·28	10·03	10·20	9·48	8·49	....	8·39	8·33	8·91	7·97

* The figures in this row give the totals for the month. † The totals from January 1st.

April, 1897.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	·02	·05	..
2	..	..	..
3	..	..	..
4	..	..	..
5	..	..	..
6	·23	·22	·20
7	·12	·13	·27
8	..	·01	..
9	·06	·06	·05
10	..	..	..
11	..	..	..
12	·01	·01	..
13	·04	·03	·02
14	..	·03	..
15	..	·03	..
16	·18	·18	·15
17	..	·04	·03
18	·01	..	..
19	·17	·16	·18
20	·01	·01	·01
21	·07	·10	·08
22	..	..	..
23	..	..	..
24	..	..	..
25	..	..	..
26	..	..	..
27	·08	·62	·20
28	·06	·12	·25
29	..	..	..
30	·12	·18	·15
*	1·18	1·98	1·59
†	7·73	9·77	7·67

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(April, 1897.)

The month has been comparatively dry, cool, and sunless. Owing to several rather severe night frosts, vegetation is backward. It has been a somewhat unhealthy month, but not so much so as the previous one. Slight snow fell on the 1st; hail fell on the 7th, 15th, and 27th; and there was thunder and lightning on the 7th and 27th throughout the district. Solar halos were seen at Upper Gatton on the 9th, 13th, 26th, and 27th, and at Croydon on the 19th; and a lunar one was seen at Croydon on the 9th, and Upper Gatton on the 16th. The thunderstorm on the 27th was very severe about Tooting. At Park Hill, Croydon, the maximum in the shade was above 60° on three days and above 50° on twenty-two days, whilst the minimum in the shade was below 40° on sixteen days. At Sidcup pears were in bloom on the 12th, and apples on the 22nd. The cuckoo was heard at Croydon on the 3rd, at Upper Gatton on the 17th, at Nutfield on the 19th, and at Warlingham on the 25th; the wryneck was heard at Nutfield on the 16th; the nightingale was heard at Upper Gatton on the 18th, at Warlingham on the 21st, and at Nutfield on the 25th; and swallows were seen at Upper Gatton on the 20th, at Nutfield on the 23rd, and at Warlingham on the 27th. The rainfall is slightly below the average. The mean temperature is about the average, and was at Croydon (Duppas House) 47·2°, at Wallington and Waddon 46·6°, at Croydon (Whitgift) 46·5°, at Chipstead 45°, and at Upper Gatton 44·6°. There were recorded at Upper Gatton 114 hours of bright sunshine, and at Hayes Common 129·2 hours, and Wallington 119·5 hours of sunlight, which latter is 12 per cent. below the April average for the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..	..	..
2	..	..	..	..	..	..	·01	·01	·01	·01	..	..	·01	·01	..	..	..		·02	..	·01	..	·02	..	..	·01
3	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
4	·14	·13	·20	·20	·16	·16	·16	·20	·17	·22	·20	·22	·18	·24	·20	·12	·13		·11	·21	·16	·16	·16	·14	·15	·14
5	·03	·01	·03	..	·03	·02	·02	·05	·05	·04	·03	·05	·04	·02	·05	·02	·07		·04	·02	·03	·04	·05	·05	·06	·05
6	..	·02	..	..	..	..	..	·02	·02	..	..	·01	..	..	..	·01	·02		..	..	..	..	..	·03	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..		·01	..	..	·02	·02	..	..	..
8	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..		..	..	..	..	..	·04	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
10	..	..	..	·02	·03	·02	·02	..	·02	·02	·01	·01	·01	·02	·03	·04	..		·02	·06	..	·06	·08	·02	·03	·02
11	·04	·05	·02	..	·04	·02	·01	·02	·03	·02	·02	·03	·02	·03	·03	·01	·01		·01	·02	·10	·03	·03	·04	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·02	..	..	..	..
16	·01	..	..	..	·03	·05	·02	·02	·02	·02	·02	·02	·02	·03	..	..	·14	MONTHLY GAUGE.	·11	·04	·02	·02	·02	·05	·01	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	·10	..	·09	..	·05	·03	·02	..	·04	·02	..	·01	·02	·05	·06	·01	..		..	·04	·01	·01	·01	·04	..	..
26	·23	·33	·23	·12	·11	·15	·10	·13	·11	·10	·19	·10	·10	·08	·18	·22	·26		·17	·19	·09	·08	·10	·14	·26	·25
27	·12	·11	·05	·05	·02	·02	·02	·02	·03	·02	·04	·03	·03	·04	·05	·09	·12		·09	·10	·04	·10	·06	·03	·08	·05
28	·10	·22	·19	·30	·12	·05	·08	·20	·12	·12	·10	·16	·32	·12	·15	·08	·10		·04	·17	·14	·18	·20	·29	·11	·10
29	·18	·21	·21	·50	·18	·16	·18	·15	·16	·18	·18	·18	·18	·19	·18	·15	·13		·14	·23	·17	·19	·21	·16	·16	·14
30	·21	·24	·33	·40	·45	·46	·30	·35	·45	·42	·50	·36	·44	·55	·56	·25	·40		·28	·34	·55	·71	·72	·64	·32	·28
31	·41	·40	·31	·30	·23	·27	·27	·29	·21	·25	·24	·27	·26	·30	·32	·38	·40		·24	·35	·37	·38	·33	·36	·52	·49
*	1·57	1·72	1·68	1·89	1·45	1·41	1·21	1·46	1·44	1·44	1·54	1·45	1·63	1·68	1·81	1·39	1·78	1·49	1·28	1·77	1·69	2·01	2·01	2·03	1·76	1·53
†	15·18	14·22	14·50	15·97	12·91	11·88	12·48	13·48	12·51	13·05	13·13	13·04	13·11	13·37	14·28	9·67	11·50	13·42	12·00	12·84	11·43	13·09	12·78	12·79	11·81	10·95

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..		..	..	..	..	..
2	·03	·02	·01	·01	·02	..	·01	·01	..	·02	..	..	·01	·02	..	·01	..	..	·01	·02		..	..	·02	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
4	·20	·15	·13	·14	·14	·15	·13	·14	·13	·15	·17	·15	·14	·14	·12	·14	·10	·16	·13	·11		·10	·10	·14	·06	·09
5	·06	·04	·03	·04	·04	·04	·04	·04	·04	·04	·05	·03	·03	·04	·05	·03	·06	·04	·05	·02		·03	·02	·05	·01	·03
6	..	·02	·01	·01	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..		..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
8	..	·01	·01	..	·01	..	·01	..	..	..	·01	..	..	·01	..	·01	..	..	·01	·01		..	..	·01	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
10	·03	·05	·02	·03	·04	..	·02	·03	·02	·03	·03	·03	..	·04	·02	·03	·02	..	·03	·02		·01	·02	·02	..	..
11	..	·02	·02	·02	·04	·05	·03	·03	..	·04	·04	·03	·05	·03	·01	·02	..	..	..	..		..	·05	·03	·02	·03
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
16	·03	·01	..	·01	..	·01	·01	·01	..	·01	·01	·01	·01	·02	..	·01	..	..	·01	..	OBSERVER DEAD.	..	·02	·01	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01		..	·01	..	·01	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
25	·05	..	..	..	·02	..	..	..	..	·01	..	·01	..	·02	..	·01	..	..	..	..		..	·05	..	·02	·10
26	·12	·15	·12	·12	·13	·13	·13	·16	·13	·16	·17	·16	·16	·20	·16	·15	·17	·24	·16	·25		·16	·08	·22	·11	·03
27	·03	·02	·01	·02	·04	·05	·05	·07	·05	·06	·07	·06	·07	·13	·06	·10	·04	·02	·05	·04		·05	·04	·08	·02	·11
28	·13	·21	·14	·14	·18	·18	·18	·17	·19	·18	·22	·13	·15	·27	·21	·14	·23	·23	·23	·19		·02	·07	·16	·02	·13
29	·16	·12	·14	·13	·13	·12	·14	·13	·12	·14	·15	·13	·14	·16	·18	·19	·13	·17	·15	·15		·12	·11	·16	·01	·10
30	·39	·29	·28	·40	·53	·49	·52	·47	·46	·46	·52	·50	·50	·41	·36	·37	·43	·52	·39	·51		·49	·40	·74	·40	·48
31	·28	·31	·27	·32	·33	·35	·37	·35	·35	·35	·32	·35	·34	·39	·36	·36	·38	·39	·42	·34		·24	·25	·37	·17	·21
*	1·51	1·42	1·19	1·39	1·65	1·57	1·65	1·61	1·49	1·65	1·76	1·59	1·61	1·88	1·53	1·57	1·56	1·77	1·65	1·67		1·22	1·22	2·01	·85	1·31
†	13·07	11·12	10·45	10·80	10·89	9·97	10·81	10·66	10·30	11·52	11·89	10·71	10·52	11·40	11·57	11·54	11·46	12·20	11·46	10·85		10·30	10·37	11·72	8·43	9·66

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S. & V. W. C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	·01	·02	·01	·01	..	·02	·01	·04	..	·03	·02	·02	·02	·03	·02	·02	·03	·02	·03	..	·02	·01	·02	·01
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·09	·11	·13	·12	·11	·11	·14	·15	·14	·16	·12	·11	·11	·14	·18	·17	·15	·17	·16	·16	·13	·12	·15	·09	·11	·11
5	·06	·03	·05	·03	·01	..	..	·05	·03	·03	·02	·02	·03	·01	..	·02	·02	·03	·04	·04	·04	·08	·02	·02	·04	·04
6	..	..	..	..	..	..	..	·02	..	·02	..	..	..	..	..	·02	·02	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·02	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·01	..	·01	·01	·01	·03	·02	·01	·02	·03	..	·01	..	·01	·01	·02	..	..	·01	·01	..	..	·01	..	·01	..
11	·02	..	..	..	..	..	·03	·05	·04	·05	·02	..	..	·01	·01	·03	·04	·01	·01	·01	..	..	..	·03	·03	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	·01	·02	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·02	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·02	..	..	·03	..	..	..	·01	..	·03	..	..	..	..	·02	..	..	..	..	·01	..	..	·01	·02	·01	..
26	·17	·15	·19	·08	·20	·17	·13	·08	·10	·12	·27	·19	·22	·29	·27	·20	·10	·07	·09	·21	·17	·20	·16	·21	·16	·13
27	·12	·04	·07	·18	·05	·10	·04	..	·01	·03	..	·07	·07	·01	·02	·02	·05	·09	·07	·04	·06	·03	·06	·09	·10	·08
28	·14	·17	·19	·19	·07	..	·08	·05	·07	·09	·09	·20	·10	·05	·09	·08	·06	·07	·24	·08	·14	·06	·10	·07	·08	·09
29	·12	·12	·13	·13	·11	·22	·12	·10	·12	·14	·06	·14	·16	·13	·13	·13	·13	·12	·13	·12	·13	..	·11	·11	·13	·11
30	·60	·62	·38	·56	·52	·50	·44	·40	·27	·29	·39	·51	·25	·22	·24	·26	·22	·41	·30	·41	·49	·64	·51	·71	·53	·58
31	·21	·31	·28	·26	·40	·43	·37	·30	·27	·32	·28	·43	·63	·35	·24	·21	·29	·37	·36	·34	·38	·40	·33	·23	·21	·21
*	1·58	1·55	1·45	1·65	1·50	1·58	1·37	1·24	1·08	1·36	1·25	1·71	1·59	1·24	1·23	1·19	1·10	1·36	1·44	1·46	1·57	1·53	1·48	1·59	1·45	1·36
†	10·34	10·31	10·36	10·13	10·12	10·28	10·24	9·91	9·95	11·81	11·46	10·83	10·97	10·83	11·46	11·00	10·38	11·39	11·64	10·94	10·06	. . . .	9·87	9·92	10·36	9·33

* The figures in this row give the totals for the month. † The totals from January 1st.

May, 1897.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	..	..
2	..	·01	..
3	..	..	..
4	·10	·15	·12
5	..	·03	..
6	..	..	..
7	..	..	..
8	..	..	..
9	..	..	..
10	..	..	..
11	..	·01	..
12	..	..	..
13	..	..	..
14	..	..	..
15	..	..	..
16	..	·01	..
17	..	..	..
18	..	..	..
19	..	..	..
20	..	..	..
21	..	..	..
22	..	..	..
23	..	..	..
24	..	..	..
25	·05	·03	..
26	·07	·09	·04
27	·05	·05	·06
28	..	·09	·05
29	..	·10	·08
30	·56	·40	·38
31	·30	·42	·33
*	1·13	1·39	1·06
†	8·86	11·16	8·73

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(May, 1897.)

The month has been cold, with a rainfall below the May average of about one-quarter of an inch. A very severe frost occurred on the night of the 12th–13th, when great damage was done to fruit trees and also delicate garden crops. Thunderstorms occurred on several days, and that on the 30th was somewhat severe, the greater portion of the rain accompanying it falling in about half-an-hour. Slight snow fell at Warlingham on the 11th and 12th. The hawthorn was in blossom at Croydon on the 13th. At Park Hill, Croydon, the maximum in the shade was 70° and above on four days, 60° and above on seventeen days, and below 50° on one day; whilst the minimum in the shade was below 40° on nine nights, and was 50° and above on three nights. Solar halos were observed at Upper Gatton on the 7th, 14th, 16th, and 31st, and a lunar one on the 9th. The mean temperature of the month is about 1·5° below the average, and was at Croydon (Duppas House) and Waddon 52·5°, at Chipstead 52°, at Wallington 51·9°, at Croydon (Whitgift) 51·8°, and at Upper Gatton 49·7°. There were recorded at Upper Gatton 223 hours of bright sunshine, and at Hayes Common 244·2 hours, and Wallington 223·1 hours of sunlight, which latter is 3 per cent. above the May average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* **June, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·04	·03	·01	·02	·01	·01	·02	·01	·01
2	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..
6	..	..	..	1·30	·67	·54	·83	1·11	·93	·91
7	..	..	..	..	..	..	..	..	·01	..
8	·57	·58	·59	·65	·58	·75	·55	·64	·60	·69
9	..	·01	..	·02	·01	..	..	·02	·01	·01
10	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	·02	..	·01
16	·03	·06	..	·05	·08	·05	..	·04	..	·04
17	·31	·35	·41	·50	·42	·41	·36	·42	·45	·39
18	·03	·06	·03	·06	·03	·02	·03	·05	·03	·04
19	·23	·25	·22	·30	·31	·29	·26	·18	·30	·31
20	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..
22	..	..	..	·05	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	·01	..	·01
26	..	·02	..	·16	·07	·07	·04	·05	·05	·04
27	·40	·40	·36	..	·10	·07	·12	..	·07	·14
28	·06	·06	·05	·10	·07	·04	·06	·18	·07	·06
29	..	..	..	..	..	..	..	..	..	..
30	..	·01	·02	·10	..	..	..	..	..	..
*	1·66	1·84	1·71	3·30	2·36	2·25	2·26	2·74	2·53	2·66
†	16·84	16·06	16·21	19·27	15·27	14·13	14·74	16·22	15·04	15·71

Day of Mo.	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·02	·02	·02	·03		..		..	·01	..	·01	·03	·16	·02	·01
2	..	..	..	..	..		..		..	·01	..	..	..	·02	..	..
3	..	..	..	..	..		·02		..	..	..	..	..	..	..	..
4	..	..	..	..	..		..		..	..	..	..	..	..	..	..
5	..	..	..	..	..		..		..	..	..	..	..	..	..	..
6	·24	·47	·30	·15	·10		·16		·11	·25	·19	·10	·11	·45	·40	·58
7	..	..	..	·01	..		..		..	·02	..	..	..	..	..	..
8	·64	·74	·88	·70	·50		·55		·61	·55	·59	·40	·55	·65	·59	·58
9	·01	·02	·02	·59	·04		·01		..	·05	·02	·17	·03	·06	·02	·02
10	..	..	..	..	..		..		..	..	..	..	..	..	..	..
11	..	..	..	..	..		..		..	..	..	..	..	..	..	..
12	..	..	..	..	..		..		..	..	..	..	..	..	..	..
13	..	..	..	..	..		..		..	..	..	..	..	..	..	..
14	..	..	..	..	..		..		..	..	..	..	..	..	..	..
15	..	..	..	..	..	RECORD CEASED.	..	MONTHLY GAUGE.	·03	..	..	..	..	..	·01	·01
16	·10	·04	·04	·05	·04		·05		·04	..	..	·05	·06	·05	·23	·02
17	·41	·36	·25	·33	·35		·32		·27	·25	·21	·21	·24	·18	·01	·21
18	·03	·03	·02	·03	·02		..		..	·03	·02	·01	·01	·04	·03	·02
19	·33	·31	·25	·32	·32		..		·29	·26	·22	·25	·25	·24	·19	·19
20	..	..	..	..	..		..		..	..	..	..	·01	..	·01	..
21	..	..	..	..	..		..		..	..	..	..	..	..	..	..
22	..	..	..	..	..		..		..	..	..	..	..	..	..	..
23	..	..	..	..	..		..		..	..	..	..	..	..	..	..
24	..	..	..	..	..		..		..	..	..	·05	·06	·26	·80	·81
25	..	..	·01	..	..		..		..	·03	..	·01	·02	·03	·03	·01
26	·05	·04	·02	·05	·11		·08		·26	..	·06	·05	·04	·06	..	..
27	·11	·12	·19	·09	..		·07		..	·34	·09	·23	·23	·38	·16	·19
28	·04	·05	·07	·04	·15		·06		·14	·05	·05	..	·04	·05	·08	·06
29	..	..	..	..	..		..		..	..	..	·03	..	..	..	..
30	·02	..	..	·37	·07		..		..	..	·11	·03	·03	..	..	·10
*	2·00	2·20	2·07	2·75	1·73		1·32	2·30	1·75	1·85	1·56	1·60	1·71	2·63	2·58	2·81
†	15·13	15·24	15·18	16·12	16·01		12·82	15·72	13·75	14·69	12·99	14·69	14·49	15·42	14·39	13·76

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* June, 1897.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·03	·01	·01	·02	..	·02	·02	..	·01	·02	·01	·02	·02	·02	·01	..	..	·03	..		·02	·01	..	·01	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	·01	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
6	·12	·22	·32	·44	·48	·53	·43	·41	·53	·45	·44	·35	·35	·32	·27	·43	·35	·43	·68	·28		·31	·27	1·35	·39	·34
7	..	·02	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..		..	..	..	..	..
8	·80	·75	·54	·53	·52	·50	·52	·51	·55	·50	·57	·59	·50	·61	·60	·64	·60	·67	·60	·67		·66	·82	·78	·64	·83
9	·03	·02	·03	·03	·03	·05	·03	·04	..	·05	·05	·04	·05	·04	·04	·01	·04	..	·06	·03		·03	·04	·08	·05	·05
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..		..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	OBSERVER DEAD.	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
15	..	..	..	..	·01	..	..	..	..	·01	·01	..	·01	..	..	..	..	·02	..	..		..	..	..	..	..
16	..	·06	·06	·05	·06	·05	·06	·06	..	·05	·05	·04	·05	·04	·05	·04	·04	..	·07	·04		·02	·03	·06	·03	·10
17	·26	·20	·20	·19	·18	·17	·18	·18	·21	·19	·20	·18	·18	·21	·21	·24	·21	·30	·19	·16		·22	·21	·25	·22	·25
18	..	..	·01	·01	·01	..	·01	..	..	·01	·01	..	·01	·01	..	·01	..	..	·01	·01		·01	·02	·03	..	·02
19	·25	·22	·22	·23	·22	·24	·22	·23	·22	·24	·26	·24	·23	·24	·25	·25	·25	·29	·25	·22		·22	·20	·21	·18	·18
20	..	..	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	·01	..		..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
24	·14	·30	·21	·25	·28	·31	·28	·30	·39	·22	·40	·24	·30	·26	·28	·11	·25	·20	·22	·10		·05	·01	·49	·06	·20
25	·02	·02	·01	·01	·02	..	·02	·01	·01	·02	·02	·02	·01	·02	·01	·02	·02	..	·03	·03		·01	·02	·04	·02	·02
26	..	·03	·02	·01	·02	..	·04	·01	..	..	..	..	..	·01	..	·02	..	..	·01	·02		·01	·02	·01	·02	·03
27	·20	·24	·27	·29	·32	·28	·28	·29	·24	·22	·23	·20	·18	·15	·24	·14	·24	·32	·30	·26		·32	·28	·39	·27	·25
28	·06	·03	·02	·03	·03	·03	·03	·03	·04	·03	·04	·04	·04	·04	·02	·04	·03	·06	·05	·05		·10	·10	·09	·05	·05
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
30	..	·02	..	·05	·04	·04	·04	·04	·03	·05	·02	·04	·02	..	..	..	..	..	..	..		..	..	..	..	..
*	1·91	2·16	1·92	2·13	2·25	2·20	2·17	2·13	2·22	2·05	2·33	1·99	1·95	1·97	2·00	1·97	2·03	2·29	2·53	1·87		1·98	2·04	3·78	1·94	2·32
†	14·98	13·28	12·37	12·93	13·14	12·17	12·98	12·79	12·52	13·57	14·22	12·70	12·47	13·37	13·57	13·51	13·49	14·49	13·99	12·72		12·28	12·41	15·50	10·37	11·98

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* **June, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	·03	·02	·01	·02	..	·02	·02	·03	·03	·03	·02	·01	·02	·03	·02	·02	·02	·01	·03	..	·01	..	·01	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	1·24	1·63	1·45	·82	1·86	1·18	·61	·07	·18	·22	·08	·07	..	·08	..	..	..	·03	·17	·74	·47	·41	·27	·27	·13	·03
7	..	..	..	..	..	·01	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·63	·70	·61	·63	·55	·55	·42	·55	·72	·72	1·19	·68	·65	·83	·89	·77	·63	·50	·58	·65	·54	·56	·50	·64	·55	·53
9	·10	·04	·06	·06	·06	·05	·07	·04	·04	·07	·03	·03	·04	·03	·02	·03	·04	·06	·06	·05	·08	·07	·07	·08	·06	·06
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..
16	·06	·03	·05	·03	·05	·08	..	·02	·01	·02	..	·03	..	..	·01	·02	·01	..	·01	·01	·02	..	·01	·03	·01	..
17	·22	·17	·18	·18	·16	·17	·21	·19	·21	·20	·18	·22	·18	·20	·20	·19	·19	·21	·20	·21	·23	·10	·21	·21	·21	·20
18	·03	·01	·03	·03	·02	..	·02	·03	·04	·06	·05	·02	·03	·02	·02	·03	..	..	·02	·03	·02	..	·02	·01	·03	·02
19	·18	·18	·20	·20	·20	·22	·25	·08	·21	·23	·20	·19	·17	·18	·22	·21	·20	·21	·28	·20	·20	·33	·19	·18	·18	·16
20	..	..	..	..	..	..	..	·19	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·33	·50	·20	·24	·35	·41	·32	·64	1·04	1·04	1·82	2·32	1·96	2·12	1·56	·73	·76	·41	·62	·86	·98	·64	·77	·89	·25	·39
25	·03	·02	·03	..	·02	·02	..	·01	·01	·03	·02	..	·01	..	·01	·01	..	..	·02	·02	..	·03	·01	·02	·02	·01
26	·03	..	..	..	·01	·02	..	..	..	·03	·03	·02	..	·01	..	·02	..	..	·01	..	..	..	..	·01	·04	..
27	·15	·21	·35	·34	·30	·17	·22	·47	·43	·36	·26	·26	·24	·21	·26	·41	·45	·26	·24	·26	·34	·36	·29	·22	·18	·16
28	·06	·04	·04	·05	·03	·02	·02	·01	·01	·03	·03	·08	·08	·02	·02	·07	·03	·03	·04	·04	·05	..	·04	·07	·06	·04
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	·03	·62	·36	·18	·04	·03	..	..	..	..	..	..	..	..	..	..
*	3·07	3·53	3·23	2·60	3·62	2·92	2·14	2·32	2·92	3·08	3·95	4·58	3·77	3·89	3·27	2·55	2·33	1·73	2·28	3·08	2·96	2·50	2·41	2·63	1·73	1·60
†	13·41	13·84	13·59	12·73	13·74	13·20	12·38	12·23	12·87	14·89	15·41	15·41	14·74	14·72	14·73	13·55	12·71	13·12	13·92	14·02	13·02	....	12·28	12·55	12·09	10·93

* The figures in this row give the totals for the month. † The totals from January 1st.

June, 1897.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	·01	·01
2	..	..	..
3	..	..	..
4	..	..	..
5	..	..	..
6	..	·01	..
7	..	..	..
8	·63	·58	·43
9	·06	·06	·05
10	..	..	..
11	..	..	..
12	..	..	..
13	..	..	..
14	..	..	..
15	..	..	..
16	..	·01	..
17	·18	·20	·18
18	·01	·01	..
19	·15	·18	·16
20	..	..	..
21	..	..	..
22	..	..	..
23	..	..	..
24	·59	·36	·25
25	..	·01	..
26	..	..	..
27	·28	·21	·22
28	·05	·05	·05
29	..	..	..
30	..	·02	·02
*	1·95	1·71	1·37
†	10·81	12·87	10·10

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(June, 1897.)

The month has been warm, wet, and somewhat sunless. All vegetables and strawberries and other small garden fruits have done well. It has, however, been somewhat unhealthy, hay fever and colds being prevalent, particularly round Abinger. The month will be memorable for its many thunderstorms, of which that on the 6th, with its maximum rainfall at Beckenham, and that on the 24th, with its maximum at Esher, are noticeable. During these storms the rapidity of the rainfall was remarkable. At Surbiton, on the 24th, the amount fell in one and a third hours, and at Beckenham, on the 6th, it fell in one and a quarter hours, and at Sidcup, on the same date, 1·20 in. fell in half an hour, and at Oxshott ·48 in. fell in a quarter of an hour; whilst at Duppas House, Croydon, where there is a self-recording gauge, on the 6th, ·30 in. fell in ten minutes, on the 24th ·30 in. fell in less than ten minutes, and on the 27th ·25 in. fell in ten minutes. Several solar halos were seen during the month. The mean temperature of the month is about 2° above the average, and was at Waddon 61·8°, at Croydon (Duppas House) 61·6°, at Chipstead and Wallington 61°, at Croydon (Whitgift) 60·9°, and at Upper Gatton 59°. A brilliant meteor was seen at Harp's Oak Cottage at 3.20 a.m. on the 30th, course N.E. to S.W. There were recorded at Upper Gatton 163·6 hours of bright sunshine, and at Hayes Common 186·7 hours, and at Wallington 169·5 hours of sunlight, which latter is 8 per cent. below the June average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,

Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* **July, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
5	·03	·05	·05	·05	·05	·05	·05	·04	·04	·04	·05	·04	·03	·05	·05		..		·05	·05	·03	..	·04	·04	·03	..
6	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..		..		..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
8	..	..	..	..	..	·01	·02	·02	·01	·01	..	·01	..	..	..		..		..	·01	·01	·01	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	RECORD CEASED.	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
19	·70	·60	·67	1·05	·52	·51	·58	·69	·56	·53	·38	·61	·64	·38	·22		..		·04	·09	·39	·20	·19	·42	·71	·58
20	·01	..	..	..	..	..	·01	·04	·02	·03	..	·01	..	..	..		..		..	..	·01	·14	·13	·16	·21	·26
21	·90	1·12	·40	·40	·41	·26	·20	·40	·75	·52	·90	·64	·19	·50	·51		·08		·06	·20	·14	·13	·13	·13	·13	·10
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	·01	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
25	·04	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..		..		..	..	..	..	·02	·16	·16	·16
26	·12	·22	·10	·60	·12	·34	·11	·17	·11	·38	·12	·51	·61	·69	·45		·12		·24	·54	·56	·58	·57	·38	·48	·38
27	·08	·11	·25	..	..	·01	·01	·01	·01	·01	..	·02	·01	·01	..		..		·03	·04	..	..	·01	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
*	1·88	2·10	1·47	2·10	1·10	1·18	·99	1·39	1·50	1·52	1·46	1·84	1·48	1·63	1·23		·20	·56	·42	·93	1·15	1·06	1·09	1·29	1·72	1·48
†	18·72	18·16	17·68	21·37	16·37	15·31	15·73	17·61	16·54	17·23	16·59	17·08	16·66	17·75	17·24		13·02	16·28	14·17	15·62	14·14	15·75	15·58	16·71	16·11	15·24

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
4	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
5	..	·03	·03	·03	·03	·03	·02	·02	·03	·03	·03	·03	·03	·04	..	·04	·02	..	·02	·04		·03	·04	·04	·02	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
8	..	..	..	..	·01	..	..	·01	..	..	·01	·01	·01	..	..	..	..	..	·01	..		..	·01	·02	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	OBSERVER DEAD.	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
19	·90	·70	·43	·42	·38	·30	·35	·34	·45	·42	·35	·17	·18	·16	·14	·07	·03	..	·11	·10		·01	·05	·03	·03	·02
20	..	..	..	..	·02	·10	·15	·08	·31	·30	·29	·25	·49	·16	·05	·05	·01	..	..	..		..	..	..	..	..
21	·12	·04	·05	·07	·12	·18	·15	·15	·13	·11	·11	·06	·05	·04	·02	·03	·03	·15	·04	·10		·25	·02	·16	1·13	·48
22	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
25	·28	·02	·01	·01	·01	..	·01	·01	..	..	·03	..	..	·04	·01	·08	·02	..	·02	·02		..	..	..	..	..
26	·47	·43	·37	·43	·44	·53	·48	·49	·47	·51	·49	·46	·42	·38	·32	·96	·45	·87	·27	·74		·62	·45	·34	·10	·17
27	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	·02	..	·02	·02		·21	·08	·32	·04	·04
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..
*	1·77	1·23	·89	·96	1·02	1·14	1·18	1·11	1·39	1·37	1·31	·98	1·18	·82	·54	1·23	·58	1·02	·49	1·02		1·12	·65	·91	1·33	·71
†	16·75	14·51	13·26	13·89	14·16	13·31	14·16	13·90	13·91	14·94	15·53	13·68	13·65	14·19	14·11	14·74	14·07	15·51	14·48	13·74		13·40	13·06	16·41	11·70	12·69

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* July, 1897.

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
5	·02	·02	·04	·03	·02	·02	·02	·01	·01	·03	..	·02	·02	·02	·01	·01	·01	..	·01	·02	·01		·01	·02	·01	..
6	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..	·01	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
8	·01	..	..	·01	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..		·01	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
19	·10	·04	·15	·06	·10	·21	·55	·47	·69	·67	1·28	·35	·36	·43	·63	·73	·58	·34	·56	·80	·21		·11	·08	·09	·32
20	..	..	·04	..	·21	·48	·05	·02	·02	·03	·11	·70	·22	·35	·44	·24	·21	·01	·01	·08	·27		·19	·03	·16	·22
21	·02	·20	·12	·10	·03	·02	·23	·11	·02	·04	·04	..	..	·01	·02	·02	·58	·01	..	..	..		·02	..	..	..
22	..	..	..	..	..	..	..	·01	..	·01	..	·05	..	..	..	..	..	..	..	..	..		..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
25	..	..	..	·01	..	..	·02	·21	·14	·17	·09	·11	·15	·02	·15	·05	·15	·14	·11	·08	·09		·11	·04	·10	·11
26	·36	·40	·50	·28	·60	·57	·76	·12	·14	·14	·17	·15	·39	·20	·32	·10	·11	·13	·12	·13	·17		·16	·21	·15	·13
27	·19	·14	·08	·06	·03	·02	..	·02	..	·01	..	·01	·02	..	..	·02	·02	·01	·03	·01	·14		·18	·27	·21	·08
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
*	·70	·80	·93	·55	1·00	1·32	1·63	·97	1·02	1·11	1·69	1·40	1·16	1·03	1·57	1·17	1·66	·64	·84	1·13	·89		·79	·65	·73	·86
†	14·11	14·64	14·52	13·28	14·74	14·52	14·01	13·20	13·89	16·00	17·10	16·81	15·90	15·75	16·30	14·72	14·37	13·76	14·76	15·15	13·91		13·07	13·20	12·82	11·79

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	..	..
2	..	..	..
3	..	..	..
4	..	..	..
5	..	·01	·01
6	..	..	..
7	..	..	..
8	..	·01	..
9	..	..	..
10	..	..	..
11	..	..	..
12	..	..	..
13	..	..	..
14	..	..	..
15	..	..	..
16	..	..	..
17	..	..	..
18	..	..	..
19	·18	·60	·57
20	·11	..	·02
21	..	..	..
22	..	..	..
23	..	..	..
24	..	..	..
25	·11	·16	·06
26	·15	·15	·05
27	·11	·02	·03
28	..	..	..
29	..	..	..
30	..	..	..
31	..	..	..
*	·66	·95	·74
†	11·47	13·82	10·84

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(July, 1897.)

The month has been warm, very sunny, and also exceedingly dry for July, and the rains which fell were mainly during the thunderstorms on the 19th, 21st, and 26th. The month has been on the whole a healthy one, but the effect of the heat and dryness on vegetation cannot be described better than in the remarks made by the observers at Abinger Hall, Redhill, and Nutfield, which can be summarized thus:—The fruit crop, apples, pears, and plums are a failure, but the trees are freer from blight than usual, and have made luxuriant growth; plants of the cabbage tribe have suffered greatly, and the potato crop is poor, owing to the potato disease (*Phytophtora infestans*); the crops, however, of wheat and oats are good. The low temperature of the 8th was remarkable, the minimum on the grass falling at Croydon (Whitgift) to 31·1°, and at Upper Gatton to 32·9°. A solar halo was seen at Croydon on the 11th. The rainfall is about $1\frac{3}{4}$ in. below the average for the month. The mean temperature of the month is about 1·5° above the average, and was at Chipstead 64·7°, at Croydon (Duppas House) 64·2°, at Wallington and Waddon 63·5°, at Croydon (Whitgift) 63·4°, and at Upper Gatton 62°. On the 30th a bright meteor was seen at Upper Gatton at 8.50 p.m. travelling from north-east to south-west. There were recorded at Upper Gatton 248·1 hours of bright sunshine, and at Wallington 240·4 hours of sunlight, which latter is 10 per cent. above the July average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	Reigate Hill Margery H.	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	·02	·04	..	·01	·03	·01	·02	·05	·02	·02	·01	·02	·01
6	·01	..	..	..	..	·03	·07	·01	·05	·04	..	..	..
7	·04	..	·06	·06	·08	·05	·02	·14	·02	·02	·12	·06	·04
8	·40	·46	·33	·75	·59	·48	·60	·62	·63	·70	·58	·60	·63
9	..	..	..	·01	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	·01	..	..	..	·01	·01	·01	..
11	·01	..	..	..	·01	..	·02	·02	·01	·01	..	·01	·02
12	..	..	..	..	..	..	..	..	..	..	..	·01	..
13	·11	·09	·07	·10	·08	·03	·03	·06	·03	·05	..	·02	·05
14	..	·03	..	..	..	..	..	..	..	..	..	..	..
15	·11	·07	·10	·10	·09	·07	·08	·10	·08	·06	·12	·07	·08
16	..	..	..	..	..	..	..	·01	..	..	..	..	..
17	·11	·13	·07	·10	·14	·20	·10	·14	·11	·12	·17	·11	·09
18	·42	·25	·29	·15	·20	·21	·17	·12	·14	·10	·22	·14	·17
19	·11	·10	·06	·05	·04	·03	·03	·05	·03	·03	·04	·04	·03
20	·11	·20	·13	·10	·12	·15	·11	·16	·10	·15	·11	·15	·13
21	..	..	·05	..	..	..	..	..	..	..	..	..	·02
22	·01	..	..	·02	..	..	..	..	..	..	..	..	..
23	·04	..	·04	·03	..	..	·05	..	..	·04	..	..	..
24	·38	·57	·29	·15	·34	·26	·20	·34	·29	·25	·25	·46	·38
25	·60	·80	·06	·03	·46	·01	·15	·04	·03	·08	·13	·09	·14
26	·30	·30	·27	·25	·29	·24	·27	·36	·27	·31	·27	·25	·27
27	·07	·02	·02	·01	·03	·12	·02	..	..	·01	·09	·03	·05
28	..	·03	·07	·07	·13	·03	..	·04	·06	..	·02	·01	..
29	·36	·30	·29	·30	·22	·19	·20	·25	·22	·23	·20	·26	·32
30	·50	·70	·72	·67	·42	·35	·54	·60	·43	·48	·42	·43	·51
31	·10	·12	·12	·30	·09	·10	·10	·20	·09	·35	·13	·49	·55
*	3·81	4·21	3·04	3·26	3·36	2·57	2·78	3·31	2·61	3·06	2·89	3·26	3·49
†	22·53	22·37	20·72	24·63	19·73	17·88	18·51	20·92	19·15	20·29	19·48	20·34	20·15

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warlingham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..		..		..	..	..	..	..	..	..	..
2	..	..		..		..	..	..	..	..	..	..	..
3	..	..		..		..	..	..	..	..	..	..	..
4	..	..		..		..	..	..	..	..	..	..	..
5	·05	..		·13		·02	..	·02	·02	·02	..	..	..
6	..	..		..		..	..	..	·02	..	..	..	..
7	·08	·20		..		·02	·09	·02	·05	·05	·05	..	·02
8	·60	·54		·75		·64	·60	·55	·56	·55	·59	·33	·42
9	..	..		..		..	..	·01	..	..	..	..	..
10	·09	·03		..		·02	·02	·01	..	..	·03	..	..
11	..	..		..		·03	..	..	·01	..	..	..	..
12	..	..		..		..	..	..	..	..	..	..	..
13	·09	·10		·01		·01	·10	·04	·04	·05	·05	·07	·06
14	..	..		..		..	..	..	..	..	..	..	..
15	·08	·08		·14		·09	·08	·07	·09	·09	·11	·07	·07
16	..	..		·03		..	..	..	·08	..	..	..	..
17	·15	·19	RECORD CEASED.	·13	MONTHLY GAUGE.	·29	·13	·08	..	·08	·06	..	..
18	·17	·20		·23		·29	·25	·26	·35	·33	·25	·30	·20
19	..	·04		..		·03	·12	·03	·03	·03	·04	..	·02
20	·15	·16		·23		·25	·08	·13	·13	·12	·09	·10	·10
21	..	..		..		..	..	·01	·05	·05	..	..	..
22	..	..		..		..	..	..	..	..	..	..	..
23	..	..		..		·02	..	..	·01	..	·03	..	..
24	·41	·30		·34		·08	·33	·30	·23	·25	·30	·06	·42
25	·02	·02		..		·20	·02	·41	·05	·04	·15	..	·37
26	·28	·30		·26		·34	·20	·22	·21	·20	·20	·40	·23
27	·06	·10		..		·01	·04	·05	·08	..	·03	..	..
28	..	·02		·23		·01	·03	·02	·01	·07	·06	..	..
29	·23	·25		·19		·14	·18	·25	·28	·26	·20	·18	·19
30	·44	..		·40		·39	·40	·43	·48	·47	·57	·47	·39
31	·52	·60		·05		·05	·56	·52	·46	·45	·55	·50	·19
*	3·42	3·13		3·12	3·11	2·93	3·23	3·43	3·24	3·11	3·36	2·48	2·68
†	21·17	20·37		16·14	19·39	17·10	18·85	17·57	18·99	18·69	20·07	18·59	17·92

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..		..	..	..	
2	..	..	..	..	..	..	..	..		..	..	..	
3	..	..	..	..	..	..	..	..		..	..	..	
4	..	..	..	..	..	..	..	..		..	..	..	
5	..	..	·01	..	·01	..	·01	·01		..	·01	..	
6	..	..	..	..	..	..	..	..		..	..	..	
7	..	..	..	..	..	..	·01	..		..	..	..	
8	·54	·60	·50	·49	·45	·46	·48	·46		·46	·44	·40	
9	..	..	..	..	..	..	..	..		..	..	..	
10	..	..	..	·01	·01	..	·01	..		..	·01	..	
11	..	·01	..	..	..	..	·01	·01		·01	·01	..	
12	..	..	..	..	..	..	..	..		..	..	..	
13	·07	·05	·11	·08	·06	·08	·05	·05		·05	·06	·08	
14	..	..	..	..	..	..	..	..		..	..	..	
15	·13	·04	·04	·06	·06	·05	·05	·06		·06	·07	·08	
16	..	..	..	..	..	..	..	..	RECORD IMPERFECT.	..	..	..	RECORD CEASED.
17	..	·01	..	..	·01	..	·01	·01		·01	·01	·02	
18	·19	·12	·14	·16	·18	·16	·18	·17		·17	·15	·15	
19	·04	·02	·01	·01	·02	..	·02	·02		·01	·02	·01	
20	·10	·10	·08	·09	·08	·07	·08	·09		·09	·08	·06	
21	..	..	..	..	..	..	·01	..		..	·02	·01	
22	·05	..	..	·01	·01	..	·01	·01		·02	·03	·01	
23	..	..	..	..	..	..	..	..		..	..	·01	
24	·25	·17	·38	·50	·29	·36	·26	·24		·23	·21	·20	
25	·62	·52	·03	·04	·03	·03	·03	·03		·03	·03	·03	
26	·20	·19	·19	·19	·18	·18	·18	·20		·21	·22	·23	
27	·05	·10	·07	·03	·03	..	..	·04		·05	..	·01	
28	·04	..	..	..	..	·03	·05	..		..	·05	..	
29	·23	·16	·13	·18	·19	·15	·18	·21		·20	·18	·20	
30	·53	·49	·59	·54	·57	·49	·60	·57		·59	·60	·60	
31	·36	·28	·36	·33	·40	·22	·44	·46		·43	·24	·42	
*	3·40	2·86	2·64	2·72	2·58	2·28	2·67	2·64		2·62	2·44	2·52	
†	20·15	17·37	15·90	16·61	16·74	15·59	16·83	16·54		17·56	17·97	16·20	

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..		..	..	..	..	..
2	..	..	..	..	..	..	..		..	..	..	..	..
3	..	..	..	..	..	..	..		..	·01	..	..	..
4	..	..	..	..	..	..	..		..	..	..	..	..
5	·03	·10	·08	·06	·13	·16	·10		·09	·03	..	·01	..
6	..	..	..	·01	..	..	..		..	..	..	..	..
7	·03	·16	·12	·04	..	·04	·02		..	..	·02	..	..
8	·45	·45	·49	·57	·46	·42	·40		·36	·38	·32	·52	·42
9	..	..	..	..	..	..	..		..	..	..	..	..
10	·01	..	·01	..	..	..	..		..	..	·01	..	..
11	..	..	..	..	..	..	·01		..	·02	..	..	..
12	..	..	..	..	..	..	..		..	..	..	..	..
13	·06	·05	·05	·03	·03	·04	·06		..	..	·09	..	..
14	..	..	..	..	..	..	..		..	..	..	..	..
15	·17	·10	·06	·06	..	·08	·03		·06	·07	·05	·05	·05
16	..	..	..	..	..	..	..	OBSERVER DEAD.	..	..	..	..	..
17	·09	·07	·09	·08	..	·08	·06		·08	·14	·09	·04	·04
18	·22	·23	·28	·25	·08	·23	·29		·15	·21	·18	·16	·17
19	·02	·02	·02	·02	..	·02	·02		·01	..	..	..	..
20	·07	·09	·11	·08	·12	·08	·07		·09	·10	·07	·07	·07
21	·01	·01	·03	..	..	..	·01		..	..	..	..	..
22	..	..	..	·01	..	·05	·01		..	·04	·09	..	..
23	..	..	·01	..	..	..	..		..	..	..	..	..
24	·42	·31	·34	·36	·45	·32	·38		·32	·14	·19	·16	·19
25	·03	·01	·01	..	..	·04	·01		·09	·02	·69	·05	·07
26	·22	·26	·25	·35	·30	·29	·26		·20	·21	·29	·27	·27
27	·06	..	·01	..	·04	..	..		..	..	..	..	..
28	·02	·02	·02	·02	..	·03	·03		·11	·06	·05	·06	·10
29	·24	·19	·23	·19	·18	·16	·15		·18	·20	·15	·09	·10
30	·43	·41	·44	·41	·39	·34	·34		·32	·39	·32	·34	..
31	·43	·61	·47	·50	·49	·61	·43		·56	·37	·72	·29	·34
*	3·01	3·09	3·12	3·04	2·67	2·99	2·68		2·62	2·39	3·33	2·11	1·82
†	17·20	17·20	17·86	17·11	18·18	17·47	16·42		16·02	15·45	19·74	13·81	14·51

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
5	·03	·09	·22	·60	·03	..	..	·01	·01	·02	..	·01	·02	·01	·01	·02	·01	·01	..	·01	..		·01	·06	·05	·01
6	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	·02	..	..	..	..	..		..	..	..	..
7	·01	·02	..	·03	·26	..	..	·03	..	..	·03	·06	·05	·02	..	..	..	..	·05	·01	..		..	·05	·10	..
8	·49	·35	·45	·32	·15	·46	·50	1·05	·74	·60	·69	·54	·50	·53	·51	·55	·87	·89	·67	·82	·70		·70	·47	·57	·62
9	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
10	..	..	..	·01	·01	..	..	..	·01	..	..	..	..	..	..	·02	..	..	·01	..	·02		·01	·01	·01	·01
11	..	..	·03	..	..	..	..	·02	..	·02	..	·02	..	..	..	..	..	..	..	·01	..		·01	..	..	..
12	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	·01	..	..		..	..	..	..
13	·03	·01	·03	·03	·05	·05	·08	..	·04	·07	..	·05	·03	·06	·03	·04	·03	·04	·07	·08	·06		·05	·05	·06	·05
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
15	·03	·02	·05	·05	·04	·05	·04	·04	·06	·06	·05	·07	·06	·05	·07	·10	·08	·08	·07	·04	·03		·02	·02	·04	·03
16	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	NO REPLY.	..	..	..	..
17	·06	·04	·06	·07	·01	..	..	..	..	·01	..	·01	..	..	..	·02	..	..	..	..	..		..	..	..	..
18	·16	·14	·15	·21	·15	·11	·17	·25	·30	·29	·37	·22	·35	·23	·38	·50	·18	·17	·19	·18	·18		·11	·24	·32	·25
19	..	·02	·01	·02	·01	..	..	·02	·01	·03	..	·02	·04	·01	·06	·03	..	..	·02	·01	..		..	..	..	..
20	·07	·05	·07	·06	·05	·06	·05	·08	·09	·10	·05	·03	·10	·07	·03	·10	·10	·06	·10	·18	·05		·08	..	·08	·05
21	..	..	..	·01	..	..	·03	·06	·01	·06	..	·04	..	·01	..	..	..	·04	·07	·02	·02		·01	·06	·03	·04
22	·02	·05	·08	·06	·07	·06	·06	·06	·20	·21	·12	·04	·06	·02	·16	·01	·01	·01	·03	·02	·01		·02	..	·02	·01
23	..	..	..	..	·01	..	..	..	..	·01	..	·01	..	·01	..	..	..	..	..	..	..		..	..	..	..
24	·30	·31	·32	·34	·35	·38	·40	·17	·07	·10	·03	·16	·09	·17	·19	·13	·07	·21	·31	·40	·31		·29	·20	·30	·28
25	·13	·56	·33	·05	·07	·04	·06	·26	·37	·27	·10	·09	·04	·27	·04	·04	·12	·12	·26	·25	1·02		·86	·06	·06	·06
26	·27	·33	·41	·29	·33	·25	·23	·26	·27	·28	·27	·28	·27	·27	·30	·26	·28	·25	·28	·35	·26		·26	·30	·30	·26
27	..	..	..	..	..	..	·05	..	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
28	·01	..	·01	·02	·05	·03	..	·01	·02	·02	·03	·02	·05	·04	·18	·08	·03	·02	·01	·01	..		·02	..	..	·02
29	·13	·15	·17	·13	·11	·09	·12	·23	·16	·18	·15	·17	·13	·32	·14	·15	·12	·16	·11	·09	·10		·05	·04	·04	..
30	·30	·41	·35	·32	·35	·65	·44	·38	·34	·35	·38	·32	·34	·35	·31	·26	·31	·35	·32	·38	·44		·36	·32	·33	·32
31	·30	·35	·29	·76	·31	·24	·23	·28	·53	·56	·50	·44	·37	·39	·31	·69	·49	·25	·57	·43	·35		·31	·30	·55	·53
*	2·34	2·90	3·03	3·38	2·41	2·47	2·46	3·23	3·23	3·27	2·77	2·62	2·50	2·83	2·72	3·02	2·70	2·66	3·15	3·29	3·55		3·17	2·18	2·86	2·54
†	16·45	17·54	17·55	16·66	17·15	16·99	16·47	16·43	17·12	19·27	19·87	19·43	18·40	18·58	19·02	17·74	17·07	16·42	17·91	18·44	17·46		16·24	15·38	15·68	14·33

* The figures in this row give the totals for the month. † The totals from January 1st.

August, 1897.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	..	..
2	..	..	..
3	..	..	..
4	..	..	..
5	..	·01	..
6	..	..	..
7	..	..	..
8	·58	·68	·56
9	..	..	..
10	..	..	..
11	..	·01	..
12	..	..	..
13	·06	·10	·03
14	..	..	..
15	·02	·13	·03
16	..	..	..
17	..	..	..
18	·19	·24	·30
19	..	..	..
20	·05	·05	·05
21	..	·07	..
22	·03	·01	..
23	..	..	..
24	·42	·34	·26
25	·21	·26	..
26	·25	·24	·23
27	..	..	·02
28	·02	·02	..
29	·02	·13	·11
30	·28	·34	·27
31	·33	·34	·38
*	2·46	2·97	2·24
†	13·93	16·79	13·08

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(August, 1897.)

The month may be divided into two parts, the first seventeen days being fairly dry and warm, whilst the latter part of the month was wet and cool. The month as a whole has been healthy, though there has been a case of scarlet fever and one of diptheria at Wallington. Garden produce has been good and plentiful, but the potato disease is very bad in some parts. The observer at Nutfield mentions the great destruction caused by blackbirds, thrushes, sparrows, and tits. Thunderstorms have been numerous throughout the district. At Croydon the maximum thermometer has been above 80° on three days, above 70° on fourteen days, and above 60° on every day; whilst the minimum thermometer has been above 60° on two days, and below 50° on three days. The harvest, as a rule, has been got in in good condition. The mean temperature of the month is about 1° above the average, and was at Croydon (Duppas House) 63·4°, at Waddon 63·3°, at Wallington 63°, at Chipstead 62·7°, at Croydon (Whitgift) 62·6°, at Redhill 61·8°, and at Upper Gatton 60·8°. Solar halos were seen at Upper Gatton on the 5th, 14th, and 27th. There were recorded at Upper Gatton 188 hours of bright sunshine, and at Wallington 208·7 hours of sunlight, which latter is 3 per cent. above the August average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·57	·60	·56	·50	·41	·42	·35	·38	·37	·36	·44	·37
2	·03	·05	·03	·05	·01	..	·01	·05	..	·05	·04	·07
3	..	·06	..	..	·02	..	..	..	..	..	..	..
4	·07	·10	·08	..	..	·05	·07	·03	·02	·06	·10	·06
5	·32	·25	·36	·55	·46	·40	·38	·82	·49	·46	·50	·47
6	..	..	..	..	..	..	..	·01	..	..	..	..
7	..	..	..	..	..	·01	..	·02	·02	·11	·11	·12
8	·39	·38	·39	·40	·31	·30	·31	·45	·39	·30	·30	·33
9	..	..	..	·02	·01	..	..	..	..	..	·01	..
10	..	..	..	..	..	..	..	..	..	..	..	..
11	·01	..	..	..	..	·01	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..
15	·01	..	..	·01	..	·01	..	..	..	..	..	·01
16	..	..	..	..	..	..	..	..	..	..	..	..
17	·22	·22	·25	·25	·18	·15	·20	·24	·24	·24	·21	·22
18	·18	·11	·12	·08	·03	·03	·03	..	·03	·03	·05	·03
19	·06	·10	·08	·12	·11	·10	·13	·20	·11	·12	·11	·10
20	..	..	..	..	..	..	..	..	..	..	·02	·01
21	..	..	..	..	..	..	..	..	..	..	..	..
22	·03	·04	·02	..	·02	·02	..	·03	·01	·01	·01	·01
23	..	·02	..	..	·02	·01	·01	..	·01	..	·01	..
24	·04	..	·06	·07	·05	·05	·04	·06	·04	·06	·06	·06
25	·01	·07	·02	..	·02	·02	·01	·01	·01	·01	·01	·01
26	..	..	..	..	..	..	..	·01	..	·01	..	..
27	·09	·12	·06	..	..	..	..	..	..	·01	..	..
28	·05	·04	·08	·11	·07	·04	·06	·08	·07	·06	·04	·08
29	·52	·54	·69	1·10	·95	·67	·75	1·03	·74	·76	·61	·95
30	·01	..	..	..	..	..	..	..	..	..	..	..
*	2·61	2·70	2·80	3·26	2·67	2·29	2·35	3·43	2·55	2·65	2·63	2·90
†	25·14	25·07	23·52	27·89	22·40	20·17	20·86	24·35	21·70	22·94	22·11	23·24

Day of Mo.	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·32	·51	·49		·43		·32	·44	·35	·39	·39	·36	·48	·47
2	·05	·03	·08		..		..	·02	·02	..	..	·05	..	·03
3	..	..	..		..		..	·03	..	..	·01	..	..	..
4	·05	·15	·10		..		·08	..	·02	·08	..	·04	..	·03
5	·37	·41	·55		·65		·47	·46	·40	·38	·43	·30	·39	·30
6	..	..	..				·01	..	..	..	..	·03	..	..
7	·09	·03	·05		·03		·02	·04	·03	·04	·04	..	·10	·10
8	·34	·37	·33		·30		·36	·38	·34	·35	·35	·33	·33	·32
9	..	..	..		·04		·02	..	·01	..	·01	·02	..	..
10	..	..	..		..		..	..	..	..	..	..	..	..
11	..	..	..		..		..	..	..	·01	..	..	..	..
12	..	..	..		..		..	..	..	..	..	..	..	..
13	..	..	..		..		..	..	..	..	..	..	..	..
14	..	..	..	RECORD CEASED.	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
15	·01	..	..		·01		·04	·04	..	..	..	..	..	·01
16	..	..	..		..		..	..	..	..	..	..	..	..
17	·24	·20	·22		·23		·19	·22	·28	·25	·23	..	..	·21
18	·03	·06	·05		..		·23	·04	·04	·23	·02	·28	..	·03
19	·10	·12	·12		·18		·20	·14	·11	·12	·10	·15	·04	·06
20	·01	·02	·05		..		..	..	·02	·02	·02	·13	·30	..
21	..	..	..		..		..	..	..	..	..	..	..	..
22	..	..	..		·02		..	..	..	..	..	..	..	..
23	..	..	·02		·02		..	..	..	..	..	..	..	..
24	·05	·07	·10		·04		·03	..	·05	·05	·04	..	..	·02
25	·01	·02	·04		·03		·05	·09	..	·01	..	·05	..	..
26	..	..	..		..		·01	..	·01	..	..	..	..	·01
27	·01	..	..		..		·01	..	·01	·01	..	·03	..	·05
28	·08	·05	..		·08		·05	..	·07	·07	·07	·10	·14	·04
29	·81	·80	·65		·74		·86	·70	·88	·87	·83	1·03	·65	·40
30	..	..	..		·01		·01	..	..	·01	..	..	..	·01
*	2·57	2·84	2·85		2·81	2·68	2·96	2·60	2·64	2·89	2·54	2·90	2·43	2·09
†	22·72	24·01	23·22		18·95	22·07	20·06	21·45	20·21	21·88	21·23	22·97	21·02	20·01

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall.

The 80 years (1816–95) mean at Greenwich for September is 2·30 in.

September, 1897.

Day of Mo.	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·42	·36	·36	·39	·34	·36	·36	·34	·40	·34	·34	·30	
2	·03	..	..	·01	·01	·02	·01	·01	·02	·01	·02	·01	
3	..	..	..	..	..	..	..	..	..	..	..	..	
4	·07	·06	·05	·05	·05	·05	..	·05	·08	·10	·04	·05	
5	·40	·32	·38	·34	·33	·36	·38	·33	·31	·29	·34	·35	
6	..	..	..	..	..	..	..	..	·01	..	..	..	
7	·04	·01	..	·01	·01	..	·01	·01	·01	·01	·02	·01	
8	·35	·28	·26	·25	·24	·25	·24	·24	·24	·20	·23	·24	
9	..	·01	·01	·01	..	·02	·01	·01	..	·05	·02	..	
10	..	..	..	..	..	..	..	..	..	..	..	..	
11	..	..	..	..	..	..	..	..	·01	..	..	..	
12	..	..	..	..	..	..	..	..	..	..	..	..	
13	..	..	..	..	..	..	..	..	..	..	..	..	
14	..	..	..	..	..	..	..	..	..	..	..	..	
15	·02	·02	..	·01	·02	..	·01	·01	·01	·01	·01	·01	
16	..	..	..	..	·01	..	..	..	..	..	..	..	RECORD CEASED.
17	·24	·21	·25	·27	·27	·28	·27	·29	·26	·30	·27	·31	
18	..	·02	·01	·01	·01	·02	·01	·01	·01	·01	·02	·02	
19	·11	·08	·08	·09	·09	·10	·09	·10	·09	·09	·09	·10	
20	·02	·02	..	..	·01	..	·01	·01	·01	..	·01	·01	
21	..	..	..	..	..	..	..	..	..	..	..	..	
22	..	..	..	..	..	..	..	..	..	..	..	..	
23	..	..	..	..	..	..	..	..	..	..	..	..	
24	·04	·03	·04	·03	·04	·04	·04	·04	·01	·05	·03	·04	
25	..	..	..	..	·01	..	..	..	·01	..	·01	..	
26	·02	..	..	..	..	..	..	..	·01	..	..	..	
27	·03	·03	·01	·01	·02	..	..	·01	·08	·02	..	·02	
28	·08	·08	·11	·11	·12	·12	·13	·11	·05	·12	·13	·10	
29	1·03	1·19	·95	1·10	1·07	·69	1·07	1·08	1·01	1·11	1·00	·92	
30	..	..	·01	..	·01	..	..	..	·01	..	..	..	
*	2·90	2·72	2·52	2·69	2·66	2·31	2·64	2·65	2·64	2·71	2·58	2·49	
†	23·05	20·09	18·42	19·30	19·40	17·90	19·47	19·19	....	20·27	20·55	18·69	

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·34	·46	·44	·42	·35	·34	·36		·36	·28		·27	·32
2	·04	·05	·03	·04	..	·04	·02		·02	·03		..	..
3	..	·01	..	..	..	..	..		..	..		..	..
4	·06	·01	·05	·03	..	·06	·16		·05	..		·02	·03
5	·37	·43	·36	·48	·54	·48	·26		·41	·48		·35	·41
6	..	..	..	..	..	..	·01		..	..		..	..
7	·03	..	·04	..	..	·02	·01		·01	..		..	..
8	·28	·38	·28	·29	·28	·26	·27		·22	·21		·16	·17
9	..	..	..	..	..	..	·01		·01	·02		·01	..
10	..	..	..	..	..	..	..		..	..		..	..
11	·01	..	..	..	..	..	·01		..	..		..	..
12	..	..	..	..	..	..	..		..	..		..	..
13	..	..	..	..	..	·01	..		..	..		..	..
14	..	..	..	..	..	..	..		..	..		..	..
15	·02	·01	·02	..	·03	·01	·03		·02	·02		·05	·08
16	..	..	..	..	..	..	..	OBSERVER DEAD.	..	..	RECORD CEASED.	·01	..
17	·32	·35	·31	·45	·41	·34	·37		·29	·25		·26	·29
18	·05	·12	·11	·11	·10	·10	·16		·18	·25		·16	·18
19	·12	·13	·11	·12	·16	·13	·15		·20	·20		·18	·20
20	·01	..	..	..	..	..	..		·02	·01		·01	..
21	..	..	..	..	..	..	..		..	..		..	..
22	..	..	..	..	..	..	..		..	..		..	..
23	·01	..	..	..	..	..	..		..	..		..	..
24	·05	·05	·04	..	·06	·04	·03		·02	·02		·01	·02
25	·01	·01	..	..	..	..	·01		..	·02		·01	..
26	..	..	..	..	..	..	..		..	..		..	..
27	·02	..	..	..	..	..	..		..	..		..	..
28	·07	·04	·03	·02	..	·02	·01		·03	·09		·03	·04
29	·80	·82	·73	·76	·79	·84	·71		·65	1·01		1·03	·90
30	..	..	..	..	·10	·02	..		..	..		..	..
*	2·61	2·87	2·55	2·72	2·82	2·71	2·58		2·49	2·89		2·56	2·64
†	19·81	20·07	20·41	19·83	21·00	20·18	19·00		18·51	18·34		16·37	17·15

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·31	·32	·39	·38	·28	·31	·33	·27	·38	·42	·50	·47
2	·02	..	·02	·03	·02	..	..	·01	·04	·09	..	·07
3	..	..	..	..	..	..	..	..	..	..	·03	..
4	·07	·03	·03	·05	·05	·10	·03	·08	..	·06	·06	·11
5	·52	·51	·50	·41	·34	·38	·42	·38	·43	·38	·40	·27
6	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	·02	..	·04	·01	·01	..	·03	..	·03
8	·19	·22	·20	·21	·21	·25	·23	·23	·23	·24	·29	·30
9	·02	..	·04	..	·03	..	..	·01	·03	·05	..	·01
10	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	·01	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..
15	·13	·10	·05	·07	·01	..	·02	·01	·01	·06	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..
17	·31	·28	·28	·27	·29	·27	·26	·38	·38	·36	·36	·27
18	·21	·13	·11	·16	·13	·04	..	·01	·01	·03	..	·02
19	·20	·18	·15	·16	·11	·10	·09	·06	·08	·07	·04	·06
20	·02	·02	·03	·02	·02	·01	·01	·01	..	·02	·02	..
21	..	..	..	..	..	..	..	..	..	..	·30	..
22	..	..	..	..	..	..	..	..	..	..	..	..
23	·01	..	..	..	..	..	..	·03	..	..	..	..
24	·03	·02	·03	·04	·02	·03	·03	..	·03	·05	..	·04
25	·01	..	·01	..	·01	..	..	..	·01	·01	·04	..
26	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	·01	..	..	·02	..	·05	..	..
28	·01	·01	·03	·02	·11	·11	·12	..	·08	·04	·07	·07
29	·57	·97	·95	·85	1·02	1·00	·96	1·23	1·00	·98	·73	·24
30	..	..	..	..	..	·02	..	..	..	·02	..	..
*	2·63	2·79	2·82	2·69	2·66	2·66	2·51	2·74	2·72	2·96	2·84	1·96
†	19·08	20·33	20·37	19·35	19·81	19·65	18·98	19·17	19·84	22·23	22·71	21·39

Day of Mo.	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·36	·37	·44	·44	·46	·33	·30	·35	·30	·53	·28	·29	·26	·23
2	·09	·07	·07	·06	·07	·06	·03	·05	·04	·04	·02	·01	·03	·02
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·06	·07	·29	·12	·03	·08	·11	·09	..	·08	·08	·05	·13	·06
5	·28	·30	·20	·39	·41	·49	·35	·45	·54	·50	·43	·53	·33	·39
6	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..
7	·07	..	·02	·03	·02	·04	·04	·04	..	..	·01	..	..	..
8	·31	·33	·30	·24	·23	·22	·21	·28	·23	·22	·20	·19	·22	·18
9	·03	·01	·01	·01	·01	·01	·02	·01	..	..	·01	..	..	·01
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	·01	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	·01	·02	·01	·01	..	·01	..	..	·01	·09	·02	·02
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·32	·29	·38	·35	·32	·34	·35	·32	·33	·38	·34	·32	·30	·30
18	·03	..	·01	·03	·02	·01	..	·01	·07	..	·05	·14	·08	·09
19	·04	·06	·08	·08	·06	·06	·10	·08	·10	·12	·09	·18	·10	·09
20	·01	·02	·01	·02	·01	·01	..	·01	·02	..	·02	·02	·01	·02
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	·05	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·03	·02	·02	·02	·01	·01	..	·04	·04	..	·02	·03	·01	..
25	..	·01	·02	..	·02	·01	·03	·01	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	·06	·02	..	..	..	·02	·02	..	·02	..	..	..
28	·05	·05	·01	·06	·06	·08	·11	·09	·08	..	·08	·03	·09	·08
29	·22	·47	·41	·28	·83	1·40	·85	·97	·97	1·22	1·05	·94	1·12	·98
30	..	..	..	..	..	·01	..	..	..	..	..	..	..	..
*	1·90	2·12	2·34	2·17	2·58	3·18	2·51	2·83	2·74	3·09	2·71	2·82	2·70	2·47
†	20·30	20·70	21·36	19·91	19·65	19·60	20·42	21·27	20·20	. . .	18·95	18·20	18·38	16·80

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	·27	·35	·25
2	·01	·06	·06
3	..	..	..
4	..	·05	·16
5	·49	·48	·38
6	..	..	..
7	..	·01	..
8	·20	·21	·17
9	..	·02	..
10	..	..	..
11	..	..	..
12	..	..	..
13	..	..	..
14	..	..	..
15	..	·01	..
16	..	..	..
17	·32	·33	·35
18	·03	·02	·02
19	·08	·07	·04
20	·02	·02	·03
21	..	..	..
22	..	..	..
23	..	..	..
24	..	·01	·01
25	..	·01	·01
26	..	..	..
27	..	..	..
28	·10	·08	·06
29	·85	1·03	1·05
30	..	..	..
*	2·37	2·76	2·59
†	16·30	19·55	15·67

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(September, 1897.)

The month has been cold and wet, and comparatively sunless. It has therefore been somewhat unhealthy, summer diarrhœa being rather prevalent in the early part of the month, and colds and coughs later on. The autumn tints have been extremely fine, and began earlier than usual. The observer at Nutfield reports that swallows left earlier than customary, being last seen on the 27th. Solar halos were seen at Upper Gatton, Wallington, and Greenwich on the 25th, and at Upper Gatton on the 27th. The thunderstorm on the 29th seems to have been general throughout the district. The rainfall of the month is about $\frac{1}{3}$ in. above the average. At Croydon (Park Hill) the maximum temperature was above 60° on eighteen days, and above 50° and under 60° on twelve days; whilst the minimum temperature was 50° and above on nine days, and below 40° on two days. The mean temperature of the month is about 2° below the average, and was at Croydon (Duppas House) 55·7°, at Wallington 55·6°, at Croydon (Whitgift) 55·5°, at Waddon 55·3°, at Redhill 55·2°, at Chipstead 53·8°, and at Upper Gatton 51·8°. There were recorded at Upper Gatton 112·6 hours of bright sunshine, and at Wallington 106·2 hours of sunlight, which latter is 15 per cent. below the September average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	ReigateHill Margery H.	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
2	·14	·14	·13	·20	·16	·17	·17	·18	·15	·11	·13	·12	·16	·15	·15		·12		·13	·17	·13	·13	·13	·12	·11	·11
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
4	..	..	..	·10	·05	·07	·06	·05	·06	·09	·11	·09	·11	·12	·15		·02		·08	·10	·13	·15	·15	·16	..	·01
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
8	·01	..	..	·03	..	..	..	..	..	..	..	..	·01	..	..		·01		·02	·04	·01	..	..	·03	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
10	..	..	·02	·08	·05	·05	·06	·08	·07	·05	·04	·04	·05	·05	·05		·01		..	..	·02	·02	..	·03	·07	·04
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
13	·04	·06	·06	·06	·06	·04	·05	·06	·05	·07	·06	·06	·06	·06	·06		·05		·06	·06	·06	·07	·06	·07	·05	·04
14	..	..	..	·02	..	·01	..	..	..	·01	..	..	..	..	..		..		..	·02	..	..	..	..	..	..
15	·13	·12	·13	·15	·04	·03	·09	·06	·06	·07	·03	·03	·06	·03	·04		..		·04	·03	·03	·04	·05	..	·10	·08
16	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	RECORD CEASED.	..	MONTHLY GAUGE.	..	..	..	·01	..	..	·02	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
18	·04	..	·08	..	·05	·04	·05	·03	·05	·05	·04	·05	·05	·05	·05		..		·03	·05	·07	·07	·07	·08	·07	·08
19	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..		..		..	..	·01	..	..	·03	..	..
20	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	·08	..	·01	..	·01
21	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	·01	..	·01
25	·32	·34	·28	·22	·12	·10	·12	·16	·11	·11	·12	·10	·09	·16	·15		·10		·03	·17	·13	·14	·10	·14	·19	·23
26	·01	..	..	..	..	..	..	..	·02	·01	..	·01	·01	..	..		..		·02	·01	·02	·02	·06	·03	..	·01
27	·01	..	..	..	..	·01	·01	·01	..	·01	..	..	..	..	..		..		..	..	..	..	..	..	..	·01
28	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..		..		..	..	..	..	..	..	·01	..
29	..	..	..	..	..	·01	..	..	..	..	..	·01	..	..	..		..		..	..	..	..	..	·02	..	..
30	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		..		..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	·01
*	·72	·68	·70	·86	·53	·56	·61	·63	·58	·60	·53	·51	·61	·62	·65	·	·31	·42	·41	·65	·61	·73	·62	·73	·62	·64
†	25·86	25·75	24·22	28·75	22·93	20·73	21·47	24·98	22·28	23·54	22·64	23·75	23·33	24·63	23·87		19·26	22·49	20·47	22·10	20·82	22·61	21·85	23·70	21·64	20·65

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1897.**

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	·01	..	..	..		..	..	..	..		..	..		..	·02		..	..
2	·13	·16	·16	·14	·14	·13	·14	·15	·15	·12	·13	·13		·15	·17	·15	·14		·12	·11		·12	·15		·07	·08
3	..	..	..	..	..	..	..	·01	..	..	..	..		..	..	..	..		..	..		..	..		..	..
4	·10	·07	·09	·09	·10	·08	·09	·10	·08	·11	·10	·10		·14	·10	·09	·07		·06	·05		·02	·01		..	·02
5	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	·01		..	..
6	..	..	..	..	..	..	..	..	..	..	..	..		..	..	·01	..		..	..		..	..		..	..
7	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
8	..	·02	..	·01	·01	..	·02	·02	..	·03	·02	·02		·02	·01	·02	·02		·04	·02		·02	·02		·03	·01
9	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
10	·04	·01	·01	·01	·02	·05	·02	·03	·04	·03	·02	·02		·03	·02	·02	·02		·03	·02		·03	·03		..	·03
11	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
12	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
13	·05	·05	·03	·03	·04	·04	·04	..	..	·04	·06	·04		·05	·05	·04	·04		·03	·04		·03	·04		·03	·02
14	..	..	..	..	·01	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
15	·10	·08	·02	·03	·02	·02	·03	·03	·06	·03	·03	·04		·06	·01	·02	·01		·02	·02		·01	·01		·01	..
16	..	..	..	..	..	..	..	·01	..	..	..	·01	RECORD CEASED.	..	..	..	..	RECORD CEASED.	..	..	OBSERVER DEAD.	..	..	RECORD CEASED.	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
18	·21	·14	·10	·08	·09	·08	·09	·09	·09	·08	·08	·10		·09	·05	·04	·04		·06	·06		·05	·03		·01	·08
19	..	·01	·01	·01	·01	..	·01	·01	..	·01	..	..		·01	..	·01	..		·01	..		..	·02		..	..
20	..	..	..	..	..	..	..	..	..	·01	..	..		..	..	·01	..		..	..		..	·01		..	..
21	..	..	..	..	..	..	..	..	..	..	..	·01		..	..	..	..		..	..		..	..		..	..
22	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
23	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
24	..	..	..	..	..	..	..	·01	..	·01	·01	..		·01	..	..	..		..	..		..	..		..	..
25	·10	·09	·14	·12	·13	·15	·12	·12	·18	·14	·11	·14		·12	·07	·10	·11		·11	·09		·05	·05		·05	·06
26	..	·01	·02	·02	·03	·02	·02	·02	·06	·04	·05	·02		·04	·09	·03	·03		·05	·08		·04	·05		·01	·03
27	..	..	..	..	..	..	..	..	..	·01	·01	·01		·01	..	..	..		..	..		..	·01		..	..
28	..	..	..	..	..	..	..	·01	..	..	..	..		..	..	..	..		·01	..		..	..		..	..
29	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..		..	..		..	..
30	..	..	..	..	..	..	·01	·01	..	·01	..	..		·01	..	..	..		..	..		..	·01		..	..
31	..	..	..	..	..	..	..	..	..	·01	..	..		..	..	..	..		·01	..		..	..		..	..
*	·73	·64	·58	·54	·60	·57	·59	·62	·67	·68	·62	·64		·74	·57	·54	·48		·55	·49		·37	·47		·21	·33
†	23·78	20·73	19·00	19·84	20·00	18·47	20·06	19·81	....	20·95	21·17	19·33		20·55	20·64	20·95	20·31		20·73	19·49		18·88	18·81		16·58	17·48

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
2	·07	·08	·12	·11	·10	·11	·14	·10	·10	·12	·11	·16	·09	·10	·10	·11	·11	·13	·12	·11	·11		·10	·09	·10	·10
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..		..	..	..	..
4	·03	·04	·06	·05	·06	·07	·07	·01	·03	·02	..	..	..	·01	·01	·01	·01	..	·01	..	..		·02	·06	·02	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
8	·05	·02	·03	·02	·02	·02	..	·01	·01	·02	..	..	..	·01	..	·02	·02	·01	·02	·02	·05		·03	·05	·04	·03
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
10	·02	·03	·02	·03	·03	·02	·02	·02	·03	·03	..	·01	..	..	..	·04	·04	·07	·05	·03	·04		·02	·01	·02	·01
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
13	·03	·02	·04	·05	·05	·05	·05	·04	·04	·05	·04	·05	·05	·05	·06	·05	·03	·04	·06	·06	·06		·05	·04	·03	·01
14	..	..	·01	..	·01	·01	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..		..	..	..	..
15	..	..	·02	·01	·03	·01	·02	·06	·08	·09	·01	·08	·09	·07	·08	·10	·06	·07	·05	·02	·02		·02	·01	·01	·01
16	..	..	..	..	..	..	..	..	..	·02	·02	..	..	..	..	..	..	..	..	..	..		..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
18	·10	·06	·07	·07	·10	·10	·09	·09	·09	·09	·10	·09	·10	·06	·11	·11	·10	·09	·10	·12	·11		·11	·12	·11	·09
19	..	..	..	..	·01	..	..	·01	·01	·02	..	..	..	..	..	·02	..	·01	·01	·01	·02		·01	..	·01	..
20	..	..	..	..	..	·01	..	·01	..	·01	..	..	..	..	..	..	..	·01	..	..	..		..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
24	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
25	·09	·10	·11	·11	·11	·11	·13	·05	·12	·13	·12	·23	·24	·16	·18	·14	·18	·18	·15	·15	·15		·11	·11	·10	·10
26	·03	·02	·04	·03	·04	·05	..	..	·01	·02	..	..	..	..	..	..	..	·03	·04	·02	·03		·04	·03	·03	·04
27	..	..	..	..	..	..	..	..	·01	·02	..	·03	..	..	..	..	·01	·01	..	·01	..		·01	..	..	..
28	..	..	..	..	..	..	..	·01	·01	·02	..	..	..	..	..	..	·01	·01	·01	·01	..		..	..	·01	..
29	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	..	..	..	..	..	..	..		..	..	..	..
30	·02	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..		·01	..	..	..
31	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
*	·45	·37	·52	·48	·56	·56	·52	·43	·55	·66	·40	·66	·60	·46	·54	·60	·57	·67	·63	·57	·59		·53	·52	·48	·39
†	19·53	20·70	20·89	19·83	20·37	20·21	19·50	19·60	20·39	22·89	23·11	22·05	20·90	21·16	21·90	20·51	20·22	20·27	21·05	21·84	20·79		19·48	18·72	18·86	17·19

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	..	..
2	·09	·11	·13
3	..	..	..
4	..	..	..
5	..	..	..
6	..	..	..
7	..	..	..
8	·03	·02	..
9	..	·01	·01
10	·01	·01	·02
11	..	..	..
12	..	..	..
13	·02	·03	·02
14	..	..	..
15	..	·03	·03
16	..	..	..
17	..	..	..
18	·10	·09	·09
19	..	..	..
20	..	..	..
21	..	..	..
22	..	..	..
23	..	..	..
24	..	..	..
25	·11	·11	·13
26	·04	·06	·02
27	..	..	..
28	·01	..	..
29	..	..	..
30	..	..	..
31	..	..	..
*	·41	·47	·45
†	16·71	20·02	16·12

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(October, 1897.)

The month has been an extraordinarily dry one for October. In the long Greenwich record there is no October in which so little rain fell, the nearest being 1879, when ·76 in. was gauged. In the Brixton record, which commences in 1871, October, 1879, was lower by ·01 in.; whilst in the long records of Surbiton (commencing in 1855) and Mt. Ararat, Wimbledon (commencing in 1854), there is no October with so small a rainfall, and the same may be said of the record at Redhill, which commences in 1867. The month, though somewhat foggy at times, has been warm, and the autumn tints have been magnificent. At Sidcup, dahlias and nasturtiums were in flower on the 31st, and the runner beans were still being gathered. At Upper Gatton solar halos were seen on the 7th, 9th, and 18th, and a lunar one on the 11th, and a solar one was seen at Wallington on the 7th. The rainfall of the month is about $2\frac{1}{4}$ in. below the October average. The mean temperature of the month is about 1° above the average, and was at Wallington 51·3°, at Croydon (Duppas House and Whitgift) and Chipstead 51·2°, and at Waddon 50·5°. There were recorded at Upper Gatton 118·1 hours of bright sunshine, and at Wallington 105·1 hours of sunlight, which latter is one per cent. above the October average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	Reigate Hill Margery H.	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	·01	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	·01	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	·14	·10	·12	·20	·06	·10	·09	·10	·07	·09	·10	·08	·08
8	·06	·01	·10	·10	·19	·16	·15	·13	·17	·15	·13	·13	·12
9	..	..	..	..	..	..	..	·01	·01	·01	..	·02	·01
10	..	..	..	..	..	..	..	·01	..	..	·01	..	..
11	·01	·01	..	·03	..	·01	·01	·01	..	·01	..	..	..
12	..	..	..	..	..	..	..	..	·01	..	..	..	..
13	..	..	..	·01	·01	..	..	..	..	..	·01	..	..
14	·26	·23	·25	·22	·21	·23	·20	·25	·20	·23	·23	·22	·23
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·09	·10	·12	·12	·05	·07	·09	·12	·09	·12	·06	·11	·13
17	·01	..	·02	..	..	..	·01	..	·01	·01	·04	·01	·01
18	..	..	..	..	..	·01	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	·05	..	·01	..	..	..	..	..	..	..
22	·01	..	..	·04	·01	·01	·01	·02	·01	·01	..	·01	·01
23	·01	..	·04	..	·01	·01	·01	·02	·02	·02	..	·01	·01
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·03	..	·02	·03	..	..	·03	..	..	·01	..	·01	·01
26	·02	·07	·05	·03	·04	·04	..	..	·03	·05	·08	·07	·05
27	·43	·55	·47	·50	·51	·50	·47	·63	·52	·46	·52	·49	·41
28	·04	·04	·06	·10	·07	·06	·08	·08	·09	·12	·15	·13	·14
29	·01	·01	·02	·02	·02	·02	·02	·01	·02	·02	·02	·03	·02
30	·06	·09	·08	·10	·10	·11	·07	·07	·08	·08	·10	·09	·06
*	1·18	1·21	1·35	1·55	1·28	1·35	1·24	1·46	1·34	1·39	1·45	1·41	1·29
†	27·04	26·96	25·57	30·30	24·21	22·08	22·71	26·44	23·62	24·93	24·09	25·16	24·62

Day of Mo.	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warlingham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	RECORD CEASED.	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
2	..	..		..		..	..	..	..	..	..	..	..
3	..	..		..		..	..	..	..	..	..	..	..
4	..	..		..		..	..	..	..	..	..	..	..
5	..	..		..		..	..	..	..	..	..	..	..
6	..	..		..		..	..	..	..	..	..	..	..
7	·08	·10		..		·07	·07	·04	·06	·05	·07	·09	·08
8	·12	·13		·26		·08	·10	·09	·09	·09	·11	·07	·08
9	..	·02		..		·03	·02	..	·01	·01	·03	..	..
10	..	..		·01		..	..	..	·01	..	·01	..	..
11	..	..		..		..	·02	..	..	..	·02	·01	..
12	..	..		..		..	..	..	..	..	·01	..	..
13	..	..		..		..	..	..	..	..	..	..	·01
14	·25	·26		·26		·16	·26	·24	·22	·23	·30	·26	·29
15	..	..		..		..	..	..	..	·01	..	..	..
16	·11	·10		..		·05	·13	·13	·15	·14	·15	·12	·09
17	·01	·02		..		·01	·02	..	..	·01	·04	·03	..
18	..	..		..		·01	..	..	·02	..	..	..	·01
19	..	..		..		·01	..	..	..	..	..	..	..
20	..	..		..		..	..	..	..	..	..	..	..
21	..	..		..		·01	..	..	..	·01	·01	..	..
22	·01	..		..		·02	..	..	..	..	·01	..	·02
23	..	..		..		·02	..	·03	·02	..	·03	..	·01
24	..	..		..		..	·02	..	..	·02	·02	..	..
25	·02	..		..		·01	·03	·02	·02	·03	..	..	..
26	·07	..		·13		·04	·07	·03	·05	·04	·09	·03	·01
27	·47	·45		·53		·50	·49	·42	·53	·50	·30	·38	·36
28	·12	·13		..		·16	·17	·19	·16	·15	·15	·11	·10
29	..	·05		·03		·03	·02	·03	·04	·03	·06	·03	·02
30	·08	·10		·16		·16	·09	·06	·07	·06	·08	·02	·02
*	1·34	1·36		1·38	1·58	1·37	1·51	1·28	1·45	1·38	1·49	1·15	1·10
†	25·97	25·23		20·64	24·07	21·84	23·61	22·10	24·06	23·23	25·19	22·79	21·75

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* November, 1897.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..		..	..	..
2	..	..	..	..	..	..	..	..		..	..	..
3	..	..	..	..	..	..	..	..		..	..	..
4	..	..	..	..	..	..	..	..		..	..	..
5	..	..	..	..	..	..	..	..		..	..	..
6	..	..	..	..	..	..	..	..		..	..	..
7	·07	·07	·06	·06	·06	·06	·05	·05		·06	·03	·05
8	·12	·11	·08	·09	·10	·10	·08	·09		·10	·12	·10
9	..	·01	..	..	·01	..	·01	·01		·01	·01	·01
10	..	..	..	..	..	..	..	..		..	..	..
11	..	·01	..	..	..	..	..	..		·01	..	..
12	..	..	..	..	..	..	..	..		..	..	·01
13	..	..	..	..	..	..	·01	..		..	..	..
14	·26	·22	·22	·20	·21	·20	·19	·20		·22	·21	·20
15	..	..	..	..	..	·02	·01	..		..	..	..
16	·14	·13	·12	·13	·12	·12	·12	·13	RECORD CEASED.	·13	·12	·13
17	..	..	..	..	·01	..	..	·01		..	·01	·01
18	..	·02	·01	..	..	..	·01	..		·01	..	..
19	..	..	..	..	..	..	..	·01		..	..	..
20	..	..	..	..	..	..	..	..		..	..	..
21	·04	..	..	..	..	..	..	·01		..	..	..
22	·03	·02	·01	..	..	..	..	..		·01	·01	·01
23	·02	·01	·01	..	·02	..	..	·01		·01	·01	·01
24	..	..	..	..	..	..	..	·01		·01	..	..
25	..	·01	..	..	..	..	..	..		..	..	..
26	·06	·03	·03	·05	·04	·05	·04	·03		·04	·03	·03
27	·48	·36	·36	·37	·35	·35	·32	·36		·35	·38	·38
28	·17	·08	·08	·09	·09	..	·10	·07		·07	·06	·10
29	·03	·03	·01	·02	·03	..	·03	·02		·02	·03	·03
30	·06	·03	·04	·03	·03	·10	·03	·03		·04	·03	·04
*	1·48	1·14	1·03	1·04	1·07	1·00	1·00	1·04		1·09	1·05	1·11
†	25·26	21·87	20·03	20·88	21·07	19·47	21·06	20·85		22·04	22·22	20·44

Day of Mo.	Croydon (L.Ad. Rd.)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1		..	..	..	..		..	..		..	..		..	..
2		..	..	..	..		..	..		..	..		..	..
3		..	..	..	..		..	..		..	..		..	..
4		..	..	..	..		..	..		..	..		..	..
5		..	..	..	..		..	..		..	..		..	..
6		..	..	..	..		..	..		..	..		..	..
7		·05	·01	·04	·04		·05	·04		·03	·05		·05	·07
8		·09	·13	·10	·11		·12	·13		·14	·08		·11	·12
9		..	..	..	..		·01	·01		..	·01		·01	·02
10		..	..	..	..		..	·01		..	..		..	..
11		·01	..	·01	..		..	·01		..	·02		..	..
12		..	..	..	..		·01	·01		·02	..		..	..
13		·01	..	..	..		..	..		..	..		..	..
14		·19	·22	·21	·23		·20	·22		·24	·29		·19	·20
15		..	..	..	..		..	..		..	·04		·01	..
16	RECORD CEASED.	·13	·13	·12	·12	RECORD CEASED.	·12	·10	OBSERVER DEAD.	·12	·14	RECORD CEASED.	·18	·17
17		·01	·01	..	..		·01	..		..	·01		..	..
18		·01	..	·01	·01		·01	·01		..	..		..	..
19		..	..	..	..		..	·01		..	..		..	..
20		..	..	..	..		..	..		..	..		..	..
21		..	..	·01	..		..	..		..	·02		..	..
22		·02	..	·01	..		·01	·02		..	·02		..	..
23		·01	..	·01	..		..	..		..	·02		..	..
24		..	..	..	..		..	..		..	..		..	..
25		·03	..	·03	·05		·06	·04		·03	..		·04	·11
26		·03	·08	·04	·03		·04	·03		·04	·07		..	·05
27		·39	·39	·38	·43		·38	·33		·36	·35		·35	·36
28		·10	·10	·08	·10		·08	·11		·10	·06		·06	..
29		·03	·01	·02	·02		·03	·04		·02	·02		·01	..
30		·06	·06	·06	·05		·06	·05		·04	·06		·03	·04
*		1·17	1·14	1·13	1·19		1·19	1·17		1·14	1·26		1·04	1·14
†		21·72	21·78	22·08	21·50		21·92	20·66		20·02	20·07		17·62	18·62

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1897.**

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh.rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
7	·08	·05	·06	·07	·06	·05	·02	·10	·08	·12	·09	·10	·09	·08	·07	·06	·07	·10	·10	·10	·11		·08	·07	·08	·07
8	·11	·11	·12	·12	·11	·10	·15	·12	·15	·13	·13	·07	·06	·08	·08	·08	·12	·12	·09	·08	·09		·09	·12	·09	·09
9	..	..	·01	..	·01	·01	..	..	·01	·02	..	..	·02	..	..	·01	·01	·01	·01	..	·02		·01	·01	·01	..
10	·03	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..		..	·01	..	..
11	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	·01	·01	..	·01	..	..		..	·01	..	..
12	·01	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	·01	..	..	..		·01	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..		..	..	..	..
14	·17	·18	·20	·20	·22	·21	·21	·25	·29	·25	·25	·24	·28	·24	·30	·29	·27	·24	·24	·23	·21		·20	·24	·20	·20
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	·01	·01	..
16	·19	·15	·15	·11	·16	·11	..	·16	·18	·19	·17	·16	·17	·16	·20	·17	·16	·16	·20	·17	·17		·15	·13	·14	·13
17	..	..	·02	..	·01	..	..	..	..	·01	..	·02	·01	..	..	·01	·01	·01	..	·01	..		..	·02	..	·01
18	·01	..	..	..	..	..	..	..	·01	·02	..	..	..	..	·01	..	..	·01	..	..	..		·01	..	·01	..
19	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	·01	..	..		..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
21	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..		..	..	..	..
22	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
23	·01	..	..	..	..	..	..	..	·01	·02	..	·02	..	..	..	..	..	·01	..	..	..		·01	..	..	..
24	·01	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		..	..	..	..
25	·05	·02	·02	·03	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..		..	..	·01	..
26	·04	·03	·05	·07	·04	·03	·05	·03	·04	·05	·03	·03	·04	·04	·03	·05	·04	·04	·06	·06	·03		·05	·03	·04	·03
27	·33	·40	·40	·37	·36	·36	·36	·49	·40	·39	·35	·28	·25	·25	·36	·33	·35	·36	·33	·49	·36		·37	·36	·37	·36
28	·06	·08	·08	·08	·08	..	·06	·03	·06	·02	·05	·07	·08	·05	·05	·05	..	·03	·03	·05	·03		·04	·07	·06	·05
29	·02	·02	·03	·03	·02	·07	·02	·02	·02	..	·01	·03	·02	·02	·03	·02	·03	·02	·02	·02	·02		·02	·02	·02	·01
30	·03	·04	·05	·03	·03	·02	..	·05	·03	·04	·02	·04	·03	·02	·04	·05	·04	·03	·03	·03	·04		·03	·03	·03	·02
*	1·15	1·08	1·20	1·11	1·12	·96	·87	1·26	1·29	1·29	1·10	1·11	1·05	·94	1·18	1·14	1·11	1·17	1·14	1·24	1·08		1·07	1·13	1·07	·97
†	20·68	21·78	22·09	20·94	21·49	21·17	20·37	20·86	21·68	24·18	24·21	23·16	21·95	22·10	23·08	21·65	21·33	21·44	22·19	23·08	21·87		20·55	19·85	19·93	18·16

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	·01	..
2	..	..	..
3	..	..	..
4	..	..	..
5	..	..	..
6	..	..	..
7	·09	·04	·05
8	·06	·15	·06
9	·01	·01	..
10	..	..	..
11	..	..	..
12	..	..	..
13	..	..	..
14	·18	·22	·18
15	..	..	..
16	·11	·13	·11
17	..	·01	..
18	..	..	..
19	..	..	..
20	..	..	..
21	..	..	..
22	..	..	..
23	..	..	..
24	..	..	..
25	..	·02	..
26	·02	·03	·02
27	·32	·33	·30
28	..	·07	·03
29	·03	·01	..
30	·01	·04	·03
*	·83	1·07	·78
†	17·54	21·09	16·90

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(November, 1897.)

The month has been warm, very dry, and cloudy, and also very unhealthy. It is the driest November since 1889. The want of rain is becoming very serious, the ground being in places exceedingly dry. There is a good deal of sickness about, especially scarlet fever, several schools in the district being closed. As an instance how warm the month has been, it may be mentioned that on the 24th there were picked in the open at Croydon no less than one hundred and sixty-eight species and varieties of flowers, including dahlias and *Lilium auratum ;* whilst on the 26th a dish of green peas was picked both at Redhill and Warlingham from the open garden. Fogs have been prevalent. The rainfall is about 1·25 in. below the average for November. The gale on the 27th does not appear to have done much damage in the district. A lunar corona was seen at Nutfield on the 1st. At Croydon the maximum thermometer stood at 50° and above on twelve days, and 40° and above on every day; whilst the minimum thermometer was 50° or above on two days, and below 40° on twenty-one days. The mean temperature of the month is about 2° above the average for November, and was at Croydon (Whitgift) 45·7°, at Wallington 45·3°, at Croydon (Duppas House) and Chipstead 45·2°, and at Waddon 44·6°. There were recorded at Wallington 37·2 hours of sunlight, which is five per cent. below the November mean of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,

Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1897.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Reigate	Reigate Hill Margery H.	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Marden Park	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Ashtead	Oxshott
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	·02	..	..	..	RECORD IMPERFECT.	..	·01	..	·01	·01	..	..	RECORD CEASED.	..	MONTHLY GAUGE.	·02	·03	·02	·03	·03	·04	..	..
2	..	..	..	..	..	..	..		..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
3	..	..	·02	..	..	..	..		..	..	..	..	..	..	..		..		..	..	..	·02	..	..	..	..
4	..	·03	..	..	..	·01	·01		..	·01	..	·01	·01	·01	..		·16		·03	·02	..	..	·01	..	..	..
5	·02	·01	..	..	·02	·01	·01		·02	·02	..	·02	·02	·03	·05		..		·01	..	·01	·02	·01	..	..	·02
6	·13	·15	·13	·20	·13	·09	·15		·17	·17	·18	·16	·13	·15	·12		..		·03	·09	·10	·11	·11	·13	·08	·05
7	·52	·68	·65	1·00	·90	·73	·76		·84	·82	·82	·85	·72	·71	1·03		·95		·90	·85	·49	·72	·72	·59	·52	·45
8	·02	..	·10	..	·06	·05	·04		·05	·02	·02	·02	·01	..	..		..		·02	..	·01	·02	·01	·06	·01	·02
9	·01	..	..	..	..	..	..		..	..	..	..	..	..	..		·16		..	·03	..	..	..	..	..	..
10	·43	·42	·37	·40	·34	·25	·30		·29	·28	·30	·29	·32	·30	·30		·25		·32	·29	·26	·34	·33	·26	·26	·21
11	..	·04	·04	·03	..	·02	·02		..	·02	·03	·03	·01	·01	..		..		·07	·03	..	..	·01	·18	·03	·01
12	·64	·52	·39	·60	·51	·52	·52		·49	·49	·54	·46	·45	·50	·47		·62		·50	·50	·45	·51	·52	·53	·43	·44
13	·33	·37	·37	·50	·22	·15	·22		·21	·27	·20	·25	·29	·23	·43		..		·17	·21	·18	·24	·25	·14	·18	·14
14	·36	·20	·28	·20	·13	·09	·13		·12	·16	·11	·24	·14	·17	·11		·32		·18	·11	·10	·19	·17	·18	·42	·38
15	·04	·05	·05	..	·03	·03	·03		·03	·04	·03	·04	·05	·04	·10		·03		·02	·05	·04	·05	·05	·06	·04	·02
16	..	..	..	..	·01	..	..		..	..	..	..	..	..	..		..		..	..	..	..	..	·04	..	..
17	..	..	·02	..	·01	·01	·01		·02	·02	·02	·01	·01	..	..		..		..	..	·01	..	..	·03	..	..
18	·01	..	·02	..	·01	·01	·01		·01	·01	·01	·01	·01	·02	·03		..		·02	·03	·02	·02	·02	·02	·04	·02
19	..	..	..	..	..	..	..		..	..	..	..	..	..	..		..		..	·02	..	..	..	..	..	..
20	..	..	..	..	..	..	..		..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..		..	..	..	..	..	..	·23		..		..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..		..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..		..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..		..	..	..	·01	..	..	..		..		..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..		..	..	..	..	..	..	..		..		..	..	..	..	..	..	..	..
26	..	..	·02	..	..	·01	..		·01	·03	..	·01	..	·05	..		..		..	..	..	·01	·02	..	..	·01
27	·19	·24	·16	·35	·20	·15	·20		·15	·20	·19	·20	·18	·25	·38		·07		·11	·23	·15	·09	·16	·08	·06	·05
28	·26	·29	·31	·30	·22	·14	·21		·27	·21	·19	·21	·19	·30	·23		·23		·05	·19	·18	·20	·21	·20	·17	·18
29	·90	·95	·98	1·50	·75	·42	·70		·74	·88	·74	·84	·80	·80	·80		·54		·44	·51	·57	·71	·75	·40	·63	·52
30	·08	·20	·09	·10	·12	·05	·04		·05	·04	·04	·04	·06	·07	·10		·07		·05	·30	·04	·05	·04	·06	·14	·07
31	·31	·09	·20	·15	·17	·21	·16		·17	·18	·22	·18	·24	·17	·25		·25		·18	..	·19	·20	·21	·21	·10	·07
*	4·25	4·24	4·20	5·35	3·83	2·95	3·52		3·64	3·88	3·64	3·89	3·65	3·81	4·63		3·65	3·82	3·12	3·49	2·82	3·53	3·63	3·21	3·11	2·66
†	31·29	31·20	29·77	35·65	28·04	25·03	26·23		27·26	28·81	27·73	29·05	28·27	29·78	29·86		24·29	27·89	24·96	27·10	24·92	27·59	26·86	28·40	25·90	24·41

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon Chatfld. rd.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Croydon (L.Ad. Rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·05	·04	·05	..	·03	·04	·04		·05	·04	·05	
2	..	..	..	..	..	..	..	..		..	..	..	
3	..	..	..	..	..	..	..	..		..	..	..	
4	·03	·01	..	·01	..	..	..	·01		·01	·01	·01	
5	..	..	..	..	·06	..	·01	·01		..	..	..	
6	·09	·05	·05	·05	·05	·04	·04	·05		·05	·05	·05	
7	·60	·63	·64	·67	·63	·80	·65	·63		·67	·67	·75	
8	..	·02	·02	·02	·02	·02	·02	·01		·03	·04	·03	
9	..	..	..	..	..	..	..	..		..	..	..	
10	·33	·30	·24	·25	·25	·23	·24	·25		·25	·23	·22	
11	·03	..	·01	..	·02	..	..	..		·10	..	..	
12	·48	·40	·42	·44	·44	·35	·47	·45		·38	·44	·42	
13	·27	·17	·14	·16	·13	·12	·13	·15		·14	·14	·14	
14	·23	·23	·22	·22	·18	·20	·13	·18		·17	·17	·27	
15	·06	·02	·02	·03	·03	·03	·03	·04		·03	·03	·03	
16	..	..	..	..	..	..	..	..	RECORD CEASED.	..	..	..	RECORD CEASED.
17	·02	..	..	..	·01	..	..	·01		·01	..	·01	
18	·03	·02	·02	·02	·02	..	·02	·02		·02	·02	·03	
19	..	..	..	..	..	..	..	·01		..	·01	..	
20	..	..	..	..	..	..	..	..		..	..	..	
21	..	..	..	..	..	..	..	..		..	..	..	
22	..	..	..	..	..	..	..	..		..	..	..	
23	..	..	..	..	..	..	..	..		..	..	..	
24	..	..	..	..	..	..	..	·01		·01	..	..	
25	..	..	..	..	..	..	..	..		·01	..	..	
26	..	..	·01	..	..	..	·01	·01		..	·01	·03	
27	·15	·10	·08	·10	·09	·10	·07	·10		·10	·08	·09	
28	·27	·24	·24	·23	·20	·20	·18	·20		·15	·19	·17	
29	1·00	·77	·77	·79	·59	·68	·66	·74		·78	·67	·60	
30	·09	·06	·07	·05	·05	·05	·05	·05		·07	·07	·05	
31	·27	·16	·24	·15	·11	·11	·12	·14		·14	·11	·06	
*	3·98	3·23	3·23	3·24	2·88	2·96	2·87	3·11		3·17	2·98	3·01	
†	29·24	25·10	23·26	24·12	23·95	22·43	23·93	23·96		25·21	25·20	23·45	

Day of Mo.	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm Wickhm.C.	Hayes	Hayes Common	Keston (Bradfield)	Keston (Tow. Fds.)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	·10	·08	·08		·05	·06		..	..		..	·08
2	..	..	..	..		..	..		..	..		..	..
3	..	..	..	..		..	..		..	..		..	..
4	·01	..	·01	..		·02	·02		..	·03		·01	..
5	·02	..	·01	..		·01	..		..	..		..	..
6	·06	·06	·06	·05		·04	·03		·02	·02		..	·03
7	·67	·69	·76	·74		·65	·50		·66	·63		·55	·69
8	·02	·02	·01	·02		·03	·02		·02	·03		..	..
9	..	..	..	..		..	..		..	..		..	..
10	·28	·29	·32	·30		·26	·25		·29	·24		·16	·13
11	..	..	..	..		·01	..		..	..		..	..
12	·43	·45	·46	·48		·43	·46		·45	·42		·38	·39
13	·18	·19	·22	·16		·15	·13		·18	·18		·04	..
14	·19	·20	·20	·15		·16	·09		·12	·14		·10	·13
15	·05	·04	·04	·03		·03	·03		·05	·06		·02	·02
16	..	..	..	..	RECORD CEASED.	..	..	OBSERVER DEAD.	..	..	RECORD CEASED.	..	..
17	·02	..	·01	..		..	·01		..	·02		..	..
18	·03	·01	·02	·02		·02	·02		·01	·03		·01	·04
19	..	..	..	..		..	..		..	..		..	..
20	..	..	..	..		..	..		..	..		..	..
21	..	..	..	..		..	..		..	..		..	..
22	..	..	..	..		..	..		..	..		..	..
23	..	..	..	..		..	..		..	..		..	..
24	·01	..	..	..		..	..		..	..		..	..
25	·03	..	·01	..		..	..		..	·03		..	..
26	..	..	·01	·04		..	..		..	..		..	..
27	·12	·10	·15	·07		·11	·10		·14	·14		·06	·09
28	·17	·22	·19	·23		·16	·15		·20	·16		·14	·14
29	·73	·69	·83	·80		·77	·51		·70	·67		·45	·34
30	·04	·14	·04	·03		·03	·05		·03	·07		·01	·02
31	·15	·22	·20	·23		·23	·16		·15	·19		·14	·12
*	3·27	3·42	3·63	3·43		3·16	2·59		3·02	3·06		2·07	2·22
†	24·99	25·20	25·71	24·93		25·08	23·25		23·04	23·13		19·69	20·84

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Sidcup	Bickley	Bromley	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Forest Hill Dartmh. rd.	Forest Hill (Nurseries)	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·02	..	..	·01	..	..	·01	·06	·07	..	·01	..	·02	·03	·06	·01	·01	·02	·03	..		·02	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
4	·02	·01	·02	..	·01	..	..	·02	·02	·03	..	·03	·05	·01	·02	·04	·01	·02	..	·02	..		·01	..	·01	..
5	..	..	..	..	·01	..	..	..	..	·01	..	·01	·01	..	·01	·03	·02	·01	·03	·01	·01		·01	·01	·02	..
6	..	·02	·03	·04	·04	·04	·05	·03	·05	·06	·05	·05	·05	·06	·05	·08	·07	·07	·04	·05	·05		·06	·03	·05	·04
7	·70	·68	·65	·62	·59	·48	·63	·59	·56	·60	·62	·57	·48	·67	·64	·49	·47	·53	·57	·69	·60		·66	·69	·61	·58
8	·02	·03	·04	·04	·04	..	..	·03	·07	·09	·13	·05	·07	·01	·07	·01	·01	..	·02	·03	·02		..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
10	·16	·17	·18	·20	·19	·19	·25	·12	·13	·14	·14	·14	·13	·13	·13	·16	·14	·13	·08	·18	·14		·14	·18	·17	·13
11	·06	..	·02	..	·01	..	..	..	..	·02	..	·04	..	..	·22	·05	..	..	..	..	..		..	..	·05	..
12	·36	·50	·45	·46	·43	·41	·46	·42	·46	·42	·53	·38	·43	·36	·25	·35	·38	·41	·37	·47	·41		·42	·46	·37	·43
13	·07	·08	·10	·11	·08	·07	·12	·06	·07	·11	·05	·12	·11	·15	·09	·11	·08	·08	·08	·09	·06		·07	·04	·06	·04
14	·13	·17	·20	·13	·11	·11	·22	·35	·33	·40	·27	·11	·10	·17	·12	·09	·18	·38	·16	·23	·14		·16	·15	·13	·12
15	·02	·02	·03	·03	·02	·01	..	..	..	·03	..	·02	·02	·01	·01	·03	·01	·01	·01	·01	·02		·01	·02	·01	·01
16	..	..	..	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
17	·01	..	..	..	..	..	..	..	·01	·02	..	..	..	..	..	·02	·01	..	..	·01	..		·01	..	·01	..
18	·01	·02	·03	·02	·02	..	..	·01	·02	·03	·03	·02	..	·01	·02	·01	·01	·03	·02	·03	·03		·01	..	·02	·01
19	·03	·01	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..	·01	·01	·02	·01	..		·01	·02	..	·01
20	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..		..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
22	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	·01	..	..
24	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
25	·01	..	..	..	..	..	..	·01	..	·02	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..
26	..	·02	·03	..	·01	·01	..	..	·02	·02	..	·01	..	..	·01	·03	·06	·01	..	·01	..		·02	·02	·01	..
27	·03	·07	·08	..	·05	·03	·08	·04	·04	·05	·08	·10	·09	·03	·08	·10	..	·06	..	·06	·09		·06	·05	·06	·06
28	·17	·12	·15	·14	·15	·15	·22	·12	·13	·10	·06	·15	·12	·12	·16	·10	·09	·12	·18	·15	·15		·14	·14	·13	·13
29	·53	·63	·56	·61	·59	·16	·66	·21	·30	·40	·32	·50	·38	·46	·43	·34	·31	·31	·22	·50	·36		·42	·44	·29	·26
30	·09	·02	·03	·03	·03	·03	·06	·05	·06	·05	·09	·10	·12	·06	·08	·14	·04	·04	·06	·04	·04		·04	·03	·03	·04
31	·13	·15	·14	·28	·16	·09	·21	·07	·09	·09	·06	·08	·19	·06	·05	·09	·06	·08	·13	·12	·14		·16	·13	·12	·11
*	2·56	2·74	2·74	2·71	2·56	1·80	2·96	2·17	2·42	2·76	2·43	2·49	2·37	2·33	2·47	2·33	1·97	2·31	2·01	2·74	2·26		2·43	2·42	2·15	1·97
†	23·24	24·52	24·83	23·65	24·05	22·97	23·33	23·03	24·10	26·94	26·64	25·65	24·32	24·43	25·55	23·98	23·30	23·75	24·20	25·82	24·13		22·98	22·27	22·08	20·13

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Nunhead	Brixton	Battersea
	IN.	IN.	IN.
1	..	..	..
2	..	..	..
3	..	..	..
4	..	·01	..
5	..	·01	..
6	·05	·09	·04
7	·42	·56	·48
8	..	..	..
9	..	..	..
10	·12	·14	·15
11	..	..	..
12	·42	·43	·35
13	·03	·09	·05
14	·19	·25	·25
15	..	·01	..
16	..	..	..
17	..	..	..
18	·01	·01	..
19	..	..	..
20	..	..	..
21	..	..	..
22	..	..	..
23	..	..	..
24	..	..	..
25	..	..	..
26	..	·02	..
27	·07	·05	·03
28	·05	·11	·08
29	·24	·35	·16
30	·03	·05	·03
31	·09	·05	·08
*	1·72	2·23	1·70
†	19·26	23·32	18·60

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks and Croydon (Waddon New Road) (10 a.m.).

NOTES.

(December, 1897.)

The month has been warm, wet, and unhealthy. There was slight snow on the 4th and 12th generally throughout the district. There was a sharp thunderstorm with hail about 3 a.m. on the 15th. Measles have been prevalent in Croydon, and towards the end of the month influenza appeared there, and also at Abinger and other places. Fogs were somewhat common. The rainfall, though heavy, does not appear, if we may take the long average at Greenwich as fairly representing the district, to be more than about a quarter of an inch above the average for December. The weather has been mild for the time of year, and at Croydon (Park Hill) the maximum thermometer stood 50° and above on five days, and below 40° on eight days; whilst the minimum thermometer was 40° and above on seven days. Primroses, roses, and polyanthus were in flower at Sevenoaks on Christmas Day. A solar halo was seen at Upper Gatton on the 24th, and one at Nutfield on the 31st; and lunar halos were seen at Upper Gatton on the 6th and 8th, and one at Nutfield on the 10th. The mean temperature of the month is about 2° above the average for December, and was at Croydon (Whitgift) 41·5°, at Croydon (Duppas House) and Wallington 40·8°, at Waddon 40·2°, and at Chipstead 40°. There were recorded at Upper Gatton 48·7 hours of bright sunshine, and at Wallington 44·4 hours of sunlight, which latter is two per cent. above the December average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

APPENDIX II.

Falls of 1·00 in. and upwards.

March 2nd.—Walton Heath, 1·22 in.; Dorking (Denbies), 1·02 in.; Keston (Tower Fields), 1·01 in.

June 6th.—Beckenham (Cedars Road), 1·86 in.; Bickley, 1·63 in.; Bromley, 1·45 in.; Sydenham, 1·39 in.; Chislehurst, 1·35 in.; Walton Heath, 1·30 in.; Sidcup, 1·24 in.; South Norwood, 1·18 in.; Reigate (Margery Hall), 1·11 in.

June 8th.—New Malden, 1·19 in.

June 24th.—Esher, 2·32 in.; Surbiton, 2·12 in.; West Molesey, 1·96 in.; New Malden, 1·82 in.; Kingston, 1·56 in.; Wimbledon (Mt. Ararat), and Raynes Park, 1·04 in.

July 19th.—New Malden, 1·28 in.; Walton Heath, 1·05 in.

July 21st.—Wilmington, 1·13 in.; Abinger (The Rectory), 1·12 in.

August 8th.—Wimbledon (Sewage Works), 1·05 in.

August 25th.—Forest Hill (Dartmouth Road), 1·02 in.

September 29th.—Wandsworth Common, 1·40 in.; Wimbledon (Sewage Works), 1·23 in.; Forest Hill (The Nurseries), 1·22 in.; Sutton, 1·19 in.; Greenwich, 1·12 in.; Croydon (Whitgift), 1·11 in.; Walton Heath, Beddington, and Sydenham, 1·10 in.; Croydon (Duppas House), 1·08 in. Waddon and Croydon (Waddon New Road), 1·07 in.; Forest Hill (Southwark and Vauxhall Water Co.) and Battersea, 1·05 in.; Reigate (Margery Hall), Purley (Tudor Cottages), Banstead, Wilmington, and Brixton, 1·03 in.; Beckenham (Cedars Road), 1·02 in.; Croydon (Chatfield Road), and Farningham Hill, 1·01 in.; Croydon (Woburn Road), South Norwood, and Wimbledon (Mt. Ararat), 1·00 in.

December 7th.—Caterham, 1·03 in.; Walton Heath, 1·00 in.

December 29th.—Walton Heath, 1·50 in.; Banstead, 1·00 in.

CONTENTS.

PROCEEDINGS.

TRANSACTIONS.

Croydon Microscopical and Natural History Club.

OFFICERS FOR 1898.

President.—J. M. HOBSON, M.D.

Vice-Presidents. — JOHN BERNEY, F.R.M.S.; PHILIP CROWLEY, F.L.S., F.Z.S.; HENRY S. EATON, M.A., F.R.Met.Soc.; HENRY T. MENNELL, F.L.S.; HENRY G. THOMPSON, M.D., J.P., &c.; EDWARD LOVETT; H. FRANKLIN PARSONS, M.D., F.G.S.; and W. MURTON HOLMES.

Treasurer.—F. J. TOWNSEND (*Alverley, Park Hill Rise, Croydon*).

Librarian.—ALFRED ROODS.

Committee.—J. H. BALDOCK; J. H. DRAGE; JAMES EPPS, Jun., F.L.S.; H. D. GOWER; G. W. MOORE; G. E. NEWBY, F.R.C.S.; E. J. PLATTS; N. F. ROBARTS, F.G.S.; and W. WHITAKER, F.R.S., F.G.S.

Hon. Secretary.—R. F. GRUNDY (*112, Lower Addiscombe Road, Croydon*), to whom all communications may be addressed.

PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON MICROSCOPICAL & NATURAL HISTORY CLUB.

FEBRUARY 15, 1898, TO JANUARY 17, 1899.

CROYDON:

PRINTED FOR THE CLUB, BY WEST, NEWMAN & CO., HATTON GARDEN, LONDON.

1899.

PROCEEDINGS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1898–99.

Twenty-ninth Annual Meeting,

Held at the Public Hall, Croydon, January 17th, 1899.

J. M. Hobson, M.D., B. Sc., in the chair.

The statement of accounts for the year 1898 was approved.

The President announced that the following had been nominated as officers of the Club for the ensuing year, and there being no other nominations they were duly elected:—President, William Whitaker, F.R.S., P.G.S.; Hon. Treasurer, F. J. Townend; Hon. Secretary, R. F. Grundy; Librarian, A. Roods; and A. J. Hogg and E. Pierce members of the Committee to fill the vacancies caused by the retirement (under the Rules) of Mr. J. H. Drage and Mr. Whitaker.

The following is a list of the officers for the year 1899:—

President.—William Whitaker, B.A., F.R.S., P.G.S.

Vice-Presidents.—John Berney, F.R.M.S.; Philip Crowley, F.Z.S., F.L.S.; Henry S. Eaton, M.A., F.R. Met. Soc.; Henry T. Mennell, F.L.S.; Henry G. Thompson, M.D., F.R.M.S., J.P.; Edward Lovett; H. Franklin Parsons, M.D., F.G.S.; W. Murton Holmes; and J. M. Hobson, M.D., B.Sc.

Treasurer.—F. J. Townend.

Hon. Secretary.—R. F. Grundy (112, Lower Addiscombe Road, Croydon).

Librarian.—ALFRED ROODS.

Committee.—J. H. BALDOCK; JAMES EPPS, Jun., F.L.S.; H. D. GOWER; A. J. HOGG; G. W. MOORE; G. E. NEWBY, F.R.C.S.; E. PIERCE; E. J. PLATTS; and N. F. ROBARTS, F.G.S.

Botanical Sub-Committee. — ARTHUR BENNETT, F.L.S., High Street, Croydon; J. EDMUND CLARK, B.A., B.Sc., 24, Birdhurst Road; JAMES EPPS, F.L.S., Norfolk House, Beulah Hill, Upper Norwood; A. FITZGERALD, 93, Addiscombe Road; Miss KLAASSEN, Aberfeldy, Campden Road; H. T. MENNELL, F.L.S. (Hon. Sec.), Park Hill Rise; H. FRANKLIN PARSONS, M.D., F.G.S., Park Hill Rise; Mrs. PARSONS, Park Hill Rise; C. E. SALMON, Clevelands, Wray Park, Reigate; ERNEST STRAKER, Wallington.

Geological Sub-Committee.—W. B. BANNERMAN, F.G.S., Sydenham Road; GEORGE HINDE, Ph.D., F.G.S., F.R.S., Avondale Road; A. J. HOGG, 5, Cargreen Road, South Norwood; G. W. MOORE, Bryndhurst, Dornton Road; H. FRANKLIN PARSONS, M.D., F.G.S., Park Hill Rise; H. WHITBY PHILLIPS, M.D., Addiscombe Road; N. F. ROBARTS, F.G.S. (Hon. Sec.), 23, Oliver Grove, South Norwood; W. W. TOPLEY, 3, Marlborough Road; THOS. WALKER, C.E., Warrington Road; WM. WHITAKER, F.R.S., Campden Road.

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Photographic Sub-Committee.—J. H. BALDOCK, F.C.S. (Lanternist and Recorder), St. Leonard's Road; H. D. GOWER, 55, Benson Road; E. PIERCE (Hon. Sec.), Claremont, Balfour Road, South Norwood; E. J. PLATTS, St. Leonard's Road; ALFRED ROODS, 67, Thornhill Road; C. J. L. RUSSELL, 56, Coombe Road; A. J. WEIGHTMAN, Langdale, Chepstow Rise.

Zoological Sub-Committee.—JOHN BERNEY, F.R.M.S. (Hon. Sec.), Chatsworth Road; PHILIP CROWLEY, F.L.S., F.Z.S., Waddon; JOHN HENRY DRAGE, Tamworth Road, Croydon; C. H. GOODMAN, Bryn Cottage, Whyteleaf; R. McLACHLAN, F.R.S., F.L.S., 23, Clarendon Road, Lewisham.

Anthropological Sub-Committee.—H. C. COLLYER, Beddington; J. M. HOBSON, M.D., B.Sc., Morland Road; A. J. HOGG, 5, Cargreen Road, South Norwood; E. LOVETT (Hon. Sec.) West Burton, Outram Road; N. F. ROBARTS, F.G.S., 23, Oliver Grove, South Norwood; J. WATSON SLACK, 56, Park Lane; H. G. THOMPSON, M.D., 86, Lower Addiscombe Road.

Museum Sub-Committee.—J. H. DRAGE, Tamworth Road; J. M. HOBSON, M.D., B.Sc. (Hon. Sec.), Morland Road; E. LOVETT, West Burton, Outram Road; H. T. MENNELL, F.L.S., Park Hill Rise; H. F. PARSONS, M.D., F.G.S., Park Hill Rise; WM. WHITAKER, P.G.S., Campden Road.

The President delivered his annual Address, in which he reviewed the operations of the Club and its various sections during the past year, and at its conclusion a vote of thanks was passed to him for the Address and his services during the past year.

The President's Address.

Ladies and Gentlemen,

At the end of the twenty-ninth year of our existence it again becomes the President's duty to review the proceedings of the past twelve months. Our present strength is 229 members; 24 new members have been elected, and 18 have resigned. There has been no thinning of our ranks through death. Of the 24 new members, no less than 11 were already contributors to our Meteorological work.

Taking the several meetings and excursions in chronological order, we find that on *Jan. 18th* the Annual Meeting was held, a report of which, together with the Address of the President, will be found in the Proceedings in the last part of our Transactions.

On *Jan. 26th* Mr. Lovett gave a demonstration, in connection with the Anthropological Section, on Primitive Fire-making Appliances, A large collection was brought down and explained by Mr. Lovett. Here is a list of them :—

Prehistoric Flints and Pyrites from Cave-deposits, Jersey.
Early English, Dutch, German, and French Flint and Steel and Tinder Boxes.
Flint and Steel and Tinder Pouches from India, China, Thibet, Japan, and Scandinavia.
Fire-sticks from Central India, South Africa, Somali-land, and Arctic America.
Bow-drills, Hand-drills, Mouth-drills, and other Fire-making Appliances in use by the Esquimaux.
Compression Fire-tube used by the Shans of Northern Burmah.
Various forms of Tinder and Sulphur Matches from England, France, Germany, Holland, India, Africa, China, and Japan.

At the meeting on *Feb. 15th*, Mr. Campbell-Bayard, President of the Royal Meteorological Society, read his Annual Report of the Meteorological Section, of which he has long been Honorary Secretary. This has already been published in our Transactions for 1897.

Mr. J. Edmund Clarke read a paper on "The Relation of Sun Spots to Rainfall, based on Fifty Years' Observations at York."

Sun spots, as was well known, varied in frequency in cycles of about eleven years, and their maximum was associated with terrestrial phenomena, such as magnetic storms and aurora borealis. He had been led to think that while the rainfall of the year as a whole bore little relation to the number of sun spots, a relation was observable in the rainfall of particular months, especially August, the rainfall in August being highest in years at or about a minimum sun spot period, and lowest in years at or about a maximum sun spot period (see Trans.).

On *March* 15*th* Dr. Parsons exhibited a collection of fossils from the gault, lower greensand, and Wealden beds; Mr. A. J. Hogg exhibited fossils and a mass of gypsum from the gault; and Mr. Murton Holmes showed echinoderms, sponges, &c., from the upper chalk.

The event of the evening was a written lecture by Mr. H. E. Turner, B.Sc., of Folkestone, lent through the South-eastern Union of Scientific Societies, and read by Dr. Franklin Parsons. Mr. Baldock operated with the Club lantern, exhibiting some sixty-nine slides to illustrate the lecture. The subject of the lecture was "The Lower Greensand, Gault, and Upper Greensand." These beds, taken from below upwards, are the oldest of the cretaceous series, so named from the predominance of the chalk, and belonging to the middle ages of geological time. The cretaceous series are found only in the East and South of England. They are overlaid by the London and Hampshire basins of the tertiary beds, and by recent alluvium on the sea coast. The general trend of the cretaceous beds having been more exactly indicated, the lecture went on to deal with the special arrangements of beds found in the part known as the Wealden area, comprising parts of Hampshire, Surrey, Sussex, and Kent. The bifurcation of the chalk of Salisbury Plain forms respectively the North Downs, terminating eastwards in Dover cliffs, and the South Downs, ending in Beachy Head; while their counterparts are seen across the Straits of Dover, in the chalk cliffs about Boulogne, a few miles to the east of which they again reunite. We have thus the interesting geological phenomenon of a closed oval, cut through indeed by the comparatively recent Straits of Dover, but presenting in concentrically arranged outcrops a vast thickness of beds, within an area one hundred and fifty miles from east to west, and forty from north to south. The chalk, which is the most recent, bounds the area as with a lofty wall. The oldest Hastings sands occupy the centre. This condition of things has been brought about by the upheaval of the beds *en masse* into the form of a dome, which has been cut down by denudation or the gradual carrying away of the materials by water, just as the coats of an onion might be cut across. The harder beds form a series of steep escarpments, or sharp elevations, always looking towards the centre of the area; while the softer beds form valleys, plains, or undulating country between them.

The lecture then gave an interesting theoretical account of the laying down of the enormous masses of rock, beginning with a great river flowing eastwards from an ancient land (which extended far to the north-west beyond the present limits of Ireland), and pouring its waters into a narrow sea or gulf, which would at first be brackish. As the sea bottom was continually subsiding, more and more deep-sea conditions would prevail, till the profound depths of the chalk period prevailed. After a thousand feet of chalk had accumulated, subsidence would be succeeded by elevation, the dome of the weald would be formed only to be cut down as it emerged from the level of the waters, and afterwards carved into its present form by the action of streams, &c. The lecture then dealt in considerable detail with the various constituents of the lower greensand, indicating their local characteristics and the physical features of the country thereby conditioned. These topics were freely illustrated by lantern slides. The most generally interesting were the results of a landslip at Sandgate in 1893. This was caused by a sliding of the absorbent Folkestone beds upon the impermeable Sandgate beds beneath them, after an unusually heavy rainfall. A long series of slides illustrated the damage done to houses and the displacements of the ground, both giving appearances very suggestive of an earthquake, as, indeed, was at first thought to have happened. A small series of slides taken from East Wear Bay, near Folkestone, illustrated the effect upon the contour of the land by the gault underlying the chalk. These showed the railway cutting in the Warren, and the upheaval of the foreshore produced by the impaction of immense masses of earth during the landslip. The lecture concluded with a very fine series of photographs of fossils from the chalk, gault, and lower greensand. Some remarks on the various points of the lecture by the President and Mr. Whitaker brought the proceedings to an end.

On *April 2nd* an excursion was conducted by Mr. J. H. Baldock to Kew Gardens, and was partly of a general and partly of a photographic character. He reports as follows:—"The afternoon was dull and rather windy, which militated against the success of the photographers. Nevertheless some pictures, notably of the Bamboo Garden, were obtained. After a stroll through the Arboretum, the party visited the Orchid House, the Succulent House, and other houses, finishing up with the always interesting Rock Garden. The number of members attending was eleven."

On *April* 19*th* Mr. Murton Holmes exhibited and explained a collection of the shelly parts of Pteropods taken off Culebra Island in the 'Challenger.'

Mr. Fred. Curtis, introduced by Mr. Crowley, gave a Lecture entitled "Notes from the Arctic." This was an account of a three months' cruise in the Barentz and Kara Seas, about the southern island of Nova Zembla and the islands of Waigats and Dolgoi, in the steam yacht 'Laura,' fitted up for the expedition by Mr. H. S. Pearson. The lecture, which described day by day the various points visited, and the human, animal, and plant-life met with, was freely illustrated by lantern-slides, taken, as I understand, by the lecturer himself. The island of Waigats, situated about 70° by 60° E., was thoroughly worked, and the observations of the geology, zoology, and botany of the adjoining island of Dolgoi which were made were, in the belief of the lecturer, the first recorded. A short visit was paid to Khabarova, on the mainland; several landings were made on the southern island of Nova Zembla, and observations on its eastern coast as far as lat. 74° 24′ added something to the geographical knowledge of that shore.

On *April* 23*rd* an excursion to Chislehurst was conducted by Dr. Percy Allan. The following is the account which Dr. Allan has kindly sent me:—

"*Excursion to Chislehurst.*—On April 23rd some thirty members of the Club, on bicycles, conducted by Dr. Allan, visited the caves near Chislehurst Station. The entrance was by a sloping low-pitched tunnel in the side of a steep hill, just at the junction of the greensand with the chalk. The galleries, of considerable extent, were of heights ranging from four to thirty feet; they ran for a considerable distance; some branched, some ended blindly, and others rejoined the main passage. A second series of galleries, more extensive than the first, were explored by two or three of the party, who had to creep into the entrance on hands and knees. In Chislehurst there is no history attached to the caves, but, as may be judged, they were constructed for the purpose of obtaining chalk. The party, on leaving, partook of tea at the 'Bickley Arms.'"

On *April* 27*th* Mr. Robarts, Hon. Sec. of the Geological Section, took charge of a Conversational Meeting on Slates. He exhibited various specimens illustrative of Welsh, Westmoreland, French, and American Slates, and described methods of obtaining and manufacturing them. The cause of the cleavage, which is the distinguishing feature of true Slates, was explained, and the geological position of the principal veins was demonstrated.

Allusion was made to the chemical composition, and comparisons were drawn showing the mercantile value of the various qualities.

On *May* 14*th* a small party accompanied Mr. Lincoln from Byfleet, along the Wey Navigation Canal to Pyrford. Newark Abbey, a ruin which stands on the banks of the river Wey, near Ripley, was then visited. Several photographs were obtained.

On *May* 14*th* Mr. H. Keatley Moore read a paper by himself and Mr. Ernest W. Johnson on "Eclipse Observations" by themselves and other members of the British Astronomical Society in India in January last. The paper was copiously illustrated by lantern-slides. The path of the moon's shadow across India, *i. e.* the area of total eclipse in that portion of the earth, stretching from the coast on the south-west to the north-eastern frontier, was shown as a broad band across the map. The special observation of Mr. Moore and three of his companions was the making of a sketch of the corona during the ninety seconds of totality, each of the four giving his or her attention to one quadrant. Mr. Johnson was to observe the "shadow-bands," and also the degree of light was to be gauged by the use of photographic plates exposed behind varying thicknesses of tissue paper. The same observation was afterwards made with the full moon in this country, and the relative effect noted. This showed very considerable advantage on the side of the corona. By long practice, the four sketchers were able to produce a very accurate picture of the shape and relative size of the corona. The light was noted to be of a bluish tinge. A series of photographs of the corona at different total eclipses was shown. The shape and magnitude of these were seen to be very various, the largest coronæ appearing to be associated with minimum periods of sun-spots. The present corona coincided in time with comparatively few sun-spots. The photograph of the corona this year, taken by Mr. Maunder, was by far the best ever taken, and bore out the accuracy of the drawings, only the long streamer to the south-west, which was shown by the latter method as three times the sun's diameter, appeared on the photograph twice as long as in the drawing. Mr. Maunder also succeeded in getting a photograph of the sun's corona shortly after the period of totality. Mr. Johnson himself described the phenomenon of shadow-bands already mentioned. These occurred shortly before totality, and consisted of the passing along the ground of groups of alternate light and dark bands about two to three inches wide, the groups being about one foot apart. No explanation could be offered of these appearances. Incidentally, it was observed that the oval patches of light, a well-known optical effect produced by the sun's light passing through small spaces amongst the leaves of trees and making his image on the ground, became altered in shape as the eclipse was in progress. A photograph taken in Bombay, where the sun's disc was not wholly obliterated, showed these patches of light as distinctly crescentic. A little series of photographs taken at fixed intervals *before* and *after* totality showed that the sun's light did actually *return* more rapidly than it *disappeared.* The concluding observations were on the spectroscopic phenomena just about the moment of totality or "second contact." Just before the edge of the shadow completely hid the photosphere or luminous envelope of the sun, the usual spectrum with dark absorption bands was obtained, but the instant that was passed, the dark bands became luminous, and the continuous spectrum disappeared, save for a narrow central band or core. The explanation was as follows:—The photosphere is supposed to consist of clouds of minute incandescent *particles*, which would give a continuous spectrum like the rainbow, but the light has to pass through an outer envelope of incandescent gases. As these consist of various elements, each on its own account obstructs or absorbs one or more bands of coloured light, thus producing dark bands in a spectrum of solar light. The instant the inner light of the photosphere was cut off, each of these gaseous elements gave off coloured light on its own account (printing white in a photograph), and exactly from that portion of the spectrum which it had previously obstructed. The central core of continuous spectrum was caused by light from the photosphere getting through between those mountains on the moon which were then on the edge of her disc. The interest of the paper, or rather lecture, which was well sustained throughout, was enhanced by descriptions—some of which were funny enough—of the doings of the observers while *en route*, and in India, and by pictures of scenery, of historic places, such as the Taj Mahal at Agra, and of every-day life in that famous and ancient country.

I am again indebted to Mr. Baldock for the following account of the Whit Monday Excursion:—

"On *May* 30*th*, being the Whit Monday Bank Holiday, a whole-day excursion was organized by Mr. J. H. Baldock to Tunbridge Wells and Groombridge. A numerous party arrived at Tunbridge Wells, and, after having a look at 'The Pantiles,' and some members having had a taste of the water of the well-known chalybeate spring there, the walk was continued across the Common, through Nevill Park, on to Rusthall Common, where a visit was of course paid to the 'Toad Rock,' of which, with some other views on the Common, successful photographs were taken. Proceeding down High Rocks Lane, with the beautiful Happy

Valley, and Broadwater Down in the distance, on the left, they crossed the stream to the High Rocks Hotel, where an excellent repast had been provided by Mr. J. F. White, the landlord. After doing justice to this, many of the party visited the High Rocks, and some capital photographs of this interesting geological formation were obtained. Leaving here, the party then proceeded through some fields, where the grass was ready for cutting, and a pretty little wood, till Groombridge Place was reached. Here they were most cordially received by the Misses Saint, who had given the invitation, and, after partaking of tea, were allowed to ramble all over the lovely garden, and to take any photographs they pleased; this done, they were shown over the old house, with its many treasures, and at length had to depart somewhat unwillingly to catch the train back to Croydon. The weather, although threatening, held fine until the last, when it began to drizzle. The number of members attending was thirty-four!"

On *June 2nd*, *3rd*, and *4th*, the Third Annual Congress of the South-eastern Union of Scientific Societies was held in Croydon by the invitation of this Club. A local Committee was formed, composed mostly of members of this Club, but including besides the member for Croydon and some leading local residents, with your President as Chairman, and Dr. C. Poulett Harris as Hon. Sec. The County Council gave permission to hold the meeting in the Town Hall. The Mayor and Mayoress gave a reception; and the officials of the Corporation gave every assistance. A temporary museum was organized somewhat after the style of our annual soirée, and the following papers were read by members of our Club:—

"The Folk-Lore of Amulets and Charms." Mr. Ed. Lovett.

"The Nature of the Soil in Relation to the Distribution of Plants and Animals." Dr. Franklin Parsons.

"Photography in Relation to Science." Mr. Baldock.

"Ideals for Natural History Societies, and how to attain them." Dr. Hobson.

These four papers are published *in extenso* in the Proceedings of the Congress. Mr. Baldock's paper was freely illustrated by lantern-slides at the Mayor's reception, and I may add that I took that opportunity of throwing a few slides on the screen illustrating the Whitgift Hospital and Morland Park. I believe that the general verdict was that the Congress was a great success. I hope we shall yet see its fruit in this district in the form of increased scientific activity. This year's meeting of the Congress will be at Rochester.

Mr. Gower has kindly furnished me with the following note on the excursion conducted by him on *June 25th* to Strand-on-the Green:—

"A showery afternoon with a corresponding small muster is all that can be said of this outing: the spot not looking at its best for picture work, and the showers causing us to seek shelter often. Pictures of Kew Bridge were taken, and will form interesting mementoes when the bridge has been rebuilt."

On *July 9th* Dr. Franklin Parsons conducted a half-day excursion to Oxted and Titsey Wood, of which the following is his account:—

"Cyclists were invited, but none turned up. We went by train to Oxted, and walked thence to Titsey Park and Botley Clump (on the highest point of the chalk downs), returning through Titsey Wood to Oxted. The chief point of interest was the remains of the Roman villa in Titsey Park, and the antique objects found there and preserved in Titsey Place, for seeing which we were indebted to the courtesy of Mr. Leveson Gower. The villa was discovered in his father's time, and its foundations have been excavated, but are now much overgrown."

The next three excursions arranged were for August Bank Holiday, *September 3rd*, and *September 10th*. Mr. Baldock has given me accounts of the first and last, but I have received no account from Mr. Platts, who conducted that on *September 3rd* to Godstone and neighbourhood.

"For the August Bank Holiday, which this year came on the first of the month, Mr. J. H. Baldock had organised another whole day excursion, and, the weather proving very fine and warm, a numerous party availed themselves of the opportunity, and a most enjoyable day was spent. The party journeyed by rail to Penshurst, and from there walked through hop-gardens and meadows to Chiddingstone. *En route*, a halt was called at a charming little spot near a bend in the river Eden, some of the party reclining on the hay under shelter of the trees, while others secured some very pretty views of the river. This done, Chiddingstone was soon after reached, where a capital lunch was provided by Mr. Bavey, of the Castle Inn; after which photographs were taken of the 'chiding-stone,' the church, and the quaint old village, the party then proceeding across the fields to Hever, where special permission had been obtained to view the Castle and to take photographs through the kindness of P. Crowley, Esq. A short walk up the hill brought the party to Hever itself, where a very welcome tea had been provided by Mr. Martin Bell, of the "King Henry VIII.," after which the party made their way across some more fields to the station for the return journey to Croydon. The number of members attending was thirty-two."

"On Saturday, *September* 10*th*, a visit to the old Roman villa at Darenth was proposed by Mr. J. H. Baldock, and although some five or six members had expressed their intention of joining, when the time came the great heat then prevailing deterred them, so that the conductor had it all to himself. As a compensation, however, he succeeded in obtaining a dozen capital photographs of the most interesting portions of the villa."

Mr. G. W. Moore has furnished me with particulars of the fungus hunt which he conducted on *September* 17*th*. The foray was practically bootless, for the long-continued dry weather had rendered the places examined too dry for anything of a living fungus nature to be found, save one specimen of the common edible mushroom. The excursion was through Wickham Wood.

On *September* 20*th* the first monthly meeting was held after the holidays. As usual, no paper was read, but members exhibited and explained objects of interest. Mr. Murton Holmes showed fossils from the sponge gravel of the Lower Greensand at Farringdon in Berkshire. Dr. Parsons showed fossils from the Red Chalk at Hunstanton. Mr. J. W. Helps sent a peculiar fungoid growth which had been found attached to a piece of cotton waste under a warm bath at the Croydon gas-works at Waddon. Mr. Lovett, as usual, had an interesting series from his anthropological and natural history collection, namely, a bone bark-peeler from Normandy; also bolas-stones from Argentine Republic; hippo-tusk charm from Africa, also one from New Guinea made of a boar's tusk; and shell money from Admiralty Island.

On *October* 18*th* Mr. Whitaker gave an address on "Changes on the Coast." The 'Croydon Chronicle' gave a long account of this and the subsequent discussion, which, having been revised by Mr. Whitaker himself, will, I hope, appear in the 'Transactions.'

Mr. Stanley, who was our delegate to the British Association in Bristol, read a short report, and handed in a schedule from the Committee appointed to organize an Ethnographical Survey of the United Kingdom.

On *November* 15*th* Mr. Lovett gave a lecture on Primeval Man and his modern representatives, illustrated by many excellent lantern views. As it was impracticable to take any notes of this lecture at the time, and as Mr. Lovett himself used none, the account which I can give must necessarily be a meagre one. Many flint implements were shown, both neolithic and paleolithic, some of the arrow-heads being very finely finished. Some of these arrow-heads were used in historic times in these islands. Stone implements and weapons as used by savage tribes at the present day were also shown. From the way these were mounted, inference could be drawn as to the way in which prehistoric man used his implements. In fact, it is not entirely a matter of inference, for stone implements have been so preserved that the handles were attached to them. Long flint flakes of neolithic age were no doubt used as knives; as when restored on the model of recent Eskimo and North American knives of stone they would be very useful implements. The scraper, used for dressing skins, and so widely distributed, has its modern representative in the Eskimo skin-dresser in use now. The polished stone adzes of neolithic times are represented by those in use in New Guinea and the Solomon Islands, whilst the curious prehistoric stone hammers of Ireland have their exact modern survivals in those used by the natives of Greenland. Prehistoric and recent savage fish-hooks were also shown having a striking resemblance to each other, especially in their mode of attachment. The stumps of piles and long piles imbedded in peat were shown,—the remains of ancient Swiss lake-dwellings,—similar dwellings being now found on the coast of Borneo. Prehistoric carvings on bone showed pictures of the mammoth, bear, horse, and ox, indicating the mammalian contemporaries of cave-dwellers, and corresponding to recent Lap drawings. Hide shoes, such as are worn at the present day by the inhabitants of Fair Isle, were shown, being most probably the foot gear of neolithic man. Other pictures were of tumuli and their internal structure, rudely analogous to the pyramids; ancient pottery, including the prototypes of our modern "tumblers," inasmuch as they could not stand up; "dug-out" boats, as used at the present day by the Ainos of Japan, and similar to boats found in Irish bogs and other peat deposits in Sussex and elsewhere. Some idealistic pictures of man of the various prehistoric epochs concluded the series of illustrations. Generally, the burden of the discourse was that our modern utensils and contrivances have their origin in the invention from necessity of our prehistoric ancestors.

On *November* 23*rd* our Annual Soirée was held. The following account is taken partly from the 'Croydon Chronicle,' and partly from the 'Croydon Advertiser.'

Entering the Large Hall, one's attention was particularly drawn to the fine display of stuffed animals, arranged by their collector, Mr. Charles Thorpe. His exhibition included birds from Ecuador, regent birds (of which there was a very handsome pair), and a large number of humming birds. This collection was arranged at the foot of the stage, which, on either side of the footlights, was radiant with a splendid display of chrysanthemums and other "pot" flowers kindly supplied by Mr. Philip Crowley. Mr. E. Lovett's collection of old Dutch mangles was a very interesting one; and made the more so by the pleasant little lecture their owner gave concerning them and his other specimens. The mangles are flat pieces of wood, beautifully carved—one, in particular with a design of birds and animals in panels. It appears to have been the custom in Holland to present such mangles, bearing appropriate mottoes, to young couples, on their marriage, as a part of their wedding outfit. Mr. Lovett also exhibited curios from Benin—one a wooden mirror frame with sliding shutter, exquisitely carved, and in which was inserted a piece of ordinary looking-glass obtained from Europeans; some interesting grades in the formation of the boomerang; hashish pipes from China; New Guinea war drums, one of which was cleft at one end so as to fit just above the knee. Very interesting, too, was Mr. H. C. Collyer's collection of lamps, ranging from the tiny Greek terra-cotta ones to the original of the bull's-eye lantern of French origin, dating back to the eighteenth century. This possessed four bull's-eyes. These lamps dated from various periods in the history of illumination, and were fashioned in brass, bronze, wrought iron, earthenware, terra-cotta, and one, a very beautiful sixteenth century Spanish lamp, in glass. There was also a very fine brass temple lamp from India. Another interesting exhibit was the "duplex telegraphy" apparatus for sending two messages on one wire, by which, during the evening, many messages were sent by special cable all the way from one end of the room to the other. Coun. Hinton's observatory hive was also an object of great attention, the operations of the bees being watched through the walls of their glass prison by large numbers of interested spectators. The dark room, which was devoted to the exhibition of the X-rays, also came in for a great deal of notice, and at no time during the whole of the evening did it lack its share of visitors, who came to inspect their own bones or those of their friends through the agency of Röntgen's wonderful discovery. In the Old School of Art Room displays were given at intervals by Messrs. Watson, of the Ives' Krōmskōp and the cinematograph, which attracted crowded "houses" on each occasion. The exhibition of photography in natural colours by the krōmskōp was eminently interesting to those whose pursuits lead them into the regions of photography, and a number of very successful and beautiful examples were shown on the screen. The animated photographs were equally successful, and brought forth unstinted approval. A very interesting exhibit in the Large Hall was a collection of flowers gathered the same day in gardens in Addiscombe and Park Hill. Of these there were one hundred and nine kinds, of which sixty-seven were summer flowers still in bloom. The highest number of different kinds recorded in November since 1881, by the way, was one hundred and seventy last year. The lowest was forty-four in 1881.

On *December* 15*th* I had the pleasure of giving "An Historical and Descriptive Account of the Whitgift Hospital" (see Trans.). This was illustrated by lantern slides, mostly made by myself, though I was indebted for a few very good ones to Mr. Baldock and my young friend Mr. Edwin Tardrew.

I now pass to the reports of the Honorary Secretaries of Sections. I much regret to have to state that these reports are mostly *nil*, although of course the conversational meetings conducted by Mr. Lovett and Mr. Robarts must be reckoned as work done by the Anthropological and Geological Sections respectively.

As to the Museum Sub-Committee, I have to report, as Hon. Sec., that the two museum cases which we were authorised at the Annual Meeting to order have actually been put in hand, and will shortly be placed in the vestibule of the Public Library in the Town Hall.

The most active Section of the Club at present is the Photographic, whose report by Mr. Gower, the late Hon. Sec., I append.

Photographic Sub-Committee.

In handing you the Report of the Sub-Committee, I am pleased to say that the Section has passed through a fairly successful season.

Meetings and lantern evenings have taken place during the year.

Thanks are due to the editors of the photographic papers, free copies being sent every week for the use of members in the club-room.

The excursions this year were on the whole fairly well attended.

Members have worked well for the 'Portfolio,' but some of the work might be much better; and it might be mentioned that members should endeavour to send in only their best work; by so doing it will bring the work up to a considerably higher standard. It was hoped that enough members would be found to start a 'Portfolio' of scientific pictures entirely apart from the pictorial element; but, up to the present, so few have availed themselves of the privilege of sending in, that it would be out of the question to circulate them under the circumstances.

The Soirée this year was well maintained as far as the sectional exhibit went; but, from several reasons, many of our best workers were not present. Lantern-slides were exhibited in the Small Hall; and also a splendid exhibit of natural history photographs by Mr. Saville Kent, comprising nearly 150 subjects.—Harry D. Gower.

Members elected, 1898.

February 15*th*.—Benjamin Hobson, of 1, Morland Road. Charles Poulett Harris, M.B., of 75, Morland Road.

March 15*th.*—John Christopher Dell, of 14, Wellesley Grove.

April 19*th.*—Harold Bailey, of 10, Lansdowne Road.

September 20*th.*—Herbert Christopher Male, M.D., of Deane House, 27, Birdhurst Road. Walter J. Stride, of The Grange, Coulsdon. Rev. J. P. Faunthorpe, of Whitelands College, Chelsea. W. H. Tyndall, of Morlands, Oxford Road, Redhill. Mrs. Carr Dyer, of Hazelea, Kenley. Alfred Tate, of Downside, Leatherhead. Charles J. Taylor, of The Larches, Banstead. M. L. Craven, of 2, Woburn Road. James Batten, of the High Field, Bickley.

October 18*th.*—Francis Druce, of Merstham. Sir J. F. Lennard, Bart., of Wickham Court. W. B. Lock, of Llanberis, Avondale Road. E. Pierce, of Balfour Road, South Norwood. J. T. Billett, of Ormond Lodge Richmond. William Whiteman Topley, of 3, Marlborough Road, Croydon.

November 15*th.*—William Bruce Bannerman, F.S.A. Scot., of The Lindens, Sydenham Road. Frederic W. Maitland, of Jesmond Lodge, St. Peter's Road. Thomas Drury Jackson, of Hillbrow, Heathfield Road.

December 20*th.*—J. H. Stanley, of 51, Morland Road. Alfred W. Field, of 64, Heathfield Road.

Exhibits, 1898.

March 15*th.*—W. Murton Holmes: Echinoderms, sponges, &c., from the Upper Chalk, Purley. A. J. Hogg: *Ammonites auritus*, *Ostrea carinata*, and *Gypsum* from the Gault, Folkestone; and an early neolithic shaft-maker found near Croham Hurst. H. Franklin Parsons: Fossils from the Gault, Wealden, and Lower Greensand Beds.

April 19*th.*—W. Murton Holmes: Collection of the shelly parts of Pteropods taken off Culebra Island on the 'Challenger.'

September 20*th.*—W. Murton Holmes: Fossils obtained at Farringdon. H. Franklin Parsons: Fossils and shell from Hunstanton. J. W. Helps: A fungoid growth found attached to a piece of cotton waste found under a warm bath at the Croydon Gas Works. E. Lovett: Bone bark peeler from Normandy; bolas-stones from Argentine Republic; hippo tusk charm from Africa, and one from New Guinea made from a boar's tusk; shell money from Admiralty Island; and a case of stag-beetles captured at Croydon.

October 18*th.*—W. Murton Holmes: Jurassic ammonites.

November 15*th.*—W. Murton Holmes: Ivy grown between the joints of a greenhouse; a dredging from the North Atlantic at a depth of 2300 fathoms, the sand grains being rounded owing to glacial action; and some jurassic fossils. H. C. Collyer: A horn book.

Additions to the Library, 1897.

From Individuals.—Arthur Bennett: Notes on *Carex aquatilis* in Lake Lancashire; *Juncus tenuis* in Westerness; and Isle of Man plants. H. D. Gower: The photographic papers, as issued. A. Roods: Knowledge, as issued.

From Societies.—Royal Microscopical Society: Journal, 1897. Quekett Microscopical Club: Journal, 1897. Brighton and Sussex Natural History Society: Report and Abstracts of Papers, 1896 and 1897. Norfolk and Norwich Naturalists' Society: Transactions,

1897. Academy of Natural Sciences of Philadelphia: Proceedings, 1896. The Manchester Geographical Society: Journal, 1896. The Scottish Microscopical Society: Proceedings, 1896. South London Entomological and Natural History Society: Proceedings, 1896. Northamptonshire Natural History Society: Journal, 1896. Belgian Microscopical Society: Journal and Proceedings. The Manchester Microscopical Society: Transactions, 1896. City of London College Science Society: Journal, 1897. Borough of Southport: Meteorological Report, 1896.

From Proprietors.—The Process Photogram for 1896. Science Siftings.

Donations to the Library during the Year 1898.

From Individuals.—Popular Photographic Printing Processes, by H. Maclean (Mr. N. Waterall). Report of the Meteorological Observatory of Southport (Mr. J. Baxendell). Transactions of the Cumberland and Westmoreland Association, 1885–6 and 1887–8; Report of the Royal Society Anniversary Meeting, 1897; The Irish Naturalist, 1895; The Midland Naturalist, 1892; The Natural History Journal and School Reporter; The Scottish Geographical Magazine (Mr. W. Whitaker). Crowborough Hill (Mr. Leeson Prince). The British Journal Almanac of Photography, 1891–95 and 1897 (Mr. Coldwells). Report of the Botanical Exchange Club; Records of Scottish Plants for 1897; *Mycetozoa* of Antigua; *Carex magellanica* in the Outer Hebrides (Mr. A. Bennett). Applied Geology, by J. V. Elsdon, B.Sc. (The Quarry Publishing Co.). Eleven vols. of Reports of the United States Geological Survey (Mr. W. W. Topley). The Photographic papers, as published weekly (Mr. H. D. Gower). Sun Pictures of the Norfolk Broads, and Photo Pictures of East Anglia (G. E. Railway Co.).

From Societies.—Journal of the Royal Microscopical Society; Journal of the Quekett Microscopical Club; Report of the West Kent Microscopical and Photographic Society; Journal of the Belgian Malacological Society; Proceedings of the Academy of Natural Sciences of Philadelphia; Reports and Papers of the Missouri Botanical Gardens; History of the Berwickshire Naturalists' Club; Report of the British Assocation Toronto Meeting; Schedule of Enquiries from the Ethnographical Committee of the British Association; Proceedings of the South London Entomological and Natural History Society; Report of the Epsom College Natural History Society; Journal of the Northamptonshire Natural History Society; Proceedings of the Scottish Microscopical Society; Extracts from the Memoirs of the Zoological Society of France; Journal of the City of London College Science Society; Report of the Geological Institution of Upsala; Journal of the Manchester Microscopical Society; Journal of the Manchester Geographical Society; Transactions of the Eastbourne Natural History Society; Transactions of the Norfolk and Norwich Naturalists' Society; Report and Transactions of the South Eastern Union of Scientific Societies; The Essex Naturalist; Report and Proceedings of the Reading Literary and Scientific Society; Report of the Brighton and Hove Natural History and Philosophical Society.

Croydon Microscopical and Natural History Club.—Balance-sheet for the Year ending 31st December, 1898.

Receipts.

	£	s.	d.	£	s.	d.
Subscriptions, 1895	0	10	0			
,, 1896	1	0	0			
,, 1897	10	10	0			
,, 1898	105	0	0			
,, 1899	6	10	0			
				123	10	0
Sale of Soirée Tickets				14	12	6
Donations—F. C.-Bayard, Esq. ...	5	0	0			
,, P. Crowley, Esq. ...	5	0	0			
,, B. Latham, Esq. ...	5	0	0			
,, O. Jepson, Esq., M.D.	1	1	0			
,, R. G. Grant, Esq. ...	0	10	0			
,, Lieut.-Col. C. N. Kidd	0	10	0			
,, Croydon Corporation ...	0	10	0			
,, Wimbledon Urban District Council ...	0	10	0			
,, Capt. Aylesbury ...	0	5	0			
,, Mrs. Barclay	0	5	0			
,, W. W. Wagstaffe, Esq.	0	2	6			
				18	13	6
Sale of Mr. Drage's Paper, &c. ...				0	1	6
Profit on Rev. W. Weston's Lecture				1	1	2
Balance due to Treasurer				9	8	0
				£167	6	8

Payments.

	£	s.	d.	£	s.	d.
Balance of 1898 Account due to Treasurer				10	17	5
Rent of Club Room to 31st July				10	0	0
Hire of Rooms for Meetings ...				4	0	0
Printing Transactions				21	2	9
Fire Insurance				1	13	9
Meteorological Sub-Committee—Printing Rainfall Returns from Dec., 1897, to Nov., 1898 ...				24	18	6
Photographic Sub-Committee—						
Rent of Dark Room to 31st July	10	0	0			
Hire of Rooms for Lantern Exhibitions	1	10	0			
Gas for same, Postages, and Sundries	4	14	8			
Subscription to Royal Photographic Society	1	1	0			
				17	5	8
Soirée Expenses				50	6	11
Stationery and Postages				3	1	2
Cost of Notice Board				1	5	6
Printing Monthly Circulars, Postages, &c.				14	18	11
Deficit on Guarantee Fund towards expenses of Congress of South Eastern Union of Scientific Societies held at Croydon ...				1	5	1
Assistant Secretary				5	0	0
Gratuities				1	11	0
				£167	6	8
Balance, January 1st, 1899 ...				£9	8	0

SPECIAL FUND ACCOUNT, 1898.

£210 11s. 8d. CONSOLS.

	£	s.	d.		£	s.	d.
Balance from last Account, January 1st	20	1	4	Balance, December 31st	26	15	10
Dividend, January	1	8	0				
,, April	1	8	0				
,, July	1	8	0				
,, October	1	8	0				
Rent of Lockers	1	2	6				
	£26	15	10		£26	15	10
Balance, January 1st, 1899	£26	15	10				

1899.	£	s.	d.	1899.	£	s.	d.
Balance of Special Account	26	15	10	Deficiency on General Account	9	8	0
				Cash at Bank	16	12	8
				Cash in hands of Secretary	0	15	2
	£26	15	10		£26	15	10

We, the undersigned, having examined the above Accounts and the Vouchers relating thereto, hereby certify that they are correct, according to the Vouchers, and the Bankers' Pass Book.

F. J. TOWNEND, *Acting Treasurer.*

January 5th, 1899.

E. PIERCE,
W. W. TOPLEY, } *Auditors.*

TRANSACTIONS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1898–99.

141.—An Historical and Descriptive Account of the Whitgift Hospital, Croydon.

By J. M. Hobson, M.D., B.Sc., President.

(Read December 20th, 1898.)

As this year's work began with a resolution, carried unanimously by this Club, against the suggested demolition of the best preserved, if not the oldest, of the ancient buildings in our town, and seeing that strongly expressed opinions have been heard in the Council and elsewhere still further threatening the Hospital of the Holy Trinity, as built by John Whitgift, it appeared to me to be not inappropriate that the close of the year, and of my term of office as your President, should be signalised by some account and discussion of this precious link with the aims and doings of our ancestors of three hundred years ago.

Now, first, a word as to John Whitgift, Doctor of Divinity, Archbishop of Canterbury, himself. Born at Great Grimsby, in Lincolnshire, in 1530, the son of a merchant of that town, and nephew of an abbot of Black Austin Canons, he came early under the influence of doctrinal and ecclesiastical thought. He studied at Queen's College, Cambridge, and at the age of twenty-five was elected a fellow of Peterhouse. In 1563 he was made Margaret Professor of Divinity, 1567 Master of Pembroke Hall, and a few months later Master of Trinity by Queen Elizabeth. While master of that college he issued the famous ordinance that if any undergraduate was caught bathing he should be publicly flogged in Common Hall, and then set in the college stocks!

At the age of forty-three Whitgift was made Dean of Lincoln, as a reward for answering the Puritan "Admonition to Parliament" in 1572. His controversial zeal was further rewarded by his elevation to the See of Worcester in 1577. In 1583 he succeeded Grindal in the Primacy of all England. This position he occupied till his death, in the reign of James I., February 29th, 1604.

Whitgift was not in advance of his time in the matter of toleration. He was evidently a fighter, and did not fail to use his great powers of nature and position to overcome, if he might, opinions which he no doubt sincerely believed to be dangerous and damnable. It is not fair to judge a man acting in the light of three centuries ago by the spirit of our own age. That he was fundamentally generous and pitiful is shown, as to the first quality, by his refusal to accept the Primacy from Elizabeth while Grindal—who was suspended by the Star Chamber—was living; and as to the second quality, by his foundation in our town.

What put the idea into Whitgift's head to build a hospital or college for the poor, with a school for poor children attached. I know not; but that several such colleges were at that time ancient institutions we know, as witness the Hospital of St. Cross, Winchester, founded in 1132.

Moreover, Whitgift gives his reason for founding his charity in his lifetime, rather than leaving it to others to do it for him at his death, for the chronicler Stow writes:—"I have heard him say he would not be to his executors a cause of their damnation, remembering the good advice that an ancient father hath left written to all posteritie. . . . It is a way far more safe for a man to doe good and charitable deeds by himself, whilest he liveth, than to hope that others will do the same for him after his death."

Well, then, Whitgift, having determined to build, first of all acquired a site on what is now the high road between London and Brighton. His own statement, publicly made not long after, when certain persons accused him of enriching himself out of his office, shows what parcels of land and buildings he acquired, and what he gave for them:—

"Lands purchased by me, John Whitgift, Archbishop of Canterbury, since my first being bishop, to this November, 1599, which is twenty-three years at the least. . . . .

"These following are for my Hospital. The Checker in Croydon cost £200, a tenement joining to it cost £30. Another tenement in Croydon, called Stay-Cross, with one acre and a half, cost £80.

"Upon these I have builded my Hospital, School-house, and school master's house, and therefore are not rented."

Then he goes on to state what other properties he bought, evidently to serve as a source of revenue to the Hospital:—

"One piece of ground called Clotmead, in Croydon, cost £14; rent 10s. The Swan, in Croydon, *cum pertinentibus*, £80; rent of this, with certain parcels belonging to the Checker, is £13 6s. 8d. One piece of woodland and some pasture, containing in the whole seventy-seven acres, in Croydon, cost £375; rent £20. One other piece of woodland and pasture in Croydon cost £410; rent £23. Three other several farms in Croydon cost £1400: rent £48." *

Samuel Finch, vicar of Croydon, was the Archbishop's agent and a sort of clerk of the works combined. There are six letters from Finch at this time in the Lambeth MS. Library bearing on the building of the Hospital, which Garrow, following Ducarel, transcribes in his book. From these I give a few extracts, as they throw a most interesting light on the method adopted at that time of carrying out an important structural work, on the wages paid, and on the behaviour of workmen, which latter seems to remind one of the ways of people even at the present day:—

I. "To the moste reverende Father in God my verie good Lorde the Archbishop of Canterburie, his grace at Lambeth, with speed. . . . Yesterday, being Thursday, Wolmer was here to view your worke. And he sayeth that he cannot be here himself: but he will appoint one from Westminster to be here, who will not come under xviiid. the day, and his laborer xijd. Hilarie sayeth he canne bring one presently whome he knoweth, and will warrant to take the charge and discharge it with credit, for xvid. a day; and laborers we can have enow: thers vli. a yeare, saved in ijd. a day wages, and beside the master workeman muste be here still [continuously] to conferre with the carpenter. [Hilarie, I take it, was made 'master workeman' instead of the absent Wolmer.] . . . The yarde ys all defenced in, strong and saffe. This day we make an ende in pulling downe as yet. Nowe we take mortar-makinge in hande, clensinge and levellinge of the grounde; and by Monday come sevennighte, Hillarie saith, we shall be readie for the foundacon and bricklayer. Weeks the bricklayer hath bene at your brick-clamps, and commendes them for very good. We have our sande from Dubbers Hill: for the Parke [Park Hill, I believe] fayleth. . . . From Croydon, this Friday the viiith of Februarie, Anno 1596, R. R. E. 39.

Samuel Finche, Vycar."

II. "By Hillarie's choyce one Henry Blease and John Greene, bricklayers, and my parishioners, have joyntlye taken the charge of the bricklayinge worke, and have xvd. apeece the day. Blease hath begune the groundworke nexte the highway leadinge to London; and finding that grounde made and false, digged the trenche alonge the

* Garrow's 'Hist. of Croydon.'

door unto some iiii foote deepe, and iii foote wide, . . . and finding firme grounde, they have filled up that trenche with great flinte and small stone, and brickbatts and rubbishe not confusedly, but orderlye layed in, and rammed stronglye, course upon course, stronge and sure [no mention of cement]. . . . Four loads of flinte, which come to xs. will well save one thousand of bricke at xvis. . . . The bearer hereof ys Wm. Tagburne, who had vli [£5] of me this morning to bye two horse tomorrow in Smithfeilde. . . . The laborers have digged up iiii skulls and the bones of deade persones in the trench that they are nowe in digginge, next the highway leadinge to the Parke." [That was in the present George Street. Garrow considers that these bones represent a fight that took place in Croydon in 1264 between the forces of King Henry III. and the Londoners after the battle of Lewes.]

III. "I thanke God, our groundworke is greatlye commended of all that view the same. And I hope well that will like his Grace at his comminge; for yt is not slubbered uppe, but strongely donne.

SA. FINCHE."

He then encloses a copy of the first bond or contract mentioned in this connection, namely, to supply the freestone for the doorways and windows, and to work and set up the same. The price to be paid was 9d. the foot for the windows, and 10d. the foot for the doors.

In Chapter V. Finche unburdens his soul to Mr. Woormall, the Archbishop's secretary (I presume), about Blease the bricklayer, who had been taking too much upon himself. Blease gets a sound rating from the reverend clerk of the works, for he seems to have been doing a little trickery on his own account by making bricklayers who came on the job pay 2d. a day as a sort of commission and condition of not being pushed on.

Letter VI. refers to the dissatisfaction with the bricks made by Rednap and stacked in the yard and in the park:—

"Fain he would have excused himselfe, but his handie work spoke against him, and we were so round with him, that he burste into tears, saying, he was never the like served in anie worke; he was ashamed of it, he could not excuse it, yt was the wickednesse and deceitfulnesse of the yearth."

Finche then proceeds to ask for instruction as to where in the Hospital gateway, of which a plan from the "Freemasons" is sent, his Grace's arms, &c. are to be placed.

The instructions from Lambeth were as follows:—"The Armes over the doore must be without helmet and mantelling; and must be the arms of the See of Canterbury, *viz.* the Pall in pale with the nowe Archbishoppe's armes, and the yeare of the Lord under them, *viz.* 1597. Over the said armes a free-stone square, with theis words in great letters, *viz.* SANCTÆ TRINITATI SACR. On the bare places over the gate, called (as I think) the ashler, this sentence following to be written in great capital letters, *viz.* :—Pro. 28. Qui Dat Pauperi non Indigebit."

It would appear that further contracts were entered into with carpenters and bricklayers respectively. Probably the way of employing men by the time for the job did not prove satisfactory. The MS. book from which Finch's letters are quoted by Garrow, entitled "The particular accounts of the Building of Trinitie Hospital alltogether with Graunt of Queen Elizabeth and other notes touching the same," contains the particulars of these contracts.

The Hospital took nearly four years to build, having been begun on January 17th, 1596, and finished September 29th, 1599. Up to 29th September, 1602, when the school-house and master's house were finished, the total cost of building was £2716 11s. 11d.

The chapel, or oratory, was dedicated on Monday, July 9th, 1599, by the Bishop of London.

A hospital for the relief of certain maimed, poor, needy, or impotent people was then founded by John Whitgift by virtue of an Act of Parliament in the 39th Elizabeth (A.D. 1596) to be incorporated as the Hospital of the Holy Trinity in Croydon, and have continuance for ever. There was to be one warden, and, including him, poor persons not to exceed forty.

In the manuscript volume at Lambeth, above mentioned, are the Statutes of Whitgift for the regulation of the Hospital. These are reproduced with the original spelling in pamphlet form, published by Hayward, of Croydon. [See Appendix.] These consist of twenty-one chapters, and thereby Whitgift no doubt believed that the future of his foundation was secured in every particular.

The deed of foundation does not allude to the school, but the statutes provide that one of the forty poor persons shall be a master of a common schoole in the school-house attached.

We may now review some of the internal history of the Hospital from its foundation.

Wardens.

From 1600 to 1898, when the present warden, Mr. Alfred Jones, was appointed, there have been, as shown by the records, forty-two wardens; but for the twenty-five years previous to Dr. Rose's time the books have disappeared.

The first warden was Walter Foster, appointed April 2nd, 1600.

The second warden was Master Edward Burton, M.A. This was the only scholar amongst the wardens. Fourteen wardens signed to "his mark" in lieu of name to everything, the schoolmaster's accounts included.

There is one solitary instance (noted below) of a warden being dismissed for dishonesty.

The fourth warden, Jasper Yardley, appointed in 1621, resigned to become warden of Archbishop Abbott's Hospital at Guildford. He left a benefaction to the poor of this Hospital, and £10 for panelling the chapel. I will refer to this point presently.

Visitations. (See Appendix, Cap. xxi.)

The first visitation was held in 1616 by assessors. As a consequence, the schoolmaster, Robert Davies, B.A., and a brother, were expelled, no cause being officially assigned; but the records show that no money was found in the Hospital alms-box for several quarters prior, and that afterwards money was found in it regularly every quarter.

The second visitation was in 1636, but no report is to be found.

The third visitation was in 1671. Result—injunction to Wm. Crowe, schoolmaster, and Geo. Cozens, warden; but nature of the injunction is not recorded.

The fourth visitation was in 1712. As an outcome, Archbishop Tennison gave £100 for money misapplied by John Cæsar, M.A., schoolmaster, deceased. It appears that in 1710 the accounts of the school were inquired into, and John Cæsar signed a bond in which he acknowledged that he owed the foundation £184 10s., and agreed not to take any stipend (£20 a year) until the debt had been paid off.

The fifth visitation was in 1717. The assessors report grievous abuses in granting leasings, and of spoil, damage, and waste, and prohibit any further leases and felling of timber, &c., without full approbation of the Archbishop in writing.

The sixth visitation was in 1719. Complaints against misappropriation declared unfounded. Injunction to inmates against frivolous and unfounded complaints.

The seventh visitation, however, so soon after as 1722, was followed by the dismissal of Wm. Ball, warden, for defalcation amounting to £8 3s. 1½d.

The eighth visitation was by the Archbishop's secretary in 1771. Complaints were considered about the division of fuel, and were settled satisfactorily.

The ninth and last visitation was in 1812. The Archbishop (Manners Sutton) visited in person. John Rose, D.D., was the schoolmaster. His accounts were looked into, and arrears to the amount of £233 were proved against him. The warden and brethren, dissatisfied with the above award, commenced the next year an action against Rose for misappropriating the funds of the foundation. The jury gave a verdict against him for £529 2s. 7d. over and above the amount already proved by the Archbishop. Researches of the present warden show some curious instances of the way in which the accounts kept by Rose, *and audited by himself*, were falsified.

The late warden, Mr. Lipscomb, was very pertinacious in picking out information from the ledger books. In 1885 I heard him read a paper on the Hospital before the Surrey Archæological Society. I have since had the MS. lent me by the present warden, and have looked up some of these entries in the ledger books.

For the notes about the wardens and visitations I am indebted to Mr. Alfred Jones, as, indeed, I am also for kindly and always ready help in inspecting and photographing the many objects of interest in the Hospital.

APPENDIX.

Statutes, &c.

CAP. I.

Of the number of those that are to be mainteyned in or by the Hospitall.

First, I do ordeine, that the number of the bretheren and sisteres of the saide Hospitall shallbe ever thirtie at the least, and so many more, under XL in all, as the revenues of the saide Hospitall, . . . may beare; . . . of the which number of bretheren, one shall teache a common schoole in Croydon in the schoolehouse there by me builded, and performe such other duties as is appointed unto him in these ordinaunces and status.

* * * * * * * *

CAP. II.

That women may be placed in the Hospitall.

I ordeine, that the saide Hospitall may have women placed in it, aswell as men; they the saide women being poore, and qualifide in like manner, forme, and degree, as is hereafter expressed in the statutes touchinge the seconde and third degree of those who are to be placed: Provided nevertheless, that at no time above one half parte of the whole number (not accounting in this behalf the wardein nor the schoole-maister) shall consiste of women only: Provided also, that the poore widowes of longeste continewance in Croydon and Lambethe, beinge quallifide accordinge to the ordinaunce, shalbe preffered before all others.

* * * * * * * *

CAP. IV.

* * * * * * * *

I ordeine and appointe, that the poore brother appointed to be the schoolmaster shall be a *parson* well qualifide for that function, that is to saye, an honest man, learnede in the Greeke and Lattin tongues, a good versifiere in bothe the foresayde languages, and able to write well, (if possible it may bee,) which poore brother appointed to that office, and quallified and placed as afore, shall have for his lodginge and dwellinge place, during the time that he contineweth schoolmaster, that howse which I have builded for that purpose, adioininge to the saide Hospitall, ...

The wardein from time to time, so often as the place shalbe voide, shalbe one of the poore brethren of the said Hospitall, and shalbe appointed by me the founder during my life; and after my deathe, and the deathe of suche wardeine as is allreadye appointed by myself, suche one of the poore brethrene shalbe chosen after moreninge prayere, in the chappell of the saide Hospitall, within seaven days after every suche vacation, as the greater parte of all, that is to saye of the schoole-master (if that place be then full) and of the other poore brethrene recconed together, and then present, shall chose to be wardein.

* * * * * * * *

The office of the wardeine shalbe to keepe one of the keyes of the comon chests and dore of the evidence-howse; to procure that the gates be locked and opened at due times appointed; and that the keyes on nightes be broughte unto him; to be present at all admissions and payinge of wages; to see that all enteries be duly made in the lidger booke, and the evidence well and safelye laide up and kepte; to keepe the keyes of the voide lodgings, and to deliver them to the next brother or sister newlye appointed; to looke in time to reparations, and to all other good husbandry of the Hospitall; to foresee that fire and candells be not daungerously kepte; to require and exacte of each one of the poore brethren and sisters the observation of the ordinaunces and statuts; and suche as be necligente and faultye gentlye to admonishe them, or, if the qualitie of the faulte so require, to complaine of the delinquents unto the Archbishopp of Canterburye, or the see archiepiscopall being voide, unto the Custos Spiritualitatis of the see of Canterbury for the time beinge, to whome I give authoritie to redress the same, accordinge to his discretion.

* * * * * * * *

CAP. VII.

Off the office of the poore brother that is appointed to be schoolemaster.

The schoolemaster shall freelye teache suche of the children of the parishe of Croydon, without exactinge any thinge for theire teachinge, as are of the poorer sorte, suche as shalbe so accounted by the vicar or curate of Croydon, and two of the better sorte of the inhabitants in Croydon.

CAP. VIII.

Of the yearely proportion of allowance of the members of the Hospitall.

Firste, the custos or wardeine shall have yerely six pounds extraordinary allowance; the schoolmaster beinge a member of the saide Hospitall, shall have yerely twenty poundes; and every other poore brother and sistere of the saide Hospitall shall have yerely five pounds apece allowance, over and beside such wood, corne, and other provisions to eache of the brethren and sisters, as nowe or hereafter shall, by God's providence, and by the devotion of charitable minded men, be allotted unto the saide Hospitall.

* * * * * * * *

CAP. XV.

Off the howse of the evidences, chestes, and comon seale.

Whereas I have allotted owte a speciall roome in the gatehowse next unto the streete, for keepinge of the evidences of the lands and revenewes of my saide Hospitall, and for other thinges of some momente, beinge not of daily use; I doe ordeine, that in the saide roome shalbe one cheste withe three lockes and keyes of severall wardes and fashions; one keye whereof to be kepte by the wardeine, another by the saide schoolemaster, and the third by the auncienteste brother, so he be able to goe and walke abroade, or ells the next in auncientye that is able; in whiche cheste shalbe kepte the comon seale, one coppy of theis ordinaunces, and suche stocke of mony as yearlye remaininge after all allowaunces shalbe reservid for reparations and for other necessarye disbursments.

* * * * * * * *

CAP. XVI.

I doe ordeine and appointe, that the saide Hospitall, uppon any reservation or otherwise, shall not encrease the rentes or revenues of those lands I leave, or shall give them any higher or greater proportion then as the rents thereof now are, and accordinge to that rate they are nowe lett for.

* * * * * * * *

And allso I doe ordeine and appointe, that such mony as they shall make or raise in fines uppon leases, or uppon sale of woods or trees, or by overpluss of their yearelye reavenues or otherwise shalbe laide upp in their comon treasorie, and kepte together untill it wile or shall amounte to the sume of a hundrethe pounds; and then the overpluss of that sume of a hundred pounds shalbe equalye devided by the wardeine or schoolemaster for the time beinge (calling to them two of the senior brethren) amongste all the poore brethren and sisters of the saide Hospitall, and then to have theire equall portions with the reste; which saide some cf one hundrethe pounds or under shalbe preserved and kepte in the place aforesaide, for any extraordinary occasions, as for sutes in lawe, reparations of the saide Hospitall and schoolehowse, and suche like; and as the same shalbe by such charges demineshed, so to be allways replenished with like receiptes as they shall come in or be receavide.

CAP. XVII.

* * * * * * * *

Every yeare, on the fourethe day of December, the schoolemaster, in the presence of the other two clavigers, and of all the other brethren and sisters that cann and wilbe presente, havinge caste up afore and sumed all accounts, aswell as receptes as of disbursments, for the yere endinge at the feaste of St. Michael next afore, shall declare unto them and goe over the perticulers of all the accounts for the said hole yere, that the estate of the Hospitall howe that it standethe may yerely so appere unto every one of them.

CAP. XXI.

* * * * * * * *

I doe ordeine, that my successors, Archbishops of Canterbury, shalbe the continewall patrons, governors, and visitors of the saide Hospitall: earnestlye requestinge them (in the bowelles of Christe) to have, frome time to time, a fatherly and compassionate care of theire good estate, and of the poore members thereof; and that they wolde be pleased from time to time (as occasion shalbe offered) to compose their controversies, to protecte, advise, order, governe, and direct them, and, when neede shall require, by themselves, or bye such discreite persons as they shall thinke fitt, in personn freelye to visite the saide Hospitall, and to enquire bothe of the publique state of itt, and also of the private demeanure of every perticuler member thereof, by suche a course as the lawes dothe allowe: which visitation I wolde hartilye wishe might at the leaste every third yeare be performed, whether there seeme anie necessarie occasion thereof or noe.

* * * * * * * *

(Signed) Jo. Cantuar.

Description of Plate.

Fig. 1.—Title-page of the "Treacle Bible" kept in the Audience Chamber, Whitgift Hospital.

Fig. 2.—Carved oak panelling over fireplace in Audience Chamber, with Archbishop Whitgift's arms in centre.

Fig. 3.—A group of a few of the things kept in the Audience Chamber: the "Treacle Bible," ledger books (that to the right is John Cæsar's book), the three survivors of a dozen wooden drinking bowls, two silver-gilt mazers, and the wooden base of the salt-cellar.

142.—On a Drift Deposit at Carshalton, and on Sections shown by the Cuttings for the Sewers.

By W. Whitaker, B.A., F.R.S., F.G.S., Assoc. Inst. C.E.

With a Note on the Mammalian Remains by E. T. Newton, F.R.S., F.G.S.

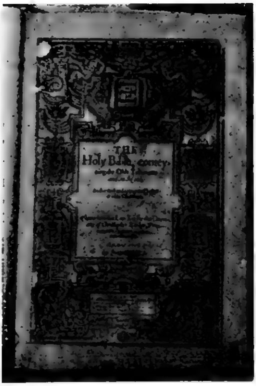
(Read December 21st, 1897.)

My friend Prof. W. W. Watts of Sutton lately took me to see the works being made for the disposal of the sewage of Carshalton, and, as he was about to leave the district (and also modestly depreciated his knowledge of the local geology), asked me to describe the sections shown.

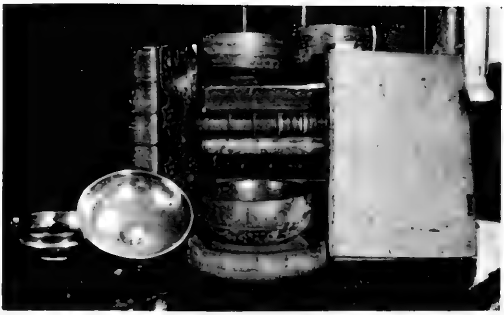
The works are north-westward of the village (I hope that our Carshalton friends will forgive me for using that term for so

2

1



3



To illustrate Dr. Hobson's paper on the Whitgift Hospital.

large a place) and just westward of The Park, whence the ground rises very slightly in that direction.

One point of interest in the sections is that they prove an error of omission on the Geological Survey map (sheet 8), for this particular part of which I am myself answerable. No twinge of conscience, however, comes over me for the error, and for at least two reasons: firstly, that it was committed many years ago; and secondly, because when committed there was practically no evidence to lead one to map Drift over this tract, and consequently it was left as London Clay, which formation certainly occurs at no great depth all over (or rather all under) the tract.

The deposit which has been found to form the surface is indeed of a kind that one had no reason to expect before the ground was opened. The Drift known in this neighbourhood was gravel, and, in the absence of anything to show the presence of gravel, Drift would not be mapped. The occurrence of sandy and loamy soil would not be taken as enough to justify the mapping of Drift, as such a soil might occur locally in a London Clay district. It was not indeed until the presence of sand over the surface was proved by trial that this ground was thought to be fitted for a sewage-farm, a purpose for which of course clay is not exactly suited. I believe that our member, Mr. Baldwin Latham, was as surprised as I was at finding so good a site in so handy a place for his work.

The above remarks are made merely to show some of the difficulties of mapping Drift, and not in the least to gloss over the faults of former years. I am far too old a geologist to feel the least shame at making a mistake, especially one of omission.

At my first visit to the works I roughly sketched, on the six-inch map, a possible boundary for the Drift here, limiting it to the higher ground, as a separate patch; but later visits have given further evidence of the extent of the deposit, showing it to extend eastward down the gentle slope until it joins the gravel of the lower ground. It will be convenient therefore to notice all the sections that have been seen at various times.

All the excavations seen show the presence of a mantle of sand, for the most part stoneless, though here and there a few flints occur in it. The boundary of this sand is mostly difficult to trace; but at two points, on the north, it was made fairly clear. Along the lane that forms the eastern border of the ground, the ditch (for the outfall) is in sand up to about the north-western corner of The Park, by the track to The Limes (E.N.E.), whilst at that spot the London Clay rises up to the surface. Again, about a sixth of a mile W.S.W. from this spot, in a slight hollow of the ground, there is peaty earth, caused by the damp springy nature of the ground, which results from the throwing out of water from permeable beds above by the London Clay below, this latter too having been laid open in some shallow excavations. The boundary of the sand, between the two spots above noted, seems to be along the hedge joining them (as engraved on the six-inch Ordnance Map), on the northern side of which the London Clay seems to form the gently rising ground, of which we may know more when the cemetery is established.

As to other parts, I decline to express any decided opinion regarding the boundary of the sand. Clay occurs along Wrythe Lane, to the west, and presumably forms the surface up to near Farm Cottage, close to the border of the sewage-farm. On the south, clay occurs at The Wrythe, and the sand therefore seems to end off somewhere in the fields northward of the former gas-works.

Perhaps the most interesting section was given by the excavation for the sludge-tank, just eastward of Farm Cottage, as many bones were found there at a considerable depth. The section was only in part open at the time of my first visit, and less so later. The Drift deposit is said to have been some 17 ft. deep, consisting mostly of sand, and the bones occurred 16 or 17 ft. down, in a loamy or clayey bed of a somewhat peaty character, whilst a specimen of the earth immediately below this, and resting on the London Clay, was a brownish-grey clay or sandy clay, with small bits of flint and of chalk, the latter mostly rounded, the bed being apparently made up largely of London Clay.

The most interesting find was a skull of *Rhinoceros*, and this curiously illustrated the absence of large stones in the sandy Drift; for the workmen used it as a firm rest for a plank whereon to trundle their barrows, an ignominious position from which it was rescued by Mr. W. W. Gale, the Surveyor to the Council, to whose ready help and freely given information we are much indebted. Luckily little damage had been done to the skull.

At the deep pump-well or tank just to the south, the sandy and loamy Drift was pierced to the depth of 18 ft., and then London Clay to a further depth of 37 ft. In the earth from the excavations, heaped up further southward, fragments of *Nautilus* were found in the septaria, or calcareous concretionary masses of stone, which were plentiful in the London Clay. Iron-pyrites, sometimes in the form of fossil wood, and Teredo borings also occurred.

Later on a large opening was made just northward of the sludge-tank, for the filter-beds, and a good section was to be seen for some time to a depth of about 10 ft. in the southern part. The beds shown were as follows:—

Brownish loam, with a few stones; the junction with the bed below slightly waved.
Sand, without stones, rather clayey at the base.
Sand said to occur below.

Smaller openings a little further northward also showed loam, in places, over sand.

Besides the sections shown at the works, there were also some interesting openings along the lines of sewers, of which the following notes may be of use, partly as helping to correct the lines on the Geological Survey Map.

In the middle of the northern part of Tile Green, or west of Leicester House, stony clay was found, pointing to the nearness of the edge of the gravel, the stones being merely the relic or wash of gravel. This was confirmed at various points just eastward, up to the road to Hack Bridge, gravel over London Clay being seen, and, by Nightingale Row, gravel.

In the road between the southern end of The Wrythe and the railway-station many large flints occurred in one layer in the gravel.

Along the south-western part of Papermill Lane the variously and brightly coloured mottled clays of the Woolwich and Reading Beds were cut into; and in North Street, immediately south of the junction with that lane, the green sand forming the bottom-bed of that formation was found, whilst further south was sand, showing the outcrop of the underlying Thanet Sand.

At Butter Hill, at the turn of the road eastward of Lower Mill, the following succession was noted:—

Presumably all Woolwich Beds.	Sand.
	Rock, with shells of *Ostrea* and *Cerithium*.
	Sand.

At the fork of Acre Lane with the road running north-east to Wallington Bridge, there was Thanet Sand. In the latter road, at the western end of the curve about half-way to Manor Road (or its continuation), the section seen was as follows:—

Made ground.
Thanet Sand: the clayey base with green-coated flints.
Chalk, of a washed or rubbly appearance.

And at the eastern end of the curve there was chalk-rubble. The junction of the Thanet Sand and the Chalk was therefore precisely marked.

In Park Lane, just south of Acre Lane, there was Thanet Sand for a little way; but further on loam over rubbly Chalk, again marking the junction.

In closing this paper, I wish to note the wise and liberal spirit in which the Carshalton Urban District Council has acted; firstly, in having specimens preserved; secondly, in placing their specimens in a public museum; and lastly, in making it a condition that those specimens should be duly noticed. There being no local museum either at Carshalton or at Croydon, I think that the Council took the best possible course in sending the choicer specimens to the Geological Museum in Jermyn Street, where they have met with the ever-ready attention of my friend and former colleague Mr. E. T. Newton, who himself went down and selected specimens.

Without waiting for a formal paper, the discovery was noticed by Prof. Watts and myself at the first meeting of the Geological Society in the session of 1897–8, an account of which will be found in Quart. Journ. Geol. Soc. vol. liv. p. ii; but I thought that it should not pass without a fuller description before a local society.

Note on the Mammalian Remains.

By E. T. Newton, F.R.S.

A number of mammalian bones were found at a depth of about fifteen feet below the sandy loam described by Mr. Whitaker, and a little above the London Clay. The remains discovered included the skull and other bones of a rhinoceros, a portion of the tusk of an elephant, and a number of bones belonging to two or three horses.

The chief interest centres in the remains of the rhinoceros. which, for reasons to be presently mentioned, indicate the age of the deposit in which they were found. The skull of this rhinoceros is unusually well preserved, notwithstanding that it has now lost its teeth, one molar arch, the tip of the nasal bones, and the nasal septum; it is 31 in. long in its present condition, and when perfect must have been at least an inch or two inches longer. The two large roughened bosses which are seen, one near the end of the nose and the other some way back, evidently supported each a horn similar to these of the two-horned rhinoceros of Africa (*Rhinoceros bicornis*). It is to be regretted that the teeth and nasal septum are wanting, for those were doubtless present when the skull was first discovered; and it is in these that the most characteristic features of the species are found. It is clear, however, from the fractured surfaces, that the bony nasal septum was well developed, and from this and the form of the skull it is concluded that it belonged to the woolly rhinoceros (*Rhinoceros antiquitatis*). Besides the skull one perfect bone of the fore-limb, the radius, was found, as well as a portion of a hind leg-bone, the tibia, and a rib.

The only portion of an elephant discovered was a piece of the base of a large tusk, which when perfect must have been nearly

7 in. in diameter; and, judging from two tusks in the Museum of Practical Geology, which are $7\frac{1}{2}$ in. and $6\frac{3}{4}$ in. in diameter, and have a length respectively of 12 ft. and 10 ft., this tusk must have been about 10 ft. in length. The fragment preserved is insufficient for specific determination, but in all probability it belonged to the mammoth (*Elephas primigenius*).

The remains of horses included portions of limb, haunch, and shoulder bones, as well as vertebræ, and belonged to animals of two or three different sizes. The bones of Pleistocene horses cannot be distinguished from those of the domestic horse of the present day (*Equus caballus*); but those from Carshalton are in much the same state of preservation as the bones of the rhinoceros, and most likely are of the same age.

With regard to the geological position of the deposit in which these mammalian remains were found, there is really little available evidence beyond that which may be derived from the bones themselves. *Rhinoceros antiquitatis* and *Elephas primigenius* are unquestionably Pleistocene forms, and horses' bones are frequently met with in the same deposits; but it is quite within the range of possibility that deposits such as these may have been of more recent origin, and derived from the denudation of Pleistocene beds, in which case it might well happen that bones of Pleistocene animals were again buried in the more modern deposit. If such were the case, then the osseous remains would show signs of such derivation by being water-worn and more or less denuded; moreover, it is very unlikely that portions of the same skeleton would be found together. Now, the rhinoceros skull and limb-bones found at Carshalton show no signs of such denudation; and besides this, the finding of several parts of the skeleton together points to the entire skeleton being present when deposited in this bed, and to the bones being but little scattered when they were covered up by the loam. Such being the case, we are justified in concluding that these beds were accumulated at the time when the *woolly rhinoceros* was living in the neighbourhood, and that they are therefore of Pleistocene age.

143.—Report of the Meteorological Sub-Committee for 1898.

Prepared by the Hon. Sec., Francis Campbell-Bayard, P.R. Met. Soc.

(Read February 15th, 1899.)

The arrangements for observing the daily rainfall round Croydon have been successfully carried out on the same plan as before, and with, it is hoped, the same efficiency. The number of stations in the printed sheet is 78, a decrease of three on the preceding year, and there are three stations (Dulwich Wood Park, Upper Norwood, Feniton, Farnborough, and The Tower, Knockholt) not in the printed sheet, the observations of which are quite complete, and will be found at the end of this Report.

Two stations, the Hermitage, Walton Heath, and The Cottage, Kenley, have come to an end owing to the discontinuance of the observations, and one, Mulgrave Road, Sutton, through the death of the observer, Mr. William Goode. The loss of this latter station is especially to be regretted, for it had been in successful operation for twenty-one and a half years. It is, however, a great matter for congratulation that the rainfall records of this station are in the possession of the Hon. Sec. The vacancies caused by these losses have, however, been filled up by the accession of new observers.

The monthly sheets contain all the records, with the exception of Upper Norwood, Farnborough, and The Tower, Knockholt, which have been received by the Sub-Committee, and the stations, of which the records have been tabulated and printed, number 78 as against 81 in 1897, but the same as in 1896, and the number of observers is 64 as compared with 68 in 1897 and 66 in 1896.

Appendix I. to this Report contains a list of the observers, with particulars relating to the stations and gauges, and also the monthly tables of daily rainfall, of which a sufficient number have from time to time been pulled for the use of the Club; and Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from the monthly tables in Appendix I.

This year has been one of very short rainfall, there having been at Greenwich only four months with a rainfall above the average, all the other months being months of very small rainfall. The records of Greenwich, commencing in 1816; at Mt. Ararat, Wimbledon, commencing in 1854; at Surbiton, commencing in 1855; and at Redhill, commencing in 1867, have been carefully examined, and all years with a smaller annual rainfall than the present year have been extracted, with the result that there are only six such years at Greenwich, five at Wimbledon, two at Surbiton, and none at all at Redhill. These years of small rainfall are shown in the table.

YEARS OF RAINFALL SMALLER THAN 1898.

Greenwich	Wimbledon	Surbiton	Redhill
in.	in.	in.	
1840 .. 16·43	1854 .. 14·95	1884 .. 15·06	
1847 .. 17·61	1858 .. 18·63	1887 .. 18·30	
1858 .. 17·70	1864 .. 16·37		None
1864 .. 16·38	1870 .. 18·22		
1870 .. 18·55	1884 .. 16·80		
1884 .. 18·05			
1898 .. 18·85	1898 .. 18·97	1898 .. 18·55	1898 .. 22·59

The significance of the above table, if carefully studied, is very great. It shows conclusively how small the rainfall of 1898 was, and how well founded were the complaints of a great scarcity of water. In order to show this more in detail, I have again constructed tables for Greenwich, Surbiton, and Mt. Ararat, Wimbledon, similar to those in last year's Report.

Tables A and B refer to Greenwich. Table A shows that the rainfall of 1898 is 6·11 in. below the 80 years' average, whilst table B shows that it is 5·37 in. below the 40 years' average; the difference between the two tables being 0·74 in., the same as last year. The great deficiency in the rainfall in the months of January, July, August, and September are specially noticeable.

When we look at the three tables B, C, and D, a great difference, as compared with the similar tables in last year's Report, is noticeable. Here we have the greatest deficiency 5·87 in. at Surbiton, and the smallest 5·09 in. at Wimbledon, the deficiency at Greenwich being nearly midway between the two. This is a very different result to that shown in last year's Report, where there was a deficiency of 2·14 in. at Greenwich, and an actual excess at Surbiton and Wimbledon of 0·01 in. and 0·04 in. respectively. In these three tables the great deficiency in the rainfall of the four months of January, July, August and September will again be noticed. There is a curious feature in table D, referring to Wimbledon, in that there is an actual excess in the month of March, an excess which appears to have been in a great measure occasioned by the fall on the 25th being heavier at Wimbledon than at Surbiton and Greenwich.

In Appendix II. the falls of rain of 1·00 in. and upwards are set out, and the very small number of days, *viz.* five, and the smallness of the amounts, not one being 2·00 in., are especially noticeable. The restricted areas of the localities where these maximum falls occurred is curious, there seeming to be no very generally large fall throughout the district on the days mentioned in this Appendix.

A.—*Greenwich Average* 80 *Yrs.* (1816–95).

	Average	1898	± Average
	IN.	IN.	IN.
Jan.	1·89	0·71	– 1·18
Feb.	1·59	1·13	– 0·46
March	1·52	1·40	– 0·12
April	1·65	0·93	– 0·72
May	2·00	2·64	+ 0·64
June	1·95	1·75	– 0·20
July	2·60	1·33	– 1·27
Aug.	2·33	0·87	– 1·46
Sept.	2·30	0·30	– 2·00
Oct.	2·82	3·15	+ 0·33
Nov.	2·37	2·41	+ 0·04
Dec.	1·94	2·23	+ 0·29
Year	24·96	18·85	– 6·11

B.—*Greenwich Average* 40 *Yrs.* (1856–95).

	Average	1898	± Average
	IN.	IN.	IN.
Jan.	1·98	0·71	– 1·27
Feb.	1·43	1·13	– 0·30
March	1·44	1·40	– 0·04
April	1·61	0·93	– 0·68
May	1·94	2·64	+ 0·70
June	2·04	1·75	– 0·29
July	2·42	1·33	– 1·09
Aug.	2·30	0·87	– 1·43
Sept.	2·18	0·30	– 1·88
Oct.	2·75	3·15	+ 0·40
Nov.	2·19	2·41	+ 0·22
Dec.	1·94	2·23	+ 0·29
Year	24·22	18·85	– 5·37

C.—*Surbiton Average* 40 *Yrs.* (1856–95).

	Average	1898	± Average
	IN.	IN.	IN.
Jan.	2·04	0·81	– 1·23
Feb.	1·47	1·13	– 0·34
March	1·44	1·24	– 0·20
April	1·64	0·94	– 0·70
May	1·92	2·60	+ 0·68
June	2·08	1·32	– 0·76
July	2·37	0·53	– 1·84
Aug.	2·43	1·36	– 1·07
Sept.	2·21	0·43	– 1·78
Oct.	2·81	3·14	+ 0·33
Nov.	2·16	2·64	+ 0·48
Dec.	1·85	2·41	+ 0·56
Year	24·42	18·55	– 5·87

D.—*Mt. Ararat, Wim., Av.* 40 *Yrs.* (1856–95).

	Average	1898	± Average
	IN.	IN.	IN.
Jan.	1·79	0·86	– 0·93
Feb.	1·38	1·31	– 0·07
March	1·33	1·50	+ 0·17
April	1·64	0·93	– 0·71
May	1·92	2·50	+ 0·58
June	2·08	1·12	– 0·96
July	2·49	0·85	– 1·64
Aug.	2·31	1·13	– 1·18
Sept.	2·28	0·39	– 1·89
Oct.	2·88	3·57	+ 0·69
Nov.	2·19	2·33	+ 0·14
Dec.	1·77	2·48	+ 0·71
Year	24·06	18·97	– 5·09

I should like to draw attention to the great differences between the two gauges at Knockholt, *viz.* the one in the field, which appears in the monthly sheets in Appendix I., and the one on the tower, which appears at the end of this Report. Both of these are gauges which are taken monthly, and in every month the total from the field gauge is larger than from the tower gauge; the total excess of the field gauge over the tower gauge is 6·96 in. It will be particularly noticed, if we examine these returns with the carefulness that they deserve, that where the month's rainfall is small, the differences between the field and the tower gauges is much less in proportion than when the month's rainfall is large. One would have thought that the percentage of the difference would have been constant, but this does not appear to be the case.

As is probably well known, the Committee of the Club, through the Honorary Secretary of the Meteorological Sub-Committee, approached the observers with the object of asking them to become members of the Club, or to give a small donation towards the expenses of the Meteorological Sub-Committee. The response has been most gratifying; many of the observers have become members of the Club, and the number of observers who have not become members but have given donations towards the expenses of the Sub-Committee is eleven, as against five in the previous year. The Sub-Committee desire to express their thanks to the observers for their very cordial co-operation in the rainfall work of the Club, for without them such a work could never be carried on.

7, Dulwich Wood Park, Upper Norwood, S.E.

Observer—T. P. Caldicott. Gauge 5 in. in diameter.
Height of gauge above ground, 1 ft. 2 in.
Height of station above sea-level, 276 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
0·76	1·18	1·41	1·07	3·10	1·46	0·89	0·96	0·29	2·74	2·66	2·40	18·92

Feniton, Farnborough, Kent.

Observer—Miss F. M. Percy. Gauge 5 in. in diameter.
Height of gauge above ground, 1 ft.
Height of station above sea-level, 376 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
0·55	1·30	1·40	1·28	3·13	1·93	0·54	1·13	0·48	3·48	3·36	2·45	21·03

The Tower, Knockholt Beeches, Kent.

Observer—W. Morris. Gauge 5 in. in diameter.
Height of gauge above ground, 24 ft. 6 in.
Height of station above sea-level, 812 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
0·56	1·03	0.76	1·01	2·96	2·27	0·53	1·06	0·41	2·88	2·56	1·93	17·96

APPENDIX I.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB

(Meteorological Sub-Committee.)

No.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
			IN.	FT.	IN.	FT.
	Abinger (The Hall)	The Lord Farrer	8	2	0	320
	Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
	Dorking (Denbies)	J. Beesley	5	0	6	610
	Walton Heath (The Hermitage)	S. Bostock	5	1	2	650
5	Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
	Nutfield (The Priory)	J. Moffatt	8	1	2	468
	Nutfield (The Priory) 2nd gauge	J. Moffatt	8	1	2	331
	Buckland (Hartswood)	R. W. Clutton	5	1	0½	174
	Reigate (The Briars)	Mrs. Barclay	5	1	0	430
10	Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
	Upper Gatton (Upper Gatton Park)	F. Druce	5	1	0	600
	Merstham (Rockshaw)	W. Gardiner	5	1	0	475
	Harp's Oak Cottage	R. C. Grant	5	1	0	454
	Chipstead (Shabden Park)	J. Crerar	5	1	0	550
15	Chaldon (The Rectory)	Rev. G. E. Belcher	5	1	0	542
	Caterham (Metropolitan Asylum)	G. S. Elliott, M.D.	5	1	0	610
	Westerham (The Fishponds)	W. Morris	5	1	0	380
	Knockholt (The Beeches)	W. Morris	5	1	0	785
	Sevenoaks (St. Johns Hill)	W. W. Wagstaffe	5	1	10	380
20	Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
	Coulsdon (The Grange)	W. J. Stride	5	1	4	525
	Kenley (Hazelea)	Mrs. Carr-Dyer	5	1	0	282
	Kenley (The Cottage)	J. B. Snell	5	1	0	294
	Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
25	Leatherhead (Downside)	A. Tate	5	1	0	250
	Ashtead (D'Abernon Chase)	Sir W. Vincent, Bart.	5	1	0	280
	Oxshott (Beverstone)	W. H. Dines	5	1	0	212
	Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
	Sutton (Mulgrave Road)	W. Goode	5	5	6	230
30	Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
	Beddington (Riverside)	S. Rostron	5	1	0	120
	Waddon (Waddon House)	P. Crowley	5	1	0	156
	Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
	Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
35	Croydon (Duppas House)	Baldwin Latham	8	1	0	158
	Croydon (Whitgift School)	A. E. Watson	5	1	0	191
	Croydon (Woburn Road)	M. L. Craven	5	1	1	178

No.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
			IN.	FT.	IN.	FT.
	Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
	Addington Hills (The Reservoir)..	Croydon Corporation	8	0	9	473
40	Addington (Park Farm)	W. Whalley	5	1	0	268
	Addington (Pumping Station)....	Croydon Corporation	8	1	0	331
	West Wickham (Wickham Court)	Sir J. F. Lennard, Bt.	5	1	2	300
	Hayes Common (The Warren) ..	Miss Akers	5	1	0	296
	Keston (Bradfield)	A. Hill	5	1	0	350
45	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
	Farningham Hill (Hill House) ..	A. J. Waring	5	3	0	300
	Chislehurst (Hawkwood)	Miss Edlmann	5	1	0	300
	Wilmington (Kent Water Co.)....	W. Morris	5	1	0	25
	Dartford (West Hill House)	Lieut.-Col. C. N. Kidd	5	1	3	100
50	Sidcup (Hatherley Road)	Lionel Burrell, M.D.	5	1	2	160
	Bickley (The High Field)	J. Batten	5	1	2	295
	Bromley (The Palace)	Coles Child	5	1	0	187
	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
	Beckenham (Cedars Road)	H. Dolling-Smith ..	5	1	0	105
55	South Norwood (Apsley Road) ..	W. H. Cullis........	5	1	0	125
	Thornton Heath (Thornton Road).	H. Wright	8	0	10	120
	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
	Raynes Park (Pumping Station)..	C. H. Cooper	5	1	0	47
60	New Malden (Sewage Works)	T. V. H. Davison....	5	1	0	45
	Esher (Sewage Works)..........	A. J. Henderson	5	1	0	40
	West Molesey (Chelsea W. Co.)..	R. Hack............	5	1	0	32
	Surbiton (Seething Wells)	R. Hack............	10	0	6	25
	Kingston (Sewage Works)	T. Stevens..........	5	1	0	25
65	Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
	Putney Heath (The Reservoirs)..	R. Hack............	5	1	0	180
	Wandsworth Com. (Patten Road).	F. J. Brodie	5	1	0	100
	Streatham (Woodfield Avenue)...	F. Jordan	5	1	0	120
	West Norwood (Thornlaw Road)..	W. Marriott	8	1	0	220
70	Sydenham (Newlands Park)	O. Jepson, M.D.	5	1	0	136
	Forest Hill (Dartmouth Road) ...	L. W. F. Behrens ..	5	1	0	220
	Forest Hill (S. & V. Water Co.)..	J. W. Restler	5	1	0	344
	Eltham (High Street)	W. Morris	5	1	0	245
	Greenwich (Royal Observatory)..	Astronomer Royal ..	8	0	5	155
75	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
	Nunhead (S. & V. Water Co.)....	J. W. Restler	5	4	0	176
	Brixton (Acre Lane)	F. Gaster	8	1	0	77
	Battersea (S. & V. Water Co.) ...	J. W. Restler	5	3	0	21

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(January, 1898.)

The month has been extremely warm, dry, cloudy, and calm. It is certainly very remarkable that the winter anticyclonic conditions have brought warmth and not cold. It has also been foggy. The month has been an extremely unhealthy one, influenza being very prevalent, and, in some places, measles, diphtheria, and scarlet fever. The rainfall is only about one-third of the average. Owing to the warmth, there are many wild flowers out. At Chislehurst snowdrops were out on the 5th, and the yellow aconite, *Pyrus japonica*, and crocus on the 10th, and at the end of the month there were violets, coloured and wild primroses, liverwort, and the yellow coltsfoot; and at Croydon the winter aconite flowered on the 10th, the snowdrop and yellow crocus on the 15th, and the *Scilla bifolia* on the 30th. Green vegetables are plentiful and good. The great tit was heard at Nutfield on the 28th; and in the middle of the month at Chelsfield a nest of young blackbirds was found. At Croydon (Park Hill) the maximum thermometer was 50° and above on eight days, and below 40° on three days; whilst the minimum stood at 40° and above on nine days. A solar halo was seen at Upper Gatton on the 10th, and a lunar one at Nutfield on the 2nd. The mean temperature of the month is about 6·5° above the average, and was at Croydon (Whitgift) 43·7°, at Wallington 43·3°, at Croydon (Duppas House) 43·1°, at Waddon 42·8°, at Redhill 42·4°, at Chipstead, Sevenoaks, and Sidcup 42°, and at Upper Gatton 41·9°. There were recorded at Upper Gatton 30·5 hours of bright sunshine, and at Hayes Common 32·1 hours, and Wallington 29·6 hours of sunlight; which latter is seven per cent. below the January mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Mersham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·16	·16	·14	·30	·18	·17	·17	·17	·17	·17	·19	·13	·16
2	..	..	..	..	..	·02	·02	·01	·01	..	·01	·01	·01
3	..	..	·02	..	·02	·01	·01	·02	·01	·02	·01	..	..
4	·06	·01	·05	·06	·01	·03	·03	..	·03	·02	·05	·03	·04
5	·20	·24	·35	·40	·29	·26	·26	·21	·27	·31	·32	·35	·33
6	·07	·07	·09	·12	·05	·05	·05	·06	·06	·07	·10	·08	·11
7	..	..	..	..	..	..	..	..	..	..	·01	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	·01
9	..	..	..	..	..	·01	·01	..	..	·01	..	..	..
10	..	..	..	..	..	..	..	..	..	..	·01	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·02	..	..	..	·01	..	·01	..	..	..	..	..	..
17	·01	..	·02	..	·02	·01	·02	..	·02	·01	·01	..	·01
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	·01	..	..	..	·01	·02	·01	..	..	·01	·02	·01
20	·05	·03	·07	·12	·03	·04	·05	·04	·03	·03	·04	·04	·03
21	..	..	..	..	..	..	..	..	·01	·01	·01	..	·01
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·01	..	·02	·03	·02	·02	·02	..	·01	·01	·02	·01	·01
30	·02	·02	·04	..	·05	·05	·05	·04	·04	·05	·04	·05	·04
31	·17	·18	·15	·20	·16	·16	·16	·14	·15	·15	·14	·15	·14
*	·77	·72	·95	1·23	·84	·84	·88	·70	·81	·86	·97	·87	·91
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Leather-head	Ashtead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·18	·17	·16	·05		·10	·11	·14	·13	·13	·15	·17	·16
2	·01	·01	..	..		..	..	·01	·01	·01	..	..	·03
3	..	..	..	..		..	..	..	..	·01	..	..	..
4	·04	·06	·06	·07		·06	·03	·03	·04	·04	·08	..	·05
5	·29	·32	·35	·32		·18	·29	·24	·29	·27	·25	·33	·29
6	·09	·11	·10	..		·06	..	·05	·07	·07	·08	..	·08
7	..	..	..	..		..	..	..	..	..	..	..	..
8	..	..	..	..		..	..	..	..	..	..	..	..
9	·01	..	..	..		..	..	..	..	..	..	..	..
10	..	..	..	..		..	..	..	..	..	..	..	..
11	..	..	..	..		..	..	..	..	..	..	..	..
12	..	..	..	..		..	..	..	..	..	..	..	..
13	..	..	..	..		..	..	..	..	..	..	..	..
14	..	..	..	..		..	..	..	·01	..	..	..	..
15	..	..	..	..		..	..	..	..	..	..	..	..
16	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
17	·01	..	..	..		..	..	..	..	·01	..	..	·03
18	..	..	..	..		..	..	·02	..	..	·02	..	..
19	·01	·03	·04	..		·02	·09	·02	·01	..	·04	..	..
20	·05	·04	·05	·04		01	·06	·03	·05	·04	·08	·14	·13
21	·01	..	..	..		..	..	·01	·02	·02	·03	..	·01
22	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..		..	..	..	..	..	..	..	..
26	..	..	..	..		..	..	..	..	..	..	..	..
27	..	..	..	..		..	..	..	..	..	..	..	..
28	..	..	..	..		..	..	..	..	..	..	..	..
29	·01	·02	·04	·02		·02	..	·01	·02	·02	·04	..	·02
30	·04	..	·05	..		·02	·05	·02	·04	·02	·05	·06	·04
31	·13	·17	·13	·13		·08	·09	·07	·09	·09	·08	·12	·12
*	·88	·93	·98	·63	·72	·55	·72	·65	·78	·73	·90	·82	·96
†	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* January, 1898.

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·15	·22	·19	·16	·14	·13	·12	·12	·13	·12	·12	·11	·09	·10	·08	·08	·08	·07	·07	·10	·07	·07	·07	·06	·06	·08
2	..	·02	..	..	..	..	..	·01	·01	·01	..	..	·02	..	·01	·01	·02	·01	..	·03	..	..	..	·01	·01	..
3	..	·02	..	·01	..	·01	..	..	·01	·01	..	·01	·01	..	·01	..	·01	·01	..	·02	..	..	..	..	·01	·02
4	·08	·06	·07	·05	·05	·05	..	·06	·05	·06	·03	·04	·05	·01	·04	·03	·04	·03	..	·04	·05	·02	·03	·04	·03	·03
5	·25	·28	·29	·26	·28	·24	·33	·24	·26	·27	·32	·28	·26	·30	·28	·31	·26	·22	·27	·20	·23	·17	·20	·22	·28	·28
6	·08	·07	·07	·06	·06	·05	·05	·05	·05	·05	·05	·05	·05	·04	·04	·02	·04	·03	·03	·03	·03	..	·04	·05	·03	·05
7	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	·01	..	·02	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	·03	..	..	..	..
10	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	·01	..	·02	..	..	..	..	..	·01	·02	..	·01	..	·01	·01	..	·01	..	..	..	·01	·01	..
18	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
19	·01	·03	·02	·02	·02	·02	..	·01	·02	·01	..	·01	·02	..	·02	·03	..	..	..	..	..	·01	·03	·01	..	..
20	·10	·06	·10	·08	·08	·08	·10	·08	·10	·09	·09	·09	·07	·06	·05	·05	·05	·03	·02	·05	·09	·05	·09	·08	·07	·08
21	..	..	..	..	..	·01	..	·01	·01	..	·02	..	..	·02	·01	..	..	·01	..	..	..	..	..	..	..	·01
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	..	·03	·02	·01	·02	..	..	·02	·02	·01	·01	·02	..	·01	..	..	..	..	..	..	..	..	..	·01	·01
30	·03	·06	·03	·03	·02	·03	·03	·03	·03	·01	·02	·03	·03	·02	·02	·01	·01	·02	·01	·01	..	·01	·02	·03	·01	·02
31	·12	·11	·08	·06	·07	·06	·06	·06	·06	·07	·08	·07	·08	·09	·08	·08	·09	·06	·07	·08	·07	·07	·06	·06	·07	·09
*	·86	·95	·88	·76	·73	·72	·69	·67	·80	·72	·74	·71	·73	·64	·68	·62	·63	·50	·47	·61	·54	·43	·54	·58	·59	·68
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh. rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·08	·08	·13	·14	·14	·15	·10	·14	·15	·11	·13	·13	·13	·11	·11	·13	·09	·10	·08	·16	·07	·07	·06	·10	·08
2	..	..	..	..	·01	·01	..	..	..	..	..	..	..	·01	..	..	·01	..	..	·01	·01	..	..	..	..	..
3	..	..	..	·01	·01	..	·02	..	..	..	..	·02	·01	..	..	·01	·01	·01	..	·01	·01	·01	..	..	..	..
4	·05	·04	..	·08	·06	·05	·06	·11	·07	·09	·06	·08	·13	·07	·10	·08	·06	·05	·04	·06	·06	·07	·05	·07	·05	·05
5	·23	·25	·22	·25	·27	·31	·31	·25	·30	·28	·27	·30	·24	·30	·29	·22	·31	·28	·31	·29	·29	·27	·27	·22	·32	·25
6	·03	·05	·05	·06	·09	·09	·08	·10	·10	·10	·10	·12	·11	·11	·09	·10	·10	·07	·09	·09	·05	·08	·06	·06	·07	·10
7	..	..	·05	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..
11	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	·01	·01	·03	..	..	·01	..	..	·01	·01	..	·01	·01	·01	..	·01	..	·01	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	·02	·04	·01	·03	·02	·02	·03	·02	..	·04	·04	·03	·02	·01	·01	..	·02	·01	·02	·01	·01	·02	·02
20	·07	·09	·10	·12	·10	·13	·11	·13	·14	·11	·13	·16	·08	·11	·13	·11	·07	·11	·12	·10	·09	·09	·07	·08	·10	·08
21	·02	·01	..	..	..	..	·01	..	..	..	..	..	..	·01	·01	·01	..	..	..	·01	·01	..	..	..	·01	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·01	..	..	..	·01	·03	·03	·03	·03	·02	·01	·04	·04	·02	·01	·01	·01	·01	·02	·01	..	·01	..	..	·01	·01
30	·02	·02	..	·03	·01	·01	·02	·02	·03	·02	·02	..	·02	·01	·02	·02	·02	·02	..	·02	·02	·02	·01	·01	·02	..
31	·08	·08	·07	·07	·07	·06	·07	·06	·09	·09	·09	·08	·07	·07	·08	·08	·08	·09	·12	·08	·05	·06	·06	·05	·07	·06
*	·58	·62	·60	·78	·86	·86	·92	·82	·93	·90	·81	·93	·90	·89	·89	·79	·82	·77	·80	·80	·76	·71	·60	·56	·78	·65
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(February, 1898.)

The month has been warm, with about an average amount of sunshine, but a rather short rainfall. There have been several snow showers, that on the 20th being the most severe. The month has been very unhealthy, influenza and measles being widely prevalent, as also scarlet fever. The rainfall is roughly about two-thirds of the average, a condition of things which gives rise to very serious apprehensions as to our water supply. The almond tree flowered at Sidcup on the 12th, and at Wallington on the 15th, which is, so far as Sidcup is concerned, the earliest date of flowering by sixteen days. The relatively cold nights have checked vegetation. At Nutfield rooks began to build on the 6th, but left off about the 17th for a few days, and then began again on the 28th. At Croydon (Park Hill) the maximum thermometer was 50° and above on four days, and below 40° on three days; whilst the minimum was below 40° on twenty-four days. A solar halo was seen at Upper Gatton and Wallington on the 8th. The mean temperature of the month is about 2° above the average, and was at Wallington 41·7°, at Croydon (Whitgift) 41·4°, at Croydon (Duppas House) 41·2°, at Chipstead 40·1°, and at Redhill 40°. There were recorded at Wallington 61·3 hours of sunlight, which is the February average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Leather-head	Ashtead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·23	..	..	·01	·02	·02	·01	·02	·01	·01	·04	·01	·02	·02	·03	·03		·04	..	·02	·02	·02	·03	..	·02
2	..	..	·02	·02	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
3	·24	·03	·19	·15	·12	·15	·17	·08	..	·10	·16	·39	·23	·22	·25	·12	·28		·15	·17	·20	·15	·14	·15	·13	·06
4	·04	·04	·05	..	·08	·05	·04	..	·03	·07	·04	·06	·06	·05	·05	·10	..		..	·09	·06	·08	·09	·12	·04	·07
5	·21	·27	·20	·20	·16	·19	·19	·20	·17	·19	·18	·30	·19	·19	·23	·15	·33		·42	·16	·20	·16	·15	·15	·15	·13
6	·12	·10	·08	·15	·12	·08	·09	·09	·09	·08	·09	·11	·12	·11	·11	..	..		·08	·09	·07	·11	·11	·06	·10	·09
7	·02	·03	..	..	·01	·01	·01	..	..	·01	·01	..	·01	·01	·02	..	..		..	·02	·01	·01	·01	..	..	·01
8	·05	·05	·04	·06	·03	·03	·03	..	·03	·04	·03	·04	·04	·03	·02	..	·02		·08	·03	..	..	..	·03	..	·04
9	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..		..	..	..	..	·01	..	..	..
10	·01	..	..	..	·01	·01	·01	..	..	..	·01	..	·01	..	..	..	·06		..	·01	..	·02	..	..	..	..
11	..	..	..	·01	·01	·01	·01	..	·01	·01	·01	·01	·01	·03	·02	..	..		..	·02	·01	·02	..	·02	..	..
12	..	·07	·08	·03	·01	·02	·01	·05	·03	·03	·03	·05	·03	·01	·07	..	..		·02	·04	·01	·03	·03	..	..	·02
13	·07	·06	·10	·15	·12	·10	·09	·04	·15	·13	·13	·13	·12	·09	·07	·12	·33		·12	·11	·10	·08	·09	..	·16	·08
14	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·01	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
17	·17	·16	·20	·25	·19	·18	·19	·17	·20	·19	·19	·16	·16	·17	·15	·15	·04		·08	·14	·13	·14	·14	·20	·18	·20
18	·24	·23	·19	·23	·16	·14	·16	·14	·18	·17	·18	·19	·18	·18	·17	·17	·22		·12	·18	·06	·17	·18	·25	·20	·20
19	·01	..	·04	..	..	·01	..	·02	·02	·01	..	·01	·01	..	·02	..	..		..	..	..	·01	..	..	..	..
20	..	..	..	·05	·04	·01	·04	..	·04	..	·04	·04	·05	·06	·04	·04	..		·04	·07	·14	·06	·08	..	·03	..
21	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	·01	..	·04	·03	..	..	..	..	..	·03	·02	..	·01	·02	..	..	..		..	·01	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	·11	·16	·10	·12	·11	·09	·11	·10	·12	·11	·08	·10	·09	·08	·10	..	·15		·10	·10	·08	·12	·12	·16	·15	·09
26	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	·02	·05	..		·02	·03	..	..	..	·05	..	..
27	·21	·20	·15	·11	·12	·14	·10	·10	·11	·10	·10	·13	·11	·08	·09	·12	·14		·21	·20	·11	·22	·21	·33	·09	·10
28	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01		..	·02	..	·01	..	·02	..	..
*	1·54	1·63	1·48	1·56	1·30	1·24	1·26	1·01	1·20	1·28	1·31	1·76	1·48	1·35	1·45	1·05	1·61	1·62	1·48	1·49	1·20	1·41	1·39	1·57	1·23	1·11
†	2·31	2·35	2·43	2·79	2·14	2·08	2·14	1·71	2·01	2·14	2·28	2·63	2·39	2·23	2·38	2·03	2·24	2·34	2·03	2·21	1·85	2·19	2·12	2·47	2·05	2·07

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1898.**

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	..	..	·01	·01	·01	..	..	·01	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·10	·29	·17	·12	·11	·11	·12	·13	·13	·21	·20	·20	·19
4	·04	·05	·03	·06	·07	·06	·05	·06	·07	·07	·08	·08	·06
5	·14	·16	·15	·15	·15	·15	·16	·20	·16	·18	·17	·15	·11
6	·07	·10	·09	·06	·08	·07	·12	·02	·07	·07	·08	·08	·09
7	·02	·03	·01	..	..	·01	..	..	..	..	..	..	..
8	·07	·04	..	·01	·03	·02	·04	..	·04	·03	·03	·04	·04
9	..	..	..	..	..	..	..	..	·01	..	·01	..	..
10	..	..	..	..	..	..	..	..	..	..	..	·01	..
11	·01	·03	·03	·01	·01	·02	·02	·04	·02	·02	·01	·01	·04
12	·03	·04	·02	·02	·02	·03	..	·06	·02	·04	·02	·01	·02
13	·05	·10	·09	·08	·08	·08	·09	·02	·08	·06	·09	·08	·08
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	·01
17	·19	·15	·14	·14	·13	·12	·12	·13	·13	·15	·14	·15	·15
18	·20	·20	·17	·16	·16	·16	·16	·18	·18	·18	·17	·16	·16
19	..	..	..	..	..	..	..	..	..	·01	·01	·01	..
20	·04	·06	·02	·01	·01	·01	..	..	·01	·01	·01	·01	·03
21	..	..	..	·01	..	..	..	..	..	·01	·01	·01	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·01	..	·04	·03	·03	·04	·03	..	·02	·04	·03	·01	·01
24	..	..	..	..	..	..	..	..	·01	..	..	..	..
25	·08	·12	·08	·07	·07	·08	·05	·09	·07	·08	·07	·07	·08
26	..	..	..	..	..	·01	..	..	..	·09	..	·01	·01
27	·12	·12	·22	·23	·27	·27	·28	·26	·28	·26	·31	·30	·26
28	..	..	..	..	..	..	..	..	·01	..	·01	..	..
*	1·19	1·49	1·26	1·17	1·23	1·25	1·24	1·19	1·32	1·51	1·45	1·39	1·34
†	2·05	2·44	2·14	1·93	1·96	1·97	1·93	1·86	2·12	2·23	2·19	2·10	2·07

Day of Mo.	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	·01	..	·01
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·13	·18	·12	·14	·10	·13	·13	·18	·07	·09	·11	·14	·12
4	·11	·08	..	·05	·07	·07	·07	·06	·05	·06	·07	·06	·08
5	·14	·16	·23	·16	·12	·15	·15	·10	·17	·13	·14	·11	·14
6	·11	·09	·08	·07	·06	·07	·08	..	·07	..	·06	·05	·06
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·05	·05	·06	·09	·08	·06	·02	·11	..	..	·01	·05	·05
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	·01	..	·01	..	..	..	..	..	·06	..	..	..
12	·02	·01	·01	·01	·02	..	..	..	..	..	·05	..	·04
13	·08	·08	·09	·09	·08	·07	·09	·10	·07	·10	·08	·09	·09
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·16	·15	·10	·10	·09	·08	·06	·08	·05	·07	·07	·08	·10
18	·19	·18	·14	·16	·18	·17	·18	·15	·18	·16	·16	·14	·17
19	·01	..	·02	..	..	..	..	·02	..	..	·01	..	·01
20	..	·05	..	..	·01	..	·02	..	·04	..	·02	·01	..
21	..	..	..	·01	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	·01	..	..	..	..	·01	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·11	·11	·08	·09	·08	·10	·09	·05	·05	·10	·06	·06	·07
26	..	..	..	·01	·01	..	..	..	..	..	·02	·02	..
27	·30	·26	·41	·36	·32	·31	·15	·15	·11	·15	·11	·13	·16
28	..	..	..	..	..	..	..	..	..	..	..	..	·02
*	1·41	1·41	1·34	1·35	1·22	1·21	1·05	1·00	·86	·92	·98	·95	1·12
†	2·05	2·09	1·96	1·98	1·72	1·68	1·66	1·54	1·29	1·46	1·56	1·54	1·80

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt.Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·01	..	..	·01	·01	·02	..	..	·02	·01	·01	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·12	·12	·11	·16	·16	·10	·11	·10	·13	·14	·18	·33	·11
4	·06	·06	..	·11	·05	·05	·09	·16	·03	·03	·03	·04	·04
5	·11	·14	·15	·16	·16	·13	·12	·09	·17	·15	·16	·19	·18
6	·06	·06	·07	·06	·06	·04	·05	..	·06	·04	·03	..	·04
7	..	..	..	..	..	..	·01	..	·01	..	·01	..	·03
8	·05	·08	..	..	·05	·03	·05	·03	·03	·03	·02	..	·02
9	..	·01	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·01	·01	..	..	·01	·02	·02	..	..	·02	·01	·01	·02
12	..	·02	·15	·02	·05	·08	·05	·07	·08	·03	·06	·13	·13
13	·10	·10	·04	·10	·09	·07	·11	·04	·04	·07	·06	..	·02
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·10	·10	·11	·13	·12	·14	·13	·13	·17	·17	·14	·15	·17
18	·14	·16	·17	·14	·17	·21	·18	·20	·16	·18	·17	·20	·18
19	..	·01	..	·01	·01	..	·02	..	..	..	..	..	·02
20	·01	·01	..	..	·02	..	·01	..	..	..	..	..	·03
21	..	..	..	..	..	·01	..	..	..	·02	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·02	..	..	·03	·03	·04	·04	..	..	..	..	..	·01
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·05	·06	·06	·08	·10	·09	·11	·08	·08	·09	·10	·11	·13
26	..	·01	..	..	·02	·01	·01	..	·01	..	..	·02	·02
27	·24	·18	·27	·27	·21	·28	·28	·20	·12	·13	·15	·22	·20
28	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·07	1·14	1·13	1·27	1·32	1·31	1·41	1·10	1·09	1·12	1·13	1·41	1·35
†	1·65	1·76	1·73	2·05	2·18	2·17	2·33	1·92	2·02	2·02	1·94	2·34	2·25

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·02	·02	·02	·02	..	·02	·02	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·11	·13	·08	·10	·11	·12	·10	·09	·16	·23	·07	·05	·05
4	·05	·05	·05	·06	..	·08	·05	·09	·05	·04	·04	·08	·04
5	·16	·24	·18	·17	·17	·17	·17	·14	·05	·13	·14	·12	·13
6	·05	·02	·05	·05	·04	·05	·05	·07	·13	·05	·02	·12	..
7	..	·01	·01	..	..	..	..	..	..	..	..	..	..
8	·04	·05	·03	·06	·07	·07	·07	..	·01	·03	·03	·06	·08
9	..	..	·01	..	·01	..	..	..	..	..	..	..	..
10	..	·01	..	..	..	..	..	..	..	..	..	..	..
11	·02	·01	·02	·02	·02	·01	·01	..	·01	..	..	..	..
12	·06	·02	·07	·06	·08	·10	·06	·03	·09	·05	·06	·07	·10
13	·11	·15	·08	·10	·09	·07	·11	·10	·06	·09	·07	·07	·01
14	·01	..	·01	..	·02	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	·01	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·13	·07	·12	·11	·11	·12	·08	·06	·08	·06	·07	·09	·05
18	·16	·13	·17	·15	·12	·13	·13	·16	·12	·13	·14	·16	·10
19	·01	·04	·01	·01	·03	..	·01	..	..	..	..	·04	·01
20	·02	·03	·02	·02	..	..	·03	·06	·08	·06	·03	·04	·10
21	..	..	..	..	·03	..	·01	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	·04	·03	·02	·02	·06	·03	..	·02	..	..	·02	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·13	·10	·10	·09	..	·07	·08	·09	·11	·12	·08	·11	·10
26	·01	·03	·02	·01	·01	·01	·01	·01	·04	..	..	..	·03
27	·20	·18	·17	·16	·13	·11	·15	·12	·12	·15	·14	·15	·15
28	·01	·01	·01	..	..	..	..	..	..	..	..	..	..
*	1·30	1·34	1·26	1·21	1·08	1·17	1·18	1·04	1·13	1·14	·89	1·18	·95
†	2·19	2·23	2·05	2·03	1·85	1·97	1·98	1·80	1·84	1·74	1·45	1·96	1·60

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(March, 1898.)

The month has been cold and somewhat dry, with numerous frosts and snow showers. A thunderstorm with lightning and hail occurred at Abinger on the 23rd; and on the 24th, 25th, and 26th there were heavy snowstorms, more particularly about Warlingham, Chipstead, and Caterham, where there were drifts in places 5 ft. to 6 ft. deep. In these storms damage was done to the peach, plum, and apricot blossom, other trees escaping. There has been a great deal of illness about, particularly influenza, measles, whooping cough, and scarlet fever, and many old people have died. The sallow bloomed on the 1st, and the plum on the 19th at Sidcup, and *Ribes* on the 30th at Nutfield. The rainfall is about a quarter of an inch below the average, and the ground water is exceedingly low, many wells and springs being dry. At Nutfield the sulphur butterfly was seen on the 18th, and the peacock on the 28th. At Croydon the maximum thermometer was 50° and above on four days, and below 40° on five days; whilst the minimum thermometer was below 40° on twenty-eight days. The mean temperature of the month is about 1° below the average, and was at Croydon (Duppas House and Whitgift) 40·4°, at Wallington 40·3°, at Chipstead 39·9°, at Waddon 39·8°, and at Redhill 39·1°. There were recorded at Wallington 82·3 hours of sunlight, which is 11 per cent. below the March mean of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Mersham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	·06	·06	·06	·06	·06	·07	·04	·05	·05	·06	·07	·05
2	..	..	..	..	..	..	·01	..	..	..	..	..	·01
3	·37	·44	·31	·35	·37	·34	·38	·42	·42	·42	·40	·51	·43
4	..	·01	..	..	·01	..	..	·01	..	·02	·02	·01	·02
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·01	..	..	..	..	..	..	..	·01	..	..	..	..
7	..	..	..	..	..	·01	·01	..	·03	·02	·06	..	·02
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	·01	..	..	..	..	..	..
13	·01	..	..	..	..	·01	·01	..	..	..	·01	..	..
14	·01	·03	..	..	·01	·02	·03	..	·01	·01	·01	·02	·02
15	·03	·02	·07	·05	·03	·02	·02	·02	·03	·04	·03	·03	·03
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·12	·10	·15	·10	·12	·12	·13	·10	·13	·12	·13	·16	·12
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·18	·15	·09	·12	·11	·08	·09	·08	·13	·12	·12	·07	·09
24	·14	·20	·02	·30	·24	·17	·28	·18	·22	·15	·24	·17	·04
25	·24	·10	·26	·14	·25	·17	·36	·25	·32	·31	·31	·41	·29
26	·33	·23	·23	·21	·31	·26	·30	·36	·32	·30	·33	·33	·27
27	·13	·15	·10	·12	08	·06	·07	·05	·32	·08	·09	·09	·09
28	·01	..	..	·01	·01	·01	·02	·01	·01	·02	·01	·02	·01
29	·01	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·65	1·49	1·29	1·46	1·60	1·33	1·79	1·52	2·00	1·66	1·82	1·89	1·49
†	3·96	3·84	3·72	4·25	3·74	3·41	3·93	3·23	4·01	3·80	4·10	4·52	3·88

Day of Mo.	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	Ashtead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·05	·06	·10		·09	·06	·08	..	·07	·08	·04	·04
2	..	..	..	..		·02	·01	..	..	..	·02	..	..
3	·47	·43	·57	·06		·29	·35	·40	·45	·54	·48	·38	·46
4	·01	..	·03	·16		·01	·02	..	·02	·01	..	..	·02
5	..	..	..	..		..	..	..	..	..	..	..	..
6	..	..	..	..		..	..	..	..	..	..	..	..
7	·05	·02	..	..		·02	·01	..	·04	·04	·05	·02	..
8	..	..	..	..		..	·01	..	..	·01	..	..	..
9	..	..	..	..		..	..	..	..	..	..	..	..
10	..	..	..	..		..	..	..	..	..	..	..	..
11	..	..	..	..		..	..	..	..	..	..	..	..
12	..	..	..	..		..	..	..	..	..	..	..	..
13	..	..	..	·02		..	..	..	..	..	..	..	..
14	·02	..	·02	..		..	·01	..	..	·01	·03	·01	..
15	·02	·02	·02	·02		·02	·02	·05	·02	·02	·08	·02	·04
16	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
17	..	..	..	..		..	..	..	..	..	..	..	..
18	..	..	..	..		..	..	..	..	..	..	..	..
19	·14	·17	·17	·12		·11	·18	·09	·13	·14	·24	·12	·15
20	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..		..	..	..	..	..	..	..	..
23	·08	·09	·08	·11		·09	·10	·07	·07	·07	..	·07	·07
24	·08	·14	·30	·20		·29	·19	..	·20	·13	·10	·06	·02
25	·24	·22	·55	·35		·15	·26	·35	·19	·33	·48	·30	·08
26	·18	·33	·33	·12		·31	·12	·26	·33	·36	·39	·29	·12
27	·10	·10	..	·11		·19	·15	·12	·13	·13	·16	·11	·15
28	·01	..	..	·09		·02	·05	·02	·03	·03	·08	·02	·02
29	..	..	..	..		..	..	..	..	..	..	..	..
30	..	..	..	..		..	..	..	..	·01	..	..	..
31	..	..	..	..		..	..	..	..	..	..	..	..
*	1·44	1·57	2·13	1·46	2·16	1·61	1·54	1·44	1·61	1·90	2·19	1·44	1·17
†	3·67	3·95	4·16	3·70	4·50	3·64	3·75	3·29	3·80	4·02	4·66	3·49	3·24

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1898.**

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·06	·05	·08	·07	·08	·06	·07	·07	·06	·06	·06	·07	·06	·07	·07	·06	·05	·07	·08	·06	·07	·07	·07	·06	·08
2	..	..	..	..	..	·01	·01	..	·01	·03	·03	·03	·03	·04	·02	..	·03	·02	..	·02	..	·01	..	·01	·01	..
3	·41	·56	·39	·35	·34	·35	·35	·40	·36	·28	·43	·36	·40	·29	·40	·26	·34	·32	·25	·29	·30	·24	·28	·28	·46	·57
4	..	·01	..	·01	..	·01	·01	·01	·01	·12	·01	·01	·02	·13	..	·10	..	·02	·05	·04	..	·05	·02	·01	·01	·02
5	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	·01	..	..	..	..	..	..	..	..	..	·01	·04	·01	·05	·02	..	..	..	..	..	..	·01	·01	·03
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..
14	·02	·02	·01	..	·01	..	..	·01	·01	·01	·01	·01	·01	..	·01	..	·01	·01	..	·02	·01	..	..	..	·01	·02
15	·02	·02	·02	·02	·03	·04	..	·02	·03	·03	·03	·02	·03	·02	·02	·02	·02	·02	..	·03	·01	..	·02	·02	·01	·03
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·17	·16	·17	·17	·15	·14	·15	·16	·15	·17	·15	·15	·17	·18	·15	·15	·16	·16	·15	·17	·17	·15	·17	·18	·18	·18
20	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·08	·11	·07	·06	·06	·06	..	·06	·08	·07	·08	·07	·08	·09	·06	·06	·06	·05	·06	·12	·06	·09	·11	·06	·05	·07
24	·03	·13	·03	·06	·10	·05	·07	·14	·11	·08	·12	·07	·05	·05	·11	..	·15	·14	·25	·23	·03	·23	·26	·22	·15	·12
25	·11	·22	·14	·19	·16	·04	·05	·18	·14	·33	·19	·16	·06	·30	·12	·31	·14	·16	·15	·19	..	·13	·12	·12	·16	·25
26	·22	·25	·23	·25	·23	·21	·42	·24	·23	·29	·25	·20	·16	·27	·25	·27	·25	·26	·28	·28	·21	·22	·20	·21	·24	·27
27	·10	·09	·08	·11	·10	·11	·13	·10	·11	·16	·14	·11	·09	·09	·10	·10	·10	·13	·11	·18	·13	·09	·12	·08	·09	·09
28	·01	·01	·02	·02	·02	·02	..	·03	·03	·03	·03	·03	·04	·04	·03	·03	·04	·05	·05	·02	·04	·01	·02	·04	·04	·06
29	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	·01	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·23	1·67	1·23	1·32	1·27	1·12	1·25	1·42	1·36	1·66	1·53	1·28	1·22	1·60	1·37	1·42	1·39	1·40	1·42	1·69	1·02	1·29	1·39	1·32	1·49	1·79
†	3·28	4·11	3·37	3·25	3·23	3·09	3·18	3·28	3·48	3·89	3·72	3·38	3·29	3·65	3·46	3·38	3·37	3·12	3·10	3·35	2·56	2·58	2·85	2·88	3·03	3·59

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall.

The 80 years (1816–95) mean at Greenwich for March is 1·52 in.

March, 1898.

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh. rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·08	·06	·04	·08	·07	·06	·08	·05	·07	·05	·07	·08	·07	·05	·05	·07	·08	·09	·08	·06	·10	·11	·05	·07	·08
2	..	·02	..	·02	·02	·01	·03	..	..	..	..	..	·01	·02	·03	·04	·03	..	..	..	..	..	·01	..	..	..
3	·15	·36	·41	·24	·40	·45	·45	·45	·28	·27	·40	·42	·30	·42	·28	·28	·30	·43	·39	·38	·37	·33	·32	·30	·35	·33
4	·13	·06	·02	·09	..	..	..	..	..	..	..	..	·01	·01	·01	·11	·08	·01	..	·01	..	·01	·01	..	·01	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	·01	..	..	..	..	·01	·01	·01	·02	..	·01	·01	..	..	..	·01	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	·01	..	..	·01	·01	..	..	..	..	..	..	..	..	..	·01	·01	·01	·01	·01	..	..	..	..	..	..
14	·03	·02	·01	..	·03	·01	·02	..	..	·01	..	·02	·04	·03	·03	·04	·03	·03	·04	·03	..	·03	·01	..	·03	..
15	·02	·01	·01	..	·01	·02	·02	..	..	·01	·03	·02	·01	·01	·02	·02	·01	·01	·01	·01	·02	·01	·01	·02	·01	·02
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·13	·19	·16	·17	·25	·19	·16	·11	·10	·16	·12	·17	·12	·15	·14	·15	·19	·17	·18	·15	·17	·21	·19	·15	·17	·05
20	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·06	·07	..	·06	·05	·08	·08	·06	·07	·07	·06	·10	·08	·05	·06	·06	·08	·09	·10	·08	·04	·05	·04	·04	·08	·06
24	·10	·14	·20	..	·03	·01	·06	·03	·02	·09	·07	·04	·09	·03	·08	·09	·11	·15	·12	·11	·11	·17	·14	·01	·09	..
25	·11	·19	·15	·14	·15	·30	·18	·10	·05	·17	·17	·09	·19	·10	·23	·14	·21	·11	·15	·10	·20	·19	·24	·03	·23	·06
26	·26	·22	·22	·16	·20	·24	·21	·22	·18	·23	·24	·23	·26	·20	·20	·16	·21	·21	·20	·16	·22	·18	·17	·13	·21	·15
27	·11	·10	·10	·09	·09	·11	·11	·05	·05	·05	·09	·07	·05	·09	·07	·09	·10	·10	·10	·09	·08	·08	·08	·06	·06	·05
28	·05	·05	·03	·06	..	..	·01	·02	·01	·02	·01	·01	·01	·02	·02	·04	·03	·04	·05	·04	·03	·03	·03	·03	·02	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	·03	·01	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·22	1·52	1·37	1·07	1·32	1·50	1·40	1·12	·81	1·15	1·24	1·26	1·26	1·21	1·24	1·29	1·48	1·45	1·47	1·27	1·30	1·40	1·36	·82	1·33	·80
†	2·87	3·28	3·10	3·12	3·50	3·67	3·73	3·04	2·83	3·17	3·18	3·60	3·51	3·40	3·47	3·34	3·51	3·30	3·44	3·25	3·10	3·24	3·10	2·27	3·29	2·40

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(April, 1898.)

The month has been dry and warm, but with a great prevalence of east winds. There were some rather severe frosts, particularly on the 23rd and 24th. There has been a good deal of illness about. At Sidcup the pear and cherry were in bloom on the 10th, and the apple on the 24th. The nightingale was heard at Abinger on the 10th; and at Nutfield the swallow was seen on the 11th, and the wryneck on the 12th, and the cuckoo heard at Sevenoaks on the 13th. Thunder was heard at Nutfield on the 26th. Solar halos were seen at Upper Gatton on seven days, and lunar halos were observed there on the 6th and 7th; whilst lightning was seen there on the 26th. The rainfall is about three-quarters of an inch below the April mean, and the want of water is already becoming serious in many places. The mean temperature of the month is about one degree above the average, and was at Croydon (Duppas House) 48·6°, at Chipstead 48·4°, at Wallington 48·1°, at Croydon (Whitgift) 47·9°, and at Waddon 47·6°. There were recorded at Wallington 166·8 hours of sunlight, which is one per cent. below the April mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	Ashtead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
3	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	·01	..	..	·02
4	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..		..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
8	·01	·08	·08	·05	·07	·06	·06	·05	·07	·07	·08	·03	·07	·07	..	·09	..		·06	·07	·08	·08	·08	·10	·04	·06
9	·11	·11	..	·05	·05	·06	·08	·08	·01	·02	·04	·05	·06	·12	·04	..	·13		·02	·14	·09	·12	·12	·12	·14	·03
10	·07	·10	·14	·12	·10	·05	·06	·05	·06	·07	·09	·08	·09	·07	·10	..	..		·03	·09	·05	·06	·05	·06	·06	..
11	·26	·29	·28	·25	·27	·25	·28	·13	·25	·30	·26	·27	·25	·24	·37	..	·33		·24	·33	·29	·34	·33	·34	·21	·26
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·01	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
14	·22	·23	·25	·30	·20	·17	·17	·17	·21	·18	·22	·21	·21	·23	·23	·35	·18		·19	·20	·20	·22	·23	·23	·18	·27
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		·04	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
26	·13	·14	·13	·15	·13	·13	·13	·13	·13	·11	·10	·10	·09	·09	·15	·10	·06		·14	·10	·09	·10	·11	·14	·11	·10
27	·14	·13	·16	·25	·22	·24	·24	·15	·21	·22	·23	·20	·22	·24	·19	·23	·34		·33	·25	·20	·23	·23	·30	·18	·20
28	·02	..	·02	·03	·02	·02	·02	..	·01	·02	·02	·02	·02	·02	·01	·04	·01		·01	·04	·03	·04	·04	·08	·02	..
29	·01	·11	·02	..	·01	·02	·02	..	·02	·02	·02	·01	·01	..	·05	·04	·06		·04	·02	·01	·01	..	·04	..	·02
30	·09	·10	·07	·10	·08	·05	·08	·11	·07	·06	·07	·11	·07	·09	·03	..	·05		·04	·09	·05	·07	·06	·15	·08	·06
*	1·06	1·29	1·15	1·30	1·15	1·06	1·15	·87	1·04	1·07	1·13	1·08	1·09	1·18	1·17	·85	1·16	1·45	1·14	1·33	1·09	1·28	1·27	1·56	1·02	1·02
†	5·02	5·13	4·87	5·55	4·89	4·47	5·08	4·10	5·05	4·87	5·23	5·60	4·97	4·85	5·12	5·01	4·86	5·95	4·78	5·08	4·38	5·08	5·29	6·22	4·51	4·26

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1898.**

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes Common	Keston (Bradfield)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..
4	..	·02	..	..	..	..	·03	..	·02	·03	..	·02	·02	·04	·02	·01	·01	·02	..	·01	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·06	·08	·06	·07	·08	·08	·06	·08	·08	·07	·08	·07	·08	·09	·08	·07	·08	·05	·08	·07	·06	·06	·06	·07	·07	·08
9	·07	·05	·08	·09	·09	·10	..	·12	·09	·10	·17	·12	·12	·17	·09	·21	·18	·15	·22	·16	·12	·09	·05	·08	·12	·15
10	·04	·06	·06	·06	·06	·05	·20	·05	·05	·07	·06	·05	·04	·05	·04	·09	·03	·02	·02	·01	·03	·02	..	·05	·03	·04
11	·20	·26	·25	·27	·25	·23	·20	·27	·24	·25	·26	·24	·24	·22	·26	·25	·22	·17	·18	·15	·15	·16	·16	·15	·18	·19
12	..	..	..	..	..	..	..	·01	..	..	·01	·01	..	·01	..	..	..	..	..	·05	..	·01	..	..	..	·01
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·15	·23	..	·15	·15	·16	·12	·16	·18	·17	·17	·16	·18	·20	·19	·17	·17	·17	·16	·20	·14	·15	·18	·14	·13	·14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·10	·10	·09	·10	·10	·11	·10	·10	·11	·12	·12	·13	·13	·13	·12	·10	·12	·12	·12	·17	·15	·28	·28	·17	·12	·14
27	·18	·25	·24	·24	·23	·23	·24	·22	·24	·25	·25	·25	·25	·30	·27	·32	·31	·31	·31	·40	·30	·36	·38	·29	·31	·33
28	..	·02	·02	·03	·04	·04	·04	·05	·05	·05	·05	·06	·05	·07	·05	·04	·05	·04	·04	·03	·04	·01	·02	·06	·03	·03
29	·02	·01	·01	·02	·01	·01	..	·01	·01	·03	·01	·01	·02	·05	·07	·07	·04	·03	·05	·02	..	·04	·02	·02	·02	·04
30	·06	·08	·08	·08	·08	·07	·06	·08	·08	·10	..	·07	·07	·09	·09	·07	·07	·08	·08	·07	·08	·01	·06	·07	·05	·06
*	·89	1·16	·89	1·11	1·09	1·08	1·05	1·15	1·15	1·24	1·18	1·19	1·21	1·42	1·29	1·40	1·28	1·18	1·26	1·34	1·07	1·19	1·21	1·10	1·06	1·21
†	4·17	5·27	4·26	4·36	4·32	4·17	4·23	4·43	4·63	5·13	4·90	4·57	4·50	5·07	4·75	4·78	4·65	4·30	4·36	4·69	3·63	3·77	4·06	3·98	4·09	4·80

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall.

The 80 years (1816–95) mean at Greenwich for April is 1·65 in.

April, 1898.

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	·01	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	·01	..	·01
4	..	·01	..	..	..	..	..	..	..	..	..	·01	..
5	..	..	..	..	..	..	·01	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	·01	..	..	..	..	..	..	..
8	·07	·06	·05	·07	·05	·05	·05	·05	·06	·06	·05	..	·06
9	·14	·15	·15	·16	·03	·05	·07	·07	·09	·05	·07	..	·09
10	·05	·16	·04	·06	·04	·04	·05	..	·05	·05	·05	·05	·06
11	·10	·17	·15	·24	·15	·21	·22	·15	·22	·25	·23	·25	·24
12	..	..	..	..	..	·01	..	..	·01	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·10	·14	·12	·14	·11	·10	·11	·08	·11	·12	·11	·12	·11
15	..	..	..	..	..	·01	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·12	·12	·10	·09	·11	·11	·11	·10	·09	·11	·11	·11	·12
27	·31	·29	·26	·24	·23	·26	·24	·25	·18	·19	·23	·30	·27
28	·04	·06	·04	·05	·02	·02	·02	·01	..	..	·01	·01	·03
29	·03	·01	..	..	·03	..	·01	..	·03	·03	·01	·05	·03
30	·08	·06	·05	·08	·03	·05	·06	·04	·05	·06	·06	·05	·06
*	1·04	1·23	·96	1·13	·80	·93	·95	·75	·89	·92	·94	·95	1·08
†	3·91	4·51	4·06	4·25	4·30	4·60	4·68	3·79	3·72	4·09	4·12	4·55	4·59

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	·01	..	..	..	..
4	..	..	..	·01	..	..	·01	..	·03	..	·02	·02	·02
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·05	·07	·05	·06	·06	·07	·06	·06	·06	·04	·05	·06	·05
9	·06	·04	..	·07	·07	·06	·05	·08	·04	·04	·01	·05	·04
10	·05	·06	·08	·06	..	·05	·05	·05	·03	·03	·03	·04	·03
11	·20	·18	·16	·20	·21	·20	·18	·06	·13	·14	·12	·16	·12
12	..	..	·01	..	..	·01	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·10	·13	·14	·16	·15	·14	·09	·15	·15	·13	·13	·15	·10
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·10	·11	·14	·12	·12	·12	·11	·15	·14	·12	·12	·11	·09
27	·23	·24	·22	·23	·27	·28	·28	·27	·27	·24	·24	·21	·20
28	·02	·03	·05	·06	·06	·07	·07	·03	·02	·02	·03	·05	·03
29	..	·03	·01	·01	·01	..	·01	·03	·01	..	..	·01	..
30	·03	·04	·04	·07	·04	·07	·05	·04	·04	·02	·03	·04	·03
*	·84	·93	·90	1·05	·99	1·07	·96	·92	·93	·78	·78	·90	·71
†	4·24	4·40	4·24	4·56	4·29	4·51	4·21	4·02	4·17	3·88	3·05	4·19	3·11

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(May, 1898.)

The month has been wet, cold, and rather sunless. It is the wettest May since 1891. There was a frost on the 17th in many parts of the district, and in the early morning of the 18th a few snowflakes fell at Warlingham. There were thunderstorms generally throughout the district on the 23rd and 31st, and on these days hail fell. Easterly winds were very prevalent, especially after the 15th. The hawthorn flowered at Croydon on the 10th, and the white may at Wallington on the same day. At Wallington the lilac, both white and purple, flowered on the 11th, the laburnum, white chestnut, and red may on the 18th, and the red chestnut on the 20th. At Croydon (Park Hill) the maximum thermometer stood at 70° on one day, 60° and above on eleven days, and below 50° on one day; whilst the minimum thermometer was 50° and above on two days, and below 40° on five days. At Nutfield the oak was in full leaf quite fourteen days before the ash. At Croydon (Duppas House) the evaporation for the month has been unusually small, whilst from the 9th percolation has been going on through the chalk gauge, but no water has passed through the gravel percolator. The rainfall for the month is about three-quarters of an inch above the average, and there has been a good deal of illness about, principally rheumatism. The mean temperature of the month is about 1·5° below the average, and was at Croydon (Duppas House) 52·3°, at Wallington 52·2°, at Waddon 51·8°, at Croydon (Whitgift) 51·7°, and at Chipstead 51·4°. There were recorded at Wallington 140·5 hours of sunlight, which is 13 per cent. below the May mean of the ten years 1886–95, and is the smallest May total in the register.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·32	·16	·28	·25	·33	·29	·30	·28	·27	·28	·28	·26	·31
2	·03	·01	..	..	·01	..	·01	..	·02	·02	·01	·03	·01
3	·37	·27	·35	·25	·21	·22	·23	·23	·20	·21	·21	·27	·22
4	·02	·08	·06	..	·05	·05	·06	·04	·05	·02	·05	..	·04
5	·34	·29	·31	·40	·35	·36	·36	·32	·32	·35	·37	·39	·39
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	·03	·04	·05	·05	·04	·04	·04	·03	·04	·04	·04	·03	·03
8	·04	·04	·04	·04	·05	·02	·03	·04	·03	·04	·02	·03	·02
9	·07	·06	·05	..	·01	·01	·01	·02	..	..	·01	·01	·02
10	·18	·20	·20	·40	·22	·20	·23	·24	·20	·26	·25	·20	·22
11	·21	·16	·20	·20	·02	·03	·05	·03	·01	·01	·01	·02	·01
12	·04	·02	·13	·03	·20	·04	·08	·23	·03	·05	·02	·07	·06
13	·64	·72	·50	·40	·35	·41	·41	·34	·39	·39	·53	·42	·53
14	·09	·08	·08	·15	·09	·15	·14	·14	·11	·11	·10	·11	·09
15	·03	..	·13	..	·13	·08	·06	·05	·10	·10	·05	·04	·06
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·01	·01	·02	·03	·01	·02	·03	·01	..	·03	·03	·02	·03
19	·41	·45	·40	·50	·45	·40	·43	·36	·47	·45	·61	·64	·61
20	·50	·43	·55	·60	·30	·45	·40	·45	·36	·39	·40	·31	·38
21	..	..	..	..	..	·01	·01	·01	·02	·02	·01	..	·01
22	..	..	..	..	..	..	..	·01	..	..	..	·01	..
23	·15	·23	·04	·20	·08	·05	·07	·26	·26	·03	·04	·02	·06
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·04	·06	..	..	..	..	..	·01	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·04	..	·03	·05	·03	·03	·03	·01	·02	·02	·03	·03	·03
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·06	·04	·07	·11	·10	·08	·08	·06	·10	·10	·10	·11	·14
30	·03	·06	·10	·25	·09	·10	·10	·06	·12	·08	·09	·09	·09
31	·14	·14	·15	·25	·26	·26	·24	·10	·24	·26	·28	·20	·28
*	3·79	3·55	3·74	4·16	3·38	3·30	3·40	3·33	3·36	3·26	3·54	3·31	3·64
†	8·81	8·68	8·61	9·71	8·27	7·77	8·48	7·43	8·41	8·13	8·77	8·91	8·61

Day of Mo.	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley(The Cottage)	Purley (Tudor C.)	Leather-head	Ashtead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·30	·31	·35	·25		·29	·32	·28	·29	·28	·30	·28	·27
2	·01	·02	..	·15		·01	..	·02	·04	·01	·05	..	..
3	·20	·28	·30	·18		·18	·32	·21	·21	·21	·20	·25	·28
4	·06	·07	·03	..		·02	·03	·01	·02	..	·04	·06	·06
5	·34	·36	·40	·46		·36	·35	·35	·33	·33	·35	·28	·24
6	..	..	..	..		·01	·02	..	·01	·01	·04	·01	..
7	..	·03	·03	..		..	·03	·03	·02	..	·03	·04	·05
8	·06	·03	·05	..		·03	·04	·03	·04	·06	..	·04	·03
9	·02	·03	·04	·08		·03	·04	·03	·04	·03	..	·02	·03
10	·15	·20	·22	·25		·30	·19	·14	·20	·18	·15	·13	·11
11	·04	·03	..	..		·02	·03	..	..	·01	..	·06	·07
12	·49	·23	·10	·28		·06	·18	·13	·14	·13	·18	·16	·27
13	·10	·26	·38	·34		·51	·45	·45	·46	·46	..	·34	·26
14	..	·10	..	..	MONTHLY GAUGE.	·09	·12	·10	·11	·12	·15	·09	·04
15	·04	·03	·05	·09		·02	·09	·08	·05	·04	·07	·16	·15
16	..	..	..	..		..	..	..	..	..	..	..	..
17	..	..	..	..		..	..	..	..	..	..	..	·01
18	·03	·04	·05	·01		·04	·04	·02	·02	·04	..	..	..
19	·63	·70	·72	·54		·59	·79	·55	·70	·73	·98	·52	·47
20	·38	·30	·35	..		·20	·37	·34	·35	·38	·49	·39	·27
21	..	..	·02	..		..	·01	·01	..	..	..	..	..
22	..	..	..	·06		..	·03	..	·01	·01	·05	·01	·01
23	·19	·13	·13	·09		..	·27	·37	·23	·23	·58	·43	·07
24	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..	..		..	..	..	..	..	..	..	..
26	..	..	..	..		..	..	..	..	..	..	..	..
27	·04	·04	·05	..		·05	·05	·05	·03	·04	·06	·05	·04
28	..	..	..	..		..	..	..	..	..	..	..	..
29	·10	·13	·16	·28		·11	·17	·10	·14	·15	·17	·09	·07
30	·07	·05	·07	·06		·06	·10	·11	·06	·06	·08	·10	·06
31	·25	·26	·25	·28		·21	·24	·29	·25	·25	·24	·24	·18
*	3·50	3·63	3·75	3·40	3·71	3·19	4·28	3·70	3·75	3·76	4·21	3·75	3·04
†	8·35	8·75	8·76	8·26	9·66	7·97	9·36	8·08	8·83	9·05	10·43	8·26	7·30

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1898.**

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickham Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·30	·23	·20	·21	·20	·22	·20	·21	·24	·26	·33	·27	·29	·30	·28	·33	·29	·30	·27	·21	·25	·15	·17	·23	·24	·26
2	..	·01	..	..	·01	·01	..	·01	·01	·01	..	·01	·01	·01	·01	..	·01	·01	..	·01	..	..	..	..	..	..
3	·37	·21	·18	·13	·14	·15	·12	·14	·15	·15	·15	·14	·18	·31	·23	·22	·20	·23	·30	·20	·18	·08	·11	·15	·17	·15
4	·01	·01	·03	·01	·01	·01	..	·02	·02	·02	·04	·03	·02	·03	·02	..	·02	·03	..	·03	·07	·03	·07	·04	·04	·06
5	·28	·35	·27	·25	·25	·25	·24	·27	·26	·29	·28	·27	·31	·31	·34	·32	·30	·30	·29	·26	·25	·21	·25	·26	·27	·28
6	..	..	..	..	..	..	..	·01	..	·01	·01	..	·01	·01	..	..	·01	·01	..	·01	..	..	..	·02	..	..
7	·03	·04	·04	·01	·02	·02	·03	·03	·03	·01	·03	·02	·02	·03	·02	..	..	·01	..	..	..	..	..	..	·01	·02
8	·02	·02	·03	·03	·03	·04	·03	·04	·04	·05	·04	·04	·04	·04	·05	·03	·03	·03	·03	·03	·03	·01	·03	·02	·02	·03
9	·03	·01	·04	·03	·05	·05	·04	·05	·05	·04	·04	·03	·06	·17	·06	·06	·06	·06	·04	·02	·04	..	..	·03	·03	·05
10	·11	·17	·15	·13	·14	·13	·12	·13	·13	·13	·05	·13	·13	·17	·17	·15	·15	·11	·13	·15	·18	·10	·10	·12	·15	·13
11	..	·01	·01	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..
12	·20	·01	·02	·10	·14	·16	·22	·20	·22	·21	·26	·20	·17	·15	·16	·07	·07	·06	·05	·11	·04	·02	·03	·06	·04	·04
13	·31	·29	·21	·19	·21	·22	·20	·22	·25	·24	·22	·22	·27	·41	·42	·43	·36	·31	·33	·31	·25	·30	·29	·25	·23	·23
14	·07	·10	·10	·07	·08	·09	·09	·08	·08	·08	·08	·08	·09	·09	·09	·08	·09	..	·07	·05	·09	·04	·06	·09	·08	·09
15	·02	·08	·06	·09	·12	·09	·10	·09	·09	·11	·12	·06	·05	·06	·05	·06	·03	·14	·04	·03	·03	·03	·03	·03	·02	·03
16	·15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	·02	·03	·02	·02	·02	..	·03	·03	·02	·02	·02	·03	·01	·03	·02	·02	·03	·04	·03	·02	..	..	·02	·02	·02
19	·49	·68	·59	·60	·59	·56	·56	·62	·60	·60	·57	·56	·63	·59	·61	·73	·57	·60	·64	·60	·53	·50	·55	·54	·62	·60
20	·25	·30	·25	·24	·23	·21	·23	·22	·24	·25	·25	·25	·26	·33	·29	·35	·31	·32	·33	·29	·22	·21	·19	·21	·25	·24
21	..	..	..	..	..	..	..	·02	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	·01	..	·01	·01	..	..	·01	·02	·02	·02	·03	·01	·03	..	·02	..	·02	..	·01	..	..	·01	..	·01
23	·07	·23	·18	·41	·24	·13	·04	·05	·05	·03	·03	·02	·01	·01	·01	·03	·03	·05	·21	·12	·09	..	..	·29	·07	·14
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·05	·03	·04	·03	·04	·04	..	·04	·05	·05	·05	·05	·06	·04	·04	·01	·05	·04	·02	·03	·04	·02	·02	·04	·04	·05
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·06	·11	·11	·11	·13	·12	·14	·11	·14	·14	·15	·13	·14	·09	·15	·17	·12	·11	·14	·14	·15	·18	·18	·16	·15	·12
30	·05	·06	·04	·03	·04	·04	·03	·04	·05	·04	·04	·04	·05	·05	·04	·03	·05	·03	·09	·04	·05	.03	·02	·04	·05	·09
31	·15	·21	·25	·25	·25	·24	·24	·23	·24	·26	·27	·24	·24	·24	·21	·33	·33	·27	·18	·35	·35	·53	·41	·62	·42	·35
*	3·02	3·18	2·84	2·94	2·95	2·81	2·63	2·87	2·99	3·03	3·06	2·83	3·10	3·46	3·31	3·42	3·12	3·05	3·22	3·04	2·87	2·44	2·51	3·23	2·92	2·99
†	7·19	8·45	7·10	7·30	7·27	6·98	6·86	7·30	7·62	8·16	7·96	7·40	7·60	8·53	8·06	8·20	7·77	7·35	7·58	7·73	6·50	6·21	6·57	7·21	7·01	7·79

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·25	·27	·27	·21	·24	·22	·21	·25	·31	·35	·30	·30	·32
2	·02	..	..	..	..	..	·01	..	·01	..	..	..	..
3	·20	·14	·10	·13	·11	·13	·12	·27	·35	·38	·33	·40	·32
4	·05	·03	·05	·04	·04	·02	·03	·03	·02	·03	·02	·03	·08
5	·27	·26	·25	·24	·33	·31	·30	·23	·23	·31	·23	·35	·23
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	·02	·02	·02	..	·02	·04	·04	·03	·04	·05	·05	·05	·05
8	·02	·03	·04	·07	·03	·03	·03	·02	·02	·02	·01	·02	·04
9	·03	·04	·03	·02	·02	·04	·05	·03	·02	·03	·03	·05	·05
10	·12	·10	·12	·13	·07	·08	·11	·05	·10	·09	·09	·08	·21
11	..	·01	..	..	·01	..	·01	..	·12	·08	·02	·01	·02
12	·04	·07	·13	·21	·10	·04	·05	·02	·04	·02	·01	·02	·03
13	·28	·25	·20	·25	·21	·25	·27	·23	·28	·17	·24	·25	·20
14	·10	·08	·07	·07	·07	·09	·09	·07	·08	·05	·06	·08	·08
15	·03	·04	·06	·08	·05	·09	·10	·15	·14	·13	·14	·08	·09
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	·03	·03	..	..	·05
18	·02	·02	..	..	·01	·01	..	..	·02	..	..	..	..
19	·59	·54	·55	·56	·42	·47	·38	·35	·32	·30	·35	·35	·40
20	·26	·21	·19	·22	·14	·22	·19	·18	·19	·18	·22	·17	·22
21	..	..	..	..	..	..	·01	..	·02	..	..	..	·01
22	·02	..	·02	·02	..	..	..	..	..	..	..	..	..
23	·18	·07	·04	·03	·02	·04	·04	·05	·02	·02	·04	·07	·03
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·05	·04	..	·04	·05	·04	·05	·05	·06	·07	·02	·03	·06
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·08	·13	·16	·13	·10	·12	·12	·05	·05	·05	·03	·07	·07
30	·05	·05	·04	·02	·05	·04	·05	..	·02	·02	·02	·03	·07
31	·25	·35	·39	·26	·19	·22	·32	·34	·26	·20	·39	·24	·17
*	2·93	2·75	2·73	2·73	2·28	2·50	2·58	2·40	2·75	2·58	2·60	2·68	2·80
†	6·84	7·26	6·79	6·98	6·58	7·10	7·26	6·19	6·47	6·67	6·72	7·23	7·39

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·24	·23	·20	·21	·27	·25	·24	·21	·25	·24	·22	·25	·21
2	..	·01	·01	·01	..	..	·01	..	..	·01	..	..	..
3	·24	·13	·07	·09	·10	·04	·09	·14	·09	·06	·08	·08	·10
4	·05	·06	·06	·04	·05	·06	·06	·07	·06	·05	·04	·05	·03
5	·27	·28	·36	·41	·35	·39	·35	·31	·18	·17	·24	·28	·17
6	..	..	·01	·01	..	..	..	·03	..	..	..	..	..
7	·03	·03	·02	·02	·02	·02	·03	·01	·01	·01	·01	·01	·02
8	·03	·05	·04	·04	·02	·02	·02	·03	·03	·02	·02	·03	·02
9	·03	·04	·03	·04	·05	·07	·05	·03	·03	·03	·04	·04	·04
10	·10	·11	·09	·10	·12	·11	·11	·13	·14	·11	·07	·10	·12
11	·03	·08	·01	..	·02	..	..	..	·01	..	..	..	·01
12	·07	·10	·22	·16	·05	·06	·06	·09	·03	·02	·03	·14	·10
13	·23	·25	·32	·34	·27	·34	·36	·31	·29	·29	·27	·18	·13
14	·08	·09	·07	·06	·07	·08	·07	·07	·06	·08	·05	·03	·07
15	·06	·05	·04	·07	·05	·05	·03	·05	·03	·03	·03	·06	·10
16	..	..	..	..	·05	..	..	..	..	..	..	..	..
17	·01	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	·01	·02	·02	·02	·01	·01	·01	..	..	..	..
19	·46	·45	·42	·49	·49	·47	·49	·59	·49	·50	·55	·56	·26
20	·24	·17	·18	·24	·22	·25	·21	·26	·18	·17	·13	·19	·11
21	·02	·01	..	..	..	..	·01	..	..	..	..	..	..
22	·02	·03	..	·03	·01	·01	·01	·01	·01	..	..	·04	·02
23	·02	·07	·07	·06	·13	·08	·05	·27	·35	·27	·04	·04	·03
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·05	·06	·06	·05	·05	·03	·04	·03	·04	·03	·03	·04	·04
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·09	·11	·11	·12	·15	·14	·15	·14	·16	·12	·11	·12	..
30	·06	·04	·06	·07	·06	·04	·04	·03	·04	·03	·02	·02	·10
31	·20	·23	·20	·30	·45	·48	·26	·22	·15	·08	·11	·18	·12
*	2·63	2·68	2·66	2·98	3·07	3·01	2·75	3·04	2·64	2·32	2·09	2·44	1·80
†	6·87	7·08	6·90	7·54	7·36	7·52	6·96	7·06	6·81	6·20	5·14	6·63	4·91

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(June, 1898.)

The month has been cold, rather dry, and comparatively sunless, and may be divided into three well-defined periods, *viz.* 1st–9th wet and cold, 10th–22nd drying winds of a March character, and 23rd–30th fine growing weather. Thunderstorms occurred pretty generally throughout the district on the 2nd and 26th, and were accompanied by hail. The cold weather has on the whole been favourable for the blossoms on the various trees and flowers, and also for the hay crop. Apples are fairly plentiful, but pears are scarce. Hay cutting commenced in most places about the 15th, and strawberries ripened on the 30th. Owing to the cloudy weather the evaporation of the month is below the average. The month has been unhealthy, but less so than last month. The mean maximum in the shade and the mean temperature of the month are the lowest in the Wallington record, which commences in 1886, for June. The mean temperature of the month is about 2° below the average, and was at Croydon (Duppas House) 58°, at Waddon 57·9°, at Chipstead 57·5°, at Redhill 57·3°, at Croydon (Whitgift) 57·1°, and at Wallington 56·7°. The maximum at Croydon was 70° and above on ten days, and below 60° on six days; whilst the minimum was below 60° on every day, and below 50° on twenty days. The rainfall is about one-quarter of an inch below the June average, and the total for the six months is about two inches below the average. There were recorded at Wallington 163 hours of sunlight, which is 9 per cent. below the June mean of the ten years 1886–95, and is the smallest June total since 1890.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	Ashtead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·04	·15		·14	·14	·13	·08	·14	·12	·20	·18	·26	·24	·20	·17	·14		·24	·15	·14	·13	·15	·14	·30	·08
2	·08	·07	·05		·30	·42	·39	·06	·24	·20	·29	·29	·38	·20	·09	·11	·06		·12	·03	·07	·01	·02	·05	·07	·20
3	..	..	..		..	·04	·05	..	·26	..	..	..	..	..	..	..	..		·01	..	·01	..	..	·02	·02	..
4	..	..	..		·01	..	..	·01	..	..	·01	..	..	·01	..	..	..		..	..	..	..	·01	..	..	..
5	..	·06	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
6	·17	·09	·13		·10	·15	·15	·10	·10	·10	·10	·12	·10	·11	·14	·15	·11		·07	·11	·13	·15	·15	·15	·14	·13
7	·04	·04	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·02	..	..	·05	..
8	·05	·05	·09		·02	·02	·02	..	·03	·02	·02	..	·02	·02	·02	·03	..		·01	·04	·02	·02	·02	·03	·06	·03
9	·12	·04	..		·01	·01	·01	..	·01	..	·01	·02	..	·01	..	..	..		·17	..	..	·02	·01	..	·03	·05
10	·02	·06	·05		..	..	..	..	..	..	..	..	·01	·01	·02	·02	..		·01	·03	..	..	..	..	..	·01
11	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
12	..	..	..		..	..	..	..	..	..	·01	..	·01	·01	..	..	..		..	..	..	·01	·02	·06	·01	..
13	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
14	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
15	..	..	..	RECORD CEASED.	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
16	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
17	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
18	..	..	..		..	..	..	..	..	..	·01	..	..	..	..	..	..		..	..	·02	..	..	·02	..	..
19	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
23	·06	·23	·15		·16	·19	·19	·20	·17	·17	·19	·11	·18	·16	..	·21	·20		·23	·18	·15	·16	·18	·10	·08	·08
24	·19	·17	·17		·25	·21	·20	..	·20	·21	·21	·29	·22	·20	·42	·22	·26		·25	·20	·17	·18	·24	·22	·33	·20
25	·16	·14	·17		·04	·17	·25	·20	·22	·05	·20	·20	·29	·08	·28	·21	·10		·12	·12	·15	·29	·13	·30	·17	·07
26	·30	·36	·22		·41	·44	·40	·29	·29	·48	·28	·33	·32	·45	·30	·47	·84		·37	·54	·50	·59	·75	·43	·38	·17
27	·17	·27	·10		·12	·15	.15	·06	·17	·13	·18	·23	·15	·18	·35	·27	·47		·45	·36	·16	·21	·22	·16	·13	·15
28	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
29	·03	·08	·03		·03	·03	·03	·04	·03	·03	·02	·02	·02	·02	..	·03	·04		..	..	·03	·02	·02	·05	·02	..
30	·01	·09	..		..	..	..	..	·01	..	..	..	..	..	..	..	..		·04	·04	..	·03	·01	·04	..	..
*	1·50	1·79	1·31		1·59	1·97	1·97	1·04	1·87	1·51	1·73	1·79	1·96	1·70	1·82	1·89	2·22	2·45	2·09	1·80	1·55	1·84	1·93	1·77	1·79	1·17
†	10·31	10·47	9·92		9·86	9·74	10·45	8·47	10·28	9·64	10·50	10·70	10·57	10·05	10·57	10·65	10·48	12·11	10·06	11·16	9·63	10·67	10·98	12·20	10·05	8·47

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	·12	·13	·15	·19	·16	·12	·16	·15	·15	·17	·16	·17	·20	·16	·22	·15	·15	·13	·13	·13	·11	·08	·15	·11	·15
2	·16	·11	·07	·04	·07	·07	·08	·09	·09	·07	·09	·06	·06	·08	·05	·06	·08	·14	·03	·01	·03	..	..	..	·01	·05
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	·01	·03	..	..	..	..	..	..
4	..	..	·01	..	·01	·02	·01	·01	·01	·01	·01	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
5	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·11	·10	·10	·10	·11	·10	·11	·10	·10	·11	·11	·12	·15	·10	·11	·07	·08	·08	·06	·06	·07	·04	·06	·07	·06	·07
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·03	·01	·02	..	·01	..	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
9	·05	·07	·15	·11	·09	·10	·09	·09	·09	·10	·04	·06	·04	·02	·02	·01	·03	·04	·41	·22	..	·16	·26	·11	·04	·05
10	·02	·01	·03	·03	·04	·03	..	·04	·04	·05	·11	·04	·03	·02	·01	..	·01	·01	..	·01	..	..	..	..	·03	·07
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
12	..	·01	·01	..	..	·01	..	..	·01	·01	·02	·01	·01	·01	·01	..	·02	..	·02	·02	·01	..	..	·01	·01	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	·02	..	·02	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·02	·11	·04	·04	·04	·06	..	·05	·06	·05	·05	·07	·09	·08	·13	·12	·08	·07	·06	·04	·05	..	..	·03	·04	·04
24	·16	·14	·16	·10	·10	·12	·14	·16	·11	·10	·12	·12	·16	·17	·18	·11	·11	·12	·12	·11	·07	·05	..	·07	·07	·12
25	·15	·11	·24	·27	·23	·19	·28	·18	·21	·25	·14	·21	·21	·12	·10	·10	·10	·01	·07	·08	·04	·18	..	·09	·05	·14
26	·12	·42	·26	·38	·35	·37	·34	·39	·35	·29	·40	·26	·43	·44	·44	·43	·45	·53	1·12	·33	·50	·47	·77	·46	·44	·35
27	·14	·26	·17	·18	·15	·15	·12	·15	·16	·21	·21	·17	·24	·39	·35	·38	·22	·24	·52	·59	·42	·52	·40	·42	·18	·24
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	·02	·02	·02	·02	·02	..	·02	·03	·03	·03	·03	·04	·06	·03	·05	·04	·04	·03	·05	·04	·02	..	·04	·02	·02
30	..	..	..	·01	·01	·01	·05	·02	·02	·04	·03	·03	·04	·02	·03	·01	..	·01	·05	·01	..	..	..	..	·01	·07
*	1·04	1·51	1·41	1·43	1·42	1·41	1·34	1·46	1·44	1·47	1·53	1·35	1·67	1·71	1·63	1·56	1·37	1·49	2·63	1·70	1·36	1·57	1·57	1·49	1·07	1·37
†	8·23	9·96	8·51	8·73	8·69	8·39	8·20	8·76	9·06	9·63	9·49	8·75	9·27	10·24	9·69	9·76	9·14	8·84	10·21	9·43	7·86	7·78	8·14	8·70	8·08	9·16

* The figures in this row give the totals for the month.

† The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* **June, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·15	·15	·11	·11	·11	·11	·15	·14	·22	·11	·18	·15	·08
2	·06	·09	·02	·06	·06	·06	·03	·03	·21	·19	·03	·07	·03
3	..	·01	..	..	..	..	..	..	·02	·01	·01	·01	·02
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·08	·10	·10	·14	·11	·12	·12	·19	·15	·18	·14	·19	·18
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	·03	·02	·03	·03	·04	·12	·03	·05	·11
9	·03	·10	·08	·13	·09	·09	·10	·06	·03	·03	·05	·04	·02
10	..	·11	·08	..	·04	·05	·04	..	·01	..	·01	..	·01
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·03	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	·02	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·06	·03	..	·05	·02	·04	·05	·10	·04	·04	·05	·04	·06
24	·09	·10	·09	·17	·10	·11	·12	·20	·13	·20	·14	·17	·31
25	·07	·17	·25	·25	·05	·14	·13	·05	·10	·10	·14	·06	·18
26	·41	·31	·24	·18	..	·23	·24	·05	·35	·11	·42	·39	·18
27	·31	·22	·26	·18	·12	·11	·12	·06	·10	·13	·10	·13	·13
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	.03	·04	·03	·02	·02	·03	·03	·02	·03	·03	·02	·03	·04
30	·08	·05	·01	..	..	·01	·01	..	..	..	..	..	·01
*	1·40	1·48	1·27	1·29	·85	1·12	1·17	·93	1·43	1·27	1·32	1·33	1·36
†	8·24	8·74	8·06	8·27	7·43	8·22	8·43	7·12	7·90	7·94	8·04	8·56	8·75

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh. rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·13	·13	·14	·14	·18	·20	·16	·24	·16	·10	·13	·15
2	·01	..	·03	·08	·09	·04	·02	·01	·01	..	·01	·02	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	·01	·01	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·13	·13	·11	·11	·12	·13	·12	·09	·10	·08	·11	·11	·13
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·04	·03	·03	·01	..	..	..	..	..	..	..	·02	..
9	·08	·13	·14	·11	·14	·10	·10	·22	·19	·13	·08	·01	·14
10	·02	·08	·04	·03	·03	·05	·04	·02	·03	·05	·04	·18	·03
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	·02	·01	..	..	·01	·02	..	..	·01	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	·01	..	..	..	·01	·02	·01	..	..	..	·01
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·03	·05	·05	·06	·05	·04	·06	·03	·06	·02	·02	·03	·02
24	·11	·15	·24	·31	·22	·18	·23	·16	·24	·25	·27	·17	·10
25	·14	·16	·08	·13	·29	·16	·19	·20	·21	·14	·17	·10	·15
26	·11	·15	·12	·11	·28	·30	·18	·25	·15	·10	·20	·08	·07
27	·12	·09	·09	·19	·21	·26	·24	·20	·47	·28	..	·08	·05
28	..	..	·01	..	..	..	·01	..	..	..	..	..	..
29	·02	·03	·04	·04	·04	·03	·03	·03	·03	·02	·01	·02	·02
30	..	·05	·02	·02	·04	·07	·09	..	·01	·01	·01	..	·01
*	·88	1·18	1·17	1·36	1·65	1·54	1·53	1·41	1·75	1·24	1·03	·95	·88
†	7·75	8·26	8·07	8·90	9·01	9·06	8·49	8·47	8·56	7·44	6·17	7·58	5·79

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(July, 1898.)

The month has been very close and dry, with temperature and sunlight rather above the average. The mean barometer at Wallington—30·108 in.—is the highest July mean in the record. Fruit crops are in the district very variable in quantity and quality, being abundant and good in some places, and bad and deficient in quantity in others. The want of water is becoming very serious in many places. Owing to the cloudiness of the weather, evaporation has been small. The rainfall is about two inches below the average. A thunderstorm occurred on the 27th throughout the district. At Sidcup the lime flowered on the 11th. At Croydon the maximum thermometer was 80° and above on two days, 70° and above on seventeen days, and below 60° on two days; whilst the minimum was below 60° on every day, and below 50° on twelve days; and at Redhill the maximum was 70° and above on nineteen days. The mean temperature of the month is about the average, and was at Chipstead 62·5°, at Croydon (Duppas House) 62·3°, at Wallington 61·9°, at Waddon 61·6°, and at Redhill 60·1°. There were recorded at Wallington 212·2 hours of sunlight, which is 4 per cent. above the July mean of the ten years 1886–95. At Lower Kingswood, near Reigate, the rainfall was ·73 in.

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⁂ Note.—The name of the station at Ashtead has been changed to D'Abernon Chase, owing to altered postal arrangements.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* July, 1898.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·15	..	·15		·17	·17	·16	·11	·11	·18	·16	·17	·15	·15	..	·16	·15		·11	·18	·15	·17	·17	·14	·10	·14
2	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
3	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
4	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
5	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
6	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
7	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
8	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
9	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
10	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
11	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
12	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
13	·06	·07	·06	RECORD CEASED.	·03	·03	·02	·04	·03	·04	·04	·04	·04	·04	·04	·05	·02	MONTHLY GAUGE.	·03	·06	·04	·05	·04	..	·04	·04
14	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
15	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
16	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
17	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
18	·03	·02	·03		·03	·02	·03	·01	·04	·03	·03	·03	·04	·04	·04	..	..		·05	·05	·04	·05	·06	·10	·05	·06
19	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
22	·17	·22	·22		·21	·18	·18	·20	·21	·18	·27	·20	·21	·27	·23	·24	·33		·21	·24	·19	·19	·24	·21	·19	·16
23	..	..	..		·02	·05	·04	..	·02	·03	..	..	..	·02	..	·02	..		..	..	·02	..	..	..	·03	..
24	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	·02	..	..		..	·01	·01	..	..	..	·01	..	..	·02	..	..	..		..	..	..	..	·01	..	·02	..
26	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		·03	..	..	..	..	..	..	..
27	..	..	..		·34	·02	·02	·02	·19	·37	·40	·01	·20	·14	..	..	·06		·03	·04	·01	·02	·02	·08	..	·07
28	·08	·11	·16		·14	·15	·15	..	·14	·10	·13	·12	·16	·17	·14	·12	·04		·11	·13	·14	·13	·12	·17	·07	·11
29	..	..	..		..	..	..	..	..	·01	..	..	..	..	..	..	..		..	..	..	..	·01	..	..	..
30	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
31	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
*	·51	·42	·62		·94	·63	·61	·38	·74	·94	1·04	·57	·80	·85	·45	·59	·60	·58	·57	·70	·59	·61	·67	·70	·50	·58
†	10·82	10·89	10·54		10·80	10·37	11·06	8·85	11·02	10·58	11·54	11·27	11·37	10·90	11·02	11·24	11·08	12·69	10·63	11·86	10·22	11·28	11·65	12·90	10·55	9·05

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·12	·14	·18	·15	·13	·12	·13	·14	·13	·13	·14	·12	·12	·14	·12	·15	·17	·15	·12	·07	·11	·06	·05	·11	·09	·12
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·03	·04	·03	·03	·03	·04	·03	·03	·04	·04	..	·04	·04	·03	·05	·03	·03	·03	..	·01	..	..	..	·02	..	·02
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·05	·05	·04	·04	·03	·04	·04	·03	·04	·04	·04	·04	·05	..	·04	..	·04	·03	·05	·04	·03	·03	..	·02	·02	·03
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·15	·42	·30	·37	·44	·36	·43	·37	·37	·39	·37	·26	·20	·22	·24	·24	·20	·15	·21	·21	·18	·20	·07	·19	·12	·21
23	·01	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	·03	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·06	·06	·20	·19	·15	·09	·06	·05	·06	·04	·02	·03	..	·20	·01	..	..	..	..	..	..	..	..	..	..	·01
28	·10	·09	·12	·24	·18	·24	·18	·18	·19	·18	·22	·16	·20	·02	·17	·16	·23	·15	·14	·28	·20	·22	·55	·26	·16	·17
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·52	·81	·87	1·02	·96	·90	·87	·80	·83	·82	·80	·65	·61	·63	·63	·58	·67	·51	·52	·63	·52	·55	·67	·63	·39	·56
†	8·75	10·77	9·38	9·75	9·65	9·29	9·07	9·56	9·89	10·45	10·29	9·40	9·88	10·87	10·32	10·34	9·81	9·35	10·73	10·06	8·38	8·33	8·81	9·33	8·47	9·72

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* **July, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·11	·12	·12	·13	·15	·16	·16	·17	·13	·13	·15	·20	·19	·17	·18	·17	·17	·14	·14	·14	·11	·15	·13	·12	·15	·14
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·02	·02	·04	·04	·03	·03	·03	·03	·03	·04	·03	·03	·04	·04	·04	·21	·03	·02	..	·02	..	·02	..	..	·03	·01
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·03	·03	·04	·02	·01	·04	·04	·04	·04	·04	·05	·03	·06	·05	·04	·05	·05	·04	·05	·04	·04	·06	·04	·03	·04	·06
19	..	..	..	..	..	..	·01	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·19	·24	·28	·38	·24	·18	·21	·15	·16	·16	·16	·09	·22	·19	·26	·26	·30	·39	·36	·35	·23	·36	·28	·22	·24	·26
23	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	·02	·03	·03	·03	·04	·01	·05
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	·03	·13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	·02	·02	·04	·18	·14	·12	..	·04	·02	..	·04	·02	·24	·10	·04	·04	·04	·11	·10	..	·44	·38	·04	·10	·12
28	·15	·17	·22	·21	·30	·30	·23	·13	·08	·15	·14	·28	·20	·19	·18	·19	·21	·21	·16	·14	·21	·27	·20	·14	·15	·15
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·50	·60	·72	·82	·94	·85	·80	·52	·52	·69	·53	·68	·74	·88	·80	·94	·80	·84	·82	·82	·62	1·33	1·06	·59	·72	·80
†	8·71	9·34	8·78	9·09	8·37	9·07	9·23	7·64	8·42	8·63	8·57	9·24	9·49	8·63	9·06	9·01	9·70	9·85	9·88	9·31	9·09	9·89	8·50	6·76	8·30	6·59

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(August, 1898.)

The month, like July, has been very warm, dry, and sunny. In character it is very similar to the month of August, 1893. Fruit crops, as a rule, are poor, but corn crops are good, and have been harvested in splendid condition. The potato crop is fairly good. The month has been a healthy one. On the 21st, at 9.15 p.m., a brilliant meteor was seen at Wallington. It arose in the S.E., and travelled slowly towards the S.W.; it was visible about two seconds, and had a bright blue nucleus, and a long tail of flame-coloured sparks. The great heat of the 22nd will long be remembered; at Greenwich, in the shade, it was 90°, at Waddon 89·5°, at Croydon (Duppas House) 87·9°, and at Wallington 86·7°. There was a good deal of thunder and lightning throughout the district on the 15th and 18th, but with the exception of the country round about Kingston, it was generally a considerable distance away. The want of rain is now becoming very serious; at Redhill a well 35 ft. deep is dry for the first time in thirty-two years, and round about Abinger people are buying water. The maximum thermometer was 80° and above on eight days at Croydon, four days at Redhill, and three days at Sidcup; it was over 70° and under 80° on fifteen days at Redhill, and eleven days at Croydon; and was under 60° on two days at Croydon. Whilst the minimum thermometer was 60° and above on eleven nights at Sidcup and three at Croydon, and was under 50° on ten nights at Croydon. The rainfall is about 1·50 in. below the August average. The mean temperature of the month is about 3° above the average, and was at Croydon (Duppas House) 64·7°, at Wallington 64·2°, at Waddon 64°, at Redhill 62·8°, and at Chipstead 62·6°. There were recorded at Wallington 234·4 hours of sunlight, which is 9 per cent. above the August mean of the ten years 1886–95. At Lower Kingswood, near Reigate, the rainfall was ·99 in.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	RECORD CEASED.	..	..	..	..	..	..	..	..	..	..	..	..	·02	MONTHLY GAUGE.	..	..	..	..	..	..	..	..
2	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
3	·03	·02	·04		·03	·04	·04	..	·04	·04	·04	·03	·03	·03	..	·03	·04		·04	·04	·03	·03	·05	·04	·02	·02
4	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	·02	..	..
5	..	·01	..		·01	·01	·01	..	..	..	·02	..	·01	..	..	·03	·02		..	..	·01	·03	·01	·03	..	..
6	·12	·04	·11		·02	·04	·04	·05	·04	·01	·06	·05	·05	·05	·10	·03	·06		·10	..	·02	..	·02	·15	·07	·09
7	·51	·56	·50		·59	·58	·55	·49	·53	·56	·53	·59	·56	·56	·61	·65	·50		·64	·60	·63	·63	·65	·34	·59	·54
8	..	..	..		·07	·05	·05	·02	·05	·03	·01	·07	·03	..	..	·07	·15		·11	·15	·02	·03	..	·04	·02	..
9	·04	·01	..		..	..	..	..	..	..	·03	..	..	..	·04	..	..		..	·02	..	..	·02	·02	..	·02
10	·01	·04	..		·02	·01	·01	..	..	·05	..	·02	·04	·02	·03	·03	..		·01	·03	·02	..	·01	·04	..	..
11	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
12	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
13	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
14	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
15	·03	·03	·03		·05	·02	·02	·02	·03	·03	·03	·01	·02	·05	..	..	..		..	·02	·02	·01	·02	·07	·01	·08
16	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
17	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
18	·03	..	·03		·02	·01	·01	·06	·02	·03	·02	·02	·02	·02	..	·09	..		·02	·02	·02	·01	·01	..	·06	·06
19	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
20	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
21	..	..	..		..	·01	·01	·01	·01	·01	·01	..	..	..	..	..	..		·02	·02	..	..	..	·02	·01	..
22	·01	..	..		..	·03	·03	..	·01	·02	·01	·01	..	·01	·03	·01	..		·04	·04	·01	..	·01	·03	..	..
23	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
24	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
25	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
26	..	·01	..		..	..	..	..	..	..	..	..	..	..	·02	..	..		..	..	..	..	..	..	..	..
27	·12	·20	·17		·14	·14	·17	·11	·13	·14	·16	·16	·15	·16	·13	·15	..		·14	·12	·12	·13	·12	·11	·08	·06
28	·06	·03	·03		·01	·01	·01	·01	·01	..	·01	·02	·01	·02	..	·02	·19		·04	·03	·02	·04	·02	·09	·02	..
29	·13	·18	·10		·12	·12	·14	·09	·13	·14	·13	·13	·13	·09	..	·14	·17		·13	·10	·06	·10	·11	·08	·05	·05
30	·06	·04	·05		·05	·06	·06	..	·04	·03	·01	·02	·01	..	..	..	·03		..	·01	..	·04	·05	·10	..	..
31	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..	..	..
*	1·15	1·17	1·06		1·13	1·13	1·15	·86	1·04	1·09	1·07	1·13	1·06	1·01	·96	1·25	1·18	1·27	1·29	1·20	·98	1·05	1·10	1·18	·93	·92
†	11·97	12·06	11·60		11·93	11·50	12·21	9·71	12·06	11·67	12·61	12·40	12·43	11·91	11·98	12·49	12·26	13·96	11·92	13·06	11·20	12·33	12·75	14·08	11·48	9·97

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·01	·02	·02	·02	·01	·02	·02	·02	·03	·02	·02	·02	·03	·02	·03	..	·03	·02	·01	·02	·01	..	..	·02	·03	·02
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	·01	·01	..	·01	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·05	·05	·04	·01	·01	·02	..	·03	·02	·02	·02	·01	·01	..	·02	..	·01	..	·01	..	..	..	..	·02	..	·02
7	·61	·55	·60	·56	·53	·54	·55	·52	·57	·57	·55	·52	·63	·65	·65	·70	·67	·69	·69	·82	·67	·65	·74	·66	·63	·58
8	·01	..	..	..	..	..	..	..	..	..	..	..	·02	·05	·06	·05	·08	·06	·09	·07	·04	·05	..	·03	·04	·03
9	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	·01	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	·01	..	·01	..	..	..	·01	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·35	·06	·06	·13	·14	·10	·12	·05	·05	·06	·07	·01	..	..	·01	..	..	..	·01	..	..	..	..	·01	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·05	·01	·02	·02	·02	·03	·01	·03	·03	·02	·02	·01	·01	·01	·01	..	·02	·02	·02	·02	..	..	·04	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·02	..	·02	..	·01	..	..
22	..	·02	·02	·02	..	..	..	·01	..	..	·02	·02	·01	·03	·02	..	..	..	..	..	..	..	..	·01	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·05	·12	·08	·09	·08	·08	·10	·08	·08	·10	·09	·09	·10	·13	·13	·05	·09	·09	·11	·11	·08	·09	..	·12	·03	·06
28	·01	·01	·04	·11	·11	·11	·10	·09	·09	·10	·10	·10	·09	·11	·10	·16	·09	·07	·06	·10	·07	·06	·11	·10	·09	·09
29	·03	·08	·04	·05	·05	·04	·05	·05	·06	·05	·05	·05	·07	·08	·09	·07	·05	·07	·07	·04	·03	·01	..	·03	·02	·03
30	·05	·04	·11	·08	·06	·06	·06	·06	·05	·07	·07	·06	·10	·09	·05	·07	·08	·06	·06	·11	·04	..	..	·02	·02	·04
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·23	·97	1·04	1·10	1·01	1·01	1·01	·95	·98	1·01	1·02	·89	1·08	1·17	1·19	1·10	1·12	1·09	1·13	1·32	·94	·90	·89	1·04	·86	·87
†	9·98	11·74	10·42	10·85	10·66	10·30	10·08	10·51	10·87	11·46	11·31	10·29	10·96	12·04	11·51	11·44	10·93	10·44	11·86	11·38	9·32	9·23	9·70	10·37	9·33	10·59

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedars rd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh. rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·03	·01	·01	·06	·02	·01	·02	..	·02	·03	·01	·02	·04	·02	·02	·02	·02	·02	·03	·03	·01	·02	·01	·01	·02	·02
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..
5	..	..	..	..	·02	..	·02	..	·02	..	..	..	..	·02	..	·02	·01	..	·01	·02	..	·02	·01	·01	·01	..
6	..	..	..	..	·04	·02	·03	·07	·05	·05	·08	..	..	·05	·02	·07	·01	..	·05	·01	·01	·06	..	..	·03	..
7	·66	·57	·59	·58	·64	·69	·63	·68	·64	·68	·68	·80	·74	·71	·77	·55	·60	·50	·51	·57	·59	·50	·55	·56	·63	·59
8	·08	·02	..	..	..	..	·01	·05	·01	..	..	..	..	..	·01	·01	..	..	..	..	·01	..	..	..	..	..
9	..	..	..	..	..	..	·01	..	·01	·01	·01	..	·02	..	..	..	..	..	..	..	..	..	..	·01	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	·02	·02	·18	·07	·13	·13	·30	·18	·18	·36	·38	·22	·21	·05	·07	·16	·02	·07	·08	..	·02	·04	·08	·06	·03
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	·01	..	..	..	·03	·04	..	·02	·02	·02	·03	..	..	..	·02	·02	·02	·02	·01	·01	·02	..	·01	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	·01	·01	·02	..	..	..	..	·01	..	·01	·01	·04	·02	·01	..	·01	..	·03	·01	·01	·02	·02
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·10	·07	..	·06	·08	·08	·06	·05	·04	·04	·04	·06	·08	·09	·14	·08	·15	·11	·16	·17	·07	·11	·06	·02	·09	·05
28	·09	·10	·16	·10	·13	·12	·11	·10	·07	·09	·11	·12	·13	·12	·12	·09	·10	·08	·12	·11	·06	·03	·02	·05	·09	·03
29	·03	·02	·03	·05	..	·04	·05	·04	·05	·05	·02	·05	·06	·04	·04	·05	·06	·05	·08	·05	·03	·05	·03	·02	·05	·02
30	·08	·03	·07	·07	·02	..	·01	..	·07	..	·03	..	..	..	..	·03	..	..	·04	·02	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·07	·85	·88	1·10	1·04	1·13	1·14	1·30	1·18	1·15	1·36	1·47	1·29	1·27	1·19	1·05	1·15	·81	1·09	1·08	·79	·87	·73	·78	1·00	·76
†	9·81	10·19	9·66	10·19	9·41	10·20	10·37	8·94	9·60	9·78	9·93	10·71	10·78	9·90	10·25	10·06	10·85	10·66	10·97	10·39	9·88	10·76	9·23	7·54	9·30	7·35

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(September, 1898.)

The month has been extraordinarily dry, hot, and sunny, and is in character very similar to September, 1895. With reference to the rainfall, there is in the long record of Greenwich, commencing in 1814, only one September with a smaller rainfall, *viz.* 1865, with ·16 in.; and in the Surbiton record, commencing in 1855, September, 1865, is the smallest total with ·35 in.; whilst in the Wimbledon (Mt. Ararat) record, commencing in 1854, September, 1865, has ·47 in., a higher total than September, 1898. It seems probable that the shade temperature of the 8th was absolutely unique for September; it was at Waddon 93°, at Greenwich 92·1°, at Croydon (Duppas House) 91°, at Beddington 90·6°, at Croydon (Waddon New Road) 90°, at Wallington 88·9°, and at Addington Hills 87·5°; and at Croydon (Waddon New Road) the maximum temperature in the shade in a Stevenson screen was 80° and above on no less than ten days. The aurora on the 9th seems to have been generally observed throughout the district. The rainfall is about 1½ to 2 inches below the September average, and the want of water is becoming most serious. The grass is generally burnt up and quite brown, and in some places, as at Keston, the trees appear as if scorched by the heat, whilst all green crops are suffering. Pears in many places are scarce, and apples are much worm-eaten. The mean temperature is nearly 4° above the September average, and was at Croydon (Duppas House) 62°, at Chipstead 61·9°, at Wallington 61·3°, and at Waddon 61·1°. There were recorded at Wallington 230·5 hours of sunlight, an excess of no less than 70·3 hours, which is 18 per cent. above the September mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..		..	..	..	..	..	..	..
2	..	..	..		..	..	..	..	..	..	..
3	..	..	..		..	..	..	..	..	..	..
4	..	..	..		..	..	..	..	..	..	..
5	..	..	..		..	..	..	..	..	..	..
6	..	..	..		..	..	..	..	..	..	..
7	..	..	..		..	..	..	..	..	..	..
8	..	..	..		..	..	..	..	..	..	..
9	..	..	..		..	..	..	..	..	..	..
10	..	..	..		..	..	..	..	..	..	..
11	·07	·03	·09		·06	·06	·07	·03	·09	·07	·08
12	..	..	..		..	..	..	..	..	..	..
13	..	·02	·02		·01	·01	..	..	..	·01	·01
14	..	·01	..		..	..	..	..	..	..	..
15	..	..	..		..	..	..	..	..	..	..
16	..	..	..	RECORD CEASED.	..	..	..	..	..	..	..
17	..	..	..		..	..	..	..	..	..	..
18	·08	·09	·10		·10	·09	·10	·08	·08	·09	·09
19	·02	·03	·03		·01	·01	·02	·01	..	·01	·01
20	..	..	..		..	..	..	..	..	..	..
21	..	..	..		..	·01	·01	..	..	..	..
22	..	..	..		..	..	..	..	..	..	..
23	..	..	..		..	..	..	..	..	..	..
24	..	..	..		..	..	..	..	..	..	..
25	..	..	..		..	..	..	..	..	..	..
26	..	..	..		..	..	..	..	..	..	..
27	..	..	..		..	..	..	..	..	..	..
28	..	..	..		..	..	..	..	..	..	..
29	·83	·85	·63		·24	·22	·25	·25	·29	·22	·27
30	·01	..	..		·01	..	..	..	·01	..	..
*	1·01	1·03	·87		·43	·40	·45	·37	·47	·40	·46
†	12·98	13·09	12·47		12·36	11·90	12·66	10·08	12·53	12·07	13·07

Day of Mo.	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	·05	..	..		..	..	..	..		..	..	..
2	..	..	..	..	..	..		..	..	..	..		..	..	..
3	..	..	..	·02	..	..		..	..	..	..		..	..	..
4	..	..	..	..	..	..		..	..	..	..		..	..	..
5	..	..	..	·04	..	..		..	..	..	..		..	..	..
6	..	..	..	..	..	..		..	..	..	..		..	..	..
7	..	..	..	..	..	..		..	..	..	..		..	..	..
8	..	..	..	..	..	..		..	..	..	..		..	..	..
9	..	..	..	..	..	..		..	..	..	..		..	..	..
10	..	..	..	..	..	..		..	..	..	..		..	..	..
11	·06	·07	·12	·12	·23	..		·07	·12	·18	·09		·10	·10	·10
12	..	..	..	..	..	..		..	..	..	..		..	..	..
13	·02	·01	..	..	..	..		·01	·03	·01	·01		·04	..	..
14	..	..	..	..	..	..		..	..	..	..		..	..	..
15	..	..	..	..	..	..		..	..	..	..		..	..	..
16	..	..	..	..	..	..	MONTHLY GAUGE.	..	..	..	..	RECORD CEASED.	..	..	..
17	..	..	..	..	..	..		..	..	..	..		..	..	..
18	·09	·11	·09	·11	·22	·22		·04	·07	·09	·09		·10	·09	·12
19	·02	·01	·01	..	..	..		·07	·05	·03	·03		..	..	·03
20	..	..	..	..	..	..		..	..	..	..		..	..	..
21	..	..	..	..	..	..		..	..	..	..		..	..	..
22	..	..	..	..	..	..		..	..	..	..		..	..	..
23	..	..	..	..	..	..		..	..	..	..		..	..	..
24	..	..	..	..	..	..		..	..	..	..		..	..	..
25	..	..	..	..	..	..		..	..	..	..		..	..	..
26	..	..	..	..	..	..		..	..	..	..		..	..	..
27	..	..	..	..	..	..		..	..	..	..		..	..	..
28	..	..	..	..	..	..		..	..	..	..		..	..	..
29	·29	·22	·26	·29	·25	·37		·28	·47	·25	·30		·40	·45	·39
30	·01	..	..	·01	..	..		..	·01	..	..		..	..	..
*	·49	·42	·48	·64	·70	·59	·53	·47	·75	·56	·52		·64	·64	·64
†	12·89	12·85	12·39	12·62	13·19	12·85	14·49	12·39	13·81	11·76	12·85		14·72	12·12	10·61

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..		..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
5	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..		..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
7	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·10	·16		·12	·11	·12	·09	·09	·10	·10	·08	·09	·13	·13	·09	·08	..	·11	·04	·03	..	..	..	·07	·02	·05
12	..	..		..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
13	..	·01		·01	·02	·02	..	·03	·03	·02	·03	·02	·03	·02	·03	..	..	..	·01	..	..	..	..	..	..	·01
14	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	OBSERVER DEAD.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·12	·10		·11	·10	·09	·10	·09	·09	·08	·09	·08	·11	·12	·10	·11	·13	..	·10	·10	·11	·08	·11	·10	·08	·11
19	·02	·03		·01	·01	·02	·02	·02	·02	·03	·03	·02	·03	·12	·02	·02	·03	..	..	·01	·01	·01	·02	·04	·01	·02
20	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·37	·42		·24	·25	·20	·19	·22	·23	·22	·21	·20	·26	·29	·33	·26	·25	·22	·23	·16	·15	·10	·13	·17	·21	·18
30	..	..		..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	..	..	..	..	..	·01	..	..
*	·61	·72		·49	·49	·45	·40	·45	·47	·45	·44	·41	·57	·69	·59	·47	·42	·34	·38	·30	·27	·19	·26	·39	·32	·37
†	10·59	12·46		11·34	11·15	10·75	10·48	10·96	11·34	11·91	11·75	10·70	11·53	12·73	12·10	11·91	11·35	10·78	12·24	11·68	9·59	9·42	9·96	10·76	9·65	10·96

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1898.**

Day of Mo.	Bromley Common	Beckenham (Cedarsrd.)	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·06	·07	·05	·06	·07	·09	·08	·10	·07	·05	·09	·08	·05	·07	·05	·07	·07	·08	·06	·05	·02	·02	·01	·03	·04	·03
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·01	..	·02	·02	·01	·01	·03	..	..	..	..	..	·03	·02	·02	·02	·01	·01	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..
18	·11	·10	·08	·09	·07	·08	·08	·07	·10	·12	·08	·11	·11	·12	·11	·09	·09	·09	·08	·08	·08	·06	·07	·06	·14	·11
19	·02	·02	·03	·03	·02	·05	·05	·03	·03	·02	·02	·04	·03	·01	·01	·03	·03	·03	·02	·02	·03	·04	·03	·02	·01	·03
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	.01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·23	·19	·12	·18	·05	·15	·15	·15	·35	·41	·24	·22	·24	·15	·09	·12	·15	·13	·10	·12	·17	·16	·10	·18	·12	·11
30	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	·43	·38	·30	·38	·22	·39	·40	·35	·55	·60	·43	·45	·46	·37	·28	·33	·35	·34	·26	·27	·30	·30	·21	·29	·31	·28
†	10·24	10·57	9·96	10·57	9·63	10·59	10·77	9·29	10·15	10·38	10·36	11·16	11·24	10·27	10·53	10·39	11·20	11·00	11·23	10·66	10·18	11·06	9·44	7·83	9·61	7·63

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(October, 1898.)

The month may be divided into four portions: the first half dry, but dull and foggy, then wet in the middle of the month, fine and warm towards the close, with heavy storms on the 29th and 30th. The rainfall is slightly above the average for the month in most places in the district. The rain has done a great deal of good, and all vegetables have flourished wonderfully. The observers at Nutfield and Warlingham remark on the wonderful growth of mushrooms, and their freedom from maggots. There was heavy rain on the 17th at Abinger; and on the 29th there was heavy rain, accompanied by thunder and lightning, throughout the district, and according to all accounts the storm was heaviest at Camberwell. The observer at Park Hill, Croydon, reports that the Jerusalem artichoke (*Helianthus tuberosus*) has flowered this year, a very rare occurrence; it flowered in 1895. The month has been a healthy one, and there has been very little illness about. The maximum and minimum temperatures in the shade have been unusually high. The mean temperature of the month is about 4° above the average, and was at Chipstead 54°, at Croydon (Whitgift) 53·7°, at Wallington 53·6°, at Waddon 53·3°, and at Croydon (Duppas House) 53·2°. There was nearly a total absence of frost, and scarlet runner beans were gathered at Redhill on the 31st, and dahlias, nasturtiums, and nearly all summer flowers were in bloom on the same day at Sidcup. A solar halo was seen at Croydon on the 10th, and at Wallington on the 20th; and a lunar one at Wallington on the 23rd. There were recorded at Wallington 83 hours of sunlight, which is 6 per cent. below the October mean of the ten years 1886–95. At Lower Kingswood, near Reigate, the rainfall was 3·46 in.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..		..	·01	·01	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
2	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
3	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	·02	..	..		..	..	..
4	..	..	..		..	..	..	..	..	..	..	..	..	..	..	·03	..		..	..	..	·01		..	..	..
5	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
6	..	..	..		..	..	..	..	..	..	..	..	..	·01	..	..	..		..	·03	·01	·01		·02	..	..
7	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
8	..	..	..		..	..	..	..	..	..	..	..	..	..	..	·03	..		..	..	..	..		..	..	..
9	·08	·05	·17		·14	·12	·14	·10	·11	·12	·12	·11	·11	·22	·15	·14	·09		·11	·20	·20	·20		·20	·16	·15
10	..	·01	..		..	·01	·01	..	·01	..	..	..	..	..	..	..	..		·01	..	..	·01		..	..	..
11	..	..	..		..	·01	·01	..	..	..	..	..	..	..	..	..	..		..	..	·01	..		..	..	..
12	..	..	·02		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
13	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
14	·11	·08	·09		·11	·13	·13	..	·11	·11	·13	·15	·13	·13	·15	·16	..		·22	·17	·08	·10		·18	..	·12
15	·04	·05	·08		..	·09	·09	·09	·09	·08	·07	·04	·07	·10	·06	·08	·24		·10	·11	·06	·09		·16	·16	·08
16	·40	·44	·51		·63	·64	·61	·59	·62	·55	·58	·75	·60	·55	·64	·83	·35		·59	·73	·58	·59		·62	·40	·31
17	1·15	1·10	·85	RECORD CEASED.	·69	·62	·62	·65	·77	·68	·65	·64	·66	·60	·80	·76	·39	MONTHLY GAUGE.	·35	·59	·20	·70	RECORD CEASED.	·72	·69	·65
18	·23	·21	·28		·20	·18	·18	·20	·16	·18	·17	·19	·17	·17	·20	·20	·12		·06	·16	·19	·19		·17	·21	·22
19	·03	·04	·04		·06	·07	·07	·06	·05	·05	·04	·15	·04	·04	·28	·07	..		·13	·12	·04	·04		·08	·04	·03
20	·42	·22	·50		·45	·43	·44	·41	·47	·49	·49	·41	·51	·44	·31	·54	·63		·43	·47	·41	·39		·38	·32	·34
21	·02	·08	·02		·03	·01	·02	·01	·02	·02	·02	·02	·02	·02	·02	·03	·03		·01	·02	·01	·01		·04	·02	..
22	·11	·11	·12		·09	·09	·10	·06	·11	·12	·14	·10	·15	·10	·14	·15	..		·12	·13	·08	·09		·07	·06	·05
23	·02	·02	·02		·01	·01	·01	..	·03	·01	·01	..	·01	·01	·05	..	..		..	..	·01	..		..	..	..
24	..	..	·02		..	..	..	..	..	·01	·02	..	·02	·04	..	·06	..		..	·03	..	..		..	..	·03
25	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..		..	..	..
26	..	..	..		..	..	..	..	..	..	..	..	..	·01	..	..	·12		..	..	..	·01		·02	..	..
27	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	·10		..	..	..	..		..	..	..
28	·03	·01	·02		..	..	..	·01	·01	·01	·01	..	·01	·01	·07	·04	·03		..	..	·03	·02		·02	·08	..
29	·83	·92	·95		·99	·78	·78	·92	·97	·93	·97	·80	·94	1·18	·77	·83	·75		·62	1·07	·80	·82		·86	1·07	·85
30	·33	·30	·37		·13	·12	·12	·12	·14	·13	·16	·12	·15	·22	·13	·14	..		·15	·11	·20	·20		·17	·25	·19
31	..	..	..		..	·01	·01	..	·02	..	·01	·01	·01	·01	·03	·04	..		..	·03	..	..		..	..	..
*	3·83	3·64	4·06		3·53	3·33	3·35	3·22	3·69	3·49	3·59	3·49	3·60	3·86	3·80	4·13	2·85	3·50	2·90	3·99	2·91	3·48		3·71	3·46	3·02
†	16·81	16·73	16·53		15·89	15·23	16·01	13·30	16·22	15·56	16·66	16·38	16·45	16·25	16·42	17·32	15·70	17·99	15·29	17·80	14·67	16·33		18·43	15·58	13·63

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1898.**

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm Wickhm.C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..		..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..		..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·02
5	..	..		..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
6	..	·01		..	..	·01	..	·02	·01	..	·02	·01	·02	..	·02	..	·03	·02	·01	·01	..	..	..	·02	·02	·02
7	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	·14	·18		·20	·21	·20	·21	·20	·21	·23	·21	·20	·25	·23	·24	·22	·20	·23	·15	·12	·10	·11	·14	·11	·12	·13
10	..	..		·01	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	·01	..	..	..	·01	..	..
11	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	·03	·02	..	·01	·01	..	..	..	·03	·03
12	·02	..		..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..
14	·09	·14	OBSERVER DEAD. RECORD CEASED.	·10	·09	·10	·10	·10	·10	·10	·10	·11	·11	·12	·12	·12	·14	·12	·14	·12	·12	·13	·18	·16	·14	·14
15	·07	·08		·09	·09	·09	·08	·09	·09	·11	·10	·10	·13	·14	·11	·11	·14	·13	·15	·25	·14	·16	·18	·20	·13	·11
16	·30	·55		·44	·48	·41	·38	·42	·43	·50	·45	·46	·47	·50	·57	·58	·55	·77	·84	·65	·57	·49	·51	·72	·53	·45
17	·63	·65		·60	·65	·53	·38	·56	·55	·50	·45	·42	·47	·45	·45	·39	·33	·37	·27	·27	·21	·23	·22	·23	·27	·32
18	·26	·20		·18	·14	·12	·12	·13	·14	·14	·19	·13	·16	·16	·15	·11	·11	·14	·12	·12	·06	·06	·19	·05	·06	·09
19	·02	·03		·01	·02	·02	·02	·02	·02	·03	·02	·02	·03	·03	·04	·03	·04	·05	·03	·13	·04	·10	·11	·08	·02	·02
20	·32	·37		·29	·30	·29	·26	·31	·30	·29	·28	·28	·32	·33	·36	·36	·32	·22	·33	·31	·33	·31	·15	·33	·33	·32
21	..	·01		·01	..	·01	..	·01	·01	·01	·01	·01	·01	·01	·01	..	..	..	·01	·01	..	..	..	·03	..	·01
22	·02	·06		·03	·04	·04	·04	·04	·04	·04	·04	·05	·08	·09	·09	·10	·09	·05	·06	·06	·06	·06	·17	·08	·06	·07
23	..	·01		..	..	..	..	·01	·01	..	..	..	·01	..	·02	..	..	·03	..	·01	·01	·02	..	·01	·01	..
24	·09	..		·04	·03	·03	·02	·03	·03	·02	·03	·03	·05	·08	·01	·05	·06	·05	·08	·04	·03	..	..	·03	·03	·04
25	..	..		..	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01
26	..	·01		..	..	..	..	..	..	..	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..
27	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	·01		·01	·01	..	..	·01	·01	·01	·01	·01	·03	..	..	..	..	..	..	..	..	..	..	..	..	·01
29	·73	·96		·85	·83	·78	·76	·83	·79	·78	·76	·78	·86	1·02	1·01	1·10	1·06	1·15	·74	·57	1·04	·47	·60	·75	1·10	1·08
30	·22	·19		·16	·17	·17	·15	·18	·20	·18	·17	·19	·20	·22	·21	·23	·22	·13	·13	·14	·18	·13	·15	·09	·10	·13
31	..	..		..	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
*	2·92	3·46		3·02	3·02	2·81	2·52	2·97	2·95	2·94	2·86	2·80	3·25	3·39	3·44	3·40	3·32	3·48	3·06	2·83	2·90	2·27	2·60	2·93	2·96	3·00
†	13·51	15·92		14·36	14·17	13·56	13·00	13·93	14·29	14·85	14·61	13·50	14·78	16·12	15·54	15·31	14·67	14·26	15·30	14·51	12·49	11·69	12·56	13·69	12·61	13·96

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1898.**

Day of Mo.	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh. rd.	Forest Hill S. & V. W. C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·02	·02	·01	..	..	..	..	..	..	..	..	..	..	..	..	·02	·01	·02	·02	·01	·01	·02	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	·15	·16	·16	·20	·14	·30	·20	·20	·18	·15	·17	·18	·14	·14	·17	·15	·17	·14	·15	·15	·14	·16	·14	·20	·14	·11
10	..	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	·01	·01	·01	..	..	·01	..	..	..	·01	..	..
11	·04	·01	..	..	..	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	·02	..	..	..	..
12	..	..	..	..	..	·01	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02
13	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·12	·12	·10	..	·12	·12	·11	·10	·19	·24	·15	·17	·16	·14	·10	·12	·13	·13	·14	·10	·14	·11	·08	·20	·14	·06
15	·13	·10	·09	·20	·03	·05	·05	·02	·06	·06	·02	·03	·06	·05	·06	·09	·08	·09	·10	·08	·16	·14	·11	..	·09	..
16	·57	·45	·55	·43	·30	·36	·35	·33	·79	·60	·25	·27	·44	·34	·28	·36	·35	·52	·48	·45	·69	·45	·50	·44	·33	·28
17	·32	·40	·30	·46	·46	·53	·57	·60	·62	·55	·63	·69	·62	·55	·47	·48	·53	·45	·48	·41	·27	·46	·37	·42	·42	·35
18	·08	·10	·13	·19	·20	·27	·22	·22	·25	·36	·25	·27	·44	·20	·29	·15	·12	·11	·16	·15	·04	·13	·17	·12	·36	·30
19	·04	·02	·01	·02	·02	·02	·03	·02	·06	·03	·04	·05	·05	·03	·05	·05	·02	·03	·03	·03	·03	·04	·03	·02	·04	·03
20	·30	·33	·28	·31	·29	·30	·30	·29	·32	·28	·31	·33	·28	·29	·34	·33	·35	·35	·34	·33	·32	·30	·27	·28	·31	·24
21	..	·01	·01	..	..	..	·02	..	..	·01	..	·01	·02	·01	..	·01	..	·01	..	·01	·01	..	·01	..	·01	..
22	·08	·05	..	..	·01	·04	·03	·04	·05	·04	·04	·05	·06	·03	·03	·04	·03	·05	·05	·03	·04	·03	·02	..	·03	..
23	·02	·01	·02	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	..	..	..	..
24	·03	·04	..	..	·03	..	·04	·04	·04	·05	·04	·04	·04	·03	·03	·04	·04	·04	·05	·04	·02	·02	·01	·01	·02	·01
25	..	·01	..	..	..	·05	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..
26	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	·02	..	..	·01	..	·01	..	..	..	..	..	..	..	·01	·03	·02	·01	·01	·02	·01	·01	·01	·01	·01	..
29	1·15	1·01	·77	·80	·92	1·12	1·12	1·05	·79	·63	·85	·96	·81	1·15	·82	·58	·78	·78	·78	·79	1·05	1·11	·81	·81	·81	·70
30	·28	·14	·11	·19	·38	·36	·34	·40	·33	·32	·38	·29	·30	·25	·32	·20	·14	·16	·10	·11	·09	·15	·15	·17	·29	·24
31	..	..	..	..	..	·02	·01	·02	..	..	·01	..	..	..	..	·01	·01	·01	·01	·01	..	..	..	..	..	..
*	3·35	3·00	2·54	2·80	2·92	3·57	3·44	3·33	3·69	3·34	3·14	3·34	3·43	3·22	3·00	2·67	2·79	2·91	2·90	2·73	3·05	3·15	2·68	2·69	3·01	2·34
†	13·59	13·57	12·50	13·37	12·55	14·16	14·21	12·62	13·84	13·72	13·50	14·50	14·67	13·49	13·53	13·06	13·99	13·91	14·13	13·39	13·23	14·21	12·12	10·52	12·62	9·97

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks 10 a.m.).

NOTES.

(November, 1898.)

The month may be divided into three portions—*viz.* from 1st to 3rd wet; from 4th to 19th dry and fine, but very foggy; and from 20th to the end very wet. At Nutfield there was a little fine snow on the 23rd, and on the 28th snow fell generally throughout the district, on which day one foot of snow when melted at Kenley gave ·45 in. of water. On the 21st it was extremely dark, especially in the morning, when artificial light had to be used in most places in the district. On the 14th one meteor was seen at 10.30 p.m., and many were seen at Lower Kingswood at 1.30 a.m. on the 15th. The month has been very warm, for the water wagtails only migrated from Nutfield on the 20th, and the *Maurandya* and *Cobæa scandens* were in flower there in a very exposed situation, and at Sidcup dahlias and other tender plants were not touched by frost till the 23rd, and at Sevenoaks mushrooms were plentiful in the first three weeks, and blackberries to the end of the month. At Ashtead Common a dragonfly was seen on the 13th. The mean temperature of the month is about 2° above the average, and was at Croydon (Whitgift) 46°, at Wallington 45·9°, at Croydon (Duppas House) 45·7°, at Waddon 45·2°, and at Chipstead 44·7°; at Croydon (Park Hill) the maximum was 50° and above on fifteen days, and under 40° on four days; whilst the minimum was 50° on one day, 40° and under 50° on eight days, and under 30° on two days. The rainfall of the month is slightly above the average, and water at Croydon (Duppas House) did not percolate through one yard of gravel till the 23rd, and through one yard of chalk till the 25th. There were recorded at Wallington 71·8 hours of sunlight, which is 7 per cent. above the November mean of the ten years 1886–95. At Lower Kingswood, near Reigate, the rainfall was 3·49 in.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	ReigateHill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·03	..	RECORD CEASED.	·01	·02	·02	..	..	·01	..	·01	..
2	·32	·35	·38		·39	·32	·41	·36	·36	·34	·39	·34	·38
3	·07	·08	·05		·06	·09	·09	..	·06	·07	·05	·07	·04
4	..	..	..		..	..	..	..	..	..	..	..	..
5	..	·01	..		..	·01	·01	..	..	..	..	..	..
6	..	·01	..		..	·01	·02	..	..	·01	..	..	..
7	..	..	·02		..	·01	·01	..	..	..	..	·01	·01
8	..	..	..		..	..	..	..	..	..	..	..	..
9	·02	..	..		..	·01	·01	..	..	..	·01	..	..
10	..	..	·02		..	·01	·01	..	·01	..	·01	..	·01
11	..	·01	..		·01	..	..	..	·01	..	·01	·01	..
12	..	..	..		·02	·02	·02	·05	·04	·02	·02	·02	·01
13	..	·02	·02		..	..	..	..	..	..	..	..	..
14	..	..	..		..	·02	·02	..	..	..	..	..	..
15	·03	·02	..		·01	..	..	..	·01	·02	·02	·02	..
16	..	..	·02		..	·01	·01	..	·01	..	..	..	·02
17	..	..	..		..	..	..	..	..	..	..	..	..
18	..	..	..		..	..	..	..	..	..	..	..	..
19	..	..	..		..	..	..	..	..	..	..	..	..
20	·23	·27	·25		·19	·31	·32	·36	·25	·16	·21	·24	·18
21	·55	·43	·55		·65	·59	·57	·52	·55	·63	·63	·57	·65
22	·07	·06	·05		·01	·04	·05	·01	·04	..	·03	·02	·02
23	1·78	1·50	1·25		·99	·84	·92	1·03	·88	·88	·79	·90	·85
24	·65	·63	·75		·48	·63	·70	·59	·52	·49	·48	·70	·54
25	·56	·55	·50		·58	·33	·25	·30	·40	·48	·48	·44	·34
26	·03	·02	·03		·03	·02	·03	·02	·04	·03	·04	·03	·03
27	..	·01	..		..	..	..	..	..	..	..	..	..
28	·43	·35	·30		·51	·56	·55	·43	·58	·24	·57	·65	·57
29	·02	·02	..		..	..	..	·01	..	..	..	..	..
30	..	·02	·04		·11	·12	·11	·07	·08	·09	·08	·08	·09
*	4·76	4·39	4·23		4·05	3·97	4·13	3·75	3·84	3·47	3·82	4·11	3·74
†	21·57	21·12	20·76		19·94	19·20	20·14	17·05	20·06	19·03	20·48	20·49	20·19

Day of Mo.	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jus. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	MONTHLY GAUGE.	·01	..	..	·01	RECORD CEASED.	·02	..	..
2	·33	·38	·36	·45		·22	·25	·26	·31		·23	·35	·29
3	·04	·05	..	..		·10	·06	·04	·06		..	·04	·03
4	..	..	..	..		..	..	..	·05		..	..	..
5	..	..	..	..		..	·01	..	..		..	..	..
6	..	..	..	..		..	..	..	·01		·01	..	..
7	..	..	..	..		..	..	..	..		..	..	..
8	..	..	..	..		..	..	..	..		·01	..	..
9	..	..	..	·06		..	..	..	·01		..	..	..
10	·01	..	..	..		·02	..	..	..		..	·01	..
11	..	·02	..	..		..	..	·01	..		..	..	..
12	..	..	·06	..		·05	·06	·02	·02		·08	·03	..
13	·02	..	..	..		..	..	..	..		..	..	..
14	..	·02	..	..		..	..	..	..		..	..	..
15	..	·02	·02	..		·02	..	·02	·02		..	..	·06
16	·02	..	..	..		..	..	..	..		·02	·02	..
17	..	..	..	..		..	·01	..	..		..	..	..
18	..	..	..	..		..	..	..	..		..	..	..
19	..	..	..	..		..	..	..	..		..	..	..
20	·22	·38	·25	·36		·23	·35	·22	·25		·37	..	·06
21	·74	·59	·62	·60		·50	·61	·71	·73		·76	·71	·46
22	·03	·06	·02	·42		·05	·11	·04	·06		·05	·04	·01
23	·76	·95	·48	·65		·56	·75	·58	·81		·77	1·34	1·10
24	·46	·68	·82	·31		·21	·85	·56	·78		·60	·54	·46
25	·54	·44	·48	·35		·56	·35	·32	·57		·51	·43	·47
26	·05	·02	..	..		·02	·05	·05	·05		·06	·06	·07
27	..	..	..	..		..	..	..	·05		..	..	..
28	·57	·68	·62	·12		·33	·62	·23	·57		·57	·33	·24
29	..	·02	·16	..		·04	..	·06	..		·10	..	..
30	·08	·06	·12	·45		·12	·07	·41	·08		·07	..	·04
*	3·87	4·37	4·01	3·77	3·67	3·04	4·15	3·53	4·44		4·23	3·90	3·29
†	20·12	20·79	21·33	19·47	21·66	18·33	21·95	18·20	20·77		22·66	19·48	16·92

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.	Croydon (Whitgift)	Croydon Woburn rd.
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..		..	..	..	..	..	·01	..	·01
2	·25	·30		·20	·23	·20	·21	·20	·22	·23	·22
3	·02	·04		·06	·07	·06	·08	·06	·05	·05	·06
4	..	..		..	..	..	..	..	·01	..	·01
5	·01	·01		..	..	..	..	·01	..	·02	..
6	..	·01		..	..	·01	..	·01	·02	·01	..
7	..	..		..	..	..	..	..	..	..	..
8	..	..		..	..	..	..	..	..	..	..
9	·01	..		..	..	·01	..	..	·01	..	·02
10	·02	·01		·01	..	..	..	·01	·01	·01	·02
11	..	..		·01	..	·01	..	..	·01	·01	·01
12	..	·03		·01	·02	·01	..	·01	·02	·01	·01
13	..	..		·01	..	..	..	..	..	..	..
14	..	·01		..	..	..	..	..	·01	..	..
15	·01	·01	OBSERVER DEAD. RECORD CEASED.	·02	·02	·03	..	·02	·03	·02	·03
16	..	..		..	..	..	..	..	..	..	·01
17	..	..		..	..	..	..	..	..	..	..
18	..	..		..	..	..	..	..	..	..	..
19	..	..		..	..	..	..	..	..	..	..
20	·03	·20		·11	·11	·12	·15	·08	·12	·12	·11
21	·45	·63		·64	·60	·59	·52	·66	·59	·61	·59
22	·02	·03		·02	·03	·04	..	·04	·03	·04	·01
23	·85	·85		·61	·62	·61	·58	·66	·68	·65	·69
24	·50	·51		·40	·40	·42	·40	·46	·46	·49	·44
25	·45	·50		·49	·39	·31	·36	·39	·38	·41	·51
26	·06	·06		·07	·06	·06	·06	·06	·06	·07	·06
27	..	..		..	..	..	..	..	..	..	..
28	·23	·51		·36	·37	·38	·35	·42	·40	·40	·48
29	..	·01		·01	..	..	..	..	·01	·04	·03
30	·02	·08		·05	·06	·06	·06	·06	·06	·06	·07
*	2·93	3·80		3·08	2·98	2·92	2·77	3·15	3·19	3·25	3·39
†	16·44	19·72		17·44	17·15	16·48	15·77	17·08	17·48	18·10	18·00

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm. Wickhm. C.	Hayes Common	Keston (Bradfield)	Orpington	Farning-ham Hill	Chislehurst	Wilming-ton	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	·01	..	..	..	·01	·01	..	..	..	..	..	..
2	·22	·24	·19	·28	·28	·22	·19	·21	·15	·15	·12	·16	·18	·17	·17
3	·08	·06	·07	·06	·06	·07	·05	·08	·09	·09	·08	..	·07	·07	·07
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	·02	..	·01	..	..	·01	..	·02	·01	..	..	·01	·01	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	·01	..	·01	·02	·03	..	..	·01	..	..	..	..	..	·01
9	·01	·01	..	·01	..	..	..	..	·01	..	..	..	·01	..	..
10	·01	..	..	·01	..	..	·01	..	·01	..	..	..	·01	..	..
11	..	·02	..	·01	..	·03	..	..	·01	..	·01	..	·01	..	..
12	·02	·02	·03	·02	..	·02	·03	·02	·02	·04	·04	·15	·03	..	·02
13	..	·01	..	..	·01	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
15	·03	·02	·03	·02	..	·04	·02	·01	..	·03	·01	..	·03	·04	·02
16	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·15	·28	·15	·21	·26	·20	·16	·22	·30	·15	·27	·20	·20	·17	·25
21	·61	·69	·90	·74	·75	·78	·70	·65	·64	·68	·49	·55	·67	·75	·68
22	·03	·05	..	·06	·04	·05	·01	·05	·03	·05	·05	..	·06	·04	·04
23	·61	·61	·65	·69	·62	·64	·63	·56	·42	·28	·23	·25	·29	·41	·40
24	·58	·66	·50	·72	·52	·43	·45	·48	·13	·33	·10	·20	·43	·32	·38
25	·45	·39	·69	·54	·50	·65	·58	·69	·60	·73	·51	·45	·74	·81	·76
26	·05	·05	·06	·04	·04	·05	·05	·04	·04	·06	·04	·05	·04	·05	·06
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·38	·40	·37	·49	·33	·43	·47	·46	·29	·28	·19	·17	·27	·32	·36
29	..	..	·14	·01	..	·01	..	..	..	·01	..	..	..	..	..
30	·06	·06	·08	·07	·10	·07	·07	·06	·06	·10	·04	..	·06	·06	·08
*	3·30	3·60	3·86	4·01	3·54	3·72	3·43	3·54	2·86	2·99	2·18	2·18	3·11	3·22	3·30
†	16·80	18·38	19·98	19·55	18·85	18·39	17·69	18·84	17·37	15·48	13·87	14·74	16·80	15·83	17·26

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1898.**

Day of Mo.	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·17	·18	·13	·23	·19	·25	·27	·21	·26	·26	·25	·29	·29	·24	·23	·14	·20	·19	·17	·17	·15	·18	·16	·11	·43	·15
3	·07	·07	·05	·04	·04	·05	·05	·02	·03	·03	·04	·06	·04	·05	·05	·05	·06	·07	·11	·08	·08	·08	·06	·04	·06	·05
4	..	..	..	..	·04	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	·01	·02	·01	..	..	..	..	·01	·01	..	·01	..	..	·01	..	·01	..	..	..	..	..	..
6	..	·01	·01	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..	..	·01	..	·01	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
9	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	·01	..	..	..	..	..	..
10	..	..	..	..	..	·01	·01	..	·01	..	..	..	..	..	·01	..	·01	·01	..	·01	..	·01	..	..	..	..
11	..	·01	..	·02	..	..	·02	..	..	..	..	..	·01	·01	..	·01	·01	·01	..	·01	..	·01	..	..	..	..
12	·02	·02	..	..	·02	..	..	..	..	..	·02	·03	·02	·03	·03	·01	·01	·01	·02	·01	·02	·02	·01	..	..	..
13	..	..	..	..	·01	·01	·03	..	..	..	..	..	·01	..	·01	..	·01	..	..	·01	..	..	..	..	..	·01
14	..	..	..	..	..	·01	·01	..	..	..	..	..	..	·02	..	·01	..	·01	..	..	..	..	..	..	..	..
15	·03	·02	·04	·02	..	·01	·02	·04	·02	·04	·01	·02	·02	·01	·01	·02	·02	·02	·02	·03	·03	·02	·01	·04	·05	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·18	·15	..	·11	·08	·06	..	·06	·06	·06	·06	·09	..	·07	·06	·06	·07	·14	·02	·08	·11	·07	·06	·06	·05	·06
21	·69	·65	·70	·50	·40	·44	·48	·39	·39	·40	·40	·36	·44	·40	·37	·44	·48	·48	·56	·48	·62	·47	·45	·45	·41	·34
22	·05	·04	..	·05	·01	·01	·02	·02	·05	·05	·03	·03	·04	·03	·01	·01	·02	..	·02	·02	·04	·03	·02	·01	·01	..
23	·47	·43	·55	·47	·21	·39	·47	·47	·72	·55	·58	·52	·28	·27	·27	·33	·39	·10	·32	·20	·24	·24	·18	·19	·31	·15
24	·38	·48	·47	·33	·20	·33	·37	·32	·34	·35	·40	·40	·30	·35	·25	·37	·33	·35	·47	·39	·30	·33	·34	·40	·29	·24
25	·58	·59	·50	·38	·58	·40	·41	·43	·42	·49	·57	·49	·40	·45	·63	·47	·56	·49	·59	·61	·67	·65	·51	·70	·66	·61
26	·06	·06	·05	·07	·03	·09	·08	·06	·06	·07	·05	·07	·09	·09	·08	·08	·07	·62	·09	·08	·07	·08	·07	·06	·07	·07
27	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·07	..	..	..	..	..	..	..	..
28	·35	·36	·37	·33	·16	·19	·17	·19	·17	·15	·20	·19	·16	·14	·16	·19	·21	·35	·17	·15	·20	·15	·14	·12	·18	·11
29	..	·01	·01	..	..	..	·02	..	..	..	..	·01	·02	·01	·01	·02	·01	..	·02	·02	..	..	..	..	·01	..
30	·07	·08	·05	·06	..	·06	·05	·05	·02	·03	·03	·04	·08	·05	·05	·06	·06	·08	·08	·07	·05	·06	·06	..	·05	·05
*	3·13	3·17	2·95	2·61	1·99	2·33	2·50	2·26	2·55	2·48	2·64	2·62	2·21	2·22	2·27	2·29	2·53	3·01	2·66	2·45	2·59	2·41	2·07	2·18	2·58	1·85
†	16·72	16·74	15·45	15·98	14·54	16·49	16·71	14·88	16·39	16·20	16·14	17·12	16·88	15·71	15·80	15·35	16·52	16·92	16·79	15·84	15·82	16·62	14·19	12·70	15·20	11·82

* The figures in this row give the totals for the month. † The totals from January 1st.

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(December, 1898.)

The month, so far as rainfall is concerned, may be divided into three sections—from 1st to 9th wet, then from 10th to 26th dry and fine, and from 28th to 31st wet and stormy. According to the Greenwich mean, the rainfall was about a quarter of an inch above that average, but it appears somewhat doubtful whether this is a correct view to take with respect to the district as a whole. It has been an exceedingly warm month, perhaps the warmest December on record, and this warmth has been accompanied by a very high barometer. As instances of the warmth, a large mushroom, four inches in diameter, was picked at Warlingham, white primroses were in flower at Abinger, and geraniums in window-boxes at Sevenoaks throughout the month. Lunar halos were seen at Nutfield on the 9th, and at Wallington on the 28th. At Croydon (Park Hill) the maximum was 50° and above on fourteen days, and below 40° on five days; whilst the minimum was 50° on one day, between 30° and 40° on thirteen days, and below 30° on seven days. Influenza and colds have been somewhat prevalent. The mean temperature of the month is about 6° above the average, and was at Croydon (Whitgift) 45·4°, at Wallington 45·2°, at Croydon (Duppas House) 44·8°, at Waddon 44·4°, at Redhill 43·8°, and at Chipstead 43·3°. There were recorded at Wallington 48·5 hours of sunlight, which is 4 per cent. above the December mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1898.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Walton Heath	Redhill	Nutfield	Nutfield (2nd gauge)	Buckland	Reigate	Reigate Hill Nutwood L.	Upper Gatton	Merstham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..		..	..	..	..	..	..	..	..	..
2	·03	·03	·03		·02	·02	·02	·01	·03	·03	·04	·04	·03
3	·04	·07	·05		·05	·04	·06	·03	·08	·06	·10	·05	·11
4	·10	·17	·12		·10	·05	·13	·08	·12	·10	·20	·12	·18
5	·02	·05	·04		·03	·01	·02	·01	..	·02	·03	·02	·04
6	·94	·98	·95		·36	·46	·54	·50	·73	·66	·89	·54	·78
7	·35	·31	·36		·53	·33	·32	·27	·37	·45	·38	·35	·37
8	·31	·38	·39		·18	·17	·22	·24	·24	·19	·35	·28	·23
9	..	..	..		·22	·25	·25	·05	·13	·21	·04	·11	·15
10	·01	..	..		..	..	..	..	..	..	..	..	..
11	·04	·04	·07		·04	·03	·04	·01	..	·07	·08	·08	·08
12	..	..	..		..	·01	·01	·01	·01	..	..	·01	..
13	..	..	..		..	..	..	..	..	..	..	..	..
14	·03	·04	·04		·01	·02	·02	·01	·01	·02	·02	·02	·02
15	..	..	..		..	..	..	..	·01	..	..	..	..
16	·01	·01	..	RECORD CEASED.	..	·01	·02	·01	·02	..	·01	·01	·01
17	..	..	..		..	·02	·02	·01	..	..	..	..	..
18	·01	·02	·02		..	..	..	·01	..	..	·01	·02	..
19	..	..	..		..	..	..	..	..	..	..	..	·02
20	..	·01	·82		·01	·03	·03	..	..	·03	·02	·03	·03
21	..	..	..		..	..	..	..	..	..	..	..	..
22	..	..	..		..	..	..	..	..	..	..	..	..
23	..	..	..		..	..	..	..	..	..	..	..	..
24	..	..	..		..	..	..	..	..	..	..	..	..
25	..	..	..		..	..	..	..	..	..	..	..	·01
26	..	..	..		..	..	..	..	·03	..	..	..	..
27	·75	·82	·77		·58	·55	·63	·72	·54	·56	·60	·62	·66
28	·13	·11	·13		·03	·04	·05	·05	·06	·04	·06	·05	·06
29	·18	·20	·15		·19	·13	·19	·09	·19	·21	·25	·22	·25
30	..	..	..		..	..	..	..	..	..	..	..	..
31	46	·46	·44		·30	·28	·32	·29	·33	·31	·35	·28	·37
*	3·41	3·70	4·38		2·65	2·45	2·89	2·40	2·90	2·96	3·43	2·85	3·40
†	24·98	24·82	25·14		22·59	21·65	23·03	19·45	22·96	21·99	23·91	23·34	23·59

Day of Mo.	Chipstead	Chaldon	Caterham	Westerham	Knockholt	Sevenoaks (St. Jus. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Kenley (The Cottage)	Purley (Tudor C.)	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..		..	..	..	..		·02	·04	..
2	·03	..	·05	..		·04	·03	·03	·05		·07	·03	..
3	·06	·11	·08	·09		·02	·07	·03	·04		..	·02	·04
4	·13	·19	·18	·02		·04	·11	·09	·10		·06	·07	·04
5	·02	·04	·08	·04		·02	·04	·02	·02		·03	·02	..
6	·84	·93	·72	·45		·50	·83	·77	·83		1.11	1·05	·96
7	·41	·23	·36	·36		·21	·30	·30	·35		·48	·33	·34
8	·19	·38	·32	·16		·20	·29	·20	·23		·15	·19	·19
9	·18	·03	·18	·15		·02	·08	·05	..		·07	·12	·03
10	..	..	..	..		..	..	..	..		..	..	..
11	·05	·08	·10	..		·02	·05	·03	·03		·15	·03	·05
12	..	..	..	..		..	·01	..	..		..	..	..
13	..	..	..	..		..	..	..	..		..	..	..
14	·02	·02	·03	..		..	·03	·02	·03		·04	·02	..
15	..	..	..	..		..	..	..	..		..	..	..
16	·01	..	..	..	MONTHLY GAUGE.	..	·01	·01	..	RECORD CEASED.	·02	..	..
17	..	..	..	..		..	·01	..	..		..	..	..
18	..	..	·02	·08		..	..	·01	·01		..	..	..
19	·01	..	..	..		..	..	..	..		..	..	..
20	·02	..	·05	..		·02	..	·03	·03		..	..	..
21	..	..	..	..		..	..	..	..		..	..	..
22	..	..	..	..		..	..	..	..		..	..	..
23	..	..	..	..		..	..	..	..		..	..	..
24	..	..	..	..		..	..	..	..		..	..	..
25	..	..	..	..		..	..	..	..		·03	..	..
26	..	·04	..	..		..	..	..	..		..	..	..
27	·70	·70	·70	·68		·70	·79	·60	·65		·58	·69	·59
28	·06	·13	·08	·04		·10	·06	·06	·07		·07	·08	·06
29	·16	·20	·27	·20		·15	·21	·15	·17		·26	·25	·14
30	..	·02	..	..		..	..	..	..		·02	..	..
31	·39	·33	·38	·23		·28	·32	·34	·40		·35	·35	·25
*	3·28	3·43	3·60	2·50	3·26	2·32	3·24	2·74	3·01		3·51	3·29	2·69
†	23·40	24·22	24·93	21·97	24·92	20·65	25·19	20·94	23·78		26·17	22·77	19·61

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1898.**

Day of Mo.	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon Duppas H.
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	OBSERVER DEAD. RECORD CEASED.	..	..	..	..	..	..
2	·03	·03		·06	·06	·06	·06	·06	·06
3	·02	·02		..	..	·01	..	·01	·01
4	·01	·09		·02	·04	·02	·02	·03	·03
5	..	·01		..	..	..	..	..	·01
6	·85	1·21		1·02	1·10	1·09	·98	1·14	1·09
7	·40	·34		·43	·41	·41	·39	·38	·40
8	·12	·16		·07	·08	·08	·07	·09	·10
9	·09	·05		·04	·03	·03	·03	·01	·02
10	..	..		..	..	..	..	..	..
11	·05	·03		·05	·05	·05	·03	·05	·05
12	..	..		..	..	..	..	..	..
13	..	..		..	..	..	..	..	..
14	..	·03		·03	·03	·03	·02	·02	·03
15	·01	..		..	..	..	..	..	..
16	·01	·01		..	..	..	..	..	..
17	..	..		..	..	..	..	..	..
18	..	·01		·01	·01	·01	..	..	·01
19	..	..		..	..	..	..	..	..
20	·02	·01		·03	·02	·02	..	·02	·03
21	..	..		..	..	..	..	..	..
22	..	..		..	..	..	..	..	..
23	..	..		..	..	..	..	..	..
24	..	..		..	..	..	..	..	..
25	..	..		..	·01	..	..	..	..
26	..	..		..	..	..	..	..	..
27	·59	·62		·56	·57	·50	·55	·53	·55
28	·05	·07		·05	·05	·04	·04	·04	·05
29	·14	·31		·16	·17	·15	·14	·16	·20
30	..	..		..	..	..	..	..	..
31	·16	·39		·30	·27	·26	·25	·27	·28
*	2·56	3·39		2·83	2·90	2·76	2·58	2·81	2·92
†	19·00	23·11		20·27	20·05	19·24	18·35	19·89	20·40

Day of Mo.	Croydon (Whitgift)	Croydon Woburn rd.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm Wickhm. C.	Hayes Common
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·01	..	..	..	..	..	..
2	·06	·07	·06	·05	·06	·06	·06	·06
3	·01	·01	·01	·02	·01	·04	·02	·02
4	·03	·03	·06	·04	·08	·10	·04	·04
5	..	·01	..	·01	·01	·01	..	·01
6	1·10	1·00	1·06	·97	·50	·74	·77	·70
7	·41	·46	·40	·35	·69	·41	·43	·35
8	·10	·08	·10	·10	·15	·16	·15	·05
9	·02	·03	·03	·03	·02	·06	·02	·03
10	..	..	..	..	..	..	..	..
11	·04	·03	·04	·04	·08	·03	·04	·06
12	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..
14	·03	·02	·02	·02	..	·02	..	..
15	..	..	..	..	..	..	..	..
16	..	·01	..	..	..	..	..	·01
17	..	..	..	..	..	..	..	..
18	..	..	..	·01	..	·01	..	..
19	..	..	..	..	..	..	..	..
20	·02	·02	·02	·02	..	·02	..	·02
21	·01	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	·01
25	..	..	..	..	·01	..	..	..
26	..	..	..	..	..	..	..	..
27	·49	·50	·54	·57	·71	·69	·79	·70
28	·05	·04	·04	·05	·05	·05	·05	·04
29	·19	·17	·19	·18	·28	·14	·13	·21
30	·01	..	..	..	..	..	..	·01
31	·27	·24	·26	·30	·34	·35	·35	·34
*	2·84	2·73	2·83	2·76	2·99	2·89	2·85	2·66
†	20·94	20·73	19·63	21·14	22·97	22·44	21·70	21·05

Day of Mo.	Keston (Bradfield)	Orpington	Farningham Hill	Chislehurst	Wilmington	Dartford	Sidcup	Bickley	Bromley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..
2	·05	..	·03	·05	·03	..	·06	·04	·06
3	·02	·05	..	·01	·01	·08	·01	..	..
4	·03	·03	·01	..	..	..	·01	·02	·01
5	·01	·01	·01	..	..	..	..	..	..
6	·70	·65	·45	·66	·50	·10	·74	·76	·84
7	·34	·42	·43	·37	·43	·90	·39	·41	·34
8	·18	·19	·13	·13	·10	·02	·12	·10	·10
9	..	·02	·01	·01	..	..	·01	·02	·02
10	..	..	..	..	..	..	..	..	..
11	·04	·03	·04	..	..	..	·02	..	..
12	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..
16	·01	..	..	..	..	..	..	..	·01
17	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..
20	·02	..	·01	·02	..	..	·02	·02	..
21	..	..	..	..	..	..	·01	..	..
22	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	·02
26	..	..	..	..	..	..	..	..	..
27	·56	·61	·52	·49	·48	·53	·53	·59	·56
28	·05	·05	·07	·03	·03	..	·07	·03	·02
29	·14	·21	·20	·12	·12	·12	·13	·14	·14
30	..	..	..	..	..	..	..	..	..
31	·29	·36	·34	·17	·16	·14	·17	·23	·20
*	2·44	2·63	2·25	2·06	1·86	1·89	2·29	2·36	2·32
†	20·13	21·47	19·62	17·54	15·73	16·63	19·09	18·19	19·58

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1898.**

Day of Mo.	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·06	·07	·06	·07	·07	·09	·09	..	·06	·08	·07	·09	·10
3	·02	·01	·01	..	..	..	·02	..	·02	..	·01	..	·01
4	·03	·02	..	·02	..	..	·01	·07	·01	..	·01	·01	·01
5	..	..	..	..	..	..	·01	..	..	..	..	..	..
6	·61	·94	·94	1·00	·98	1·00	·95	1·00	·91	·98	·94	1·06	·96
7	·38	·37	·30	·28	·35	·44	·39	·26	·34	·30	·32	·34	·33
8	·14	·09	·14	..	·01	·09	·13	·11	·16	·13	·14	·13	·10
9	·03	·02	·02	..	..	..	·02	..	·04	..	·01	..	·01
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·04	·01	·01	..	..	..	..	..	·02	..	..	..	·01
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	·03	..	·02	·02	·03	..	·02	·03	·01	·02
15	..	..	..	..	..	..	..	..	..	..	..	..	·01
16	..	..	..	..	..	..	·01	..	·02	..	..	·02	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	·02	·02	..	..	..
19	..	..	..	..	·01	..	..	..	..	..	·02	..	..
20	..	·01	·01	..	·01	·02	·01	..	·02	·02	·01	·01	·03
21	..	..	..	..	·01	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	·02
25	..	..	..	..	..	..	·02	..	..	..	..	..	..
26	..	..	..	..	..	..	·01	..	..	..	..	..	..
27	·62	·54	·39	·55	·53	·52	·50	·45	·58	·48	·56	·62	·56
28	·05	·05	·03	·09	·01	·02	·03	·02	·06	·05	·03	·03	·05
29	·20	·17	·10	·07	·04	·14	·16	·09	·09	·09	·11	·13	·09
30	..	..	..	..	·01	..	..	..	..	..	..	..	..
31	·25	·20	·26	·22	·06	·14	·14	·11	·16	·25	·15	·31	·21
*	2·43	2·50	2·27	2·33	2·09	2·48	2·52	2·14	2·51	2·42	2·41	2·76	2·52
†	19·15	19·24	17·72	18·31	16·63	18·97	19·23	17·02	18·90	18·62	18·55	19·88	19·40

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Sydenham	Forest Hill Dartmh.rd.	Forest Hill S.&V.W.C.	Eltham	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	·01	·01	..	..	..	..	..	..	..	..	..	..
2	·08	·08	·07	·08	·08	·06	·08	·06	·05	·04	·08	·06	·04
3	·01	·01	·01	·01	..	·01	·02	..	..	·01	..	..	..
4	·01	..	·01	·02	·01	·01	·01	..	..	..	..	..	..
5	..	..	..	..	..	·01	..	..	..	..	..	..	..
6	1·06	·99	·96	·98	·95	·88	·95	·78	·97	·95	·89	·89	·84
7	·25	·37	·33	·33	·40	·47	·41	·35	·32	·35	·35	·50	·34
8	·10	·09	·09	·10	·08	·08	·07	·06	·05	·05	·04	·08	·06
9	·01	..	·01	·01	·01	..	·01	..	..	..	..	..	..
10	..	..	·01	..	..	..	..	..	..	..	..	..	..
11	..	..	..	·01	·01	·01	..	..	..	..	..	..	..
12	..	..	..	·01	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·01	·01	·01	·01	..	..	·01	..	..	..	..	·01	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	·01	..	..	..	..	·01	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·01	·02	·02	·02	·02	·03	·02	·01	·02	·01	·01	·02	·02
21	..	..	..	..	·01	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·01	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	·01	..	·01	..	..	..	..	..	..
25	..	..	..	..	·01	..	..	..	..	..	..	..	..
26	..	·01	..	..	..	..	..	..	..	..	..	·01	..
27	·54	·61	·53	·54	·52	·58	·59	·46	·53	·52	·46	·60	·44
28	·05	·02	·04	·02	·03	·03	·02	·01	·01	·01	·01	·01	·04
29	·07	·12	·12	·15	·12	·12	·17	·10	·14	·13	·10	·15	·06
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	·41	·30	·10	·18	·16	15	·13	·11	·13	·10	·12	·29	·28
*	2·63	2·64	2·32	2·48	2·42	2·44	2·50	1·94	2·23	2·17	2·06	2·62	2·12
†	18·34	18·44	17·67	19·00	19·34	19·23	18·34	17·76	18·85	16·36	14·76	17·82	13·94

* The figures in this row give the totals for the month. † The totals from January 1st.

APPENDIX II.

Falls of 1·00 in. and upwards.

June 26th.—Orpington 1·12 in.

October 17th.—Abinger (The Hall) 1·15 in.; Abinger (Rectory) 1·10 in.

October 29th.—Chipstead 1·18 in.; Keston (Bradfield), Bromley Common, and Putney Heath 1·15 in.; Wimbledon (Mt. Ararat) and Raynes Park 1·12 in.; Greenwich 1·11 in.; West Wickham and Bickley 1·10 in.; Bromley 1·08 in.; Warlingham and Leatherhead 1·07 in.; Hayes Common 1·06 in.; New Malden and Eltham 1·05 in.; Chislehurst 1·04 in.; Addington (Park Farm) 1·02 in.; Addington (Pumping Station) and Beckenham 1·01 in.

November 23rd.—Abinger (The Hall) 1·78 in.; Abinger (Rectory) 1·50 in.; Leatherhead 1·34 in.; Dorking (Denbies) 1·25 in.; D'Abernon Chase 1·10 in.; Buckland 1·03 in.

December 6th.—Banstead 1·21 in.; Croydon (Waddon New Road) 1·14 in.; Purley (Tudor Cottages) 1·11 in.; Beddington and Croydon (Whitgift) 1·10 in.; Waddon and Croydon (Duppas House) 1·09 in.; Croydon (Park Hill), Kingston, and Putney Heath 1·06 in.; Leatherhead 1·05 in.; Wallington 1·02 in.; Croydon (Woburn Road), Thornton Heath, Wimbledon (Mt. Ararat), and New Malden 1·00 in.

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PRINTED BY WEST, NEWMAN AND CO., HATTON GARDEN, LONDON.

PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON

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SOCIETY.

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HATTON GARDEN, LONDON.

—

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PROCEEDINGS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1899–1900.

Thirtieth Annual Meeting.

Held at the Public Hall, Croydon, January 16th, 1900.

Wm. Whitaker, B.A., F.R.S., P.G.S., in the chair.

The Statement of the Accounts for 1899 was approved.

The President announced that the following gentlemen had been nominated as Officers of the Club for the ensuing year, and there being no other nominations they were duly elected:—President, William Whitaker, B.A., F.R.S., P.G.S.; Hon. Secretary and Treasurer, F. J. Townend; Librarian, A. Roods; and J. E. Clark, B.A., B.Sc., and R. F. Grundy to fill the vacancies on the Council caused by the retirement (under the Rules) of Jas. Epps, Jun., F.L.S., and G. E. Newby, F.R.C.S.

The following is the list of the Officers for the year 1900:—

President.—William Whitaker, B.A., F.R.S., P.G.S.
Vice-Presidents.—John Berney, F.R.M.S.; Philip Crowley, F.L.S., F.Z.S.; Henry S. Eaton, M.A., F.R.Met.Soc.; Henry T. Mennell, F.L.S.; Henry G. Thompson, M.D., J.P.; Edward Lovett; H. Franklin Parsons, M.D., F.G.S.; W. Murton Holmes; J. M. Hobson, M.D., B.Sc.
Hon. Secretary and Treasurer.—F. J. Townend.
Librarian.—Alfred Roods.

Council.—J. H. Baldock, F.C.S.; J. Edmund Clark, B.A., B.Sc., F.G.S.; H. D. Gower; R. F. Grundy; A. J. Hogg; G. W. Moore; E. Pierce; E. J. Platts; N. F. Robarts, F.G.S.

Botanical Committee. — Arthur Bennett, F.L.S., High Street, Croydon; J. Edmund Clark, B.A., B.Sc., Avondale, Coombe Road; James Epps, F.L.S., Norfolk House, Beulah Hill, Upper Norwood; A. Fitzgerald, 93, Addiscombe Road; Miss Klaassen (Hon. Sec.), Aberfeldy, Campden Road; H. T. Mennell, F.L.S., Park Hill Rise; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; Mrs. Parsons, Park Hill Rise; C. E. Salmon, Clevelands, Wray Park, Reigate; Ernest Straker, Wallington.

Geological Committee. — W. B. Bannerman, F.G.S., Sydenham Road; George Hinde, Ph.D., F.R.S., F.G.S., Avondale Road; A. J. Hogg, 5, Cargreen Road, South Norwood; G. W. Moore, Bryndhurst, Dornton Road; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; N. F. Robarts, F.G.S. (Hon. Sec.), 23, Oliver Grove, South Norwood; W. W. Topley, 3, Marlborough Road; Thos. Walker, C.E., Warrington Road.

Meteorological Committee. — F. C.-Bayard, LL.M. (Hon. Sec.), Wallington; J. Edmund Clark, B.A., B.Sc., Avondale, Coombe Road; Thos. Cushing, F.R.A.S., Chepstow Road; Baldwin Latham, C.E., Duppas House, Croydon.

Microscopical Committee. — Rev. R. K. Corser, 57, Park Hill Road; T. A. Dukes, M.B., B.Sc., 16, Wellesley Road; E. Lovett, West Burton, Outram Road; W. Murton Holmes, Glenside, St. Peter's Road; G. W. Moore (Hon. Sec.), Bryndhurst, Dornton Road.

Photographic Committee. — J. H. Baldock, F.C.S. (Lanternist and Recorder), St. Leonard's Road; H. D. Gower, 55, Benson Road; E. Pierce (Hon. Sec.), Claremont, Balfour Road, South Norwood; E. J. Platts, St. Leonard's Road; Alfred Roods, 67, Thornhill Road; C. J. L. Russell, 56, Coombe Road; A. J. Weightman, Langdale, Chepstow Rise.

Zoological Committee. — John Berney, F.R.M.S., Chatsworth Road; Philip Crowley, F.L.S., F.Z.S., Waddon; John Henry Drage (Hon. Sec.), Tamworth Road, Croydon; C. H. Goodman, Bryn Cottage, Whyteleaf; R. McLachlan, F.R.S., F.L.S., 23, Clarendon Road, Lewisham.

Anthropological Committee. — H. C. Collyer, Beddington; J. M. Hobson, M.D., B.Sc., Morland Road; A. J. Hogg, 5, Cargreen Road, South Norwood; E. Lovett (Hon. Sec.), West Burton, Outram Road; N. F. Robarts, F.G.S., Oliver Grove, South Norwood; J. Watson Slack, 56, Park Lane; H. G. Thompson, M.D., 86, Lower Addiscombe Road; G. Clinch, F.G.S., 22, Nicholson Road.

Museum Committee. — J. H. Drage, Tamworth Road; J. M. Hobson, M.D., B.Sc., Morland Road; E. Lovett, West Burton, Outram Road; H. T. Mennell, Park Hill Rise; H. Franklin Parsons, M.D., F.G.S., Park Hill Rise; N. F. Robarts, 23, Oliver Grove, South Norwood (Hon. Sec. and Curator).

In accordance with a notice given at the last meeting on December 12th, Mr. Baldock moved, and Mr. Roods seconded, a motion that in future the Committee of the Club should be styled the "Council," and the various "Sub-Committees" should be styled the "Committees." This was unanimously carried.

In accordance with a notice which appeared in the circular for this month, it was moved by the President, and seconded by Mr. Baldock, that a portion of the Club's Library should be transferred to the Reference Library at the Town Hall, the President remarking that members of the Club, on satisfying the Librarian of their membership, would be allowed to take away any of the books placed there, but that other people would only be allowed access to them at the Library. He also called attention to the board placed over the Museum cases at the Town Hall, stating that they belonged to the Club. The expense of the board has been defrayed by Mr. W. B. Bannerman, to whom a hearty vote of thanks was accorded. The President also gave notice that at the next meeting he should move that a Curator be appointed, to be *ex-officio* a member of the Council.

The usual summary of the Proceedings and Meetings of the year has been prepared by the Editorial Committee, and follows the Address.

The President's Address.

Ladies and Gentlemen,

It has been usual on these occasions for the President to give a *résumé* of the work done by the Society in the past year. Though there may be a good deal to be said for this proceeding, yet it seems to me that it should be done in a Report from the Council, rather than in the Address of the President.

If you must follow the lead of many other Societies, and insist on having an Address, a proceeding which I regard as most mistaken, then surely it would be better to leave your President to choose his text, and, rather than limit him to a *réchauffé* of our own proceedings, to allow him to hash up any other mental food that he can readily deal with. Moreover, you have all had the chance of attending the evening meetings, and, if you have not done so, it is not clear to me that it is the duty of a President to tell you all about them.

A record of the proceedings of our sections should perhaps be given to you, especially as regards excursions; but I think that such record is secretarial and not presidential work. As a matter of fact, it is done by the sectional secretaries, and surely they should communicate their several Reports to the general Secretary, for inclusion in a general Report.

You see, then, that I have a strong feeling that a President should be saved from work as much as possible: it is the business of a Secretary to do the writing for a Society, whilst a President has only to do right. Being somewhat of an evolutionist, or revolutionist, which are much the same thing, the difference between them being one of amount only—I venture to break through the established rule, and I propose to draw your attention not so much to what we have done ourselves as to what other folk have done for us,—to give you a short account of work that has been done on the Geology of Surrey during the nineties. Naturally, as ours is a general and not a special Society, this greatly exceeds our own geologic work, and therefore it is all the more important that we should know of it. During the period named, however, our Society has made good contributions to our stock of knowledge of local geology, by the publication of the papers abbreviated titles of which are given below, and of accounts of various excursions.

W. M. Holmes. Glauconite Casts from Godstone Firestone.

W. M. Holmes. Microscopic Structure of Hearthstone from Betchworth.

W. Whitaker. Surrey Wells.

Dr. Parsons. Sewer Section at Park Hill Rise.

Dr. Hinde. Gravels of Croydon and its Neighbourhood (a paper of general as well as of local interest).

N. F. Robarts. Occurrence of Mammalian Remains near Purley.

W. Whitaker and E. T. Newton. Drift Deposit at Carshalton.

It seemed to me that if my retrospect were carried back for ten years that would be enough, especially as in 1889 a fairly exhaustive account of our Tertiary Beds, including the Drift associated with them, was given in a Geological Survey Memoir.* Comparatively little of the work that I have to bring before you refers to the tract covered by that Memoir.

1890.

Part III. of Sir J. Prestwich's Papers on the Westleton Beds is devoted to The Southern Drift,† and its distribution in Surrey is treated of on pp. 158–160. The best exhibition of this is on the Tertiary hills, in the gravel of Norwood, of Wimbledon Common, of St. George's Hill near Weybridge, and of Chobham Ridges.

The valley of Smitham Bottom is noticed (pp. 171–173). The

* The Geology of London, &c. 2 vols.

† Quart. Journ. Geol. Soc., vol. xlvi, pp. 155–181, pl. viii.

gravel in its upper part above Merstham contains fragments of hard beds of the Lower Greensand, so that "this Drift was deposited before the strata beyond the [Chalk] escarpment had been removed, and when the valley was prolonged . . . into the Wealden area."

Dr. A. IRVING also took up the subject of "The Plateau-gravels of East Berks and West Surrey,"* reviewing some of Sir J. Prestwich's conclusions. He alludes to the mass of coarse gravel of Hungry Hills, Aldershot, as an illustration of the great amount of Upper Chalk that must have been worn away to furnish the flints, and concludes that the Plateau-gravels are of fluviatile origin and of Pliocene age.

In a paper on Pleistocene Mollusca † B. B. WOODWARD notices two Surrey localities of fossiliferous Alluvium, Kew and Blackfriars (pp. 340, 342).

Our member H. M. KLAASSEN contributed a paper on "The Pebbly and Sandy Beds overlying the Woolwich and Reading Series on and near the Addington Hills,"‡ in which he recorded the section shown by the excavations for a sewer from the windmill in Shirley Road to near the top of the hills, for a distance of 1636 ft. The new sections showed that the pebbles were underlain by sand, beneath which come the Woolwich and Reading Beds, consisting of clays over pebbles and sand. The section of a cutting for a sewer in Oaks Road is also recorded. An account of the excavations for the reservoir by Dr. G. J. HINDE is included: these were wholly in the Blackheath pebble-beds, in which some pebbles of quartzite were the only stones found other than those of flint.

In this year there was an epidemic of notes on the Denudation and Elevation of the Weald, in the pages of the 'Geological Magazine,'§ by H. W. MONCKTON, Dr. A. IRVING (three), and Sir J. PRESTWICH. Though of a general nature they are of Surrey interest, and the second refers to the sands of Chipstead, &c. I may claim some credit for not having been infected, the subject being one in which I am somewhat interested.

Dr. J. G. GARSON and G. F. LAWRENCE have noticed "Skulls dredged from the Thames in the neighbourhood of Kew" and "the Geological Position of the Skulls,"|| but whether the fifteen skulls belong to Surrey or to Middlesex, or to both counties, is a moot point. They seem to belong to the dolichocephalic race, who inhabited the country before "the brachycephalic or Celtic race usually associated with the Bronze period."

* Quart. Journ. Geol. Soc., vol. xlvi, pp. 557–564.

† Proc. Geol. Assoc., vol. xi, no. 8, pp. 335–388.

‡ *Ibid.*, pp. 464–472.

§ Dec. iii, vol. vii, pp. 395–397; 403–409; 479, 480; 575, 576.

|| Journ. Anthrop. Inst.

Sections of the river-bed are given. The skulls came "from the lowest layer of the river-bed" overlying the London Clay.

1891.

Sir J. PRESTWICH's paper on the Valley of the Darent and on the Origin of the Chalk escarpment,* refers partly to the eastern margin of Surrey, into which the basin of the Darent runs. As, however, the paper mainly concerns Kent, we may be content with noting the special references to our county.

The occurrence of rude flint implements on the high grounds of Titsey and Tatsfield is noted (p. 132). The high-level Limpsfield gravel is treated of (pp. 137, &c.), and the brickearth of Limpsfield Common (pp. 145, 146).

A description of an "Excursion to the Bagshot Country between Aldershot and Brookwood," with some notes on the gravels and the Bagshot Beds, appeared this year,† as also one of an "Excursion to Leith Hill," by our former member W. TOPLEY,‡ in which the features of the country are noticed.

Whether the specimens from which C. D. SHERBORN and H. W. BURROWS drew up their "Report on the Microscopical Examination of . . . London Clay from . . . Cannon Street Railway Bridge" § came from Surrey or from Middlesex is doubtful: anyhow, they came from the borderland of the river-bed. Twenty-five samples, in vertical order, are described, and many species of Foraminifera noted.

In their paper "On some Recent Sections at Dulwich," T. LEIGHTON and J. B. OGLE || describe a section some 700 ft. long, of Woolwich and Reading Beds with Drift, in the grounds of the London and County Athletic Club. The old landmarks of Dulwich having mostly gone, and the description of sections seen many years ago not being in accord with modern topography, the authors have kindly translated three of my own notes of obsolete localities into the modern tongue, for which I heartily thank them. The Woolwich Beds noticed consist of mottled clay, underlain by clay shell-beds, underlain by sandy clay, and the Drift (brickearth, gravel and sand) rests irregularly on the upper two, at one place filling a pipe or channel.

H. W. MONCKTON described an "Excursion to Guildford,"¶ giving an account of sections of the Bargate Stone, and of the succession of beds in the Lower Greensand.

An "Excursion to West Surrey"** was also noticed, by W. H.

* Quart. Journ. Geol. Soc., vol. xlvii, pp. 126–163, pls. vi–viii.

† Proc. Geol. Assoc., vol. xi, no. 9, pp. cliv, clv.

‡ *Ibid.*, pp. clxiii–clxvii.

§ *Ibid.*, vol. xii, no. 1, pp. 4–7.

|| *Ibid.*, pp. 8–15.

¶ *Ibid.*, pt. 3, pp. 97–99.

** *Ibid.*, pp. 100–104.

HUDLESTON, who treats of Bagshot Beds and Gravelly Drifts, and criticizes the Geological Survey mapping and classification of the beds at St. Anne's Hill, near Chertsey.

In this year appeared that very useful work, the Geologists' Association's 'Record of Excursions,' during the years 1860 to 1890. Of this pp. 74 to 114 are devoted to Surrey, the places mentioned in the titles being Addington, Box Hill, Caterham, Chilworth, Croydon, Dorking, Epsom, Godstone, Guildford, Kew, Kingston, Leith Hill, Mole (Valley of), Nutfield, Redhill, Richmond, Riddlesdown, Shirley, and Tilburstow.

In "Physical Studies of an Ancient Estuary,"* Dr. IRVING treats of the Bagshot Beds of the London Basin generally.

J. T. HARRISON's paper "On the Subterranean Water in the Chalk Formation of the Upper Thames, and its Relation to the Supply of London,"† deals, of course, with Surrey, including some parts that can hardly be described as connected with the Upper Thames, such as the Basin of the Wandle, with a map of its Chalk gathering ground (pp. 5, 7–10). Other references to Surrey are to be found on pp. 12, 14, 15, and in the discussion, on pp. 26, 31, 52–57, 60, 63, 64, 67, 71, 73–75, 85–87, 96, 98.

T. LEIGHTON, in the abstract of his paper "On Recent Discussions relating to the Geology of the South-East of England,"‡ refers to the Bagshot Question, to the Sands of doubtful Age on the North Downs, and to Coal in South-East England. The first he describes "as an attempt to establish certain unconformities which do not exist," in which many geologists will agree with him; but the other two are left as open questions.

1892.

H. W. MONCKTON's paper "On the Gravels south of the Thames from Guildford to Newbury" § refers partly to Surrey.

"The greater part of the hill-gravel . . . belongs to the Southern Drift of Prof. Prestwich," which consists "of materials derived from the Wealden area of Kent and Surrey, the Chalk . . . Eocene formations . . . and older gravels." The author thinks it to be "the gravel of old rivers which had little or no relation to our present river-system." The gravel of Chobham Ridges and the Fox Hills is an example of this Drift.

The gravels of the valleys and terraces are of local origin, and largely derived from the older gravels.

The same author also gave a paper on "The Bagshot Beds of Bagshot Heath,"|| which is concerned with a controversy as to

* Geol. Mag., dec. iii, vol. viii, pp. 357–364.
† Proc. Inst. Civ. Eng., vol. cv, pt. iii, pp. 1–99, pls. 1, 2.
‡ Twentieth Ann. Rept. S. Lond. Micr. Nat. Hist. Club, pp. 9, 10.
§ Quart. Journ. Geol. Soc., vol. xlviii, pp. 29–47.
|| *Ibid.*, pp. 48–59.

the classification of certain beds with Upper Middle or Lower Bagshot, a discussion which I always avoid when I can, as now, especially as the district is to a great extent not in Surrey. Those who wish for more of it should refer also to the "Rejoinder," by Dr. A. Irving.* I am glad to find that W. H. Hudleston has come to much the same conclusion as that which I have independently reached: "It might, indeed, simplify the problem if we abolished the so-called Middle and Upper Bagshots [meaning the names, not the deposits, which, unfortunately, are beyond our power], and replaced those names by those of the richly fossiliferous Hampshire equivalents."†

Prof. G. S. Boulger gave an account of an "Excursion to Wotton and Ranmer,"‡ noting a junction-section of Gault and Folkestone Beds, and other sections of Lower Greensand.

In "The Hybodont and Cestraciont Sharks of the Cretaceous Period,"§ A. S. Woodward figures specimens from the Lower Chalk of Guildford and of Warlingham: the latter perhaps should have been noted as Middle Chalk (pl. 2).

J. W. Grover, in "An Explanation of the London Water Question,"|| advocates the taking of a large amount of spring water from the Basin of the Mole, near Leatherhead (pp. 214, 215).

F. Lasham, in "Palæolithic Man in West Surrey,"¶ records the finding of a good flint implement at Worplesdon, in "ballast" said to have come from Farnham. This led to a search in the latter neighbourhood, which has resulted in the finding of more than three hundred specimens. The Farnham gravels are noticed and some implements described.

1893.

Two papers, by H. W. Monckton "On the Occurrence of Boulders and Pebbles from the Glacial Drift in Gravels south of the Thames," and by O. A. Shrubsole "On the Plateau-gravel South of Reading,"** refer to our county, one of the districts described in the former being "Weybridge, Kingston, and Wimbledon," whilst Chobham Ridges is one of the localities alluded to in the latter.

Mr. Monckton concludes that, though probably "rivers flowing in the direction of the present Thames and Kennet existed at the time when the Glacial Gravel was spread out, the valleys in

* Quart. Journ. Geol. Soc., vol. xlviii, pp. 485–487.
† *Ibid.*, vol. xlix, Proceedings, p. 101 (Presidential Address).
‡ Proc. Geol. Assoc., vol. xii, pts. 9, 10, pp. 403–406.
§ Proc. Yorksh. Geol. Soc., vol. xii, pt. i, pp. 62–68, pls. 1, 2.
|| Trans. Surveyors' Inst., vol. xxiv, pt. vii, p. 195.
¶ Coll. Surrey Archæol. Soc., vol. xi, 5 pp., 2 pls.
** Quart. Journ. Geol. Soc., vol. xlix, pp. 308–324.

which those rivers now flow have to a large extent been excavated since."

An important contribution to the literature of one of our chief formations was given by Prof. BOULGER and T. LEIGHTON in their paper "On the Lower Greensand Area . . . between Wotton and Dorking,"* in which they advocate the extension of the Folkestone Beds, at the expense of the Hythe Beds, southward to the great east and west "Rookery Fault." The Rookery section is described and seven new sections. As it is allowed that "it is difficult, in words, to express the difference between the Hythe and Folkestone Beds of this district," we need not be surprised that a reading adopted by the Geological Survey many years ago does not now commend itself to everybody, especially as so much fresh information is to hand. The classification of the Bargate Stone is discussed. I am by no means ready to join in the idea of the authors that they will be "charged with presumption in attempting to correlate beds upon lithological evidence only." It is very good evidence, when rightly used, especially when there is no other.

An account of an "Excursion to Farnham" † deals with Gravels, Gault, Folkestone Beds, and flint implements; whilst one of an "Excursion to Dorking" ‡ refers to the subject of the paper last noticed.

T. LEIGHTON also described an "Excursion to Abinger,"§ noticing gravel and various sections in the Lower Greensand of Leith Hill.

The Report of the Royal Commission on the Water Supply of the Metropolis, with its bulky Minutes of Evidence and Appendices, contains much matter relating to Surrey, for the analysis of which more time would be needed than I can at present dispose of.||

1894.

In his Presidential Address to the Geological Society, W. H. HUDLESTON refers to the question of "Coal in the South-east of England," concluding that, if "a coal-basin exists within hail of the metropolis, it is quite as likely to be found between Croydon and Reigate as anywhere else. If the Board of Trade could be persuaded to bore at suitable intervals along a line connecting those two towns, geological science would certainly be a gainer, and Surrey as well as Kent might be proved to have its coal-field."¶ I should like to see some one suggesting such a course

* Proc. Geol. Assoc., vol. xiii, pt. 1, pp. 4–16.
† *Ibid.*, pt. 3, pp. 74–81.
‡ *Ibid.*, pt. 5, pp. 140, 141.
§ *Ibid.*, pp. 163–167.
|| Fol. Lond.
¶ Quart. Journ. Geol. Soc., vol. l, Proceedings, p. 71.

to the Board of Trade, or to any other Government Department! And I should like to see some one else doing the borings.

In his paper on "The Bargate Beds of Surrey and their Microscopic Contents," F. Chapman* has added largely to our knowledge of that part of the Lower Greensand.

He thinks that these beds are neither the base of the Folkestone Beds nor the top of the Hythe Beds, both of which suggestions had been made; but are rather a distinct series, perhaps representing the intervening Sandgate Beds, which had been supposed to be absent here.

Like the Sandgate Beds, these Bargate Beds contain much clayey matter, and they thin out toward the area where the former occur.

Two sections near Guildford are noticed in great detail, with an account of the heavy minerals in one case, and with microscopic sections in the other.

The Ostracoda and the Foraminifera are described, there being 20 species of the former (of which 7 are new, and 4 are Jurassic forms), and 139 of the latter (of which 11 are new, and 107 others hitherto unrecorded from beds of this age). This part of the paper (41 pages) should be of interest to our microscopic members.

A. S. Woodward's "Notes on the Sharks' Teeth from British Cretaceous Formations"† has a reference to one Surrey specimen, from Upper Chalk near Guildford (pl. v, fig. 13).

Dr. W. F. Hume's general paper, "The Genesis of the Chalk,"‡ is of interest to all chalky counties.

An "Excursion to Oxted and Titsey" § contains but a short reference to two pits in the Folkestone Beds.

The paper by B. Fowler on "the Hythe Beds . . . in the Liphook and Hindhead District" || refers to our county and the bordering part of Hampshire. Various sections and springs are noticed.

An account of an "Excursion to Redhill and Nutfield"¶ deals with the Fuller's earth and with the classification thereof.

Dr. J. W. Gregory's notice of an "Excursion to Guildford and Shalford," ** contains a map showing the outcrops of the Gault and of the following divisions of the Lower Greensand:—Upper Sands, Bargate, Pebble Beds, Lower Sands, Passage Beds and Atherfield Clay, the Bargate Beds irregularly disposed in the Pebble Beds, and not at one horizon.

* Quart. Journ. Geol. Soc., vol. l, pp. 677–730, pls. xxxiii, xxxiv.
† Proc. Geol. Assoc., vol. xiii, pt. 6, pp. 190–200, pls. v, vi.
‡ *Ibid.*, pt. 7, pp. 211–246.
§ *Ibid.*, pt. 8, p. 291.
|| *Ibid.*, pts. 9, 10, pp. 361–365.
¶ *Ibid.*, pt. 10, pp. 371–374.
** *Ibid.*, pp. 377–381.

Though Dr. J. W. GREGORY's paper, "The Evolution of the Thames,"* is of a general character, and contains no special reference to Surrey, yet, as we have a share in that river, we are concerned therewith.

1895.

T. LEIGHTON's paper, "The Lower Greensand . . . of East Surrey,"† which deals especially with the Hythe Beds and the Sandgate Beds, is of importance both for the details given and for the conclusions drawn from these as to the classification of the beds.

He concludes (1) that the chert-beds at Leith Hill and to the west have been eroded south of the escarpment southward of Dorking; and that, "instead of a lithological change from east to west," as had been supposed, there is one "from south to north, from deep-water beds to shallow"; (2) "that at the base of the Folkestone Sands an area of pebbles . . . can be traced . . . from Leith Hill to Tilburstow Hill, the pebbles becoming smaller . . . eastward"; (3) "that the Lower Greensand of this area consists of beds formed in a marine estuary or shallow sea," and "that no correlation with beds at Hythe and Sandgate is possible."

He thinks that there are "groups of beds developed locally throughout this area," as follows:—1. "The Fuller's Earth Beds . . . between Reigate and Tilburstow Hill." 2. "The chert-beds of Leith Hill and . . . to the west," in two divisions. 3. "The clayey sands . . . south of Dorking." 4. "The iron-sands which overlie the Atherfield Clay . . . throughout . . . the district."

The Chert-beds of Leith Hill and the Pebble- and Chert-beds east of Dorking are described in detail, with a useful digression to the Fuller's earth in the latter case. A comparative table of sections (six compilations) from east of Dorking to east of Bletchingley is given, and a summary of the author's conclusions. The paper itself should, of course, be studied by our geologic members.

Dr. J. W. GREGORY, in his account of an "Excursion to Chilworth,"‡ gives a map of the neighbourhood of Woodhall, of like kind to that of 1894, but on a larger scale, introducing "Chert Series" between the Pebble Beds and the Lower Sands, and omitting the Bargate Stone, which has disappeared.

In the notice of an "Excursion to Betchworth and Headley,"§ H. W. MONCKTON treats of the Eocene outliers, of the sands of doubtful age, but later than Eocene, of the gravels, and of the clay-with-flints.

* Nat. Sci., vol v, p. 97.

† Quart. Journ. Geol. Soc., vol. li, pp. 101–124.

‡ Proc. Geol. Assoc., vol. xiv, pt. 3, pp. 120–124.

§ *Ibid.*, pp. 124–128.

T. Leighton's account of an "Excursion to Tilburstow Hill"* continues his work eastward (see first notice of this year). I beg leave to doubt whether the beds in the large pits north of the high road can be altogether grouped with the Folkestone Beds. Late visits to this long line of section, perhaps now in better form than then, lead me to think that Sandgate Beds and Hythe Beds are also shown, Folkestone Beds only at one part.

In noticing "Fossils from the Lower Greensand of Great Chart, in Kent,"† and the beds from which they came, Dr. J. W. Gregory refers to other parts, including Surrey, giving a table of our representatives of the Kentish beds, and making the upper part of our Folkestone Sand the equivalent of the Lower Gault further east.

G. E. Grimes records "Two Occurrences of Radiolarians in English Cretaceous Rocks,"‡ one being in the rock above the Fuller's earth of the Lower Greensand between Redhill and Nutfield, the other in the Upper Greensand of Colley Farm, near Reigate.

W. G. Peirce, in a Presidential Address,§ drew attention to the water-supply of Richmond, from a well and galleries in the Chalk.

In this year there was a re-issue of Prestwich's important work, "A Geological Inquiry respecting the Water-bearing Strata of the Country around London, . . ."‖ with a new Preface and "Preliminary Remarks," referring to the deep borings that have been made since the original issue, and to the possibility of getting water from the Lower Greensand deep underground.

Sheet 12 of the Index Map of the Geological Survey, printed in colours, on the scale of four miles to an inch, was published this year. It represents the whole of Surrey, and much more; but, as we have a copy, no more need be said of it.

1896.

T. Leighton again adds to our Lower Greensand literature, by an account of an "Excursion to Dorking and Leith Hill."¶ An outcrop of Bargate Sand and Stone, from beneath Folkestone Sands, was found at Dorking, three miles east of any record. Several other sections are noticed.

One of our members, Mr. B. Latham, in the discussion on a

* Proc. Geol. Assoc., vol. xiv, pt. 5, pp. 191, 192.
† Geol. Mag., dec. iv, vol. ii, pp. 97–103, 187, 188.
‡ *Ibid.*, pp. 345–347.
§ Trans. Soc. Eng., pp. 16, 17 (of separate copy).
‖ 8vo. London.
¶ Proc. Geol. Assoc., vol. xiv, pt. 8, pp. 331–335.

paper on Percolation Gauges, refers to two that he had made in Surrey.* One was on the Chalk Downs and the other in the gravel part of Croydon. "After about sixteen years he found that the vegetation which was natural to the downs had changed its character and was putting on a new garment altogether, and growing at a very different rate to the rate at which herbage on the downs generally grew." He found that "more water passed through a chalk percolating gauge than actually flowed off a chalk area," and that "the average percolation through a chalk gauge was 11·18 inches at Croydon out of a rainfall of 26·08 inches."

1897.

In this year there appeared a paper of considerable interest to Croydon geologists, by W. P. D. Stebbing, on "Boulders of Granite from the Middle Chalk of Betchworth, . . ."† as one of the best known occurrences of the sort is that at the Haling pit, generally and wrongly called the Purley pit.

The two stones described came from the zone of *Terebratulina gracilis*, and their weights were 7lb. 7oz. and 3lb. 12oz., the former being a fine-grained much decomposed rock with valves of *Spondylus* and *Serpulæ* attached; the later being of a coarser kind, and less decomposed.

The author thinks that coast-ice was probably the means of transport, but allows that in some like cases entanglement in the roots of trees may have acted.

With the conclusion that boulders "seem to come chiefly from the Middle Chalk," I am hardly disposed to agree, as the richest locality I know of is close to the base of the Lower Chalk at Gayton, in Western Norfolk, whence I have got many boulders of various kinds.

In the report of an "Excursion to Redhill and Merstham,"‡ a Fuller's earth pit, near Redhill Station, is noticed, also a section of Drift loam over Folkestone Beds at Frenches (see 1899), and a sand with phosphatic nodules further north. The new railway-cutting near Merstham is described, and then the large pit in Middle and Lower Chalk.

F. Meeson's account of an "Excursion to Woking" § deals with the Bagshot Beds.

Our member E. A. Martin || alluded to "Foreign Boulders in the Chalk," discussing the method of transport and referring to the Haling and to the Betchworth stones. Prof. Bonney objects

* Trans. Soc. Eng., pp. 170, 171.
† Quart. Journ. Geol. Soc., vol. liii, pp. 213–220, pl. xv.
‡ Proc. Geol. Assoc., vol. xv, pt. 3, pp. 113–115.
§ *Ibid.*, pt. 5, pp. 185–188.
|| Geol. Mag., dec. iv, vol. iv, pp. 169, 170.

to his conclusion that the Betchworth boulders may have come from the West of England.*

The little work by H. B. Woodward, entitled "Soils and Subsoils from a sanitary point of view; with especial reference to London and its Neighbourhood,"† is one that most of you should have. The coloured map of sub-soils, arranged according to composition, is a new adaptation of a geologic map, and the work is throughout of great practical interest.

In this year appeared a very elaborate paper, by Prof. W. F. Barrett, "On the so-called Divining Rod,"‡ and Surrey is in the running. A successful case at Holmwood is recorded on p. 99; but without any note of the geology of the sites referred to. "The Richmond Experiments" are described in pp. 188–195, and we hear that "the results were only of transient success." As two diviners were employed, and their "results were rather startlingly different," one can hardly speak of success. The experiments were made in a gallery at the Waterworks, deep underground. That the moderate success was "transient" may be gathered from the facts, chronicled by the engineer, that "the one bore-hole that yielded 8000 gallons a day on the first day gradually fell off and was exhausted at the end of the week," and that twenty-two bore-holes gave "a very small increase in the quantity of the water." It is only right to say that the cost of the experiment was not borne by the Corporation, but by one of its members, and purely as a test.

"The Wimbledon Experiments" were made by the author himself, to test "the lad who bears the appropriate name of Fred. Rodwell," and the account of them takes up pp. 203–206. We hear of one experiment that "here he blundered a good deal"; of another that "the test was . . . a complete failure"; in another an old well, grassed over, was crossed and recrossed without any indication of water; in yet another a hidden tank, full of water, fared the same way. Other smaller kinds of failure are chronicled, and therefore we may agree with the author that "the result was unsatisfactory" from the dowsing point of view, though I could hardly join him in adding "or, to say the least, inconclusive"; for it seems to me conclusive enough, as far as regards this one performer.

The balance, then, of the Surrey evidence is not in favour of the magic twig.

P. Griffith, in treating of the "Water Supply of Small Towns, . . ."§ described the second Godalming works (pp. 68–

* Geol. Mag., dec. iv, vol. iv, pp. 238, 239.

† Geological Survey Memoir. 8vo, London.

‡ Proc. Soc. Psychical Research, pt. xxxii. I have to quote from an author's copy, in which the original pagination has been unwisely abandoned by the printer.

§ Trans. Soc. Eng., p. 55.

72, pls. 4, 5), in which the water from a spring is impounded. The water must come from the Lower Greensand.

J. Mansergh referred to a bill promoted by the Croydon Corporation in his address, "The Law and Allocation of Underground Water," at the Engineering Conference of the Institution of Civil Engineers.*

1898.

H. W. Monckton described "some Gravels of the Bagshot District."† This tract includes contiguous parts of Berkshire, of Hampshire, and of Surrey, and is therefore of interest to Surrey geologists.

The presence of large blocks of greywether-sandstone in gravel of Chobham Ridges and of other places is treated of at length, and this is an analogous occurrence to that of the blocks of pudding-stone in gravel around Croydon, the stones in both cases being for the most part the relic of some old Tertiary beds, though the author thinks that some are consolidated gravel.

The Farnham Gravels are also noticed, and are taken to be all River Gravels, although on the Geological Survey map some of the patches are classed simply as Hill Gravel of doubtful age.

The author's conclusion is that there is "no evidence of the presence of the sea in this district during the Drift period," but that there is "ample evidence of ice-action, and this evidence is more or less present in the gravel of all levels," and that the gravel "practically coincides in age with the duration of the Glacial Period."

A. E. Salter's paper, "Pebbly and other Gravels in Southern England,"‡ refers to Surrey, under the headings High Level or Early Drifts (pp. 266, 267); Lower Plateau and Glacial Drifts (pp. 271–274); The River Drifts (pp. 275, 276).

T. Leighton, in an account of an "Excursion to Godalming,"§ continued his work on the Lower Greensand, noting sections of Bargate Stone and Pebble Beds, and of clay. He objects to the Fullers' earth of Nutfield, &c., being classed as Sandgate Beds.

A report of an "Excursion to Kingswood and Walton-on-the-Hill,"‖ describes cuttings on the Chipstead Valley Railway, which show various Drift beds over Thanet Sand and Chalk, as well as a very irregular piped junction of Thanet and Chalk. The gravel of the Heath is also noticed.

A short note of an "Excursion to Upper Warlingham and Worms Heath,"¶ alludes to the Valley Gravel at the former

* Separate copies, not otherwise published.
† Quart. Journ. Geol. Soc., vol. liv, pp. 184–195.
‡ Proc. Geol. Assoc., vol. xv, pt. 7, pp. 264–268.
§ *Ibid.*, pt. 10, pp. 445–450.
‖ *Ibid.*, pp. 456–458.
¶ *Ibid.*, pp. 458, 459.

place, and to the Blackheath Pebble Beds at the latter. The occurrence of allophane here is recorded for the first time.

In "Memoranda chiefly on the Drift Deposits," from the manuscripts of Sir J. Prestwich, there is a reference to sections at Clapham and Wandsworth Commons.*

"The Problem of the Water Supply"† notices a new well at Camberwell, with a section of the beds passed through, which particular well gave occasion to paragraphs in many papers.

In a paper on "New Borings round London,"‡ E. A. Martin notes one Surrey section, which, however, had been already printed in our Transactions. If our members have any new information of this sort, I hope that they will let us have it, or will let me have it, as I have a third paper on Surrey Wells on the stocks.

1899.

In my Presidential Address to the Geological Society, I alluded to some experiments of Dr. Klein on Thanet Sand from Beddington, which show that this sand, as a filtering material, is highly bacteriocidal.§

In his "Analysis of the Genus Micraster,"‖ Dr. A. W. Rowe has made a very important contribution to the palæontology of the Chalk, especially from an evolutionary point of view. Although the specimens on which it is based do not come from Surrey, the reasoning is applicable to our Chalk. The object is to show that, "from the zone of *Rhynchonella Cuvieri* to the upper part of the zone of *M. coranguinum*, we can trace an unbroken continuity in the evolution of *Micraster*." All our collectors of Chalk fossils should read this paper.

W. P. D. Stebbing's account of an "Excursion to . . . Walton-on-the-Hill and Betchworth,"¶ gives some further particulars of the new railway cutting (see 1898), and of the pinnacles of chalk that extend up into the Thanet Sand. The Betchworth pit, in Middle and Lower Chalk, is also noticed.

An "Excursion to Reigate," described by Miss Crosfield,** notes a junction of Gault and Lower Greensand, a pit in Upper Greensand, and a deposit with recent species of shells.

A. M. Davies, in treating of "The Base of the Gault in Eastern England," refers to three places in our county.††

* Geol. Mag., dec. iv, vol. v, p 407.
† The London Argus, March 5, p. 389.
‡ Science Gossip, n. ser., vol. v, p. 118.
§ Quart. Journ. Geol. Soc., vol. lv, pp. lxxvi, lxxvii.
‖ *Ibid.* pp. 494–547, pls. xxxv–xxxix.
¶ Proc. Geol. Assoc., vol. xvi, pt. 3, pp. 155–157.
** *Ibid.*, pt. 4, p. 162.
†† Geol. Mag., dec. iv, vol. vi, p. 159.

An account of the excursion of 1897, to Redhill, &c., by Miss CROSFIELD,* gives a detailed section at Frenches sand-pit.

"Holmesdale Towns: A Handbook for Reigate, Redhill, and Neighbouring Districts,"† is undated, which is bad; but a reference to something that has occurred since 1897 inclines one to give it the latest possible date.

If often seems to me a pity that the compilers of such useful books think it incumbent on them to have a chapter on the geology. In the present case, "Geological Features" include pp. 18–30, but three pages of this are taken up with figures utterly ungeologic, and as we are told in the preface that Dr. Mantell's works are the chief authority for the geology, some of this part is naturally somewhat out of date. However, the modern divisions of the Lower Greensand are noted, the Sandgate Beds being hoisted above the Folkestone Beds (a clear case of inversion). No other science is specially treated of, which leads me to wonder when folk will cease to think that any intelligent person can write an account of local geology.

According to the definition of the Valley of Holmesdale that is given, the term Valley is a misnomer; Vale is more correct for such a tract as that, bounded by a certain length of the Chalk escarpment on the north, and a certain length of the Lower Greensand escarpment on the south; which tract is cut by various valleys.

In the past ten years, then, it is clear that much has been done on the geology of Surrey.

The two formations for which most work has been done are the Drift, in the top part of the scale, and the Lower Greensand in the lower part, in our county. This is perhaps owing to there having been more opening for fresh work with these than with other formations; indeed, the literature of the Lower Greensand of Surrey was not very large before the period under review, and many new sections have been made since the publication of the Geological Survey Memoir on the Weald, by TOPLEY. We have greatly to thank Mr. T. LEIGHTON for a renewed interest in the formation which gives rise to the most beautiful scenery of our county. In the case of the later deposits classed as Drift, their wide occurrence of course leads to more frequent notice, and the fact that some of these deposits are connected with the study of the antiquity of our race gives them an additional charm to many observers.

Though so much has been done, I have no hesitation in assuring you that plenty remains to be done, and that Croydon naturalists need fear no dearth of work.

* Proc. Holmesdale Nat. Hist. Club, for 1896–8, pp. 65, 66.

† By T. F. W. Hamilton. 8vo, Reigate, Redhill, and London.

Excursions.

The following excursions have taken place during the past year :—

1st. *April 8th*, 1899.—To Merstham, to visit the new railway cutting. Of this meeting Mr. Robarts sends the following notes :—

"An excursion to Merstham took place on April 8th, when a party of thirteen met under the guidance of the President. The unfavourable meteorological conditions—the day being sleety with strong cold wind—no doubt prevented members from coming in greater numbers.

"The new London, Brighton, and South Coast cutting south of the Merstham tunnel was first visited. The entrance to the cutting was found to be in the gault, which dipped to the north, and consisted of dark sandy clay, with few fossils except foraminifera. The higher beds were of lighter colour, and merged insensibly into Upper Greensand, in which no great way up a considerable bed of fossils was found by Dr. Parsons. This was the more notable, as at an excursion of the Geologists' Association the year before no fossils were seen. Higher up in the series firestone was noted, but the dark greensand at the top of the formation was not visible. Traversing the cutting, one or two faults were noticed, one particularly with a downthrow of about 4 ft.; still more northerly the gault was squeezed up nearly to the surface almost vertically for a few feet.

"The party then went to an old firestone mine east of the northern part of the cutting, which was found to be abandoned, though it was being worked the year before.

"An advance was then made to the chalk-pit, which showed the junction of the Middle and Lower Chalk, the massive beds and the jointing of the former being in strong contrast to the thinner bedding and curved marly fracture of the latter. The junction was marked by a narrow yellowish band, which was probably the Belemnite Marl.

"After inspecting the outside of Merstham Church most of the party took tea at the 'Feathers.'"

2nd. *April 15th*.—To Walton-on-the-Hill, in conjunction with the Geologists' Association, under the guidance of the President. The following Report, prepared by Mr. W. P. D. Stebbing, one of the leaders of the excursion, is taken from the Report of the Geologists' Association :—

"The members reached Kingswood at 2.2 p.m., and walked to the cutting on the western side of the tunnel under Walton Heath, in progress for the Chipstead Valley line. At its south-eastern end the cutting showed chalk covered with pipes of Thanet Sand, and redeposited Woolwich Clay with flint pebbles; near the working face at the north-western end the Thanet Sand seemed to occur in mass. A point of interest, however, in this cutting was the way in which the chalk had been worn to a series of pinnacles, divided by holes or pipes penetrating almost down to the level of the railway; in some cases the pinnacles rise to within four or five feet of the surface.

"Thence the party walked to the present working face south of the Walton Road Bridge, and to the site of the Walton Station, passing what remained of the section figured below. Returning on the western side of the cutting, the party saw a fairly good section of Thanet Sand with an undulating surface, and two or three pinnacles of chalk standing up in it. On the south side of the Walton Road Bridge, but on the opposite side of the cutting, the strata in the cutting were the same as those previously seen on the north side of the bridge, but the movement that had taken place owing to the destruction of the chalk was more pronounced on account of its occupying less space longitudinally. The Directors pointed out that, though the Thanet Sand was marked in the Drift Edition of the Geological Survey Map as covering a large patch of the surface of the ground about here, at no spot in these cuttings did it reach the surface, except in the case of some pipes at the northern end.

"After tea at Walton Mill the party proceeded to a small sand-pit on Headley Heath, containing sand and a gravel largely composed of flint pebbles. The gravel occurs in isolated patches on high ground from Netley Heath eastwards, and is of uncertain age. Walking southward, the party reached the edge of the North Downs, near Betchworth Clump. Thence they descended to the chalk-pits, which, we believe, had not previously been visited by the Association. Here was seen a section embracing a large part of the Middle and Lower Chalk. The Directors pointed out in descending order; (1) the zone of *Echinoconus subrotundus*, equivalent to the zone of *Terebratulina gracilis*, which does not seem to occur here; (2) the zone of *Rhynchonella cuvieri*, called by the quarrymen 'Burr Chalk,' and equivalent to the Melbourn Rock; (3) the zone of *Belemnitella plena*, a very distinct narrow band round the quarry, and forming the top of the Lower Chalk; and (4) the zone of *Holaster subglobosus*. The distinction between zones 1 and 2 was very easily seen on one side of the pit. The marked difference in character between the massive thickly-bedded Middle Chalk and the more thinly-bedded and marly Lower Chalk was well seen."

3rd. *May 6th.*—To Tilburstow chert-pits. The object of this excursion was to see the long line of pits on the dip-slope, dug for the purpose of getting at the chert-beds of the Lower Greensand for road-metal. To do this a large amount of overlying loamy beds has to be removed, sometimes to a thickness of from twenty to thirty feet. At one part still higher beds of sand are touched, and a small landslip has occurred, through water being thrown out from the more permeable beds above by the less permeable mass below. Fossils occur in the Lower Greensand here, and the chert yields sponge-spicules.

The section has been described in various papers, or accounts of excursions, some of which are noticed in the President's Address.

4th. *May 13th.*—To Gatton Hall, conducted by Mr. Pierce (a cycling excursion).

5th. *May 22nd* (Whit Monday).—To Forest Row and Crowborough, conducted by Mr. J. H. Baldock.

6th. *June 3rd.*—Geological Excursion to Redhill and Reigate, in conjunction with the Geologists' Association. The following Report, prepared by Miss M. C. Crosfield, is taken from the 'Proceedings' of the Geologists' Association:—

"The party met at Reigate Station about 2.30 p.m., and first visited a sand-pit in the Croydon Road, where the junction of the Gault and Lower Greensand is well seen. Phosphatic nodules and fragments of wood were found, but no fossils. Crossing the Gault on Wray Common, the company walked westward by Raglan Road, at the foot of the Upper Greensand escarpment, and thence to a pit in Upper Greensand just below Colley Hill, where the following section is exposed:—At the top—chloritic marl, 7 ft. 6 in.; cherty band, 6 in.; hearthstone, 6 ft.; cherty band, 6 in.; hearthstone, 5 to 6 ft.; fire- and building-stone, 6 ft. Sponge spicules occur abundantly in the cherty bands. Two small faults were distinctly visible. In the 'Horseshoe' quarry (450 ft. O.D.) adjoining, Mr. George Taylor, on whose property the Association was now assembled, met the party. He stated that the tunnels recently discovered in the hill were two hundred years old. From borings made for water he found that the thickness of the Upper Greensand here was about 55 ft. After a vote of thanks had been passed to Mr. Taylor, the Rev. R. Ashington Bullen described the Holocene deposit in the same quarry. It is 4 ft. thick, and yielded *Bulimus montanus*, *Helicigona arbustorum*, and *Clausilia rolphii*, no longer extant there. *Terebratulina gracilis* from the Middle Chalk, and an abnormal facetted nodule (hydrated MnO), probably from the Upper Greensand, occurred. The abundance of

Arion ater (granules) and *Carychium minimum* at 2 to 3 ft. levels attest moister conditions than now obtain.* A Neolithic scraper occurred at a depth of 2½ ft. A few of the members scaled Colley Hill to see a block of ferruginous conglomerate, measuring 46 in. × 40 in. × 24 in. Mr. H. W. Monckton considers this mass of cemented angular and rounded pebbles to be a relic of a deposit of sand, &c., similar to that which has been mapped at Chipstead, 2½ miles north-east, and to a larger patch at Headley Heath, 2½ miles north-west from the site of the block under discussion. Unfortunately this conclusion does not carry us very far, for the deposit is mapped and described as 'Sands of Doubtful Age.'† A visit was then paid to the Reigate Hill pit in Lower and Middle Chalk."

7th. *June* 17*th.*—To Godstone and Oxted, led by Dr. Franklin Parsons.

"On June 17th an excursion, under the leadership of Dr. Parsons, took place to Godstone and Tandridge. From Caterham Station the party proceeded by road to Godstone Hill, from the top of which a fine view over the Weald is obtained. In some old overgrown chalk-pits and spoil-heaps a number of interesting plants were observed, including several species of Orchidaceæ; also the great Roman snail, *Helix pomatia.* Descending the hill, a visit was paid to the firestone quarries (Upper Greensand), which some of the party explored. These quarries are tunnels extending a distance of some three hundred yards into the hill-side, the farther end having a cover of some 230 ft. of strata. The party then went by way of Flower Lane, passing other quarries, a Roman road, and the track of the Pilgrim's Way, to Godstone Church, where a halt was made for tea. Afterwards the ponds were visited, and the picturesque mill with its over-shot water-wheel. From the mill a path led through woods and hop-fields to Tandridge Church, with its quaint dormer windows and splendid yew-tree, and thence on across meadows to Oxted, whence a return was made by train."

8th. *June* 24*th.*—To Charlton—a Geological Excursion in conjunction with the Essex Field Club, conducted by Dr. Franklin Parsons, who sends the following Report:—

"The chief interest of the excursion was geological, its objective being a large sand-pit about half a mile east of the station, permission to visit this pit having been kindly given by the proprietor, Mr. Gilbert. This pit is at the north-west corner of a grassy hill commanding a fine view of the Thames. On the flat

* Proc. Malacological Soc. vol. iii.

† Whitaker, "Geology of the London Basin." Mem. Geological Survey, vol. iv, p. 336 (1872).

summit of this hill are the remains of an ancient (? Roman) camp, but the entrenchments have been much encroached on and destroyed by the excavations which have been subsequently made on the sides of the hill. This is especially the case on the east side, where the wall of the camp has been entirely destroyed by a very large excavation, now disused and converted into a recreation ground for Woolwich. The numerous large excavations, now mostly disused, which exist along the ridge of hill overlooking the Thames, were made in former times, chiefly for the purpose of digging sand and gravel as ballast for ships returning to the Tyne and other northern ports after having brought cargoes of coal to London. The digging of sand and gravel for this purpose has now been superseded by the use of water ballast. Mr. Gilbert's pit is worked chiefly for the purpose of obtaining moulding sand for foundry use. It exhibits a fine section of the strata from the Oldhaven Pebble beds to the Upper Chalk inclusive. The Upper Chalk is seen in the bottom of the pit, and a few specimens of *Inoceramus* and the commoner sea-urchins were obtained from it. At the junction of the chalk with the superjacent Thanet Sand is a bed of green-coated unworn flints. This bed ranges in thickness from 6 to 18 in. or more, being thicker where it fills up hollows in the surface of the chalk beneath. Above this is the Thanet Sand, for which the pit is worked. This bed is some 30 to 40 ft. thick. The lowermost portion, 7 ft. thick, and locally called 'blackfoot,' is of a somewhat loamy nature, and is valuable for moulds for brass castings. The next twelve feet above this consist of larger-grained and less cohesive sand, better adapted for mould for iron castings. The upper part of the Thanet Sand is a sharp white sand. In the lower part of the pit a pocket was observed in the sand containing a current-bedded infilling with clayey partings. Above the Thanet Sand, and separated from it by a pebble layer, come the Woolwich Beds, some 20 ft. in thickness; these consist of an alternating series of sands with ferruginous concretions, shelly clays, and pebble beds. These beds dip and thin out to the west on the slope of the hill on that side, this being due to their having slid down the hill and become thereby drawn out. At the top of the pit the Oldhaven pebble beds are seen.

"The shelly clays of the Woolwich Series, and the Oldhaven pebble beds, are, however, better seen on the steep face at the east side of the hill, where they abound in fossil shells. These are mostly in fragments, but by careful search good specimens may be found. The most plentiful fossils in the Woolwich Beds are two species of *Cyrena* (*C. cordata* and *C. cuneiformis*), and the turreted gasteropod, *Melania inquinata;* another similar shell, *Cerithium funatum;* and a large species of oyster (*O. bellovacina*) are also found. The Oldhaven Beds yield the same species, and some others, as *Pectunculus plumsteadensis*, and the gasteropods *Melanopsis*, *Neritina*, and *Buccinum*."

9th. *July* 1*st.*—To the outlier of the Blackheath pebble-beds at Worms Heath. In the large pit on the south-western side of the heath these beds are of a somewhat exceptional character, being largely of a bright crimson, from the occurrence of iron-oxide, and often cemented into huge blocks by the iron-oxide. There are signs too of their having been partly let down into a pipe or hollow in the chalk beneath. The rather rare but by no means beautiful mineral, allophane (a hydro-silicate of alumina) was found here by the President a short time before, and plenty of small pieces were now got in sandy and loamy beds beneath the pebbles. This is the only recorded locality in the county. Above the pebble-beds is some irregular gravel, chiefly composed of flints, but little worn, and in places between this and the pebble-beds is a little fine sand, with some green-coated flints and pieces of allophane. The green-coated flints presumably come from the base of the Thanet Sand, and probably the sand is a mass of that formation, which has slipped over, or has been carried over the pebble-beds from some former high land; its proper place being, of course, beneath them, and next above the chalk.

10th. *July* 15*th.*— To Coulsdon, Chaldon, White Hill, and Caterham. Conducted by Mr. A. J. Hogg.

"An excursion was conducted by Mr. A. J. Hogg from Coulsdon to Caterham. About twenty-five members attended, and, leaving Coulsdon Station, ascended to the broad elevated chalk ridge of Farthing Down, some 480 ft. above O.D. At nearly the highest point the remains of several British tumuli were observed, and the turf was gay with patches of *Polygala*, *Spiræa*, *Campanula*, &c. After some pleasant loitering, the party proceeded through a shady lane, a mile or so in length, to the ancient church at Chaldon. Here a prolonged stay was made for the purpose of inspecting and photographing the curious painting of the 'Ladder of Salvation,' supposed to date from the twelfth century, which covers one wall of the little building. The picture is a graphic representation of the infernal regions as they existed in the imagination of the enlightened artist.

"Leaving the church, which stands at 550 ft. above sea-level, an uphill road led to Hill-top Farm (600 ft.), and, turning in here, the Pilgrim's Way was soon entered, and the wayfarers were charmed with the great variety and beauty of the wild flowers, as well as by the diversified and extensive views of the weald valley from different points of vantage, at heights of 700 ft. and upwards. The gravel-pit on Willey Farm was next visited, and the geological members were favoured by Mr. Whitaker with an explanation of the sections exposed of the Upper Chalk, with several interesting sand-pipes. The walk was extended, after a long and steep descent of the chalk escarpment, across the intervening valley to White Hill (700 ft.), a cliff composed of Upper Greensand beds, which, gleaming white in the sunshine, forms a conspicuous object in the landscape. The large Roman snail, *Helix pomatia*, abounds here, with other scarce molluscs; but, owing to the long continued dry weather, few examples were met with.

"A couple of miles farther by hill, dale, and road, and the descent was made by the pretty little Hare Valley into Caterham, where tea at the comfortable 'Railway Hotel' refreshed the tired pedestrians before the return journey to Croydon."

11th. *August 7th* (Bank Holiday).—To Leith Hill. Conducted by Mr. Townend.

12th. *September 16th.*—A Fungus Hunt. Conducted by Dr. Franklin Parsons.

"A fungus-hunt was made at Shirley Hills, under the guidance of Dr. Parsons, but with somewhat indifferent success, owing to the dryness of the season. About a dozen kinds were found, and were exhibited at the meeting on Sept. 19th."

Evening Meetings.

February 21st, 1899.—The paper of the evening was "On the Commons near Croydon, and their Flora," by Dr. H. F. Parsons. (See Trans., art. 144.)

March 21st.—At this meeting Mr. Edward Lovett delivered an address on "Primeval Commerce and the Evolution of Coinage."

Mr. Lovett began by saying that man had always been an acquisitive animal, and that decided evidence of commercial barter had been found in relics of the Stone age. Certain stone of great value for implements was undoubtedly traded with early races who desired to obtain that stone, much in the same way that certain South Pacific islanders even now barter the special kind of shell fish-hooks they manufacture with the natives of other islands. As civilization advanced this commerce by simple barter became very troublesome, and so we find that certain articles became standards of value by which other productions were assessed, so to speak. These standards then became symbolized, as we find in the slabs of metal bearing the effigy of an ox, the ox being one of the most universal standards of value, and is so now in South Africa. In Central Africa hoes, and in China knives, have been modelled as currency in lieu of the real article. As it was necessary that currency should be difficult to copy or forge, it naturally followed that metals soon attracted attention, and we find bars of copper doing duty as currency. As an additional precaution these bars (and sections of them) were officially stamped; hence we get the first coin. Later again these rough lumps were neatly rounded, and made gradually shapely, until we arrive at the *true* coin, still bearing in many instances the effigy of the object it symbolized. The use of gold and silver was another proof of the anxiety to construct a currency that could not be debased by fraud.

This paper, which was of considerable length, was published in the 'Bankers' Magazine' for May, 1899.

April 18*th.*—Mr. R. J. Hinton read an address on "Some Wonders of Bee Life," in which he gave a very interesting account of the anatomy, physiology, and life-history of the bee, illustrated by diagrams and specimens.

May 16*th.*—"On Deep-sea Deposits obtained by the 'Challenger' and other Scientific Expeditions," by W. Murton Holmes.

The lecturer said that the history of deep-sea exploration was of quite recent origin. Previously to 1864 it was the general opinion among men of science that life did not, and could not, exist below a certain depth of the sea. There were, according to Edward Forbes, fixed zones of depth:—(1) the Littoral Zone between low and high water marks; (2) the Laminarian Zone, from low water to a depth of fifteen fathoms; (3) the Coralline Zone, from the fifteen-fathom line to a depth of fifty fathoms; and (4) the Zone of Deep-sea Corals, extending from the edge of the Coralline Zone to an unknown lower limit. "In this region," he says, "as we descend deeper and deeper, its inhabitants become more and more modified, and fewer and fewer, indicating our approach towards an abyss where life is either extinguished, or exhibits but a few sparks to mark its lingering existence."

In 1864 a crinoid, or lily-star (*Rhizocrinus lofotensis*) was discovered by G. O. Sars off Norway in water 700 ft. deep, and abundance of animal life was procured in further dredging operations in depths of from 700 to 800 ft. This discovery led to the fitting out of surveying ships with improved apparatus. Among these were the 'Lightning,' which surveyed the North Atlantic Ocean in 1868, and the 'Porcupine,' which made surveys off the West Coast of Ireland and in the Bay of Biscay in 1869, and again the following year between Falmouth and the Mediterranean.

So much interest was felt in the bearings in the new discoveries upon important biological, geological, and physical problems that, on the representations of the Royal Society, the Government fitted up the 'Challenger' in 1872 for the purpose of investigating each of the great oceans, and to take an outline survey of that new field of research, the bottom of the sea.

The scientific results of this survey were very important, and a series of valuable reports was published, which filled fifty large volumes, beautifully illustrated. These reports were not completed until 1895. Our knowledge of deep-sea forms may be said to have commenced from the publication of these reports.

The lecturer next described some of the groups of deep-sea life, which were illustrated by micro-photographs taken from nature. Foraminifera were described as belonging to the lowest class of animal life, the Protozoa. They consist of a mass of structureless jelly-like protoplasm, which is capable of emitting long thread-like processes which entangle particles of food from the surrounding water, and by a streaming movement of the protoplasm conveys this food to the central body. In most cases the main portion is enveloped by a calcareous shell perforated with holes, through which the delicate filaments are protruded. The majority of species live at the bottom of the sea; others are pelagic, and occur in abundance at the surface.

The most abundant genus is Globigerina. It occurs in immense numbers, forming what is known as Globigerina Ooze, mostly at depths of from 600 to 2500 fathoms in the Atlantic, Western Indian Ocean, and Pacific, and the total area covered by its remains is estimated by Murray and Renard at 49,520,000 square miles. Radiolaria are distinguished from the Foraminifera by the presence of a siliceous or a horny, in place of a calcareous skeleton, and by the presence of a membranous central capsule surrounding a nucleus. They are commonly floating organisms, and are often present in enormous numbers in all seas, the greatest variety of species, however, being found in the warm waters of the tropics. Their remains constitute Radiolarian Ooze, which is found principally at depths of from 2000 to over 4000 fathoms, and are estimated to cover 2,290,400 square miles. About 4000 species have been described.

Pteropods also form an ooze of a more limited extent (400,000 square miles), especially between Cuba and Florida Keys. Pteropods, or 'winged snails,' are pelagic molluscs found swimming near the surface of the sea, and are all of small size. They have no distinct head, and the mouth is placed in the fore part of the foot, which is rudimentary. The lateral parts of the foot are, however, developed into a pair of wing-like fins by means of which the animal swims actively. The shell is generally calcareous, and very delicate in texture, frequently taking the form of a slender hollow cone. Pteropod ooze is not found below 1500 fathoms, the carbonic acid in the water dissolving the delicate shells. For the same reason Globigerina ooze disappears below 2500 fathoms, the shell being somewhat thicker.

Sponges. — The simplest form of sponge consists of a thin-walled sac with the walls perforated by pores, and the central cavity lined by flagellated cells. The constant vibration of these flagellated cells gives rise to a strong current of water, which is drawn through the pores into the central cavity, and passes out through the mouth of the sac. About 2000 species are known, and 300 are found round the British coast. They may be either soft, stony, leathery, or horny, and vary in weight from one grain to over one hundred pounds. The more complicated forms are built up of a number of cells supported on a framework either of horny fibres or of siliceous or calcareous spicules. The skeletons of the siliceous species form extensive deposits in deep water. They are divided into four orders:—(1) Monaxonida, with one-rayed spicules; (2) Tetractinellida, with spicules of four rays; (3) Lithistida, which are massive and stony sponges, with interlocking spicules; (4) Hexactinellida, with six-rayed spicules. The calcareous and horny sponges form separate groups—the Calcarea and Keratosa.

Diatoms are one-celled plants, belonging to the Algæ, inhabiting both fresh and sea water. The cell-wall is hardened by the deposition of silica, so as to give rise to a glassy case, known as the frustule, composed of two parts which fit into one another like the lid of a pill-box. The cells may be either separate or connected into filaments, either free or attached to some other body. The separate valves are of various forms, and their surfaces exhibit more or less delicate sculpturings and markings, or they present a cellular appearance like honeycomb. The accumulation of these flinty envelopes gives rise to very extensive deposits, more especially in the Arctic and Antarctic regions, the total of which has been estimated at 10,880,000 square miles.

Minute bodies known as Coccoliths and Rhabdoliths are to be met with in nearly all deep-sea deposits. Coccoliths are oval calcareous discs, having a thick strongly refracting rim and centre, and are the disintegrated remains of a spherical body known as a coccosphere. Rhabdoliths consist of minute calcareous rods, having a disc at one end, and are the disintegrated remains of a body called a rhabdosphere. Coccospheres and rhabdospheres are now regarded as pelagic Algæ.

From a depth of 2000 fathoms downwards there is a widespread deposit of red and grey clays, the area of which is estimated at 51,500,000 square miles. These consist of silicate of alumina with the oxides of iron and manganese. They result from the decomposition of pumice and volcanic dust, either from terrestrial or submarine volcanoes.

The extreme slowness of deposition is shown by the fact that the 'Challenger' frequently procured in a single haul hundreds of sharks' teeth, some of them of gigantic size, and occasionally embedded in manganese; dozens of ear-bones and other bones of whales, large numbers of manganese nodules, zeolites, and magnetic spherules, which are believed to be the dust of meteorites, which in the course of long ages have fallen upon the sea. Sharks and whales could never have been so numerous at one time that their remains should form a continuous stratum. Many generations would therefore be represented.

The lecturer then compared chalk with Globigerina ooze, and also exhibited sponge spicules contained in the Greensand, and various specimens of Radiolarian earth which were comparable with Radiolarian ooze.

September 19*th.*—This meeting was devoted to the exhibition of specimens of interest, with brief descriptions of them.

October 17*th.*—"On the Leonid Showers," by James Edmund Clark, B.A., B.Sc., largely illustrated by lantern slides:—

A meteor, in brief, is a minute particle of matter permeating the whole of space, subject to the same laws of gravity as our own earth. Like her, it is temporarily, at any rate, moving in an orbit round the sun with astronomical velocity measured by miles per second. The two orbits happen to intersect: the two bodies happen to come at the same instant to the point of intersection, though the earth shifts its place by its own diameter every seven minutes. Most likely the meteor has been voyaging for the better part of a million years, since its last visit to us and the sun, and only for five minutes of this million years is it in danger of collision with the earth. And yet the collision comes. High up in the atmosphere the meteor, about the size of a mustard seed, and weighing at most, perhaps, a couple of grains, burns in an instant or two to impalpable dust. During this time it has traversed thirty to fifty miles, through atmosphere attenuated to almost an inconceivable degree. At the end it is rarely within thirty-five miles of the surface, and the air-pressure is still but one-thousandth of that at sea-level, or enough to raise the mercury in a barometer about $\frac{1}{35}$ of an inch in place of 30 inches. This pressure is less than the best vacuum from an ordinary air-pump. Most meteors vanish when still fifty miles high, having appeared at about seventy-five miles. At fifty miles the air is five hundred times rarer still; at seventy-five the pressure is less than one-hundred-millionth that at the sea-level. And yet this little grain is glowing with an intensity which makes it visible more than a hundred miles away. This is simply from the intense friction against the infinitesimal amount of air. It is accounted for by its prodigious velocity, which would take it from over Edinburgh to over London in a quarter of a minute. There is no time for the air to get out of the way. Air is heated by compression, as we all now know from our bicycle pumps. In front of our meteor it reaches an ultra-white heat, which almost instantly consumes the solid particles.

A shooting star, consequently, can never reach the ground. But from time to time far larger bodies appear, rivalling the brilliance of the moon or electric lights. These penetrate far further, and occasionally very large ones actually fall. Assuming them to be, as it were, boulders of the same nature as the sand grains which vanish overhead, we learn from them that meteoric matter often consists of nearly pure nickel-iron, but more often of a stony substance, usually rich in grains of iron, and most like some igneous rocks. No new elements have been found in them, but some of their mineral combinations are otherwise unknown on the earth.

If the paths of the meteors seen on a given night are noted, it will be found that most of them point backwards to the same position among the stars. This place is accordingly called their radiant. This was noted in 1833; but observations of Mr. G. J. Symons in 1860 first brought attention to its significance. Thus, on April 20th meteors radiate from a point near Vega, in the constellation Lyra. They are therefore called the *Lyrids.* In early August a few go out from the Square of Pegasus, but more, especially on the 9th and 10th, from Perseus. Thus we get the *Pegasids* and *Perseids.* The latter may be counted at the rate of thirty to fifty in the hour, instead of the usual average of four or five. We therefore speak of a "shower" of Perseid meteors. This name is more appropriate to the Andromeda shower, a display first seen on November 27th, 1872, again in 1885, and possibly recurring in the early evening of November 27th of this year.

But the mid-November shower, the meteors of which, radiating from the sickle of Leo, give the name in our title, pre-eminently form a meteor shower. In August it is surprising if one is seen every minute, and yet they are under one common bond, each and all pursuing the same orbit with such unerring exactitude that it cuts our own every August without fail. Nevertheless the members of the group are as far from each other, as a rule, as London and New York. Their speed, compared to our earth, is forty miles per second. Even if one were seen each minute nearly in line with its predecessor, it would be actually 2,400 miles in the rear. As a fact they rarely come so close.

The grand Leonid shower of 1866 came just when astronomers were sufficiently advanced in meteoric study to avail themselves of its lessons. The previous display in 1833 had suggested to some that meteors bore a certain resemblance to comets, but the full consequences were not immediately grasped. Foremost, perhaps, was the now obvious meaning of their radiating from one point. Plainly it was the result of perspective upon a number of bodies whose actual paths were parallel. Therefore they were moving together; that is, they were all describing the same orbit round the sun. This orbit was quickly calculated, and almost at once came the startling announcement that it was identical with that of a comet seen earlier in the year.

Comets, then, and some meteors were of common origin. For, when once set on the right track, other meteor displays, notably that of August, were also found to be so connected. The fact was, of course, disputed, but in 1872 it was finally set at rest in the most convincing manner. Biela's comet was then expected, the comet which astonished everyone in 1845 by splitting into two. Since its next return, in 1852, it had been lost to sight, but in 1872 the return was very favourable, as it was due not far away when our earth came near its orbit on November 27th. Astronomers searched in vain, but early that night there was a remarkable display of meteors of rather diminutive size. Calculations quickly showed that they belonged to the Biela system. It is now held that the head of a comet consists of multitudes of these meteoric particles, the light being partly caused by their incessant collisions. A further result is that many are constantly dropping behind or getting in front, but still follow on in the comet's orbit. The attraction of the earth and other planets is another, perhaps more potent, cause. Thus meteors arise from the comet's *trail*—an entirely distinct affair from the still mysterious *tail*.

Whence, we may ask, do the comets come which supply our meteors? Casual visitors from infinity, say some. Eruptive matter from the sun, say others. It is possible that both these ways have helped in the work, but the main source is yet more interesting, namely, the outermost fringe of our own solar system. This is deduced upon two grounds. Nearly all move, as said, at twenty-six miles per second. Their orbits, too, are practically parabolic. This means that they probably are reaching the sun for the first time, or else move in ellipses, whose centres lie further away even than Neptune. Had they come from yet remoter stellar regions, they would have a higher velocity and hyperbolic orbits.

Unless a comet passes very near us, the Earth does not materially change the comet's course, but with our four big brothers—Jupiter, Saturn, Neptune, and Uranus—the case is different. Their distance from the sun adds to the effect of their enormous mass in two ways. It increases their power relative to the sun, and the comets pass them at speeds only fractions of their twenty-six miles per second past us. The consequence is that they each have their special band of captives. These are easily recognised by their orbits having been shortened down in space and time. Jupiter's captives go at most a little further from the sun than himself, and take only eight years or less to revolve. Among them is Biela's comet, which gives us the Andromedes, cutting our orbit every $6\frac{2}{3}$ years. The Perseids belong to Tuttle's comet, a captive of Neptune; while the Leonids follow Temple's comet, slave to Uranus, due next year and every $33\frac{1}{4}$ years following. This comet is believed, as stated, to have been captured in 126 A.D. By 902 its orbit was so shifted as to cut ours. The main body of the comet's trail collided with us on October 19th (N.S.), and has continued to do so ever since. The day may come when another encounter with Uranus will switch it off again to the depths of space. But the main body of meteors would remain. Planetary action induces an advancing date in the Leonid shower, as shown by the subjoined table of records:—

A.D.				
902,	10 mo.	19th	......	The Arabic 'Year of Stars.'
934,	,,	20th	......	'Signs in the heavens as stars falling.'
1002,	,,	21st	......	'Thousands of small stars.'
1101,	,,	24th	......	'Stars were seen to fall from heaven.'
1202,	,,	26th	......	'Towards daybreak thousands of shooting stars . . . flew about like grasshoppers.'
1366,	,,	30th	......	'Such numbers that the sky and air seemed to be in flames.'
1533,	11 mo.	3rd	......	'Many thousand stars . . . fall and dash together.'
1602,	,,	6th	......	'Many hundred . . . in the same direction.'
1698,	,,	9th	......	Seen at Geneva.
1766,	,,	9th	......	In South America.
1799,	,,	12th	......	Greenland to South America.
1833,	,,	13th	......	North America.
1866,	,,	13th	......	Europe (morning of 14th).

This table tells us plainly that the shower may be expected about the years '33, '66, and '99 of each century, and has now been so recorded without any break for four times in succession. At its last appearance it was foretold as probable. Certainty of observation cannot be assured for two reasons. The stream, though so compact as to give only one chief display per revolution, may yet not be continuous, and the Earth may slip in between. Also, the meteors may last barely a couple of hours, and so only a quarter or less of the Earth (over a segment the shape of a melon slice) be favoured. Clouds, too, have to be reckoned with. This year, also, the Moon, nearly full, will seriously interfere with the spectacular effect.

Mr. Clark gave a vivid description of the great display of November 14th, 1866, which he witnessed as a schoolboy at York. Diagrams of this display, prepared by him at the time, were shown upon the screen.

November 21*st.*—"On the Evolution of Form and Design in Art," by Edward Lovett.

Mr. Lovett began by dealing with the work of man of the Stone Age, showing how all his ideas as to form and design were in all probability suggested to him by some natural object—the fish-hook being originally a thorn from a bush (for instance); indeed, such hooks actually survive to this day. Pottery, with all its modern beauties, may be traced back step by step to the clay-covered gourd fashioned and baked by primæval man.

In decorative art, a great deal of apparently meaningless design is simply a gradual differentiation from a useful and necessary part of the object. A simple illustration of this consists of the blue lines of a modern registered letter, which represent the ligature by which such letters were once tied up.

The lecturer then exhibited a series of thirteen sketches, each of which had been copied from its predecessor by different artists.

The original design was from a Japanese design of a pair of birds flying; and Mr. Lovett showed that, after thirteen artists had given their individual ideas to the subject, it became absolutely unlike the original. So it is, and has always been, with the perpetuation of any antique form of decoration; it becomes so changed from the original as to be quite difficult of identification.

Mr. Lovett then proceeded to describe many examples of copying the human face in art, and the way in which it becomes conventionalized by the multiplication of certain parts. The lecture dealt very fully with many other phases of this subject, which was illustrated by a large collection of aboriginal art specimens.

December 12*th.*—Was devoted to a lecture by Mr. F. Enock on the "Wonders and Romance of Insect Life." This lecture was kindly arranged for by our Vice-President, Mr. Philip Crowley.

January 16*th*, 1900.—The Annual Meeting and President's Address.

February 20th.—"The Report of the Meteorological Sub-Committee for 1899," by Mr. F. Campbell-Bayard, President of the Royal Meteorological Society (Trans., Art. 145). Also a "Report on Ground Temperatures during 1899," by Dr. H. F. Parsons (Trans., Art. 146).

The following Reports have been received from the various Sub-Committees:—

Geological Committee.

The Geological Committee have to report that during the year they have held eight Committee and Sectional Meetings, whilst some of the Club's Conversational Meetings have been upon Geological subjects, under the superintendence of your Committee.

The Section has also had four Excursions (see *ante*).

By the co-operation of the Photographic Sub-Committee, several photographs of geological interest have been secured for the Album presented to your Committee by Mr. Harry D. Gower.

Duplicates of these photographs will be sent to the British Association Committee on Geological Photographs whenever considered desirable.

In accordance with an arrangement made with the Museum Sub-Committee, steps have been taken by this Committee to secure geological specimens on loan, for exhibition in the Club's Loan Museum at the Town Hall.

Dr. H. Franklin Parsons and Mr. N. F. Robarts have superintended the selection of specimens, which now number upwards of two hundred, lent by the following gentlemen, to whom the Committee tender their warmest thanks:—Messrs. W. B. Bannerman, Thos. Brockbank, George Clinch, Noel E. Corry, Dr. G. J. Hinde, W. Murton Holmes, A. J. Hogg, H. T. Mennell, E. W. Moore, Dr. H. Franklin Parsons, A. J. Potter, —. Paget, N. F. Robarts, A. E. Salter, W. P. D. Stebbing, W. W. Topley, W. Whitaker, and C. H. Williams.

Your Committee are also much indebted to Mr. W. Murton Holmes for providing labels for the specimens.

The object of your Committee in arranging their portion of the Museum has so far been to exhibit fossils from localities within twenty miles of Croydon, on the south side of the Thames, with specimens illustrative of the rocks and minerals obtainable in the above district, and a series of specimens illustrative of the rocks composing the Croydon Gravels.

Specimens of Flint Implements from the district have also been placed in the Museum.—N. F. Robarts, *Hon. Sec.*

Photographic Sub-Committee.

During 1899 the Photographic Section have held their usual weekly meetings, at many of which very interesting papers have been read.

The most notable papers were on the Photography of Flowers, by Mr. H. T. Malby, F.R.P.S.; on Outdoor Work with the Camera, by the Rev. A. H. Blake; and Mr. A. P. Hoole's lecture on lantern-slide making.

Among other successful meetings were Mr. Sandell's exhibition of lantern-slides of Italian Cathedrals and of the Halls of the City Companies; Mr. Hoole's lantern-lecture on the Norfolk Broads and the Channel Islands; the Exhibition of Geological lantern-slides, lent by the British Association, and described by the President; and Mr. Crowley's exhibition of lantern-slides of places in Italy, including some striking views of Vesuvius and of Pompeii.

At the Soirée a good collection of over eighty pictures was shown.

Mr. Saville-Kent showed a collection of beautiful lantern-slides in natural colours, made by Mr. Sanger-Shepherd's new system of trichromatic photography.

A collection of members' slides was also shown.—E. Pierce, *Hon. Sec.*

Anthropological Sub-Committee.

The Sub-Committee continue to make notes upon Folk-lore and kindred subjects, which may be regarded as belonging to the locality. Four of these are given herewith; and it is to be hoped that members and their friends will bring before my notice any points of interest they may observe connected with our subject—such, for instance, as the survival of ancient customs, old superstitions and sayings, the use of primitive implements and appliances, as well as authentic records of prehistoric stone and flint implements.

During the year several exhibits have been made at the ordinary meetings, of objects of general Ethnographical interest, and two papers have been read, one on Primitive Commerce and the Evolution of Coinage, and the other on the Evolution of Form and Design in Art.—Ed. Lovett, *Hon. Sec.*

Implementiferous Gravels of Surrey.—Although worked flints of undoubted human chipping have been found in the marly gravel beds of Wandsworth, and also in those of Mitcham, I have never yet succeeded in finding even the slightest indication of such work in our Croydon "Fairfield" Gravels. The patchy gravel beds in the Brighton Road, too, which are probably of the same age, have, so far as I am aware, yielded no evidence of the work of Stone-age Man. I am inclined to think that these gravels are of greater age than the gravels of Wandsworth and Mitcham. As regards the Purley Gravels, in or near to which the mammoth tusks were found, I could not trace, nor have I heard of any trace of flints bearing evidence of human workmanship being observed there.—Edward Lovett.

During the last two or three years a considerable number of flint implements and flakes have been found in part of Beddington Park; in form and in texture of the flint they much resemble specimens from the Thames at Wandsworth, Putney, and Mortlake; the flint is in most cases clear, translucent, and brownish, and shows no trace of patina discolouration or decomposition on the surface, thus differing much from specimens from the South Downs, in which, while the centre is of black opaque flints, the surface to a depth of one-sixteenth of an inch or so is white, apparently caused by a dissolving away of soluble portions of the silica, as the white portion shows a porous structure. The Beddington flints are found in a plantation, extending down to the Wandle, and on sloping ground close to springs. The situation is exactly such as would be chosen by a primitive people for a camp or settlement. The site has always formed part of the parks, and no doubt under the undisturbed turf of the park adjoining abundance of other specimens exist, as it is in such positions we must look for the traces of the early settlements, which were the primitive forerunners of the villages which now exist along the line of the springs rising from the chalk. Photographs of some of the flints will be sent to the Scientific Portfolio.—H. C. Collyer.

Surrey Rush Clips.—The Rush Clip is an appliance of iron of the rough and ready blacksmith's kind; like an inverted pair of pincers on a stand, and carrying a douser or extinguisher. They were certainly used as far back as the thirteenth century, and probably all over Europe; they may be even older. They have, curiously enough, survived in Surrey as late as 1862, though they are undoubtedly extinct now. I was recently talking to a man who was a Surrey farm hand in the early sixties. He fully described the method of using a Rush Clip, and how they gathered the rushes from the water-side, dried them, peeled two strips of the cuticle off, and then soaked the rush in hot mutton fat. When cold the rush was practically a taper; and he told me how the farmer's wife cut off a certain length, and no more, for a light to light the men to bed. This took place, he assured me, in 1861–2. As I pretended absolute ignorance on the subject, and as the man gave me a very practical object-lesson in how a Rush Clip is worked, I feel sure that he really had actually used them. This was near Horley.—Edward Lovett.

May Day Survival in Croydon.—The observance of this ancient Scandinavian celebration of the advent of summer and tree worship is, unfortunately, rapidly disappearing before the advance of our practical and matter-of-fact view of life. The Maypole is almost extinct, except in a forced and unnatural sort of way; and the "Jack in the Green," with its quaint mixture of incongruities, has now become a thing of the past. On May 1st, 1899, I saw in Croydon what may be regarded as a poor survival of a former great occasion. A group of small boys carried, suspended from a horizontal bar some five feet long, a sort of globular cage made of the branches of trees, the whole being decorated with flowers and bits of coloured paper (the diameter of this cage was about eighteen inches). Inside the cage was fixed a gaily dressed doll—the whole representing the Queen of the May in her bower. Another boy carried a sort of sceptre, consisting of a piece of wood elaborately decorated with flowers and paper in a spiral. This was a devoluted Maypole, which was, in its days, the Tree God, with its offerings and gifts (*vide* also the Christmas Tree, which is a Scandinavian myth too). The children referred to sang some meaningless verses, doubtless a devolution from a song of thankfulness. I questioned them as to why they did this and what they knew of it, and found that they knew nothing at all about it, and that they did it because others had done so before them, and—there was money in it!—Edward Lovett.

Members elected, 1899.

February 21st.—George Henderson, St. Katharines, Oxted.

March 21st.—E. A. Martin, 69, Bensham Manor Road, Thornton Heath. E. Alexander, Grasmere, Birdhurst Road. A. Hall, Stanton House, 16, Park Hill Rise. Mr. & Mrs. Marten Sells, Lodore, Campden Road.

May 16*th.*—A. H. Smee, J.P., The Grange, Wallington. A. E. Bradley, Appleshaw, Friends' Road, Croydon. Stephen Campbell Bayard, Cotswold, Wallington. Geo. Clinch, 22, Nicholson's Road, Croydon.

September 19*th.*—Ernest Alfred Smedley, M.A., B. Sc., 173, Albert Road, East Croydon. Ebenezer Topley, Ingleside, St. Augustine's Avenue, South Croydon. Miss Mary de Fraine Whitaker, 3, Campden Road, Croydon.

October 17*th.*—H. Whitmore Cutts, L.D.S. England, Ardeen, Masons Avenue, Croydon. Chs. Henry Hughes Williams, 7, Montpelier Row, Blackheath.

November 21*st.*—Mrs. A. C. Crowley, 16, Chatsworth Road. Miss Margaret Page, Woodlands, Coombe Road. Wm. Saville Kent, F.L.S., F.G.S., The Elms, Elmwood Road. Louis Stanley Jart, 203, Brighton Road.

December 12*th.*—Mr. & Mrs. Francis Allen, Croutelle, 3, Friends Road. Charles Fox, The Chestnuts, Warlingham.

January 16*th*, 1900.—Miss Emily Rush, Woodford House School, East Croydon. Miss D. Neligan, Croydon High School. Miss Edith Gladys Parsons, 4, Park Hill Rise. W. J. Allbright, 1, Tamworth Road. W. A. Voss, F.C.S., Rosella, Nicholson Road.

Donations to the Library, 1899.

From Individuals.—Eight microscopical slides of sponges (Mr. W. Murton Holmes); Half a Century of Sanitary Progress and its Results (Dr. H. F. Parsons); Nature Notes of the Selborne Society (Mr. W. Whitaker); Manual of Photography (Mr. Baldock); Text-book of Comparative Geology (Mr. Topley); Applied Geology, Part II. (Mr. J. V. Elsden); Prehistoric Man in the neighbourhood of Kent and Surrey (Mr. G. Clinch).

From Societies.—Report of the Bristol meeting, 1898, of the British Association; Journal of the Royal Microscopical Society; Journal of the Scottish Microscopical Society; Journal of the Belgian Microscopical Society; Journal of the Northamptonshire Natural History Society; The Essex Naturalist; Proceedings of the Academy of Natural Sciences, Philadelphia; Proceedings of the South London Entomological Society; Transactions of the Eastborne Natural History Society; History of the Berwickshire Naturalists Club, and the Session Booke of Bouckle from 1684 to 1690; Report of the East Kent Scientific and Natural History Society; Journal of the City of London College Science Society; Proceedings of the Holmesdale Natural History Club; Transactions of the Norfolk and Norwich Naturalists Society; Proceedings of the Reading Literary and Scientific Society; Report of the Brighton and Hove Natural History and Philosophical Society; Transactions of the Zoological Society on the remains of a gigantic species of bird from the Lower Eocene beds near Croydon; Report of the Geological Institution of the University of Upsala; Tenth Annual Report of the Missouri Botanical Garden; Reports of the Meteorological Council; Report of the Meteorological Observations of the Borough of Southport; Journal of the Manchester Geographical Society; Report of the Kent and Surrey Committee Commons and Footpaths Preservation Society: Journal of the Quekett Microscopical Club.

From Publishers.—Magic Lantern Journal; Photography; The British Journal of Photography; The Amateur Photographer; Science Siftings.

Exhibits, 1899.

February 21*st.*—Mr. A. Hogg: Flint implements from Croham Hurst. Mr. Lovett: Native models of Eskimo sledges. Dr. Parsons: a Roman snail (*Helix Pomatia*) hybernating, with calcareous lid.

March 21*st.*—Mr. Holmes: specimens of glass rope sponges.

April 18*th.*—Dr. Parsons: Gault fossils from the Railway cutting at Merstham, obtained on the excursion of April 8th. Mr. Murton Holmes: A case of slides of Foraminifera from the same cutting. Mr. Goodman: Cases of bees.

May 16*th.*—Geological Section: Sheet of the Index Geological Map, obtained for the use of the Section. Dr. Hinde: A Roman snail, and the lid which the snail throws off after the winter, and also a section of fossil ivory under the microscope. Mr. Hogg: A section of the tusk of the mammoth (*Elephas primigenius*) from Siberia, and a section from the leg-bone of the Swanage crocodile (*Goniopholis crassidens*).

September 19*th.*—Mr. Ed. Lovett: Mexican pottery; shoes worn by oxen in South Africa and part of Switzerland; shoes worn by the dogs of the Eskimo, to protect them from hard snow and sharp ice; a specimen of a natural horn drinking horn, from which our term "tumbler" for a glass is derived; and Limestone striated by glacial action; and also specimens of Alpine Granite, Jura Limestone, &c., from an old moraine near Geneva. Dr. Parsons: Fungi from the Shirley Hills found during the fungus hunt on the previous Saturday; also fossils and Scythe-stones from Blackdown, Devon; and hone stone from Llyn Ogwen, North Wales. Mr. Murton Holmes: Drawings of Radiolaria from Chalk Flints found at Coulsdon; Eocene fossils from Barton Cliff, Hants; and fossil urchins (*Offaster Pilula*) from Winchester. Miss Klaassen: Paintings of fungi, moss, and flowers, done by Miss Stubbs. Mr. Bennett: dried specimens of northern holy grass and vanilla grass. Mrs. Parsons: Apples eaten by insects.

October 17*th.*—Mr. Lovett: A primitive time measuring appliance used by the Brandon flint workers, and specimens of primitive currency. Mr. Jas. Epps, Jun.: Potatoes pierced by Couch grass, and sheaths from bamboo stems. Mr. N. F. Robarts: Specimens of hone stones from Dolwyddelen; Selenite from Thornton Heath; Lingulella from Upper Lingula Slags, Portmadoc, and from Llandeilo Beds, Festiniog.

January 16*th,* 1900.—Mr. Robarts: A few specimens lent to the Museum, including silicified wood found in Sydenham Road, showing Teredo's borings, and coins dug up locally. Mr. Holmes: Some slides of fish parasites.

Croydon Microscopical and Natural History Club.—Balance-sheet for the Year ending 31st December, 1899.

Receipts.

1900.	£	s.	d.	£	s.	d.
January 1.						
Subscriptions, 1897	1	0	0			
,, 1898	6	0	0			
,, 1899	101	10	0			
				108	10	0
Sale of Soirée Tickets				15	3	9
Donations—W. Bannerman, Esq.	1	1	0			
,, F. C.-Bayard, Esq. ...	5	0	0			
,, B. Latham, Esq. ...	5	0	0			
,, P. Crowley, Esq. ...	5	0	0			
,, W. Wagstaffe, Esq.	0	2	6			
,, Corporation of Croydon	0	10	0			
,, Sutton Waterworks Co.	0	5	0			
,, Wimbledon Urban District Council ...	0	10	0			
				17	8	6
Sale of Papers and Transactions ...				1	15	6
Balance due to Treasurer				17	1	2
				£159	18	11

Payments.

1899.	£	s.	d.	£	s.	d.
January 1.						
Balance of '98 Account due to Treasurer				9	8	0
Rent of Club Room to 31st July				10	0	0
Hire of Rooms for Meetings				4	0	0
Printing Transactions				17	11	0
Fire Insurance—Due to County Fire Office	1	13	9			
Less Bonus received from the Company	1	13	9			
				—		
Meteorol. Sub-Com.—Printing Rainfall Returns, Dec. 1898, to Nov. 1899				24	15	6
Photographic Sub-Committee—						
Hire of Dark Room to 31st July ...	10	0	0			
Hire of Rooms for Lantern Exhibition	4	0	0			
Gas for same, Postages, and Sundries	6	13	1			
Subscrip. to Royal Photogr. Society	1	1	0			
				21	14	1
Soirée Expenses				45	6	11
Stationery and Postages				2	8	0
Printing Monthly Circulars & Postages				15	18	0
Geolog. Sub-Com., Postages & Printing				1	16	5
Subscription to South-Eastern Union of Scientific Societies	0	5	0			
Subscription to Commons and Footpaths Preservation Society ...	0	5	0			
				0	10	0
Assistant Secretary				5	0	0
Gratuities				1	11	0
				£159	18	11
Balance, January 1st, 1900 ...				£17	1	2

SPECIAL FUND ACCOUNT.

£186 9s. 0d. CONSOLS.

1899.	£	s.	d.	1899.		£	s.	d.
January 1.				January 1.				
Balance from last Account, January 1st	26	15	10	Cost of new Lens for Lantern		1	18	0
Dividend, January	1	8	0	,, Museum Cases in Town Hall		30	10	0
,, April	1	8	0	,, Trays, Labels, &c., for same		1	16	1
,, July	1	8	0	Balance, December 31st		25	4	9
,, October	1	8	0					
Rent of Lockers	0	15	0					
Sale of old Lantern Lens	1	10	0					
Sale of £24 2s. 8d. Consols @ $104\frac{1}{8}$, less Expenses	24	16	0					
	£59	8	10			£59	8	10
Balance, January 1st, 1900	£25	4	9					

BALANCE SHEET.

1900.	£	s.	d.	1900.	£ s. d.	£	s.	d.
January 1.				January 1.				
Balance of Special Account	25	4	9	Deficiency on General Account ...		17	1	2
Subscriptions, 1900, paid in advance	8	10	0	Balance at Bank	15 3 11			
				Balance with Treasurer	1 9 8			
						16	13	7
	£33	14	9			£33	14	9

F. J. TOWNEND, *Treasurer.*

We, the undersigned, having examined the above Accounts and the Vouchers relating thereto, hereby certify that they are correct, according to the Vouchers, and the Bankers' Pass Book.

J. HENRY DRAGE,
W. A. WEIGHTMAN.

LIST OF MEMBERS.

(*Revised to January,* 1900.)

Date of Election.

1887. Adam, Walter R., 16 Chepstow-road.
1897. Ainger, William Dawson, Simla, Normanton-road.
1900. Allbright, W. J., 1 Tamworth-road.
1897. Aldrich, Miss F. K., 14 Tavistock-road.
1899. Alexander, E., Grasmere, Birdhurst Rise.
1897. Allan, Arthur Percy, M.B., Abbotsford, Croham-road.
1884. Allen, A. H., 10 Morland-road.
1899. Allen, F., 3 Fell-road.
1899. Allen, Mrs. F., 3 Fell-road.
1899. Allen, G. J., J.P., Dunheved, Dunheved-road North.

1879. Backwell, R. J., 16 Penge-rd., South Norwood.
1873. Bailey, E., 10 Lansdowne-road.
1898. Bailey, H., 10 Lansdowne-road.
1890. Baker, W. R., 9 Belmont Villas, Wallington.
1874. Baldock, J. H., F.C.S., Overdale, St. Leonard's-road, Waddon.
1898. Bannerman, W. B., The Lindens, Sydenham-road.
1885. Barber, J. H., 92 Oakfield-road.
1898. Batten, J., The High Field, Bickley, Kent.
1886. Bayard, F. Campbell-, LL.M., F.R. Met.Soc., Cotswold, Wallington, Surrey.
1899. Bayard, S. Campbell-, Cotswold, Wallington, Surrey.
1871. Beeby, W. H., F.R.M.S., Hildasay, Portsmouth-road, Thames Ditton.
1896. Becker, G. E., Dorincourt, Addiscombe Grove.
1897. Bennett, A., 143 High-street.
Origl. Berney, J., F.R.M.S., Chatsworth-road.
1895. Berry, H. B., Pampisford-road.
1898. Billett, J. T., Ormond Lodge, Richmond.
Origl. Blake, W. J., Elmfield, Park-lane.
1884. Brebner, G. R., M.D., 232 London-road.
1880. Brewer, J. G. B., 12 Havelock-road.
1873. Brodie, R., M.A., 19 Wellesley-road.
1884. Buckland, J. W., Edgecumbe, Ashburton-road.

1877. Carpenter, A. B., B.A., M.R.C.S., F.R.M.S., Bedford Park.
1898. Carr-Dyer, Mrs., Hazelea, Kenley.
1892. Carrington, L., Penmare, Tavistock-road.
1888. Cash, Wm., 15 Fairfield-road.
1897. Chatterton, G., M.I.C.E., 6 The Sanctury, Westminster, S.W.
1880. Cheesewright, F. R., Maythorne, Birdhurst Rise.

1877. Chisholm, J., Addiscombe Lodge, Addiscombe-road.
1877. Chumley, J., Worcester Lodge, Canning-road.
1891. Clark, Hy., 12 High-street.
1897. Clark, J. E., B.A., B.Sc., 48 Coombe-road.
1899. Clinch, G., F.G.S., 22 Nicholson-road.
1882. Collyer, H. C., Breakhurst, Croydon-road, Beddington.
1895. Corser, Rev. R. K., East Brook, Park Hill-road.
1873. Corry, J., J.P., Rosenheim, Park Hill-road.
1887. Couchman, A., Llanberis, Spencer-road.
1879. Cowdell, H. S., Cotleigh, West Wickham.
1898. Craven, M. L., 2 Woburn-road, Wellesley-road.
1897. Cristall, Ed., 1 The Waldrons, Duppas Hill.
1899. Crowley, Mrs. A. C., 16 Chatsworth-road.
Origl. Crowley, P., F.L.S., F.Z.S., Waddon House, Waddon.
1874. Curling, Geo., Elgin House, Addiscombe-road.
1896. Cunnington, J. G. S., 41 Ashburton-road.
Origl. Cushing, Thos., F.R.A.S., 2 Southside, Chepstow-road.
1890. Cutler, W. C., Derwent Bank, Addiscombe-road.
1899. Cutts, H. W., Ardeen, Mason's Avenue.

1887. Davies, A. C., The Glen, Duppas Hill.
1875. Dickenson, Wm., M.A., F.G.S., Warham-road.
1897. Dighton, J., Fairlight, Altyre-road.
Origl. Dix, T. H., 8 High-street.
1891. Dodd, W. H., M.A., Burton, Chatsworth-road.
1895. Donn, Ed., Glenerne, Epsom-road.
1895. Douglas, Thos., Gairloch, Alcester-road, Wallington.
1887. Down, H. W., Bank Chambers, North End.
1888. Drage, J. H., Tamworth-road.
1891. Drew, H. W., Eastgate, Addiscombe-road.
1898. Druce, F., 65 Cadogan-square, S.W.
1893. Dukes, T. A., M.B., B.Sc., 16 Wellesley-road.
1887. Duncan, P. T., M.D., 40 Park-lane.
1891. Durham, R., Nuthurst, Park Hill Rise.

1887. East, F. W., Bleak House, Whyteleafe, Surrey.
1879. Eaton, H. S., M.A., F.R.Met.Soc., 4 Belfield Terrace, Rodwell, Weymouth.
1890. Edridge, Sir F. T., J.P., Addiscombe Court.
1897. Epps, Miss A. M., Norfolk House, Beulah Hill, Norwood, S.E.
1881. Epps, Jas., Jun., Norfolk House, Beulah Hill, Norwood, S.E.

1898. Faunthorpe, Rev. J. P., Whitelands Training College, Chelsea.
1883. Fenn, W. G., Heath Lodge, Thornton Heath.
1898. Field, A. W., Homerton, Addiscombe Grove.
1894. Fitzgerald A., 93 Addiscombe-road.
1892. Flint, R., Woodstock House, Park-lane.
1899. Fox, Ch., The Chestnuts, Warlingham-on-the-Hill.

1891. Gibson, W. M., M.A., 17 Lower Grosvenor-place, S.W.
1897. Goddard, E., 12 Canning-road.
1887. Goodman, C. H., Bryn Cottage, Whyteleafe, Surrey.
1885. Gower, H. D., 55 Benson-road.

1897. Groves, Mrs. M. M., 2 Canning-road.
1885. Grundy, R. F., 112 Lower Addiscombe-road.
1882. Guimaraens, P. G., Parkside, Warham-road.

1899. Hall, A., 16 Park Hill Rise.
1898. Harris, C. P., M.B., 63 Lower Addiscombe-road.
1899. Harvey, J. E., 13 Carew-road, Thorton Heath.
1888. Helps, J. W., As.M.I.C.E., F.C.S., 3 Tavistock-road.
1899. Henderson, G., St. Katherine's, Oxted.
1887. Hinde, Dr. G. J., F.G.S., Avondale-road.
1881. Hobson, Dr. J. M., M.D., B.Sc., 1 Morland-road.
1898. Hobson, B., 1 Morland-road.
1896. Hogg, A. J., 5 Cargreen-road, South Norwood.
1886. Holmes, W. M., Glenside, St. Peter's-road.
1893. Hoole, A. P., The Willows, Sutton, Surrey.
1890. Hopewell, J. M., 79 Lansdowne Gardens.
1891. Hovenden, A., Oaklands, Haling Park-road.
1881. Hovenden, R. G., Heathcote, Park Hill-road.
1885. Hughes, M., M.R.C.S., L.D.S., Eastbridge, Addiscombe-road.
1896. Hunt, G. H., Leecroft, St. Peter's-road.

1890. I'Anson, W. H., 39 Dingwall-road.
1871. Ingrams, W., Whitgift Schools, Church-road.

1897. Jackson, M., J.P., 139 Lower Addiscombe-road.
1898. Jackson, T. D., Hillbrow, Heathfield-road.
1894. Jarrett, C., 2 St. John's-grove.
1899. Jast, L. S., 203 Brighton-road.
1896. Johnson, E. W., 50 Birdhurst-road.
1897. Jones, E. H. S., 1 Craigerne-road, Blackheath.

1899. Kent, W. S., F.Z.S., F.L.S., The Elms, Elmwood-road.
1888. Klaassen, H. M., Aberfeldy, Campden-road.
1897. Klaassen, Miss, Aberfeldy, Campden-road.

1877. Laing, R. A., 43 Addiscombe-road.
Origl. Latham, B., C.E., Duppas House.
1892. Lincoln, J. G., Kirkdale, Selsdon-road.
1896. Link, F., 43 Park Hill-road.
1891. Lloyd, F., Coombe House, Coombe-road.
1892. Lloyd, A., Coombe Wood, Coombe-road.
1895. Lock, W. J., Llanberis, Avondale-road.
1898. Lock, W. B., Llanberis, Avondale-road.
Origl. Long, Hy., 132 High-street.
1874. Lovett, E., 41 Outram-road.

1898. Maitland, F. W., Jesmond Lodge, St. Peter's-road.
1895. Malden, A., 26 Windmill-road.
1898. Male, H. C., M.D., 74 Birdhurst-road.
1886. Marshall, R., 31 The Waldrons.
1899. Martin, E. A., 23 Campbell-road.
1895. Martyn, J. W., 74 Wellesley-road.
1878. Mather, C. W., 47 Dingwall-road.
Origl. McKean, K., F.L.S., Lloyds, London, E.C.

1886. McLachlan, R., F.R.S., F.L.S., 23 Clarendon-road, Lewisham.
1879. Mennell, H. T., The Red House, Park Hill Rise.
1895. Moore, G. W., Bryndhurst, Dornton-road.
1896. Moore, H. K., Chipstead, Chepstow Rise.
1898. Morris, W., C.E., The Kent Waterworks, Deptford, S.E.
1880. Morton, S., M.D., Wellesley Villas, Wellesley-road.
1880. Morris, A. M., Harcourt-road, Wallington.
1895. Moss, A, 3 High-street, South Norwood.
1897. Moss, M. L., Montorio, Park Hill Rise.

1900. Neligan, Miss D., Croydon High School, Wellesley-road.
1895. Newby, G. E., F.R.C.S., 124 Lower Addiscombe-road.

1874. Oldfield, J., 16 Tamworth-road.
1895. Olive, C. D., M.A., Rokeby, The Downs, Wimbledon.

1892 Packham, J., 16 Katharine-street.
1899. Page, Miss M., Woodlands, Coombe-road.
1892. Page, Thos. K. F., 9 Rosemount, Wallington.
1881. Parsons, H. F., M.D., F.G.S., Oakhyrst, Park Hill Rise.
1897. Parsons, Mrs., Oakhyrst, Park Hill Rise.
1900. Parsons, Miss E. G., Oakhyrst, Park Hill Rise.
1895. Parsons, S. G., Downside, Epsom.
1893. Pascall, J., Ambleside, Addiscombe-road.
1891. Pelton, J. O., 26 Friends'-road.
1894. Perrey, H. W., The Cedars, London-road.
1897. Petri, R., Hazeltryst, Havelock-road.
1892. Phillips, H. W., M.D., 28 Addiscombe-road.
1870. Philpot, C. W., M.D., Friends' House, Park-lane.
1898. Pierce, E., Claremont, Balfour-road, South Norwood.
1896. Platts, E. J., Haslemere, St. Leonard's-road.
Origl. Price, G. N., 74 High-street.
1897. Purser, J., 41 Addiscombe-road.
1880. Pye-Smith, A., J.P., 27 Park Hill Rise.

1885. Reed, L., Hyrst Hof, South Park Hill-road.
1880. Rich, A. W., Grove House, Chatsworth-road.
1895. Ritchie, Rt. Honble. C. T., M.P., 19a Wetherby Gardens, South Kensington.
1894. Robarts, N. F., F.G.S., 23 Oliver-grove, South Norwood.
1888. Roods, A., 67 Thornhill-road.
1900. Rush, Miss E., Woodford House School, East Croydon.
1895. Russell, C. J. L., Upton Dene, 56 Coombe-road.
1877. Rymer, S. L., J.P., Wellesley-road.

1892. Salmon, C. E., Clevelands, Wray Park, Reigate.
1888. Sandell, J. T., 213 Selhurst-road, South Norwood.
1888. Schmitz, J. H., J.P., 4 Lansdowne-road.
1895. Shore, E. L., Lansdowne Villa, Wellesley-road.
1896. Shore, E. R., Lansdowne Villa, Wellesley-road.
1896. Shore, H. H., Lansdowne Villa, Wellesley-road.
1895. Slack, J. W., 64 Park-lane.
1896. Smart, H. C., 29 Cherry Orchard-road.

1899. Smedley, E. A., M.A., B.Sc., 173 Albert-road.
1899. Smee, A. H., The Grange, Wallington, Surrey.
1894. Smith, H. D., 19 Cedars-road, Beckenham.
1894. Smith, Dr. S. Parsons, Park Hyrst, Addiscombe-road.
1898. Stanley, J. H., 51 Morland-road.
Origl. Stanley, W. F., F.G.S., Cumberlow, Lancaster-road, South Norwood.
1896. Stokes, F., 125 Melfort-road, Thornton Heath.
1878. Straker, E., Richmond, Malden-road, Wallington.
1888. Streeter, J. S., 78 High-street.
1874. Swaine, J. C., 52 Park Hill-road.
1882. Syms, J. E., Stanton Villa, Stanton-road.

1897. Tarver, A., Polruan, Stuart-road, Thornton Heath.
1898. Tate, A., Downside, Leatherhead.
1898. Taylor, Rev. C. H., The Larches, Banstead.
1880. Thompson, F., Lynton, Haling Park-road.
1894. Thompson, H. C., Hermitage, Dunheved-road South, Thornton Heath.
1878. Thompson, H. G., M.D., J.P., 86 Lower Addiscombe-road.
1892. Thorpe, C., Selborne, Chatsworth-road.
1899. Topley, E. E., Ingleside, St. Augustine's Avenue, S. Croydon.
1898. Topley, W. W., 3 Marlborough-road, South Croydon.
1896. Townend, F. J., 11 Park Hill Rise.
1898. Tyndall, W. H., Morlands, Oxford-road, Redhill.

1900. Voss, W. A., F.C.S., Rosella, Nicholson-road.

1877. Walker, T., C.E., Warrington-rd., Duppas Hill.
1876. Walton, A., The Homestead, Bedford Park.
1897. Ward, Miss C., 36 St. Peter's-road.
1877. Warner, A., 2 Grosvenor Villas, Holmesdale-road, Selhurst.
1881. Waterall, N., Waddon Lodge, Croydon.
1897. Waterall, Miss F. A., Grove Cottage, Addiscombe-grove.
1895. Weightman, A. J., Langdale, Chepstow Rise.
1897. Weightman, W. A., Langdale, Chepstow Rise.
1898. Webster, R. T., 13 Havelock-road.
1877. Wenham, W. P., Horndean, Waddon.
Origl. West, F., The Waldrons.
1875. Whealler, G. A., 46 Friends'-road.
1896. Whitaker, W., F.G.S., F.R.S., Freda, Campden-road.
1899. Whitaker, Miss M. de F., Freda, Campden-road.
1887. Wild, A. S., 28 Canning-road.
1883. Williams, B. A., L.D.S., 22 Wellesley-road.
1899. Williams, C. H. H., 7 Montpelier-road, Blackheath.
1892. Willoughby, C. W., 28 Friends'-road.
1896. Wills, G. S. V., Southwood, Croham-road.
1897. Wills, Miss G., Southwood, Croham-road.
1889. Wise, H. R., Beechfield, Bramley-hill.
1895. Wissenden, A. C., 50 Canning-road.
1887. Wratten, F. C. L., Hellingley, Dingwall-avenue.

TRANSACTIONS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1898–99.

144.—The Commons near Croydon, and their Flora.

By H. Franklin Parsons, M.D., F.G.S.

(Read February 21st, 1899.)

The South-east of England owes much of its beauty and amenity to its numerous commons, heaths, and open grassy downs, over which one may roam in enjoyment of a delightful sense of freedom, and where we may see Nature in something like her primitive aspect. In this respect the south-eastern counties are in contrast with other parts of the country, such as the fertile but unpicturesque plains of the Midlands, where the land is all enclosed or parcelled out into formal and highly cultivated fields, separated by closely trimmed hedges, and diversified only with an occasional spinney or plantation for the benefit of the fox-hunter. We at Croydon, though there is now no common within the borough, are fortunate in possessing two beautiful open spaces on our immediate border—*viz.* Shirley Hills and Croham Hurst; within an easy distance are Mitcham and Hayes Commons, and Riddlesdown; while farther off are Keston Common, Worms Heath, Farthing Down, Park Downs, and others. In speaking of these as commons, I only use the word for convenience as meaning an open tract of land which has never been brought under cultivation, and not in a legal sense as implying the existence of rights of common. Indeed, as I understand, to the lawyer the word "common" means not a tract of open land, but a right to a share in the natural produce of land the soil of which belongs to another person. Such a tract of land as in ordinary speech is called a common is usually in legal language "waste of the manor": the soil belongs to the lord of the manor, but the freeholders and copyholders of the manor have certain rights over it—*e. g.* the right to turn out to pasture upon it as many horses, cattle, and sheep as their respective holdings can support during the winter; and in some cases the right to cut fuel or dig gravel for their own use.

In early periods of English history the land was mainly uninclosed; but with the growth of the population the wastes gradually became inclosed, sometimes under the authority of law, at other times by unauthorized encroachments on a large or small scale. As Hudibras says—

"The law condemns the man or woman
Who steals a goose from off a common,
But lets the greater villain loose
Who steals the common from the goose."

In the last century and the earlier part of the present one the dictum of Dean Swift, that the greatest benefactor to mankind was the man who made two blades of grass grow where only one grew before, was in high esteem; and under the influence of the high prices of food, brought about by wars and duties on imported corn, numerous Inclosure Acts were passed under which much of the more fertile common land was divided up and brought under cultivation. Even so late as 1846 a general Inclosure Act was passed to facilitate the process of inclosure and obviate the need for obtaining private Acts. But in the middle of the present century the repeal of the Corn Laws made the country no longer dependent wholly on home-grown corn for its supply of food; the growth of towns drew attention to the importance of preserving open spaces in their vicinity; and people began to appreciate that man does not live by bread alone, but that there are other things—such as health, recreation, and enjoyment of the beauties of Nature—to be taken into consideration. Until recent years the law had recognized no right on the part of the public at large to the use of a common for purposes of recreation, but only the right of the commoners to pasturage or similar uses; hence it was in the power of the lord of a manor to buy up the commoners' rights and inclose the common, even against the wishes of some of the commoners. But some thirty years ago a movement, headed by the late Prof. Fawcett and by Mr. Shaw Lefevre, was started for the preservation of commons; in 1866 the Metropolitan Commons Act was passed for the preservation and regulation of the commons around London within the Metropolitan Police District, and, ten years later, the Commons Act of 1876. In the latter Act it is directed that inclosures, as opposed to regulation of commons, should not be made unless it be proved to the satisfaction of the Commissioners (now the Board of Agriculture) and of Parliament that such inclosures will be of benefit to the neighbourhood as well as to private interests; and in every order made for the inclosure of a common certain conditions, so far as applicable, shall be inserted for the benefit of the neighbourhood—such as the preservation of free access to any particular point of view; of particular trees and objects of historical interest; of space for recreation; and of roads and footpaths. It is stated that under the private Inclosure Acts passed during the last century and the first half of the present one, some seven millions of acres of common land were inclosed, and under the Inclosure Act of 1846, 618,000 acres more; but in the twenty years 1876–1895 only about 26,600 acres have been inclosed.

In Croydon the commons were inclosed in the last century, though the names of Croydon Common and Thornton Heath still survive in what are now populous districts. In the Inclosure Act a piece of woodland in the North Wood—*i. e.* Norwood—was reserved to the parish to furnish the poorer inhabitants with fuel; the parishioners, however, afterwards shortsightedly sold it for £2000, wherewith to build a town hall "for the better entertainment of His Majesty's Judges." This town hall, which was never an object of beauty, and had become inadequate for the needs of the town, was pulled down a few years ago; so that Croydon has nothing left to show for the loss of its commons. If the money for building the town hall had been borrowed, it would long since have been paid off, and the land at Norwood would now have been of great value. We have of course recreation grounds, but they have been laid out in recent years, and can hardly be said to illustrate the native flora.

Of the commons and open spaces near Croydon, Shirley Hills are maintained by the Corporation of Croydon; and Mitcham Common, Hayes Common, and Wimbledon Common by Conservators; while West Wickham Common, Riddlesdown, Farthing Down, Kenley Common, and Coulsdon Common are maintained by the Corporation of the City of London, to whom the public are also indebted for the preservation of Epping Forest and Burnham Beeches. It is to be hoped that some such benefactor may come forward to save for us our beautiful Croham Hurst.

But when a common itself has been secured to the public as an open space, the native flora which has escaped the ploughman or the speculative builder finds another enemy in the landscape gardener, whose idea of improvement is to drain the wet places, or else form them into artificial pools; lay out roads and avenues; level and smooth the turf; plant borders and shrubberies; and thus convert into a trim park or formal garden what was a relic of primitive wilderness. The commons which are favourite holiday resorts are frequented by increased numbers of people; and the more showy plants suffer at the hands of trippers, and the rarer ones through the rapacity of collectors. In dry seasons the herbage is often destroyed by fires. When a common gets surrounded by houses, the smokiness of the air is unfavourable to the growth of certain plants, especially of cryptogams. From all these causes it happens that the original flora of our commons, especially near towns, tends to become impoverished by the loss of its most interesting members, while, on the other hand, introduced species of plants may be added. This leads me to the suggestion which is the main object of this paper—*viz.* that our Club should compile for future reference lists as complete as possible of the flora of each of our commons and wild spaces in the neighbourhood of Croydon. The compilation of such lists would afford opportunity for interesting comparisons between the floras of different open areas. Thus it would be seen what an almost complete difference there is between the plants growing on a gravelly heath, such as Shirley Hills or Keston Common, and those on a chalk down, snch as Riddlesdown and Farthing Downs. The flora of a tract containing wet places, like Keston Common, would also contain many species not met with on a dry tract like Hayes Common. But, apart from these differences of soil, there is hardly one of the commons around Croydon which does not contain in its flora some plant which is not met with on the others. Thus Croham Hurst has the whortleberry and lily of the valley; Hayes Common the butcher's broom; Keston Common the sundew, bog asphodel, and meadow thistle (*Carduus pratensis*); and Chislehurst Common the bog St. John's wort (*Hypericum elodes*) and pennyroyal. A catalogue of the insects and mollusca of each of these commons would doubtless show like differences.

The commons on the pebble beds of the Oldhaven series have a peaty soil on which the heaths are the predominant feature in the vegetation. We find on Shirley Hills, for instance, three species of heath—*viz.* the ling, the cross-leaved heath, and the purple heath. Of these the latter is confined to dry places, and the cross-leaved heath to wet places, while the ling is ubiquitous there. The larger terrestrial mosses and lichens and fungi are plentiful, and in the wet hollows boggy places are formed where plants such as *Sphagnum*, sundew, and petty whin occur. Where the pebble gravel is less sharp and the top soil is loamy, the gorse is the predominant shrub, as on Hayes Common and Chislehurst Common, and also on the alluvial gravel of Mitcham Common. Where the soil is fine sand, as on parts of Shirley Hills, Hayes Common, and Mitcham Common, minute annual plants, such as species of *Trifolium* and *Cerastium*, *Mœnchia erecta*, *Ornithopus perpusillus*, and *Erodium cicutarium* are found.

The chalk downs support a fine close velvety herbage composed of a much larger number of species of plants than are to be met with on sandy, clayey, or peaty soils. The juniper is the characteristic shrub, and among other plants peculiar to a chalky soil may be mentioned the rock rose, the small burnet (*Poterium Sanguisorba*), the horse-shoe vetch (*Hippocrepis comosa*), the dropwort (*Spiræa Filipendula*), and the small scabious (*Scabiosa Columbaria*). The plants of wet situations are, as might be expected, absent on our dry chalk commons.

The following are further particulars about the principal commons in our neighbourhood:—

Shirley Hills.—Area of space dedicated to the public, 87 acres; altitude 340–480 ft. (O. D.);—consist geologically of a bank of rounded flint-pebbles, formed on or near the old tertiary sea-shore, and more than 50 ft. thick. The most prominent features of these hills are the steep rounded slopes and deep intersecting hollows on their north side—*i. e.* in the direction of the dip of the strata. In this respect they differ from the other commons and tracts of Oldhaven pebble beds in this neighbourhood, which, though they may have an abrupt escarpment on the south side, at the outcrop of the pebble bed, as at Hayes and Keston Common, have only a gradual slope northwards in the direction of the dip. The peculiar formation of the Shirley Hills is probably due to the way in which the pebbles have been originally heaped up at this spot. The pebble bed varies greatly in thickness; thus in the Park Hill Rise section, described by me in a paper read to the Club in 1896, it was found to vary from 4 in. to 11 ft. in thickness in less than a quarter of a mile. Botanically, the chief rarities at Shirley Hills are found in the enclosed portion near Oaks Road, and therefore hardly come within the limits of my paper; but many interesting plants may be found, especially in the damp hollows. Some, however, have disappeared: thus, some years ago I saw young plants of the northern hard fern (*Lomaria spicant*), but have not found it in recent years. Some of the larger terrestrial mosses and lichens are plentiful, and in the sides of ditches in the damp hollows are to be found several species of scale mosses (*Jungermanniaceæ*). These may be found in fruit in spring; and their black shining capsules, borne on silvery thread-like stalks, and ultimately splitting into four valves, and discharging spores mingled with spiral threads, form interesting and beautiful microscopic objects.

Fungi are plentiful in autumn; among them may be mentioned the beautiful but poisonous fly agaric, with its tall ringed stem and scarlet cap dotted with white warts; *Sparassis crispa*, a rare and curious sponge-like species; and *Torrubia militaris*, a species parasitic upon caterpillars. The mycelium of this fungus penetrates the tissues of the caterpillar, and when the latter has buried itself in the ground it dies, and the fungus sends up its fructification in the form of a slender orange club, the stalk of which can be traced down into the body of the dead insect.

Croham Hurst.—Area 80 acres; altitude 288–477 ft. This hill is an outlier of the Oldhaven pebble beds, surrounded on all sides by chalk, the intervening Woolwich Beds and Thanet Sand being very thin, and almost wanting; hence, in the absence of an impermeable bed to throw out the water from the gravel, there are no springs or wet places. The south slope of the hill is in places so steep that no vegetation can find a foothold, and the pebble gravel is left bare. The summit of the hill is open heathy ground, but the sides and base are wooded. The flora in the woods at the base of the hill on the chalk is markedly different from that on the pebble beds higher up. Among the species found at Croham Hurst are the whortleberry and the lily of the valley; though the latter appears very seldom to flower there. The rare ground-pine (*Ajuga chamæpitys*) grows close to, if not actually within, the Hurst.

Hayes Common and West Wickham Common together form one open tract, being only separated from one another by an unfenced road. This tract has an area of 200 acres, and varies in altitude from some 230 to 400 ft. It rests on the pebble beds, which end in a steep escarpment on the south and west. On the top of West Wickham Common at its south-west corner are some ancient barrows and entrenchments, possibly marking the site of a battle which is said to have taken place at Addington between Hengist and the British. A noticeable feature is the fine group of venerable oaks on the steep north-west slope of West Wickham Common, the ground beneath which in spring is carpeted with bluebells. Among plants met with at Hayes and West Wickham Commons are *Saxifraga granulata*, the climbing fumitory (*Corydalis claviculata*), *Mœnchia erecta*, and *Trifolium glomeratum*. The butcher's broom (*Ruscus aculeatus*) grows close to but not actually on the common.

Keston Common.—Area 55 acres; altitude 400–520 ft.; is situated on the north slope of the Oldhaven pebble beds, and is intersected by two valleys, one of which is occupied by a boggy piece of ground, and the other by artificial ponds. Keston Common has perhaps the most interesting flora of any of the commons near Croydon. In the boggy ground are found the sundew (*Drosera rotundifolia*), the marsh pennywort, the bog violet, the bog asphodel, *Carduus pratensis*, and several species of *Sphagnum*; while in the ponds grow the arrow-head, the small bur-reed, *Scirpus fluitans*, and several other aquatic plants—whether planted or brought by birds, I cannot say. In 1894 I saw a single plant of the butterwort (*Pinguicula vulgaris*) at

Keston Common, but though, of course, I did not disturb it, I have not seen it there since. Mr. Beeby suggests that it may have been planted, as *Pinguicula* is not known to grow elsewhere in this part of the country. I also found there a specimen of the white mullein (*Verbascum Lychnitis*), usually a plant of the chalk.

Mitcham Common.—Area 480 acres; altitude 80–112 ft.; is flat and low lying, resting on the alluvial gravels of the Wandle valley. It is perhaps the least picturesque of the commons in this neighbourhood, being covered with stunted gorse bushes, while part of it has been excavated for gravel. Several interesting dwarf plants, however, grow there, as *Trigonella ornithopodioides* and *Limosella aquatica*.

Wimbledon Common with Putney Heath.—Area 1000 acres; altitude 30–180 ft.; is on a plateau of gravel, resting on London Clay. The higher part is peaty, and the smaller sundew (*Drosera intermedia*) formerly grew there.

Worms Heath.—Area 37 acres; altitude 700–800 ft.; is on an outlier of Oldhaven pebble gravel, which contains masses of hard ferruginous conglomerate.

Farley Green (area 20 acres; altitude 540–570 ft.) and Kenley Common (area 77 acres; altitude about 550 ft.) are situated on the clay-with-flints, over the chalk; and their flora, as is usually the case on clayey tracts, presents, so far as I have seen, no very noticeable feature.

Riddlesdown.—Area 120 acres; altitude 240–420 ft.

Farthing Down.—Area 100 acres; altitude 400–500 ft.

Park Down.—Area 77 acres; altitude 400–500 ft.

Banstead Downs.—Area 400 acres; altitude 300–450 ft.

Epsom Downs.—Area 430 acres; altitude 350–500 ft.

These are all on the chalk, and their flora has the general character before described. The white mullein (*Verbascum Lychnitis*) grows at Riddlesdown, and the sweet briar (*Rosa rubiginosa*) at Epsom Downs. At the last mentioned place a little ling grows, a rare occurrence, as the heaths usually shun a calcareous soil; but probably at this spot the chalk is more or less covered by some superficial bed.

A more careful investigation of the flora of these commons than I have yet made might be expected to yield interesting results, and this is the work which I propose for the Club. Each common should be visited several times a year, London Catalogue in hand, and all the species observed within the limits open to the public should be marked, common as well as rare ones. The cryptogams should if possible be recorded as well as the flowering plants. The help of all members of the Club is invited, and the Botanical Sub-Committee would be happy to render assistance in naming doubtful finds.

145.—Report of the Meteorological Committee for 1899.

Prepared by the Hon. Sec., Francis Campbell-Bayard, F.R.Met.Soc.

(Read 20th February, 1900.)

The arrangements under which the daily rainfall of the district around Croydon has been observed and tabulated have been carried out with, it is hoped, the same efficiency as in previous years. The number of stations in the printed sheet is 85, an increase of five over the year 1898, and there is one station (the Sewage Farm, Carshalton) not in the printed list, the observations of which are quite complete, and will be found at the end of this Report.

It is with very great regret that the Sub-Committee have to announce the discontinuance of five stations at the end of the year. Three of these stations have come to an end owing to the death of the observers—*viz.* Reigate which has been in existence for five years, Coulsdon with a record of ten years, and Sydenham with a record of three years. The other two stations, *viz.* Thornton Heath with a record of eight years, and Richmond with a record of twenty-eight years, have come to an end owing to the discontinuance of the observations, in the first case due to old age, and in the second to the removal of the observer. The loss of two of these stations, *viz.* Coulsdon and Richmond, is much to be deplored, owing to the great difficulty of finding new observers in these neighbourhoods, Two other observers have also died during the year, *viz.* Lord Farrer and Sir J. F. Lennard, Bart., but, so far as is at present known, the records will be continued. The Sub-Committee consider that it would be a very graceful act on the part of the Club if a vote of condolence and thanks was passed to the families of the deceased observers, and to the two gentlemen who have discontinued their observations, for the great services rendered to the Club in the past.

Appendix I. to this Report contains a list of the observers, with particulars relating to the stations and gauges, and also the monthly tables of daily rainfall, of which a sufficient number have from time to time been pulled for the use of the Club. These printed tables contain the records of all observers, with the exception of the observer at Carshalton, reporting to the Sub-Committee, and it will be observed that the records are 83 in number, and that all, with the exception of two, are complete to the end of the year. The number of observers whose records are printed is 65, as against 64 in 1898.

Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from the monthly tables in Appendix I. It will be noticed that there is only one fall over 2·00 in., and that the number of days on which these falls occurred is seven. Attention will be called to this Appendix further on in this Report.

So far as the records of rainfall in the possession of the Sub-Committee show, the year has been a dry year, the deficiency throughout the district being something like 2 in. The deficit does not on paper look very serious, but in order to show what a serious state of things is revealed, tables A, B, C, and D, have been constructed. These four tables have been constructed on the same plan. Tables A and B refer to Greenwich, table C to Surbiton, and table D to Wimbledon (Mt. Ararat).

A single glance at these tables will show the state of affairs. Table A shows the departures from the Greenwich average of 80 years of each of the past 10 years, and the result shows a deficit of just ·28 in., which is practically just 3 in. above a

A.—*Greenwich Av.* 80 *Yrs.* (1816–95) 24·96 in.

Year		± Average
	IN.	IN.
1890	21·88	− 3·08
1891	25·02	+ 0·06
1892	22·35	− 2·61
1893	20·09	− 4·87
1894	26·88	+ 1·92
1895	19·72	− 5·24
1896	22·47	− 2·49
1897	22·08	− 2·88
1898	18·85	− 6·11
1899	22·33	− 2·63
Total deficiency		− 27·93

B.—*Greenwich Av.* 40 *Yrs.* (1856–95) 24·22 in.

Year		± Average
	IN.	IN.
1890	21·88	− 2·34
1891	25·02	+ 0·80
1892	22·35	− 1·87
1893	20·09	− 4·13
1894	26·88	+ 2·66
1895	19·72	− 4·50
1896	22·47	− 1·75
1897	22·08	− 2·14
1898	18·85	− 5·37
1899	22·33	− 1·89
Total deficiency		− 20·53

C.—*Surbiton Av.* 40 *Yrs.* (1856–95) 24·42 in.

Year		± Average
	IN.	IN.
1890	19·41	− 5·01
1891	27·79	+ 3·37
1892	21·17	− 3·25
1893	18·77	− 5·65
1894	27·67	+ 3·25
1895	20·79	− 3·63
1896	24·60	+ 0·18
1897	24·43	+ 0·01
1898	18·55	− 5·87
1899	21·38	− 3·04
Total deficiency		− 19·64

D.—*Mt. Ararat, Wim., Av.* 40 *Yrs.* (1856–95) 24·06 in.

Year		± Average
	IN.	IN.
1890	21·42	− 2·64
1891	28·39	+ 4·33
1892	25·36	+ 1·30
1893	19·32	− 4·74
1894	29·54	+ 5·48
1895	22·05	− 2·01
1896	23·82	− 0·24
1897	24·10	+ 0·04
1898	18·97	− 5·09
1899	22·32	− 1·74
Total deficiency		− 5·31

year's average rainfall. Table B shows the departures from the Greenwich average of 40 years of each of the same past 10 years, and the result is a deficit of 20½ in., which is practically 3¾ in. below the year's average rainfall. In both of these tables it will be noticed that only the years 1891 and 1894 have a rainfall over the average. Table C refers to Surbiton, on the western side of the Club's district. This table shows the departures from the same 40 years' average of each of the same 10 years, with the result of a deficiency of rather over 19½ in., which is practically nearly 5 in. below the year's average rainfall. In this table it will be noticed that 4 years have a rainfall over the average, one of which years, however, *viz.* 1897, may be disregarded. Table D refers to Wimbledon, and here we have a very different state of things. This table shows the departures from the same

A.—*Greenwich Average* 80 *Yrs.* (1816–95).

	Average	1899	± Average
	IN.	IN.	IN.
Jan.	1·89	2·52	+ 0·63
Feb.	1·59	1·93	+ 0·34
March	1·52	0·61	− 0·91
April	1·65	3·00	+ 1·35
May	2·00	1·65	− 0·35
June	1·95	1·20	− 0·75
July	2·60	1·29	− 1·31
Aug.	2·33	0·35	− 1·98
Sept.	2·30	2·26	− 0·04
Oct.	2·82	2·32	− 0·50
Nov.	2·37	3·73	+ 1·36
Dec.	1·94	1·47	− 0·47
Year	24·96	22·33	− 2·63

B.—*Greenwich Average* 40 *Yrs.* (1856–95).

	Average	1899	± Average
	IN.	IN.	IN.
Jan.	1·98	2·52	+ 0·54
Feb.	1·43	1·93	+ 0·50
March	1·44	0·61	− 0·83
April	1·61	3·00	+ 1·39
May	1·94	1·65	− 0·29
June	2·04	1·20	− 0·84
July	2·42	1·29	− 1·13
Aug.	2·30	0·35	− 1·95
Sept.	2·18	2·26	+ 0·08
Oct.	2·75	2·32	− 0·43
Nov.	2·19	3·73	+ 1·54
Dec.	1·94	1·47	− 0·47
Year	24·22	22·33	− 1·89

C.—*Surbiton Average* 40 *Yrs.* (1856–95).

	Average	1899	± Average
	IN.	IN.	IN.
Jan.	2·04	2·43	+ 0·39
Feb.	1·47	2·40	+ 0·93
March	1·44	0·44	− 1·00
April	1·64	2·44	+ 0·80
May	1·92	1·46	− 0·46
June	2·08	1·15	− 0·93
July	2·37	0·34	− 2·03
Aug.	2·43	0·46	− 1·97
Sept.	2·21	2·57	+ 0·36
Oct.	2·81	2·21	− 0·60
Nov.	2·16	4·21	+ 2·05
Dec.	1·85	1·27	− 0·58
Year	24·42	21·38	− 3·04

D.—*Mt. Ararat, Wim., Av.* 40 *Yrs.* (1856–95).

	Average	1899	± Average
	IN.	IN.	IN.
Jan.	1·79	2·22	+ 0·43
Feb.	1·38	2·15	+ 0·77
March	1·33	0·61	− 0·72
April	1·64	2·37	+ 0·73
May	1·92	1·54	− 0·38
June	2·08	1·01	− 1·07
July	2·49	0·67	− 1·82
Aug.	2·31	0·39	− 1·92
Sept.	2·28	3·43	+ 1·15
Oct.	2·88	2·31	− 0·57
Nov.	2·19	4·36	+ 2·17
Dec.	1·77	1·26	− 0·51
Year	24·06	22·32	− 1·74

40 years' average of each of the same 10 years, with the result of a deficiency of only 5¼ in. This result is startling; but if the table be examined it will be seen to be the result of 3 years of excessive rainfall (for the excess in 1897 may be disregarded) combined with smaller deficits in other years. I do not suppose that anyone would have imagined that over the series of years shown in the table the deficit at Surbiton would be nearly four times as great as at Wimbledon.

Let us now come back to the year 1899, and see how the deficit shown in the first set of tables has arisen.

With this view I have again constructed, on the model of previous years, tables A, B, C, and D. Tables A and B refer to Greenwich. It will be noticed that in table A there are only four months showing an excess of rainfall, whilst in table B there are five, the fifth month being September, the other four in each case being January, February, April, and November. Table C refers to Surbiton, and table D to Wimbledon. In the two latter tables the same five months as in table B are in excess. If one examines these tables some very curious features present themselves. I will take, first, the month of April. In table A, with the 80 years' mean, there is an excess of 1·35 in.; and in table B, with the 40 years' mean, of 1·39 in., an excess which, though the same 40 years are taken, diminishes, in the case of Surbiton to 0·80 in., and Wimbledon to 0·73 in. Let us now take the month of November. This month was an exceedingly curious one, being extremely wet at the beginning and extremely dry at the close. I have no doubt that you all, like myself, were wondering what the rainfall of that month was going to amount to, when it suddenly stopped completely. If we turn to the tables, we see that there is in table A an excess of 1·36 in., in table B of 1·54 in., in table C of 2·05 in., and in table D of 2·17 in., very nearly the exact opposite of what occurred in April. If we now turn to the deficiencies, we shall first notice the month of June. Here the deficiency increases throughout the four tables: in table A it is 0·75 in., in table B it is 0·84 in., in table C it is 0·93 in., and in table D it is 1·07 in. Again, let us take the month of August. Here we have a distinct change, in that the deficiency in the four tables is practically the same, only differing from one another by a very few hundredths; in table A it is 1·98 in., in table B it is 1·95 in., in table C it is 1·97 in., and in table D it is 1·92 in. Again, if we take the month of July we have another change. In table A the deficiency is 1·31 in., in table B it is 1·13 in. In table C it is nearly an inch more than in table B, *viz.* 2·03 in., whilst in table D it is less than that of table C, *viz.* 1·82 in. It is extremely difficult to account for these different excesses and deficiencies without intervening gauges, which do not exist, and which even if they had existed would, it seems to me, have thrown very little light on these peculiarities, owing to the want of trustworthy averages of a sufficiently long time with which to compare them.

I should like to say a few words with reference to November fall, in order to amplify the remarks in the printed notes of this month. It is extremely rare to have two falls consecutively of over 1 in., and only one instance occurs at Brixton, in, I think, July, 1867, and none at all at Greenwich. On looking over the November tables, we shall see this very rare circumstance in Westerham (Town), *viz.* on 2nd we have 1·02 in., on the 3rd 1·23 in., and on the 5th 1·68 in., a record which I think must be nearly, if not quite, unique in the South-East of England.

With respect to the peculiar dust-storm mentioned in the August notes as having occurred on the 15th, the observer at Kenley, who was then staying at Hindhead, near Haslemere, Surrey, says, in a letter dated September 2nd, "the same sudden gust of wind, whirling the trees about, and only lasting two or three minutes, occurred at 5 p.m. and again at 7·30 p.m. A peculiar lull and airless feeling as before a storm preceded it, and all windows and doors were hastily closed. The heat was intense; no rain fell. The centre of the storm seemed to be over Oxford." So far as is known, no account of this storm has been published, and it seems desirable that it should be put on record.

In Appendix II. the falls of rain of 1·00 in. and upwards are set out. The number of days on which these fell is 7 as against 5 in 1898. There is only one fall over 2·00 in., *viz.* 2·18 in. at Abinger Rectory on Nov. 3rd. The falls on September 29th, November 3rd, and November 5th seem to have been fairly general throughout the district.

In conclusion, the Sub-Committee desire to tender their thanks to all those, numbering eight, who have so kindly sent donations to enable the Club to continue this useful organization. The Sub-Committee also tender their thanks to the observers for their returns, and also for the notes which many of them contribute, and which tend to make the returns much more valuable and interesting.

The Sewage Works, Carshalton, Surrey.

Observer—W. Willis Gale. Gauge 5 in. in diameter.
Height of gauge above ground, 1 ft.
Height of station above sea-level, 118 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
2·71	2·30	0·61	2·30	1·26	0·67	0·39	0·60	2·51	2·34	4·40	1·72	21·81

APPENDIX I.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB

(Meteorological Sub-Committee.)

No.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
			IN.	FT.	IN.	FT.
	Abinger (The Hall)	The Lord Farrer	8	2	0	320
	Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
	Dorking (Denbies)	J. Beesley	5	0	6	610
	Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
5	Nutfield (The Priory)	J. Moffatt	8	1	2	468
	Nutfield (The Priory) 2nd gauge	J. Moffatt	8	1	2	331
	Buckland (Hartswood)	R. W. Clutton	5	1	0½	174
	Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
	Upper Gatton (Upper Gatton Park)	F. Druce	5	1	0	600
10	Merstham (Rockshaw)	W. Gardiner	5	1	0	475
	Harp's Oak Cottage	R. C. Grant	5	1	0	454
	Chipstead (Shabden Park)	J. Crerar	5	1	0	550
	Chaldon (The Rectory)	Rev. G. E. Belcher	5	1	0	542
	Caterham (Metropolitan Asylum)	G. S. Elliott, M.D.	5	1	0	610
15	Westerham (Hill Estate)	W. Morris	5	1	0	539
	Westerham (The Town)	W. Morris	5	1	0	380
	Knockholt Beeches (Field Gauge)	W. Morris	5	1	0	785
	Knockholt Beeches (Tower Gauge)	W. Morris	5	24	6	812
	Sevenoaks (St. Johns Hill)	W. W. Wagstaffe	5	1	10	380
20	Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
	Kenley (Hazelea)	Mrs. Carr-Dyer	5	1	0	282
	Sanderstead (The Red House)	Capt. Carpenter, R.N.	5	1	0	320
	Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
	Burgh Heath (Sutton Water Co.)	J. D. Grant	5	1	0	580
25	Leatherhead (Downside)	A. Tate	5	1	0	250
	D'Abernon Chase	Sir W. Vincent, Bart.	5	1	0	280
	Oxshott (Beverstone)	W. H. Dines	5	1	0	212
	Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
	Sutton (Sutton Water Co.)	J. D. Grant	5	1	0	110
30	Carshalton (Sewage Works)	W. W. Gale	5	1	0	118
	Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
	Beddington (Riverside)	S. Rostron	5	1	0	120
	Waddon (Waddon House)	P. Crowley	5	1	0	156
	Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
35	Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
	Croydon (Duppas House)	Baldwin Latham	8	1	0	158
	Croydon (Whitgift)	A. E. Watson	5	1	0	191

No.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
			IN.	FT.	IN.	FT.
	Croydon (Woburn Road)	M. L. Craven	5	1	1	178
	Croydon (Windmill Road)	A. Malden	5	1	6	174
40	Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
	Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
	Addington (Park Farm)	W. Whalley	5	1	0	268
	Addington (Pumping Station)	Croydon Corporation	8	1	0	331
	West Wickham (Wickham Court)	Sir H. F. Lennard, Bt.	5	1	2	300
45	Hayes Common (The Warren)	Miss Akers	5	1	0	296
	Keston (Bradfield)	A. Hill	5	1	0	350
	Farnborough (Feniton)	Miss Percy	5	1	0	376
	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
	Farningham Hill (Hill House)	A. J. Waring	5	3	0	300
50	Southfleet (Kent Water Co.)	W. Morris	5	1	0	82
	Chislehurst (Hawkwood)	Miss Edlmann	5	1	0	300
	Bickley (The High Field)	J. Batten	5	1	2	295
	Bromley (The Palace)	Coles Child	5	1	0	187
	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
55	Beckenham (Oakwood Avenue)	H. Dolling-Smith	5	1	0	184
	South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
	Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
60	New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
	Esher (Sewage Works)	A. J. Henderson	5	1	0	40
	West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
	Surbiton (Seething Wells)	R. Hack	10	0	6	25
	Kingston (Sewage Works)	T. Stevens	5	1	0	25
65	Putney Heath (The Reservoirs)	R. Hack	5	1	0	180
	Wandsworth Com. (Patten Road)	F. J. Brodie	5	1	0	100
	Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
	West Norwood (Thornlaw Road)	W. Marriott	5	1	0	220
	Up. Norwood (Dulwich-wood Park)	J. P. Caldicott	5	1	2	276
70	Forest Hill (Dartmouth Road)	L. W. F. Behrens	5	1	0	220
	Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
	Sidcup (Hatherley Road)	Lionel Burrell, M.D.	5	1	2	160
	Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
	Dartford (West Hill House)	Lieut-Col. C. N. Kidd	5	1	3	100
75	Eltham (High Street)	W. Morris	5	1	0	245
	Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
	Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
	Brixton (Acre Lane)	F. Gaster	8	1	0	77
80	Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·14	·18	·14	·12	·12	·14	·14	·12	·12	·12	·12	·13	·15
2	·20	·08	·13	·12	·12	·12	·07	..	·13	·10	·08	·08	·03
3	·02	·02	·02	·01	·02	·02	..	·01	·01	·02	·03	·02	·01
4	..	..	..	..	·01	·01	..	·01	..	..	..	..	..
5	..	·02	..	..	..	..	..	..	·02	..	..	·01	..
6	·05	·05	·06	·03	·03	·03	·05	·06	·05	·07	·04	·05	·04
7	·04	·06	·05	·07	·04	·04	·07	..	·04	·05	·04	·04	·09
8	..	..	..	..	·01	·01	..	·03	..	..	..	..	..
9	..	..	..	·03	·02	·02	·03	·02	·05	·03	·02	·08	·04
10	·23	·21	·24	·20	·19	·23	·20	·17	·17	·16	·20	·20	·08
11	·45	·50	·44	·38	·30	·36	·36	·39	·47	·42	·40	·46	·41
12	·16	·28	·21	·24	·19	·20	·21	·20	·23	·42	·26	·49	·46
13	·25	·25	·33	·38	·36	·38	·34	·36	·37	·38	·41	·41	·35
14	..	·06	..	..	..	..	..	·02	·05	..	..	·04	..
15	·35	·35	·40	·42	·43	·48	·44	·35	·35	·44	·45	·47	·43
16	·14	·18	·21	·14	·13	·14	·15	·16	·16	·24	·16	·25	·22
17	·20	·20	·13	·15	·15	·16	·19	·15	·14	·14	·16	·14	·13
18	·02	·07	·04	·01	·01	·01	·01	·03	·02	·05	·02	·04	·04
19	·10	·18	·10	·12	·06	·08	·08	·08	·10	·15	·09	·14	·09
20	·44	·55	·47	·44	·30	·42	·45	·39	·44	·47	·40	·47	·43
21	·23	·25	·27	·15	·07	·12	·14	·12	·13	·15	·15	·15	·18
22	·03	·04	·04	..	·03	·06	·02	·04	·02	·06	·03	·02	·02
23	·03	·01	·04	·10	·07	·05	..	..	·09	·02	·05	·06	·06
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	·01	..
29	·06	·05	·05	·03	·03	·02	·05	·06	·08	·07	·04	·05	·08
30	..	..	..	·02	·01	·01	..	·01	·01	·01	·01	·01	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..
*	3·14	3·59	3·37	3·16	2·70	3·11	3·00	2·78	3·25	3·57	3·16	3·82	3·34
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·16	·12	·15	·13			·20	·14	·10	·13	·08		·10
2	·02	·07	·14	..			·08	·05	·08	·09	·12		·11
3	..	..	·04	..			·02	·03	·01	..	..		..
4	..	..	..	..			..	..	..	..	..		..
5	·03	..	..	..			..	..	..	..	..		..
6	·03	·05	·03	..			·04	·04	·02	·03	·02		·02
7	·04	·06	·07	·29			·12	·01	·09	·09	·07		·04
8	..	..	..	..			..	..	..	..	..		..
9	·03	..	..	..			..	..	·04	·04	·15		..
10	·20	·20	·15	·15			·15	·20	·18	·21	·20		·19
11	·48	·48	·33	·22			·27	·38	·35	·33	·28		·32
12	·67	·48	·38	·22			·24	·42	·39	·48	·72		·43
13	·23	·45	·53	·52	MONTHLY GAUGE.	MONTHLY GAUGE.	·48	·43	·38	·42	·45	MONTHLY GAUGE.	·30
14	·07	..	..	..			·03	..	..	..	·08		..
15	·42	·56	·65	·61			·45	·43	·33	·42	·16		·33
16	·20	·27	·15	..			·17	·23	·28	..	·24		·30
17	·14	·14	·18	·36			·20	·15	·12	·13	·13		·12
18	·05	·06	·02	..			·02	·14	·02	·04	·03		·02
19	·13	·16	·08	·03			·01	·04	·04	·07	·06		·06
20	·49	·55	·45	·37			·22	·46	·23	·37	·20		·33
21	·15	·23	·08	·10			·07	·16	·10	·16	·08		·25
22	·08	·04	·03	..			·06	·06	·03	·06	·03		·04
23	..	·07	·08	..			·03	·05	·05	..	·07		·04
24	..	..	..	..			..	..	..	..	..		..
25	..	..	..	..			..	..	..	..	..		..
26	..	..	..	..			..	..	..	..	..		..
27	..	..	..	..			..	..	..	..	..		..
28	..	·02	..	·06			..	..	..	·04	..		..
29	·08	·06	·08	·08			·06	·09	·04	·05	·06		·07
30	..	..	·01	..			..	..	..	..	..		..
31	..	..	..	..			..	..	..	..	..		..
*	3·70	4·07	3·63	3·14	3·94	2·23	2·92	3·51	2·88	3·16	3·23	3·23	3·07
†	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* January, 1899.

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml. rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·04	·11	·07	·08	·08	·07	·06	·07	·08	·07	·07	·06
2	·07	·06	·06	·07	·09	·09	·08	·08	·08	·07	·07	·08	·07
3	..	..	·01	·01	..	..	·01	..	..	·01	..	..	..
4	..	·01	..	..	..	..	..	..	..	..	..	..	..
5	·01	..	·01	..	..	..	..	..	..	·01	·01	..	..
6	..	..	·01	·01	..	·01	·01	..	·01	·01	..	..	..
7	·03	·03	·04	·03	·03	·02	·03	..	·02	·03	·02	·03	·02
8	..	..	·01	..	..	..	..	..	..	·01	..	..	..
9	..	..	·01	·01	·03	·03	·04	·04	·04	·06	·08	·07	·03
10	·12	·13	·18	·14	·14	·16	·14	·15	·13	·18	·17	·17	·16
11	·27	·27	·36	·24	·26	·27	·24	·15	·22	·25	·27	·22	·22
12	·64	·63	·51	·59	·60	·56	·49	·48	·53	·43	·48	·48	·48
13	·40	·38	·41	·41	·41	·40	·37	·31	·39	·37	·35	·39	·39
14	·03	..	..	..	..	..	·02	..	..	·01	..	·01	..
15	·33	·35	·43	·38	·36	·39	·37	·28	·39	·37	·35	·41	·41
16	..	·10	·19	·12	·14	·14	·15	·15	·13	·14	·23	·18	·13
17	·20	·09	·13	·09	·10	·10	·09	·09	·10	·09	·10	·10	·09
18	·01	..	·02	·01	·01	·01	·01	..	·01	·01	·02	·01	..
19	·05	·04	·06	·04	·05	·06	·06	·04	·06	·05	·07	·06	·04
20	·24	·19	·34	·19	·20	·24	·19	·12	·22	·21	·25	·22	·20
21	·14	·15	·26	·18	·20	·22	·18	·15	·18	·20	·02	·21	·18
22	·03	·02	·02	·04	·05	·03	·04	..	·03	·03	·05	·02	·03
23	·02	·02	·03	·04	·04	·05	·05	·08	·05	·06	·05	·08	·06
24	·03	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	·02	·02	..	·01	·01	..	..	·02	..	·01	..
29	..	·08	·07	·07	·05	·06	·07	·06	·08	·07	·09	·08	·08
30	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	·01	·01	..	..	..	..	..	..	..	..	..
*	2·69	2·59	3·30	2·77	2·84	2·93	2·72	2·24	2·74	2·77	2·75	2·90	2·65
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·08	·09	·10	·11	·09	·11	·09	·10	·09	.11	·06	·08	·08
2	·08	·07	·12	·11	·09	·08	·06	·08	·09	·09	·07	·08	·08
3	..	..	·01	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	·01	..	·02	..	·01	..	..	..	..	..
6	..	..	..	·01	·01	·01	..	·01	..	·03	·04	·02	..
7	·03	·06	·09	·07	·03	·06	·03	·02	·03	·02	..	·05	·04
8	..	..	..	..	·02	..	..	..	..	·01	..	..	..
9	·12	·03	·03	·02	·03	·03	·01	·01	..	..	·06	..	·02
10	·17	·19	·20	·20	·11	·22	·18	·15	·12	·10	·02	·16	·15
11	·22	·25	·29	·29	·37	·26	·26	·28	·32	·35	·21	·17	·19
12	·62	·54	·59	·67	·66	·53	·45	·60	·59	·41	·35	·50	·47
13	·40	·38	·42	·42	·43	·42	·32	·37	·38	·42	·31	·34	·51
14	..	..	..	..	..	·01	..	·01	..	..	..	..	..
15	·37	·36	·41	·42	·46	·37	·35	·39	·39	·38	·42	·42	·46
16	·17	·16	·18	·16	·20	·23	·15	·16	·19	·11	·14	·20	·16
17	·08	·10	·12	·13	·08	·11	·09	·10	·11	·08	·04	·08	·08
18	·01	·01	·02	·03	·01	·02	·01	·01	·01	..	..	..	·09
19	·08	·05	·05	·07	·05	·05	·03	·04	·05	·03	·02	·05	..
20	·27	·27	·34	·37	·34	·30	·20	·21	·34	·21	·12	·14	·22
21	·17	·17	·20	·19	·17	·19	·10	·10	·14	·10	·05	·10	·13
22	·03	·02	·01	·04	·02	·03	·04	·04	·07	·02	·02	·05	·03
23	·06	·06	·11	·08	·07	·08	·05	·07	·01	·12	·04	·06	·08
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·01	·01	..	·02	..	·03	..	·01	..	·03	..	..	·03
29	·07	·08	·10	·08	·10	·08	·09	·08	·08	·08	·09	·10	·08
30	..	..	·01	·01	..	..	·02	·01	·02	·01	..	..	..
31	..	·01	..	..	..	..	..	..	..	..	..	..	..
*	3·04	2·91	3·40	3·51	3·34	3·24	2·53	2·86	3·03	2·71	2·06	2·60	2·90
†	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for January is 1·89 in.* **January, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·06	·08	·07	·07	·13	·06	·04	·07	·02	·06	·06	·07	·50	·12	·05	·07	·09	·06	·08	·05	·03	·06	·07	·06	·06	·06
2	·08	·06	·07	·01	..	·05	·04	·05	·05	·05	·05	·06	·03	·05	·10	·09	·04	·08	·05	·10	·11	·10	·11	·09	·05	·13
3	..	..	·01	..	..	·01	·01	·02	..	·01	·02	·01	·02	·03	·02	·01	·02	·01	·02	·01	·02	·02	·01	..	..	·01
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	·04	..	..	..	..	·01	..	..	..	..	..	·01	..	..	·01	·01	..	..	..	·01	·02	·02	..	..
7	·05	·07	..	·01	·03	·01	..	·02	·02	·03	·03	·02	·02	·03	·03	·01	·02	·02	·02	·02	·03	·02	·04	·01	·06	·02
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
9	..	·02	·03	·08	·01	..	..	·01	..	..	..	..	..	·03	..	..	·01	·02	..	·11	·05	·04	..	..	..	·01
10	·02	·19	·19	·13	·16	·16	·13	·15	·11	·16	·14	·14	·17	·20	·12	·15	·15	·14	·15	·14	·13	·14	·18	·07	·15	·11
11	·15	·22	·20	·20	·22	·22	·27	·29	·24	·33	·32	·28	·35	·27	·30	·27	·20	·22	·19	·21	·21	·18	·17	·16	·10	..
12	·45	·30	·46	·34	·40	·26	·23	·25	·30	·34	·28	·31	·28	·23	·21	·21	·16	·26	·25	·26	·23	·25	·34	·40	·30	·29
13	·46	·39	·47	·36	·35	·40	·38	·38	·31	·42	·35	·42	·42	·41	·42	·44	·37	·46	·46	·47	·45	·46	·49	·42	·45	·44
14	..	..	..	..	..	·05	..	·01	..	·02	..	..	·22	..	..	..	·02	..	..	·02	·06	..	..	..	..	..
15	·45	·39	·48	·36	·40	·37	·37	·37	·20	·34	·36	·37	·21	·39	·39	·43	·30	·40	·35	·36	·36	·49	·44	·39	·41	·44
16	·16	·13	·15	·10	·13	·15	·14	·13	·11	·14	·17	·14	·28	·12	·17	·20	·07	·17	·15	·12	·17	·16	·13	·15	..	·18
17	..	·08	·10	·10	·12	·13	·14	·13	·12	·12	·16	·14	·15	·16	·15	·16	·14	·12	·12	·11	·12	·13	·09	·06	·08	·10
18	..	·02	·01	·11	..	..	..	·02	..	·02	·02	..	·01	·02	·01	·01	·01	..	·01	..	..	·01	·01	..	..	..
19	·08	·05	·07	·03	·04	·07	·07	·04	·04	·04	·03	·04	·07	·03	·05	·08	·05	·05	·06	..	·05	·06	·08	·03	..	·07
20	·20	·18	·22	·09	·17	·13	·15	·17	·09	·19	·18	·20	·21	·25	·18	·17	·15	·17	·14	·19	·13	·15	·17	·12	·15	·14
21	·12	·11	·15	·08	·17	·03	·05	·09	·04	·12	·09	·10	·08	·11	·07	·05	·07	·12	·10	·14	·12	·10	·13	·07	·05	·09
22	·05	·03	·05	..	·05	..	·02	·03	·02	·03	·03	·02	·03	·04	·03	·04	·04	·04	·06	·05	·02	·04	·08	·03	..	·01
23	·07	·05	·08	·09	..	·03	·04	·04	·02	·02	..	·01	·02	·04	·04	·04	·03	·06	·06	·09	·10	·07	·09	·02	·08	·10
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	·02	..	..	·02	·02	·02	·01	·03	·03	·01	..	·03	..	·02	·01	·01	·03	·02	·02	·02	·01	·02	..	·02
29	·09	·09	·09	·08	·10	·13	·11	·10	·06	·08	·10	·08	·15	·15	·14	·13	·12	·11	·11	·10	·13	·12	·10	·10	·15	·11
30	..	..	·01	·01	..	·01	·01	·02	..	·02	..	·01	..	·02	·01	·01	·01	·01	..	·02	·02	·02	·01	..	..	·02
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	2·49	2·46	2·97	2·25	2·48	2·29	2·22	2·42	1·76	2·57	2·42	2·43	3·22	2·74	2·49	2·59	2·09	2·54	2·41	2·59	2·56	2·67	2·77	2·22	2·09	2·35
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

January, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·09	·05	·13	·05	·05
2	·11	·15	·02	·13	·11
3	·01	·01	..	..	·02
4	..	..	..	·01	..
5	·01	..	..	..	..
6	·01	..	..	..	..
7	·02	·02	..	·01	·04
8	..	..	..	..	..
9	·05	·09	·02	..	..
10	·12	·12	·11	·13	·10
11	·17	·16	·14	·23	·26
12	·23	·20	·13	·23	·14
13	·45	·40	·38	·45	·35
14	·05	..	..	..	..
15	·36	·37	·36	·44	·35
16	·13	·11	·08	·21	·08
17	·13	·12	·12	·14	·11
18	..	·01	..	·01	..
19	·07	·06	·05	·10	·04
20	·15	·12	·05	·17	·10
21	·10	·07	·04	·04	·04
22	·03	·03	·02	·01	·02
23	·05	·05	·05	·08	·03
24	..	..	..	..	..
25	..	..	..	..	..
26	..	..	..	..	..
27	..	..	..	..	..
28	·03	·01	..	·01	·02
29	·14	·14	·13	·10	·12
30	·01	·01	..	·02	..
31	..	..	..	..	..
*	2·52	2·30	1·83	2·57	1·98
†	..	..	..	..	..

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(January, 1899.)

The month has been wet and warm, sunny and stormy. It is the sunniest January in the Wallington sunlight record. As instances of the warmth, it may be mentioned that strawberries were in bloom at Coulsdon on the 12th, larks were singing on the 20th at Chislehurst, a pear tree was in bloom on the 21st at Sidcup, and the winter aconite bloomed at Croydon on the 24th. Myrtles were untouched by frost at Chislehurst, where also violets, yellow jasmine, and primroses flowered throughout the month, and geraniums at Sevenoaks. Great gales occurred on the 12th, 19th, 21st, and 22nd, and some amount of damage was done in the district. Slight snow fell on the 2nd in most places, at Croydon there was a thunderstorm on the 9th, at Nutfield lightning was seen on the 16th, a lunar halo was seen at Wallington on the 19th, and a rainbow at Nutfield on the 23rd. A hailstorm occurred at Croydon and Farnborough on the 10th. At Croydon (Whitgift) the maximum in the shade was 50° and above on eleven days, whilst the minimum in the shade was at or below 32° on five days. The mean temperature of the month is about 5° above the average, and was at Croydon (Whitgift) and Wallington 42·5°, at Croydon (Duppas House) 42·2°, at Waddon 42·1°, at Redhill 41·1°, and at Chipstead 40·7°. The rainfall is about ·75 in. in excess of the average, and colds, influenza, and rheumatism have been somewhat prevalent. There were recorded at Wallington 70 hours of sunlight, which is 9 per cent. above the January mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1899.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..
4	·36	·34	·33	·30	·38	·41	·42	·40	·36	·36	·35
5	·02	·03	..	·09	·02	·02	·02	·04	·07	·03	·04
6	·62	·60	·52	·38	·35	·36	·37	·30	·35	·35	·41
7	·23	·30	·22	·12	·13	·13	·18	·19	·20	·17	·16
8	·67	·56	·81	·68	·55	·69	·74	·69	·69	·75	·62
9	·17	·18	·17	·15	·11	·15	·15	·16	·18	·17	·15
10	..	..	..	..	..	..	..	..	..	..	..
11	·13	·16	·17	·11	·09	·13	·16	·17	·13	·15	·11
12	·36	·45	·44	·47	·43	·47	·49	·37	·40	·44	·46
13	·14	·13	·15	·11	·14	·13	·15	·09	·08	·06	·14
14	·04	·06	·04	·03	·03	·04	·02	·02	·04	·05	·05
15	·38	·40	·38	·39	·38	·38	·39	·42	·37	·39	·39
16	·01	·01	..	..	·01	·01	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	·01	·01	..	..	..	..	..
19	·06	·04	·03	..	·01	·01	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..
*	3·19	3·26	3·26	2·83	2·64	2·94	3·09	2·85	2·87	2·92	2·88
†	6·33	6·85	6·63	5·99	5·34	6·05	6·09	5·63	6·12	6·49	6·04

Day of Mo.	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jus.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..			..	..	..	..	..		..
2	..	..	..	..	..	..			..	..	..	..	..		..
3	..	..	..	..	..	..			..	..	..	..	..		..
4	·40	·43	·43	·42	·35	·42			·47	·38	·35	·35	·43		·35
5	..	·03	·23	·06	·02	·02			·02	·01	·05	..	·06		·02
6	·35	·36	·15	·36	·29	·20			·19	·37	·33	·35	·37		·49
7	·18	·23	·16	·14	·16	·17			·15	·11	·16	·22	·24		·22
8	·70	·70	·72	·70	·68	·61			·62	·76	·58	·74	·66		·77
9	·17	·18	·18	·19	·12	·10			·08	·11	·15	·15	·12		·17
10	..	..	..	..	..	..			..	..	..	..	..		..
11	·18	·13	·12	·11	·12	·08			·04	·10	·10	·13	·09		·18
12	·42	·39	·48	·47	·43	·26	MONTHLY GAUGE.	MONTHLY GAUGE.	·29	·37	·25	·34	·25	MONTHLY GAUGE.	·39
13	·06	·03	·09	·13	·05	..			·06	·14	·02	·05	·06		·10
14	·07	·06	·05	·09	·06	·10			·02	·08	·07	..	·04		·03
15	·40	·42	·39	·38	·33	·32			·40	·40	·36	·38	·38		·12
16	..	..	·01	..	..	..			·01	·02	..	..	..		..
17	..	..	..	..	..	..			..	..	..	..	·01		..
18	..	..	..	..	..	..			..	..	..	..	..		..
19	·01	·03	..	..	·01	..			..	..	·02	·03	·05		·04
20	·01	..	..	..	..	..			..	..	..	..	..		..
21	..	..	..	..	..	..			..	..	..	..	..		..
22	..	..	..	..	..	..			..	..	..	..	..		..
23	..	..	..	..	..	..			..	..	..	..	..		..
24	..	..	..	..	..	..			..	..	..	..	..		..
25	..	..	..	..	..	..			..	..	..	..	..		..
26	..	..	..	..	..	..			..	..	..	..	..		..
27	..	..	..	..	..	..			..	..	..	..	..		..
28	..	..	..	..	..	..			..	..	..	..	..		..
*	2·95	2·99	3·01	3·05	2·62	2·28	2·71	1·93	2·35	2·85	2·44	2·74	2·76	3·04	2·88
†	6·77	6·33	6·71	7·12	6·25	5·42	6·65	4·16	5·27	6·36	5·32	5·90	5·99	6·27	5·95

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·37	·37	·45	·29	·35	·35	·40	·34	·40	·37	·34	·34	·37	·36	·39	·31	·38	·43	·38	·39	·45	·36	·43	·35	·36	·46
5	..	..	·01	·04	·03	·03	·02	·03	..	·03	·03	·04	·01	·02	·02	·11	·03	·02	·03	·01	·04	·03	·02	·13	·03	·02
6	·37	·40	·45	·38	·31	·28	·38	·23	·27	·28	·27	·25	·25	·30	·27	·26	·29	·26	·28	·30	·21	·18	·20	·05	·19	·23
7	·18	·17	·20	·17	·17	·20	·18	·21	·18	·21	·19	·20	·19	·19	·19	·24	·19	·17	·08	·09	·14	·23	·18	·15	·15	·18
8	·56	·45	·73	·52	·59	·64	·59	·54	·62	·67	·67	·63	·62	·70	·74	·79	·75	·73	·69	·57	·59	·62	·67	·46	·47	·62
9	·15	·14	·16	·12	·11	·12	·10	·08	·10	·11	·11	·11	·11	·11	·12	·15	·15	·13	·13	·12	·12	·13	·12	·08	·09	·09
10	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..
11	·08	·12	·17	·14	·15	·13	·12	·12	·12	·14	·14	·14	·08	·13	·12	·12	·12	·12	·13	·09	·10	·09	·06	·04	·08	·09
12	·24	·22	·33	·22	·23	·25	·21	·20	·22	·21	·23	·23	·22	·22	·28	·28	·30	·32	·28	·18	·23	·26	·18	·11	·15	·19
13	·04	·04	·11	·12	·09	·08	·06	·05	·06	·05	·06	·06	·07	·04	·04	·06	·05	·05	·07	·08	·17	·17	·09	·05	·04	·02
14	·01	·05	·03	..	·01	·01	·02	·02	·01	·01	·01	·02	·01	·01	·05	·07	·10	·06	·04	·08	·05	·03	·03	..	·03	·02
15	·30	·30	·36	·33	·35	·35	·35	·35	·36	·34	·35	·36	·35	·37	·35	·41	·40	·40	·37	·36	·33	·33	·35	·36	·37	·35
16	..	..	·01	·01	..	..	..	..	·01	·01	·01	·01	..	..	..	..	·01	..	·02	..	..	..	·01	..	..	..
17	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
18	..	..	..	·01	..	..	..	..	..	·01	..	..	..	·01	..	..	·01	..	..	..	..	..	·01	..	..	..
19	·03	·02	·04	·03	·03	·02	·02	..	·02	·03	·02	·02	·01	·02	·03	..	·03	..	·02	·02	·01	..	..	..	·03	·03
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
27	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
*	2·36	2·30	3·05	2·38	2·42	2·46	2·45	2·17	2·37	2·49	2·44	2·41	2·29	2·48	2·62	2·80	2·83	2·69	2·52	2·30	2·46	2·44	2·38	1·78	1·99	2·30
†	5·05	4·89	6·35	5·15	5·26	5·39	5·17	4·41	5·11	5·26	5·19	5·31	4·94	5·52	5·53	6·20	6·34	6·03	5·76	4·83	5·32	5·47	5·09	3·84	4·59	5·20

* The figures in this row give the totals for the month. † The totals from January 1st.

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·43	·36	·37	·39	·40	·40	·42	·38	·36	·40	·39	·37	·43	·35	·37	·45	·37	·36	·39	·36	·35	·34	·43	·37	·65	·38
5	·03	·04	·06	·03	..	·01	..	·04	·02	·02	·02	·02	..	·03	·03	·01	·02	·02	..	·03	·04	·04	·03	·03	..	·03
6	·22	·26	·22	·20	·26	·31	·39	·38	·39	·39	·43	·40	·46	·35	·35	·33	·25	·39	·22	·21	·19	·16	·18	·17	·10	·21
7	·18	·17	·17	·13	·14	·15	·13	·15	·12	·15	·13	·13	·16	·13	·14	·17	·14	·17	·11	·15	·11	·10	·16	·18	·18	·15
8	·59	·63	·58	·40	·51	·25	·31	·36	·25	·32	·29	·35	·36	·29	·30	·31	·32	·38	·36	·43	·32	·33	·52	·40	·37	·42
9	·10	·11	·10	·07	·10	·09	·11	·12	·11	·19	·20	·15	·18	·20	·17	·13	·10	·09	·08	·10	·09	·09	·09	·08	·05	·07
10	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·08	·11	·09	·05	·13	·08	·08	·13	·06	·10	·11	·08	·10	·12	·08	·09	·11	·09	·08	·13	·10	·08	·09	·06	..	·04
12	·18	·21	·22	·12	..	·14	·18	·21	·16	·22	·18	·24	·20	·18	·16	·17	·17	·19	·16	·20	·15	·16	·18	·12	·18	·15
13	·03	·05	·04	·02	·30	..	·02	·05	·01	·07	·15	·04	·18	·21	·04	·01	·03	·08	·10	·07	·10	·11	·03	·13	·09	·02
14	..	·04	·03	·03	..	·26	·18	·17	·19	·19	·05	·30	·07	·03	·16	·20	·10	·01	..	·02	·03	·02	·03	·01	·02	·02
15	·35	·35	·34	·30	·34	·30	·29	·29	·28	·30	·32	·30	·36	·32	·29	·31	·33	·31	·33	·34	·33	·33	·37	·32	·34	·33
16	..	..	·01	..	..	·01	·01	·02	..	..	..	..	..	·01	..	·01	..	..	..	..	..	·01	..	..	..	..
17	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	·01	·02	..	..	..
19	·02	·02	·02	·02	..	·01	·03	·03	·01	·03	·03	·02	·02	·01	·02	·01	·03	·02	..	·03	·01	·01	·02	..	..	·02
20	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	...	..	..	..	..	·01	..	..	..	..
*	2·21	2·35	2·26	1·76	2·18	2·03	2·15	2·35	1·96	2·40	2·30	2·40	2·52	2·23	2·11	2·21	1·97	2·11	1·83	2·12	1·83	1·80	2·17	1·87	1·98	1·84
†	4·70	4·81	5·23	4·01	4·66	4·32	4·37	4·77	3·72	4·97	4·72	4·83	5·74	4·97	4·60	4·80	4·06	4·65	4·24	4·71	4·39	4·47	4·94	4·09	4·07	4·19

* The figures in this row give the totals for the month. † The totals from January 1st.

February, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..
2	..	..	..	..	..
3	..	..	..	..	..
4	·41	·33	·34	·30	·34
5	·01	·03	·03	·07	..
6	·21	·21	·24	·28	·24
7	·13	·11	·11	·14	·10
8	·33	·28	·22	·31	·22
9	·09	·08	·06	·12	·12
10	..	..	..	..	..
11	·08	·07	·03	·10	·06
12	·18	·15	·11	·18	·13
13	·09	·09	·05	·02	·04
14	·05	·06	·09	·22	·11
15	·32	·32	·32	·30	·29
16	..	..	..	..	·01
17	..	..	..	..	..
18	·01	..	..	..	..
19	·02	·01	·01	..	..
20	..	..	..	·01	..
21	..	..	..	..	..
22	..	..	..	..	..
23	..	..	..	..	..
24	..	..	..	..	..
25	..	..	..	..	..
26	..	..	..	..	..
27	..	..	..	..	..
28	..	..	..	..	..
*	1·93	1·74	1·61	2·05	1·66
†	4·45	4·04	3·44	4·62	3·64

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(February, 1899.)

The month may be divided into three portions—from 1st to 3rd fine and frosty, then to the 15th wet and stormy, and then fine and frosty. The 10th was an exceedingly hot day, probably the hottest February day on record, the maximum in the shade being well over 60° throughout the district. In the Wallington record, commencing in 1886, the mean maximum in shade and the total sunlight are the highest February values, and the mean temperature is the highest February value with the exception of February, 1897, and the total rainfall with the exception of February, 1893. The month has been unhealthy, influenza and rheumatism being very prevalent. Notwithstanding the warmth, flowers, both wild and garden, are somewhat backward. The yellow crocus flowered at Croydon on the 10th, and the lesser celandine on the 18th; whilst at Warlingham the ground ivy flowered on the 18th. At Croydon the maximum in shade was 50° and upwards on ten days, and below 40° on seven days; whilst the minimum in shade was 40° and above on six days, and below 30° on ten days. The rainfall is nearly three-quarters of an inch above the average. In the well of the Sutton Waterworks on the 28th, the water was 3 ft. 5 in. higher than on the same day last year. The mean temperature of the month is about 3° above the average, and was at Croydon (Duppas House) 42·5°, at Croydon (Whitgift) 42·4°, at Wallington 42·2°, at Waddon 42·1°, at Chipstead 41·8°, and at Redhill 40·1°. Lunar halos were seen at Wallington on the 17th, at Wallington and Croydon on the 23rd, and at Nutfield on the 25th. There were recorded at Wallington 117·5 hours of sunlight, which is 19 per cent. above the February mean of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	·01	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·03	·04	..	..	..	..	·01	..	..	·03	·02	·01	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·22	·22	·25	·17	·13	·16	·18	·08	·18	·22	·16	·23	·31
9	..	..	..	..	..	..	..	..	..	..	·01	·01	..
10	..	·01	..	·01	·01	·01	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	·01	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	·01	·01	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·02	·02	..	..	..	..	..	..	·01	..	..	..
21	·07	·06	·10	·07	·06	·06	·07	·08	·07	·03	·04	·06	·09
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·01	·01	..	·01	·02	·01	..	·01	·02	..	·02	·01	·02
24	..	..	..	..	..	..	..	·01	..	·04	..	·01	..
25	·24	·30	·28	·26	·27	·31	·34	·24	·25	·29	·36	·34	·27
26	..	·01	..	..	..	..	..	..	..	..	..	..	..
27	..	·01	·03	..	·01	·01	..	..	..	·02	·01	·01	..
28	·02	·02	·03	·04	·04	·04	·04	·05	·05	·04	·04	·04	·05
29	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·08	·06	·08	·07	·07	·07	·07	·08	·07	·09	·05	·09	·07
31	..	..	..	·01	..	..	..	·02	·01	..	..	..	..
*	·67	·76	·79	·64	·63	·68	·71	·57	·65	·77	·71	·82	·81
†	7·00	7·61	7·42	6·63	5·97	6·73	6·80	6·20	6·77	7·26	6·75	7·59	7·14

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..			..	..	..	..	..		..
2	..	..	..	..			..	..	..	..	..		..
3	..	..	..	..			..	..	..	..	..		..
4	·05	·16	·01	..			·05	·07	·12	·07	·04		..
5	..	..	..	..			..	..	..	..	..		..
6	..	..	..	..			..	..	..	..	..		..
7	..	..	..	..			..	..	..	..	..		..
8	·20	·23	·25	·19			·23	·22	·24	·30	·30		·18
9	..	..	·02	..			·03	·01	..	·01	..		·01
10	..	..	..	..			..	..	..	..	..		..
11	..	..	..	..			..	..	..	..	..		..
12	..	..	..	..			..	..	..	..	..		..
13	..	..	..	..			..	..	..	..	..		..
14	..	..	..	..			..	..	..	..	..		..
15	..	..	..	..			..	..	..	..	..		..
16	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	..	MONTHLY GAUGE.	..
17	..	..	..	..			..	..	..	..	..		..
18	..	..	..	..			..	..	..	..	..		..
19	..	..	..	..			..	..	..	..	..		..
20	..	..	·02	..			·06	·01	..	..	..		·03
21	..	·08	·04	..			·04	·08	·03	·12	·13		·12
22	..	..	..	..			..	..	..	..	..		..
23	..	..	..	..			..	·02	..	·02	..		·01
24	..	..	..	..			·02	..	..	..	..		..
25	·41	·39	·42	·50			·40	·34	·30	·32	·35		·21
26	..	..	..	..			..	..	..	·01	..		..
27	·01	..	..	..			·01	..	..	..	..		·01
28	..	·07	..	..			·02	·07	·03	·03	·02		·03
29	·03	..	..	·06			..	..	..	·01	·03		..
30	·07	·08	·07	·04			·05	·06	·04	·06	·05		·06
31	..	..	..	..			..	..	..	..	·03		..
*	·77	1·01	·83	·79	·86	·48	·91	·88	·76	·95	·95	·76	·66
†	7·48	8·13	7·08	6·21	7·51	4·64	6·18	7·24	6·08	6·85	6·94	7·03	6·61

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* March, 1899.

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..
2	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
3	..	..	..	·01	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	·01	..	..	..	..	..	..	..
4	..	..	·01	·06	·01	·03	·03	..	·02	·02	·02	·02	·02	·02	·02	·04	·01	..	..	..	·02	..	·06	..	·02	..
5	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·15	·10	·24	·16	·18	·22	·22	·30	·22	·24	·23	·23	·19	·23	·32	·23	·23	·26	·22	·14	·17	·25	·22	·20	·13	·25
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
11	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
13	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
15	..	..	..	·01	..	..	..	..	..	..	·01	..	..	..	..	..	·01	..	·02	..	..	..	..	..	..	..
16	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	·02	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	..	·01	..	..	..	..	..	..	..	..	..
18	·03	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·01	·01	·01	..	..	..	..	..	..	..	..	..	..	·01	..	..	·04	..	·02	·02	..	·07	·01	·02	..
21	·04	·05	·13	·12	·09	·09	·09	·12	·13	·10	·11	·16	·13	·12	·13	..	·13	·08	·08	·10	·09	·09	·07	·03	·13	·17
22	·06	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	·02	·01	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
24	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
25	·17	·13	·27	·19	·20	·25	·22	·20	·22	·22	·21	·20	·18	·23	·23	·40	·29	·32	·30	·20	·29	·25	·25	·20	·22	·24
26	..	..	·01	..	..	..	..	..	..	·01	..	·01	..	..	·01	..	..	..	..	..	·01	..	·01	·02	..	..
27	..	·01	·01	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	·01	..	..	..
28	·03	..	·02	·02	·01	·02	·02	·02	·02	·02	·02	·02	·02	·02	·02	·03	·02	·02	..	·01	·02	·02	·01	..	·02	·03
29	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·10	·10	·09	·08	·08	·08	·08	·06	·08	·09	·09	·10	·10	·09	·09	·08	·07	·07	·11	·14	·07	·06	·07	·10	·08	·09
31	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·02	..	..	..	..	·01	..	..	..	..	·01
*	·59	·46	·83	·67	·57	·69	·66	·70	·69	·76	·70	·75	·64	·74	·88	·80	·80	·79	·76	·61	·71	·67	·79	·56	·62	·79
†	5·64	5·33	7·18	5·82	5·83	6·08	5·83	5·11	5·80	6·02	5·89	6·06	5·58	6·26	6·41	7·00	7·14	6·82	6·52	5·44	6·03	6·14	5·88	4·40	5·21	5·99

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·03	·04	..	..	..	..	·07	·08	..	·02	·02	..	..	·04	..	..	·01	·01	..	..	..	..	·04	·03	..	·02
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·18	·16	·27	·13	·15	·04	·07	·09	·05	·09	·08	·11	·10	·09	·05	·05	·05	·06	·08	·14	·08	·08	·14	·15	..	·14
9	..	..	..	..	..	·01	·01	·02	..	..	·03	..	..	·01	..	..	·01	·01	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	·01	·01	..	·01	..	..	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..
11	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..
12	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	·02	·02	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·02	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	·01	·01	..	..	·02	..	·01	·01	..	·02	..	..	..	..	..	·01	..	..	..	..
18	..	..	..	..	..	·01	..	·02	..	..	..	..	..	..	..	..	·02	·01	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·07	..	..	..	·01	..	·02	..	·02	..	·03	..	..	·01	..	..	..	..	..	..	..	·03	·04	..	..
21	·16	·29	·12	·03	·13	·02	..	·06	..	·03	·03	·04	·02	·02	·02	·03	·04	·06	·07	·11	·07	·02	·08	·06	·25	·04
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·24	·22	·22	·09	·16	·12	·20	·16	·14	·14	·15	·17	·15	·19	·17	·20	·16	·19	·18	·19	·18	·22	·24	·23	·21	·23
26	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	·01	..	·01	·01	..	..	..	..	..	..	..	..
27	..	..	·01	..	..	·04	·07	·06	·02	·01	·07	·01	·03	·04	·03	·04	·06	·05	·03	·02	·07	·08	·01	..	..	·03
28	·02	·02	·03	·02	·02	·01	·01	·03	..	·03	·02	..	..	·04	·02	·03	·02	..	..	..	·02	·03	·01	·01	..	·02
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·08	·09	·10	·08	·10	·02	·10	·10	·09	·08	·11	·08	·11	·13	·10	·11	·10	·10	·10	·12	·12	·08	·11	·07	·11	·09
31	·01	·02	..	..	..	..	..	·01	..	..	·01	..	..	..	..	·01	·01	..	..	..	·01	·01	·01	·02	·02	·01
*	·72	·91	·75	·36	·56	·32	·61	·71	·30	·43	·54	·44	·42	·59	·41	·49	·49	·51	·46	·59	·55	·55	·70	·61	·59	·58
†	5·42	5·72	5·98	4·37	5·22	4·64	4·98	5·48	4·02	5·40	5·26	5·27	6·16	5·56	5·01	5·29	4·55	5·16	4·70	5·30	4·94	5·02	5·64	4·70	4·66	4·77

* The figures in this row give the totals for the month. † The totals from January 1st.

March, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..
2	..	..	..	..	..
3	..	..	..	..	..
4	·04	·01	..	..	..
5	..	..	..	..	..
6	..	..	..	..	..
7	..	..	..	..	..
8	·07	·08	·04	·05	·03
9	·01	..	..	..	..
10	..	..	..	..	..
11	..	..	..	..	..
12	..	..	..	..	..
13	..	..	..	..	..
14	..	..	..	..	..
15	..	..	..	..	..
16	..	..	..	..	..
17	..	..	..	..	..
18	..	..	..	..	..
19	..	..	..	..	..
20	..	..	..	..	..
21	·04	·02	..	·03	..
22	..	..	..	..	..
23	·01	..	..	..	..
24	·01	..	..	..	..
25	·24	·19	·11	·20	·15
26	..	..	..	..	..
27	·03	·02	·05	·05	·04
28	·02	·02	·01	..	·04
29	..	..	..	..	..
30	·13	·10	·10	·08	·06
31	·01	·01	..	·02	..
*	·61	·45	·31	·43	·32
†	5·06	4·49	3·75	5·05	3·96

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(March, 1899.)

The month has been remarkably dry, sunny, and somewhat cold. It is the driest March since 1893 at most places in the district, though in some, as, for instance, at Redhill, where the record commences in 1867, it is the driest March in the period. The week ending the 25th was extremely cold, and snow showers were prevalent in some parts of the district on most of the days, the snow on the 21st being about one and a half inches deep. Radiation throughout the month has been great, the days being hot, and the nights cold, with the result that vegetation is generally somewhat backward. The month has been very unhealthy, influenza being extremely prevalent; whilst at Wallington there have been several cases of scarlet fever and one of diphtheria. Solar halos were seen at Croydon on the 6th and 26th, and a lunar one there on the 26th; whilst a lunar one was seen at Nutfield on the 1st, and thunder heard there on the 21st. The almond bloomed at Wallington on the 2nd, and at Sidcup on the 4th; the white and purple crocus at Wallington on the 12th, and the plum at Sidcup on the 29th. At Croydon the maximum thermometer was 50° and above on twelve days, and below 40° on seven days; whilst the minimum was 40° and above on four days, 20° and under 30° on fifteen days, and under 20° on three days. The mean temperature is about one degree below the average, and was at Chipstead 41·4°, at Croydon (Whitgift) 41°, at Wallington 40·7°, at Croydon (Duppas House) 40·5°, at Waddon 39·8°, and at Redhill 39·4°. There were recorded at Wallington 140·9 hours of sunlight, which is 6 per cent. above the March mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1899.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	·02	·01	·02	·02	·01	·02	·02	·01	·01	·01	..	·01	..	·01	..			·01	·02	..	·02	·04		·01
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
3	..	..	..	..	·01	·01	..	..	·01	..	..	..	·01	..	·02	..	..			..	..	..	..	..		..
4	·08	·08	·10	·07	·07	·07	·05	·07	·08	·09	·08	·09	·10	·10	·11	·07	..			·04	..	·04	·08	·06		·06
5	..	..	·02	..	·01	·01	..	..	..	·01	..	·02	·01	·01	·03	·03	·06			·03	·06	..	·02	·03		·01
6	·22	·20	·15	·15	·12	·16	·15	·15	·13	·20	·15	·20	·17	·20	·22	·13	·17			·16	·04	·12	·16	·10		·15
7	·12	·22	·31	·28	·33	·33	·16	·28	·29	·26	·20	·23	·21	·20	·04	·21	·04			·21	·21	·13	·12	..		·21
8	·05	·05	·05	·02	·04	·04	·05	·05	·03	·05	..	·01	·01	·04	·08	·04	·20			·05	·06	·04	·04	·06		·08
9	·18	·19	·20	·26	·31	·31	·16	·25	·27	·26	·27	·26	·20	·24	·27	·24	·35			·24	·20	·20	·21	·14		·15
10	·06	·07	·07	·11	·07	·07	·04	·14	·11	·10	·06	·09	·09	·07	·17	·12	·08			·11	·11	·11	·11	·11		·09
11	·03	·03	·03	..	..	..	·01	..	..	..	..	·01	..	·02	·07	·01	..			·02	·03	·02	·02	·04		..
12	·27	·23	·28	·14	·19	·22	·20	·22	·16	·22	·16	·22	·23	·04	·16	·18	..			·15	·26	·19	·21	·18		·29
13	·30	·22	·22	·43	·40	·42	·23	·37	·37	·41	·49	·47	·48	·35	·44	·68	·62			·46	·51	·52	·47	·40		·25
14	·16	·14	·10	·16	·14	·17	·11	·14	·15	·13	·13	·12	·12	·10	·13	·17	·24			·19	·03	·10	·09	·08		·10
15	..	..	..	·03	..	..	..	..	..	·01	..	..	·01	..	·06	·04	..	MONTHLY GAUGE.	MONTHLY GAUGE.	·03	..	..	·01	·03	MONTHLY GAUGE.	..
16	·07	·03	·04	..	·04	·04	..	·02	·14	·24	·21	·20	·15	·20	·28	·16	..			·16	·16	·22	·21	·10		·03
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..			..	..	..	..	..		..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03			..	..	..	..	..		..
20	·29	·31	·25	·14	·20	·21	·24	·22	·10	·21	·20	·17	·18	·38	·17	·15	·06			·24	·32	·19	·20	·20		·21
21	·40	·40	·29	·42	·35	·35	·37	·35	·35	·30	·40	·35	·33	·22	·43	·33	·20			·27	·26	·38	·36	·41		·37
22	..	..	..	..	..	..	·01	·01	..	..	..	..	..	·03	..	..	·07			..	..	..	·01	..		..
23	..	·01	..	..	..	..	..	..	·01	·01	·01	..	·01	..	·02	·01	..			..	·07	·02	·02	·02		..
24	·42	·45	·40	·40	·45	·44	·44	·46	·36	·49	·44	·46	·47	·44	·45	·45	·10			·38	·43	·40	·38	·35		·48
25	·14	·14	·17	·19	·14	·14	·13	·15	·20	·17	·18	·16	·16	·16	·25	·17	·09			·20	..	·15	·16	·14		·12
26	·01	·01	..	..	..	..	·01	·05	..	..	·01	·04	..	..	·02	..	..			·01	..	·02	·01	·03		..
27	·03	·04	·03	·03	·03	·03	..	..	·04	·04	·03	..	·03	·02	·04	·03	..			·01	..	·01	·01	..		..
28	·03	·03	·03	·03	·03	·03	·01	..	·01	·02	·02	·02	·03	·02	·03	·02	..			·02	..	·02	·03	..		..
29	·07	·08	·06	·04	·05	·05	·10	·06	·04	·08	·08	·10	·16	·12	·11	·09	·11			·08	·14	·13	·05	..		·21
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
*	2·94	2·92	2·82	2·91	3·00	3·12	2·48	3·01	2·87	3·31	3·13	3·23	3·16	2·97	3·60	3·35	2·42	3·12	2·20	3·07	2·91	3·01	3·00	2·52	2·89	2·82
†	9·94	10·53	10·24	9·54	8·97	9·85	9·28	9·21	9 64	10·57	9·88	10·82	10·30	10·45	11·73	10·43	8·63	10·63	6·84	9·25	10·15	9·09	9·85	9·46	9·92	9·43

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* April, 1899.

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·02	·01	·02	·03	·02	·02	·01	·01	·02	·02	·02	·02	·01	·03	·05	·01	·01	·02	·02	·01	·01	·01	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	·01	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	·01	..	·01	..	·01	..	..	..	..	·02	..	·01	·01	..	..	..	..
4	·07	·05	·09	·08	·07	·06	·07	·06	·07	·07	·06	·07	·07	·06	·06	·06	·06	·05	..	·03	·03	..	·01	·03	·05	·06
5	·01	..	·01	..	·01	·01	·01	·01	·01	·01	·01	·01	..	·01	·01	·01	·02	..	·05	·01	·01	..	·01	..	·02	·01
6	·10	·07	·13	·08	·07	·08	·09	·06	·09	·09	·09	·09	·08	·11	·12	·14	·17	·15	·17	·14	·13	·13	·08	·09	·07	·07
7	·09	·20	·17	·10	·09	·12	·12	·12	·16	·14	·20	·20	·17	·18	·18	·19	·22	·18	·08	·11	·11	·10	·16	·10	·13	·12
8	·03	·04	·02	·02	·05	·04	·04	·03	·05	·05	·06	·07	·04	·05	·04	·02	·04	·01	·05	·02	·02	·08	·08	·02	·08	·08
9	·17	·16	·21	·09	·21	·23	·23	·21	·22	·23	·23	·24	·23	·23	·21	·23	·22	·25	·23	·18	·22	·22	·22	·21	·24	·27
10	·08	·06	·07	·01	·12	·12	·12	·14	·13	·14	·15	·15	·14	·15	·12	·15	·14	·15	·14	·14	·12	·10	·12	·24	·10	·08
11	·02	..	..	·02	·02	·03	·03	·03	·03	·03	·03	·03	·02	·03	·03	·03	·02	·01	·02	..	·01	..	·02	..	·01	..
12	·18	·15	·27	·20	·18	·16	·14	·06	·13	·16	·15	·10	·13	·17	·14	·11	·18	·13	·16	·10	·13	·11	·10	·03	·07	·06
13	·30	·27	·43	·35	·36	·36	·34	·29	·40	·37	·38	·39	·35	·38	·45	·52	·52	·68	·57	·63	·65	·62	·64	·60	·52	·63
14	·07	·03	·08	·05	·04	·04	·04	·03	·03	·04	·04	·06	·03	·04	·06	·12	·09	·07	·07	·10	·10	·13	·11	·07	·09	·11
15	..	·02	·01	·02	·01	..	..	..	..	·01	..	·01	·01	..	·02	·03	·01	·01	·03	·01	·01	·01	·03	·01	·01	..
16	·03	..	·03	·05	·07	·06	·03	·04	·03	·03	·04	·04	·03	·03	·03	·06	·08	·05	·10	·07	·09	·13	·12	·10	·17	·15
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	·01	..	·01	..	·01	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·22	·23	·21	·20	·18	·20	·20	·14	·18	·18	·20	·20	·18	·16	·17	·10	·17	·16	·17	·18	·15	·22	·13	·18	·18	·15
21	·37	·40	·41	·29	·30	·29	·28	·19	·27	·29	·25	·28	·28	·31	·32	·39	·36	·33	·30	·35	·34	·24	·30	·19	·27	·29
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·01	·01	·01	·02	..	·01	·01	·01	·01	·01	·02	·02	·02	·01	·01	·03	·02	..	·02	·01	·01	·01	·02	·01	·02	·02
24	·45	·45	·39	·39	·37	·37	·36	·30	·38	·35	·39	·39	·42	·35	·29	·24	·31	·30	·27	·22	·24	·21	·25	·32	·34	·45
25	·12	·15	·13	·15	·15	·16	·15	·14	·18	·17	·18	·23	·15	·18	·14	·23	·19	·21	·20	·22	·22	·24	·30	·36	·21	·20
26	..	..	..	·02	..	·01	·01	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
27	..	..	·01	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	·01	..	·02	·02
28	..	..	·01	·01	..	..	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	..	..	..	..
29	·05	·04	·06	·02	..	·01	·01	..	·02	·01	·03	·03	·03	·02	·02	·03	·02	·01	·02	·01	·01	·02	·04	·10	·06	·08
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	2·39	2·35	2·76	2·19	2·33	2·38	2·31	1·87	2·40	2·43	2·53	2·66	2·40	2·50	2·46	2·75	2·87	2·76	2·70	2·55	2·65	2·60	2·77	2·66	2·66	2·85
†	8·03	7·70	9·94	8·01	8·16	8·46	8·14	6·98	8·20	8·45	8·42	8·72	7·98	8·76	8·87	9·75	10·01	9·58	9·22	7·99	8·68	8·74	8·65	7·06	7·87	8·84

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·01	..	..	..	·02	·02	·02	·01	·01	..	..	..	·03	·01	·02	·01	·02	·02	·01	·02	·01	..	·02	..	..
2	..	..	..	..	..	..	·01	·01	·01	·01	..	·02	..	..	·02	..	·01	·01	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·06	·05	·06	·07	..	·06	·06	·07	·04	·04	·05	·05	·05	·07	·05	·06	·07	·08	·07	·06	·07	·07	·05	..	..	·04
5	..	·02	·02	·02	..	..	..	·01	..	..	..	..	..	·02	·01	·01	·02	·02	·01	·02	·02	·02	·02	·02	..	·02
6	·10	·08	·09	·02	·07	·07	·09	·10	·07	·08	·10	·10	·10	·10	·10	·10	·08	·09	·09	·10	·08	·08	·09	·05	·08	·08
7	·13	·10	·12	·14	·15	·10	·11	·11	·08	·09	·07	·11	·11	·14	·14	·08	·07	·13	·12	·11	·12	·12	·14	·11	·15	·18
8	·05	·03	·03	..	·03	·05	·04	·06	·02	·03	·03	·08	·02	·06	·07	·03	·01	·02	·03	·04	·16	·06	·11	·02	..	·12
9	·26	·22	·27	·27	..	·25	·27	·26	·17	·16	·16	·17	·13	·29	·29	·30	·25	·28	·26	·28	·22	·30	·24	·21	·26	·26
10	·07	·09	·09	·12	·15	·15	·14	·14	·02	·05	·09	·11	·17	·19	·14	·12	·09	·10	·10	·09	·12	·14	·16	·25	·31	·19
11	..	·02	·01	·02	..	·02	·01	·03	..	..	..	..	..	·02	·02	·01	·01	·02	·01	·01	..	·01	·02	·03	·02	·02
12	·04	·08	·09	·08	·19	·20	·08	·09	·06	·10	·07	·11	·09	·06	·05	·07	·09	·08	·03	·08	·08	·05	·12	·05	·34	·04
13	·71	·76	·54	·44	·30	·31	·28	·29	·25	·24	·30	·29	·29	·28	·24	·36	·33	·35	·36	·41	·35	·33	·46	·58	·75	·48
14	·09	·14	·08	·06	..	·07	..	·08	·06	·08	·11	·07	·09	·13	·15	·17	·10	·11	·12	·12	·15	·16	·13	·13	·15	·17
15	·01	·02	·01	·01	·04	·03	·10	·03	·03	·06	·03	·10	·03	·01	·03	·03	·03	·03	·02	·01	·02	·02	·02	..	..	..
16	·11	·09	·07	·02	..	·05	·04	·04	·03	·01	·04	·02	·04	·12	·04	·04	·03	·04	·03	·05	·05	·03	·09	·10	·08	·05
17	..	..	..	..	·03	·03	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·17	·16	·17	·13	·18	·16	·15	·17	·17	·18	·20	·18	·25	·20	·19	·13	·19	·17	·15	·14	·11	·15	·16	·14	..	·14
21	·27	·30	·30	·28	·28	·24	·27	·28	·21	·30	·24	·28	·24	·27	·23	·30	·27	·34	·32	·29	·32	·27	·26	·19	·37	·26
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·02	·03	·02	·01	..	·02	·02	·03	·01	·02	·02	·02	·03	·03	·03	·04	·03	·02	·01	·03	·04	·03	·03	·01	·14	·02
24	·44	·28	·49	·40	·46	·38	·43	·51	·43	·40	·33	·47	·45	·35	·35	·39	·47	·55	·56	·58	·52	·50	·50	·35	·51	·46
25	·17	·20	·18	·16	·12	·12	·14	·13	·10	·14	·13	·13	·13	·19	·16	·18	·15	·13	·12	·14	·16	·17	·24	·27	·25	·24
26	..	..	·01	..	..	..	·01	·02	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
27	·01	..	..	·01	·01	..	·01	·02	·01	·01	·02	·01	·01	·04	·03	·02	·03	·02	·01	·02	..	·03	·02	·03	..	·02
28	..	·02	·01	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·06	·04	·09	·02	·04	·10	·09	·10	·10	·12	·12	·12	·10	·08	·03	..	·14	·09	·11	·14	·13	·12	·10	·05	·14	·11
30	..	..	..	..	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	2·77	2·74	2·75	2·28	2·05	2·49	2·37	2·60	1·88	2·13	2·11	2·44	2·35	2·68	2·39	2·46	2·49	2·70	2·55	2·74	2·74	2·67	2·96	2·61	3·55	2·90
†	8·19	8·46	8·73	6·65	7·27	7·13	7·35	8·08	5·90	7·53	7·37	7·71	8·51	8·24	7·40	7·75	7·04	7·86	7·25	8·04	7·68	7·69	8·60	7·31	8·21	7·67

* The figures in this row give the totals for the month. † The totals from January 1st.

April, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·01	·01	·01	..	·04
2	·01	..	..	..	..
3	..	..	..	..	..
4	·06	·03	·03	·07	·03
5	·02	·01	..	·01	·04
6	·10	·07	·07	·10	·08
7	·18	·16	·11	·11	·08
8	·13	·22	·06	·02	·06
9	·31	·27	·22	·27	·20
10	·22	·19	·19	·20	·23
11	·01	..	..	..	..
12	·03	·02	·06	·03	·04
13	·47	·40	·29	·38	·27
14	·21	·22	·18	·18	·13
15	·01	..	..	·02	·02
16	·05	·03	·03	·03	·01
17	..	..	..	..	..
18	..	..	..	..	..
19	..	..	..	..	..
20	·17	·13	·14	·08	·14
21	·21	·20	·27	·36	·16
22	..	..	..	..	..
23	·05	·03	·02	·03	·03
24	·45	·38	·41	·30	·27
25	·24	·20	·14	·20	·15
26	..	..	..	..	..
27	·02	..	·01	·03	..
28	..	..	..	..	..
29	·04	·03	·04	·05	·06
30	..	..	..	..	..
*	3·00	2·60	2·28	2·47	2·07
†	8·06	7·09	6·03	7·52	6·03

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(April, 1899.)

The month has been cool and very wet. It is certainly the wettest April in most places since 1882, and in some since 1877, an exceptionally wet April. The nights as a rule have been warm—in fact, so far as the Wallington record is concerned, they are the warmest with the exception of April, 1894,—whilst the days have been cold. The result is that vegetation, though looking well, is very backward, and there has been much sickness about, though not so much as in the previous month. Snow, with hail and thunder, occurred in most places in the district on the 8th, and on the 27th lightning was seen at Sevenoaks in the south-west. At Sidcup the cherry flowered on the 9th, the pear on the 15th, and the apple on the 30th. At Nutfield the wryneck was heard on the 5th, the cuckoo there and also at Abinger on the 15th, and at Croydon on the 16th; the nightingale was heard at Abinger on the 20th; whilst the swallow was seen at Nutfield on the 20th, at Beddington on the 22nd, and at Abinger on the 23rd. At Croydon the maximum in the shade was 60° and above on four days, between 50° and 59° on fifteen days, and between 40° and 49° on eleven days; whilst the minimum in the shade was between 40° and 45° on thirteen days, between 30° and 39° on thirteen days, and below 30° on four days. Solar halos were seen at Croydon on the 5th and 23rd, and at Wallington on the 12th, 20th, and 23rd. The mean temperature of the month was about $\frac{3}{4}$° above the average, and was at Croydon (Duppas House) 48·1°, at Wallington 47·8°, at Croydon (Whitgift) 47·6°, at Waddon 47·2°, at Chipstead 47·1°, and at Redhill 46·5°. There were recorded at Wallington 137·1 hours of sunlight, which is 8 per cent. below the April mean of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..
8	·02	·02	·02	·01	·02	·02	·01	·02	·01	·01	·02	·02
9	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	·01	·01	..	..	..	..	..	..	..	..	..	..
14	·40	·43	·46	·35	·39	·38	·36	·38	·35	·39	·38	·39
15	·24	·13	·22	·23	·22	·22	·20	·20	·19	·16	·20	·21
16	·13	·20	·25	·06	·09	·09	·09	·14	·11	·18	·08	·16
17	..	..	..	..	..	..	..	..	·01	..	..	..
18	·01	..	..	..	..	..	·01	..	..	..	..	..
19	·19	·10	·19	·16	·16	·17	·16	·15	·14	·16	·15	·14
20	·02	·07	·05	·05	·03	·02	..	·04	·07	·06	·08	·08
21	·15	·02	·20	·22	·23	·24	·24	·26	·26	·15	·21	·24
22	·01	..	·08	·01	·01	·01	..	·02	·02	·05	·03	·02
23	..	·04	·04	..	..	..	·01	·02	·01	·03	..	·01
24	·13	·12	·17	·14	·25	·24	·16	·20	·14	·19	·23	·17
25	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..
*	1·31	1·14	1·68	1·23	1·40	1·39	1·24	1·43	1·31	1·38	1·38	1·44
†	11·25	11·67	11·92	10·77	10·37	11·24	10·52	10·64	10·95	11·95	11·26	12·26

Day of Mo.	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..			..	..	..	..	..		..
2	..	..	..	..	..			..	..	..	..	..		..
3	..	..	..	..	..			..	..	..	..	..		..
4	..	..	..	..	..			..	..	..	..	..		..
5	..	..	..	..	..			..	..	..	..	..		..
6	..	..	..	..	..			..	..	..	..	..		..
7	..	..	..	..	..			..	..	..	..	..		..
8	·01	..	·04	·02	..			·05	..	·02	..	..		·12
9	..	..	..	..	..			..	..	..	..	..		..
10	..	..	..	..	..			..	..	..	..	..		..
11	..	..	..	..	..			..	..	..	..	..		..
12	..	..	..	..	..			..	..	..	..	..		..
13	·01	..	..	..	..			..	·04	·01	·03	·03		·03
14	·48	·45	·43	·34	·34			·43	·36	·40	·40	·39		·41
15	·24	·28	·26	·19	·14			·11	·27	·18	·20	·18		·12
16	·31	·08	·14	·13	·13	MONTHLY GAUGE.	MONTHLY GAUGE.	·05	·22	·33	·49	·46	MONTHLY GAUGE.	·31
17	..	..	..	..	..			..	..	..	..	·02		..
18	..	..	..	..	..			..	..	..	..	..		..
19	·18	·15	·16	·21	·14			·12	·18	·12	·13	·10		·15
20	·09	·11	·10	·07	·24			·03	·06	·05	·05	·06		·14
21	·19	·20	·22	·20	..			·18	·24	·16	·16	·10		·25
22	·02	..	·03	·03	..			·04	·01	·03	·04	·03		·04
23	·06	·04	..	..	..			·05	..	·04	·06	·06		·01
24	·20	·21	·26	..	..			·10	·37	·24	·29	·28		·15
25	..	..	..	..	..			..	..	..	..	..		..
26	..	..	..	..	..			..	..	..	..	..		..
27	..	..	..	..	..			..	..	..	..	..		..
28	..	..	..	..	..			..	..	..	..	..		..
29	..	..	..	..	..			..	..	..	..	..		..
30	..	..	..	..	..			..	..	..	..	..		..
31	..	..	..	..	..			..	..	..	..	..		..
*	1·79	1·52	1·64	1·19	·99	1·45	1·18	1·16	1·75	1·58	1·85	1·71	1·62	1·73
†	12·09	11·97	13·37	11·62	9·62	12·08	8·02	10·41	11·90	10·67	11·70	11·17	11·54	11·16

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	·01	·01	·02	..	..	..	..	..	·01	·01	·01	..	·01	·01	·03	·02	·01	·02	·02	·01	·01	·03	..	·01	·02
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	·03	·02	·06	·04	·04	·04	·02	·03	·02	·02	·01	·01	·02	·01	·04	·05	·05	..	·01	..	..	·01	..	..
14	·47	·42	·40	·39	·38	·38	·39	·38	·40	·38	·39	·37	·39	·38	·37	·35	·36	·40	·34	·35	·35	·35	·40	·38	·35	·36
15	·15	·12	·18	·11	·12	·11	·12	·10	·13	·14	·15	·12	·07	·19	·25	·36	·19	·25	·24	·22	·18	·18	·10	·09	·21	·12
16	·32	·28	·32	·26	·29	·32	·33	·22	·32	·32	·32	·27	·23	·32	·35	·38	·43	·37	·31	·35	·34	·30	·29	·28	·23	·29
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·15	·15	·11	·09	·08	·08	·08	·05	·08	·10	·08	·09	·07	·08	·10	·11	·13	·05	·11	·09	·08	·10	·11	..	·07	·07
20	·02	·02	·06	·03	·03	·03	·03	·04	·04	·03	·05	·05	·04	·04	·02	·05	·05	·08	..	·04	·04	·05	·04	..	·05	..
21	·23	·22	·18	·16	·18	·16	·15	·10	·15	·15	·12	·14	·11	·14	·14	·15	·16	·15	·11	·15	·16	·13	·08	·10	·09	·14
22	·02	·02	·03	·04	·04	·03	·03	·03	·03	·03	·09	·04	·03	·04	·03	·05	·03	·03	·04	·02	·03	·02	·02	..	·03	·03
23	·20	·17	·02	·20	·23	·25	·26	·22	·33	·32	·28	·26	·21	·26	·09	·13	·13	·07	·11	·02	·01	..	·01	·18	·27	·20
24	·13	·12	·20	·20	·30	·29	·22	·30	·22	·19	·22	·26	·20	·20	·28	·39	·31	·45	·39	·25	·26	·32	·14	·12	·35	·36
25	..	..	..	·01	..	..	..	..	..	·02	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·69	1·53	1·54	1·53	1·71	1·69	1·65	1·48	1·72	1·72	1·73	1·65	1·36	1·67	1·68	2·02	1·86	1·91	1·72	1·51	1·47	1·46	1·22	1·16	1·66	1·59
†	9·72	9·23	11·48	9·54	9·87	10·15	9·79	8·46	9·92	10·17	10·15	10·37	9·34	10·43	10·55	11·77	11·87	11·49	10·94	9·50	10·15	10·20	9·87	8·22	9·53	10·43

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
2	..	..	..	..	..	..	·01	..	..	..	..	..	..	·03	..	..	..	..	..		..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
8	..	·02	·01	..	..	..	·01	·02	..	·01	..	·01	·01	·01	·01	..	·01	..	..		..	·01	·02	..	..	·01
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
10	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	·01	..	..	..	..
13	..	..	..	..	..	·01	·01	·01	·01	·01	·01	·01	·02	·02	·01	..	..	..	..		..	..	..	..	..	..
14	·35	·34	·46	·35	·36	·33	·40	·40	·35	·41	·39	·44	·49	·45	·39	·38	·36	·38	·36		·38	·38	·37	·37	·40	·37
15	·15	·20	·20	·08	·05	·11	·13	·10	·11	·10	·09	·17	·10	·04	·11	·10	·07	·11	·08	OBSERVER DEAD. RECORD CEASED.	·06	·07	·13	·17	·15	·10
16	·29	·27	·25	·21	·24	·24	·26	·31	·21	·21	·30	·25	·30	·38	·27	·23	·26	·40	·34		·34	·38	·23	·22	·34	·33
17	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..		·02	..	·01	..	..	..
19	·07	·09	·06	·05	·08	·09	·10	·11	·08	·15	·14	·15	·16	·11	·10	·08	·09	·09	·07		·09	·08	·07	·04	..	·04
20	·06	·05	·08	·07	·11	·11	·13	·16	·19	·12	·12	·21	·15	·10	·11	·17	·12	·19	·17		·19	·16	·16	·09	..	·15
21	·09	·11	·10	·10	·10	·05	·09	·09	·10	·14	·10	·09	·09	·10	·06	·07	·06	·06	·06		·03	·06	·09	·05	·19	·07
22	·03	·03	·03	·03	·03	..	·04	·04	·02	·04	·04	·03	·03	·03	·02	·02	·03	·03	·03		·04	·03	·02	·01	..	·02
23	·20	·24	·24	·21	·11	..	..	·01	·02	·05	·04	·03	·04	·03	·01	·01	·02	·09	·04		·06	·05	·15	·23	·09	·07
24	·33	·33	·43	·20	·22	·20	·35	·37	·08	·14	·14	·07	·04	·22	·14	·21	·25	·31	·23		·28	·27	·20	·10	·21	·30
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
*	1·57	1·68	1·87	1·30	1·30	1·14	1·54	1·63	1·17	1·39	1·37	1·46	1·43	1·52	1·23	1·27	1·27	1·66	1·38		1·49	1·50	1·45	1·28	1·38	1·46
†	9·76	10·14	10·60	7·95	8·57	8·27	8·89	9·71	7·07	8·92	8·74	9·17	9·94	9·76	8·63	9·02	8·31	9·52	8·63		9·17	9·19	10·05	8·59	9·59	9·13

* The figures in this row give the totals for the month. † The totals from January 1st.

May, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..
2	..	..	..	..	..
3	..	..	..	..	..
4	..	..	..	..	..
5	..	..	..	..	..
6	..	..	..	..	..
7	..	..	..	..	..
8	·01	..	·02	·01	·01
9	..	..	..	..	..
10	..	..	..	..	..
11	..	..	..	..	..
12	..	..	..	..	..
13	..	..	..	..	..
14	·38	·31	·35	·34	·37
15	·05	·04	·03	·09	·05
16	·28	·24	·20	·22	·20
17	..	..	..	..	..
18	..	..	..	..	..
19	·09	·05	·05	·07	·05
20	·18	·16	·15	·16	·04
21	·07	·05	·06	·06	·10
22	·02	·02	·02	·01	..
23	·02	·03	·05	·01	·03
24	·55	·31	·21	·30	·10
25	..	..	..	..	..
26	..	..	..	..	..
27	..	..	..	..	..
28	..	..	..	..	..
29	..	..	..	..	..
30	..	..	..	..	..
31	..	..	..	..	..
*	1·65	1·21	1·14	1·27	·95
†	9·71	8·30	7·17	8·79	6·98

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(May, 1899.)

The month may be divided into three portions, *viz.* from 1st to 12th very dry and cold, from 13th to 24th wet and warm, and from 25th to 30th dry and cold. All vegetation is extremely late, the cold period at the end of the month doing great damage, especially to the early potatoes, beans, and strawberries. The hawthorn flowered at Croydon on the 11th, and was with the horse-chestnut and laburnum still in flower at the end of the month. There has been a great deal of sickness throughout the district, mainly influenza, with colds and sore throats. Mushrooms were found in the open at Warlingham on the 12th. A hailstorm occurred at Addington Hills about half an hour after noon on the 15th, and at Sidcup on the 23rd, and thunder was heard at Sidcup on the 16th, and a rainbow was seen on the same day at Addington Hills. At Croydon on the 21st there was a heavy black mist at noon. The rainfall throughout the district is between a quarter and half an inch below the average. At Croydon the maximum was 70° on one day, between 60° and 69° on twelve days, and between 50° and 59° on eighteen days; whilst the minimum was between 40° and 49° on eighteen days, 30° and 39° on eleven days, and below 30° on two days. The mean temperature of the month is below the average, as much as 2° at Redhill and Wallington, and was at Croydon (Duppas House) 51·8°, at Chipstead 51·2°, at Croydon (Whitgift) 51·1°, at Waddon and Wallington 51°, and at Redhill 50·4°. There were recorded at Wallington 205·5 hours of sunlight, which is the May average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	..	MONTHLY GAUGE.	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
18	·11	·11	·11	·04	·05	·06	·01	·05	·04	·06	·05	·06	·06	·05	·08	·11	·30			·12	·09	·07	·08	·06		·06
19	·54	·49	·60	·27	·22	·24	·31	·33	·27	·32	·22	·25	·31	·24	·29	·36	·37			·33	·40	·20	·25	·22		·47
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	·01	..		..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
22	·12	·12	·10	·10	·15	·15	..	·10	·09	·11	·10	·11	·16	·14	·15	·15	·13			·14	·20	·18	·20	·14		·06
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	·03		..
25	·02	·02	·02	·04	·04	·04	·03	·06	·06	·05	..	·04	·06	·07	..	..	..			..	·01	·03	·02	·02		·05
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
28	·05	·01	·10	·05	·25	·34	·09	·04	·04	·02	·16	·03	·02	·05	·11	..	..			·25	·07	..	·03	..		·16
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·10	·24			..	..	..	..	..		..
30	·52	·65	·50	·39	·51	·52	·45	·45	·43	·59	·38	·62	·56	·64	·58	·47	·36			·54	·68	·57	·57	·43		·42
*	1·36	1·40	1·43	·89	1·22	1·35	·89	1·03	·93	1·15	·91	1·11	1·17	1·19	1·21	1·19	1·40	1·24	1·04	1·38	1·45	1·05	1·16	·90	1·13	1·22
†	12·61	13·07	13·35	11·66	11·59	12·59	11·41	11·67	11·88	13·10	12·17	13·37	13·26	13·16	14·58	12·81	11·02	13·32	9·06	11·79	13·35	11·72	12·86	12·07	12·67	12·38

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* **June, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farnborough	Orpington	Farningham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·06	·06	·06	·05	·05	·04	·05	·05	·05	·07	·05	·05	·05	·05	·06	·07	·07	·06	·07	·06	·07	·07	·12	·09	·04	·06
19	·41	·40	·36	·23	·18	·14	·20	·18	·22	·23	·24	·25	·22	·26	·29	·33	·33	·32	·35	·35	·34	·27	·33	·15	·24	·31
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	·06	·05	·12	·11	·12	·13	·13	·12	·13	·14	·14	·13	·12	·16	·18	·20	·17	·17	·19	·16	·18	·18	·28	·35	·21	·19
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·09	·08	·06	·03	·01	..	·01	..	·01	·01	·01	·02	·02	·02	·02	·02	·02	..	..	·05	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·21	·15	·01	..	..	·01	..	..	..	·01	..	·01	..	·01	·01	·01	·02	..	·02	·04	·04	·06	·05	·04	·02	·01
29	..	..	..	·02	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·37	·32	·41	·38	·41	·40	·41	·38	·44	·40	·43	·39	·38	·42	·46	·45	·54	·53	·43	·50	·51	·44	·61	·49	·34	·52
*	1·20	1·06	1·02	·82	·77	·72	·81	·73	·85	·86	·87	·85	·79	·92	1·02	1·08	1·15	1·08	1·06	1·16	1·14	1·03	1·39	1·12	·85	1·09
†	10·92	10·29	12·50	10·36	10·64	10·87	10·60	9·19	10·77	11·03	11·02	11·22	10·13	11·35	11·57	12·85	13·02	12·57	12·00	10·66	11·29	11·23	11·26	9·34	10·38	11·52

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for June is 1·95 in.* **June, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	OBSERVER DEAD. RECORD CEASED.	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
18	·06	·05	·07	·05	·04	·07	·07	·06	·06	·11	·10	·07	·09	·08	·06	·06	·06	·06	·07		·11	·08	·08	·09	·10	·07
19	·30	·34	·30	·22	·21	·18	·25	·27	·20	·33	·30	·25	·25	·27	·26	·18	·17	·23	·21		·22	·20	·31	·22	·23	·25
20	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	·01	·02	..	..		..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
22	·21	·17	·20	·12	·13	·14	·11	·10	·08	·08	·10	·08	·09	·15	·15	·17	·16	·17	·16		·17	·16	·17	·30	·25	·21
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
25	..	..	·02	·01	..	..	·02	·02	·08	·06	·06	·07	·09	·04	..	..	·02	·01	·03		·01	·01	..	..	..	·01
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
28	..	·03	·01	..	..	·08	·20	·14	·18	·90	·60	·32	·28	·58	·23	·08	..	..	..		..	..	·03	·01	..	..
29	..	..	..	..	..	..	..	·01	..	·01	·01	·02	..	..	..	..	..	..	..		..	..	..	..	..	..
30	·54	·35	·57	·38	·36	·40	·36	·55	·26	·27	·28	·34	·30	·40	·36	·33	·56	·47	·62		·56	·53	·48	·40	·42	·52
*	1·11	·94	1·17	·78	·74	·88	1·01	1·16	·86	1·76	1·45	1·15	1·10	1·52	1·06	·83	·99	·94	1·09		1·07	·98	1·07	1·02	1·00	1·06
†	10·87	11·08	11·77	8·73	9·31	9·15	9·90	10·87	7·93	10·68	10·19	10·32	11·04	11·28	9·69	9·85	9·30	10·46	9·72		10·24	10·17	11·12	9·61	10·59	10·19

* The figures in this row give the totals for the month. † The totals from January 1st.

June, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..
2	..	..	..	..	..
3	..	..	..	..	..
4	..	..	..	..	..
5	..	..	..	..	..
6	..	..	..	..	..
7	..	..	..	..	..
8	..	..	..	..	..
9	..	..	..	..	..
10	..	..	..	..	..
11	..	..	..	..	..
12	..	..	..	..	..
13	..	..	..	..	..
14	..	..	..	..	..
15	..	..	..	..	..
16	..	..	..	..	..
17	..	..	..	..	..
18	·07	·05	·07	·06	·05
19	·25	·27	·21	·20	·16
20	..	..	..	..	..
21	..	..	..	..	..
22	·18	·14	·15	·17	·14
23	..	..	..	..	..
24	..	..	..	..	..
25	·01	..	·01	·03	·02
26	..	..	..	..	..
27	..	..	..	..	..
28	..	..	..	·02	·04
29	..	..	..	..	..
30	·69	·67	·67	·44	·40
*	1·20	1·13	1·11	·92	·81
†	10·91	9·43	8·28	9·71	7·79

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(June, 1899.)

The month has been remarkably dry and sunny, but the temperature has been somewhat variable. The absolute drought lasted from May 24th to June the 18th, a period of twenty-four days, and all growing crops, with the exception of wheat, suffered severely. The month has been a healthy one. Solar halos were seen at Greenwich on the 18th, 19th, 21st, and 30th, at Sidcup on the 19th, and at Wallington on the 19th and 21st; whilst a parhelion was seen at Greenwich on the 21st. A thunderstorm occurred on the 28th, but it was of no importance except in the Thames valley. At Croydon the maximum temperature was 70° and above on fifteen days, 60° and under 70° on thirteen days, and 50° and under 60° on two days; whilst the minimum temperature was 50° and above on eleven days, 40° and under 50° on seventeen days, and under 40° on two days. The mean temperature of the month is somewhat variable, but may be taken to be from 1° to 2·5° above the average, and was at Chipstead 61·7°, at Croydon (Duppas House) 61·6°, at Croydon (Whitgift) 61·2°, at Waddon 60·8°, and at Wallington 60·7°. The rainfall of the month is ¾ in. below the average. There were recorded at Wallington 256·3 hours of sunlight, which is ten per cent. above the June average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* **July, 1899.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·16	·27	·20	·35	·29	·31	·25	·25	·20	·12	·18
2	·09	·10	·06	·04	·06	·06	·02	·06	·05	·05	·07
3	..	..	..	·01	·01	·01	·01	..	·02	·02	·15
4	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..
7	·04	·02	..	..	..	..	..	..	..	..	·04
8	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..
10	·10	·09	·11	·05	·05	·05	·04	·06	·05	·04	..
11	..	..	..	..	..	..	·01	..	..	..	..
12	·01	..	..	·01	·01	..	·01	..	·01	·01	..
13	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..
20	·18	·24	·41	..	..	..	..	..	..	..	..
21	·02	..	·02	·03	·03	·03	·01	·03	·02	·03	·03
22	·07	·06	·05	·06	·05	·05	·01	·05	·07	·05	·11
23	·24	·13	1·42	·09	·05	·04	·06	·15	·32	1·13	·20
24	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..
26	·02	..	..	..	·03	·03	..	·01	·03	·02	·03
27	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..
*	·93	·91	2·27	·64	·58	·58	·42	·61	·77	1·47	·81
†	13·54	13·98	15·62	12·30	12·17	13·17	11·83	12·28	12·65	14·57	12·98

Day of Mo.	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·14	·29	·15	·18	·42	·39			·45	·20	·27	·23	·15		·14
2	·06	·07	·08	·08	·10	·18			·02	·16	·08	·13	·14		·05
3	·03	·02	..	·05	..	..			..	·02	·02	·01	·10		..
4	..	..	..	..	..	..			..	..	..	..	..		..
5	·01	..	..	..	..	..			..	..	..	..	..		..
6	..	..	·08	..	..	..			..	·01	..	..	..		..
7	..	..	·04	·14	..	..			..	..	..	..	..		..
8	..	..	..	..	..	..			..	..	..	..	..		..
9	..	..	..	..	..	..			..	..	..	..	..		..
10	·04	·07	·05	·04	..	..			..	·08	·05	·07	·05		·15
11	..	..	..	..	..	..			..	..	..	·02	..		..
12	..	..	..	..	..	..			·05	..	..	..	..		..
13	..	..	..	..	..	..			..	..	..	..	..		..
14	..	..	..	..	..	..			..	..	..	..	..		..
15	..	..	..	..	..	..			..	..	..	..	..		..
16	..	..	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	..	MONTHLY GAUGE.	..
17	..	..	..	..	..	..			..	..	..	..	..		..
18	..	..	..	..	..	..			..	..	..	..	..		..
19	..	..	..	..	..	..			..	..	..	..	..		..
20	..	..	..	..	..	..			·04	..	..	..	..		·31
21	·02	·02	·02	·04	·03	·04			·11	·04	·03	·03	..		·02
22	·06	·04	·13	·11	·02	·06			·16	·23	·13	·24	·34		·10
23	1·31	·48	1·14	1·32	·81	..			·54	·61	·13	·08	·08		·11
24	..	..	..	..	..	..			..	..	..	..	..		..
25	..	..	..	..	..	..			..	..	..	..	..		..
26	·03	·04	..	·04	·03	..			..	·08	·04	·04	·02		·02
27	..	..	·01	..	..	..			..	..	..	..	..		..
28	..	..	..	..	..	..			..	..	..	..	..		..
29	..	..	·02	..	..	..			..	..	..	..	..		..
30	..	..	..	..	..	..			..	..	..	..	..		..
31	..	..	..	..	..	..			..	..	..	..	..		..
*	1·70	1·03	1·72	2·00	1·41	·67	1·22	1·33	1·37	1·43	·75	·85	·88	·60	·90
†	15·07	14·29	14·88	16·58	14·22	11·69	14·54	10·39	13·16	14·78	12·47	13·71	12·95	13·27	13·28

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* **July, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·08	..	·22	·12	·17	·15	·15	·12	·14	·15	·11	·14	·10	·15	·26	·27	·19	·20	·31	·16	·21	·22	·30	·29	·16	·15
2	·04	·04	·04	·06	·09	·13	·13	·14	·13	·14	·10	·08	·07	·08	·07	·07	·09	·09	·04	·05	·05	·05	·06	..	·08	·05
3	..	..	·01	·03	·02	·01	·01	·02	·01	·01	·02	·02	·01	·01	·02	·03	·02	·02	·02	·02	·01	..	·02	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
6	..	..	..	..	..	..	..	·02	·01	·03	·05	·08	·09	·01	·01	·05	..	..	..	..	..	..	..	..	·02	·09
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·69	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..
10	·10	·07	·08	·11	·08	·08	·07	·06	·06	·06	·07	·08	·06	·08	·07	·07	·05	·04	·06	..	·01	·02	..	..	..	·04
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	·03	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	·02	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·12	·05	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·07	·08	·03	..	..	..
21	·01	·02	·02	·03	·03	·02	·03	·02	·03	·04	·03	·03	..	·02	·03	·02	·03	·02	·04	·04	·05	·05	·10	·10	·05	·05
22	·25	·16	·17	·10	·18	·17	·14	·16	·18	·17	·19	·18	·20	·18	·27	·52	·29	·21	·27	·22	·23	·29	·33	·77	·30	·33
23	·11	·09	·09	·04	·02	·02	·02	..	·02	·02	·02	·01	·02	·02	·02	·11	·16	·04	·08	·17	·16	·12	·12	·05	·07	·08
24	·02	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·02	..	..	·01	·01	..	·01	·02	·01	·02	·01	·03	·01	·01	·02	·01	·01	..	..	·02	·02	..	·02	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
*	·75	·43	·63	·52	·60	·58	·56	·56	·59	·64	·60	·66	·56	·56	·77	1·17	·86	·62	·82	·69	·82	·83	1·73	1·23	·70	·79
†	11·67	10·72	13·13	10·88	11·24	11·45	11·16	9·75	11·36	11·67	11·62	11·88	10·69	11·91	12·34	14·02	13·88	13·19	12·82	11·35	12·11	12·06	12·99	10·57	11·08	12·31

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·20	·18	·11	·10	·07	·11	·07	·06	·02	·02	·04	·02	·04	·15	·10	·13	·12	·13	·10		·16	·14	·14	·27	·22	·27
2	·06	·04	·06	·04	·09	·12	·05	·07	·03	·02	·03	·04	·03	·06	·11	·06	·04	·04	·04		·05	·04	·03	·05	·05	·04
3	·01	·02	·01	·02	·02	·02	·02	·03	·01	..	..	..	·01	·03	·02	·02	·02	·02	·02		·01	·01	·01	·02	·03	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
5	·01	..	..	·03	·08	..	..	..	·05	..	·03	·02	·05	·02	..	..	..	..	..		..	..	..	..	..	..
6	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..		..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
10	·06	·05	·08	·07	·08	·10	·13	·13	·10	·14	·14	·09	·11	·13	·10	·18	·11	·10	·06		·08	·05	·02	..	..	·05
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
12	..	..	·07	..	..	..	..	·01	..	·01	..	..	..	..	..	..	·01	..	..		..	..	..	·06	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	OBSERVER DEAD. RECORD CEASED.	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
17	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·07	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
20	..	..	..	..	..	·05	..	·19	·08	·01	..	·01	·02	..	·06	·05	·01	..	..		..	..	..	·02	·05	..
21	·03	·05	·04	·03	·03	·04	·17	·04	·03	·03	·03	·02	·04	·06	·04	·04	·04	·02	·06		·05	·04	·08	·08	·09	·06
22	·31	·26	·30	·16	·17	·12	·19	·12	·09	·22	·24	·12	·14	·12	·15	·15	·20	·29	·22		·31	·38	·57	·77	·83	1·08
23	·08	·08	·07	·02	·02	·02	·03	·04	·02	·05	·04	·02	·03	·04	·03	·02	·02	·05	·04		·06	·05	·07	·08	·09	·09
24	..	..	·02	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..		..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
26	..	..	·02	·01	..	..	·01	·02	..	·02	·01	..	..	·03	·01	..	·01	·02	..		·01	..	·01	·03	..	·02
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
*	·76	·68	·79	·49	·56	·58	·67	·72	·43	·52	·56	·34	·47	·64	·62	·65	·60	·67	·54		·73	·71	·93	1·45	1·36	1·61
†	11·63	11·76	12·56	9·22	9·87	9·73	10·57	11·59	8·36	11·20	10·75	10·66	11·51	11·92	10·31	10·50	9·90	11·13	10·26		10·97	10·88	12·05	11·06	11·95	11·80

* The figures in this row give the totals for the month. † The totals from January 1st.

July, 1899

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·13	·10	..	·12	·18
2	·04	·01	·07	·04	·08
3	..	..	..	·01	·02
4	..	..	..	..	..
5	..	..	..	..	..
6	..	·21	..	..	..
7	..	..	..	..	..
8	..	..	..	..	..
9	..	..	..	..	..
10	·09	·05	·05	·10	·10
11	..	..	..	..	..
12	..	..	..	..	..
13	..	..	..	..	..
14	..	..	..	..	..
15	..	..	..	..	..
16	..	..	..	..	..
17	..	..	..	..	..
18	..	..	..	..	..
19	..	..	..	..	..
20	..	..	..	·02	..
21	·06	·04	..	·04	·03
22	·84	1·00	·61	·50	·04
23	·12	·06	·03	·03	·60
24	..	..	..	..	·02
25	..	..	..	..	..
26	·01	..	..	..	..
27	..	..	..	..	..
28	..	..	..	..	..
29	..	..	..	..	..
30	..	..	..	..	..
31	..	..	..	..	..
*	1·29	1·47	·76	·86	1·07
†	12·20	10·90	9·04	10·57	8·86

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(July, 1899.)

An exceedingly hot, dry, and sunny month. The rainfall has varied very much owing to the thunderstorm on the 23rd, the rain accompanying which was exceedingly heavy in some parts of the district, more especially on the high ground towards the south. At Dorking (Denbies) the observer reports that the rain 1·42 in. fell in three-quarters of an hour; whilst in another thunderstorm on the 20th he reports that a large cedar tree was struck by lightning. The 20th was an exceedingly hot day, and so also was the 21st, the maximum thermometer in the shade being well over 85°, the Greenwich maximum on the 20th being 88·5°. Owing to the dry weather, all pastures and gardens are burnt up, and should rain not come soon there will be a great scarcity of vegetables in the autumn. Owing to the heat and dryness the month has been somewhat unhealthy, colds and influenza being somewhat prevalent, as well as summer diarrhœa. It is difficult to say what the deficiency of the rainfall is—in some parts it is only one-fourth of the average, whilst at Greenwich it is half the average—but probably, taking the district as a whole, we may say that only half the average amount has fallen. With respect to the temperature there have been about eight days with a shade temperature of over 80°, but it seems to have varied so much that no place exactly represents the district. The mean temperature is about 4·5° above the average, and was at Croydon (Duppas House) 66·9°, at Chipstead 66·8°, at Croydon (Whitgift) 66·4°, at Waddon 66·2°, at Wallington 66·1°, and at Redhill 64·9°. There were recorded at Wallington 278·4 hours of sunlight, which is eighteen per cent. above the July average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
5	..	..	·02	·01	·01	·01	·01	..	·01	·02	·02	..	·02	·02	·02	·05	·12			·11	·03	·02	·02	·05		..
6	..	..	·02	·01	·02	·02	·01	..	·01	..	·01	·02	·02	·02	..	·02	..			·03	..	·02	·04	·04		·02
7	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..			·02	..	..	..	..		..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	..	MONTHLY GAUGE.	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
27	·01	·01	..	..	..	..	·01	..	·01	·01	..	..	·01	..	..	..	·09			·02	..	..	..	·02		..
28	·58	·57	·44	·53	·50	·49	·45	·35	·30	·45	·69	·42	·69	·37	·45	·91	·30			·40	·56	·54	·63	·52		·35
29	·15	·12	·13	·12	·09	·10	·12	·15	·11	·15	·06	·13	·19	·12	·11	·14	·17			·19	·12	·15	·14	·16		·17
30	..	..	..	·03	·06	·06	·01	..	..	..	·03	·01	·01	..	·02	·03	·04			·03	·03	·04	·11	·09		·07
31	·14	·04	·06	·03	·03	·04	·04	·03	·03	·04	·03	·03	·03	·03	·02	..	·03			·02	·02	·03	·04	..		..
*	·88	·74	·67	·73	·71	·72	·66	·53	·47	·67	·84	·61	·97	·56	·62	1·15	·75	·76	·82	·82	·76	·80	·98	·88	·57	·61
†	14·42	14·72	16·29	13·03	12·88	13·89	12·49	12·81	13·12	15·24	13·82	15·68	15·26	15·44	17·20	15·37	12·44	15·30	11·21	13·98	15·54	13·27	14·69	13·83	13·84	13·89

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	·01	·03	·03	·03	·03	·03	·03	·04	·05	·05	·05
6	..	..	·04	·02	·03	·02	·03	·03	·03	·03	·03	·03	·03
7	·01	..	..	·02	·04	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	·01	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	·01	..	..	·01	..	·01	..
28	·21	·15	·36	·43	·38	·37	·44	·34	·43	·47	·44	·40	·35
29	·15	·17	·16	·16	·17	·11	·14	·14	·14	·15	·14	·15	·15
30	·03	·02	·09	·04	·09	·05	·08	·03	·06	·07	·04	·02	·03
31	·03	·01	·02	·01	..	·01	·01	..	·01	·01	·01	·01	·01
*	·43	·35	·68	·72	·74	·59	·74	·57	·70	·78	·71	·67	·62
†	12·10	11·07	13·81	11·60	11·98	12·04	11·90	10·32	12·06	12·45	12·33	12·55	11·31

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	·05	·06	·07	·07	·07	·10	·13	·36	·12	·14	..	·42	·25
6	·04	·04	·04	·04	·03	·04	·07	·03	·02	·02	..	·02	·03
7	..	..	·01	..	..	..	..	..	·01	·02	·03	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	·01	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	·03	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	·03	..	..	..
19	..	..	..	..	..	..	..	·01	·02	·01	·02	·05	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	·01	..	·01	..	..	..	..	..	..	..	..	..
23	..	·01	..	·01	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	·48	·48	·49	·44	·40	·34	·40	·52	·29	·40	·37	·31	·47
29	·12	·16	·12	·15	·13	·11	·09	·08	·08	·07	·05	·10	·12
30	·09	·06	·06	·25	·06	·05	·30	·42	·33	·17	·39	·10	·07
31	·01	·02	·01	·01	·01	..	..	·01	·01	·01	..	..	·01
*	·79	·85	·80	·98	·70	·64	·99	1·43	·88	·87	·89	1·00	·95
†	12·70	13·19	14·82	14·86	13·89	13·46	12·34	13·54	12·94	13·86	11·46	12·08	13·26

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	OBSERVER MOVED. RECORD CEASED.	..	..	..	..	..	OBSERVER DEAD. RECORD CEASED.	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
4	..	..	·02	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
5	·19	·16	·09	·01	·07	·04	·04	·04	·02	..	·01	·02	·03		·04	·03	·03	·06	·07		·09	·07	·35	·12	·32	·17
6	·06	·04	·03	·03	·04	·04	·03	·04	·02	·02	..	·02	·02		·04	·03	·01	·04	·06		·05	·03	·03	·03	..	·02
7	·02	..	..	..	..	..	·01	·03	..	·01	·02	..	..		..	..	·01	..	..		..	..	..	·01	·04	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
10	..	..	·01	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	·02	..	..		..	..	..	..	..		..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	·03	·04	..
19	..	·01	·01	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		·01	·02	·02	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..		..	·01	..	·02	..		..	..	..	..	..	..
28	·43	·39	·36	·30	·36	·16	·19	·19	·20	·42	·18	·22	·29		·14	·12	·16	·23	·21		·19	·17	·35	·31	·46	·13
29	·13	·10	..	·12	·16	·06	·07	·09	·06	·11	·15	·07	·08		·07	·08	·08	·13	·13		·11	·07	·13	·08	·11	·13
30	·07	·04	·06	·03	·08	·05	..	·08	·06	·10	·05	·12	·04		·03	·06	·04	·05	·14		·04	·03	·13	·22	·10	·11
31	·02	·02	·02	..	..	·01	·05	·02	·02	·02	·03	·01	..		·01	·01	·01	·02	·01		·01	·02	·01	..	..	·01
*	·92	·76	·60	·49	·71	·36	·39	·49	·38	·68	·46	·46	·46		·33	·34	·34	·55	·60		·50	·41	1·02	·80	1·07	·57
†	12·55	12·52	13·16	9·71	10·58	10·09	10·96	12·08	8·74	11·88	11·21	11·12	11·97		10·64	10·84	10·24	11·68	10·86		11·47	11·29	13·07	11·86	13·02	12·37

* The figures in this row give the totals for the month. † The totals from January 1st.

August, 1899

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..
2	..	..	..	..	..
3	..	..	..	..	..
4	..	..	..	..	..
5	·09	·07	·14	·05	·04
6	·02	·02	·04	·04	..
7	..	..	..	..	·03
8	..	..	..	..	..
9	..	..	..	..	..
10	..	..	..	..	..
11	..	..	..	..	..
12	..	..	..	..	..
13	..	..	..	..	..
14	..	..	..	..	..
15	..	..	..	..	..
16	..	..	..	..	..
17	..	..	..	..	..
18	..	..	..	..	..
19	..	..	·02	..	..
20	..	..	..	..	..
21	..	..	..	..	..
22	..	..	..	..	..
23	..	..	..	..	..
24	..	..	..	..	..
25	..	..	..	..	..
26	..	..	..	..	..
27	..	..	..	..	..
28	·15	·12	·12	·12	·10
29	·05	·03	·06	·05	·08
30	·01	..	·03	·04	..
31	·03	..	..	..	·14
*	·35	·24	·41	·30	·39
†	12·55	11·14	9·45	10·87	9·25

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(August, 1899.)

An exceedingly hot dry sunny month. Mr. Watson, of Croydon, remarks that "July with a mean temperature of 66·4°, and August with 66·2° are the two hottest months he has any record of, and the three summer months, June to August, with a rainfall of 2·18 in., are the three driest summer months in a record of over thirty years; and that with the exception of July 14th, when there was a deficiency of 0·8°, the mean daily temperature was above the average from July 6th to Sept. 10th." Complaints of the heat and drought are numerous, and the unhealthiness of the season was general, summer diarrhœa being especially prevalent, and cases of heat apoplexy being numerous, many of which were fatal. There was a very peculiar gust of wind and dust storm on the 15th at 5 p.m., which was noticed by the observers at Sidcup and Kenley. The observer at Kenley has written a very interesting account of it, too long for insertion here, but in which she calls special attention to a peculiar lull and airless feeling as is generally experienced before a hurricane. The storm only lasted about two or three minutes, and no rain fell, though lightning was seen at Sidcup and elsewhere. Thunderstorms occurred throughout the district on the 5th and 28th. The rainfall is about one-third of the average, and in the long record of Greenwich there is only one August with a smaller rainfall, *viz.* August, 1818, when the monthly total was only ·07 in. Solar halos were seen at Upper Gatton on the 2nd, 4th, and 31st. The mean temperature of the month is about 5° above the average, and was at Croydon (Duppas House) 67°, at Waddon 66·6°, at Croydon (Whitgift) 66·2°, at Wallington 66·1°, at Chipstead 65·9°, at Redhill 64·9°, and at Sevenoaks 64·5°. The maximum in the shade at Beddington was over 80° on seven days, and at Croydon (Waddon New Road) on nine days, and at Redhill on two days, and below 70° the days were respectively three, two, and one. There were recorded at Wallington 275·5 hrs. of sunlight, which is 18 per cent. above the August average of the ten years 1886–95.—F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·03	·03	·03	·03	·03	·02	..	·03	·04	·04	·04	·04
2	·05	·09	..	·01	·02	·01	·02	·05	·02	·03	·03	·04	·07
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·58	·48	·35	·48	·65	·79	·56	·59	·65	·62	·53	·38	·52
7	·05	·07	·02	..	·01	·01	·01	..	·01	..	·01	..	·01
8	..	..	..	..	..	..	..	..	..	..	..	·01	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	·01	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·18	·20	·24	·20	·22	·23	·19	·20	·19	·19	·19	·16	·17
16	·11	·11	·11	·01	·11	·12	..	·02	·02	·04	·03	·13	·09
17	..	..	..	..	..	..	..	..	·01	..	..	..	..
18	..	..	..	..	·01	·01	..	·10	..	..	..	..	..
19	·11	·12	·12	·11	·12	·11	·09	·12	·12	·14	·15	·15	·13
20	..	..	..	..	..	..	..	·13	..	..	..	..	..
21	·10	·15	·11	·17	·25	·28	·17	·13	·13	·15	·14	·15	·14
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	·11	·08	·13	·07	·08	·07	·13	·08	·07	·05	·03	·03	·03
24	·03	·03	·03	·03	·05	·04	·02	·03	·03	·04	·04	·04	·03
25	·05	·05	·05	·05	·06	·06	..	·11	·04	·02	·03	·02	·02
26	..	·01	..	..	·01	·01	..	·01	..	..	..	..	..
27	·03	·08	·05	·04	·06	·07	·07	·06	·06	·05	·06	·05	·16
28	·16	..	·20	·10	·07	·07	·05	·17	·13	·17	·12	·17	·19
29	1·26	1·24	1·47	1·20	1·03	1·04	1·37	1·17	1·13	1·19	·97	·88	1·00
30	·07	·16	·10	·04	·06	·05	·05	·04	·05	·08	·04	·08	·13
*	2·93	2·90	3·01	2·54	2·84	3·00	2·76	3·04	2·69	2·81	2·41	2·33	2·73
†	17·35	17·62	19·30	15·57	15·72	16·89	15·25	15·85	15·81	18·05	16·23	18·01	17·99

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·05	..	..			·02	·04	·04	·04	·07		·04
2	..	·09	·07	..			·03	·03	·04	·05	·04		·06
3	..	..	..	..			..	..	..	..	·06		..
4	..	..	..	..			..	..	..	..	..		..
5	..	..	..	..			..	..	..	..	..		..
6	·58	·59	·69	·78			·64	·57	·54	·61	·37		·32
7	..	..	·03	·02			·24	..	..	..	·15		·01
8	..	..	..	..			..	..	..	..	..		..
9	..	..	..	..			..	..	..	..	..		..
10	..	..	..	..			..	..	..	..	..		..
11	..	..	·01	..			..	·01	..	..	·03		..
12	..	..	..	..			..	..	..	..	..		..
13	..	..	..	..			..	..	..	..	..		..
14	..	..	..	..			..	..	..	..	..		..
15	·20	·24	·22	·21	MONTHLY GAUGE.	MONTHLY GAUGE.	·18	·25	·20	·22	..	MONTHLY GAUGE.	·13
16	·06	..	·19	·13			·08	·10	·04	·05	·06		·02
17	..	..	..	..			..	..	·01	..	..		..
18	..	..	..	..			·01	..	·01	..	..		..
19	·13	·15	·16	·14			·16	·13	·11	·16	·13		·10
20	..	..	..	·21			..	..	..	..	·04		..
21	·18	·13	·17	..			·25	·16	·13	·15	·12		·11
22	·04	..	..	..			..	..	..	..	..		..
23	·01	·05	·07	·05			·04	·07	·04	·07	·09		·09
24	..	·03	·03	·03			·03	..	·02	·03	·12		·04
25	·05	·03	·03	·07			·06	·05	·02	·01	·03		·02
26	·05	..	..	..			·05	..	..	..	·06		·01
27	·03	·09	·09	·17			·18	·23	·21	·21	·15		·23
28	·14	·14	·08	..			·03	·04	·08	·05	·10		·06
29	1·10	·88	·96	1·01			1·05	·92	·92	·89	·95		1·12
30	·14	·07	·08	·12			·19	·13	·10	·10	·12		..
*	2·76	2·54	2·88	2·94	2·85	2·55	3·24	2·73	2·51	2·64	2·69	2·59	2·36
†	18·20	19·74	18·25	15·38	18·15	13·76	17·22	18·27	15·78	17·33	16·52	16·43	16·25

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml. rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	·03	·04	·04	·04	·03	·04	·04	·04	·04	·03	·03	·04	·03	·04	·05	·05	·05	·05	·04	·04	·03	·06	·04	·02	·03
2	·16	·10	·05	·07	·07	·11	·14	·12	·14	·15	·16	·15	·19	·16	·07	·11	·05	·17	·39	·14	·18	·24	·35	·06	·22	·20
3	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·33	·38	·40	·63	·43	·36	·44	·38	·44	·42	·47	·45	·45	·57	·53	·87	·75	·80	·87	·68	·50	·39	·73	·55	·75	·72
7	·02	·01	..	·03	·07	·08	·09	·10	·14	·14	·29	·21	·24	·17	·02	·06	·07	·08	·13	·10	·24	·19	·40	·03	·07	·04
8	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	·01	·03	·02	·02	·02	·03	·04	·02	·02	·02	·04	·01	·02	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·19	·17	·23	·23	·23	·20	·19	·17	·18	·19	·18	·18	·16	·18	·20	·21	·22	·21	·19	·16	·18	·18	·18	·13	·20	·21
16	·02	·01	·08	·15	·04	·01	·01	..	·01	·01	..	·01	·01	·01	·10	·24	·27	·20	·21	·13	·10	·04	·10	·05	·05	·06
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..
18	..	..	..	·02	..	·01	·01	..	..	..	..	·01	..	..	..	..	..	·01	·01	..	·01	·02	·16	..	·06	·04
19	·16	·15	·16	·12	·11	·11	·10	·09	·10	·10	·09	·10	·10	·10	·12	·12	·13	·12	·11	·09	·10	·10	·11	·04	·11	·09
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·07	..	..
21	·10	·10	·13	·12	·11	·11	·11	·11	·11	·11	·10	·11	·11	·10	·12	·15	·14	·13	·12	·12	·11	·13	·11	·06	·09	·10
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	..
23	·03	·04	·04	·10	·09	·07	·06	·05	·05	·05	·05	·05	·04	·05	·04	·05	·04	·03	·02	·03	·02	..	..	..	..	..
24	·02	·02	·01	·03	·03	·04	·04	·04	·04	·04	·04	·04	·04	·04	·05	·05	·04	·05	·04	..	·04	·02	·01	..	·02	·02
25	..	..	·01	·01	..	·01	·01	..	·01	·02	..	..	·01	..	·01	·02	·01	·01	..	·05	·01	..	..	·09	..	..
26	·03	·03	..	·03	·02	·01	..	..	..	·02	·02	·02	..	·02	..	..	..	..	..	·01	..	..	..	..	..	..
27	·03	·10	·22	·03	·06	·05	·10	·06	·10	·10	·10	·08	..	·11	·16	·10	·11	·10	·12	·12	·13	..	·15	·08	·12	·10
28	·02	·02	·12	·03	..	·01	·01	·02	·01	·01	·01	·03	·02	·01	·02	·01	·02	·01	·03	·02	·02	·14	·04	·03	·02	·01
29	1·17	1·11	1·24	1·03	·91	·85	·83	·85	·87	·87	·71	·91	·93	·98	1·09	1·03	1·07	1·02	1·13	1·07	·90	·82	1·15	1·21	·69	·90
30	·03	·02	·10	·03	·07	·07	·05	·05	·03	·06	·10	·06	·08	·07	·09	·15	·11	·10	·10	·08	·08	·06	·20	·07	·08	·10
*	2·31	2·29	2·84	2·71	2·29	2·16	2·25	2·10	2·30	2·36	2·39	2·47	2·44	2·62	2·70	3·23	3·10	3·09	3·52	2·86	2·67	2·36	3·75	2·54	2·50	2·62
†	14·41	13·36	16·65	14·31	14·27	14·20	14·15	12·42	14·36	14·81	14·72	15·02	13·75	15·32	15·89	18·05	17·96	16·98	16·98	15·20	16·21	15·30	17·61	14·00	14·58	15·88

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·05	·03	·03	·03	·10	·01	·06	·05	·06	·05	·06	·07	OBSERVER MOVED. RECORD CEASED.	·04	·06	·06	·05	·04	OBSERVER DEAD. RECORD CEASED.	·05	·04	·03	·03	..	·03
2	·16	·41	·14	·18	·26	·02	·07	·16	·27	·21	·13	·29	·12		·02	·03	·03	·08	·08		..	·02	·08	·05	·04	·01
3	..	..	..	..	..	..	·09	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
6	·56	·79	·61	·36	·32	·96	·82	·79	·45	·35	·38	·52	·41		·41	1·12	·53	·49	·30		·36	·36	·54	·62	·65	·47
7	·10	·05	·24	·18	·15	·12	·28	·33	..	·01	..	..	..		·09	·10	·12	·10	·02		·07	·08	·07	·08	·05	·05
8	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	·02		..	..	..	·01	..		..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
11	..	..	..	..	..	..	·02	·03	..	..	..	..	..		..	..	..	..	..		..	·01	·01	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
15	·20	·17	·19	·16	·17	·15	·17	·16	·15	·12	·13	·16	·17		·16	·17	·16	·18	·18		·22	·21	·25	·15	·15	·20
16	·12	·08	·19	·10	..	·06	·15	·20	·03	·03	·04	·04	·03		·05	·01	·02	·02	·15		·24	·24	·11	·06	·06	·06
17	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
18	·04	·03	·04	..	..	·01	..	..	..	..	..	..	..		·01	·02	·03	·04	·04		·11	·08	·12	·01	..	·02
19	·09	·09	·09	·08	·11	·09	·10	·10	·09	·11	·10	·10	·10		·10	·11	·10	·10	·10		·11	·14	·10	·09	..	·11
20	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	·01	..	..		..	..	·01	..	..	..
21	·10	·11	·10	·09	·12	·14	·17	·15	·14	·16	·15	·16	·18		·16	·18	·15	·16	·13		·15	·16	·10	·10	·08	·13
22	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..		..	..	..	..	..	..
23	·01	·02	..	·01	·05	·02	·07	·07	·09	·05	·07	·08	·10		·02	·01	·01	·01	..		·03	·01	..	..	·02	..
24	·02	·03	·03	·03	·03	·02	·03	·04	·02	·02	·03	·02	·03		·02	·02	·03	·02	..		..	·02	·02	..	..	·02
25	·01	·01	·01	..	..	..	..	·01	..	·01	..	..	..		..	..	·01	·02	..		·01	·01	·01	..	..	·01
26	..	..	·01	..	..	..	..	·01	..	·03	..	·03	..		..	..	·01	..	..		..	..	..	..	..	..
27	..	·12	·10	·07	·10	·32	·19	·09	·12	·09	·19	·10	·32		·12	·18	·15	·07	·01		·05	·07	·09	·09	·10	..
28	·01	·03	·01	·01	·03	·05	·05	·03	·02	·04	·04	..	·06		·02	..	·09	·03	·02		·09	·10	·01	·03	..	·08
29	·88	·90	1·02	·97	·84	·94	1·21	1·09	·92	1·15	1·06	1·00	1·05		1·00	·83	·84	1·03	·90		·98	·95	·91	1·04	1·10	·80
30	·08	·08	·07	·06	·08	·02	..	·03	·02	·03	·02	·01	·12		·02	..	·02	·02	·04		·06	·03	·09	·05	·05	·07
*	2·42	2·97	2·88	2·33	2·29	3·02	3·43	3·35	2·37	2·47	2·39	2·57	2·78		2·24	2·84	2·37	2·43	2·01		2·53	2·53	2·55	2·40	2·30	2·06
†	14·97	15·49	16·04	12·04	12·87	13·11	14·39	15·43	11·11	14·35	13·60	13·69	14·75		12·88	13·68	12·61	14·11	12·87		14·00	13·82	15·62	14·26	15·32	14·43

* The figures in this row give the totals for the month. † The totals from January 1st.

September, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·04	·02	·03	·05	·03
2	·02	..	..	·05	·02
3	..	..	..	..	..
4	..	..	..	..	..
5	..	..	..	..	..
6	·42	·42	·33	1·01	·95
7	·12	·03	·06	·15	·37
8	..	..	..	..	..
9	..	..	..	..	..
10	..	..	..	..	..
11	..	..	..	..	..
12	..	..	..	..	..
13	..	..	..	..	..
14	..	..	..	..	..
15	·21	·19	·17	·20	·18
16	·07	·14	·22	·07	·07
17	..	..	..	..	..
18	·02	..	·05	·12	·03
19	·15	·18	·07	·10	·15
20	..	..	..	..	..
21	·17	·15	·15	·18	·13
22	..	..	..	..	..
23	·02	..	..	·02	..
24	·02	..	·01	·02	·02
25	·01	..	..	·01	·01
26	..	..	..	..	..
27	·15	·13	·13	·44	·05
28	..	..	·01	·01	..
29	·78	·76	1·00	·99	·80
30	·06	·02	·01	·01	·04
▪	2·26	2·04	2·24	3·43	2·85
†	14·81	13·18	11·69	14·30	12·10

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(September, 1899.)

A warm showery month. There were two noticeable thunderstorms, *viz.* on the 6th and 29th, and thunder and lightning occurred on many days. The thunderstorm on the 6th was preceded by heavy darkness, which was noticed by the observers at Kenley and Abinger Hall. The month has been somewhat unhealthy, and the number of sudden deaths that have taken place is remarkable. The observer at Abinger Hall reports that there were 4° of frost on the 20th, and that vegetable marrows were blackened. The rainfall of the month would appear to be about the average. The maximum thermometer in the shade was very high on the 5th, being considerably over 80°. Solar halos were observed at several stations in the district. The average temperature of the month is variable, ranging from half a degree below to about a degree above the mean, and was at Croydon (Duppas House) and Wallington 58·6°, at Waddon and Chipstead 58·3°, at Croydon (Whitgift) 58·2°, and at Redhill 56°. There were recorded at Wallington 176·2 hours of sunlight, which is 4 per cent. above the average for September of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·45	·34	·40	·29	·36	·39	·32	·38	·29	·33	·31	·30	·34	·33	·39	·55	·38			·71	·34	·22	·33	·32		·31
2	·01	·01	·02	·03	·03	·03	..	·03	·03	·02	·03	·03	·03	..	·04	·04	..			·02	·14	·02	·02	·04		..
3	..	·01	..	·02	·02	·02	·02	·02	·02	·03	·03	·03	·01	·03	..	·07	·09			·05	·02	·02	·02	·03		..
4	·39	·38	·46	·34	·29	·31	·29	·31	·31	·38	·33	·37	·39	·47	·51	·39	·49			·55	·46	·40	·39	·43		·31
5	..	..	..	·01	..	..	..	..	..	..	·01	..	·01	..	..	..	·05			·02	·01	·01	..	·04		·03
6	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..			..	..	..	..	·02		..
7	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
10	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
11	..	·01	..	..	·02	·02	..	..	..	..	..	..	..	..	..	..	·03			..	..	..	..	..		..
12	·06	·08	·06	·09	·07	·07	·06	..	·08	·07	·08	·07	·07	·09	·10	·08	·07			·07	·08	·08	·08	·08		·07
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	·03		..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	..	MONTHLY GAUGE.	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
20	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	·02		..
21	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..	..			·01	..	..	..	·01		..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·01	..	..	..	..		..
23	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·01	..	..	..	..		..
25	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..			..	..	..	·02	..		..
26	·23	·20	·25	·22	·25	·25	·21	·32	·22	·22	·23	·22	·22	·24	..	·22	·24			·11	·25	·20	·18	·23		·30
27	·87	·98	1·00	·72	·65	·66	·64	·77	·78	·89	·71	·85	·73	·86	·84	·63	·56			·44	·78	·69	·75	·67		·88
28	·01	·03	..	..	..	..	..	·03	·01	·01	..	..	..	..	..	..	·04			·01	·07	·01	..	..		..
29	·45	·65	·50	·41	·44	·50	·38	·36	·36	·51	·51	·45	·44	·49	·55	·37	..			·37	·54	·28	·41	·25		·48
30	·01	·01	·02	·01	·01	·01	..	..	..	·01	·01	·01	·02	..	·03	..	..			·01	..	·02	·18	·08		..
31	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·01	..	..	·02	..		..
*	2·48	2·72	2·71	2·14	2·18	2·29	1·92	2·22	2·12	2·48	2·25	2·33	2·26	2·51	2·46	2·35	1·95	2·29	1·72	2·40	2·69	1·95	2·40	2·25	2·36	2·38
†	19·83	20·34	22·01	17·71	17·90	19·18	17·17	18·07	17·93	20·53	18·48	20·34	20·25	20·71	22·20	20·60	17·33	20·44	15·48	19·62	20·96	17·73	19·73	18·77	18·79	18·63

* The figures in this row give the totals for the month. † The totals from January 1st.

October, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·12	·10	·12	·17	·08
2	·01	..	..	..	..
3	·05	·03	·02	·01	·02
4	·30	·27	·24	·23	·10
5	..	..	·01	·02	·01
6	..	..	..	..	..
7	..	..	..	..	..
8	..	..	..	..	..
9	..	..	..	..	..
10	..	..	..	..	..
11	..	..	..	..	..
12	·11	·11	·08	·07	·07
13	..	..	..	..	..
14	..	..	..	..	..
15	..	..	..	..	..
16	..	..	..	..	..
17	..	..	..	..	..
18	..	..	..	..	..
19	..	..	..	..	..
20	..	..	..	..	..
21	..	..	..	..	..
22	..	..	..	·01	..
23	..	..	..	..	..
24	..	..	..	..	..
25	..	..	..	..	..
26	·28	·21	·25	·26	·21
27	1·02	·93	·96	1·06	·99
28	·01	·01	..	..	..
29	·40	·37	·32	·31	·22
30	·02	·02	·01	·08	·01
31	..	..	..	..	..
*	2·32	2·05	2·01	2·22	1·71
†	17·13	15·23	13·70	16·52	13·81

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(October, 1899.)

The month, as a whole, has been a calm one, with a mean temperature and total rainfall below the average. Fogs have been very prevalent, more especially between the 16th and 24th. The month has been an unhealthy one, and there have been cases of scarlet fever at Wallington and Nutfield, and in the latter place also diphtheria. The slight frosts that have occurred have done little or no injury to even the most delicate plants; and, as showing the mildness of the month, Dr. H. F. Parsons mentions that the Jerusalem artichoke was in flower at Addington on the 22nd, and at Warlingham there was a great crop of mushrooms, which continued till the 28th. The observer at Upper Gatton reports that a very fine solar halo with parhelia occurred on the 11th between 1.30 and 2.15 p.m. At Park Hill, Croydon, the maximum temperature was above 60° on one day, between 50° and 59° on twenty days, and between 40° and 49° on ten days; whilst the minimum was above 50° on one day, between 40° and 49° on ten days, between 33° and 39° on twelve days, and 32° and below on eight days. The rainfall is about half an inch below the average. The mean temperature of the month is about half a degree below the average, and was at Chipstead 49·7°, at Croydon (Whitgift) 49·5°, at Croydon (Duppas House) and Wallington 49·2°, at Waddon 48·8°, and at Redhill 47·5°. There were recorded at Wallington 121·8 hours of sunlight, which is 6 per cent. above the October average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1899.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jus. H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·19	·14	·12	·03	·14	·14	·18	..	·05	·18	·10	·21	·17	·20	·11	·07	..			·02	·13	·19	·16	·12		·04
2	·36	·60	·46	·50	·31	·31	1·34	·35	·57	·39	·38	·38	·36	·29	·41	·67	1·02			·46	·34	·30	·34	·45		·53
3	1·70	2·18	1·50	1·45	1·20	1·36	·45	1·53	1·52	1·78	1·52	1·70	1·56	1·70	1·68	·90	1·23			·90	1·67	1·28	1·35	1·43		1·40
4	·51	·61	·52	·41	·30	·40	·41	·35	·39	·52	·44	·49	·52	·50	·55	·45	·34			·41	·49	·34	·36	·35		·44
5	1·55	1·48	1·57	1·45	1·53	1·52	1·49	1·53	1·45	1·44	1·54	1·44	1·51	1·48	1·45	1·74	1·68			1·85	1·59	1·39	1·40	1·51		1·50
6	·01	·01	..	·05	·01	·01	..	·02	·05	·01	·02	·01	·01	..	·03	..	..			..	..	·01	·01	·05		·02
7	·66	·72	·75	·68	·64	·72	·69	·70	·70	·70	·59	·66	·65	·65	·63	·70	·75			·82	·66	·61	·64	·68		·66
8	..	..	..	..	·01	·02	·01	..	..	..	..	..	..	..	..	..	..			..	·01	·01	·01	·03		..
9	·61	·63	·57	·56	·50	·53	·52	·62	·57	·57	·55	·59	·62	·60	·69	·59	·53			·58	·56	·51	·50	·54		·49
10	·01	·01	..	·01	·01	·01	·01	·02	·02	·02	·02	·02	..	..	·14	..	·01			·01	·04	..	·03	·05		·04
11	..	..	·02	·01	·03	·02	..	..	·04	·04	·03	·05	·07	·07	·10	..	·04			·04	·01	·04	·01	·04		·05
12	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
13	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
14	·01	..	..	..	·01	·01	..	..	·01	..	..	..	..	..	..	..	..			..	..	..	..	..		..
15	·01	..	..	..	·01	·01	..	..	·01	·01	..	·01	..	..	·02	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	·01	·01	..	MONTHLY GAUGE.	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
17	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..			..	..	..	..	..		..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·02	..	..	..	..		..
20	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..			..	·03	..	..	..		·01
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	·03		..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
29	..	..	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..		..
*	5·62	6·38	5·53	5·15	4·73	5·09	5·10	5·12	5·38	5·66	5·19	5·56	5·48	5·49	5·81	5·12	5·60	5·18	3·91	5·11	5·53	4·69	4·82	5·28	5·37	5·18
†	25·45	26·72	27·54	22·86	22·63	24·27	22·27	23·19	23·31	26·19	23·67	25·90	25·73	26·20	28·01	25·72	22·93	25·62	19·39	24·73	26·49	22·42	24·55	24·05	24·16	23·81

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·13	·07	·12	·08	·10	·10	·12	·09	·13	·12	·10	·05	·09
2	·44	·37	·41	·34	·35	·39	·33	·31	·35	·36	·34	·47	·39
3	1·32	1·21	1·38	1·30	1·20	1·19	1·14	1·19	1·16	1·18	1·14	1·23	1·24
4	·43	·35	·51	·32	·33	·34	·32	·28	·28	·32	·30	·35	·32
5	1·50	1·46	1·51	1·48	1·49	1·44	1·39	1·30	1·48	1·45	1·51	1·40	1·48
6	..	..	·01	·01	..	..	..	·01	·01	·03	·01	·03	·01
7	·61	·55	·62	·50	·55	·59	·57	·50	·58	·58	·60	·55	·52
8	·01	·01	..	·03	·03	·02	·02	·02	·02	·02	·02	·01	..
9	·43	·40	·51	·36	·36	·37	·36	·33	·36	·36	·35	·34	·33
10	..	·01	·02	·03	·03	·03	·04	..	·03	·03	·03	·04	·01
11	..	·02	·02	·08	·05	·05	·05	·09	·06	·05	·05	·07	·09
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·03	..	..	..	..	..	..	..	..	..	..	..	..
14	..	·01	·01	..	..	..	..	..	..	·01	·01	..	..
15	..	..	..	·01	..	..	..	..	..	..	..	..	..
16	..	..	·01	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	·01	..	..	..	..	..	·01	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
*	4·90	4·46	5·13	4·55	4·49	4·52	4·34	4·12	4·46	4·52	4·46	4·54	4·48
†	21·76	20·14	24·14	21·18	21·01	21·02	20·72	18·79	21·17	21·71	21·48	21·91	20·56

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm. (Wick. Ct.)	Hayes. Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·09	·12	·01	·09	·10	..	·12	·06	·06	·01	..	·04	·06
2	·38	·27	·50	·41	·35	·22	·35	·35	·42	·44	·35	·29	·28
3	1·14	1·24	1·23	1·33	1·34	1·26	1·25	1·11	1·24	1·25	1·10	·98	1·10
4	·27	·34	·34	·40	·36	·35	·40	·32	·44	·41	·29	·22	·27
5	1·35	1·38	1·50	1·45	1·62	1·50	1·60	1·44	1·53	1·69	1·60	1·40	1·57
6	·01	·01	·08	·02	·01	·02	·01	·02	..	·05	·05	·02	·03
7	·47	·64	·68	·77	·76	·65	·68	·68	·75	·65	·45	·46	·58
8	·02	·03	·04	·02	·02	·02	·01	·03	·02	..	..	..	..
9	·37	·42	·41	·43	·43	·38	·41	·41	·42	·37	·32	·22	·32
10	·03	·02	·04	·03	·02	·04	·02	·01	·02	·01	..	·02	·01
11	·05	·03	·05	·03	·02	·06	·02	·03	·05	·10	..	·14	·13
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	·01	..	..	..	..	..	..	..	·01	..	..	..
14	..	·01	..	·01	..	..	..	·01	..	·01	..	..	..
15	·01	·01	..	·01	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	·01	..	..	..	..	..
17	..	..	..	..	..	·02	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	·01	..	·01	..	..	..	·01	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	·01	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..
*	4·19	4·54	4·88	5·02	5·03	4·52	4·87	4·49	4·95	5·00	4·16	3·79	4·35
†	21·81	22·74	25·21	25·22	24·41	23·77	22·08	22·77	22·29	24·92	20·23	20·36	22·63

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·07	·06	..	·07	..	·03	·03	·05	·05	·06
2	·30	·34	·36	·34	·42	·37	·39	·39	·36	·28
3	1·06	1·14	1·20	1·15	1·20	1·13	1·12	1·09	1·05	1·23
4	·26	·26	·32	·30	·37	·20	·27	·22	·20	·38
5	1·50	1·45	1·46	1·35	1·45	1·44	1·56	1·47	1·40	1·37
6	·53	·30	·01	·02	..	·01	·01	·01	..	·02
7	..	·56	·52	·41	·50	·36	·41	·44	·35	·39
8	..	·02	..	·01	..	·01	..	·01	..	·02
9	·29	·32	·34	·25	·34	·34	·38	·39	·32	·49
10	·14	·03	·01	·01	..	·02	..	·01	..	·01
11	·01	·07	·15	·11	.09	·11	·13	·10	·04	·05
12	..	..	..	·01	..	·01	·01	..	..	·01
13	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	·01	·01	·01	..	..
15	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..
20	..	·03	..	..	..	..	·01	..	..	..
21	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	·01	·02	..	..	..
29	..	..	..	..	..	·01	..	·01	..	..
30	..	..	..	..	..	..	·01	..	..	..
*	4·18	4·58	4·37	4·03	4·37	4·06	4·36	4·20	3·77	4·31
†	21·43	22·27	22·74	18·32	19·44	19·09	21·06	21·89	17·02	20·84

Day of Mo.	West Molesey	Surbiton	Kingston	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·06	·06		·05	·04	·05	·08	·04		·02	·05	·06	·01	..	·03
2	·27	·29	·30		·37	·47	·50	·39	·44		·39	·37	·28	·25	·38	·25
3	1·23	1·17	1·30		1·23	1·22	1·06	1·11	1·11		1·09	1·12	·98	·88	·91	1·12
4	·36	·30	·40		·23	·23	·24	·25	·21		·35	·24	·28	·31	·32	·24
5	1·23	1·43	1·39		1·39	1·53	1·34	1·44	1·45		1·30	1·37	1·44	1·50	1·50	1·41
6	..	..	..		·02	·02	·01	·01	·03		·02	·02	·01	·02	·03	·01
7	·40	·43	·43		·34	·41	·40	·43	·35		·37	·36	·49	·53	·44	·40
8	·01	..	..		·01	·01	·01	·01	..		..	..	..	..	..	..
9	·52	·46	·62		·41	·41	·38	·34	·31		·32	·32	·33	·31	·34	·26
10	..	..	..		·01	·01	..	·01	..		..	·01	·02	·01	..	..
11	·04	·07	·09		·07	·05	·08	·09	·11		·07	·06	·04	·03	..	·02
12	..	..	..		·01	..	..	..	..		..	·01	..	..	..	..
13	..	..	..		..	..	..	..	..		..	..	..	..	..	..
14	..	..	..		..	..	..	·01	..		..	·01	·01	..	..	..
15	..	..	..		..	..	..	..	..		..	..	..	..	..	..
16	..	..	..	RECORD CEASED.	..	..	..	..	..	RECORD CEASED.	..	..	..	..	..	..
17	..	..	..		..	..	..	..	..		..	..	..	..	..	..
18	..	..	..		..	..	..	..	..		..	..	..	..	..	..
19	..	..	..		..	..	..	..	..		..	..	..	..	..	..
20	·01	..	..		..	..	..	..	..		..	..	..	..	..	..
21	..	..	..		..	..	..	..	..		..	..	..	..	..	..
22	..	..	..		..	..	..	..	..		..	..	..	..	..	..
23	..	..	..		..	..	..	..	..		..	..	..	..	..	..
24	..	..	..		..	..	..	..	..		..	..	..	..	..	..
25	..	..	..		..	..	..	..	..		..	..	..	..	..	..
26	..	..	..		..	..	..	..	..		..	..	..	..	..	..
27	..	..	..		..	..	..	..	..		..	..	..	..	..	..
28	..	..	..		..	..	..	..	..		..	·01	..	..	..	..
29	..	..	..		..	..	..	..	..		..	..	..	..	..	..
30	..	..	..		..	..	..	..	..		..	..	..	..	..	..
*	4·12	4·21	4·59		4·14	4·40	4·07	4·17	4·05		3·93	3·95	3·94	3·85	3·92	3·74
†	19·91	20·11	21·52		19·09	20·32	18·70	20·67	19·26		20·26	20·01	21·83	20·20	21·49	20·56

* The figures in this row give the totals for the month. † The totals from January 1st.

November, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·04	·02	·03	·01	·02
2	·29	·33	·34	·56	·42
3	1·03	·97	1·01	1·14	1·10
4	·21	·16	·14	·20	·16
5	1·34	1·30	1·37	1·44	1·23
6	·01	..	·01	·06	·01
7	·37	·31	·29	·38	·27
8	..	..	..	..	..
9	·41	·33	·36	·40	·35
10	·01	..	..	..	..
11	·01	..	..	·04	·02
12	..	..	..	..	..
13	..	..	..	..	..
14	..	..	..	..	..
15	..	..	..	..	..
16	..	..	..	..	..
17	..	..	..	..	..
18	·01	..	..	..	..
19	..	..	..	..	..
20	..	..	..	..	..
21	..	..	..	..	..
22	..	..	..	..	..
23	..	..	..	..	..
24	..	..	..	..	..
25	..	..	..	..	..
26	..	..	..	..	..
27	..	..	..	..	..
28	..	..	..	..	..
29	..	..	..	..	..
30	..	..	..	..	..
*	3·73	3·42	3·55	4·23	3·58
†	20·86	18·65	17·25	20·75	17·39

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(November, 1899.)

The month has been a very remarkable one. The small number of rainy days, the larger total fall, the absolute drought of, in most cases, nineteen days, the fact of two falls of over 1 in. only separated by a single day, present a curious record; but if we combine this with the extreme mildness of the weather, as shown by the fact of the numberless delicate flowers in blossom at the end of the month, the month has been a most wonderful one for November. It has been very unhealthy, rheumatic affections and scarlet fever being rather prevalent. Thunder and lightning occurred at Nutfield on the 2nd, and lightning only at Nutfield and Croydon on the 8th. Solar halos were seen at Croydon on the 7th, 9th, 12th, and 13th, and a lunar one on the 13th. The observer at Nutfield mentions a magnificent dawn on the 21st. The rainfall for the month is about 1·5 in. above the November average. The mean temperature of the month is about 4° above the average, and was at Croydon (Whitgift) 47·9°, at Waddon 47·7°, at Croydon (Duppas House) and Wallington 47·6°, and at Chipstead 46·2°. Fogs have been somewhat prevalent. There were recorded at Wallington 55·4 hours of sunlight, which is one per cent. above the November average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc.,
Hon. Sec.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* December, 1899.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	Reigate	ReigateHill (Nutw. L.)	Upper Gatton	Merstham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·20	·18	·24	·15	·18	·18	·13	·20	·19	·22	·23
2	..	·02	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..
4	·12	·10	·09	·05	·08	·08	·09	·08	·09	·10	·06
5	·07	·07	·10	·11	·12	·13	·08	·12	·12	·15	·16
6	·05	·05	·06	·10	·07	·08	·06	·03	·08	·09	·08
7	..	·02	..	..	..	..	..	·05	·01	·01	·02
8	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	·02	·01	..	..	..	·02	·02	..
11	·06	·04	·06	·01	·01	..	..	·03	·01	·02	·05
12	·01	·03	..	·13	·08	·08	·12	·09	·12	·12	..
13	..	..	..	..	..	..	..	..	..	..	..
14	..	·02	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..
17	·02	·01	·06	·03	·03	·03	·02	..	·03	·04	·03
18	·02	·04	..	·02	·02	·02	..	..	·03	·06	·06
19	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..
21	·03	·03	·05	·03	·03	·03	..	..	·01	·03	·02
22	·09	·12	·10	·06	·05	·08	·08	..	·05	·03	·05
23	·04	·07	·10	·12	·14	·14	·11	·05	·11	·12	·13
24	·09	·10	·04	·03	·04	·04	·05	·04	·03	·04	·02
25	·03	..	·04	..	·05	·05	..	..	·05	·05	·05
26	..	..	·04	·07	·04	·04	·07	..	·05	..	·06
27	·05	·05	·03	..	·02	·03	·01	..	..	·06	·02
28	·32	·29	·28	·22	·16	·16	·18	·20	·20	·21	·20
29	·37	·35	·41	·26	·18	·25	·22	·23	·22	·23	·23
30	..	·03	·02	·01	·05	·05	·03	·03	·02	·01	·04
31	·04	..	..	·04	·01	·01	..	·03	..	·01	..
*	1·61	1·62	1·72	1·46	1·37	1·48	1·25	1·18	1·44	1·62	1·51
†	27·06	28·34	29·26	24·32	24·00	25·75	23·52	24·37	24 75	27·81	25·18

Day of Mo.	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks (St. Jns.H.)	Warling-ham	Coulsdon	Kenley (Hazelea)	Purley (Tudor C.)	Burgh Heath	Leather-head
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·23	·24	·27	·25	·35	·19			·21	·28	·28	·25	·28		·25
2	..	..	..	..	..	..			..	..	..	..	..		..
3	·01	..	..	..	..	..			..	..	..	..	..		..
4	·08	·07	·08	·07	·24	·09			·10	·09	·07	·09	·09		·10
5	·14	·09	·19	..	·09	·21			·20	·18	·21	·28	·38		·11
6	·08	·06	·09	·28	·09	·10			·08	·14	·05	·05	..		·04
7	..	·01	..	..	..	..			..	·02	·01	·01	·05		·02
8	..	..	..	..	..	..			..	..	..	..	..		..
9	..	..	..	..	..	..			..	..	..	..	..		..
10	·01	·02	..	·06	..	..			·01	·01	..	·01	..		..
11	..	·02	..	..	..	..			·01	..	..	·03	·02		·02
12	..	·11	·03	·04	..	..			·08	·02	..	..	·03		·06
13	..	..	·05	..	..	..			..	·03	..	..	..		..
14	..	..	..	..	..	..			..	..	..	..	..		..
15	·09	..	..	..	..	..			..	..	..	..	..		..
16	..	..	..	..	..	·01	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	..	MONTHLY GAUGE.	..
17	·04	·06	..	·05	·15	..			..	..	..	·06	·03		..
18	·05	·02	·04	..	..	..			·03	·02	·10	·07	·12		..
19	..	..	..	..	..	..			..	..	..	·01	..		..
20	·01	·04	..	..	..	..			..	..	..	..	..		..
21	·02	..	·07	·10	..	..			..	·08	·02	..	·03		..
22	·04	·10	·04	·07	..	..			·02	·03	·03	·03	·05		·05
23	·12	·12	·15	..	·19	·21			·14	·15	·11	·11	..		·19
24	·03	·03	..	..	..	·03			·03	·03	·02	·03	·07		·05
25	·05	·06	·08	·08	·08	·03			·06	·04	·07	·07	·10		·06
26	·05	·05	..	·06	·05	..			·04	·01	·04	..	·02		·06
27	..	..	·06	..	·01	..			·05	·03	·02	·03	..		·02
28	·22	·24	..	·25	·23	·36			·22	·06	·20	·27	·43		·30
29	·24	·26	·40	·25	·22	·29			·23	·38	·20	·26	·32		·34
30	·02	·01	·03	·04	·04	..			·11	·14	·01	·02	..		..
31	·01	..	·01	..	·01	·03			·05	·01	..	..	·04		..
*	1·54	1·61	1·59	1·60	1·75	1·55	1·77	1·32	1·67	1·75	1·44	1·68	2·06	2·17	1·67
†	27·44	27·35	27·79	29·61	27·47	24·48	27·39	20·71	26·40	28·24	23·86	26·23	26·11	26·33	25·48

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1899.**

Day of Mo.	D'Abernon Chase	Oxshott	Banstead	Sutton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·23	·25	·27	·24	·22	·25	·25	·23	·31	·26	·27	·26	·24
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	·01	..	..	..	..	..	..	..	..	·01	..	..	..
4	·12	·10	·08	·08	·06	·08	·07	·08	·09	·09	·10	·11	·09
5	·14	·15	·21	·31	·25	·22	·21	·20	·25	·21	·21	·23	·21
6	·05	·05	·04	·03	·03	·03	·03	·03	·05	·04	·04	·05	·04
7	..	·04	·01	·02	·01	·01	·01	·01	·02	·02	·02	·01	·02
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	·01	·02	·02	·01	·02	..	·01	·02	·01	·01	..
11	·02	..	·01	..	..	..	..	..	..	..	..	..	..
12	·03	·06	·06	·03	·01	·02	·02	..	·01	·01	·02	·02	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	·01	..	..	..	..	·01	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·06	·05	·05	·01	·04	·04	·04	..	·05	·03	·04	·03	·05
18	·07	·05	·09	·11	·10	·09	·09	·12	·10	·12	·10	·09	·10
19	..	..	..	..	..	..	..	..	..	..	·01	..	..
20	..	..	·01	·01	·01	..	..	..	..	..	..	·02	..
21	..	·02	·01	·01	·01	·01	·01	..	·03	·02	·02	·02	·01
22	·05	·06	·07	·06	·07	·05	·05	·05	·06	·03	·06	·07	·01
23	·09	·08	·09	·07	·06	·07	·06	·05	·08	·07	·07	·07	·05
24	·02	..	·03	·03	·02	·03	·03	..	·04	·03	·03	·03	·06
25	·07	·08	·06	·07	·08	·07	·08	·08	·08	·08	·07	·07	·07
26	·02	·04	·05	·08	·03	·04	·04	·03	·05	·05	·04	·05	·04
27	·02	..	·02	·01	·01	·01	·01	..	·01	·01	·02	·01	..
28	·40	·39	·31	·31	·28	·27	·26	·16	·27	·26	·25	·25	·23
29	·30	·30	·31	·30	·29	·29	·27	·20	·35	·28	·30	·29	·26
30	..	..	..	·01	..	..	..	..	·01	..	·01	·01	..
31	..	..	·01	·02	..	..	..	..	..	·01	..	..	..
*	1·70	1·72	1·80	1·83	1·61	1·59	1·55	1·24	1·87	1·66	1·69	1·70	1·48
†	23·46	21·86	25·94	23·01	22·62	22·61	22·27	20·03	23·04	23·37	23·17	23·61	22·04

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·28	·27	·30	·27	·31	·26	·25	·22	·20	·27	·20	·23	·25
2	..	..	..	..	..	..	..	·01	..	..	..	..	..
3	·01	·01	..	·01	..	·02	..	..	..	..	..	..	..
4	·09	·09	·09	·09	·09	·08	·05	·07	·09	·08	·05	·09	·09
5	·22	·23	·24	·23	·15	·20	·20	·21	·21	·22	·18	·19	·20
6	·04	·03	·04	·04	·06	·03	·03	·03	·03	·04	·07	·03	·04
7	·02	·02	·02	·02	..	·02	·02	·01	·01	·02	..	·02	·03
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·02	·03	..	·02	..	·03	·02	·01	..	..	..	..	·02
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·01	·02	..	·01	·01	·02	..	·03	..	·01	·09	..	·02
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	·03	·04	·12	·05	·02	·05	·05	·05	·06	·08	·07	..	·03
18	·11	·09	·05	·10	·15	..	·11	·10	·06	·07	..	..	·07
19	..	..	..	..	..	..	..	·01	..	..	..	..	..
20	·01	·01	..	..	..	·09	..	..	..	..	..	..	..
21	·01	·02	·02	·01	·01	·01	..	·01	·01	..	..	..	·01
22	·06	·05	·04	·03	·01	·04	·03	·03	..	·04	..	..	·06
23	·07	·08	..	·04	·07	..	·04	·08	·09	·10	·14	·20	·06
24	·02	·03	..	·03	..	·10	·03	·02	·02	·06	..	·05	..
25	·07	·06	..	·06	·08	·08	·04	·05	·06	·07	..	·05	·09
26	·05	·04	·08	·04	..	·06	·08	·04	·05	·06	·06	·03	·04
27	..	·02	..	·02	·02	·02	·04	·01	..	..	..	·01	·01
28	·25	·30	·41	·38	·41	·32	·32	·36	·33	·25	·06	·20	·25
29	·26	·30	·29	·30	·30	·29	·27	·30	·27	·25	·44	·15	·26
30	..	·01	..	·01	·01	·03	·02	·04	..	·01	·08	..	..
31	..	·01	·02	·01	..	·01	..	·01	..	·02	..	..	..
*	1·63	1·76	1·72	1·77	1·70	1·76	1·60	1·70	1·49	1·65	1·44	1·25	1·54
†	23·44	24·50	26·93	26·99	26·11	25·53	23·68	24·47	23·78	26·57	21·67	21·61	24·17

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1899.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Thornton Heath	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·23	·22	·25	·21	·25	·21	·24	·23	·19	·21	·22	·20	·25
2	..	..	..	..	..	·01	..	..	..	·02	..	..	..
3	..	..	..	..	..	..	·01	..	..	..	..	..	..
4	·08	·08	·08	..	·09	·07	·07	·09	·05	·06	·05	·05	·06
5	·20	·18	·19	·27	·15	·20	·25	·23	·30	·21	·21	·21	·35
6	·04	·03	·04	·08	·10	·03	·04	·04	·02	·05	·06	·04	·04
7	·02	..	·02	..	..	·01	·01	·01	..	·02	..	·01	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·02	·03	·03	·04	..	·02	..	·03	..	..	..	..	..
11	..	..	..	..	..	..	·01	..	..	·02	..	..	..
12	·03	·05	·04	·04	..	·01	..	·04	·02	·07	·10	·06	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	·02	..	..	..	..	..	..
17	·02	..	·02	·02	..	·02	..	·03	..	·06	·02	·04	·09
18	·08	·10	·09	·08	..	·04	·02	·05	·08	·03	·02	·04	·03
19	..	..	·01	..	..	·01	·05	·01	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·01	..	·01	..	..	·01	·01	·02	·01	·02	·02	..	·02
22	·05	·06	·06	·04	..	·05	·07	·09	·07	·08	·07	·08	·08
23	·06	·07	·07	·06	..	·06	·05	·05	·04	..	·05	·06	·06
24	·05	·04	·05	·04	..	·02	·05	·05	·06	·05	·08	·02	..
25	·06	·06	·07	·06	..	·03	·03	·03	·02	·02	·03	·02	..
26	·05	·03	·04	·04	·35	·05	·03	·04	·03	·06	·03	·03	·04
27	·01	..	·01	..	·06	·01	..	·02	..	·03	·01	..	·01
28	·22	·24	·20	·16	·07	·08	·11	·13	·14	·21	·18	·17	·18
29	·23	·26	·26	·21	·35	·15	·19	·23	·16	·26	·20	·24	·25
30	..	·02	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	·01	..	..	..	..	..	..	..
*	1·46	1·47	1·54	1·35	1·42	1·10	1·26	1·42	1·19	1·48	1·35	1·27	1·46
†	22·89	23·74	24·28	19·67	20·86	20·19	22·32	23·31	18·21	22·32	21·26	21·38	22·98

Day of Mo.	Richmond	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Sydenham	Forest Hill (Dartm. rd.)	Forest Hill (S&VWO)	Sidcup	Wilming-ton	Dartford	Eltham
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	RECORD CEASED.	·25	·22	·18	·24	·24	RECORD CEASED.	·26	·27	·24	·26	·21	·27
2		..	..	..	..	..		..	·01	..	..	..	..
3		..	..	..	..	..		..	..	..	..	..	·01
4		·07	·07	·07	·08	·08		·08	·08	·10	·06	·05	·07
5		·21	·22	·20	·21	·21		·20	·20	·19	·18	·17	·27
6		·05	·06	·05	·06	·05		·05	·06	·05	·06	·05	·06
7		·01	·01	·02	·02	·02		..	·01	·04	·02	..	·03
8		..	..	..	..	..		..	..	..	..	..	..
9		..	..	..	..	..		..	..	·01	..	..	..
10		·02	·01	·02	·01	·01		·03	·02	..	..	..	..
11		..	..	..	..	..		·05	..	..	·02	..	·01
12		·05	·05	·03	·02	..		..	·02	·02	·01	..	·03
13		..	..	..	..	..		..	..	..	..	..	..
14		..	..	..	..	..		..	..	..	..	..	..
15		..	..	..	..	..		·02	..	..	..	..	..
16		..	..	..	..	..		..	..	..	..	..	..
17		·03	·03	..	·03	..		..	·02	..	·05	·15	·02
18		·03	·04	·05	·06	·10		·02	·03	·07	·03	..	·03
19		..	..	..	·01	..		·03	·01	·02	..	..	..
20		..	..	·01	..	..		·02	..	..	..	..	..
21		·02	·01	·01	·02	·02		·01	·01	·02	..	..	..
22		·06	·06	..	·05	·07		..	·04	·05	·04	·05	·03
23		·06	·06	·11	·06	·05		·06	·07	·08	·09	·08	·07
24		·02	..	..	·04	..		·04	·02	·05	·02	..	·01
25		·03	·04	·08	·04	·07		..	·06	·08	·05	·05	·04
26		·06	·03	·06	·05	·06		·06	·05	·05	·03	·03	·03
27		·01	..	·01	·01	..		..	·01	·02	..	..	..
28		·13	·17	·12	·14	·16		·11	·14	·25	·20	·28	·20
29		·19	·19	·10	·22	·16		·22	·24	·22	·21	·20	·20
30		..	..	..	..	..		·04	..	..	..	..	..
31		..	..	..	..	..		·02	·01	·02	·02	..	..
*		1·30	1·27	1·12	1·37	1·30		1·32	1·38	1·58	1·35	1·32	1·38
†		20·39	21·59	19·82	22·04	20·56		21·58	21·39	23·41	21·55	22·81	21·94

* The figures in this row give the totals for the month. † The totals from January 1st.

December, 1899.

Day of Mo.	Greenwich	Deptford	Nunhead	Brixton	Battersea
	IN.	IN.	IN.	IN.	IN.
1	·29	·24	·21	·25	·21
2	..	..	..	..	..
3	·01	..	..	..	..
4	·11	·08	·06	·06	·07
5	·23	·18	·18	·20	·17
6	·06	·05	·03	·05	·04
7	·05	·01	·01	..	..
8	..	..	..	..	..
9	..	..	..	..	..
10	·02	·02	..	·03	..
11	..	..	..	..	..
12	·03	·04	..	·02	..
13	..	..	..	..	·01
14	..	..	..	..	..
15	..	..	..	..	·01
16	..	..	..	..	..
17	·02	..	..	·04	..
18	·02	·01	..	·03	·01
19	..	..	·01	..	..
20	..	..	..	·01	..
21	·01	..	..	·01	..
22	·03	·02	·05	·06	·02
23	·06	·05	·04	·06	·04
24	..	..	..	·01	·01
25	·05	·05	·05	·05	·05
26	·05	·04	·03	·05	·02
27	·01	..	..	..	..
28	·18	·13	·15	·16	·11
29	·24	·18	·15	·19	·15
30	..	..	..	..	..
31	..	..	..	..	..
*	1·47	1·10	·97	1·28	·92
†	22·33	19·75	18·22	23·03	18·31

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill (Nutwood Lodge), Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

(December, 1899.)

The month has been damp, cold, and exceedingly unhealthy, more especially towards the end. The rainfall is about half-an-inch below the average, but the number of rainy days is greatly in excess. Snow fell on five days, but the principal fall was on the 12th, when the average depth was about an inch. The observer at Sidcup reports that *Cydonia japonica* was in bloom on the 8th. Fogs have been somewhat prevalent, especially on the 7th, 15th, 18th, 19th, 20th, and 23rd. With respect to the last-mentioned day, the observer at Nutfield reports that "a dense wall of fog rolled up from the south, and in ten minutes one could not see a yard in front." Influenza, chest affections, and rheumatism have been exceedingly prevalent, and many deaths have occurred throughout the district. The self-recording barometer at Wallington fell to 28·40 in. at 5 p.m. on the 29th. Solar halos were seen at Upper Gatton on the 9th, 20th, and 26th, and at Croydon on the 9th and 26th; whilst lunar halos were seen at Upper Gatton on the 10th, 11th, and 13th, and at Croydon and Wallington on the 10th and 13th. At Croydon the maximum thermometer was between 50° and 51° on two days, between 40° and 49° on nine days, between 30° and 39° on nineteen days, and under 30° on one day; whilst the minimum thermometer was 40° and above on four days, between 30° and 39° on nine days, between 20° and 29° on fifteen days, and below 20° on three days. The observer at Redhill reports that on three days the temperature did not rise in the shade at any time above 32°. The mean temperature of the month is about 2·5° below the average, and was at Croydon (Whitgift) 36·8°, at Croydon (Duppas House) 36·3°, at Chipstead and Wallington 36·1°, and at Waddon 35·7°. There were recorded at Wallington 37·9 hours of sunlight, which is one per cent. below the December average of the ten years 1886–95.

F. Campbell-Bayard, P.R.Met.Soc., *Hon. Sec.*

APPENDIX II.

Falls of 1·00 in. and upwards.

July 23rd.—Dorking (Denbies) 1·42 in.; Caterham 1·32 in.; Harp's Oak Cottage 1·31 in.; Chaldon 1·14 in.; Upper Gatton 1·13 in.; Eltham 1·08 in.; Deptford 1·00 in.

September 6th.—Wandsworth Common 1·12 in; Brixton 1·01 in.

September 29th.—Dorking (Denbies 1·47 in.; Buckland 1·37 in.; Abinger (The Hall) 1·26 in.; Abinger (Rectory) and Banstead 1·24 in.; Southfleet and Wimbledon (Mt. Ararat) 1·21 in.; Redhill 1·20 in.; Upper Gatton 1·19 in.; Reigate and D'Abernon Chase 1·17 in.; Farningham Hill and Esher 1·15 in.; Reigate Hill (Nutwood Lodge) and Hayes Common 1·13 in.; Leatherhead 1·12 in.; Oxshott 1·11 in.; Chaldon and Dartford 1·10 in.; Addington Hills and Raynes Park 1·09 in.; Addington (Pumping Station) and Keston (Bradfield) 1·07 in.; West Molesey 1·06 in.; Sevenoaks (St. John's Hill) and Kingston 1·05 in.; Nutfield (new gauge) and Wilmington 1·04 in.; Nutfield (old gauge), Sutton, Addington (Park Farm), and West Norwood 1·03 in.; West Wickham (Wickham Court) and Beckenham 1·02 in.; Westerham (Town) 1·01 in.; Chipstead, Surbiton, Putney Heath, and Nunhead 1·00 in.

October 27th.—New Malden and Kingston 1·20 in.; West Molesey and Wandsworth Common 1·18 in.; Surbiton 1·16 in.; Esher 1·15 in.; Thornton Heath 1·14 in.; D'Abernon Chase 1·10 in.; Wimbledon (Mt. Ararat), Putney Heath, Forest Hill (Dartmouth Road) and Brixton 1·06 in.; Oxshott and Forest Hill (Southwark and Vauxhall Water Co.) 1·05 in.; Raynes Park, West Norwood, and Greenwich 1·02 in.; Dorking (Denbies), South Norwood, and Upper Norwood 1·00 in.

November 2nd.—Buckland 1·34 in.; Westerham (Town) 1·02 in.

November 3rd.—Abinger (Rectory) 2·18 in.; Upper Gatton 1·78 in.; Abinger (The Hall), Harp's Oak Cottage, and Chaldon 1·70 in.; Caterham 1·68 in.; Warlingham 1·67 in.; Chipstead 1·56 in.; Reigate 1·53 in.; Reigate Hill (Nutwood Lodge) and Merstham 1·52 in.; Dorking (Denbies) 1·50 in.; Redhill 1·45 in.; Purley (Tudor Cottages) 1·43 in.; Leatherhead 1·40 in.; Banstead 1·38 in.; Nutfield (new gauge) 1·36 in.; Kenley (Hazelea) 1·35 in.; West Wickham (Wickham Court) 1·34 in.; Addington (Pumping Station) 1·33 in.; D'Abernon Chase 1·32 in.; Sutton and Kingston 1·30 in.; Coulsdon 1·28 in.; Hayes Common 1·26 in.; Keston (Bradfield) and Farningham Hill 1·25 in.; Croydon (Windmill Road), Addington Hills, and Orpington 1·24 in.; Westerham (Town), Croydon (Woburn Road), Addington (Park Farm), Esher, West Molesey, and Putney Heath 1·23 in.; Wandsworth Common 1·22 in.; Oxshott 1·21 in.; Nutfield (old gauge), Wallington, Beckenham, and Thornton Heath 1·20 in.; Beddington and Croydon (Brimstone Barn) 1·19 in.; Croydon (Duppas House) 1·18 in.; Surbiton 1·17 in.; Croydon (Waddon New Road) 1·16 in.; South Norwood 1·15 in.; Waddon, Croydon (Whitgift), Croydon (Park Hill), Bromley Common, and Brixton 1·14 in.; Wimbledon (Sewage Works) 1·13 in.; Wimbledon (Mt. Ararat), Forest Hill (Southwark and Vauxhall Water Co.), and Eltham 1·12 in.; Farnborough, West Norwood, and Upper Norwood 1·11 in.; Southfleet, Bickley, and Battersea 1·10 in.; Raynes Park and Forest Hill (Dartmouth Road) 1·09 in.; Bromley and Streatham 1·06 in.; New Malden 1·05 in.; Greenwich 1·03 in.; Nunhead 1·01 in.

November 5th.—Sevenoaks (St. John's Hill) 1·85 in.; Westerham (Hill Estate) 1·74 in.; Farningham Hill 1·69 in.; Westerham (Town) 1·68 in.; West Wickham (Wickham Court) 1·62 in.; Keston (Bradfield) and Southfleet 1·60 in.; Warlingham 1·59 in.; Dorking (Denbies) and Bickley 1·57 in.; Wimbledon (Mt. Ararat) 1·56 in.; Abinger (The Hall) 1·55 in.; Merstham 1·54 in.; Nutfield (old gauge), Reigate, Orpington, and Wandsworth Common 1·53 in.; Nutfield (new gauge) 1·52 in.; Chipstead, Purley (Tudor Cottages), Banstead, and Croydon (Whitgift) 1·51 in.; Leatherhead, D'Abernon Chase, Addington (Park Farm), Hayes Common, Bromley, Wilmington, and Dartford 1·50 in.; Buckland and Wallington 1·49 in.; Abinger (Rectory), Chaldon, Sutton, Croydon (Waddon New Road), and Croydon (Windmill Road) 1·48 in.; Raynes Park 1·47 in.; Oxshott and Beckenham 1·46 in.; Redhill, Reigate Hill (Nutwood Lodge), Caterham, Croydon (Duppas House), Addington (Pumping Station), Bromley Common, Thornton Heath, and Upper Norwood 1·45 in.; Upper Gatton, Harp's Oak Cottage, Beddington, Farnborough, Wimbledon (Sewage Works), West Norwood, Sidcup, and Brixton 1·44 in.; Surbiton 1·43 in.; Eltham 1·41 in.; Kenley (Hazelea), Croydon (Woburn Road), Chislehurst, and New Malden 1·40 in.; Coulsdon, Waddon, Kingston, and Putney Heath 1·39 in.; Addington Hills 1·38 in.; Esher, Forest Hill (Southwark and Vauxhall Water Co.), and Nunhead 1·37 in.; Croydon (Park Hill) and South Norwood 1·35 in.; Streatham and Greenwich 1·34 in.; Croydon (Brimstone Barn), Forest Hill (Dartmouth Road), and Deptford 1·30 in.; West Molesey and Battersea 1·23 in.

146.—Notes of Ground Temperature during 1899.

By H. F. Parsons, M.D., F.G.S.

(Read February 20th, 1900.)

The annexed table shows the means of daily readings of thermometers in the ground at depths of 1 ft. and of 4 ft. for periods of four weeks in 1899, as compared with the average of the three previous years 1896–8.

The general course of the rise and fall of temperature in the soil has been described by me in former papers read before the Club. The special features of 1899, as compared with the previous triennial average, were, first, the steady fall of the ground temperatures from January to March, due to the spell of cold weather in the latter part of February and March; and, second, the high and sustained temperature of the ground in the latter part of the summer, due to the hot and dry weather which prevailed in July, August, and the earlier part of September.

Of the 1 ft. thermometer the lowest reading was 35·2° on March 25th, against 36·9° in 1898, 34·2° in 1897, and 35·8° in 1896. (During the long frost of 1895 the thermometer was below 32° for about a fortnight; but being frozen into the tube, the lowest reading could not be ascertained.) The highest temperature in 1899 was 71·7° on July 22nd, which is higher than any reading in the three previous years; the highest in 1898 and 1897 having been 69°, and in 1896 71·1°.

Of the 4 ft. deep thermometer the lowest reading in 1899 was 41·7° on March 27th and 28th, against 42·0° in 1898, 39·7° in 1897, and 42·0° in 1896, and 37·4° in 1895. The highest temperature in 1899 was 64° on August 5th–8th, against 62·3° in 1898, 63·5° in 1897, and 62·6° in 1896.

The 4 ft. thermometer stood at or above 56° from June 12th to October 8th = 119 days, against 113 days in 1898 and 1897, and 123 days in 1896.

The hot dry weather of the summer of 1899 was unfavourable to health, epidemic diarrhœa having been more fatal than in any year since 1884, and enteric fever more fatal than in any year since 1893; while the infant mortality was the highest on record in any year since 1848. It would seem as if the effect of hot summers in the production of epidemic diarrhœa were cumulative: 1899 is the fourth hot dry summer in succession, and the death-rate from diarrhœa has steadily increased from 55 per 100,000 persons living in 1896, to 98 in 1899.

Earth Temperatures.

Periods of 4 weeks.

	Average 1896–98.		*1899.*	
PERIOD.	1 FT.	4 FT.	1 FT.	4 FT.
1	40·2	43·8	41·8	45·4
2	40·8	44·9	40·8	43·8
3	41·7	43·2	38·3	42·7
4	45·8	45·4	45·9	44·6
5	51·7	48·8	50·8	48·2
6	58·8	53·5	59·4	53·4
7	63·8	58·0	64·0	58·2
8	64·8	61·0	68·5	62·6
9	60·1	60·5	66·2	63·0
10	56·9	58·2	56·2	59·1
11	50·1	54·0	49·0	52·9
12	44·4	49·2	46·7	50·7
13	41·3	45·9	38·4	45·4

CONTENTS.

Croydon Microscopical and Natural History Club.

OFFICERS FOR 1900.

PRINTED BY WEST, NEWMAN AND CO., HATTON GARDEN, LONDON.

PROCEEDINGS & TRANSACTIONS

OF THE

CROYDON MICROSCOPICAL & NATURAL HISTORY CLUB.

FEBRUARY 20. 1900, TO JANUARY 15, 1901.

CROYDON:

PRINTED FOR THE CLUB, BY WEST, NEWMAN AND CO.,
HATTON GARDEN, LONDON.

—

1901.

PROCEEDINGS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1900–1901.

Thirty-first Annual Meeting,

Held at the Public Hall, Croydon, January 15th, 1901.

Wm. Whitaker, B.A., F.R.S., P.G.S., in the chair.

The Statement of the Accounts for 1900 was approved.

The President announced that the following gentlemen had been nominated as Officers of the Club for the ensuing year, and there being no other nominations they were duly elected :—

President.—Jas. Epps, Jun., F.L.S.
Vice-Presidents.—John Berney, F.R.M.S.; Henry S. Eaton, M.A., F.R. Met. Soc.; Henry T. Mennell, F.L.S.; Henry G. Thompson, M.D., J.P.; Edward Lovett; H. Franklin Parsons, M.D., F.G.S.; W. Murton Holmes; J. M. Hobson, M.D., B.Sc.; William Whitaker, B.A., F.R.S., F.G.S.
Hon. Curator of Museum.—N. F. Robarts, F.G.S.
Hon. Lanternist.—J. H. Baldock, F.C.S.
Hon. Librarian.—Alfred Roods.
Hon. Treasurer.—F. J. Townend.
Council.—W. Bruce Bannerman, F.G.S.; J. Edmund Clark, B.A., B.Sc., F.G.S.; George Clinch, F.G.S.; A. Fitzgerald; R. F. Grundy; A. J. Hogg; E. Pierce; W. W. Topley; J. Watson Slack.
Hon. Secretary.—Geo. W. Moore, Bryndhurst, Dornton Road.

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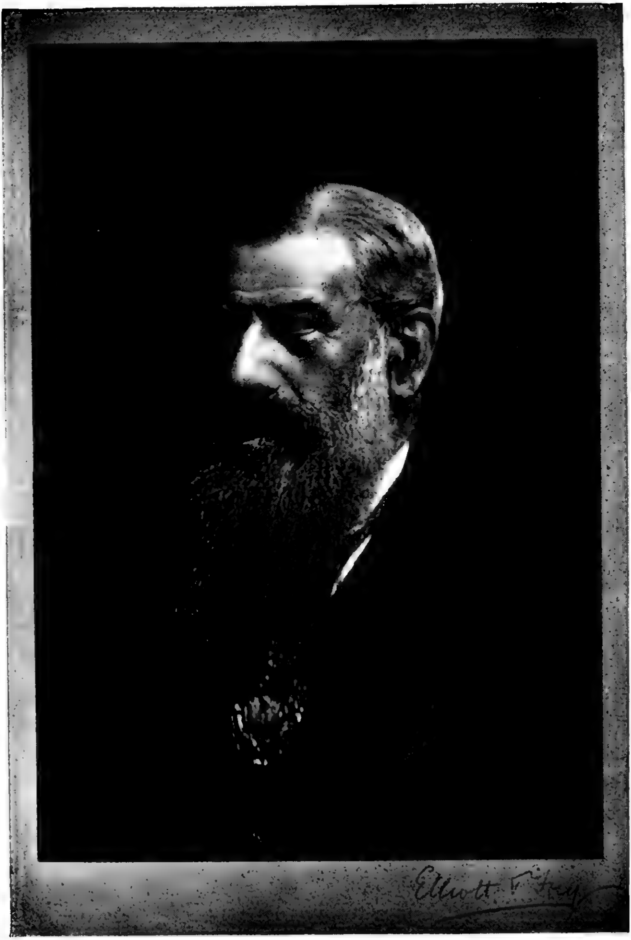

PHILIP CROWLEY, ESQ., F.L.S., F.Z.S.,

TREASURER OF THE ROYAL HORTICULTURAL SOCIETY,

AND

MASTER OF THE WORSHIPFUL COMPANY OF GARDENER

Mr. Mennell at the opening of the meeting said:—

"I feel that our first duty, though a mournful one, to-night, is to refer to the great loss the Club has sustained since its last meeting in the death of our friend and colleague, Mr. Philip Crowley.

"It is the lot of us who are older to see our leaders dropping away one by one, and it is with some anxiety that we look for those who are ready to take their and our places.

"Mr. Crowley's is a loss that it will be difficult to replace. To the personal qualifications, the knowledge, and the zeal which distinguished him, were added in his case all the material advantages of wealth and position, which enabled him to serve the Club so well.

"He was our President in the years 1881 and 1882, and, previously to that, for many years our Treasurer. Subsequently, and up to the time of his decease, he was one of our Vice-Presidents, and, until within the last year or two, he was rarely absent from our meetings.

"His superb collections, especially of Diurnal Lepidoptera, Birds, and their Nests and Eggs, were ever at the service of the Club, and it would be difficult to imagine a Soirée without the valuable and constantly varied contributions from his vast collections.

"Many of our members will long remember the pleasant evenings spent at Waddon, when his treasures were freely opened to them, and on several occasions Mr. Crowley has obtained the services of eminent men, travellers, and naturalists, to lecture, on his invitation, to the members and their friends.

"I think it is fitting that we should place on record our sense of the loss we have sustained, and respectfully tender to those nearest to him the expression of our sincere sympathy with them in their loss.

"I beg to move that the Officers of the Club be instructed to carry this into effect."

This proposal, having been seconded, was most cordially adopted by the meeting.

By the courtesy of the Royal Horticultural Society, through their Secretary, the Rev. W. Wilks, and the liberality of our new President, we are able to give to our members an admirable portrait of Mr. Crowley, prepared for the Transactions of the R. H. Soc.

Mr. Crowley was the son of Mr. Abraham Crowley, of Alton, and was born on August 28th, 1837. Very early in life he displayed a strong love for Natural History, especially for Ornithology.

He was for many years Treasurer of the Royal Horticultural Society, and Chairman of its Fruit and Vegetable Committee.

In both capacities his services to the Society have been of the greatest value.

He was also at the time of his death Master, for a second term, of the Worshipful Company of Gardeners.

His death took place after a brief illness on the 20th December, 1900, in the 64th year of his age, and he was interred in the Churchyard at Shirley on the 24th December, his friend and colleague, the Rev. W. Wilks, the vicar, conducting the last sad offices.

His valuable collections have been by his will placed at the disposal of the Natural History Museum, South Kensington, to select from them such specimens as they need to complete their own series.

The usual summary of the Proceedings and Meetings of the year has been prepared by the Editorial Committee, and follows the Address.

Address of the President,
Wm. Whitaker, B.A., F.R.S., F.G.S.

Some Notes on Surrey Science.

Ladies and Gentlemen,

Last year I brought under your notice what had been done, outside our Club, for the Geology of our county in the past ten years. I have tried to carry on this work for other sciences, but need hardly say that the work soon proved to be too great, so that my notes had to be limited to one branch of natural science, besides my own special one. For valuable notes on other branches of Natural History, the 'Proceedings' of the kindred Holmesdale Club and the 'Surrey Magazine' should be referred to by those who are studying the Natural History of the county.

Meteorology.

As our Club does regular systematic work in this subject, an account of some of the papers published elsewhere that refer to the Meteorology of the county may be the more acceptable. I have therefore carefully gone through the 'Journal of the Royal Meteorological Society' and the 'Proceedings' of the Holmesdale Club, leaving those specially interested to look up other works. It is needless to refer to Symons's 'British Rainfall,' or to his 'Meteorological Magazine.'

1890.

W. Marriott. Distribution of Thunderstorms over England and Wales, 1871–1887.*

* Quart. Journ. Meteor. Soc., vol. xvi, p. 1.

It may be satisfactory to know that we are to the front. The division (the same as that of the Registrar-General) in which Surrey is placed has the greatest frequency (58·4), with the greatest number of summer thunderstorms (43·7), and the second greatest number of winter storms (14·7).

C. Harding. The Cold Period at the beginning of March.*

On the 4th "the greatest area of cold was situated over Kent and Surrey"; the minimum temperature recorded in Surrey being 5·4° at Beddington.

A short abstract of a paper on the possibility of forecasting weather by means of monthly averages is based on "averages for monthly mean temperature and rainfall for Croydon for 25 years," and the "forecasts have been published in the two best local papers," with satisfaction to the author.

Capt. J. P. Maclear. On the Action of Lightning during the Thunderstorms of June 6th and 7th, 1889, at Cranleigh.†

He tried to find out the cause of selection of particular trees, &c. On June 6th, the objects noted were mostly "in a line North-west and South-east, three miles in length," and the like was found to be the case on June 7th. The storm passed N.W. with a S.E. wind.

The oak was the most frequently struck tree; he thinks, not because they were more common, but because "the roughness of the bark causes gaps of its continuity as a conductor." Other trees were struck, "but it is said that the beech is never struck."

There are two kinds of injury to trees, the most common a score out of the bark of the trunk, out along a limb, and then to the outer twigs. "In these cases I imagine that the rain is falling, and streams of water are running down the sides of the tree, forming a conductor which becomes insufficient, at the time of discharge, to carry off all the electricity, and therefore becomes so suddenly converted into steam as to blow out the bark."

"The other form is the shattering of the tree, which I imagine to occur when the electricity is insufficiently carried off by the outer surface."

He concludes "that the causes of selection of objects struck appear too slight to be readily perceptible, or to enable one to say beforehand that such and such an object will probably be struck," and he asks observers to note the surrounding conditions of objects that are struck.

W. H. Tyndall gave a Report on the Meteorology of Redhill for 1887 and for 1888.‡

T. P. Newman, in a paper on Fog, instanced the railway-

* Quart. Journ. Meteor. Soc., vol. xvi, p. 152.

† *Ibid.*, pp. 229–232.

‡ Proc. Holmesdale Nat. Hist. Club for 1888–9, published 1890, pp. 1–5, 37–40.

cutting between Forest Hill and New Cross as a sheltered place in cold soil (clay), and therefore subject to fog, and noted a spring at Haslemere from which a mist rises during sharp frost, the temperature of the water being then much higher than that of the air.*

1891.

S. Rostron noted remarkably low temperature at Beddington on November 28th, 1890—down to 2·3°, the thermometer on the snow as low as −8°. "The minimum must have been about 5 p.m., the extreme cold lasting only a few minutes."†

1892.

F. J. Brodie. On the Prevalence of Fog in London . . . 1871 to 1890.‡

B. Latham. Evaporation and Condensation (Address §).

Calls attention to a number of experiments that he had made in Croydon, "which throw some light upon the conditions which promote or check evaporation." Detailed accounts of the investigations are given, and the results of those made with a floating evaporator of a foot diameter are that "the annual average amount of water evaporated in these thirteen years was 19·948 inches; but at certain times there was condensation, and this averaged a little over three-tenths of an inch a year. With an evaporator of five inches diameter freely exposed to air, there was an average annual depth of evaporation equal to 38·185 inches." The chief factor in evaporation is movement of the air; sunshine is of more limited effect.

A curious result of our Park Hill railway-cutting is noticed. It diverted water from the drainage-area of the River Graveney, reducing this from 8·35 to 7·8 square miles.

1893.

R. H. Scott. Fifteen Years' Fogs in the British Islands, 1876-1890.||

"If we take the winter first, as being the foggiest season, the greatest number of fog observations is in the Thames Valley and Yarmouth. The six months total, October to March, being for London 680" (p. 230). But it is satisfactory to know that a prevalent idea as to the increase of fogs in London is baseless, "neither in any monthly nor in the annual curve is there any

* Proc. Holmesdale Nat. Hist. Club for 1888–9, published 1890, p. 7.

† Quart. Journ. Roy. Meteor. Soc., vol. xvii, p. 42.

‡ *Ibid.*, vol. xviii, p. 40.

§ *Ibid.*, pp. 53–67.

|| *Ibid.*, vol. xix, pp. 229, &c.

trace of a regular increase" (p. 232). The extension of buildings, and therefore of chimneys, is perhaps the cause of the idea.

W. H. TYNDALL's Meteorological Notes, Redhill,* were continued later in 1896† (for 1892–4) and in 1899‡ (for 1895–7).

1894.

A. E. WATSON. On Changes in the Character of Certain Months.§

Based on "records kept at Croydon," which show that the January rainfall has decreased, so that "from being, as it was from 1866 to 1875, by far the wettest month of the year, it has been, from 1881 to 1890, almost . . the driest." December also shows a decrease, but November an increase, as also May.

December seems also to show a decrease in mean temperature, but January some increase. October, again, is colder. The conclusion (p. 62) is that "the character of particular months may change, as time goes on, to a very marked extent."

W. MARRIOTT. Audibility of "Big Ben" at West Norwood under certain Meteorological Conditions.‖

Naturally the audibility was greatest at the times of least noise, as on Sunday evenings. The bell "was most frequently heard with winds from West to North, and less frequently with winds from South to East" (244); also "the percentage of audibility was greater with the low and high readings of the barometer than with the intermediate readings" (245). "The conditions most favourable for audibility are when a cyclonic disturbance is to the eastward of London, or when an anticyclonic area is in the neighbourhood. Under some such circumstances there is a tendency for the wind to blow as a downward current."

1895.

H. B. GUPPY. Suggestions as to the Methods of determining the influence of Springs on the Temperature of a River, as illustrated by the Thames and its Tributaries.¶

Treats largely of Surrey rivers, and says, that "small tributaries, like the Malden River [Hogsmill] and the Wandle . . . chiefly fed by head-springs, are under the control of the springs for the whole of their courses," that is to say, their temperature varies less than in the case of longer streams. He concludes that "affluents mainly fed by head-springs and up to ten miles in length never get beyond the control of the temperature of

* Proc. Holmesdale Nat. Hist. Club for 1890–2, pp. 1–4, 23–31, 71–76.
† *Ibid.* for 1893–5, pp. 16–21, 37.
‡ *Ibid.* for 1896–8, pp. 7–11, 45–53, 82–92.
§ Quart. Journ. Roy. Meteor. Soc., vol. xx, pp. 59, &c.
‖ *Ibid.*, pp. 243, &c.
¶ *Ibid.*, vol. xxi, pp. 1–11.

the springs; that those twenty-five miles long are able to free themselves from their sway; and that rivers forty to fifty miles in length are not affected by the springs beyond the upper half of their course."

Tables of the temperatures of the Wandle and of the Hogsmill at various points are given.

J. Bartlett gave an account of the destruction of trees at Bramley and Wonersh, near Guildford, in a paper by Marriott on the storm of January 23rd*; but "the whole devastation was limited to a line of a little more than a mile in length."

G. J. Symons and G. Chatterton. The November Floods of 1894 in the Thames Valley.†

Refer to our county on pp. 194, 204, and give a chronological list of Thames Floods from the year 9.

R. H. Curtis. Hourly Variation of Sunshine at Seven Stations in the British Isles.‡

One of the stations is Kew, which holds the third place in average daily duration for a year (over a period of ten years), the maximum duration being in May. Pl. xii. shows the curves for mean diurnal variation for each month, and for the year, during the years 1881–90.

1896.

R. Inwards. Meteorological Observatories.§

Kew Observatory, which apparently is in Richmond, is described on pp. 89–92. It was established in 1769, as the King's Observatory, for astronomical purposes, which use ceased about 1840. Here "all English thermometers, with any pretensions to accuracy, are sent for examination and certificate." Other instruments also are tested, "while watches and chronometers, after having been duly baked, frozen," &c., "are sent out with a certificate of the number of marks attained." After this, probably you will not be surprised to hear that "the Kew certificate adds considerably to the selling price of any instrument."

Various original observations have also been made.

1897.

Hon. F. A. R. Russell. Haze, Fog, and Visibility.||

Most of the observations as to haze were made at Haslemere. "The frequent prevalence of haze during a dry North-east wind" was unexpected; but was found to occur when that wind prevailed only to a comparatively small height, with the upper

* Quart. Journ. Roy. Meteor. Soc., vol. xxi, p. 104.
† *Ibid.*, pp. 189, &c.,
‡ *Ibid.*, p. 216.
§ *Ibid.*, vol. xxii, p. 81.
|| *Ibid.*, vol. xxiii, p. 10.

air moving westward or southward, and when the maintenance of the N.E. wind was short, so that this is in favour of the view that haze is caused by the mixture of winds. It would seem, therefore, that it is equally inadvisable to mix your winds as to mix your liquors.

Mr. Russell also gave the "Results of Observations on Haze and Transparency near Haslemere."*

These observations were made at a height of 630 ft. above the sea.

"On fifty-seven days [in the year 1895] the views were visible to a distance estimated between twenty-two and forty-nine miles."

"The season of greatest clearness corresponds with that during which the upper and lower currents are most similar, and the mean temperatures of sea and land most in agreement."

Early rising is not altogether commended, for we are told that "the early hours of the morning are, in general, hazy or misty."

"The clearest hours . . are about the middle of the day, say noon to 3 p.m."

"The clearest winds are those from" W.S.W., W., and W.N.W.

It is not satisfactory to hear that "at any distance within one hundred miles of London, or of the Black Country, observations requiring clear views are likely to be interfered with when the wind blows from those localities."

E. Mawley. Shade Temperature.†

Some of the observations were made on his lawn at Croydon (pp. 78–80); but I am sorry to say that he has migrated northward into Herts.

One may note that the Phenological Observations reported on by this author at various times refer to Surrey amongst other districts.

R. C. Mossman. The Non-Instrumental Meteorology of London, 1713–1896.‡

Many MSS. Registers are referred to, amongst them one kept at Richmond from 1713 to 1745.

The year of least thunderstorms was 1729, with but one. The most (twenty-five) occurred in 1878 and 1880. The foggiest year was 1873, with seventy-four fogs. "The great increase of fog during recent years" is alas shown. The snowiest winter was in 1887, 8, with forty-three days, whilst that of 1862, 3 was snowless.

In the following year this author returned to the subject, with two papers under different titles, but with no special reference to Surrey.

* Quart. Journ. Roy. Meteor. Soc., vol. xxiii, pp. 145–154.
† *Ibid.*, p. 69.
‡ *Ibid.*, pp. 287–298.

C. Harding. Hailstorm in the South-west of London, April 27, 1897.*

The neighbourhood of Streatham Hill seems to have been the most affected, the chief damage being to plants.

The limits of the storm are shown on a map. They reach from New Malden on the S.W., by Wimbledon, Tooting, Streatham, and Camberwell, to Old Kent Road on the N.E.

1898.

Hon F. A. R. Russell. Results of Observations on Haze and Transparency in 1897.†

In this case, again, the observations were mostly made at Haslemere, and they show some difference in results with those of 1895.

1899.

R. H. Scott. On the Heavy Falls of Rain recorded at the Seven Observatories connected with the Meteorological Office, 1871–1898.‡

Kew is noticed on p. 323, but it did not have any of the worst falls.

W. Marriott. The Tornado at Camberwell, October 29, 1898.§

This has been described as "the most terrible windstorm that has ever been experienced in the metropolis"; but how the 'South London Observer' knows this can only be explained on the principle of the infallibility of the newspaper. The author, however, agrees that this newspaper "fairly described the damage that had been done," and adds that "the area affected was about half a mile in width and half a mile in length," which tempts one to ask what is the difference between length and width? The area is shown as an ovoid on the map. Judging from the direction of fallen trees, &c., "the blast must have come from the North-east." Luckily, it lasted "only two or three minutes," which seems to have been enough for much damage.

The Reports of Medical Officers of Health often contain matter of scientific interest, apart from technical questions of public health. As an example, the Report of Dr. E. C. Seaton to the Surrey County Council for 1899 contains a short paper by our member, Mr. F. C. Bayard, on the "Meteorology of Surrey" (pp. 30–34), from which we learn that the year was the sunniest since the invention of the sunshine-recorder. We have also remarks on "Domestic Water Supplies," by Dr. Seaton (pp. 60–77), in which the important question of the protection of water-supplies is noticed.

* Quart. Journ. Roy. Meteor. Soc., vol. xxiii, pp. 298–304.
† *Ibid.*, vol. xxiv, pp. 207–210.
‡ *Ibid.*, vol. xxv, p. 317.
§ *Ibid.*, pp. 19–23.

Water Supply.

Before returning to Geology, the subject of last year's Address, some papers, &c., referring to Water Supply, may be conveniently noticed together. Two of these escaped noticed before; but the others are of late date.

1894.

G. Hodson. Epsom Local Board of Health. Report . . on the Water Supply to the Town. Fol. Pp. 29.

Describes the existing works and the sources of supply, with an outline of the geology. Gives a chemical report on the water by Dr. E. Frankland, with an analysis. Other analyses by Dr. Jacob and Dr. Stevenson are also given. All show the water to be pure.

The water in an eighteen inch bore-hole stands seven feet above that in shallower bores, and is slightly harder.

1891.

B. Latham, "The Relation of Ground Water to Disease."*

In this Presidential Address, our member, as is not unnatural, deals "more especially with the records of Croydon"; but you may be surprised to hear that one reason for this is that we have "a comparatively perfect register of Baptisms and Burials, going back to . . 1539."

That Mr. Latham has laboured long in observations on underground water is well known to us, and that he spares neither trouble nor cost in this work; so that his words are weighty.

We learn many things: for instance, "that the incidence of disease in Croydon three hundred years ago did not differ greatly from what is observed at the present time"; that, although cold is shown to affect health, yet, "in all probability, cold is not an important factor as affecting the health of children under five"; that "the deaths of children increase in a remarkable degree at the period of low ground water, and the death rate fluctuates in a singular manner compared with the variation in the annual amount of ground water . . being . . greatest with the lowest ground water."

However, "certain diseases are more rife when the water is high in the ground, and others when the water is low," but, on the whole, "periods of drought mark the periods of disease," and "wet summers are usually healthy," which is some consolation for bad weather.

The occurrence of fever-epidemics in Croydon in connection

* Quart. Journ. Roy. Meteor. Soc., vol. xvii, pp. 1–18.

with lowness of water is gone into in detail. Measles go the other way, and apparently whooping cough.

I may be allowed to notice a Report as to the future source of Water Supply, made by myself to the Corporation of Croydon, and printed in vol. xiii. of their Records (pp. 103–110).

1900.

ANON. Some Deep Borings in London.*

Notes eleven borings in Surrey (of three of which, however, details had been published), with the thickness of the various geologic formations passed through, the water-level, and the yield.

In a paper on "Upward Boring for Water," an anonymous writer describes a "Proposed Scheme for Reigate and Redhill."†

The geologic features of the district are described, with their effect on water-supply.

There are old quarries and underground workings in the Upper Greensand. As the beds dip northward these underground galleries get to lower levels in that direction, and "extend beneath the great chalk water system." The water in the Chalk being held up by the clayey Chalk Marl, it is suggested that "at any point in the tunnels water can be at once obtained by the simple process of boring upwards through the roof."

The idea is ingenious, but I fear that to carry it out might be found a less simple matter than is supposed. I should not like to be one of the boring party, not being partial to shower-baths. It should be remembered, moreover, that a site near the escarpment is not one where a large area of Chalk can be put under contribution, and therefore not one where a large supply can be got.

When the writer compares this scheme with what has been done at Folkestone Waterworks, we must note a difference. At Folkestone the supply from Chalk springs has been increased by driving galleries in the Chalk which are nearly horizontal (rising but slightly northward, or against the dip) into the Chalk, from the base of the escarpment. From these borings have been carried up some twenty-five feet, much less than would be needed in the Reigate case, in which, moreover, the galleries are in Upper Greensand.

Geologic sections at both places are given, to explain in the one case what is proposed, and in the other what has been done, and there are other figures of geologic interest, from photographs.

Analyses of Reigate Water and of water from Margery Hall are given, the latter to show the quality of the proposed supply, the former to show the need of it.

* Science Gossip, n. ser., vol. vii, no. 78, p. 186.
† Water, vol. 2, no. 19, pp. 256–265.

Geology.

As a geologist I am bound to turn at last to my own subject, to supplement my notes of last year, and to add notes of what has been done for Surrey geology during that year.

1893.

W. Gilford, in a paper entitled "Are there Coalfields in Surrey?"* gave a general account of the subject of the underground range of old rocks in the South-east of England, and concluded that the "line of probable Coalfields passes in Surrey rather north of the escarpment of the North Downs," and that the title-question "will receive an affirmative answer."

1898.

Presumably it is our member Mr. E. A. Martin who, in "Norwood and Croydon Notes,"† gives a short account of sections in sewer-cuttings, &c., at Thornton Heath, showing Woolwich Beds, Oldhaven Beds, and Gravel.

1900.

E. A. Martin, in a note on "Westow Hill Gravels,"‡ alludes to the extension of the high-level gravel of Upper Norwood, as shown by excavations for electric wires. He has clearly done the right thing in recording the nature and position of the various deposits along a very temporary section.

The title "Coal Mines under Surrey," by the same author,§ reminds one of the chapter on "Snakes in Ireland," the contents of which are simply "There are none." The author of course alludes to the possibility of there being Coal Measures in the position named, a subject which I have discussed so often that I hesitate to start it again, though always glad to see the question brought forward. First find your Coal, then mine it, may be taken as a new version of an old proverb.

The subject of "Underground Geology in the South-east of England"‖ was taken as the chief subject of my Presidential Address to the Geological Society; but, though reference is made therein to places in Surrey, the remarks are only general.

G. W. Lamplugh's "Note on the Age of the English Wealden Series"¶ is of a general nature, but affects Surrey. He main-

* Proc. Holmesdale Nat. Hist. Club for 1890–9, pp. 42–7.
† Science Gossip, n. ser., vol. v, p. 158.
‡ *Ibid.*, vol. vii, p. 124.
§ Surrey Mag., vol. 2, October, pp. 245–6.
‖ Quart. Journn. Geol. Soc., vol. lvi, pp. lxxi, &c.
¶ Geol. Mag., dec. iv, vol. vii, pp. 443–5.

tains the classification with the Cretaceous rather than with the Jurassic Series, which had been suggested.

G. E. Dibley. Zonal Features of the Chalk Pits in the Rochester, Gravesend, and Croydon Areas.*

Pp. 490–492 are given to the Croydon District, with a short note of five great pits at Haling, Purley, Rose and Crown, Whyteleaf, and Oxted, the sites of which are marked on the map.

In the list of fossils which follows, the occurrences in eight different zones are marked, as well as the localities.

J. P. Johnson. Palæolithic Man in Valley of the Wandle.†

Gives a good description of the gravel, under the four headings of Upper Terrace, Lower Terrace, Angular Detritus of Dry Valleys, and Subangular Gravel of the Eocene Tract. There seems little to distinguish the gravel of the second and fourth headings.

It is hardly right to say that the river "flows entirely through a tract of soft Eocene strata," as, at first, from Croydon to Carshalton, it is partly over Chalk.

Whether the sandy Drift of Carshalton, which has been described to you,‡ can be definitely said to be "a mass of re-arranged Kentish Tertiaries" is doubtful, Kentish being used presumably for "Lower London."

The account of the Detritus of the Dry Valleys is the more valuable, as the deposit is not always shown on the Geological Survey Map.

The record of a flint implement found by the author in a section in Miles Lane, Mitcham, and of two or three surface-specimens, is all that strictly justifies the use of the term Palæolithic, although no geologist can doubt that it is rightly applied, as an age-term.

This paper gave rise to a criticism, by Mr. Robarts,§ and to some further notes by the author.‖

Our member Mr. W. M. Holmes read a paper to the Geological Society "On Radiolaria from the Upper Chalk at Coulsdon,"¶ which greatly extends our knowledge in that matter.

Radiolaria are of rare occurrence in the Chalk of England, those hitherto recorded being from the "Cambridge Greensand," which is the basal bed of the Chalk, and from the Melbourne Rock, which is the base of the Middle Chalk.

The specimens described came from cavities of two flints thrown out from the new railway-cutting southward of Coulsdon station, which has been carefully watched by Mr. Holmes and

* Proc. Geol. Assoc., vol. xvi, p. 484.

† Science Gossip, n. ser., vol. vii, pp. 69–71.

‡ Trans. vol. iv, pp. 288–293.

§ Science Gossip, vol. vii, no. 78, p. 177.

‖ *Ibid.*, no. 79, p. 221; no. 80, pp. 233–4 (1901).

¶ Quart. Journ. Geol. Soc., vol. lvi, pp. 694–704, pls. xxxvii, xxxviii.

others of our members, and "it may fairly be concluded that they came from the *Holaster planus* zone," which used to be classed as the uppermost zone of the Middle Chalk, and not with the Upper Chalk.

"That radiolaria existed in considerable numbers in the Cretaceous seas is proved by the fact that in the small quantity of material examined forty-one species, belonging to twenty genera, have been recognized."

Amongst the most important geological publications of the past year is that by A. J. Jukes-Browne, entitled "The Cretaceous Rocks of Britain. Vol. i. The Gault and Upper Greensand of England."*

There are, of course, frequent references to Surrey, and chap. vi. (pp. 92–102) is devoted to that county. One misses, however, any reference to the Caterham boring, which shows the greatest thickness of Gault anywhere except in eastern Sussex, and also any notice of the fine new railway-cutting at Merstham.

In chap. xxvi., which treats of Subterranean Extension, there is no reference to one of our deep borings, at Streatham, in which both Upper Greensand and Gault were passed through.

In chap. xxix., on Economics, our building-stones are noticed, but Farnham is treated as if in Hants.

This comprehensive treatise, which is to be followed by other volumes, should certainly be in the hands of Surrey geologists.

During the past year the Geologists' Association has held five Excursions in Surrey, in some of which we joined.†

The first was at Wimbledon and Kingston, to see the gravels of the high grounds, which were described by Mr. H. W. Monckton.

The second was to Caterham, Godstone, and Tilburstow, for the study of the Upper and Lower Greensands.

At Guildford, the Reading Beds and the Chalk were seen, the sections being described by Mr. Coomara-Swamy, with an analysis of "race" from the Reading Beds by Mr. A. C. Young.

Then our own Chalk, at Purley, Kenley, and Whyteleafe was examined and described by Mr. G. E. Dibley.

Lastly, Netley Heath and Newlands Corner were visited, under the guidance of Mr. W. P. D. Stebbing, who describes the sands of the former place (resting on the Chalk). Fragments of shells of marine genera were found in these, and more have been found since, this being the first record of such. Should this discovery show that these sands are of the same age as those of Lenham, in Kent, the Crag will be claimed as a formation to be added to the Surrey list.

* Mem. Geol. Survey, pp. xiv, 499, and 5 plates. Price 9s.

† Proc. Geol. Assoc., vol. xvi, pp. 443–5, 510, 1, 518, 524–6.

Excursions.

1st. *April 7th.*—Visit to the Museum of Geology, Jermyn Street. Mr. F. W. Rudler, the Curator of the Museum, kindly conducted the party.

2nd. *April 28th.*—To Wimbledon and Kingston. This excursion was under the charge of the Geologists' Association. Mr. H. W. Monckton reports on this excursion in the Proc. Geol. Assoc., p. 443, from which we extract the following:—

"The first section visited was a small gravel pit a little to the north of Cæsar's Camp, showing some 5 ft. of yellow and brown, very sandy current-bedded gravel. The party then proceeded across the Beverley Brook to the large gravel pit at the top of Kingston Hill; this shows some 20 ft. of well stratified current-bedded gravel, in places very sandy, several large patches being evidently rearranged Bagshot sand. The gravel is composed of subangular flints, brown and black, mostly the former; of flint pebbles, probably from the Bagshot Beds; of Lower Greensand fragments; and of a varied collection of quartzite and sandstone pebbles, many of which are probably from the Bunter Beds."

3rd. *May 5th.*—Cycling excursion to Chislehurst, Eltham, and Greenwich, conducted by Mr. E. Pierce.

4th. *May 12th.*—To West Wickham and Hayes, and over some cultivated fields at West Wickham, in which a large number of palæolithic implements have been found. Conducted by Mr. Clinch. Upon arriving at Hayes station, the party, about twelve in number, walked to the steep hill just above Coney Hall Farm, in order to inspect the remarkably fine specimens of ancient oak trees. It was observed that most of the trees had been pollarded, and that all bore unmistakable evidences of great age. A few of the neolithic hut-circles on Hayes Common were then examined, and the party afterwards descended by a steep path into the bottom of the valley on the south side of Hayes Common. Here, at a spot known as Gates Green, was seen a good pit-section of drift gravel, exhibiting rolled flints, fossils, and other material derived from the chalk. By kind permission of Sir Harry Lennard, Bart., a visit was paid to several ploughed fields somewhat further south, and after a careful search a few palæolithic flakes were discovered. The party then dispersed, some returning to Croydon by rail, and others walking.

5th. *June 4th.*—To Cowden and Holtye Common, under the guidance of Dr. H. Franklin Parsons. This excursion was favoured by magnificent weather, and there was a good attendance. A more lovely region can hardly be found than this, where the three fair counties of Kent, Surrey, and Sussex join, diversified as it is by hill and vale, wood and stream, and in early June looking at its brightest with the vivid green of the young foliage, the snowy blossom of the hawthorn, and the abundance of flowers of varied hues. It is hard to imagine that this peaceful scene was until little more than a century ago a part of the Black Country of England, as South Staffordshire is now. Yet that such was the case is witnessed not only by history and tradition, but by the evidence of local names like Furnace Mill and Hammer Pond, by old heaps of slag, and by specimens of the local iron manufacture which are still to be seen.

The Wealden beds yielded the iron ore, which was smelted with charcoal, obtained by cutting down the forests; and the streams, dammed up to form ponds, yielded the motive power for working the furnace blast and forge hammers. Several well-preserved monuments, cast of the local iron, are to be seen at Cowden Church, which was courteously shown to the party by the rector. The church also contains, among other interesting features, an hour-glass in a stand, affixed to the fine Jacobæan pulpit, and used for timing the preacher's discourse; also some massive timber-work supporting the belfry and spire, and taking the place of a chancel arch.

From Cowden the party went on to Holtye Common, passing some picturesque old houses with quaint brickwork chimneys, and halted for lunch at the Furnace Pond. The more energetic members of the party then walked on some two miles through beautiful woods to visit an ancient camp at Dry Hill in the parish of Lingfield, and therefore within the Surrey boundary. This camp occupies the summit of a wooded hill more than 500 ft. in height, from which extensive views are to be obtained in almost every direction, from Hindhead on the west to Crowborough Beacon on the south-east. The camp, though locally called the Roman camp, is British rather than Roman in form, being nearly circular in shape, not square, but following the contour of the hill. It is about a quarter of a mile in diameter. The rampart is fairly well preserved on the west side, where it consists of a double line of ditch and bank, but is more or less obliterated on other sides.

A somewhat doubtful stone implement was picked up by one of the party. It was formed of a highly fossiliferous piece of sandstone. These were the only fossils seen during the day, although several quarries of the local rock—Ashdown sandstone—were examined. At one place where the massive beds of this sandstone cropped out in the side of the valley the rock had been excavated to form a rude kind of cave dwellings.

Several interesting plants were found during the day, including two or three commoner in northern or mountain localities than in the southern counties, as the bitter cress (*Cardamine amara*), the bistort (*Polygonum Bistorta*), the mountain fern (*Lastræa Oreopteris*), the hard fern (*Lomaria spicant*), and the club moss (*Lycopodium Selago*). Others were the ramsons (*Allium ursinum*), a plant common in some parts of England, but rare or absent in Surrey and the adjacent counties; *Hieracium murorum*, *Typha latifolia* and *angustifolia*, and *Carex vesicaria*. Tea at the White Horse and a stroll back across the common to the station concluded a most enjoyable day.

6th. *June* 16*th*.—Cycling excursion to Godstone to join the Geologists' Association, conducted by the President. From the Proc. Geol. Assoc., p. 510, we extract as follows:—

"The party walked from Caterham station to the crest of the Chalk escarpment at Upwood Scrubs, where a mass of Blackheath pebble beds was examined, and a fine view over the Lower Greensand tract was obtained. The walk was continued along a footpath down the escarpment to Godstone quarry in the Firestone of the Upper Greensand, with its underground workings dipping northward. Some old workings near Quarry Farm were visited, and then a new working about a third of a mile eastward, where a good section was seen. The party proceeded thence to Godstone, stopping at the northern part of the village to see a sand-pit in the Folkestone Beds. The walk was then continued to the pits of Tilburstow, which are more than one-third of a mile long, and made simply to get the Chert at the bottom for road-metal. At one part a small portion of the Folkestone Beds (sand) is touched. The whole thickness of the Sandgate Beds (clay with greensand) is passed through. The Chert is classed with the Hythe Beds by the Geological Society. Thence the party walked eastward by way of the road-cutting on Tilburstow Hill, and through Tandridge to Oxted."

7th. *June* 30*th*. — To Reigate, conducted by Mr. J. H. Baldock.

"Being away at the time, Mr. Gower kindly took this for me. The weather was very gloomy, and but few members came. On reaching Reigate the small party were met by an equally small party under Mr. Brooks, who thereafter became conductor. Ground new to our Club was traversed, disclosing some pretty scenery, and I would suggest that this excursion be taken again when more favourable weather may be hoped for." — J. H. Baldock.

8th. *July* 28*th*.—To Chipstead, conducted by Mr. G. W. Moore. "At this excursion unfortunately only six members and friends appeared, meeting as arranged at Chipstead Church, which was examined as well as a short visit would allow. It is not mentioned by Rickman in his list of Surrey churches, but would probably be included amongst the mixed churches of Norman origin. In Brayley's 'History of Surrey,' it is mentioned as early Norman, but no date of foundation is given. Locally, 1130 is stated. The chancel, nave, and transept all contain Norman work, and there are semicircular Norman arches with typical good zig-zag mouldings at the west end and on the north side. The round columns of the nave are mentioned as examples of the Early Norman style. The windows of the chancel have narrow lights with splayed recesses—the heads of which are angular, and appear to be of a very early style—*i.e.* if now as originally constructed.

"In the chancel there are several good brasses. One to Lucy Roper, dated 1614, and a slab dated 1649, to Alice Hooker, daughter of the author of Hooker's 'Ecclesiastical Polity.' A helmet and coat of arms in the chancel belonged to a family named Stephens, of Epsom.

"The chief stone of the interior of the church is probably from the firestone quarries of the district. The ashlar has a good surface and is very white. The exterior is chiefly of flint. The tower has apparently been restored, and is built of brick. It bears a later date—nearing 1600—but I have not the actual year. The church is dedicated to St. Margaret.

"The parish of Chipstead is mentioned in the Domesday Book as Tepestead, probably for Cepestead.

"From Chipstead the party proceeded to Kingswood, some pedestrian members calling on the way at The Mint House, the residence of Dr. Freshfield, and saw the marble capitals, also an old Eastern household corn mill in the grounds, brought by him from Ephesus and Constantinople. Dr. Freshfield has a large collection of Eastern pottery and curios, which, in reply to a letter sent to him, he said he would gladly have shown, but was otherwise particularly engaged. Dr. Freshfield kindly suggested a visit on a future occasion.

"At Kingswood, the little church, called the Church of the Wisdom of God, built by Dr. Freshfield in the Byzantine style, was seen. In the construction a variety of beautiful marbles, brought from the different parts of the East, have been used. The font is of alabaster, and is very beautiful. Tea was obtained near, after which the cyclists and pedestrians separated and returned home."—G. W. Moore.

9th. *August 6th* (Bank Holiday).—To Chilworth and Wootton, conducted by Mr. H. D. Gower.

"Whole day excursion to Chilworth Powder Mills and Tangley

Manor.—Between fifteen and twenty members took part in this excursion, but unfortunately it turned out a very wet day, pouring in torrents nearly the whole of the time.

"The party were met at Chilworth station by Capt. Bouverie, who kindly conducted the members over the powder mills, explaining and showing the method of manufacturing cordite and other explosives from the raw material to the finished article, after which he very kindly invited the members to his house to partake of light refreshments.

"Upon leaving, Mr. P. Crowley tendered a vote of thanks to Capt. and Mrs. Bouverie for their very kind hospitality; and, as it was still raining, the visit to Tangley Manor was abandoned, as was also the walk to Gomshall and Shere. A telegram of regret was sent to Mr. Flower, of Tangley Manor, asking excuse for the party owing to the inclemency of the weather.

"The members returned by an early train to Croydon, and, except for the unfortunate climatic conditions, would otherwise have had a most interesting day."—Harry D. Gower.

10th. *August 8th.*—Cycling excursion to Kingswood, conducted by Mr. J. H. Baldock.

11th. *August 18th.*—Excursion to Kew Gardens.

"The day was an exceedingly fine one, and some twenty members attended, including several ladies. The Director had kindly given permission to photograph to those wishing to do so, and several cameras were in evidence. All the most interesting parts of the gardens were visited, including the orchid and Victoria Regia houses, the rock and bamboo gardens, &c., and many very successful photographs were secured. The party then had tea at Kew Green, when a very enjoyable afternoon was brought to a close."—J. H. Baldock.

12th. *September 15th.* — Fungus hunt to Addington Wood. Conducted by Dr. H. Franklin Parsons.

"On Sept. 15th an excursion in search of fungi was made under the leadership of Dr. Parsons to Threehalfpenny Wood, between Addington and Kent Gate. Fungi were not plentiful, owing to the dry weather which had prevailed during the preceding fortnight, though not so scarce as on several preceding occasions. About twenty species were found and identified; the most interesting being *Nyctalis parasitica*, a small Agaric which grows parasitically on the large blackened Agarics of the genus *Russula*."

The members were also invited to join three excursions of the Geologists' Association, *viz.*: June 23rd, to Guildford; July 14th, to Purley and Whyteleafe; August 11th, to Netley Heath and Gomshall; and some of our members availed themselves of this invitation.

Evening Meetings.

February 20*th.* — The Report of the Meteorological Section, prepared by Mr. F. Campbell-Bayard, was read, and was printed in the 'Transactions' for last year.

Dr. H. F. Parsons also read a short paper on "Earth Temperatures," which has also been printed in our 'Transactions.'

March 20*th.*—The paper of the evening was entitled "Colour Photography applied to the Record and Delineation of Natural History Subjects," by Mr. W. Saville Kent. This paper was illustrated by lantern slides. (See Trans., art. 147.)

April 10*th.*—Mr. Edward Lovett contributed a paper on "The Habits of the Lobsters, Crabs, Shrimps, and Prawns of the British Isles." The paper was illustrated by a very large collection of specimens.

May 15*th.*—Mr. H. C. Collyer gave an account of "The Stone Monuments of Brittany." Illustrated by lantern slides. (See Trans., art. 148.)

September 18*th.*—This meeting was devoted to the exhibition of specimens by members, and a description of them.

Mr. Martin gave an account of Mr. Clinch's diggings and search for implements at Croham Hurst and West Wickham.

The President gave an account of the meeting of the British Association at Bradford.

October 16*th.*—The paper of the evening was on "The Jewellery of Old Japan," by Mr. J. O. Pelton, illustrated by many beautiful specimens of Japanese work.

Mr. Pelton said that, correctly speaking, Japan had neither the art of the goldsmith nor that of the jeweller. The Japanese of neither sex wore jewellery, no vessels of silver were placed upon their tables, nor vases of gold upon their altars, yet the art of the metal worker was carried to a high state of perfection, the chief object being the decoration of the sword. The vast majority of the best works were on metals which have virtually no intrinsic value. The blade of the sword was seldom decorated at all, the ornamentation being lavished upon the guard. The subjects of the decorations were innumerable. They were taken from Old Japan—its history, its art, its civilization, its religion, and its domestic life—all were represented on delicate chasings, incrustations, relief work, and piercings in metal of a minute perfection such as no other nation has ever produced.

At this meeting it was agreed that junior members under 18 years of age should be admitted at a subscription of 2*s.* 6*d.* per annum, entitled to all the privileges of membership except voting.

November 20*th.*—At this meeting Mr. W. Law Bros, of the Camera Club, London, was to have given a lecture on "Buddhist Jain and Hindu Temples in India"; but, owing to his lamented death, very shortly before the meeting, the Club were deprived of the privilege.

In its place Mr. J. E. Clark gave an account of the Nordrach district in the Black Forest, illustrated by photographs taken by one of the patients at this consumptive sanatorium. Lying nine miles from town or rail in the recesses of the pine forests, at a height of 1500 ft., with mountains as high again forming a horse-shoe round it to east and north, the spot is ideal for the purpose. Dr. Walther's triple system consists of open-air life without fatigue, unceasing individual oversight, and the most liberal consumption of wholesome but carefully varied food.

At this meeting also Dr. Parsons exhibited a collection of dried plants gathered in August, 1900, in company with Mr. Mennell, at Fionnay, Switzerland. Fionnay is a village in the Val de Bagne by the muddy glacier-fed river Dranse; it stands at an altitude of 5000 ft. above the sea, and the mountains rise steeply on either side into snowy peaks, the highest of which—the Grand Combin—is some 14,000 ft. in height. The plants were collected at various elevations—from the fir woods which occupy the lower slopes, from the high mountain pastures, or "alps," and from the moraines of the glaciers up to a height of some 10,000 ft.

Of the plants exhibited, a few found in the lower ground were of South European type, as the hyssop (*Hyssopus officinalis*); but those found on the high mountain pastures and moraines were of an alpine and northern type. Some of these were species which are rare natives of the north of Britain; others were not British species, though mostly of genera or families represented in Britain.

The alpine plants have many of them a characteristic habit of growth, *viz.* a rosette of root-leaves and a leafless stem bearing one or more brightly-coloured flowers. They have also commonly two sets of roots, *viz.* a long tap-root penetrating into the rock to reach the deeply seated moisture, and a bunch of rootlets immediately under the surface to collect the moisture from dew and passing showers. Gentians, saxifrages, sedums, and sempervivums were numerously represented.

The locality also abounded in insect life, especially grasshoppers and butterflies. One kind of grasshopper had bright red under wings, and was conspicuous in flight, but on alighting on a rock and folding its wings it became suddenly invisible, so much did its colour resemble that of the stone. Another made a loud hissing noise like an angry snake, or like clockwork running down. Among butterflies, two species of swallow-tails, fritillaries, clouded yellows, blues, coppers, and others were plentiful; also the Apollo, of which specimens were exhibited. Another exhibit was a wasp living in small colonies in nests with exposed cells, and attached by a stalk to the face of rocks. The President remarked that the swallow-tail butterfly, which in Switzerland frequented the mountains, was in England only found in the fens.

November 28*th*.—In place of the Annual Soirée, which has been regularly held since the formation of the Club, the Committee arranged for a lecture by Mr. R. Kearton, F.Z.S., on "Haunts and Habits of British Birds." This lecture, which was profusely illustrated by the beautiful photographs shown upon the screen for which the Messrs. Kearton are renowned, was largely attended, and was greatly appreciated by the members and their friends. The following brief report is extracted from the 'Croydon Advertiser':—

"On Wednesday last, at the Public Hall, Mr. Richard Kearton, F.Z.S., gave a very interesting lecture on 'The Haunts and Habits of British Birds,' illustrated by photographs taken by himself and his brother, some of which were obtained under great difficulties and at considerable risk. He first showed a picture showing the special camera and the other apparatus used by them for taking pictures of birds on nests in situations difficult of access. He then called attention to the protective colouring and markings in the young of birds, especially of sea-birds, and showed how, when alarmed, they crouched down on shingle or sand, so as to be almost invisible. Then followed several pictures of gulls and gannets at rest and in flight, from photos taken at St. Kilda and the Faroe Islands, where he was assisted by the last living representative of the family of Grace Darling. He further gave pictures of sea-birds feeding and uttering their cries, illustrating same by giving specimens of the various calls of the birds. He also showed an eyrie of the osprey on Helen's Island, in Scotland, where his brother succeeded in obtaining photographs of the birds, after two hours' patient waiting, immersed in the water. These included the birds perched on the trees, of one of the birds dropping down to its perch, and another illustrating the down stroke of the wing when taking flight. Other photographs showed the devices they had to resort to to obtain life-like pictures of familiar birds, and he gave examples of the calls of the lapwing, dove, owl, osprey, and falcon. Another interesting series showed a great tit feeding on a cocoanut suspended in a garden. These last had never been shown before. He then showed a series showing the daily growth of a young blackbird, especially noticeable from the rapid growth of the wing feathers. One of the devices made use of was the figure of a cow, which they placed in fields where certain birds congregated, and when the birds were familiar with the object one of them got inside with a camera and photographed them. The danger incurred in taking many of the pictures was considerable, and evidenced the enthusiasm of the Messrs. Kearton in their work. On one occasion Mr. G. Kearton suffered from a severe attack of blood poisoning arising from gnat bites, to which he was exposed for two hours, being unable to move for fear of frightening his quarry; and on another he narrowly escaped death from the fall of a boulder from a cliff, it having been accidentally displaced."

December 18*th*.—At this meeting the President read a paper on "Some New Surrey Wells, and what we learn from them." (See Trans., art. 149.)

"On Stone and Bronze Celts recently found in the Neighbourhood of Croydon," by Mr. N. F. Robarts, F.G.S., illustrated by specimens. (See Trans., art. 150.)

The following Reports have been received from the Sectional Committees:—

Botanical Committee.

The Botanical Committee have been devoting attention to the commons and wild tracts in the neighbourhood of Croydon, with a view to recording the finding of new or notable plants, the disappearance of recorded species, and the occurrence of casuals, and to preparing a complete catalogue of the present flora of these tracts. The records are still incomplete, but the Committee will continue their work, and hope to publish the details next year. The commons which are being thus dealt with are as follows (the figures refer to the number of species recorded for this year (1900)):—

Shirley Hills and Croham Hurst. 213. Recorders: J. Edmund Clark, B.A., B.Sc., and H. T. Mennell, F.L.S.

Mitcham Common. 107. Recorder: Arthur Bennett, F.L.S.

Riddlesdown.* 129. Recorders: A. Fitzgerald and C. E. Salmon.

Hayes and West Wickham Commons. 125. Recorder: Dr. H. Franklin Parsons.

Keston Common. 100. Recorder: Dr. H. Franklin Parsons.

* Of the Riddlesdown flora, Mr. Salmon reports that the most interesting records are of *Euphrasia Kerneri*, a new county record, and *Thesium humifusum*.

Of the general excursions of the Club at which the Section was represented, those on June 4th to Cowden and Holtye Common, and on September 15th to Threehalfpenny Wood, Addington, were of especial botanical interest. At the former a number of interesting plants were observed, including several of somewhat northern and mountain proclivities; and at the latter some twenty species of fungi were collected—not a large number, but more than might have been expected in so dry a season. These were exhibited at the meeting of the Club on September 21st. Accounts of the above excursions will be found in the general Report.

Besides the general excursions of the Club, two special botanical rambles were made during the summer, as follows:—

On May 17th an evening ramble was made to Shirley Hills, and was well attended, Dr. Parsons acting as guide. About eighty-nine species of plants were recorded; not so many, however, on the hills themselves, where the gravelly soil supports a moorland flora not numerous in species, as in the neighbouring roadsides and enclosures. A patch of sandy ground near the drinking-trough is covered with a fine turf, rich in dwarf annual plants, as *Erophila vulgaris, Cerastium quaternellum* and *pumilum*, *Erodium cicutarium, Trifolium subterraneum* and *filiforme*, and *Myosotis collina* and *versicolor*. *Potentilla argentea* was also found here. In a neighbouring hedge were found *Myosotis sylvatica* and *Claytonia perfoliata*, both probably having been recently introduced. In some wet places were found several bog plants not commonly met with in so dry a neighbourhood as that of Croydon; among them the sundew (*Drosera rotundifolia*) and the marsh St. John's wort (*Hypericum elodes*). By the Oaks Road were found several plants not occurring on the hills themselves, among them *Saxifraga granulata;* and in Coombe Lane the goutweed (*Ægopodium Podagraria*) and the sweet-scented butterbur (*Petasites fragrans*) have established themselves, probably from former cultivation.

On July 5th a botanical ramble was made to Mitcham Common, under the leadership of Mr. Arthur Bennett, and was attended by members of the Botanical Section and two or three visitors. Train was taken to Mitcham Junction, and the party crossed the common, returning by Beddington station. About one hundred and seven species were gathered or seen; a search for the rare *Hypocharis glabra*, L., was unsuccessful, though the species was seen in some plenty a few years ago. The full list is reserved for the Report of the Botanical Committee, to be made after another season's work.

Mr. J. Edmund Clark, B.A., B.Sc., reports that he saw at Abinger on April 24th the first ash in leaf, but no oak in leaf before April 26th. He saw in flower, on May 16th, a hawthorn (*Cratægus oxyacanthus*); May 19th, a horse-chestnut (*Æsculus hippocastanum*); May 26th, a white ox-eye (*Chrysanthemum leucanthemum*); June 9th, a dog rose (*Rosa canina*).

The extraordinary mildness of the season during the later months of the year deserves to be placed on record in this Report, so far as it has affected the vegetable world.

On November 4th Mr. Mennell recorded seventy distinct species and varieties of plants in his garden on Park Hill, Croydon, in good flower; these included a large variety of dahlias, nasturtiums, and other tender plants. They were not merely survivals, as has often been the case with the collection made for the Soirées, but were all in excellent condition. A week later a night frost, not of a very severe character, cut off the more tender species; but on the 24th November forty-three species were still in flower in the same garden.

On Christmas Day Dr. H. Franklin Parsons made a list of twenty-five plants in flower in his garden, to which Mr. Mennell was able to add a dozen additional species.

On the same day the honey-bees were flying briskly.

At Haslemere in Surrey—at a greater elevation than at Croydon, but on warmer soil—Mr. T. P. Newman made a list of no less than forty-seven plants in flower in his garden on Christmas Day, and adds that a big bowl of roses was cut on that day.

Of wild flowers, Mr. J. B. Crosfield informs us that on Christmas Day he gathered, on Leith Hill and neighbourhood, in good flower, *Erica tetralix*, *E. cinerea*, *Stellaria holostea* and *graminea*, *Lychnis diurna*, *Ulex nanus*, *R. repens;* and on January 5th, *Hieracium pilosella*. The knapweed (*Centaurea Jacea*) was found in good flower on January 5th, 1901, by Dr. H. F. Parsons.

The President of the Club, Mr. James Epps, F.L.S., reports that he has fruited his cacao trees at Beulah Hill, Upper Norwood, which on December 23rd had on them both a pod and blossoms.

Geological Committee.

The Geological Committee has met eight times during the year, and a like number of sectional meetings have been held. The average number of members present at the sectional meetings has been seven.

Four excursions have been held, as follows:—

April 21st.—The Section, under the leadership of Dr. H. Franklin Parsons, F.G.S., made an excursion to the Chalk heaps at Hooley for the purpose of collecting fossils. About a dozen members attended. The weather being very favourable, a considerable number of fossils were secured, consisting principally of Micrasters, Terebratulæ, and Ventriculites.

June 12th.—The Section, numbering about twenty, met at Waddon station, and walked to Mr. H. C. Collyer's, Beddington, for the purpose of seeing the place in his garden where neolithic flakes and implements had been found. On the way to Beddington a stoppage was made to examine the Thanet Sand exposed in a pit on the right-hand side of the road. At Mr. Collyer's, the position of the neolithic factory was pointed out on the banks of the Wandle, and numerous flakes and a small number of neolithic implements were shown. A palæolithic implement (?) was also shown. Mr. Collyer subsequently showed the members his large collection of Surrey and other archæological objects, and entertained the members to tea.

July 10th.—The Section paid a visit to the Corporation's new well in Stroud Green Road, under the guidance of the President and Mr. Thos. Walker, C.E. The spoil heaps, consisting of Woolwich Shell Bed (*Ostrea*), were examined, and various specimens secured. About fifteen members attended.

September 29th.—By the kind permission of the Town Clerk the Section paid a visit to the Beddington Sewage Farm to examine the rocks discovered in the foundations of works connected with the pumping station. The party, numbering about twenty, under the guidance of the President, W. Whitaker, F.R.S., included the Mayor, Messrs. E. T. Newton, F.R.S., G. J. Hinde, F.R.S., Councillor Noakes, Dr. H. Franklin Parsons, Mr. G. Clinch, and some members of the Whitgift Natural History Society. The President explained that after sinking about seventeen feet in gravel, a hard rock had been met with which was quite new to the neighbourhood of Croydon. From the fossil contents, which were all freshwater species, including *Paludina*, *Unio*, &c., the rock showed a change of conditions from the underlying shell bed of the Woolwich and Reading series, which contained the usual brackish water fauna—*Ostrea*, *Cyrena*, &c. Considerable interest was shown by the party in collecting fossils, which were exceeding difficult to extricate, owing to the very hard nature of the rock, but a fair collection was made, including some remains of wood and bones.

A considerable number of geological specimens have been contributed to the Club's Museum during the year by members of the Section, and the Museum now contains a good representative collection of the different rocks in Surrey and the west of Kent.

Interesting sections have been exposed during the year at Beddington Sewage Farm, showing the Woolwich and Reading Beds; at Park Hill, showing all the beds from the Upper Chalk to the top of the Oldhaven Beds, inclusive; and at the Stroud Green Road Corporation Well, from the Thanet Sand to the London Clay. Good sections of Gravel have been exposed in the Brighton Road and at Thornton Heath.

The following five photographs of sections have been sent to the British Association Committee on geological photographs:—Addiscombe Road Sandpit, by Mr. F. W. Robarts; Sandstone Boulder, Thornton Heath, by Mr. W. Bruce Bannerman; Gravel Pits, Shortlands (two), by Mr. J. H. Baldock; Chalk Pit, Whyteleafe, by Mr. J. H. Baldock; and duplicates have been placed in the Committee's Geological Album.—N. F. Robarts, *Hon. Sec.*

Photographic Committee.

During the past year the Photographic Section have held their usual weekly meetings.

The attendance of members has not been large, but during the latter part of the year members have shown a greater inclination to attend meetings on those occasions when the lantern was in use.

It is probable that many more of the seventy members of the Club who are known to be interested in Photography would attend, if the room in which the meetings of the section are held were larger. Several very interesting papers have been read, and no doubt many members would have attended if a special circular had been sent out drawing their attention to them; but, seeing that an attendance of fifteen taxes the accommodation to the utmost, it has not been considered desirable to take any special measures to obtain a larger attendance of members.

A series of lectures on elementary photographic subjects would, no doubt, be appreciated by the junior members now joining the Club, and probably by many others, and would tend to give the section the position it should hold in Croydon as a Photographic centre; but in the absence of accommodation for anything but a small audience, it is perhaps inadvisable to undertake any such series of lectures.

Amongst the principal lectures, &c., given before the members of the section during the past year may be mentioned:—

Mr. Baldock's demonstration of the use of the "Cristoid" films.

A lecture on lens-making by C. P. Goerz, of Berlin.

A practical demonstration of the Toning of Bromide prints, by our member Mr. A. P. Hoole.

A demonstration of the various methods of Intensification and Reduction, by Mr. Baldock.

Two sets of lantern-slides, illustrating excursions of the South London Photographic Society to Ireland and to Belgium.

A most instructive lecture by Mr. Sanger Shepherd on "Orthochromatic Photography."

Several technical lectures of the 'Amateur Photographer' series.

The section is much indebted to Mr. Baldock for his admirable management of the lantern during the year.—E. Pierce, *Hon. Sec.*

Microscopical Committee.

I regret to have very little to report on behalf of the Microscopical Section.

In January last a notice was received from the Royal Microscopical Society regarding the Standardising of the different parts of Microscopes, a copy of which was sent to the various members of the Committee.

A sectional conversational meeting was held on February 28th, presided over by Mr. Lovett, who gave a demonstration of fluid mounting of subjects.

Mr. W. Murton Holmes presented the Society with fourteen slides illustrating fish parasites, originally belonging to the collection of the late Mr. Lee.—G. W. Moore.

Museum Committee.

The Museum Committee have to report that considerable interest appears to have been taken, by visitors to the Free Library at the Town Hall, in the objects shown in the Club's Loan Museum.

No doubt the attraction would be still greater if more specimens could be displayed in open cases instead of in drawers. The present open case is also not sufficiently high to exhibit objects of any considerable height.

It would be an advantage if a wall case could be obtained.

The Committee are particularly indebted to the Corporation for the loan of various Roman and Saxon antiquities found in Croydon; to Mr. Kenneth McKean, for the loan of part of his fine collection of local shells; and to Mr. G. E. Dibley, F.G.S., for the loan of a large number of Chalk fossils.

They have also to offer their thanks to the following members of the Club:—Messrs. W. B. Bannerman, F.G.S., J. E. Clark, F.G.S., George Clinch, F.G.S., G. J. Hinde, Ph.D., F.R.S., F.G.S., A. J. Hogg, J. M. Hobson, M.D., W. Murton Holmes, E. Lovett, E. A. Stebbing Maclin, F.G.S., G. W. Moore, H. Franklin Parsons, M.D., F.G.S., N. F. Robarts, F.G.S., C. H. Williams, W. Whitaker, B.A., F.R.S., F.G.S., &c.; and to Messrs. J. C. Cambridge, F. Churchill, J. Kidd, Mrs. A. W. H. Lefroy, Messrs. H. Mitchell, A. J. Potter, G. H. Thatcher,

A. J. Sass, — Spalding, J. J. Springhall, and T. Woolger (who are not members), for loans and donations.

The Committee hope that during the ensuing year more Zoological and Botanical specimens will be lent than has been the case during the past twelve months.

The Committee believe that it is only necessary for the Museum to become more known to enable a very satisfactory local collection to be formed, as they have found the greatest willingness on the part of those who possess objects of local interest to lend them when applied to.

Members elected, 1900.

February 20*th.*—Nemo.

March 20*th.*—Rev. G. A. Jones, M.A., 56, Heathfield Road.

April 10*th.*—Mr. Edward Moffatt, M.A., 65, Addiscombe Road. Miss Nora H. Sankey, Farleigh, Park Hill Rise.

May 15*th.*—Nemo.

September 18*th.*—Mr. Bryan Corcoran, Fairlight, Oliver Grove, South Norwood.

October 16*th.*—Lt.-Col. Fredk. J. King, 17, South Park Hill Road. Miss Kate Whitley, 11, Chichester Road. Mr. C. L. Faunthorpe, 69, Parson's Mead.

November 20*th.*—Miss A. E. Whitley, 11, Chichester Road.

December 18*th.*—Mr. J. W. Culverwell, 119, Lower Addiscombe Road. Mr. H. C. H. Goodwin, Hurst View, South Park Hill Road. Mr. A. Bodoano, 25, Greyhound Lane, Streatham. Miss Z. Mayers, 2, Friends' Road. Miss S. A. Gardiner, 4, Bedford Place. Junior Members :—Master E. F. Chaney, 375, Brighton Road. Master R. K. Clark, Lile Garth, Ashburton Road. Master Frank Hobson, 1, Morland Road. Miss Josephine Hobson, 1, Morland Road. Miss Mary Hobson, 1, Morland Road. Miss Beatrice A. Hogg, 5, Cargreen Road, South Norwood. Miss Florence M. Parsons, 4, Park Hill Rise.

January 15*th*, 1901.—Mr. Bryan T. Harland, 3, Fell Road. Master Cyril M. Croft (Junior), St. Olave, 48, Birdhurst Road. Miss Nora K. Hobson (Junior), 1, Morland Road.

Donations to the Library, 1900.

From Individuals.—*Senecio paludosus* and *S. palustris* in East Anglia—Mr. Bennett. Notes on the Drift Gravels of West Wickham, Kent—Mr. G. Clinch. Some Sections of Chalk between Croydon and Oxted—Mr. Caleb Evans. The Origin, Development, and Aims of our Scientific Societies—Sir John Evans, K.C.B. Natural History of Reigate and Vicinity, with List of Coleoptera—Mr. Linnell. Comparative Mortality of English Districts—Dr. Franklin Parsons. Notes on the Flora of Kent; Plant Notes from Sutherland and Cantire—Mr. Salmon. British Land and Freshwater Mollusca (Reeve); Building of the British Isles (Jukes Brown); Physical Geology and Geography of Great Britain (Prof. Ramsay); Monograph of the Gault (Price); Geology of Oxford and the Thames Valley (Phillips)—Mr. W. Topley. Nature Notes; Professor Prestwich's Geology; Geology of the London Basin, The Chalk and Eocene Beds of the Southern and Western Tracts; Guide to Geology of London—Mr. W. Whitaker.

From Societies.—Report of the St. Leonard's and Hastings

Natural History Society, 1899; Proceedings of the Hampshire Field Club, volume iv., part 1; Journal of the Quekett Microscopical Society, November, 1899; Report of the British Association meeting at Dover; Journal of the Royal Microscopical Society, Nos. 133, 134, 135; Report of the Missouri Botanical Garden, 1899; Proceedings of the South London Entomological Society, 1899; Bulletin of the Lloyd Library, Cincinnati; The Essex Naturalist, volume ix., nos. 4–12; Proceedings of the Academy of Natural Sciences, Philadelphia; Journal of the Manchester Geographical Society; Report of the Surrey Footpaths Preservation Society; Proceedings of the Berwickshire Natural History Club; Session Book of Buncle and Preston, 1665–1690; Transactions of the Eastbourne Natural History Society; The Rochester Naturalist; A New Reduction of the Meteorological Observations at Greenwich; Report of the Brighton Meeting of the South-eastern Union of Scientific Societies; Journal of the City of London College Science Society; Transactions of the Norfolk and Norwich Naturalists' Society; Proceedings of the Geologists' Association; Proceedings of the Scottish Microscopical Society; Annual Report of the Brighton and Hove Natural History and Philosophical Society; Catalogue of the Library of the Geological Society of London.

From Publishers.—Photography; The British Journal of Photography; The Amateur Photographer; Science Gossip.

During the past year, in accordance with the resolution passed on January 16th, 1900, arrangements have been made with the Librarian of the Public Library for the transfer of part of the Club's Library to the Reference Library at the Town Hall. Up to the present, 313 volumes have been handed over.—Alfred Roods.

Exhibits, 1900.

February 20th.—Mr. H. C. Collyer: Flint Implements from Denmark. Mr. W. M. Holmes: Nautilus and Specimens of Ammonites.

March 20th.—Dr. Parsons: Fossils (*Paludina lenta*) from the Corporation Well-boring in Stroud Green.

April 10th.—Mr. Hogg: Relics from Battlefields in South Africa. Mr. N. F. Robarts: Bone Implements and Skates from excavations at Finsbury.

May 15th.—Nil.

September 18th.—Mr. N. F. Robarts: Pyritized Wood from Mitcham Gravel, and Transverse Section of Silicious Sponge. Dr. Hinde: Rounded Fragment of Lower Greensand Chert, also specimens of *Ventriculites Raratus* from Valley Gravels, Foxley Heath. Mr. W. M. Holmes: Female Cockroach. Miss Klaassen: Rubbing of old Carving from Hartland Quay, Dorsetshire.

October 16th.—Nil.

November 20th.—Mr. N. F. Robarts: Neolithic Celt from Salisbury Plain.

December 18th.—Mr. J. S. Clark: Specimens of Sandstone with Unios from Woolwich Beds at Beddington Sewage Farm. Mr. H. C. Collyer: Collection of Bronze Celts. Mr. N. F. Robarts: Fibula and ring from Whyteleafe. Mr. Lovett: Series of Paleolithic Implements from Thames Valley, with models showing system of mounting in Deer's Antler.

January 15th, 1901.—Nil.

Croydon Microscopical and Natural History Club.—Balance-sheet for the Year ending 31st December, 1900.

Receipts.

1900. December 31.	£	s.	d.	£	s.	d.
Subscriptions, 1899	1	10	0			
" 1900	103	0	0			
				104	10	0
Donations—F. C.-Bayard, Esq. ...	5	0	0			
" P. Crowley, Esq. ...	5	0	0			
" B. Latham, Esq. ...	5	0	0			
" Corporation of Croydon	0	10	0			
" Sutton Waterworks Co.	0	5	0			
" Wimbledon Urban District Council ...	0	10	0			
				16	5	0
Sales of Papers and Transactions...				1	6	6
Balance over Expenses on the X-Ray Lecture	3	16	6			
Less paid Dr. Chisholm Williams	3	16	6			
Balance due to Treasurer				10	6	4
				£132	7	10

Payments.

1900. January 1 to December 31.	£	s.	d.	£	s.	d.
By Balance due Treasurer				17	1	2
Rent of Club Room				10	0	0
Hire of Rooms for Meetings				4	10	0
Printing Transactions				23	13	3
Fire Insurance—Paid County Fire Office	1	13	9			
Less Bonus received from the Company	1	3	10	0	9	11
Meteorol. Committ.—Printing Rainfall Returns, Dec. 1899, to Nov. 1900				26	12	6
Photographic Committee—						
Rent of Dark Room	10	0	0			
Hire of Rooms for Lantern Exhibition	0	10	0			
Portfolio, Postages, &c.	1	6	8			
Gas for Lectures, Postages, &c. ...	6	17	1			
Repairing Sink in Dark Room ...	0	8	7			
Subscrip. to Royal Photogr. Society	1	1	0			
				20	3	4
Cost of Lecture by Mr. R. Kearton, F.L.S.	13	14	6			
Less Sale of Tickets...	10	5	6			
				3	9	0
Printing Monthly Circulars & Postages				12	5	5
Geological Committee, Postages, &c.				1	16	7
Botanical Committee, Postages ...	0	4	3			
London Cat. Brit. Plants (12 copies)	0	12	0			
				0	16	3
Secretary's Expenditure for Stationery and Stamps				4	14	5
Subscription to South-Eastern Union of Scientific Societies	0	5	0			
Subscription to Commons and Footpaths Preservation Society ...	0	5	0			
				0	10	0
Assistant Secretary				5	0	0
Gratuities				1	6	0
				£132	7	10

SPECIAL FUND ACCOUNT.

£186 9s. 0d. CONSOLS.

1900. January 1.	£	s.	d.	1900. January 1.	£	s.	d.
Balance	£25	4	9	Cost of Title Board on Museum Case	2	15	0
W. Bruce Bannerman, Esq., for Cost of Title Board on Museum Case	2	15	0	Fire Insurance—Paid County Fire Office, to cover Museum Case and Books in Library (£100)	0	2	6
Dividend, January	1	8	0	Cost of Trays, &c., for Specimens	2	0	2
,, April	1	4	9	,, Locks for drawers, and fitting same ...	2	0	0
,, July	1	4	4	Balance	26	3	6
,, October	1	4	4				
	£33	1	2		£33	1	2

BALANCE SHEET.

1901. January 1.	£	s.	d.	1901. January 1.	£	s.	d.	£	s.	d.
Balance of Special Account	26	3	6	Deficiency on General Account ...				10	6	4
Subscriptions received, a/c 1901	6	12	6	Cash at Bank	21	19	8			
				Cash with Treasurer	0	10	0	22	9	8
	£32	16	0					£32	16	0

We, the undersigned, having examined the above Accounts and the Vouchers relating thereto, hereby certify that they are correct according to the Vouchers and the Bankers' Pass Book.

GEORGE CLINCH.
W. A. WEIGHTMAN.

TRANSACTIONS

OF

THE CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB.

1899—1900.

147.—Three-colour Photography applied to the Correct Delineation of Natural History Subjects.

By W. Saville-Kent, F.L.S., F.Z.S., &c.

(Read March 20th, 1900.)

The three-colour printing process as applied to the production of artistic and commercial illustrations is doubtless familiar to the majority of those present at this meeting; it having within the last few years made such substantial progress, that it promises within the next decade to completely outstrip and supersede the older and more elaborate system of chromo-lithography.

In chromo-lithography a complex colour subject may require as many as twelve to sixteen or even twenty ponderous stones, each one specially engraved and supplied with its respective colour tint to produce in the combined print a correct replica of the original. Add to this, that each printing has to dry thoroughly before the application of the succeeding tint, such drying occupying at least twenty-four hours, so that if we have only twelve colour stones to deal with, a fortnight is, at the shortest, occupied before the result is realised.

The three-colour process, as its name implies, involves the employment of three colour-printings only, in conjunction with a proportionate abbreviation of the time occupied in its mechanical accomplishment. It is, moreover, an essentially photographic method; three separate negatives of diverse but scientifically gauged intensities being taken of each subject, and the combined colour printings or positives from these negatives having a corresponding but complementary colour ratio.

The scientific principle upon which the very remarkable colour reproductions now obtainable have been rendered possible owes its origin to the late Professor Clerk-Maxwell, who so long since as the year 1861 demonstrated the fact that all the colours of the solar spectrum, and concurrently all those of nature, are the equivalents of an admixture in varying proportions of the three primary colours of the spectrum, *viz.* red, green, and blue-violet.

It is only of late years, with the perfecting of photographic apparatus generally, and of plates and emulsions of extreme and discriminating sensibility in particular, that Clerk-Maxwell's discovery has been found capable of practical commercial application. Among those who have contributed most extensively to both the theoretical and practical utilisation of this three-colour photographic process, the names of our own countryman, Captain Sir William Abney, Frederick E. Ives, of Philadelphia, Prof. Joly, of Dublin, and Lumière, of Paris, are most eminently notable.

The outcome of Mr. Ives's experiments and investigations has more especially been the production of that very ingenious instrument the photo-chromoscope, or kromskop, as it is more popularly known. This is a contrivance by which, through the medium of accurately regulated red, blue, and green-coloured glasses and reflectors, photographs of objects previously taken through screens of the same tint are presented to the eye—more especially in the stereoscopic modification of the instrument—with the most realistic fidelity. Mr. Ives has also invented a kromskop lantern, by which, through coloured glasses, similar realistic images can be projected on a screen. The one drawback, however, to these nature-like pictures as produced in the kromskop, or with the aid of the kromskop lantern, is that they are after all only intangible images that cannot be presented without the aid of the complex and costly instruments devised by their inventor. To meet popular requirements and general application, natural colour pictures or lantern slides that are available, like monochromes of the ordinary type, for individual handling and examination, or for projection by any ordinary optical lantern, have been the desideratum.

Substantial progress has now been made towards the achievement of this much desired goal. Ives himself was among the first to produce such tangible natural colour lantern pictures, the positives being printed on three transparent primary colour carbon tissues, which were then superimposed in correct register. Mr. Benetto, of Cornwall, from whom great expectations were in evidence a year or so since, has produced noteworthy results by the same process. Lumière, of Paris, has employed stained collodion films consecutively printed in correct register on top of one another with the accomplishment of the same object, and the results of his labours in this direction are likely to constitute one of the most interesting displays at the forthcoming Paris Exhibition.

There yet remains to be mentioned the very ingenious adaptation of the three-colour system invented by Prof. Joly, of Dublin. In accordance with his system the three primary colours are all included in alternating microscopically minute parallel lines ruled upon a single original or taking screen, and in the reverse or complementary order on a corresponding or viewing screen, which has to be bound up in perfect register with each resulting positive.

The impression to the eye of these Joly pictures, with their serried lines, while very pleasing, is highly suggestive of a piece of tapestry work, and when greatly enlarged upon the lantern screen the objects delineated present the aspect of being viewed through a wire cage, or thin closely approximate park railings. This aggressive prominence of the ruled colour lines is undoubtedly a fatal obstacle to the utilisation of the Joly process for the colour registration of subjects requiring scientifically accurate reproduction of their minuter details.

Neither of the several systems hitherto enumerated fulfilling the requirements of the easy practical application and scientific accuracy that is in demand, I will now pass on to the introduction and illustration of that modification of the three-colour process which, so far as my personal experiments and experience is concerned, appears to me to hold out the most encouraging future prospects. In common with the original Ives transparency system, the construction of the final positives has much in common with the ordinary carbon process, but with modifications that have been specially devised by Mr. E. Sanger Shepherd, a former collaborator with Mr. Ives. The essential details of Mr. Shepherd's process are described in a paper on "Three-colour Lantern Slides," communicated by him to the meeting of the Royal Photographic Society, held on Nov. 28th, 1899, and are published at some length in the 'British Journal of Photography' of Dec. 1st of the same year. The practical application of this Sanger Shepherd lantern slide process has been so far assured that all the materials and instructions for its employment are now obtainable through the ordinary commercial channels, so that anyone possessed of a camera and ordinary manipulative skill can compose his own natural colour pictures.

Before proceeding to submit to you some few results of my own experiments with this process, I may briefly explain that the negatives from which the slides have been produced were all taken in triplicate through a set of coloured screens similar to that which I now exhibit, and which is in point of fact the one with which I originally took several hundred negatives for the composition of positives or kromograms for illustration in the Ives kromskop. This set of screens is, as you will see, tinted respectively red, green, and blue-violet, and the positives printed from the three consecutive negatives taken have in corresponding order to be printed in or stained the complementary tints of blue, red, and yellow, and are then carefully superimposed to produce the natural colour replica. This reversal of the printing colours as compared with those of the original negative screens will suggest itself as being a rational and consistent outcome of the principles that obtain in the practice of ordinary photography; the black of the negative being rendered white in the positive, and the white of the negative by black. In like manner the negative taken through the red screen has to be printed blue because that colour represents the combined tints of the solar spectrum minus red, which must be omitted; the red, or more correctly pink, print from the green screen similarly represents all the spectrum tints minus green, and the yellow prints from the blue-violet screen the spectrum tints minus blue-violet.

The slides which I will now throw upon the screen will, I trust, fulfil their object of demonstrating the practical utility of this process for the correct delineation of, or, I should perhaps say, counterfeiting, the natural aspect of the objects photographed. Yet more perfected results can and will no doubt be accomplished by further experiment and experience along this same line of research, and I shall be very pleased if what I am about to submit to you may encourage many here present to take up this same fascinating branch of photography.

Mr. Saville-Kent then proceeded to the exhibition on the screen of an extensive series of subjects that he had prepared on the system he advocated. These included representative lantern slides illustrating all the leading natural history branches. Among floral subjects, the orchid class was largely to the fore, various species of *Dendrobium*, *Masdevallia*, *Cypripedium*, and *Cattleya* being especially noteworthy. Various tropical butterflies, suitably associated with the orchids indigenous to their corresponding districts, were included in this series. More ordinary floral types included a bright crimson *Gloxinia* associated with a brilliant blue *Morpho* butterfly; a vase of lilac, and several groups of tropical water-lilies. Of abnormal plant forms, two typical species of the genus *Stapelia*, or so-called carrion flowers of South Africa—the one, *S. variegata*, resembling a spotted starfish, and the other, *S. psomaensis*, clothed with brown fur-like hair, were of special interest. It was explained by Mr. Saville-Kent that the carrion-like odour of these flowers attracted flies, who, in the last-named species more particularly, deposited their eggs freely upon them, apparently under the impression that the malodorous blossom, with its hairy clothing, was the skin of a defunct quadruped. Mr. Saville-Kent had further observed of the plants grown in his conservatory, that the large blow-flies would insert their proboscis between the central rigid anther-styles, and be held prisoners in such a position for many hours. He anticipated that in its native country the species and its allies would be found to be to a large extent insectivorous. A group of scarlet and white spotted fungi from the Shirley Woods, for which the exhibitor acknowledged his indebtedness to Dr. Franklin Parsons for the original specimens photographed, concluded the botanical series. Among the various forms of butterflies and moths projected on the screen, that of our familiar red admiral, *Vanessa atalanta*, complacently resting on a cabbage leaf, was more particularly admired.

Mr. Saville-Kent, as is well known, has of late years devoted much attention to the study of lizards, and possesses an extensive and interesting collection of living types. Of several of these Mr. Saville-Kent had secured life-like colour photographs. These included more especially the Australian stump-tailed lizard, the Algerian and Egyptian skinks, and the so-called teguexin of Central America, which Mr. Saville-Kent has recently demonstrated is in the habit of running bipedally, after the manner of a bird, in common with other lizard types that have formed the subject of his special investigation.

Fish were found to lend themselves very appropriately to three-colour photographic delineation. A group of gold and silver carp and a common red-spotted plaice were particularly realistic, as also that of a John Dory with extended jaws in the act of engulfing a smaller rock fish. A spring idyll—such as may be often re-enacted in the woods and hedgerows around us when the spring is fairly advanced—constituted the subject of a more ambitiously artistic colour picture. It consisted of a bank of primroses and bluebells, with a couple of brimstone butterflies toying over them, while ensconced in a sheltering corner of fern leaves a young leveret was inquisitively watching the sportive butterflies. This lantern slide more particularly demonstrated the latent possibilities of this three-colour photographic process as an aid towards the composition of colour pictures, and as such recommends itself to the attention of both the oil and water colour artist.

Bird life constituted the subject of the concluding series of colour slides shown by Mr. Saville-Kent. The so-called Australian wrens, belonging to the genus *Malurus*, were particularly notable for their bright coloration, and coincidently formed appropriate subjects for colour reproduction. One species—

M. cyaneus—was a brilliant turquoise blue and black; another, black and scarlet; while a third—*M. pulcherrimus*—combined the tints of the two foregoing. The little emu wren, *Stipiturus malachurus*, while of a more sober brown tint, was conspicuous for the peculiarly elongated and slender growth of its primary tail feathers. Both this and others of the preceding species were photographed in association with Australian acacias and other flowering plants indigenous to their native habitats.

A justly admired peacock's feather, in which the characteristic tints were most realistically reproduced, brought Mr. Saville-Kent's demonstration to its conclusion.

Mr. Saville-Kent remarked in conclusion that the more important materials that are, so to say, essential for the successful prosecution of this photographic process illustrated by him that evening were:—Correct colour screens, such as are constructed by Mr. Sanger Shepherd and the Cadett Lightning Spectrum Plate, which has been specially manufactured for use in conjunction with the foregoing screens. As regards cameras, any form of stand camera could be utilised for this process; many of the subjects which he had exhibited having been taken with a kodak camera, across the front lens of which he had slung consecutive sections of his colour screen.

148.—The Stone Monuments of Brittany.

By H. C. Collyer.

(Read May 15th, 1900.)

These monuments are mainly concentrated in that part of Lower Brittany surrounding the Morbihan Sea, near the villages of Carnac, Plouharmel, and Locmariaker. and not far from the town of Auray, a district which seems to have been dedicated to religious and sepulchral purposes by the population of a large tract of country. They consist of Menhirs or Standing Stones, arranged in rows side by side, which stretch for long distances across the country; others are placed to form square or circular enclosures, and some, the largest of all, standing singly; and, secondly, Dolmens, or Table Stones, which in this country we call Cromlechs; but the term Cromlech is there applied to the square or circular enclosures of standing stones. The dolmens are larger than anything of the kind found in these islands, and occur in great numbers, and in various states of preservation.

There are many hundreds of standing stones, but, numerous as they now are, it is evident that they were once far more so, for the alignments are in places interrupted by cultivated fields, and isolated stones that were too large for removal show that the lines were once continuous. All the stones are of granite; the subsoil of the country is also granite, and the land exceedingly poor; and it is doubtless owing to the barren nature of the country that the monuments have been preserved in the numbers that they fortunately have been. It is certain that the dolmens were places of burial, and were all originally covered by tumuli or cairns; some few retain their original tumulus intact, as, for example, Mont St. Michel, at Carnac, and the fine tumulus on Gavr-Inis, or Goat Island, in the Morbihan Sea. Both of these were carefully explored by a society having its headquarters at Vannes, the capital of the department, and the various articles found in them, and in other dolmens, are in the museum there; they consist of exquisitely formed cells of jade, jadeite, nephrite, and similar stone, some of which are the finest specimens of the kind known; there are also some fine necklaces of a greenish blue stone like turquoise.

In the Gavr-Inis tumulus, the sepulchral chamber and the gallery leading to it have the upright stones at the sides, and which support the roof, richly decorated with various designs sculptured on the surface. The arrangement of this ornamentation shows that it must have been done before the stones were placed in position; on one stone is a recess deeply cut into the substance of the granite, leaving two columns in front; it is about 2 ft. long and 4 in. deep behind the columns, which are 4 ft. high and 1½ in. thick, and there is a trough at the bottom of the recess 1¼ in. deep.

The human bones found in the chambers of these dolmens all showed that they had been burned, and cremation seems to have been generally practised; but some small stone chambers have been found called "Kist-Vaens," each containing a body lying on its side in a doubled-up position; one such is preserved in the museum at Carnac.

Others also of the dolmens have designs and hieroglyphics sculptured on their stones, as we shall notice later on, and the question has been raised if it is possible that they could have been done with stone tools. Experiments have been tried, and it is found that such designs *can* be worked on the surface of granite with tools of diorite or a similar stone, but *not* with tools of flint, which, though harder and bearing a better cutting edge, is not so tough as diorite, and breaks in use on such a hard stone as granite, just as stonemasons of the present day use steel tools of a softer temper for granite than for limestone.

Another large dolmen near Locmariaker, called "The Table of the Merchants" (photographs shown), has the end stone sculptured, and on the under side of the roof-stone is a figure, of which I give a sketch about full size, as it is not possible to photograph it. This is mentioned by Sir John Evans in his work on "Stone Implements," but he gives no illustration. He says that it is "The outline of a celt in its handle, carved on the under side of the roof-stone of a dolmen known as 'La Table des Marchands,' near Locmariaker, Brittany. The end of the handle seems . . . to be curved back beyond the socket for the blade, which, however, it does not touch; at the other end of the handle there is a loop like a sword-guard for the insertion of the hand. There is some little difficulty in determining the exact form of this incised carving, as the lines are shallow, and the light does not fall on them."

You see that, in addition to the details just described, there is an ornamental scroll at the top; this seems to represent the feathers or lock of hair so often used by savages to decorate their weapons; so we have here a representation of a stone axe in its handle. Many of the incised carvings seem to be more or less crude drawings of stone axes, as will be noticed in some of the accompanying photographs, and were intended either as a symbol of rank of the person buried, or as a charm. Stone axes are still used as a symbol of authority in the South Pacific (specimen shown) and in Egypt; amongst the jewellery found recently with the mummy of a princess of the early Empire was an axe of pure gold, mounted in a wooden handle, which could only have been a sign of rank. Some of the Pharaohs are represented with somewhat similar axes in their hands.

The name "Table of the Merchants" is suggestive, as the classic authors tell us that the method of trading adopted between the Phœnicians and savage tribes was for the tribe to put the goods they had to barter on a flat rock and go away; the traders would then put what they thought a fair exchange and leave it; if the tribe were satisfied, they took the goods offered and left their own; if not, they took their own goods away, leaving those offered, and the deal was over for that day. The photograph shows that when the ground was higher this would have been just the sort of stone suitable for the purpose.

The supporting stone at the end of this dolmen, which faces the entrance, has its surface decorated with sculptures in slight relief (as shown in the two photographs). These sculptures were evidently done before the cap-stone was put in its place, and many of the carvings in other dolmens show evidence of the same kind.

A dolmen near Plouharmel, called Manè Lud, has some curious carvings on the stones supporting the central chamber, of which I was able to secure a photograph; the markings on the edge of one very much resemble Ogham inscriptions, others seem to represent axes and serpents. All these markings consist of shallow grooves or channels about $\frac{1}{2}$ in. wide and $\frac{1}{8}$ in. deep, just such as would be made with a stone chisel.

The covering stones of this dolmen are flush with the surrounding soil, and on one of them is a row of wedge holes, as shown in the photograph. The edges of the holes are much weathered.

These wedge holes are exactly like those made by the Egyptians in detaching large blocks of stone from the quarry. The photograph shown I took some time ago, in the disused quarries in the desert near Assouan, Upper Egypt. A row of wedge-shaped holes was cut along the line of fracture desired. These were filled with dry wood wedges, driven in hard, and then moistened with water; the resulting expansion split the syenite with such certainty that obelisks were partly finished in the quarry before being detached from the natural rock. It is evident that the Stone Age people knew of this method, and used it to break off pieces from blocks that were too large, but none of the stones show any signs of quarrying, and they were all probably blocks found loose on the surface; but the method by which the largest were got into position is a mystery of which no definite solution has yet been offered, but it seems to have been done by the combined efforts of large numbers of men all pulling together, with wooden rollers placed under the stone to reduce the friction, as shown in some of the Egyptian sculptures.

Sir Joseph Hooker mentions the existence of large numbers of rude stone monuments in Southern India, erected in rows and circles, resembling Stonehenge in dimensions and appearance, and he says that they are erected at the present day by the Kharjias, a race of barbarous hill men very low in the scale, of bloodthirsty disposition, and addicted to human sacrifices. Their method of removing the blocks for their dolmens and menhirs is by cutting grooves, along which fires are lighted, and into which, when heated, cold water is run, which causes the rock to fissure along the groove.

The blocks are erected by sheer brute force, the lever being the only aid.

In a dolmen near Locmariaker are some curious incised markings, of which the sketch shown represents three. Two of them seem intended for boats with men in them; the large one is on the stone facing the entrance, and seems meant for a pair of eyes with eyebrows. There is not light enough in the chamber to photograph by.

Many of the dolmens are in groups of three or four together, so close that one large tumulus must have covered the whole. In some cases the base of the tumulus remains, so that the covering stones of all the chambers only just show at the surface, as in the case of the dolmens of Kondossec, shown in the photographs, and several other groups near. In the case of the dolmen of Keriaval, of which two photographs are shown, there is a centre gallery with chambers at each side. This dolmen has been entirely denuded of its covering of earth, as also has the fine dolmen of Manè Kerioned, of which I took three photographs. This is one of the most picturesque of all. Most of the finest monuments have been taken possession of by the French Government, and cared for and protected by them. Notices to this effect are put on stones near, as will be seen in the photograph of the dolmen of Crucuno, which is a purchased one, plates having run short.

It would be well if our Government took more steps to preserve ancient monuments in this country than they do; so much damage and destruction is constantly going on that can never be remedied afterwards, and priceless memorials of the past are being lost for ever.

Another photograph shows a group of dolmens that have not been considered important enough to clear of bushes or take possession of, and they stand amongst the gorse in the wilds in the condition they all were in a few years ago (the covering stone of one shows a rounded boulder of quartzite in the granite). The stone of which the monuments are composed is a fine grained grey granite, and all (with two exceptions only) are stated to be of the granite of the country. I show a specimen or two of granite, and also some pebbles of a jasper, &c., which occur on the surface near the menhirs. These show a curious weathering, as of partial solution, like half-dissolved crystals of sugar.

The menhirs, or standing stones, next claim our attention. Opinions differ greatly as to the original purpose for which they were erected, but most authorities consider that they had a sepulchral origin—in fact, that they were nothing else than rows of gigantic tombstones; but, with regard to the large isolated menhirs, it is probable that they were objects of worship, or connected with the worship of the sun; also from the superstitions still prevalent amongst the peasantry they may have had a phallic significance. The largest of these now standing is about forty feet high, but one which has been thrown down and broken measures seventy-eight feet in all, and must have stood seventy-two feet above ground. I show a photograph of this, and the six feet of the broken stump-end which was in the ground is clearly noticeable in the photograph (and still more so to the eye) by the difference in weathering. Now this monolith was thrown down about 1300 or 1400 years ago, when the people were first converted to Christianity, for we are told that when Christianity was introduced in the sixth century the

Christian missionaries began to throw down these stones, which were objects of worship, but, finding the task beyond their powers, they consecrated the remainder, and put crosses on them. Crosses are on some to this day. Now, when the stone was thrown down, the weathering must have gone on, both on the newly exposed part as well as the rest of the surface, and the difference still apparent and the sharpness of the fractured surfaces, compared to the weathering that occurred previously, shows that it must have been in a standing position for an immensely longer time than it has been in a broken and recumbent one. Again, one of the menhirs of the alignments of Kermaric is shown by Mr. Miln, who carried out extensive excavations there, to have been thrown down by the Romans, and used as a cooking place for the Roman camp, which utilised some of the standing stones in its vallum, and in this the same evidence of great weathering is shown, which must have occurred when it was in an upright position. Indicative of a remote antiquity, of course some must be much older than others, and the erection of these monuments must have gone on through long ages. Another interesting point is the similarity of idea between the obelisks and pyramids of the early Empire in Egypt, and the giant menhirs and the large tumuli of the Stone Age people. Is it not probable that both peoples started with the same ideas, but that the Egyptians elaborated them as civilization advanced? For stone monuments of similar kind are found in Algiers, Tripoli, and Syria, as well as in Europe and in India; also instances are known in Arabia and Persia, on islands in the Pacific, and the coast of Peru.

Omitting the latter isolated instances, it will be seen that these megalithic monuments form a continuous series from Northern Africa, through Syria, Arabia, and Persia, to India, and along the Western coast of Europe, being found in the West of Spain, the West of France, the South and West of England, all over Ireland, and in Denmark and the extreme South of Sweden. They are hardly found at all in Central Europe, and from their distribution along the Western coast exclusively, it seems to show that the Neolithic people who erected them were, to some extent, a sea-faring people, or else migrated along a tract of country now submerged, which skirted the West of Europe, whilst prevented by the then existing physical conditions from going far into the interior.

The facts seem to point to Northern Africa as the original home of these people; had they been a sea-faring race they would naturally have spread themselves round the coasts of the Mediterranean before venturing into the Atlantic, but this does not appear to have been the case.

It is certain that the coast-line and climate of Europe have varied greatly during the human period; the northern part of Sweden is rising now at the rate of 25 ft. in a century, so that it must have been under water at a comparatively recent period, and that may account for the fact that Stone Age monuments are found only in the extreme south of that country. If the level of the land in South-western Europe were 1000 ft. higher than it is at present, the Continent would extend beyond the present coast of Ireland, but the Mediterranean basin would be represented by large and deep lakes, which would prevent people in Africa from migrating northwards, but extensive plains to the west and north-west, covered with forests and teeming with game, would probably tempt them to move in that direction.

On the island of Lanec, in the Morbihan Sea, is a large stone circle, half of which stands on land, and the completion of the circle can be seen under water at low tide; a model of the island, with the circle, is in the museum at Vannes. This is conclusive proof that the level of the land has sunk considerably since the erection of the stones.

There can be no question that a continuous lowering of the level of the land went on along the coast of Western Europe for ages; the latest instance seems to have occurred shortly after the break up of the Roman Empire in the fifth century. The numerous Celtic legends on the subject all point in the same direction, and seem to have a foundation in fact. In Brittany, there is the legend of the City of Is submerged by a sudden inroad of the sea. In Cornwall, King Arthur's Land of Lyonnesse is said to have stretched out beyond Mount's Bay; and in Wales there are several legends of the sea suddenly swallowing up Cardigan Bay. Again, there is the historical account of the first irruption of the sea into Holland, which drowned great part of the Batavian people about that time.

Therefore, during the Stone Age, and at the time of the erection of many of these monuments, the land may have extended much farther to the westward than it does now, even if Britain was not then joined to the Continent, which it may have been. The period of submergence must have extended over a very long time. Ireland, it is generally considered, was separated from Britain before Britain was separated from the Continent, and the latter event was probably a gradual one.

It is customary to term these rude stone monuments "Druidical." This name is unwarranted, there being no evidence to connect them with the Druids, who are described as the priests of the Celtic tribes of Gaul and Britain at the time of their subjugation by the Romans, and who worshipped in groves of trees; but these monuments date from a time far earlier than that, and are considered to be the work of a race who preceded the Celts, to whom the name Iberian is generally given, and are represented at the present day by the Basques of Spain, by the people of South Wales, called by the Romans Silures, and by the people of the extreme West of Ireland, who are alluded to in Erse literature as Firbolgs, the race who were there before the coming of the Milesians, a short dark non-Aryan people, who form a large proportion of those peoples of Western Europe called Celtic. The Celts themselves came through Central Europe in at least three distinct waves of immigration, and brought with them the use of bronze for weapons and tools, and at the time they came into contact with the Romans had attained the use of iron, for we are told that the Gauls had long iron swords, which bent in fighting and had to be straightened again.

Where bronze or iron have been found associated with the dolmens or menhirs, there have been indications of later work, in the form of secondary interments, or of intrenchments, camps, or buildings, placed amongst the menhirs long subsequent to their first erection.

It will be seen that these megalithic remains of the Stone Age open for us a vista of remote antiquity, and suggest many questions of profound interest relative to the spread and development of the human race, and the changes in the physical conditions of the earth's surface.

On the table are some stone implements from Brittany. Most of them were found in the districts round Lamballe and Dinant by the peasants in cultivating the fields, and are made of a diorite, very hard and tough, of a dark grey colour when freshly broken, but turning brown by weathering, as will be seen by the specimen of natural rock; a few are of flint. There is no true flint in the country, so it must have been brought from a long distance. The smaller specimens are mostly of jadeite, and a stone called by the French "tirholite." The locality from whence this stone was procured seems doubtful, but it is said that a thin vein of jadeite has been found on the sea-coast. There are also some bronze weapons found in the fields, and some stone amulets bored for suspension, also three polishing stones for smoothing the skins used for clothing. Some of the small celts in the museums have holes bored in them, and one of these has evidently been begun, for the commencement of a drill hole is on one side of it. The small celts on the table were collected by a resident in Brittany, and I believe were found in dolmens.

149.—Some Surrey Wells. (Third Paper.)

By W. Whitaker, B.A., F.R.S., V.-P.G.S., Assoc. Inst. C.E., F. San. Inst., Pres. Geol. Assoc.

(Read December 18th, 1900.)

My second paper, in our Transactions for 1894, 5, brought the total number of recorded well-sections in our county up to 257. Now 45 are added, bringing the total to 302. Besides these, however, there are records of depth, water-level, &c., of many other wells, in papers by Mr. Latham, Mr. Lucas, and others, which would have to be noticed in any systematic account of the water-supply of Surrey. I have noticed only wells with some geologic bearing, and, owing to the length of this paper, some in distant parts of the county are kept back.

The wells now to be noticed are, with few exceptions, divisible into two groups: those in which the Lower Greensand is the source of supply aimed at (5), and the much greater number (38) in which the Chalk is the object. Besides these, there is one well in Tertiary beds, and one in gravel.

Of these wells, only one, at Kingston, is more than 500 feet deep (615 feet). Only one, on the other hand, is under 100 feet.

As regards the thickness of the geologic formations passed through, the greatest amount of the Drift, with other superficial beds, is only 34 feet, at Southwark. The London Clay is nowhere passed through, from top to bottom; but 300 feet of it has been found in one case, at Raynes Park, Merton. The thickness of the Lower London Tertiaries, where proved from top to bottom, varies from 57 feet at Streatham to 119 at Croydon; and of the three members of the Series, the uppermost (Blackheath and Oldhaven Beds) is rarely found, the middle (Woolwich and Reading Beds, in one condition or another) and the lowest (Thanet Sand) are always present. The greatest depth in Chalk recorded is 358 feet (much less than the total thickness). Of the Upper Greensand we learn absolutely, and of the Gault practically, nothing. Of the Lower Greensand, a thickness of 250 feet has been proved at Oxted; but the uppermost division (Folkestone Beds) has nowhere been pierced from top to bottom: the next underlying division (Sandgate Beds) is 38 feet thick at Godstone, decreasing to 30 at Oxted, and 11 at Limpsfield: of the Hythe Beds, a thickness of 152 feet has been recorded at Oxted.

Where not otherwise stated, the figures stand for feet. Words in square brackets have been added by the writer.

Battersea. *The Pure Water Co.*

Made and communicated by MESSRS. ISLER.

Lined with 240 feet of tubes, $8\frac{1}{2}$ inches in diameter, from 10 feet down.

Water-level 43 feet down. Supply 4000 gallons an hour.

		Thickness	Depth
Well		—	12
[River Gravel]	Ballast	14	26
[London Clay, 142 feet.]	Blue clay, with claystone at 46 to 48 feet	30	56
	Blue clay and stones	61	117
	Clay and stone	51	168
[Reading Beds, 38 feet.]	Mottled clay and stone	3	171
	Green stone	3	174
	Blue clay and stone	4	178
	Mottled clay and stone, with 6 inches of stone at base	$18\frac{1}{2}$	$196\frac{1}{2}$
	Pebbles	$3\frac{1}{2}$	200
	Green sand and stone	6	206
Grey [Thanet] Sand		35	241
Chalk and flints		159	400

Battersea. *York Road. Messrs. Orlando Jones & Co. Second well.* 1894.

Made and communicated by MESSRS. LEGRAND and SUTCLIFF.

Water-level $76\frac{3}{4}$ feet down.

		Thickness FT.	Thickness IN.	Depth FT.	Depth IN.
Pit (the rest bored)		—	—	9	0
[River Drift]	Sand and gravel (mostly sand)	18	0	27	0
	Coarse gravel	4	0	31	0
[London Clay, $123\frac{1}{4}$ feet.]	Blue clay and septaria	71	0	102	0
	Clay, sandy, and septaria	51	0	153	0
	Black [flint] pebbles	1	3	154	3
[Woolwich and Reading Beds, $69\frac{3}{4}$ feet.]	Shells, conglomerate	1	8	155	11
	Clay	2	1	158	0
	Mottled clay	11	0	169	0
	Grey sand, with an inch of mundic at the base	13	0	182	0
	Mottled clay	8	0	190	0
	Red clay	15	6	205	6
	Pebbles and clay	18	6	224	0
[Thanet Sand, $26\frac{1}{4}$ feet.]	Grey running sand	6	0	230	0
	Dark grey sand, with 3 inches of flints at the base	20	3	250	3
[Upper Chalk.]	Chalk and flints	86	9	337	0
	Flints and sticky chalk	13	0	350	0

BEDDINGTON. *Russell Hill School.*

About 324 feet above Ordnance Datum.

Communicated by MESSRS. A. WILLIAMS & Co., who made the boring (1895).

Shaft 208 feet, with beds of flints in the Chalk nearly all the way down. Depth of water 14 feet.

Boring 150 feet in hard dry chalk, with no flints and no water.

In summer the supply is pumped out easily in about an hour.

Bermondsey. *Rovel Road. Mr. T. J. Lipton's.*

Made and communicated by Messrs. Legrand and Sutcliff.

Water-level 21 feet down.

		Thickness	Depth
Pit (the rest bored)		—	8
[River Drift]	Ballast [gravel]	13	21
	Gravel and clay	3	24
[Woolwich and Reading Beds, 45 feet.]	Mottled clay	3	27
	Sand	3	30
	Shells, sand, and strong clay	9	39
	Mottled clay and grey stone	5	44
	,, ,, red ,,	1	45
	Pebbles and sandy clay	3	48
	Conglomerate; pebbles and sandy clay	3	51
	Very hard sand and pebbles	18	69
Thanet Sand		35½	104½
Chalk and flints		270½	375

Bermondsey. *Staple Street. Messrs. Pink's. ? Second well.* 1898?

Made and communicated by Messrs. Isler.

Lined with 160 feet of tube, of 12 inches diameter, from 7½ feet down.

Water-level 78 feet down in the boring. Supply 8000 gallons an hour.

		Thickness	Depth
Well (? old), the rest bored		—	8
[River Gravel]	Ballast	19	27
[London Clay, 45 feet.]	Blue clay	17	44
	Sandy clay	22	66
	Dead sand and pebbles [? basement bed]	6	72
[Woolwich and Reading Beds, 64 feet.]	Mottled clay	18	90
	Mixed clay	2	92
	Mixed clay and shells	7	99
	Mottled clay and stones	5	104
	Green sand and pebbles	2	106
	Clay and pebbles	4	110
	Green sand and pebbles	5	115
	Mixed sand and pebbles	8	123
	Dead sand and pebbles	13	136
Dead [Thanet] sand		24	160
[Upper Chalk.]	Grey chalk and flints	10	170
	Chalk and flints	130	300

CAMBERWELL. *Messrs. White's, Bagshot Street, Albany Road.*

Made and communicated by MESSRS. ISLER & Co.

Water-level 23 feet down. Good supply, 12,000 gallons an hour. Pumping at this rate lowers the water-level to 40 feet down.

		Thickness	Depth
Dug well (the rest bored, 13½ inches diameter)		—	10
[River Drift, 10½ feet.]	Gravel	8½	18½
	Gravel and sand	2	20½
[Woolwich Beds, 13½ ft.]	Dead green sand	2½	23
	Green sand and pebbles	6	29
	Pebbles and grey sand	5	34
Dark grey [Thanet] sand		37	71
Chalk and flints		289	360

CAMBERWELL. *Messrs. White's, Cunard Street, Albany Road.*

Made and communicated by MESSRS. ISLER & Co.

Lined with 90 feet of tubes, 13½ inches diameter.

Water-level 27 feet down. Good supply, 12,000 gallons an hour. Pumping at that rate lowers the water-level to 40 feet down.

		Thickness	Depth
Dug well (the rest bored, 13½ inches diameter)		—	11½
[River Drift, 9½ feet.]	Ballast	7	18½
	Ballast and clay	2½	21
[Woolwich Beds, 10 feet.]	Sand and pebbles	4	25
	Green sand and pebbles	6	31
Grey [Thanet] sand		35	66
Chalk and flints		296	362

CAMBERWELL. *Messrs. White's, Neate Street. (? Artis Capel & Co.)*

Made and communicated by MESSRS. ISLER & Co.

Water-level 18 feet down. Yield 6000 gallons an hour.

	Thickness	Depth
Dug well (the rest bored, 10 inches diameter) ...	—	12
[Woolwich and Thanet Beds] Sand &c.	68	80
Chalk and flints	219½	299½

Another well in same street. Also Messrs. White's. Same authority.

Water-level 20½ feet down. Supply 12,000 gallons an hour. Pumping at this rate lowers the water-level to 40 feet down.

		Thickness	Depth
Dug well (the rest bored, 13½ inches diameter)		—	13½
[River] gravel		9½	23
[Woolwich Beds, 4½ feet.]	Loamy green sand	½	23½
	Dead green sand	4	27½
Grey [Thanet] sand		36½	64
Chalk and flints		302	366

CAMBERWELL. *North Surrey Brewery, Messrs. Pugh & Co.*

Made and communicated by MESSRS. ISLER & Co.
Water-level 25 feet down. Supply about 2000 gallons an hour.

	Thickness	Depth
Dug well (the rest bored)	—	30
[Woolwich Beds] Green sand and pebbles	9	39
Green [Thanet] sand	41	80
Chalk and flints	101	181

Carshalton. *Ansell's Paper Mill. [? Papermill Lane.]* 1900.

Made and communicated by MESSRS. LEGRAND and SUTCLIFF.
Water rose to 17 inches above the ground (October).

		Thickness	Depth
Soil		8½	8½
[Reading Beds, 50½ feet.]	Blue clay	10	18½
	Sandy clay	5½	24
	Mottled clay	25	49
	Green sandy clay and pebbles	10	59
Grey [Thanet] sand		38	97
Chalk and flints		203	300

Clapham Road. *No. 139. Messrs. Causton's.* 1898?

Made and communicated by MESSRS. ISLER.
Lined with 190 feet of tube, 15 inches in diameter, from 20 feet down.
Water-level 54 feet below surface in bore. Supply 12,000 to 18,000 gallons an hour.

		Thickness	Depth
Soil (made ground)		8	8
[River] Gravel		20	28
[London Clay, 81½ feet.]	Blue clay	77	105
	[Basement-bed] Black [flint] pebbles...	1½	106½
	[Basement-bed] Green sand	3	109½
[Woolwich and Reading Beds, 41 feet.]	Bed of shells	1½	111
	Dead grey sand	10	121
	Mottled clay	6½	127½
	Loamy sand	5½	133
	Hard mottled clay	14½	147½
	Congealed [cemented] pebbles	3	150½
[Thanet Sand, 44½ feet.]	Green sand	11½	162
	Hard grey sand	9	171
	Dark green sand	11	182
	Dark grey sand	13	195
[Upper Chalk.]	Flints with chalk	225	420
	Hard grey chalk	5	425

COULSDON. *Reedham Asylum.*

Letter from Mr. J. C. CARTER (Master) to Mr. Topley.

Well 230 feet deep. Headings south, north, and west (10 feet high, 6 wide); the first 20 feet long, the other two 40. Their floors are about 12 feet above the bottom of the well, and the northern one dips down considerably.

The water (April, 1894) 20 feet up in the well, so that the headings are nearly full. The lowest level, according to Mr. TOPLEY, gave about 6 feet of water in the well.

Croydon. *Gloucester Road. American Steam Laundry.*

Made and communicated by MESSRS. ISLER.

Lined with 175 feet of tubes, 6 inches in diameter, from 5 feet down.

Water-level 66 feet down. Supply about 1000 gallons an hour.

		Thickness	Depth
[River Gravel.]	Ballast, with water	19	19
[London Clay, 50 feet.]	Blue clay	47	66
	Clay and pebbles (? with water)	3	69
[? Oldhaven Beds.]	Hard grey sand (? with water)	13	82
[Woolwich and Reading Beds, 51 feet.]	Blue clay	11	93
	Mottled clay	20	113
	Green sand and pebbles	5	118
	Green sand, with water	15	133
[Thanet Band, 42 feet.]	Grey " " "	27	160
	Green " " "	9	169
	Loamy sand	6	175
Chalk and flints		75	250

Croydon. *Ice Co. By the western end of the Barracks, Mitcham Road.* 1899.

Made and communicated by MESSRS. LEGRAND and SUTCLIFF.

Water-level 12 feet down (June).

		Thickness	Depth
Soil		$1\frac{1}{2}$	$1\frac{1}{2}$
[River Drift.]	Gravel	$17\frac{1}{2}$	19
	Brown sand	4	23
[Woolwich and Reading Beds, $40\frac{1}{2}$ feet.]	Blue clay and shells	$8\frac{1}{2}$	$31\frac{1}{2}$
	Black clayey soil	$3\frac{1}{2}$	35
	Blue clay	4	39
	Mottled clay	$15\frac{1}{2}$	$54\frac{1}{2}$
	Grey loamy sand	1	$55\frac{1}{2}$
	Green sandy clay	8	$63\frac{1}{2}$
Grey [Thanet] sand		$45\frac{1}{2}$	109
[Upper Chalk]	Chalk and flints	12	121
	" " harder	129	250

Croydon. *Morland Road. Messrs. White's Mineral Water Manufactory.* 1898 ?

Made and communicated by Messrs. Isler.

Lined with 190 feet of tube, of 8½ inches diameter, from 2 feet down.

Water-level 32 feet down. Supply 4200 gallons an hour.

		Thickness	Depth
Well (made ground), the rest bored		9	9
[London Clay.]	Clay	17	26
	Blue clay	17	43
[Blackheath Beds, 37½ ft.]	Dark gravel [pebbles]	18	61
	Rock	1½	62½
	Ballast [pebbles]	18	80½
[Woolwich and Reading Beds, 42½ feet.]	Blue clay	4	84½
	Mottled clay	23½	108
	Green sand and pebbles	15	123
[Thanet Sand, 41 feet.]	Rock	3	126
	Sandstone [firm sand]	23	149
	Dark loamy sand	15	164
[Upper Chalk.]	Chalk	8	172
	Chalk and flints	51	223
	Chalk	127	350

Croydon. *Gas Co. Third well.* 1898.

Made and communicated by Messrs. Legrand and Sutcliff.

Water-level 4½ feet down (June).

		Thickness	Depth
Soil		2	2
[River] Gravel		4½	6½
[Reading Beds, 31½ feet.]	Mottled clay	13½	20
	Sandy clay	4	24
	,, ,, and pebbles	14	38
[Thanet Sand, 36 feet.]	Grey sand	2	40
	Dark ,,	30	70
	Loamy sand	3	73
	Green flints	1	74
[Upper Chalk, 330½ feet.]	Chalk and flints, sticky	179	253
	,, ,, hard	151½	404½

Croydon. *The Jolly Sailor, Norwood.*

From Sir J. Prestwich's MSS.

Depth 140 feet. Water found in the pebble-bed [below London Clay].

London Clay, 70 feet.

Bed of clayey limestone with shells [? Woolwich Beds] at 80 feet.

Epsom. *Horton Manor Estate.* 1898 ?

Made and communicated by Messrs. Isler.

Lined with 29 feet of tube, of $11\frac{1}{2}$ inches diameter, 5 feet down; and with 320 feet, of $7\frac{1}{4}$ inches diameter, 2 feet down.

Water-level 56 feet down. Supply 1200 gallons an hour.

		Thickness	Depth
[London Clay.]	Well (the rest bored)	—	6
	Brown clay	6	12
	Claystone	6	18
	Brown clay	122	140
	Brown clay and sandstone [septaria ?]	9	149
	Brown clay	9	158
	Blue clay	10	168
	Sandy clay and stone	$15\frac{1}{2}$	$183\frac{1}{2}$
	Hard sandy clay	37	$220\frac{1}{2}$
[Reading Beds, 71 feet.]	Variegated clay	$10\frac{1}{2}$	231
	Variegated clay and sand	6	237
	Variegated clay	6	243
	London [? bluish-grey] clay	14	257
	Green sand	8	265
	Brown mottled clay	$11\frac{1}{2}$	$276\frac{1}{2}$
	Sand and clay	$2\frac{1}{2}$	279
	Clayey green sand	6	285
	Green sand and pebbles ...	$6\frac{1}{2}$	$291\frac{1}{2}$
[Thanet Sand, $16\frac{1}{2}$ feet.]	Grey sand	$1\frac{1}{2}$	293
	Green sand	14	307
	Flint	1	308
Chalk and flints		142	450

Godstone. *Bransfield House, just northward of the Church.* 1898 ?

Made and communicated by Messrs. Legrand and Sutcliff.

Water-level 35 feet down.

		Thickness	Depth
[Folkestone Beds.]	Sandy clay	3	3
	Sand	6	9
	Running sand	19	28
	Stone	1	29
	Stone and sand	5	34
	Blowing sand	11	45
	Dead sand	27	72
	Green sand	2	44
	Blue sand	22	96
[Sandgate Beds, 38 feet.]	Dark sandy clay	8	104
	Hard stony marl	5	109
	Sandy clay and stone	$12\frac{1}{2}$	$121\frac{1}{2}$
	Hythe marl	$12\frac{1}{2}$	134

		Thickness	Depth
[Hythe Beds, 38 feet.]	Very hard stone	4	138
	Stone and sand	3	141
	Sandy clay	3	144
	Stone and clay	2½	146½
	Sand and sandy clay ...	13½	160
	Stone and sand	4	164
	Sandy clay	8	172

Kennington Road. *Lambeth Baths.*

Made and communicated by Messrs. Baker.
Water-level 90 feet below road-level.

		Thickness		Depth	
		FT.	IN.	FT.	IN.
[River Drift.]	Ballast [gravel]	19	0	19	0
	Bed of stones	1	0	20	0
[London Clay, 79½ feet.]	Blue clay	69	6	89	6
	Sandy clay	7	3	96	9
	Pebbles	2	9	99	6
[Woolwich and Reading Beds, 67 feet.]	Fine grey sand	5	0	104	6
	Hard stone	1	3	105	9
	Sand	0	3	106	0
	Sandstone	0	8	106	8
	Pebbles	0	4	107	0
	Very hard stone	2	0	109	0
	Dark grey sand	6	6	115	6
	Light-coloured clay	11	0	126	6
	Dark clay	4	0	130	6
	Shelly bed	2	0	132	6
	Clay and shells	1	0	133	6
	Dark sandy clay	8	6	142	0
	Clay and pebbles	19	6	161	6
	Pebbles	5	0	166	6
[Thanet Sand, about 20 feet.]	Dark sand	2	2	168	8
	Thanet sand	16	0	184	8
	Green-coated flints	2	0	186	8
Chalk		229	4	416	0

The total is given as 406 feet.

Kingston. *Hodgson's Brewery. Second well.* 1896.

		Thickness	Depth
Ballast [Gravel]		14	14
Blue [London] clay, full of clay-stones ...		245	259
[Reading and Thanet Beds.]	Mottled clays	65	324
	Not described	30	354
Chalk			

Kingston. *Messrs. R. White & Sons.*

Made and communicated by Messrs. Isler.

Shaft 9 feet, the rest bored. Lined with 365 feet of tubes, of $8\frac{1}{2}$ inches diameter, from $2\frac{3}{4}$ feet down.

Water-level $2\frac{3}{4}$ feet down. Supply 540 gallons an hour.

		Thickness	Depth
[River Drift.]	Gravel and clay	9	9
	Gravel	6	15
	Gravel and clay	7	22
[London Clay, 246 feet.]	Clay and clay-stones	85	107
	Gravel [? pebbles]	4	111
	Clay	10	121
	Clay and stones	7	128
	Clay	16	144
	Clay and stones	3	147
	Clay	2	149
	Clay-stone	3	152
	Clay	8	160
	Clay and stones	11	171
	Clay	8	179
	Clay and stones	83	262
	[Basement-bed] Blue clay and pebbles	6	268
[Woolwich and Reading Beds, 85 feet.]	Mottled clay and sand	6	274
	Blowing sand	2	276
	Sand and clay	2	278
	Mottled clay	51	329
	Green sand	6	335
	Mottled clay	2	337
	Sand [may be Thanet Sand]	16	353
[Upper Chalk, 262 feet.]	Flints and chalk	181	534
	Grey chalk	45	579
	Chalk	16	595
	Grey chalk	20	615

Lambeth. *Messrs. J. C. & J. Field's (? at the back of the Canterbury).* 1889 ?

Made and communicated by Messrs. Isler.

Lined with 100 feet of tubes, $15\frac{1}{2}$ inches in diameter, from 28 feet down; and with 215 feet, $11\frac{1}{2}$ inches in diameter, from 12 feet down.

Water-level 90 feet down. Supply 7000 gallons an hour.

		Thickness	Depth
Pit		—	15
[River Drift, 18 feet.]	Ballast [gravel] and sand	3	18
	Live sand	2	20
	Ballast	5	25
	Ballast and sand	3	28
	Ballast	5	33
[London Clay, ? 102 feet.]	Clay, with claystone at 40 to 41 feet	29	62
	Mixed marl and stone	1	63
	Clay	46	109
	Clay and stone	5	114
	Clay	19	133
	Pebbles & sand [? Basement-bed]	2	135
[Reading Beds, ? 55 feet.]	Mixed marl and sand	10	145
	Mixed marl	12	157
	Mottled clay	4	161
	Pebbles	1	162
	Stone	2	164
	Mottled clay	14	178
	Ballast [? pebbles]	2½	180½
[Thanet Sand, 35 feet.]	Green sand and pebbles	9½	190
	Sand	14	204
	Grey sand	7	211
	Sand	14	225
Chalk and flints		179	404

Lambeth. *Lambeth Distillery, Messrs. Daun and Vallentin.*

Made and communicated by Messrs. Isler.

Lined with 35 feet of tubes, 8½ inches in diameter, from 9¼ feet down; and with 215 feet, 7¼ inches in diameter, from 9 feet down.

Water-level 81 feet down. Supply 4000 gallons an hour.

		Thickness	Depth
Made ground		8	8
[River] Gravel		23½	31½
[London Clay, 93 feet.]	Blue clay	90½	122
	Rock	2½	124½
[Reading Beds, ? 47 feet.]	Mottled clay	37½	162
	Black [flint] pebbles	3½	165½
	Pebbles and sand	6	171½
[Thanet Sand, ? 43½ feet.]	Green sand	13	184½
	Grey sand	30½	215
Chalk		105	320

Leatherhead. *Waterworks.* 1898.

Made and communicated by Messrs. Legrand and Sutcliff.

Water-level 3¾ feet down (December).

		Thickness	Depth
Soil		2	2
[River Gravel.]	Ballast, big flints	18	20
[Upper Chalk.]	Rubbly chalk and flints	18	38
	Hard grey rock	2	40
	Chalk and flints	222	262

Limpsfield. *Church Missionaries' Children's Home (College, about half a mile south of the church). Boring, N.N.W. of the building.* 1895.

Made and communicated by Messrs. Legrand and Sutcliff, and from information on the spot (1900).

About 450 feet above Ordnance Datum (? less).

Water-level 122 feet down (140, later ?). Yield about 60,000 gallons a day.

		Thickness	Depth
[Folkestone Beds.]	Sand and ironstone	18	18
	Loamy sand (moisture at 22 ft.)	25	43
[? Sandgate Beds, 11 feet.]	Blue sandy clay	7	50
	Green sand	2	52
	Sand and clay	2	54
[Hythe Beds, 107½ feet.]	Green sand	4	58
	Hard sandstone	3¼	61¼
	Layers of soft sandstone and very hard rock (chert an inch and 2 inches thick)	2¾	64
	Layers of white sandstone (a foot to 2 feet thick) and clay (3 to 6 inches thick)	20	84
	Hard loamy sand	6	90
	Sandstone	1	91
	Hard loamy sand and thin bands of sandstone	22	113
	Hard rock and sandstone	1½	114½
	Loamy sand and sandstone	4½	119
	Coarser brown sand. Water at 124 feet	6	125
	Coarse sand and sandstone	5	130
	Loamy sand; a foot of sand at 138 feet	14½	144½
	Hard sand and rock	6½	151
	Coarse sand and sandstone	2	153
	Blue sandy clay and sandstone	8½	161½

Merton. *Abbey. For the Southwark and Vauxhall Water Co.* 1897.

Communicated by Mr. J. W. Restler, Engineer to the Co.

Shaft. 46 feet above Ordnance Datum.

Water stood 4½ feet down.

		Thickness FT. IN.		Depth FT. IN.	
Surface and ashes		5	0	5	0
[London Clay, 152 feet.]	Yellow clay	12	0	17	0
	Blue clay, with clay-stones (1 ft. at 32 feet, 4 in. at 47 feet, 6 in. at 50 feet, 1 ft. at 55 feet, 1½ ft. at 95½ feet)	124	0	141	0
	Clay and sand	1	0	142	0
	Shells	2	0	144	0
	Blue clay	4	0	148	0
	Sandy clay	3	4	151	4
	Blue clay (specimen of lignite, from 163½ to 164½)	17	8	169	0
[Woolwich and Reading Beds, 32 feet.]	Mottled clay	7	0	176	0
	Light mottled clay	5	0	181	0
	Mottled clay	4	0	185	0
	Shells	1	2	186	2
	Mottled clay	7	8	193	10
	Black peaty clay	0	6	194	4
	Sandy clay	6	8	201	0
[Thanet Sand, 24 feet.]	Green sand	22	0	223	0
	Dark green sand	0	6	223	6
	Pebbles and flints	1	6	225	0
Chalk		10	0	235	0

Perhaps the London Clay should only be carried to 141 feet.

Merton. *Raynes Park. Trial boring, for the Southwark and Vauxhall Water Co.* 1897.

Communicated by Mr. J. W. Restler, Engineer to the Co. A little over 43 feet above Ordnance Datum.

		Thickness FT. IN.		Depth FT. IN.	
Surface [soil]		0	9	0	9
[Drift]	Yellow clay	1	4	2	1
	Gravel	0	11	3	0
	Coarse sand	2	7	5	7
[London Clay, 300½ feet.]	Blue clay, with twelve layers of clay-stones [septaria] a foot thick 27½ feet down; 14 in. about 46 feet down; a foot 123 feet down; 1½ feet 152½ feet down; 8 in. at 174⅓ and 183 feet down; ? 3 in. at 206 feet down; a foot thick 235 feet down; 4 in. 260 feet down; 8 in. 262½ and 268 feet down; and 4 in. at 272 feet down	299	5	305	0
	[Basement-bed.] Pebbles	1	0	306	0

		Thickness FT.	Thickness IN.	Depth FT.	Depth IN.
[Reading Beds, 66 feet.]	Coloured [mottled] clay	3	0	309	0
	Mottled clays	47	0	356	0
	Mottled sandy clay	5	0	361	0
	Sandy clay	0	9	361	9
	Mottled clay	5	9	367	6
	Pebbles	1	0	368	6
	Dark green sand and pebbles	3	6	372	0
[Thanet Sand, nearly 27½ feet.]	Green sand	8	0	380	0
	Grey sand	4	0	384	0
	Fine grey sand	13	9	397	9
	Coarse grey sand	1	4	399	3
	Flints	0	2	399	5
Chalk		90	2	489	7

Mitcham. *Gas Works.*

Boring made and communicated by Messrs. Isler.

Lined with 240 feet of tubes, 8½ inches in diameter, from 5 feet down.

Water-level in bore-hole 20 feet down. Yield 3500 gallons an hour.

		Thickness	Depth
Well (the rest bored), believed to be about 20 feet of sand and gravel over blue [London] clay		—	136
Blue [London] clay		34½	170½
[Reading Beds, 38½ feet.]	Blue and mottled clay	6½	177
	Mottled clay	21½	198½
	Dead green sand and pebbles	10½	209
Green [Thanet] Sand		30½	239½
[Upper Chalk, ? 98½ feet.]	Flints and chalk	48½	288
	Chalk	20	308
	Flints and chalk	50	358

A short note of two wells here by Mr. J. Lucas, in 'The Geology of London,' vol. ii. p. 209, gives the height of the ground as 63 feet.

Mitcham. *Brewery. Messrs. Thunder & Little.*

Made and communicated by Messrs. Isler.

Lined with 30 feet of tubes, 7¼ inches in diameter, and with 180 feet, 5 inches in diameter, both from 6 feet down.

Supply 2000 gallons an hour.

		Thickness	Depth
Well, in Made Ground, the rest bored		—	7
[River Drift, 19 feet.]	Gravel	13	20
	Gravel and clay	6	26
[London Clay, 67 feet.]	Clay	52	78
	Blue clay	15	93
[Reading Beds, 54 feet.]	Sands	15	108
	Mottled clay	20	128
	Sands	11	139
	Sand and pebbles	8	147
Green [Thanet] sands		39	186
[Upper Chalk.]	Chalk	6	192
	Flints and chalk	158	350

Mitcham. *London Brighton and South Coast Railway Station.* 1898.

Made and communicated by Messrs. Legrand and Sutcliff. Water-level 46½ feet down (September).

		Thickness	Depth
Well (old), the rest bored		—	61
[London Clay, 119½ feet.]	Blue clay	92	153
	Dark mottled sandy clay ...	26	179
	Blue sandy clay and pebbles	1½	180½
[Woolwich and Reading Beds, 60½ feet ?]	Hard bands, and shell and clay conglomerate	8½	189
	Mottled and sandy clay	4	193
	Blue clay and shells	2½	195½
	Black peaty clay and shells	4½	200
	Light-coloured mottled clay	19½	219½
	Green mottled clay	4	223½
	Green sandy clay and pebbles	17½	241
Thanet Sand		24	265
Chalk and flints		169	434

Possibly the top bed classed with the Woolwich Beds may belong to the basement-bed of the London Clay.

Mitcham. *Messrs. Typke & King. On the northern side of the Common, just north of Tamworth Lodge.* 1896.

Made and communicated by Messrs. Legrand and Sutcliff. Water-level 44 feet down.

		Thickness	Depth
[River] Gravel		12	12
[London Clay, 102 feet.]	Brown clay and stones	2	14
	Blue clay and septaria	83	97
	Brown sandy clay	17	114
[Woolwich and Reading Beds, 54 feet.]	Clay, shells (*Ostrea* & *Cyrena*) and mundic	29½	143½
	Mottled clay	24½	168
[Thanet] Sand		40	208
Chalk and flints		92	300

Mitcham. *Rubber Chemical Works, Seringa Mills.* 1900.

Made and communicated by Messrs. Legrand and Sutcliff. Water-level 47 feet down (October).

		Thickness	Depth
Soil		1½	1½
[River Gravel.]	Ballast	13	14½
[London Clay, 131½ feet.]	Blue clay and septaria	110½	125
	Blue sandy clay	10	135
	Sandy clay and pebbles	11	146
[Woolwich and Reading Beds, 54 feet.]	Shell-rock	1	147
	Black clay and shells	13	160
	Black clay	10	170
	Sand and shells	2	172
	Mottled clay	18	190
	Hard sandy clay and pebbles	10	200
Thanet Sand		33½	233½
Chalk and flints		67½	301

Nunhead. *Trial-boring, for the Southwark and Vauxhall Water Co.* 1897.

Communicated by Mr. J. W. Restler, the Co.'s Engineer (and from specimens).

110 feet above Ordnance Datum.

			Thickness FT.	Thickness IN.	Depth FT.	Depth IN.
Soil			1	6	1	6
[London Clay.]		Yellow (brown) clay, clay-stones (septaria) 8 inches thick at base	11	8	13	2
		Yellow (brown, rather sandy) clay	1	10	15	0
		Yellow (brown) clay, with clay-stones 6 inches thick at base	8	6	23	6
		Yellow (brown and partly grey) clay, with clay-stones (septaria) a foot thick at base	2	3	25	9
		Yellow (brownish-grey) clay (with selenite in upper part)	5	5	31	0
		Blue (grey and brownish) clay	40	6	71	6
	[Basement bed]	Blue clay (grey sandy, with green grains) and stones (flint pebbles)	3	6	75	0
		Blue sandy clay (grey clayey sand, hard)	2	6	77	6

		Thickness FT.	IN.	Depth FT.	IN.
[Woolwich and Reading Beds, $51\frac{3}{4}$ feet.]	Blue (grey) clay and shells (? *Cyrena*)	1	4	78	10
	Blue clay (grey, some bits of *Ostrea*, ? carried down)	0	8	79	6
	Light mottled (pale grey and brown) clay	0	9	80	3
	Dark blue (light-grey) clay	5	9	86	0
	Grey sand (buff, compact, fine, ? part clayey)	10	6	96	6
	Clayey sand and shells (grey sandy clay, broken shells)	8	0	104	6
	Mottled clays (puce, grey purple and brown, small calcareous concretions in lower part)	6	0	110	6
	Sandy clay (grey and brownish) and pebbles (of flint)	5	9	116	3
	Green sand (deep green, clayey) and small (flint) pebbles	4	6	120	9
	Green sand (clayey) with concretion (white calcareous matter, and a few very small flint pebbles)	8	6	129	3
[Thanet Sand, 38 feet.]	Grey sand (fine, buff)	37	3	166	6
	Dark green-coated flints	0	9	167	3
Chalk and flints		167	3	320	0

Oxted. *Railway Station.* 1898.

Made and communicated by Messrs. Legrand and Sutcliff.

About 340 feet above Ordnance Datum.

Pit $7\frac{1}{2}$ feet, the rest bored.

Water-level $52\frac{1}{2}$ feet down (December, 1898, ? lower, 236 above O. D., later, from local information, 1900).

		Thickness FT.	IN.	Depth FT.	IN.
[Folkestone Beds, $62\frac{1}{4}$ feet ?]	Buff sand	34	0	34	0
	Buff sand and ferruginous sandstone	5	0	39	0
	Brown sandy clay	10	0	49	0
	Brown sandy clay, with bands of calcareous sandstone	11	2	60	2
	Calcareous grit	2	1	62	3
[? Sandgate Beds, $30\frac{1}{4}$ feet.]	Brown sandy clay	6	9	69	0
	Dark sandy clay	14	6	83	6
	Green sandy clay	9	6	93	0

		Thickness FT.	IN.	Depth FT.	IN.
[Hythe Beds, 152½ feet.]	Bands of green clayey sand and calcareous sandstone	11	0	104	0
	Bands of grey clayey sand and calcareous sandstone	11	3	115	3
	Bands of green clayey sand and calcareous sandstone	5	9	121	0
	Green clayey sand and thin bands of grey sandstone	18	6	139	6
	Kentish Rag	3	0	142	6
	Soft grey sandstone and thin bands of blue clay	1	6	144	0
	Bands of hard and soft grey sandstone	6	0	150	0
	Hard grey sandstone and bands of grey sandstone	9	0	159	0
	Grey clayey sand and bands of grey sandstone	10	0	169	0
	Hard grey sandstone	2	0	171	0
	Grey sand and thin bands of grey sandstone	6	6	177	6
	Grey sandstone and bands of grey sandy clay	17	6	195	0
	Blue sandy clay and bands of grey sandstone	17	4	212	4
	Hard sandstone	2	8	215	0
	Blue sandy clay and thin bands of stone	10	0	225	0
	Hard blue sandy clay	12	6	237	6
	Grey sand	2	6	240	0
	Bands of blue sandy clay and grey sand	3	0	243	0
	Grey sand	2	6	245	6
[? Atherfield.]	Brownish-blue clay	4	6	250	0

I have some doubt in classifying any of the beds as Sandgate Beds, that division not having been recognized above the outcrop of the Hythe Beds, close by. It is possible that the Folkestone Beds may end at 49 feet, and that the rest may belong to the Hythe Beds, which would then have a thickness of 196½ feet, or more if the Atherfield Clay has not really been reached.

Putney. *Brandon's Brewery.* 1898.

Made and communicated by Messrs. Legrand and Sutcliff.
Water-level 98 feet down (May).

		Thickness	Depth
Pit (the rest bored)		—	10
[River Gravel.]	Ballast	16	26
[London Clay, 159 feet.]	Blue clay	150	176
	Blue sandy clay	9	185

		Thickness	Depth
[Reading Beds, 62 feet.]	Mottled clay	33	218
	Brown clay	17	235
	Sandy clay and pebbles	$6\frac{1}{2}$	$241\frac{1}{2}$
	Greensand	$5\frac{1}{2}$	247
Grey [Thanet] Sand		23	270
Chalk and flints		230	500

REDHILL. *Brewery, Messrs. Cutforth's.*

Made and communicated by MESSRS. ISLER and Co.

Lined with tubes of 5 inches diameter to 84 feet down.

Water-level 31 feet down. Supply about 1000 gallons an hour.

		Thickness FT.	Thickness IN.	Depth FT.	Depth IN.
Dug well (the rest bored, 5 inches diameter)		—	—	5	0
[Lower Greensand.]	Ironstone and sand	28	6	33	6
	Sand	4	0	37	6
	Blowing sand	53	2	90	8
	Loamy sand	7	0	97	8
	Sandstone	11	1	108	9
	Blowing sand	10	6	119	3
	Black loamy sand	5	6	124	9

Rotherhithe. 251 *Rotherhithe Street. Messrs. Dick and Co.*

Made and communicated by MESSRS. ISLER.

Lined with 135 feet of tubes, $8\frac{1}{2}$ inches in diameter, from $1\frac{1}{2}$ feet down.

Water-level 45 feet down. Supply 3580 gallons an hour.

		Thickness	Depth
Pit		—	13
[? River Drift and Eocene Tertiary.]	Gravel	20	33
	Clay and stones	21	54
	Gravel and clay	5	59
	Gravel	10	69
	Gravel and clay	5	74
	Gravel	4	78
	Gravel and clay	6	84
	Gravel and sand	33	117
	Clay sand and flints	7	124
Chalk and flints		139	263

SOUTHWARK. *Falcon Wharf. Central Pumping Station of the London Hydraulic Power Co., a little below Blackfriars Railroad Bridge. Sumph.*

Communicated by MESSRS. ELLINGTON and WOODALL.

15 feet above Ordnance Datum.

		Thickness	Depth
Made ground		12	12
[Alluvium.]	Silt	6	18
	Peat	4	22
[River Drift.]	Sand	2	24
	Ballast, the lower part coarse. To blue [London] clay	8	32

SOUTHWARK. *South London Brewery, Southwark Bridge Road (Messrs. Jenners').*

Made and communicated by MESSRS. ISLER and Co.
Water-level 114½ feet down. Supply good.

		Thickness FT.	Thickness IN.	Depth FT.	Depth IN.
Dug well (the rest bored)		—	—	15	0
[River Drift, 19 feet.]	Grey sand	12	0	27	0
	Ballast [gravel]	7	0	34	0
Blue [London] clay		75	0	109	0
[Woolwich and Reading Beds, 56¾ feet.]	Mottled clay	22	9	131	9
	Stone	1	0	132	9
	Sand and mud	4	6	137	3
	Mottled clay and pebbles	14	3	151	6
	Congealed [concreted] ballast	1	6	153	0
	Pebbles	0	9	153	9
	Sand and ballast	3	3	157	0
	Clay and pebbles	8	9	165	9
Green [Thanet] sand		37	5	203	2
Chalk and flints		129	10	333	0

This section shows a curious likeness to another, at Bankside, near by, published in the 'Geology of London,' vol. ii. p. 218. There is, too, a general agreement with the sections at Barclay's brewery, also near by (pp. 219, 220, of above.)

Streatham Common. *Messrs. Forster and Gregory's Chemical Works.*

Boring made and communicated by MESSRS. ISLER.
Lined with 80 feet of pipe, 10 inches in diameter, from 64 feet down.
Water-level 43 feet down. Supply 8000 gallons an hour.

		Thickness	Depth
Well. Believed to be gravel and sand over blue clay		—	67
Blue [London] clay		5	72
[Reading Beds, 28 feet.]	Mottled clay	16	88
	Green sands	12	100
Blowing [Thanet] sands		29	129
[Upper Chalk.]	Chalk	8	137
	Chalk and flints	97	234

Titsey. *South Green. By road and brook.*

From Mr. Topley's MSS. Shaft.

Gault [clay] over 100 feet.

At 106 feet the rock-bed [base of Gault] was broken through, and then water burst up, rising to a level of 30 feet below the surface. The level never varies, and the water is good.

Whiteleaf. *Near the Rose and Crown. Caterham Gas Co.* 1900.

Made and communicated by Messrs. Legrand and Sutcliff.

Water-level 13 feet down (April).

	Thickness	Depth
Clay and flints	11	11
Pebbly chalk and flints	17	28
Pebbly chalk	23	51
Solid chalk	11	62
Solid chalk with soft partings	16	78
Solid chalk	16	94
Very hard chalk	6	100

Wimbledon. *Chambers' Watercress Beds, close to the Wandle (on its eastern side), and just south of the road (? Gap Road), westward of Lambeth Cemetery.* 1893.

About 35 feet above Ordnance Datum.

Bored and communicated by Messrs. Legrand and Sutcliff.

Water rose 17 feet above the surface. Flow at the surface 2600 gallons an hour (February, 1893).

		Thickness	Depth
[Alluvium.]	Yellow clay	$1\frac{1}{2}$	$1\frac{1}{2}$
	Mould	1	$2\frac{1}{2}$
[River Drift.]	Gravel and sand	$5\frac{1}{2}$	8
Blue [London] clay, with 2 inches of stone at top and a layer of pebbles at the bottom		40	48
[Woolwich and Reading Beds, 55 feet.]	Clay sand and shells	11	59
	Stone	$\frac{1}{2}$	$59\frac{1}{2}$
	Coloured [mottled] clay	$37\frac{1}{2}$	97
	Pebbles and clay	3	100
	Green sand and pebbles	3	103
[Thanet Sand, $33\frac{1}{2}$ feet.]	Green sand	8	111
	Green sand and few pebbles [fallen down]	8	119
	Sand	$17\frac{1}{2}$	$136\frac{1}{2}$
Chalk and flints		$29\frac{1}{2}$	166

150.—Stone and Bronze Celts recently discovered in Croydon and Neighbourhood.

By N. F. Robarts, F.G.S.

(Read December 18th, 1900.)

Although there have been various finds of flint implements at Croydon, I cannot trace that any polished celts have been found here at all equalling those which our Vice-President, Dr. J. M. Hobson, has lately secured, and I think it is therefore desirable that the find should be recorded. At the same time, as there are several workers in this field, I have thought it might be as well to collate the records of previous finds, so that the particulars of same may be conveniently referred to for future guidance.

In our own 'Transactions' we have the paper by Mr. Alexander J. Hogg, "The Flint Implements of Addington";* and our member Mr. George Clinch, F.G.S., has described a number of specimens in his paper, "Prehistoric Man in the Neighbourhood of the Kent and Surrey Border: Neolithic Age."†

Beyond these papers I can only find the following:—In 'My Garden,'‡ Mr. Smee wrote as follows:—"Flint instruments are found over the district, but not in great numbers. Mr. J. Wickham Flower, of Croydon, has a very fine collection, and is an authority on the subject. He lent me a specimen to figure, which was found at Croydon." The specimen is so badly figured that it is impossible to say whether it is a celt or a scraper. "He also found specimens of scrapers at Haling Park, which he regards as authentic." The specimen figured is a fair scraper. "Mr. Cressingham has also picked up a Celtic worked stone on the downs south of my garden." This, from the figure, appears to be a well-polished celt, but I cannot help noticing the unfortunate confusion in the mind of the author between a stone celt and a Celtic stone, and my calling attention to it will, I hope, prevent any of our members from falling into a similar error.

The only other reference I find is in Mr. J. Corbet Anderson's 'Croydon, Prehistoric and Roman,'§ where he writes:—"Relics of the Neolithic or later stone age have been found at Croydon. A flint scraper was found in Haling Park." Mr. Flower's "scrapers" are by this historian reduced to one. "Some time since a stone celt was picked up out of the gravel in our parish"—by Mr. Francis Warren. Whether this was a palæolith or

* Trans. Croydon Micros. and Nat. Hist. Club, 1898, p. 257.

† Journ. Anthrop. Inst. (n. s.), vol. ii, p. 124.

‡ 'My Garden,' Alfred Smee, F.R.S., 2nd edit. 1872.

§ Anderson's 'Croydon, Prehistoric and Roman,' p. 17.

neolith is not mentioned, beyond its coming under the above heading of "relics of the Neolithic or later stone age," upon which definition I do not place much reliance. Mr. Anderson goes on to say:—"In the year 1861 part of another finely formed stone-cutting implement was dug out of the gravel in this immediate neighbourhood; the original is shaped out of a very hard white stone." This was found by the late Mr. West when digging for the foundation of his cottages on Bandon Hill. The celt is figured by Mr. Anderson, and appears to be a well-polished one, broken across the upper part, and therefore not showing its original length; the specimen as found was $6\frac{1}{4}$ in. long, and probably was originally 7 to $7\frac{1}{2}$ in. in length. The "very hard white stone" was probably flint. Mr. Anderson also records Mr. Cressingham's celt mentioned in 'My Garden,' from which work his information appears to be derived.*

With respect to the two celts secured by Dr. Hobson. These were dug up last month when connecting one of the houses in Beech House Road, Croydon, with the sewer in that road. The position was about one hundred yards from Park Lane, and the finder informed me that they were both lying together at a depth of about 6 ft. 6 in. in apparently undisturbed ground. He saw no signs of any interment or other remains. The trench was about 3 ft. 6 in. wide, and was still open when I saw it a day or two after the find. I could discern no signs of any disturbance on either side of the trench, such as there would probably have been had the ground been opened to that depth in such a narrow space. The implements were lying in a pebbly loam, the 6 ft. 6 in. superincumbent soil being made up of 3 ft. 6 in. made soil and 3 ft. pebbly loam. The pebbles were tertiary ones, and I think the loam has washed down from higher ground and covered the implements, which from their condition have certainly not been rolled, and were probably buried very slightly, or even left on the surface, and the considerable thickness of black made soil has probably principally accumulated in the same way as the loam.

No. 1, the smaller of the two celts, is quite perfect, and is $6\frac{1}{4}$ in. in length and $2\frac{1}{2}$ in. broad in the widest part. It is made of a dark-coloured flint, and has an oblique edge. It has been considerably polished, and has apparently been used.

No. 2 is a very fine specimen, made of a light-coloured flint, also in perfect condition, with an oblique cutting edge. It is highly polished, and the crust of the flint is almost entirely removed. It has to all appearances never been used. It is $7\frac{1}{4}$ in. in length and $2\frac{3}{4}$ in. wide in the broadest part.

Both these celts differ from those which have been figured in

* Since the above paper was read, I learn of a broken neolithic celt found at Russell Hill by R. Garraway Rice, Esq., F.S.A.

the works I have mentioned, as none of those hitherto recorded have had oblique edges. It is of course possible that these implements are of very late manufacture, being found so near the Anglo-Saxon burials in Edridge Road.

Bronze Hoard, Beddlestead, near Chelsham.

Coming from the Stone to the Bronze Age, I have to call your attention to the specimens before you; but before describing them I desire again to collate for future use the information which exists regarding bronze implements in this neighbourhood.

Only two previous finds have been recorded. The first, a founder's hoard, at Wickham Park, for which Mr. J. Corbet Anderson's 'Croydon, Prehistoric and Roman' is again my authority. Mr. Anderson writes:—"A number of articles in bronze were found in Wickham Park, and were deposited in the British Museum in the year 1855" by Lewis Loyd, Esq., J.P. "The find included part of a spear-head, a portion of the handle of a dagger, fragment of a knife with socket, and also fragment of a matrix or mould for knife, a hammer, a cooped (*sic*) palstave, fragment of a gouge, and various broken bits of circular bronze cakes."

This hoard may be seen in the British Museum; it really consists of twenty-five pieces, some of which are referred to by our honorary member [Sir John Evans, K.C.B., &c.] in his standard work, 'Ancient Bronze Implements.' The hoard includes five lumps of bronze.

The other find was described by our late member, Mr. J. Wickham Flower, F.G.S.* It consisted of a hoard discovered about 1871 in preparing the ground for the foundation of a house nearly opposite the schoolroom, Beddington. There were in all thirteen pieces, *viz.* three cakes or lumps of bronze, one gouge, two broken spear-heads, one half of a mould for casting bronze celts, and six celts.

The hoard was found lying some eighteen inches below the surface, all huddled together.† The relics, with the exception of one celt, which came into the possession of Mr. J. Corbet Anderson, were until lately in the possession of our former member, Dr. Strong, who obtained them from Mr. Mathews, of the Old Town, who bought them as old metal, and long retained them. Dr. Strong kindly promised me some months ago that he would lend these interesting specimens to our museum, but he has unfortunately been unable to find them, and believes that they were either lost or stolen when he removed from Croydon. Fortu-

* Surrey Arch. Soc. Coll. vol. vi. 1874.

† Anderson's 'Croydon, Prehistoric and Roman.'

nately several of the best implements have been figured in the Surrey Archæological Society's 'Transactions,' and in Mr. J. Corbet Anderson's 'Croydon, Prehistoric and Roman.' Perhaps, in view of this much to be regretted loss, I may point out to our members how very desirable it is that such objects should not remain in private collections, but be intrusted to our museum, for it is constantly the case that by the death or removal of the owner the objects are dispersed, and their local value disappears.

Although not in our immediate neighbourhood, a third hoard has been discovered in Surrey, and may be seen in the British Museum. This was found at Farley Heath, and was given to the Museum by Henry Drummond, Esq., in 1853. It consists of ten pieces, and includes a perfect spear-head, and well-finished arrow-head, parts of several celts, one quite perfect, and an implement which might be a small pick. I do not know if it has been described.

The hoard which I have brought to show you consists of nine pieces. It was found about a year ago by a labourer digging for flints in the chalk rubble of a dry chalk valley at Beddlestead Farm, near Chelsham. The two fine celts, Nos. 5 and 6, belong to Mr. Frank Churchill, of Warlingham, who has kindly lent them to our museum; and the other seven pieces were generously given me by Mr. McBay, of Beddlestead Farm, when I called to inquire about them. These will also be placed in the museum to make the hoard complete.

No. 1 is a broken palstave, very similar to the one in the Wickham Park hoard, but in much less oxidised condition. With regard to this form, I extract the following from 'Ancient Bronze Implements':—

"The form of palstave so common in France and Germany, without stop ridge, and with the side wings hammered over so as to form a kind of semi-cylindrical socket, is rare in England. There is usually at the top of the blade a sort of dovetailed notch, which may possibly have been of service in hafting the tool. It originates, however, in there having been two runners, by which the metal was conducted into the mould, which, when broken off, left two projections at the top of the blade. These being hammered so as to round the external angles and flatten the ends, have come over towards each other, and made what was a notch with parallel sides into one which is dovetailed."

In the specimen before us this notch has been filed or hammered away. but there is a very slight trace of it left. The wings meet, but in the Wickham Park specimen they do not quite touch; the latter is also slightly bent in, and is $5\frac{3}{8}$ in. in length.

"The upper part of a palstave of this character was found with socketed celts, &c., in the Hundred of Hoo, Kent. It has been thought that this was cast hollow to receive a central prong, but the cavity is probably due to defective casting."

You will notice our specimen is also broken, apparently from the same cause, and has a similar cavity. It is 3 in. in length.

No. 2 is the later form of socketed celt, but it is interesting to observe, moulded upon it as an ornament, the now useless wings of the palstave which remain as an ornamental survival. Above the wings is a pellet; in one of the Beddington celts there are two pellets between the wings. There is a probability that these pellets are also ornamental survivals representing the heads of nails driven through the palstave the more firmly to secure it to the hafting. It has occurred to me that the ornaments of both wings and pellets may originally have been produced in the socketed celts by the use of a winged, nailed palstave for making the matrix of the first mould. The edge of the blade is imperfect, but bears traces of having been rubbed laterally upon a whetstone. The length of No. 2 is $4\frac{1}{2}$ in.

No. 3.—This is a further development of the socketed celt. The wings and pellets have disappeared, and are succeeded by moulded horizontal lines round the socket. The edge of the blade is extended in width, but has suffered considerably in use, the part farthest from the handle being worn away, The socket is almost oval. The length of the celt is $3\frac{5}{16}$ in.

No. 4 is a more massive celt, although shorter than No. 2, being $4\frac{1}{4}$ in. in length. The edge of the socket, which is almost square, is left much more unfinished where the metal was poured into the mould, but the tool has been hammered to a fine cutting edge, and has suffered little or no wear. The ornamentation is more simple than in either No. 2 or No. 3, consisting merely of double lines round the socket above the top of the loop, which in both No. 2 and No. 4 is placed much higher upon the implement than in No. 3. This very closely resembles one in the Wickham hoard. I have not yet compared them together, but they seem to be possibly from the same mould.

No. 5 is also a massive implement, capable of being used with great effect. It is still more simply ornamented than No. 4, having a single line round it above the loop. The socket is almost quadrilateral, measuring $1\frac{7}{16}$ in. × $1\frac{3}{16}$ in. The edge of the blade has been sharpened by hammering, and shows the effect of use. It is $3\frac{3}{16}$ in. in length. Neither No. 4 nor No. 5 appears to have suffered so much from corrosion as Nos. 2 and 3, and this makes it probable that the metal is somewhat different.

The remaining objects are three cakes of copper, one of which shows that it was melted down in a circular vessel, and the lower half of a socketed celt.

The hoard is evidently that of a founder who hid his scrap bronze and cakes, together with three second-hand and one new celt. It is interesting to note that in both this and the Wickham hoard the oldest form—the palstave—is in both cases in a condition of scrap; while the later forms of socketed celts are some of them new, or almost new, implements ready for sale or barter. The weights of the cakes are respectively $17\frac{3}{4}$ oz., 10 oz., $6\frac{1}{4}$ oz.*

151.—Report of the Meteorological Committee, 1900.

Prepared by the Hon. Sec., Francis Campbell-Bayard, F.R.Met.Soc.

(Read 19th February, 1901.)

The same arrangements under which the daily rainfall of the district around Croydon has been observed and tabulated have been continued throughout the year 1900. The number of stations at the beginning of the year was 80, and this number was further increased to 82 in July by the addition of Worcester Park and Richmond, the observations of which are complete for the whole year. These additional complete observations, together with the complete observations for Chevening Park, Chelsham, Morden, and Clapham Park, will be found at the end of this Report.

It is with very great regret that the Committee have to announce the closing of one station—Purley—by the discontinuance of the observations in January; and of two other stations by the removal of the observers—*viz.* Hayes Common and Keston (Bradfield). Two very old observers in the district have been removed by death—*viz.* Mr. Crowley, whose record commenced with the year 1871, and continued till the close of the year; and Mr. Devas, of Wimbledon, who began to record in January, 1854, and continued till the end of July, 1900. This record was completed by a neighbour, Mr. Penrose, till the end of the year. The station also of Warlingham has changed hands during the year; and that of Burgh Heath, a monthly one, has suffered through the destruction of the gauge. These great losses will be replaced during the present year by new gauges at Wimbledon, Chelsham, Chevening Park, Morden, and Clapham Park. The gaps occasioned by the losses at Purley, Hayes Common, and Keston have not yet been filled, and there is a large space unrepresented by any gauge east of Greenwich. The

* Since the above paper was read, I find that there is a fine socketed celt from Guildford, Surrey, in the Norwich Museum. I have also obtained one from Riddlesdown, Croydon.

Committee venture to suggest that the Club should pass a vote of condolence with the families of the deceased observers; and to the observers who have ceased recording, for their great services so ungrudgingly rendered in the past.

Appendix I. to this Report contains a list of the observers, with particulars relating to the stations and gauges, and also the monthly tables of daily rainfall, of which a sufficient number have from month to month been pulled for the use of the Club. These printed tables contain the records of all observers, with the exceptions already mentioned, reporting to the Committee.

Appendix II. contains a record of all falls of rain of 1·00 in. and upwards, extracted from the monthly tables in Appendix I., and the records of the other stations at the end of this Report. It will be noticed that there is only one fall of 2·00 in., and that there are only six days with falls over 1 in.

The Committee do not propose to discuss the rainfall of the past year beyond saying that it has been a dry year, and that the deficiency in the amount of rain is about 2·50 in. The reason of this decision on their part is, that they think that the time has arrived at which a discussion of the observations on which so much money and toil have been expended may usefully be undertaken. Owing to want of time, this discussion cannot be exhaustive, but it seems desirable to make an attempt to deal with the problems that are revealed by the tables.

To facilitate this, the mean monthly and annual rainfall for the ten years 1891–1900 of all the stations in the district reporting to the Committee have been calculated, and is contained in Appendix III. This Appendix contains the records of forty-eight stations, and is believed to comprise the records of all stations in the district having this length of period, with the single exception of Kew Observatory. Owing to certain gaps in the records of some of the stations, it has been necessary to have recourse to interpolation. This method has been adopted with respect to Keston, Hayes Common, Sutton, and South Norwood, but the gaps in each case amounted to but a very few months. Other records are comprised of the figures from two or more separate stations either under the same or a new observer. These changes have been duly notified from time to time in the printed tables, and nothing further need be said about them, except to say that no records have been conjoined where the stations are more than one mile apart. Slight differences may occur in the elevation of the conjoined stations above sea-level, but it does not appear probable that this slight difference materially affects the ten years' average. The stations in Appendix III. have been arranged in accordance with their height above sea-level, and, where the stations are of the same height, in alphabetical order. This has been done on what seemed to be the well-founded assumption that rainfall up to a certain point—*viz*. about 1500 ft.

—increases with the elevation of the station above sea-level. That this assumption is incorrect a single glance at Appendix III. will show. If we take the annual rainfall, we at once see that our highest station—Knockholt—instead of standing first, stands fifth, the station with the highest rainfall being Caterham, which is 175 ft. lower, and the station with the second highest rainfall is no less than 465 ft. lower. Again, the station with the lowest rainfall is Battersea, 21 ft. above sea-level; the next station is Nunhead, which is no less than 155 ft. higher; and the third station is Deptford, which is 1 ft. lower. These few facts at once show that other considerations besides elevation enter into rainfall statistics, and these are, the position of the gauge with reference to the country around. To ascertain this, the only person capable of doing it accurately is the observer himself, if he would only take the trouble. He would be able to say whether the gauge was on the west or east side of rising ground, whether the rainfall is influenced by eddies occasioned by houses, hills, woods, &c. All that the collector of statistics of rainfall, like your Committee, can do is to endeavour to form groups of neighbouring stations of the aspect of which he knows but little, and from the records of each group to form his judgment of what the rainfall of the districts represented by the groups is likely to be. If he is careful, his estimate of the average fall will not be far out, though he will of course have no means of judging as to what may be the fall of any particular year.

With reference to the monthly rainfall, it will be noticed that without a single exception October, as is well known, is the wettest month of the year, and then in order, with but very few exceptions, come November, December, August, July, and September. This arrangement of the last six months of the year is singular, for a very large number of persons would have said that July was the second wettest month, whereas it is the fifth, August being the fourth. The first six months of the year seem to arrange themselves in the following order, *viz.* January, the wettest; then February, June, March, May, and April. May and April seem to be the driest months of the year, April having the smallest rainfall.

With reference to the seasonal rainfall, the percentages have been calculated of the stations with the largest and smallest rainfall, *viz.* Caterham and Battersea, and they are—

	Caterham.	Battersea.
	per cent.	per cent.
Winter (Dec., Jan., Feb.) . . .	27	23
Spring (March, April, May) . .	17	16
Summer (June, July, August) .	24	27
Autumn (Sept., Oct., Nov.) . .	32	34

If we study these percentages, we see at once that practically the winter and summer rains are identical in volume, regard being had to differences created by height above sea-level and position; and, secondly, that the autumn rainfall is just about double the spring rainfall.

It is much to be regretted that the limited time at the disposal of your Committee does not enable them to go into the problems which arise out of the tables more fully, but it is hoped that this will be undertaken at a future time. Probably this is an advantage, for the period covered by the tables is but short.

In conclusion, the Committee desire to tender their thanks to those, six in number, who have so kindly sent donations to enable the Club to continue this useful organization, and also to the observers for their returns, and for the valuable notes which many of them contribute and which are most welcome.

Chevening Park, Sevenoaks, Kent.

Observer—C. Sutton. Gauge 5 in. in diameter.

Height of gauge above ground, 1 ft.
Height of station above sea-level, 360 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
4·27	5·57	0·99	1·39	1·16	2·72	0·66	4·11	1·58	2·04	2·95	3·64	31·08

Fairchildes, Chelsham, Surrey.

Observer—A. S. Daniell. Gauge 8 in. in diameter.

Height of gauge above ground, 1 ft.
Height of station above sea-level, 600 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
3·63	5·63	0·93	1·02	1·14	2·92	1·23	2·97	1·25	1·94	3·20	3·14	29·00

Manor Lodge, Worcester Park, Surrey.

Observer—F. D. Outram. Gauge 5 in. in diameter.

Height of gauge above ground, 1 ft. 9 in.
Height of station above sea-level, 120 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
2·70	3·82	0·92	0·78	0·99	2·58	1·15	2·66	0·52	1·70	1·93	1·96	21·71

The Terrace Gardens, Richmond, Surrey.

Observer—J. H. Brierley. Gauge 8 in. in diameter.

Height of gauge above ground, 1 ft. 6 in.
Height of station above sea-level, 109 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
2·63	1·97	1·93	1·40	1·39	1·83	1·00	1·92	2·08	2·01	2·03	2·38	21·74

Steel Hawes, Morden, Surrey.

Observer—Miss R. Hames. Gauge 5 in. in diameter.

Height of gauge above ground, 5 ft. 2 in.
Height of station above sea-level, 100 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
3·37	4·80	0·94	1·03	1·33	2·70	1·21	2·43	0·73	1·66	1·90	2·09	24·19

No. 82, New Park Road, Clapham Park, Surrey.

Observer—D. W. Horner. Gauge 5 in. in diameter.

Height of gauge above ground, 1 ft. 3 in.
Height of station above sea-level, 128 ft.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
2·23	4·12	0·85	0·59	0·85	2·22	1·41	4·06	0·59	1·47	1·83	1·96	22·18

APPENDIX I.

CROYDON MICROSCOPICAL AND NATURAL HISTORY CLUB

(Meteorological Sub-Committee.)

No.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
			IN.	FT.	IN.	FT.
	Abinger (The Hall)	The Lord Farrer	8	2	0	320
	Abinger (The Rectory)	Miss Brodie-Hall	5	1	0	381
	Dorking (Denbies)	J. Beesley	5	0	6	610
	Redhill (Oxford Road)	W. H. Tyndall	8	1	0	300
5	Nutfield (The Priory)	J. Moffatt	8	1	2	468
	Nutfield (The Priory) 2nd gauge	J. Moffatt	8	1	2	331
	Buckland (Hartswood)	R. W. Clutton	5	1	0½	174
	Reigate (The Briars)	Mrs. Barclay	5	1	0	430
	Reigate Hill (Nutwood Lodge)	H. E. Gurney	5	1	0	440
10	Upper Gatton (Upper Gatton Park)	F. Druce	5	1	0	600
	Merstham (Rockshaw)	W. Gardiner	5	1	0	475
	Harp's Oak Cottage	R. C. Grant	5	1	0	454
	Chipstead (Shabden Park)	J. Crerar	5	1	0	550
	Chaldon (The Rectory)	Rev. G. E. Belcher	5	1	0	542
15	Caterham (Metropolitan Asylum)	G. S. Elliott, M.D.	5	1	0	610
	Westerham (Hill Estate)	W. Morris	5	1	0	539
	Westerham (The Town)	W. Morris	5	1	0	380
	Knockholt Beeches (Field Gauge)	W. Morris	5	1	0	785
	Knockholt Beeches (Tower Gauge)	W. Morris	5	24	6	812
20	Sevenoaks (St. Johns Hill)	W. W. Wagstaffe	5	1	10	380
	Warlingham (The Vicarage)	Rev. F. R. Marriott	5	1	0	614
	Coulsdon (The Grange)	W. J. Stride	5	1	4	525
	Kenley (Hazelea)	Mrs. Carr-Dyer	5	1	0	282
	Purley (Tudor Cottages)	J. Bonwick	5	1	0	216
25	Burgh Heath (Sutton Water Co.)	J. D. Grant	5	1	0	580
	Leatherhead (Downside)	A. Tate	5	1	0	250
	D'Abernon Chase	Sir W. Vincent, Bart.	5	1	0	280
	Oxshott (Beverstone)	W. H. Dines	5	1	0	212
	Banstead (The Larches)	Rev. C. J. Taylor	8	1	0	488
30	Sutton (Sutton Water Co.)	J. D. Grant	5	1	0	110
	Wallington (Maldon Road)	F. Campbell-Bayard	5	4	1	140
	Beddington (Riverside)	S. Rostron	5	1	0	120
	Waddon (Waddon House)	P. Crowley	5	1	0	156
	Croydon (Brimstone Barn)	Croydon Corporation	5	1	0	130
35	Croydon (Waddon New Road)	Croydon Corporation	5	1	0	146
	Croydon (Duppas House)	Baldwin Latham	8	1	0	158
	Croydon (Whitgift)	A. E. Watson	5	1	0	191

No.	Stations.	Observers.	Size of Gauge.	Height above Ground.		Height of Statn. ab. Sea-level.
			IN.	FT.	IN.	FT.
	Croydon (Woburn Road)	M. L. Craven	5	1	1	178
	Croydon (Windmill Road)	A. Malden	5	1	6	174
40	Croydon (Park Hill Rise)	H. F. Parsons, M.D.	5	1	0	250
	Addington Hills (The Reservoir)	Croydon Corporation	8	0	9	473
	Addington (Park Farm)	W. Whalley	5	1	0	268
	Addington (Pumping Station)	Croydon Corporation	8	1	0	331
	West Wickham (Wickham Court)	Sir J. F. Lennard, Bt.	5	1	2	300
45	Hayes Common (The Warren)	Miss Akers	5	1	0	296
	Keston (Bradfield)	A. Hill	5	1	0	350
	Farnborough (Feniton)	Miss Percy	5	1	0	376
	Orpington (Kent Water Co.)	W. Morris	5	1	0	220
	Farningham Hill (Hill House)	A. J. Waring	5	3	0	300
50	Southfleet (Kent Water Co.)	W. Morris	5	1	0	82
	Chislehurst (Hawkwood)	Miss Edlmann	5	1	0	300
	Bickley (The High Field)	J. Batten	5	1	2	295
	Bromley (The Palace)	Coles Child	5	1	0	187
	Bromley Common (Elmfield)	Rev. J. P. Faunthorpe	5	0	9	240
55	Beckenham (Oakwood Avenue)	H. Dolling-Smith	5	1	0	184
	South Norwood (Apsley Road)	W. H. Cullis	5	1	0	125
	Thornton Heath (Thornton Road).	A. Wright	8	0	10	120
	Wimbledon (Sewage Works)	C. H. Cooper	5	1	0	58
	Wimbledon (Mount Ararat)	T. Devas	12	3	0	157
60	Raynes Park (Pumping Station)	C. H. Cooper	5	1	0	47
	New Malden (Sewage Works)	T. V. H. Davison	5	1	0	45
	Esher (Sewage Works)	A. J. Henderson	5	1	0	40
	West Molesey (Chelsea W. Co.)	R. Hack	5	1	0	32
	Surbiton (Seething Wells)	R. Hack	10	0	6	25
65	Kingston (Sewage Works)	T. Stevens	5	1	0	25
	Richmond (Ormond Lodge)	J. T. Billett	5	0	9	51
	Putney Heath (The Reservoirs)	R. Hack	5	1	0	180
	Wandsworth Com. (Patten Road).	F. J. Brodie	5	1	0	100
	Streatham (Woodfield Avenue)	F. Jordan	5	1	0	120
70	West Norwood (Thornlaw Road)	W. Marriott	5	1	0	220
	Up. Norwood (Dulwich-wood Park)	J. P. Caldicott	5	1	2	276
	Sydenham (Newlands Park)	O. Jepson, M.D.	5	1	0	136
	Forest Hill (Dartmouth Road)	L. W. F. Behrens	5	1	0	220
	Forest Hill (S. & V. Water Co.)	J. W. Restler	5	1	0	344
75	Sidcup (Hatherley Road)	Lionel Burrell, M.D.	5	1	2	160
	Wilmington (Kent Water Co.)	W. Morris	5	1	0	25
	Dartford (West Hill House)	Lieut-Col. C. N. Kidd	5	1	3	100
	Eltham (High Street)	W. Morris	5	1	0	245
	Greenwich (Royal Observatory)	Astronomer Royal	8	0	5	155
80	Deptford (Kent Water Co.)	W. Morris	5	1	0	20
	Nunhead (S. & V. Water Co.)	J. W. Restler	5	4	0	176
	Brixton (Acre Lane)	F. Gaster	8	1	0	77
	Battersea (S. & V. Water Co.)	J. W. Restler	5	3	0	21

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·61	·62	·66	·43	·40	·41	·50	·41	·50	·42	·42	·49
2	·03	·03	·02	·05	·03	·02	·02	·07	·01	·03	·04	·05
3	·28	·10	·15	·15	·18	·19	·15	·15	·15	·21	·15	·18
4	·07	·20	·20	·21	·21	·18	·16	·22	·20	·33	·20	·18
5	..	..	..	..	..	..	..	·01	..	..	..	..
6	1·20	1·09	1·30	·65	·55	·60	·88	·68	·77	·70	·77	·85
7	..	·01	·03	·15	·07	·08	·04	·11	·05	·10	·07	·07
8	..	·10	·08	·09	·15	·12	·07	·12	·13	·17	·17	·20
9	..	·01	..	..	..	..	..	·01	·01	·01	·01	..
10	·13	·04	..	·07	·02	·02	..	·04	·02	..	·01	·02
11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	·09	·15	·08	·08	·05	·07	·01	·06	·07	·08	·07	·09
15	·23	·24	·25	·23	·24	·26	·30	·19	·25	·24	·23	·21
16	·37	·40	·40	·43	·44	·41	·37	·47	·43	·40	·43	·44
17	·05	·08	·06	·06	·04	·05	·04	·05	·04	·05	·04	·03
18	..	..	..	..	..	..	..	..	..	..	..	..
19	·29	·35	·34	·29	·24	·28	·29	·26	·35	·28	·33	·31
20	·05	·03	·02	·02	·02	·02	..	·02	·01	·01	·02	·01
21	·18	·25	·23	·23	·20	·23	·28	·25	·26	·27	·23	·23
22	..	·01	..	·02	..	..	·01	·01	..	·01	..	..
23	·02	·06	·03	..	·01	·01	·01	·02	·04	·02	·03	..
24	·05	·04	·13	·14	·12	·12	·05	·12	·16	·16	·16	·08
25	..	·01	..	..	..	..	..	·01	·26	..	..	..
26	·04	·05	·06	·04	·04	·04	·06	·06	·08	·08	·08	·04
27	·03	·05	..	·16	·12	·15	·16	·07	·16	·13	·09	·12
28	·28	·24	·25	·22	·22	·31	·29	·27	·23	·32	·24	·17
29	·06	·04	·06	·06	·06	·06	·06	·06	·05	·07	·05	·05
30	·04	·02	..	..	·01	·01	·01	·01	·02	·02	·01	·02
31	..	·01	·02	..	·01	·01	·01	·01	·01	·03	·01	·02
*	4·10	4·23	4·37	3·78	3·43	3·65	3·77	3·76	4·26	4·14	3·86	3·86
†	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·47	·40	·33	·20			·31	·44	·41	·36	·46		·53	·43
2	·03	·04	·03	·13			·01	·13	·03	·02	·08		·03	·03
3	·17	·21	·33	·50			·08	·12	·23	·21	·21		·13	·09
4	·05	·32	·18	·16			·14	·31	·21	·18	·29		·22	·17
5	·03	..	..	..			..	..	·02	..	·05		..	..
6	·82	·70	·42	·20			·65	·84	·72	·61	·76		·92	·81
7	·04	·10	·41	·23			·06	·07	·13	·06	·05		·03	·01
8	·19	·24	·29	·14			·16	·21	·19	·17	·26		·09	·11
9	·01	·02	·01	·15			·03	·07	·05	·08	·06		..	..
10	..	·01	..	..			..	..	·01	·01	..		..	·02
11	..	..	..	..			..	..	..	..	..		..	..
12	..	..	..	..			..	..	..	..	..		..	..
13	..	..	..	..			..	..	..	..	..		..	..
14	·13	·10	·10	..			·08	·02	..	·05	·10		·08	·02
15	·26	·24	·26	·35			·26	·28	·29	·15	·18		·21	·21
16	·37	·43	·44	·43	MONTHLY GAUGE.	MONTHLY GAUGE.	·33	·37	·37	·36	·46	MONTHLY GAUGE.	·38	·39
17	·03	·04	·04	..			·03	·05	·04	·03	·08		..	·02
18	·05	..	..	..			..	..	..	..	..		..	..
19	·28	·32	·32	·33			·23	·33	·26	·19	·30		·28	·23
20	..	..	·01	·01			·02	..	..	..	·06		..	·01
21	·20	·29	·30	·30			·23	·28	·26	·19	·22		·22	·22
22	..	..	..	..			·01	..	·01	..	·02		..	..
23	·06	·05	·05	·03			·03	·02	·04	·02	·06		·02	·02
24	·08	·10	·12	·02			·10	·08	·07	·10	·08		·10	·04
25	..	..	..	..			..	..	·01	..	..		..	..
26	·07	·15	·11	·17			·08	·03	·04	·03	·06		·02	·03
27	·14	·13	·05	·12			·13	·21	·24	·20	·32		·12	·16
28	·23	·14	·16	·04			·24	·25	·26	·23	·46		·25	·16
29	·07	·15	·34	·30			·09	·08	·05	·05	·06		·04	·02
30	·04	·03	·05	·06			·05	·04	·02	·02	·02		·02	·01
31	·02	..	·02	·08			·03	·01	·02	·03	..		..	..
*	3·84	4·21	4·37	3·95	4·06	2·82	3·38	4·24	3·98	3·35	4·70	3·82	3·69	3·21
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·35	·54	·41	·40	·37	·35	·25	·26	·41	·33	·30	·34	·38
2	·06	·06	·06	·03	·04	·03	·03	·03	·02	·04	·06	·04	·03
3	·09	·21	·19	·18	·16	·14	·13	·12	·16	·15	·16	·16	·15
4	·12	·18	·15	·15	·15	·12	·14	·12	·14	·15	·15	·14	·14
5	..	·01	..	..	..	..	..	..	..	..	·01	..	·01
6	·68	·88	·76	·71	·70	·61	·67	·36	·53	·64	·50	·60	·56
7	..	·05	·07	·06	·06	·09	·05	·07	·28	·09	·22	·09	·09
8	·11	·18	·16	·14	·15	·16	·14	·12	·14	·14	·13	·14	·12
9	..	·01	·01	·02	·02	·04	·06	·05	·07	·07	·10	·02	·09
10	..	·01	·01	..	·01	·01	..	..	·01	·01	·01	·09	..
11	..	..	..	..	..	..	..	..	..	..	..	·01	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·01	·09	·11	·05	·09	·09	·08	·08	·08	·07	·06	·09	·07
15	·17	·19	·17	·16	·17	·16	·15	·14	·34	·16	·17	·14	·16
16	·37	·41	·32	·32	·32	·33	·32	·32	·24	·33	·35	·37	·35
17	·02	·03	·02	·02	·02	·02	·02	·03	·01	·02	·03	·04	·03
18	..	..	·01	..	..	..	..	..	..	..	..	..	..
19	·23	·23	·21	·22	·21	·21	·20	·20	·23	·19	·19	·20	·19
20	..	·01	·01	..	·01	..	..	..	..	..	·01	·01	·01
21	·20	·21	·19	·20	·18	·20	·20	·21	·21	·20	·21	·20	·20
22	..	..	..	..	..	..	·01	..	..	..	..	·01	·01
23	·01	·01	·02	·01	..	·01	·01	..	..	·01	·01	·01	·01
24	·02	·04	·09	·04	·03	·10	·09	·08	·09	·08	·06	·06	·06
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·03	·04	·03	·02	·03	·04	·03	·02	·04	·04	·03	·03	·03
27	·15	·29	·23	·05	·23	·23	·23	·20	·26	·22	·24	·22	·22
28	·14	·21	·20	·43	·23	·21	·19	·20	·26	·20	·24	·20	·26
29	..	·03	·03	·02	·03	·02	·03	·02	·03	·03	·04	·04	·03
30	·02	·01	·02	·01	·01	..	·01	..	·01	·01	·01	·02	·01
31	..	·01	·01	..	·01	..	..	..	..	..	·01	·01	..
*	2·78	3·94	3·49	3·24	3·23	3·17	3·04	2·63	3·56	3·18	3·30	3·28	3·21
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·31	·32	·34	·33	·33	·30	·32	·31	·35	·22	·28	·29	·30
2	·03	·03	·02	·03	..	·03	·03	·10	..	·02	..	..	·02
3	·16	·18	·23	·25	·26	·33	·21	·15	·28	·31	·25	·15	·21
4	·15	·17	·20	·21	·14	·11	·10	·09	·10	·04	..	..	·06
5	..	..	..	..	..	..	..	·01	..	..	..	..	..
6	·50	·62	·58	·70	·71	·61	·66	·66	·64	·50	·76	·45	·66
7	·08	·07	·14	·08	·08	·09	·09	·05	·08	·11	·08	·05	·09
8	·12	·14	·11	·18	·14	·14	·12	·14	·14	·16	·14	·17	·15
9	·06	·04	·01	·02	·01	·03	·02	·02	·03	·01	·06	·04	·03
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·05	·04	·05	·07	·04	·07	·06	·03	·03	·05	·05	·02	·03
15	·15	·16	·11	·17	·15	·16	·10	·15	·19	·15	·20	·15	·11
16	·33	·34	·37	·34	·33	·31	·33	·32	·27	·29	·30	·28	·32
17	·02	·02	·05	·03	·02	·03	·02	·02	·02	·02	..	·03	·02
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·21	·19	·22	·23	·22	·22	·19	·22	·21	·18	·10	·18	·19
20	..	·01	..	·01	..	..	..	..	..	·01	..	..	..
21	·17	·20	·24	·23	·24	·21	·17	·20	·22	·20	·18	·21	·23
22	..	..	..	..	..	·01	..	·01	..	..	..	..	..
23	·01	·01	·02	·03	·01	·02	·03	·02	·02	·02	..	..	·02
24	·05	·04	·04	·05	·01	·02	·03	·03	·02	·03	..	·04	·03
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·03	·03	·05	·05	·03	·04	·04	·05	·05	·04	..	·05	·04
27	·23	·23	·17	·25	·12	·23	·27	·21	·18	·16	·15	·10	·16
28	·16	·12	·34	·25	·26	·23	·20	·21	·25	·26	..	·23	·21
29	·03	·04	·05	·05	..	·04	·03	·03	·02	·03	..	·03	·03
30	·01	·02	·02	·02	·05	·02	·03	·02	·02	·03	..	·02	·01
31	..	·01	·01	·02	..	·01	·04	·01	·03	·05	·06	..	·01
*	2·86	3·03	3·37	3·60	3·15	3·26	3·09	3·06	3·15	2·89	2·61	2·49	2·93
†	..	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·32	·27	·32	·30	·37	·35	·37	·37	·46	·42	·39	·52
2	·02	·03	·02	·05	·05	·07	·07	·03	·07	·07	·07	..
3	·21	·18	·18	·08	·10	·14	·14	·07	·14	·15	·13	·17
4	·08	·07	·13	·15	·12	·14	·13	·12	·08	·05	·13	·16
5	..	..	..	..	·01	..	·01	..	..	..	..	..
6	·48	·58	·50	·49	·22	·35	·35	·40	·60	·57	·45	·52
7	..	·08	·07	·07	·05	·03	·05	·03	·02	·04	·02	..
8	·24	·16	·16	·11	·10	·11	·12	·11	·14	·11	·13	·15
9	·03	·02	·02	·02	·05	..	·02	·03	..	·01	..	·04
10	..	..	..	..	·01	·01	·01	..	·03	..	·04	..
11	..	..	..	..	..	..	..	..	..	·02	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	..	·05	·05	·02	·02	·03	·04	·03	·05	·04	·05	·05
15	·18	·14	·14	·15	·10	·11	·12	·10	·15	·14	·15	·22
16	·31	·30	·34	·35	·35	·38	·36	·36	·40	·40	·38	·35
17	·03	·02	·03	..	·03	·04	·04	·02	·03	·04	·02	·03
18	..	..	..	..	..	..	..	..	·01	..	..	..
19	·20	·18	·23	·21	·20	·22	·21	·17	·21	·18	·21	·23
20	..	..	..	..	·01	·23	·01	..	·01	..	..	..
21	·21	·21	·21	·19	·16	·20	·21	·15	·19	·20	·19	·20
22	..	·02	·01	..	..	..	..	..	·02	..	..	..
23	·02	·01	·02	..	·02	·01	·02	·02	·03	·02	·03	·03
24	·03	·02	·02	..	·08	·05	·05	·03	·02	·02	·03	·02
25	..	..	..	..	..	..	..	..	..	..	..	..
26	·05	·03	·04	·06	·06	·04	·05	·02	·04	·03	·03	·03
27	·17	·18	·17	·23	·15	·06	·21	·18	·12	·21	·15	·20
28	·22	·24	·24	·20	·14	·33	·18	·15	·22	·20	·15	·20
29	·03	·03	·04	..	·01	·01	·02	·01	·03	·02	·01	·01
30	·02	·02	·02	..	·01	..	·01	..	..	..	..	..
31	·01	·01	·01	..	..	..	..	..	..	..	..	..
*	2·86	2·85	2·97	2·68	2·42	2·91	2·80	2·40	3·08	2·94	2·76	3·13
†	..	..	..	..	..	..	..	..	..	..	..	..

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·38	·41	·35	·35	·33	·28	·27	·32	·23	..	·31	·32	·27	·30
2	·08	·06	·01	·03	·03	·02	·02	·02	·01	..	·02	·02	·02	·02
3	·10	·11	·12	·11	·10	·11	·10	·19	·28	·23	·13	·09	·08	·07
4	·10	·08	·08	·12	·11	·12	·11	·05	·04	·03	·07	·05	·08	·09
5	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
6	·34	·33	·25	·29	·32	·30	·23	·41	·36	..	·26	·26	·17	·29
7	·08	·02	·04	·08	·03	·05	·09	·07	·07	·53	·08	·03	·07	..
8	·14	·15	·15	·13	·14	·12	·15	·12	·14	·15	·14	·17	·13	·10
9	·02	..	·03	·02	·02	·03	·02	·02	·04	·05	·01	·03	·02	·02
10	·01	·03	..	..	..	..	..	..	..	..	·01	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·03	·02	·02	·02	·02	·03	·01	·04	·02	·03	·03	·02	·01	·02
15	·14	·14	·13	·14	·12	·15	·14	·16	·14	·15	·10	·11	·09	..
16	·35	·37	·34	·34	·35	·32	·30	·31	·32	..	·30	·34	·29	·40
17	·02	..	·03	·03	·05	·03	·02	·03	·02	·35	·02	·02	·02	·01
18	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
19	·19	·23	·20	·21	·20	·32	·24	·18	·15	..	·20	·25	·21	·16
20	..	·01	·01	·01	..	·02	..	·01	..	..	..	..	..	..
21	·20	·22	·20	·21	·21	·20	·22	·23	·22	·23	·23	·22	·19	·18
22	..	..	·01	..	·01	..	·01	..	..	..	..	..	..	·01
23	·03	·04	·02	..	·01	·02	·01	..	·02	..	..	·02	..	..
24	·09	·02	·01	·04	·02	·01	·02	·03	·02	..	·02	·01	..	·02
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·04	·03	·04	·05	·05	·06	·05	·06	·05	..	·06	·05	·03	·03
27	·15	·13	·17	·17	·18	·10	·07	·07	·04	..	·05	·09	·06	·03
28	·16	·13	·10	·17	·19	·23	·22	·20	·22	·05	·21	·15	·16	·18
29	·01	·01	·02	·04	·04	..	·03	·02	·02	·07	·03	·02	·01	·01
30	..	..	·01	·02	·02	·01	·01	·02	·01	·02	·01	·01	..	·01
31	..	..	..	..	..	..	..	·01	·01	..	·01	..	..	..
*	2·66	2·55	2·34	2·59	2·55	2·53	2·34	2·57	2·43	1·89	2·30	2·28	1·91	1·95
†	..	..	..	..	..	..	..	..	..	..	..	..	..	..

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Brixton	Battersea
	IN.	IN.
1	·39	·31
2	·02	·05
3	·11	·11
4	·07	·08
5	..	..
6	·28	·29
7	·04	·02
8	·15	·12
9	..	·02
10	·03	..
11	..	..
12	..	..
13	..	..
14	·03	·03
15	·15	·15
16	·32	·30
17	·03	·02
18	..	..
19	·20	·13
20	..	..
21	·24	·15
22	..	..
23	·03	·02
24	·01	·02
25	..	..
26	·03	·02
27	·12	·12
28	·16	·11
29	·01	·01
30	..	..
31	..	..
*	2·42	2·08
†	..	..

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(January, 1900.)

A wet, warm, dull, and exceedingly unhealthy month. It is somewhat difficult to say how much the rainfall is above the average, but it is probably about half an inch, and it is certainly the wettest January since 1894. Snow fell on several days, but the principal fall was on the 27th and 28th, when the depth was about one inch where it had not drifted. Fog occurred on the 5th and 20th. A description of the solar phenomenon which occurred on the 11th is too long for insertion in these notes, but must be reserved for the annual report. The month has been exceedingly unhealthy, owing principally to influenza, which has been very fatal, and to diphtheria, which has been somewhat prevalent. The observer at Upper Gatton reports that "a brilliant meteor was seen on the 9th at 2.58 p.m. travelling S. to W. It appeared like an arrow or kite with the narrow end foremost. It seemed to turn over, presenting a broad side to the sun, which caused a very bright silvery white reflection. It then disappeared." Lunar halos have been somewhat numerous. Lightning was seen and thunder heard in many places in the district on the 3rd. Garden vegetables are scarce, and vegetation, as a rule, is very backward, the winter aconite not being in flower till the 25th, and the snowdrop not at all. At Croydon the maximum temperature was 50° on one day, between 49° and 40° on twenty days, and between 39° and 34° on ten days; whilst the minimum temperature was between 43° and 40° on two days, between 39° and 30° on twenty-one days, and between 29° and 24° on eight days. The mean temperature of the month is about 3·5° above the average, and was at Croydon (Whitgift) 40·8°, at Wallington 40·2°, at Croydon (Duppas House) 39·8°, at Waddon 39·4°, and at Chipstead 38·3°. There were recorded at Wallington 34·3 hours of sunlight, which is five per cent. below the January average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* **February, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·08	·09	·05	·05	·05	·05	·03	·08	·05	·05	·09	·08
2	·81	·85	·52	·47	·61	·60	·53	·64	·67	·72	·47	1·04	·76
3	·01	·02	..	..	·01	..	..	·02	..	..	·02	·02	..
4	..	..	..	..	..	·01	..	..	..	..	..	..	..
5	·05	..	..	..	·10	·10	·08	·08	·07	·12	·06	·07	·08
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·72	·43	·54	·75	·27	·46	·54	·55	·69	·43	·61	·78	·44
11	..	..	..	..	·01	·01	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·60	·45	·68	·44	·50	·47	·49	·46	1·04	·61	·40	·59	·45
14	·13	·18	·09	·09	·04	·07	·08	·04	·05	·07	·06	·05	·69
15	1·52	1·35	1·39	·86	·47	·96	·79	·89	1·01	·76	·95	1·21	·37
16	·13	·12	·18	·10	·08	·11	·13	·10	·11	·08	·11	·13	·14
17	·22	·23	·23	·37	·37	·40	·42	·34	·35	·34	·32	·35	·28
18	·12	·50	·40	·21	·18	·25	·26	·19	·35	·22	·31	·37	..
19	·76	·49	·58	·43	·26	·38	·34	·39	·45	·35	·44	·53	·36
20	·08	·12	·06	·07	·08	·09	·15	·06	·04	·04	·04	·07	·05
21	·16	·20	·12	·13	·08	·10	·11	·11	·10	·10	·10	·11	·13
22	·36	·32	·27	·36	·31	·31	·35	·28	·32	·34	·29	·24	·25
23	·12	·13	·12	·09	·05	·06	·07	·07	·07	·06	·06	·07	·05
24	·06	·06	·07	·03	·04	·05	·05	·04	·05	·04	·04	·05	·04
25	·12	·11	·09	·02	·05	·05	·06	·03	·04	·06	·06	·07	·08
26	·29	·31	·35	·26	·27	·27	·19	·27	·32	·27	·28	·31	·34
27	·07	·09	·12	·10	·05	·05	·14	·12	·07	·07	·06	·06	·04
28	·01	..	..	·02	·02	·02	·01	·01	·01	·01	·01	·01	·02
*	6·44	6·00	5·90	4·85	3·90	4·87	4·84	4·72	5·89	4·74	4·74	6·22	4·65
†	10·54	10·23	10·27	8·63	7·33	8·52	8·61	8·48	9·89	8·88	8·60	10·08	8·49

Day of Mo.	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·12	·05	..			·02	·10	·05	·03			·10	..
2	1·02	·55	·51			·60	·48	·80	1·36			·57	·47
3	..	..	..			..	·01	·03	·04			·06	..
4	..	..	..			..	..	..	..			..	..
5	..	·15	·04			..	·02	·09	·08			·05	·03
6	..	..	..			..	..	..	..			..	..
7	..	..	..			..	..	..	..			..	..
8	..	..	..			..	..	..	..			..	..
9	..	..	..			..	..	..	..			..	..
10	·55	·40	·25			·49	·32	·50	·36			·90	·25
11	..	..	..			..	..	..	..			..	..
12	..	..	..			..	..	..	..			..	..
13	·60	·45	·30			·42	·41	·47	·41			·38	·30
14	..	..	..			..	..	·11	·06			·14	·09
15	1·04	1·04	·90	MONTHLY GAUGE.	MONTHLY GAUGE.	·59	1·24	1·04	·93	OBSERVER ILL. RECORD NOT TAKEN.	MONTHLY GAUGE.	1·22	1·30
16	·12	·11	..			·09	·11	·13	·10			·15	·11
17	·34	·42	·29			·44	·28	·28	·26			·26	·31
18	·35	·28	·50			·18	·28	·36	·21			·31	·17
19	·46	·36	·54			·33	·47	·45	·33			·46	·32
20	·05	·08	·20			·07	·22	·06	·04			·05	·04
21	..	·09	..			·10	..	·09	·06			·07	·05
22	·35	·35	·50			·38	·11	·16	·10			·21	·10
23	·12	·04	·06			·03	·05	·05	·05			·09	·05
24	..	·17	..			·14	·08	·04	·04			·06	·07
25	·08	·06	·06			·04	·08	·07	·05			·07	·07
26	·28	·24	·24			·25	·27	·25	·29			·51	·37
27	·08	·03	·03			·03	·05	·05	·03			·08	·18
28	·02	..	·03			·01	·02	·02	·03			..	·02
*	5·58	4·87	4·45	3·48	2·44	4·21	4·60	5·10	4·86		5·32	5·74	4·30
†	9·79	9·24	8·40	7·54	5·26	7·59	8·84	9·08	8·21		9·14	9·43	7·51

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for February is 1·59 in.* February, 1900.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	·02	·02	..	·01	·02	·01	·02	·02	·02	·01	·02	..	·01	·01	..	·01	..	..	·02	·02	·01	..	..	..	·02
2	·87	·87	·76	·65	·68	·83	·63	·85	1·09	·82	·65	·95	·97	·86	·59	·54	·75	·60	·68	·83	·98	·92	·84	·49	·60	·74
3	..	·03	·03	·01	·07	·03	·04	..	·01	·04	·02	·02	·02	·04	·04	·03	·02	..	·04	·08	·04	..	·05	..	·01	·02
4	..	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	·04	·04	·03	·04	·04	..	·06	..	·04	·04	·04	..	·03	·04	·35	·06	·10	·06	·04	·06	·08	·07	·40	..	·04
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·32	·89	·36	·28	·34	·55	·35	·33	·62	·50	·50	·40	·50	·41	·30	·45	·49	·30	·54	·50	·60	·38	·48	·23	·21	·49
11	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·10	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..
13	·33	·50	·37	·34	·39	·45	·37	·37	·57	·46	·42	·50	·52	·39	·54	·40	·34	·50	·48	·48	·50	·48	·68	·48	·43	·56
14	·14	·08	·06	·06	·07	·05	·06	·07	·16	·08	·07	·04	·07	·08	·06	·02	·11	·03	·04	·10	·04	..	·01	·04	·03	·04
15	·83	1·16	·95	·75	·92	1·00	·80	·42	1·08	·97	1·06	1·03	·95	·73	·93	1·15	·96	·95	·97	·80	·92	·95	·76	·76	·39	·86
16	·09	·14	·11	·09	·12	·12	·11	·08	·10	·12	·11	·11	·11	·11	·11	·15	·12	·12	·13	·09	·09	·11	·09	..	..	·08
17	·26	·31	·31	·34	·28	·25	·28	·26	·32	·30	·31	·29	·28	·25	·24	·26	·25	·19	·29	·30	·30	·33	·34	·39	·35	·37
18	·16	·26	·16	·11	·16	·18	·16	·14	·19	·16	·18	·16	·15	·18	·19	·21	·28	·23	·21	·20	·23	·29	·23	·15	·11	·13
19	·30	·48	·36	·32	·38	·38	·32	·25	·36	·31	·33	·33	·32	·26	·34	·42	·40	·44	·36	·25	·25	·31	·34	·28	·22	·29
20	·02	·02	·05	·03	·05	·05	·05	·05	·02	·05	·05	·05	·03	·04	·05	·07	·06	·06	..	·06	·05	·03	·02	·03	..	·03
21	·01	·08	·07	·07	·07	·07	·06	·06	·10	·06	·07	·07	·07	·07	·07	·09	·09	·09	·15	·08	·08	·07	·08	·08	·08	·06
22	·11	·14	·08	·07	·08	·08	·08	·07	·09	·07	·07	·07	·07	·07	·08	·10	·11	·07	·08	·08	·09	·08	·09	·09	·05	·07
23	..	·07	·04	·03	·05	·05	·05	..	·05	·06	·05	·05	·04	·05	·04	·05	·04	·03	·03	·03	·03	·04	·03	·02	·01	·02
24	·02	·05	·07	·07	·05	·04	·06	·05	·06	·06	·05	·06	·05	·04	·04	·08	·07	·09	·09	·09	·09	..	·18	·18	·11	·11
25	·07	·07	·06	·05	·05	·04	·05	·04	·05	·05	·05	·03	·05	·04	·03	·01	·05	·04	·04	·03	·03	·10	·02	·02	·01	·02
26	·36	·39	·33	·27	·24	·25	·26	·22	·32	·29	·34	·34	·41	·35	·34	·30	·30	·34	·30	·30	·27	·35	·21	·17	·32	·35
27	·18	·08	·05	·03	·04	·04	·04	·05	·04	·04	·05	·08	·05	·05	·04	·10	·04	·03	·04	·02	·04	·05	·08	·09	·05	·05
28	·03	·01	·05	·04	·05	·06	·06	·05	·08	·09	·10	·08	·06	·09	·07	·10	·06	·10	·11	·11	·11	·13	·07	·08	..	·03
*	4·12	5·70	4·34	3·64	4·14	4·58	3·84	3·44	5·33	4·59	4·54	4·72	4·72	4·15	4·15	4·88	4·61	4·31	4·64	4·49	4·82	4·74	4·67	4·08	2·98	4·38
†	6·90	9·64	7·83	6·88	7·37	7·75	6·88	6·07	8·89	7·77	7·84	8·00	7·93	7·01	7·18	8·25	8·21	7·46	7·90	7·58	7·88	7·89	7·56	6·69	5·47	7·31

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·02	..	..	..	..	·03	..	..	·11	·01	·01
2	·93	·93	·79	·80	·67	·16	·75	·73	·58	·87	·78
3	·02	..	·02	..	·02	·28	·03	..	·01	·04	·01
4	..	..	..	..	..	·36	..	..	·01	..	..
5	·06	·08	·04	..	·02	·12	·02	·02	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	·01	..	·01	..	..	..	..
9	..	..	..	..	·03	..	·01	..	..	..	..
10	·20	·57	·47	·10	·07	·22	·37	·19	·51	·37	·69
11	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	·04	..	..	..	..	..
13	·53	·28	·24	·07	·37	·25	·48	·34	·37	·42	·46
14	·06	·08	·06	·60	·04	·26	·07	·07	·09	·08	·07
15	·70	·76	·96	·70	·32	·52	·63	·44	·61	·61	·65
16	·10	·10	·10	..	·06	·07	·07	·06	·10	·10	..
17	·26	·29	·23	·33	·35	·28	·26	·25	·25	·22	·38
18	·14	·17	·15	..	·05	·09	·10	·06	·14	·11	·12
19	·25	·31	·30	·28	·20	·23	·25	·18	·26	·25	·20
20	..	·06	·05	·04	·03	·04	·06	·02	·04	·03	·03
21	·10	·07	·08	·05	·03	·04	·04	·03	·03	·05	·03
22	·06	·06	·08	..	·05	·05	·06	·05	·08	·07	·06
23	·04	·02	·03	..	·02	·03	·04	·02	·04	·03	·03
24	·07	·10	·05	..	·08	·04	·07	·05	·11	·09	·06
25	·03	·02	·04	·16	·05	·04	·06	·03	·08	·07	·05
26	·31	·31	·29	·36	·30	·35	·32	·33	·32	·32	·30
27	·06	·03	·07	·05	·10	·13	·09	·05	·10	·11	·06
28	·05	·08	·05	·04	·03	·02	·03	·02	·02	·01	·01
*	3·99	4·32	4·10	3·58	2·90	3·65	3·82	2·94	3·76	3·86	4·00
†	6·85	7·17	7·07	6·26	5·32	6·56	6·62	5·34	6·84	6·80	6·76

Day of Mo.	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	·01	·01	..	·01	..	..	..	..	..	..	..	..
2	·78	·43	·69	1·01	1·01	·82	·93	·57	·77	·66	·85	·84	·68	·75	·40
3	·01	·03	·11	·03	·09	·07	..	·03	·01	·04	..	·03	·02	·02	·03
4	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01
5	..	..	·01	..	·03	·04	·03	·02	·04	·04	·07	·03	..	..	·01
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·40	·22	·42	·38	·41	·24	·25	·15	·66	·35	·55	·26	·33	·17	·20
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·54	·34	·64	·64	·74	·45	·23	·24	·64	·43	·54	·41	·56	·52	·33
14	·07	·06	·05	·10	·08	·07	·17	·04	·06	·02	..	·06	·04	·05	·05
15	·59	·40	·49	·43	·59	·46	·59	·37	·72	·66	·53	·55	·47	·36	·38
16	·08	·07	·08	·07	·07	·06	·07	·07	·07	·05	·05	·06	·09	·06	·07
17	·28	·36	·37	·28	·22	·26	·28	·28	·33	·36	·33	·29	·27	·21	·26
18	·10	·07	·07	·09	·08	·07	·09	·08	·13	·10	·09	·08	·06	·03	·04
19	·25	·19	·24	·34	·31	·22	·23	·25	·25	·25	·22	·20	·22	·19	·23
20	..	·02	·03	·04	·05	·03	·05	·05	·06	·05	·05	·05	·05	·04	·05
21	·05	·05	·05	·03	·03	·04	·05	·03	·06	·10	·07	·05	·05	·04	·06
22	·07	·08	·07	·06	·06	·05	·07	·05	·07	·06	·06	·06	·08	·05	·05
23	·03	·03	·03	·02	·02	·03	·03	·03	·02	·02	·02	·03	·03	·01	·01
24	·06	·04	·11	·07	·06	·06	·06	·05	·13	·12	·15	·07	·03	·02	·03
25	·09	·06	·04	·04	·04	·05	·07	·04	·04	·01	·02	·02	·02	·01	·03
26	·30	·33	·38	·28	·37	·38	·31	·32	·38	·27	·27	·37	·38	·33	·35
27	·07	·11	·11	·13	·16	·17	·13	·15	·11	·11	·09	·08	·07	·03	·05
28	·02	·03	·04	·04	·07	·07	·07	·06	·08	·08	·08	·08	·14	·10	·07
*	3·79	2·92	4·03	4·09	4·50	3·64	3·72	2·88	4·63	3·78	4·04	3·63	3·59	2·99	2·71
†	6·92	5·58	6·58	6·43	7·09	6·19	6·25	5·22	7·20	6·21	5·93	5·93	5·87	4·90	4·66

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Brixton	Battersea
	IN.	IN.
1	·01	..
2	·74	·29
3	·07	·02
4	..	·01
5	·01	..
6	..	..
7	..	..
8	..	..
9	..	..
10	·39	·20
11	..	..
12	..	..
13	·62	·13
14	·09	·08
15	·49	·28
16	·07	·06
17	·27	·40
18	·05	·04
19	·28	·15
20	·03	..
21	·03	·05
22	·06	·06
23	·02	..
24	·06	·09
25	·01	·04
26	·37	·26
27	·09	·06
28	·07	·05
*	3·83	2·27
†	6·25	4·35

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.—February, 1900.

The month has been cool, and exceedingly wet for February; but, if I may be allowed to say so, I think that the greatest feature is the total amounts for January and February combined. Taking the stations with the longest series of observations, for these two months we have to go back, as far as Greenwich is concerned, to 1879, as to Surbiton to 1866, and as to Nutfield and Waddon to 1877; whilst at Wimbledon (Mt. Ararat), going back to 1854, the total has never been exceeded. Taking the month February by itself, we find that at Greenwich it has only been exceeded four times in eighty-five Februaries, *viz.* in 1831, 1833, 1866, 1879; at Redhill, Nutfield, and Wimbledon (Mt. Ararat), it has never been exceeded, and at Surbiton it was only exceeded in 1866. Snow fell on several days, but, as far as can be ascertained, it at no place exceeded seven and a half inches on the level. The rainfall of the month is about two and a half inches above the average. Solar halos were seen at Upper Gatton on the 9th, 12th, and 21st, and at Croydon on the 18th and 21st; whilst lunar halos were seen at Upper Gatton on the 9th, and Croydon on the 9th and 14th. With respect to temperature there are many peculiarities, but I will deal with the phenological part in the first place. At Wallington, on the 23rd, the yellow and black-striped crocus was out, and on the 25th the yellow crocus; at Chislehurst, snowdrops were hardly out in the third week, and there were no primroses in the woods. At Bromley the cuckoo was heard on the 26th; whilst at Nutfield rooks began to build on the 20th, and the great woodpecker was heard on the 6th. Lightning was seen at Chaldon on the 20th, and thunder heard at Upper Gatton on the 22nd. The mean temperature of the month is about the average, and was at Croydon (Whitgift) 38·2°, at Croydon (Duppas House) and Wallington 37·9°, at Waddon 37·4°, and at Chipstead 37°. At Croydon the maximum temperature was 50° and above on six days, between 40° and 49° on eight days, and between 30° and 39° on fourteen days; whilst the minimum was 40° to 47° on seven days, between 30° and 39° on eleven days, between 20° and 29° on six days, and between 14° and 19° on five days. The month appears to have been on the whole unhealthy, but less so than January. There were recorded at Wallington 53·3 hours of sunlight, which is three per cent. below the February average of the ten years 1886–95.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* March, 1900.

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	·02	·02	·02	·02	·01	·02	·02	·02	·02	·03	·03	·02	·01	..			·03	·01	·02	·01			·01	·01
2	·03	·04	·04	·02	·02	·01	..	·03	·02	·02	·03	·03	..	·02	·01	..			·03	·01	..	·02			..	..
3	·01	·01	..	..	·01	·01	·04	·01	·01	..	..	·01	..	..	·01	·06			·06	..	..	·01			..	..
4	..	..	..	..	..	..	·01	·01	..	·01	..	..	..	..	..	..			..	..	·03	·01			..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·02	..	..	..			..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	·01	·01			..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
11	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·02	·02	..	..			..	..
13	..	..	..	·01	·03	·03	·02	·03	·03	·03	·03	·03	..	..	..	·05			..	·05	·01	·02			..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	..			..	..	..	..			..	..
15	..	..	..	..	·01	·01	·01	·01	·01	·01	·02	..	·03	·04	·07	·04			·05	·03	·06	·05			..	·07
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	RECORD CEASED.	MONTHLY GAUGE.	..	·01
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	·01			·02	..
18	·48	·45	·45	·43	·33	·47	·47	·41	·45	·43	·42	·52	·52	·48	·64	·50			·65	·65	·53	·51			·47	·47
19	·20	·19	·22	·15	·04	·04	·14	·17	·15	..	·05	·12	·04	·10	·10	·15			·02	·02	·02	·04			·22	·20
20	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
21	·22	·15	·17	·12	·09	·11	·13	·15	·15	·15	·13	·14	·14	·12	·14	·13			·11	·16	·16	·15			·18	·15
22	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01			..	..	..	..			..	..
23	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	·01	..			..	..
25	·01	·01	..	..	..	..	·01	·02	..	..	..	..	..	..	..	..			..	·01	..	..			..	..
26	·02	·01	..	..	·02	·01	..	..	·02	·01	·02	·02	..	·03	..	..			·04	·06	·02	·02			·03	·04
27	·04	·04	·06	·04	·01	·01	·01	·03	·06	·04	·06	·07	·07	·07	·07	·05			·06	·01	·06	·05			·07	·10
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·03			·07	·01	..	..			..	·04
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
*	1·02	·94	·96	·79	·59	·72	·85	·89	·92	·72	·79	·97	·83	·91	1·06	1·02	·87	·61	1·16	1·04	·93	·91	—	·84	1·00	1·09
†	11·56	11·17	11·23	9·42	7·92	9·24	9·46	9·37	10·81	9·60	9·39	11·05	9·32	10·70	10·30	9·42	8·41	5·87	8·75	9·88	10·01	9·12		9·98	10·43	8·60

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for March is 1·52 in.* **March, 1900.**

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	·01	..	..	·01	·01	·02	..	·01	·02	·02	·02	·01	·02	..	·01	·01	..	·02	·02	·02	·02	·03	..	·04	..
2	·04	·02	..	·03	·03	·02	·02	·03	·01	·02	·04	·03	·02	·02	·02	·01	·01	·01	..	..	·02	·03	·02	·02	..	·02
3	·02	·01	·03	..	..	..	..	..	..	·01	..	·02	·01	·01	·01	..	..	..	..	·35	·01	·01	·01	·07	..	·01
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·02	..
5	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·13	..	..	..	·01	..	·01
6	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·02	·01	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	·01	..	·01	·01	·02	·02	·02	·02	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..
13	..	·01	..	..	..	..	·02	..	·01	..	..	..	..	·01	·02	..	·01	·01	..	·02	·02	..	..	..	·01	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·02	·05	·07	·09	·07	·09	·10	·09	·09	·10	·09	·08	·08	·09	·07	·09	·06	·11	·12	·10	·10	·08	·07	·02	·06	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..	·04	..	·06
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..
18	·38	·47	·46	·44	·47	·46	·46	·42	·62	·46	·50	·52	·49	·50	·53	·59	·57	·78	·67	·70	·71	·70	·53	·60	·51	·76
19	·20	·18	·08	·05	·07	·03	·03	·02	·01	·02	·01	·02	·01	·01	·02	·05	·02	·01	·04	..	·01	..	·02	·02	..	·01
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
21	·15	·14	·13	·14	·15	·13	·13	·10	·14	·12	·13	·12	·10	·10	·12	·15	·13	·15	·15	·13	·12	·14	·15	·09	·18	·14
22	..	..	..	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	·01	·01	·01	·01	..	·01	·01	..	..	..	·02	·01	·01	..	·01	..	..	·02
26	·01	·01	..	·01	·02	·01	·01	..	..	·02	·01	·01	..	·01	·02	..	·01	..	·02	·01	·01	..	..	..	·01	·01
27	·11	·08	·11	·11	·10	·09	·08	·09	·08	·09	·07	·08	·09	·07	·06	·08	·06	·06	·06	·04	·04	·04	·05	·03	·08	·08
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..	..	·01	..	·01	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
*	·94	·98	·88	·88	·92	·85	·88	·76	·99	·89	·90	·95	·83	·86	·92	·99	·91	1·13	1·11	1·54	1·09	1·03	·91	·90	·92	1·12
†	7·84	10·62	8·71	7·76	8·29	8·60	7·76	6·83	9·88	8·66	8·74	8·95	8·76	7·87	8·10	9·24	9·12	8·59	9·01	9·12	8·97	8·92	8·47	7·59	6·39	8·43

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·01	..	..	·02	·01	·01	·02	·01	·01	..	..	·01	·03	·01	·01	·01	·02	·02	·01	·01	·02	·03	..	·01	·01	·01
2	·01	·02	..	..	·02	·01	·02	·02	..	..	·02	·02	·01	·02	·02	·02	·02	·02	·02	·02	·01	·02	·01	·01	..	·01
3	..	..	·01	·03	..	·01	·02	..	·01	·02	·01	·03	·01	..	..	·01	·02	·01	·01	..	·01	..	..	·01	..	·01
4	..	..	..	..	·01	..	..	..	·02	·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..
5	..	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..	..	..	..	..	..	..	·01
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
13	..	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	·06	·07	·07	·10	·07	·10	·12	·07	·04	·06	·07	·08	·05	·07	·06	·07	·08	·08	·07	·07	·05	·07	·07	·07	·08	·04
16	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01	..	·03	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	·04	·01	·01	..	..
18	·62	·55	·52	·41	·31	·36	·43	·29	·43	·37	·38	·42	·38	·52	·47	·46	·43	·42	·36	·70	·54	·53	·59	·48	·37	·39
19	·04	·04	·01	·04	·04	·15	·13	·15	·19	·19	·15	·15	·12	·06	·02	·02	..	·06	·01	·01	·01	..	·01	·01	·06	..
20	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·15	·08	·14	·11	·13	·13	·12	·12	·15	·15	·13	·13	·12	·13	·08	·11	·12	·13	·11	·15	·11	·09	·13	·12	·11	·20
22	..	..	·01	..	..	..	·01	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·02	..	·01	..	..	..	·01	..	..	..	..	..	·01	·01	·01	·01	..	·02	·02	..	·01	..	·03	·02	·01	·01
26	..	·03	..	..	..	..	·01	..	..	·02	·02	..	..	·01	..	..	..	..	..	·03	·01	..	·01	..	..	..
27	·10	·08	·10	·10	·18	·18	·15	·15	·21	·21	·18	·23	·17	·18	·17	·16	·16	·18	·16	·10	·06	·08	·10	·14	·13	·12
28	..	..	..	..	..	..	·01	..	·01	·01	..	..	..	..	·01	..	..	..	·01	..	·01	..	..	·01	..	·01
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·03	·92	·87	·81	·77	·95	1·07	·81	1·08	1·04	·96	1·07	·90	1·01	·86	·89	·86	·98	·79	1·13	·84	·87	·96	·91	·77	·80
†	7·88	8·09	7·94	7·07	6·09	7·51	7·69	6·15	7·92	7·84	7·72	7·99	6·48	7·59	7·29	7·98	7·05	7·23	6·01	8·33	7·05	6·80	6·89	6·78	5·67	5·46

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Brixton	Battersea
	IN.	IN.
1	..	..
2	·02	·01
3	..	..
4	..	..
5	..	..
6	..	..
7	..	..
8	..	..
9	..	..
10	..	..
11	..	..
12	..	..
13	..	..
14	..	..
15	·06	·05
16	..	..
17	..	..
18	·50	·40
19	·01	·02
20	..	..
21	·11	·08
22	..	..
23	..	..
24	..	..
25	..	..
26	..	..
27	·12	·12
28	..	..
29	..	..
30	..	..
31	..	..
*	·82	·68
†	7·07	5·03

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(March, 1900.)

The month has been cold, dry, and sunless, but it presents some peculiar features which are worth noticing, *viz.* the very low mean maximum in the shade, the very large mean amount of cloud, and the very small mean wind force. Snow fell on many days, but the heaviest fall was on the 18th. All vegetation is extremely backward. The almond flowered at Sidcup on the 10th, and at Beddington on the 12th, and the sallow at Sidcup on the 19th. At Nutfield the observer reports that "crocuses are only in full flower; glory of the snow opened its flowers in a sheltered corner in the rockery on the 7th; *Draba* flowered on the 15th; and blue Hepaticas on the 1st, and the red and white on the 15th." The month has been exceedingly unhealthy, colds, coughs, and influenza being very frequent, whilst there have been several cases of diphtheria and typhoid, and also a large number of scarlet fever and measles cases. The rainfall of the month is rather over half the average. With respect to temperature Dr. Parsons reports that at Croydon the maximum thermometer was between 50° and 54° on two days, between 40° and 49° on twenty days, and between 37° and 39° on nine days; whilst the minimum thermometer was 40° on one day, between 30° and 39° on twenty-two days, and between 20° and 29° on eight days. The mean temperature of the month is about 2·5° below the average for March, and was at Croydon (Duppas House) 39·3°, at Croydon (Whitgift) 39·2°, at Wallington 38·8°, at Waddon 38·4°, at Chipstead 38·3°, and at Redhill 37·7°. At Upper Gatton a solar halo was seen on the 18th, and a lunar one on the 10th. There were recorded at Wallington 74·1 hours of sunlight, which is no less than 50 hours and 13 per cent. below the March average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* **April, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·02	·02	..	·01	·02	·02	·02	·01	·01	·02	·02	·01	..
3	·48	·45	·45	·36	·30	·33	·36	·35	·40	·42	·43	·53	·48
4	·03	·05	..	·01	·01	·01	·01	·02	..	·01	·01	..	..
5	·05	..	·04	·25	·21	·21	·18	·20	·20	·11	·22	·24	·11
6	·02	..	..	·03	·03	·03	..	·03	·03	·06	·03	·04	..
7	·02	..	..	·01	·01	·01	..	·02	·02	·03	·02	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	·01	..	..	..	·08
10	·10	·08	·15	·11	·10	·10	·07	·10	·15	·15	·15	·13	·08
11	·06	·08	·07	·06	·03	·03	..	·05	·06	·05	·06	·06	·05
12	·03	..	·03	..	·01	·01	·03	·03	·04	·05	·05	·03	·04
13	..	·05	..	·01	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·04	·05	·09	·18	·16	·16	·04	·11	·07	·12	·13	·07	·06
17	·05	·07	·05	·04	·04	·04	..	·04	·03	·04	·05	·05	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	·01	..	..	..	..
25	..	..	..	..	·03	·03	·06	·03	·02	·02	·04	..	·05
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	·05	·03	·01	·01	·01	..	·01	·03	·01	·01	·06	·02
30	·19	·17	·16	·18	·15	·15	·12	·19	·23	·12	·20	·19	·16
*	1·11	1·07	1·07	1·26	1·11	1·14	·89	1·19	1·31	1·21	1·42	1·41	1·13
†	12·67	12·24	12·30	10·68	9·03	10·38	10·35	10·56	12·12	10·81	10·81	12·46	10·45

Day of Mo.	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..			..	..	..	..			..	..
2	·02	..	..			..	·02	..	..			·01	..
3	·46	·53	·30			·38	·55	·51	·37			·33	·27
4	..	..	..			..	..	..	·02			·11	·12
5	·10	·04	·05			·12	..	·07	·03			·06	·15
6	·08	..	·04			·03	·02	..	·03			..	·02
7	·05	·07	·06			·04	·14	..	·05			·03	·04
8	..	..	..			..	..	..	..			..	..
9	..	..	..			·01	..	..	..			..	..
10	·15	·17	·14			·11	·13	·22	·08			·10	·10
11	·07	·05	·05			·05	·07	·05	·04			·06	·11
12	·05	·08	..			·06	·08	·05	·01			..	·03
13	..	..	..			..	..	..	..			..	..
14	..	..	..			..	..	·02	..			..	..
15	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	RECORD CEASED.	MONTHLY GAUGE.	..	..
16	·05	·05	·09			·11	·04	·03	·04			·11	·13
17	·06	·05	·04			·05	·06	·06	·04			·04	·04
18	..	..	..			..	..	..	..			..	·04
19	..	..	..			..	..	..	..			..	..
20	..	..	..			..	..	..	..			..	..
21	..	..	..			..	..	..	..			..	..
22	..	..	..			..	..	..	..			..	..
23	..	..	..			..	..	..	..			..	..
24	..	..	..			·03	..	..	..			..	..
25	·03	..	..			·01	·04	·04	·04			·03	..
26	..	..	..			..	..	..	..			..	..
27	..	..	..			..	..	..	..			..	..
28	..	..	..			..	..	..	..			..	..
29	·02	·04	..			·02	·04	·03	·01			·01	..
30	·16	·10	·16			·08	·13	·13	·09			·12	·06
*	1·30	1·18	·93	1·04	·70	1·10	1·32	1·21	·85		1·25	1·01	1·11
†	12·00	11·48	10·35	9·45	6·57	9·85	11·20	11·22	9·97		11·23	11·44	9·71

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·02	·02	·02	·01	..	..	·01	..	..	·01	·01	·01	..
3	·20	·42	·30	·25	·31	·32	·32	·20	·35	·30	·29	·28	·27
4	·05	·01	·04	·04	·07	·06	·04	..	·02	·03	·04	·05	·04
5	·06	·16	·12	·08	·08	·05	·04	·07	·04	·04	·04	·03	·03
6	·01	·06	·03	·02	·02	·02	·02	..	·01	·02	·02	·02	·02
7	·05	·07	·04	·03	·04	·04	·04	·12	·08	·07	·14	·18	·14
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	·02
10	·09	·11	·17	·08	·08	·09	·08	·06	·09	·10	·09	·09	·09
11	·09	·04	·01	·10	·07	·07	·06	·05	·07	·05	·06	·09	·08
12	·01	·04	..	·01	..	..	..	..	..	·01	..	·01	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·10	·05	·02	·01	·02	..	·02	·03	·02	·02	·04	·07	·08
17	·04	·03	·04	·04	·05	·05	·05	..	·05	·04	·04	·05	·03
18	..	..	..	..	..	..	..	..	..	..	..	·01	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	·01	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·01	·01	·02	·01	·01	..	..	..	..	..	..	..	..
25	·03	·02	·03	·03	·04	·04	·04	·07	·04	·05	·05	·04	·04
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·05	·02	·03	·01	·03	·02	·03	..	..	·03	·02	..	..
30	·09	·18	·12	·11	·10	·09	·09	·10	·12	·09	·10	·11	·03
*	·90	1·25	·99	·83	·92	·85	·84	·70	·89	·86	·94	1·04	·87
†	8·74	11·87	9·70	8·59	9·21	9·45	8·60	7·53	10·77	9·52	9·68	9·99	9·63

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·01	·01	..	..	..	..	..	..	..	..	..	..	..
3	·29	·34	·40	·45	·43	·38	·35	·38	·38	·38	·20	·10	·29
4	·03	·04	·03	·02	..	·02	·01	..	..	·04	·12	·03	·03
5	·02	·02	·07	·05	·10	·09	·13	·09	·07	·29	·15	·09	·09
6	·02	·01	..	·02	..	·03	·02	·03	·01	·01	·02	·02	·01
7	·17	·09	·14	·07	·20	·07	·17	·08	·03	·03	..	..	·03
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	·05	·01
10	·10	·08	·09	·09	·08	·08	·07	·08	·08	·09	·07	·08	·08
11	·04	·05	·07	·06	·05	·05	·03	·04	·02	·04	·03	·04	·06
12	·01	·01	·02	·01	..	..	..	·01	..	·01	·02	·02	·02
13	..	..	·01	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·05	·05	·09	·06	·09	·08	·09	·08	·04	·10	·06	·08	·07
17	·04	·04	·06	·05	·06	·03	·05	·05	..	·05	..	·05	·04
18	..	..	..	..	·03	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..
25	·03	·04	·05	·04	..	·04	·04	·04	·05	·05	·02	·06	·05
26	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·04	·02	..	·02	..	..	·01	·01	..	·01	..	..	..
30	·09	·09	·11	·13	·09	·08	·06	·05	·03	·06	·06	·06	·06
*	·94	·89	1·14	1·07	1·13	·95	1·03	·94	·71	1·16	·75	·68	·84
†	8·81	8·99	10·38	10·19	9·72	9·96	10·15	9·91	9·63	9·63	8·34	7·07	9·27

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for April is 1·65 in.* April, 1900.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	·03	..	·03	·03	·02	·02
3	·28	·30	·30	·22	·20	·23	·22	·18	·22	·27	·19	·26
4	·05	·07	·06	·03	·02	·04	·05	·07	·16	·22	·10	·12
5	·10	·09	·11	·05	·07	·16	·15	·12	·08	·06	·12	·15
6	·01	·02	·02	·01	·01	·01	·02	·01	·04	·02	·02	·02
7	·04	·05	·04	..	·01	..	·04	..	..	·01	·01	·02
8	..	..	..	..	..	·02	..	..	·03	..	..	..
9	·01	..	..	..	..	..	..	·01	..	..	..	..
10	·10	·07	·09	·11	·08	·10	·10	·06	·09	·08	·07	·10
11	·08	·05	·10	·09	·03	·04	·06	·02	·04	·03	·03	·05
12	·02	·01	·01	..	·03	..	·02	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	·10	..	·01	..	·01	..	..	..	..	..
16	·10	·07	·06	·07	·08	·04	·03	·02	..	·04	·01	·02
17	·05	·05	·01	·04	·02	·04	·05	..	·04	·03	..	·02
18	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	·02	..	·03	..	·02	..	02	·01	·02	·03
25	·05	·04	·02	·02	·02	·04	·03	..	·02	·01	·01	·01
26	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	·02	..	..	·01	·03	..	·05	·03	·03	·03
30	·07	·06	·05	·10	·02	·05	·06	·05	·06	·02	·04	·03
*	·96	·88	1·01	·74	·63	·78	·92	·54	·88	·86	·67	·88
†	8·84	8·97	8·95	7·81	6·72	8·29	8·61	6·69	8·80	8·70	8·39	8·87

Day of Mo.	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
3	·26	·28	·16	·19	·15	·20	·20	·20	·19	·26	·20	·23	·23	·26
4	·03	·02	·06	·07	·06	·04	·03	·02	·07	·03	·03	·04	·03	·04
5	·07	·07	·04	·04	·07	·14	·14	·11	·16	·14	·15	·16	·15	·12
6	·02	·01	·01	·01	..	·03	·02	·03	..	..	·04	·02	·04	·03
7	·01	·03	·01	·01	·01	..	..	..	..	..	..	·01	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	·01	·01	·01	..	·01	·01	..	..	..	..	·02	..	·01
10	·10	·10	·09	·10	·10	·09	·08	·10	·05	·07	·07	·08	·07	..
11	·05	·05	·06	·08	·08	·08	·09	·12	·03	·06	·12	·09	·07	·10
12	·01	·02	·04	·04	·04	·05	·03	·04	·03	·03	·02	·01	·01	..
13	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	·02	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
16	·06	·05	·05	·10	·15	·07	·04	·06	·06	·07	·10	·09	·12	·02
17	·03	·04	·03	·03	·05	·03	·05	·05	..	·05	·04	·04	·04	·03
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·04	..	..	·02	..	..	..	..	..	..	..	·02	..	·02
25	·02	·05	·04	·04	·07	·07	·04	·06	·06	·05	·03	·04	·03	·02
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	..	·03	·02	·02	·02	·01	·02	..	·01	..	..	..	..
30	·04	·04	·04	·07	·08	·07	·07	·05	·02	·02	·03	·05	·02	·03
*	·76	·77	·68	·83	·90	·90	·81	·86	·67	·79	·83	·92	·81	·68
†	7·24	8·36	7·97	8·81	7·95	8·13	6·82	9·19	7·72	7·59	7·72	7·70	6·48	6·14

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Brixton	Battersea
	IN.	IN.
1	..	..
2	..	..
3	·25	·27
4	·05	..
5	·04	·08
6	·01	·01
7	..	..
8	..	..
9	·01	·01
10	·13	·06
11	·06	·03
12	·01	..
13	..	..
14	..	..
15	..	..
16	·03	·05
17	·03	..
18	..	..
19	..	..
20	..	..
21	..	..
22	..	..
23	..	..
24	..	·03
25	·05	..
26	..	..
27	..	..
28	..	..
29	..	..
30	·05	·04
*	·72	·58
†	7·79	5·61

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(April, 1900.)

The month has been one of about the average temperature for April, but with great extremes, the 21st being very remarkable for its great heat. The rainfall has been small, not more than half the average. The wealth of blossom on the trees has been a splendid sight. At Nutfield plums and peaches on the wall flowered on the 3rd and 5th, the blackthorn on the 16th, plums in the open on the 26th, and pears on the 30th; whilst at Sidcup the plum flowered on the 16th, the cherry on the 20th, and the pear on the 22nd. The cuckoo and wryneck were heard at Nutfield on the 16th, and the cuckoo at Abinger on the 17th, where also four were seen together, a rather unusual sight. Martins were seen at Nutfield on the 14th, and swallows at Nutfield and Abinger on the 18th, and at Beddington on the 19th, and the nightingale was heard at Upper Gatton on the 21st, at Wallington on the 25th, and at Abinger on the 29th. A thunderstorm occurred throughout the district on the 16th. The month has been a very unhealthy one, there having been many cases of diphtheria, scarlet fever, measles, and pneumonia in many places. The observer at Sanderstead sends a report of a gentle tornado there, which will be inserted in the annual report. Solar halos were seen at Beddington on the 6th, at Upper Gatton on the 9th, 22nd, and 29th, and at Wallington on the 21st and 26th; and a lunar halo at Upper Gatton on the 6th. The mean temperature of the month is variable, being sometimes above and sometimes below the average, but not more than 1° either way, and was at Croydon (Duppas House) 48·2°, at Croydon (Whitgift) and Wallington 47·6°, at Chipstead and Waddon 47·4°, and at Redhill 45·8°. There were recorded at Wallington 175·9 hours of sunlight, which is one per cent. above the April average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
2	·08	·05	·07	..	·04	·05	·04	..	·06	·05	·03	·04	·09	·04	..	..			·04		·09	·04			..	·19
3	·05	·11	·09	·14	·10	·13	·12	·12	·07	·10	·09	·08	·04	·11	·11	..			·06		·03	·07			·13	·19
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
6	·08	·07	·07	·10	·10	·10	·08	·10	·11	·12	·11	·12	·13	·13	·49	·16			·38		·13	·14			·07	·08
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·02		·01	·01			..	..
9	..	..	·04	..	..	..	..	·02	·04	·03	·04	·04	·04	·08	·01	..			·02		·06	·04			·03	·05
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		·02	·02			·01	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		·02	·01			..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·04		..	..			..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	MONTHLY GAUGE.	MONTHLY GAUGE.	·02	RECORD CEASED.	..	..	RECORD CEASED.	MONTHLY GAUGE.	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	·02	..	..			..		·01	·01			..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
21	·16	·16	·17	·17	·15	·15	·18	·14	·17	·14	·15	·14	·20	·11	·03	·10			·08		·13	·08			·16	·13
22	·40	·43	·53	·38	·30	·32	·39	·40	·44	·27	·42	·45	·33	·34	·39	·22			·20		·38	·31			·40	·27
23	·15	·13	·11	·10	·11	·10	·08	·08	·17	·08	·14	·18	·09	·09	..	·06			·10		·16	·09			·15	·22
24	·04	·04	·03	·18	·18	·19	·16	·20	·21	·08	·29	·20	·34	·11	·17	..			·01		·10	·11			·15	·09
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..		..	..			..	..
31	·10	·12	·14	·16	·21	·19	·10	·16	·23	·24	·21	·20	·29	·27	·25	·22			·34		·28	·25			·16	·14
*	1·06	1·11	1·25	1·23	1·19	1·23	1·15	1·22	1·50	1·11	1·48	1·45	1·55	1·30	1·45	·79	1·31	1·05	1·31		1·42	1·18		1·30	1·26	1·36
†	13·73	13·35	13·55	11·91	10·22	11·61	11·50	11·78	13·62	11·92	12·29	13·91	12·00	13·30	12·93	11·14	10·76	7·62	11·16		12·64	11·15		12·53	12·70	11·07

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farnborough	Orpington	Farningham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
2	·05	·05	·05	·05	·04	·04	·04	..	·05	·04	·06	·03	·04	·03	·03	..	·03	..	·03		·02	..	..	..	..	·01
3	·18	·09	·17	·14	·17	·15	·17	·17	·15	·15	·15	·17	·15	·12	·11	·14	·07	·13	·12		·09	·10	·16	·16	·10	·10
4	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..		..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
6	·06	·11	·11	·05	·10	·10	·10	·11	·11	·13	·14	·14	·13	·14	·15	·22	·19	·24	·26		·29	·29	·46	·33	·22	·26
7	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..	..		..	..	..	..	..	..
8	..	..	·01	..	..	..	·01	..	·01	·01	·01	·01	..	·01	·01	·01	..	..	·02		·04	·01	..	..	·02	·03
9	·05	·07	·04	·05	·04	·04	·03	·04	·03	·04	·04	·05	·03	·04	·04	·06	·05	·05	·04		·04	·03	·03	·05	..	·04
10	·01	·01	·01	·02	·02	·01	·01	·02	·02	·02	·02	·02	·02	·01	·02	·01	·01	·01	..		·02	·01	·02	..	·04	·03
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		·01	·01	..	·03	..	..
12	..	..	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·02		..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·03	..	..
15	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	RECORD CEASED.	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
18	..	·01	·01	·01	·01	..	·01	..	..	·01	·01	·01	..	·01	·02	·01	·01	..	..		..	..	·01	..	..	·01
19	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
21	·12	·13	·09	·08	·08	·09	·08	·09	·08	·09	·09	·09	·08	·10	·09	·11	·12	·09	·09		·06	·06	·06	·33	·05	·05
22	·23	·39	·27	·26	·31	·31	·32	·26	·32	·31	·30	·31	·29	·29	·35	·39	·38	·45	·34		·24	·26	·21	·16	·21	·30
23	·22	·13	·12	·15	·13	·14	·13	·13	·13	·13	·13	·15	·13	·12	·13	·15	·13	·14	·12		·08	·03	·03	·05	·13	·11
24	·15	·12	·13	·25	·20	·25	·25	·23	·26	·29	·28	·22	·24	·29	·26	·12	·13	·09	·10		·13	·05	·06	·30	·09	·13
25	..	..	·05	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..		·01	..	..	·01	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
30	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
31	·10	·23	·20	·21	·23	·22	·22	·20	·22	·23	·24	·23	·23	·16	·22	·23	·25	·25	·22		·26	·24	·25	·16	·15	·16
*	1·17	1·35	1·27	1·30	1·33	1·35	1·37	1·25	1·38	1·45	1·47	1·45	1·35	1·34	1·43	1·45	1·37	1·45	1·36		1·29	1·09	1·29	1·61	1·01	1·23
†	9·91	13·22	10·97	9·89	10·54	10·80	9·97	8·78	12·15	10·97	11·15	11·44	10·98	10·15	10·42	11·83	11·56	11·17	11·32		11·20	10·72	10·92	9·95	8·08	10·50

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for May is 2·00 in.* **May, 1900.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	·03	·02	·02	..	·04	·02	·04	..	·03	·03	·03	·03	·03	·01	..	·03	·02	..	·02	..	..	..	·01	·01	·01	·01
3	·11	·12	·12	·13	·10	·13	·09	·10	·05	·24	·07	·11	·15	·15	·12	·08	·09	·11	·10	·11	·07	..	·05	·12	·08	·07
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·24	·24	·20	·16	·09	·07	·08	·05	·06	·06	·04	·07	·10	·11	·13	·14	·15	·16	·16	·29	·57	·55	·27	·28	·20	·17
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	·06	·09	·01	..	·01	·01	·02	..	·01	·01	..	·01	·02	·01	·02	·01	·01	·03	·01	·05	·02	·02	·03	·04	·01	·01
9	·04	·04	·04	·05	·05	·07	·07	·05	·05	·06	·05	·09	·07	·07	·07	·07	·06	·06	·07	·07	·04	·07	·07	·07	·07	·05
10	·03	·03	·02	..	·01	·02	·02	·03	·02	·02	·01	·01	·02	·01	·02	·02	·04	..	·02	·04	·01	·02	·01	·01	..	·01
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	·01	·04	..	·10	·02	..	..	..	..	..	..	..	..	·01	..	..	·01	·01	..	..	..	·01	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	·07	·07	·07	·05	·08	..	·07	·06	..	·11	·10	·10	·10	·09	·06	·07	·10	·05	·07	·06	·03	·04	·05	·06	·04	·04
22	·28	·31	·29	·28	·16	·80	·17	·10	·27	·28	·17	·27	·20	·21	·21	·23	·26	·25	·22	·25	·13	·18	·20	·19	·13	·14
23	·12	·12	·09	·14	·09	·16	·15	·10	·12	·25	·10	·18	·13	·09	·18	·21	·15	·23	·20	·13	·08	·11	·07	·15	·17	·15
24	·16	·16	·16	·12	·10	·16	·10	·12	·16	·14	·11	·18	·04	·06	·08	·21	·26	·09	·12	·07	·01	·01	·09	·41	·29	·06
25	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·01	..	..	..	·01	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
31	·17	·31	·20	·15	·11	·12	·13	·10	·08	·10	·12	·10	·09	·10	·11	·15	·17	·14	·12	·14	·10	·11	·11	·10	·08	·08
*	1·31	1·51	1·24	1·11	·85	1·66	·97	·71	·85	1·31	·80	1·15	·95	·91	1·00	1·24	1·31	1·12	1·13	1·23	1·06	1·11	·96	1·46	1·08	·79
†	10·15	10·48	10·19	8·92	7·57	9·95	9·58	7·40	9·65	10·01	9·19	10·02	8·19	9·27	8·97	10·05	9·26	9·25	7·95	10·42	8·78	8·70	8·68	9·16	7·56	6·93

* The figures in this row give the totals for the month. † The totals from January 1st.

May, 1900.

Day of Mo.	Brixton	Battersea
	IN.	IN.
1	..	..
2	..	·01
3	·16	·09
4	..	..
5	..	..
6	·15	·11
7	..	..
8	·01	·01
9	·07	·05
10	·01	..
11	..	..
12	..	..
13	..	..
14	..	..
15	..	..
16	..	..
17	..	..
18	..	..
19	..	..
20	..	..
21	·07	·08
22	·20	·15
23	·10	·10
24	·02	·08
25	..	..
26	..	..
27	..	..
28	..	..
29	..	..
30	..	..
31	·10	·05
*	·89	·73
†	8·68	6·34

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(May, 1900.)

The month has been cold and sunless, and is the third in succession in which the rainfall is under the average. It has also been unhealthy, there having been several cases of diphtheria, and scarlet fever, and rheumatic affections being very prevalent. Vegetation is very backward, and the hawthorn and horse-chestnut were not fully in bloom till the end of the month. A thunderstorm occurred throughout the district on the 6th. The following are the dates at which certain phenological phenomena were observed:—At Wallington the white lilac flowered on the 4th, the purple on the 11th, the white chestnut on the 19th, and the pink one on the 23rd; a small white butterfly was seen on the 6th, and a small blue one on the 21st. At Croydon the hawthorn flowered on the 15th, and swifts were seen both there and at Wallington on the 27th. On the 11th a small cyclonic gust came from the north and passed over Sanderstead about noon; it passed away to the S.S.W., whirling papers and leaves to a great height. Solar halos were seen at Upper Gatton on the 5th and 27th, and at Wallington on the 7th. The rainfall throughout the district is about half an inch below the average. The mean temperature of the district is between a degree and half a degree below the average, and was at Croydon (Duppas House) 53·1°, at Worcester Park 52·8°, at Chipstead 52·4°, at Waddon and Croydon (Whitgift) 52·2°, at Wallington 52°, and at Redhill 51·3°. There were recorded at Wallington 168·7 hours of sunlight, which is 8 per cent. below the May average of the ten years 1886–95.

Returns of rainfall have been received from Worcester Park and Richmond. The total fall recorded for May at Worcester Park was ·99 in., and for Richmond 1·23 in.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·14	·08	·10	·08	·08	..	·11	·15	·14	·16	·20
2	..	..	..	..	..	..	..	..	..	..	..	·01
3	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..
6	·01	..	..	·07	·05	·05	·06	·03	·03	·04	·03	·02
7	·21	·32	·15	·23	·22	·21	·18	·22	·21	·25	·24	·19
8	·01	..	..	·04	·02	·03	·01	·03	..	..	·01	·02
9	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..
12	·37	·36	·07	·28	·17	·18	·37	·18	·17	·05	·10	·15
13	..	..	..	..	..	..	..	..	..	..	..	..
14	·21	·26	·22	·26	·27	·26	·24	·24	·29	·24	·25	·27
15	·01	·02	..	·02	·01	·01	..	·02	·03	·01	·02	·02
16	..	..	..	·01	..	..	..	..	·01	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..
19	·10	·13	·12	·10	·10	·10	·08	·09	·12	·11	·11	·10
20	·62	·27	·50	·16	·18	·17	·29	·19	·31	·16	·25	·24
21	·36	·41	·37	·57	·62	·59	·57	·58	·57	·56	·57	·53
22	·30	·31	·25	·12	·13	·13	·09	·11	·13	·11	·15	·17
23	·01	..	..	·02	·01	..	·01	·02	..	..	..	..
24	·45	·56	·32	·24	·23	·23	·21	·22	·27	·24	·26	·29
25	·55	·29	·24	·29	·33	·26	·34	·26	·47	·42	·52	·38
26	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..
29	·16	·19	·15	·12	·11	·11	·10	·13	·20	·14	·18	·15
30	·01	·03	..	·02	·02	·02	..	·02	·02	·02	·03	·02
*	3·43	3·29	2·47	2·65	2·55	2·43	2·55	2·45	2·98	2·49	2·88	2·76
†	17·16	16·64	16·02	14·56	12·77	14·04	14·05	14·23	16·60	14·41	15·17	16·67

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·19	·22	·38	·21	MONTHLY GAUGE.	MONTHLY GAUGE.	·35	RECORD CEASED.	·27	·31	RECORD CEASED.	MONTHLY GAUGE.	·16	·15
2	..	..	..	..			·01		·01	·01			..	..
3	..	..	..	..			..		..	..			..	..
4	..	..	..	..			..		..	..			..	..
5	..	..	..	..			..		..	..			..	..
6	·02	·04	·01	·04			·03		·03	·02			..	..
7	·22	·21	·27	·13			·11		·11	·09			·22	·20
8	..	·02	·14	..			·01		·04	·08			..	·04
9	..	..	..	..			..		..	..			..	..
10	..	..	..	..			..		..	..			..	..
11	..	..	..	..			..		..	..			..	..
12	·04	..	·03	·06			·05		·09	·09			·16	·22
13	..	..	..	..			·02		..	..			..	·01
14	·26	·30	..	·23			·19		·14	·11			·17	·20
15	..	·03	·01	..			..		·02	·01			·02	·05
16	..	..	..	..			..		..	..			..	..
17	..	..	..	..			..		..	..			..	..
18	..	..	..	..			..		..	..			..	..
19	·12	·11	·16	·19			·25		·11	·08			..	·15
20	·20	·19	·14	·30			·15		·20	·29			·32	·14
21	·56	·62	·62	·45			·52		·43	·42			·38	·53
22	·13	·14	·13	·13			·21		·18	·12			·18	·17
23	..	..	..	..			..		..	..			..	..
24	·55	·32	·17	·34			·14		·23	·18			·24	·18
25	·26	·64	·62	·45			·57		·54	·41			·16	·14
26	..	..	..	..			..		..	..			..	..
27	..	..	..	..			..		..	..			..	..
28	..	..	..	..			..		..	..			..	..
29	·20	·20	·11	·13			·06		·14	·12			·12	·20
30	·04	·06	·03	·02			·08		·01	..			..	..
*	2·79	3·10	2·82	2·68	2·49	2·39	2·75		2·55	2·34		2·47	2·13	2·38
†	14·79	16·40	15·75	13·82	13·25	10·01	13·91		15·19	13·49		15·00	14·83	13·45

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·15	·25	·23	·23	·25	·24	·24	·21	·26	·26	·30	·30	·26	·24	·31	·36	·32	·40	·35		·35	·37	·43	·18	·27	·35
2	..	·01	·01	·01	..	..	..	..	..	·02	..	·01	..	·01	·01	·02	..	..	·01		·01	·01	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	·09	·08
6	..	·03	·02	·01	·02	·02	·02	..	·02	·03	·03	·02	·02	·02	·04	·02	·03	·03	·04		·03	·02	·02	·01	·02	·02
7	·22	·16	·17	·15	·13	·12	·13	·10	·12	·13	·12	·12	·10	·16	·16	·17	·17	·16	·16		·11	·09	·05	·04	·12	·18
8	·03	·13	..	..	·02	·01	·01	..	·01	·01	..	·01	..	·01	·11	·09	·12	·05	·05		·09	·05	·01	..	..	·01
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
12	·20	·14	·31	·16	·13	·09	·10	·15	·12	·13	·12	·10	·09	·16	·45	·34	·71	·07	·09		·12	·06	·18	·06	·06	·07
13	·03	..	..	..	..	..	·01	..	..	..	..	·02	..	..	..	..	..	..	..		·01	..	·01	·03	..	..
14	·17	·29	·18	·09	·13	·18	·20	·16	·26	·25	·26	·28	·28	·20	·11	·12	·13	·10	·10		·10	·14	·10	·13	·14	·15
15	·01	·02	·02	·18	·02	·01	·01	..	·01	·01	..	·02	01	·01	·01	..	·01	..	..	RECORD CEASED.	·02	..	..	·02	..	·02
16	..	..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..		·01	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
19	·16	·09	·07	·07	·06	·05	·06	·06	·05	·05	·05	·06	·06	·05	·07	·12	·11	·10	·10		·10	·09	·11	·14	·18	·06
20	·10	·16	·56	·41	·62	·49	·49	·40	·44	·51	·42	·34	·36	·44	·32	·28	·23	·31	·30		·13	·10	·14	·30	·34	·32
21	·43	·49	·48	·48	·56	·53	·52	·48	·54	·55	·57	·58	·52	·58	·49	·48	·46	·56	·53		·58	·56	·64	·74	·39	·68
22	·20	·17	·15	·15	·15	·14	·15	·15	·15	·15	·16	·16	·13	·13	·12	·16	·17	·20	·18		·13	·11	·11	·11	·11	·12
23	..	..	·01	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..		..	..	..	..	..	..
24	·06	·24	·15	·14	·17	·17	·18	·15	·17	·19	·18	·18	·16	·17	·17	·17	·20	·17	·15		·15	·14	·12	·06	·15	·12
25	·14	·48	·50	·33	·43	·39	·35	·33	·38	·34	·33	·32	·30	·33	·39	·47	·46	·50	·14		·63	·38	·44	·20	·17	·45
26	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..		·01	..	..	·05	..	..
27	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	·01	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	..
29	·19	·16	·23	·21	·19	·19	·16	·19	·18	·18	·18	·20	·19	·16	·14	·18	·14	·15	·15		·11	·10	·11	·21	·17	·20
30	..	·01	..	·01	..	..	·01	..	..	..	..	·01	..	..	·01	..	·01	..	..		·01	..	·01	..	..	..
*	2·09	2·83	3·10	2·63	2·88	2·63	2·64	2·38	2·71	2·82	2·72	2·75	2·48	2·68	2·91	2·98	3·27	2·80	2·35		2·70	2·22	2·48	2·29	2·21	2·83
†	12·00	16·05	14·07	12·52	13·42	13·43	12·61	11·16	14·86	13·79	13·87	14·19	13·46	12·83	13·33	14·81	14·83	13·97	13·67		13·90	12·94	13·40	12·24	10·29	13·33

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·32	·30	·30	·35	·03	·26	·23	·18	·15	·17	·18	·17	·16
2	·01	..	·01	..	..	..	·01	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	·02	..	..	..	..
6	·02	·06	·02	·04	·03	·02	·03	·02	·05	·03	·03	·01	·03
7	·18	·14	·07	·11	·07	·11	·15	·06	·11	·14	·08	·11	·06
8	..	·02	·01	..	..	..	·01	..	·01	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·09	·10	·09	·32	·11	·18	·15	·23	·11	·08	·26	·28	·17
13	·01	..	·01	..	..	..	·01	..	..	..	..	..	..
14	·15	·12	·18	·26	·08	·11	·11	·11	·14	·09	·12	·12	·14
15	·02	·01	·01	..	..	..	·01	..	·02	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·07	·08	·06	·07	·06	·07	·07	·06	·05	·01	·09	·08	·08
20	·33	·39	·28	·38	·20	·15	·20	·25	·20	·20	·38	·31	·21
21	·61	·58	·60	·55	·37	·44	·43	·31	·35	·30	·32	·37	·39
22	·14	·15	·11	·11	·12	·16	·15	·15	·16	·17	·20	·20	·18
23	·12	..	..	..	..	..	..	..	..	..	..	..	..
24	·09	·13	·15	·14	·07	·09	·09	·04	·07	·09	·09	·24	·09
25	·44	·50	·48	·44	·43	·38	·36	·26	·46	·75	·43	·52	·64
26	·01	..	..	..	..	..	..	..	·01	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·21	·17	·21	·19	·17	·20	·20	·18	·22	·19	·20	·21	·18
30	..	..	..	..	..	..	·01	..	..	..	..	..	..
*	2·82	2·75	2·59	2·96	1·74	2·17	2·22	1·85	2·13	2·22	2·38	2·62	2·33
†	12·97	13·23	12·78	11·88	9·31	12·12	11·80	9·25	11·78	12·23	11·57	12·64	10·52

Day of Mo.	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·16	·20	·29	·31	·26	·29	·29	·19	·22	·23	·15	·16	·18
2	·02	·01	..	·01	..	·01	..	·01	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·03	·02	·03	·05	·05	·03	·02	·01	..	·06	·05	·04	·01
7	·05	·12	·11	·10	·10	..	·18	·20	·15	·06	·13	·09	..
8	..	..	·01	..	·02	·03	·03	..	..	·01	·02	·01	·09
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	·04	·13	·26	·19	·10	·11	·12	·20	·10	·20	·09	·08	·06
13	..	·01	·02	·05	·05	·03	·01	·01	·03	·01	·15	·05	..
14	·14	·13	·34	·28	·26	·26	·15	·14	·20	·22	·20	·17	·18
15	·01	..	·01	·01	·01	..	·02	·03	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..
19	·05	·08	·09	·17	·13	·13	·10	·12	·20	·05	·09	·06	·08
20	·30	·14	·17	·16	·12	·13	·15	·22	·09	·10	·16	·11	·16
21	·37	·49	·55	·57	·55	·48	·66	·78	·75	·58	·44	·38	·41
22	·15	·13	·11	·12	·13	·12	·14	·10	·11	·07	·09	·08	·10
23	·12	·01	..	..	..	..	..	..	..	..	..	..	..
24	·13	·11	·14	·16	·16	·17	·13	·06	·10	·16	·18	·13	·12
25	·40	·33	·43	·44	·51	·58	·48	·26	·25	·37	·51	·38	·59
26	..	·01	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	..	..	..	..	·04	·26	·40	..
29	·20	·21	·22	·26	·25	·23	·23	·18	·18	·22	·20	·17	·18
30	..	·01	..	..	..	·01	..	..	..	..	..	..	..
*	2·17	2·14	2·78	2·88	2·70	2·61	2·71	2·51	2·38	2·38	2·72	2·31	2·16
†	11·44	11·11	12·83	12·14	11·95	10·56	13·13	11·29	11·08	11·06	11·88	9·87	9·09

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Brixton	Battersea
	IN.	IN.
1	·22	·06
2	..	..
3	..	..
4	..	..
5	..	..
6	·03	·03
7	·05	·07
8	·02	·02
9	..	..
10	..	..
11	..	..
12	·52	·22
13	..	..
14	·14	·07
15	..	..
16	..	..
17	..	..
18	..	..
19	·04	·08
20	·19	·02
21	·40	·27
22	·12	·13
23	..	..
24	·10	·08
25	·63	·70
26	..	..
27	..	..
28	..	..
29	·19	·16
30	..	..
*	2·65	1·91
†	11·33	8·25

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

NOTES.

(June, 1900.)

The month has been one of about the average temperature for June, but very wet, the rainfall being about three-quarters of an inch above the average. The month has been somewhat unhealthy, there having been many cases of diphtheria about the district. The wild rose, elder, and hawthorn have been pictures of beauty. The wet weather has been detrimental to the hay crop, but of great benefit to all garden and root crops. Thunderstorms occurred throughout the district on the 7th, 12th, 20th, and 25th. Solar halos were observed at Upper Gatton on the 9th, 18th, 19th, and 29th, at Wallington on the 5th, 19th, 24th, and 29th, and at Sidcup on the 27th. The mean temperature of the district is about the average, and was at Croydon (Duppas House) 60·9°, at Worcester Park 60·8°, at Waddon 60·3°, at Chipstead 60°, at Wallington 59·8°, at Croydon (Whitgift) 59·7°, and at Redhill 59·2°. There were recorded at Wallington 203·1 hours of sunlight, which is one per cent. below the June average of the ten years 1886–95.

Returns of rainfall have been received from Worcester Park and Richmond. The total fall recorded for June at Worcester Park was 2·58 in., and for Richmond 1·89 in.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·16	·16	·15	·14	·14	·14	·14	·12	·14	·14	·14	·13	·18	·12	·14	·14			·15	·13	..	·14			·15	·18
2	·39	·37	·40	·41	·44	·44	·37	·35	·39	·42	·39	·35	..	·48	·35	·37			·31	·44	·39	·36			·33	·28
3	..	·17	..	·05	·09	·13	·08	·04	·01	·01	·02	·01	..	·15	·17	..			·45	·24	·19	·11			·09	·07
4	..	·02	..	..	·01	·01	..	..	·01	..	..	..	..	·02	..	..			·01	..	..	..			..	..
5	·07	..	..	·03	·02	·02	..	·03	·01	..	·01	·01	·04	..	..	..			..	·02	..	..			..	·02
6	·01	·02	..	·01	..	..	..	..	·01	·01	·01	..	..	·02	·01	..			·03	..	..	·02			..	·02
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
14	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..			..	..	..	·02			..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
16	..	..	..	·05	·07	·09	·03	·03	·03	·06	·02	·01	..	·05	·03	·05	MONTHLY GAUGE.	MONTHLY GAUGE.	·04	·05	·03	..	RECORD CEASED.	MONTHLY GAUGE.	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
20	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
27	·35	·41	·49	·44	·47	·50	·34	·36	·37	·38	·35	·38	·37	·37	·36	·23			·22	·34	·49	·44			·49	·41
28	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
29	·15	·14	·12	·25	·23	·20	·08	·26	·09	·15	·07	·31	·09	·09	·11	..			..	·12	·14	·06			·08	·12
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
*	1·13	1·29	1·16	1·38	1·47	1·53	1·07	1·19	1·06	1·17	1·01	1·20	·68	1·30	1·17	·79	·95	1·11	1·21	1·34	1·24	1·15		..	1·14	1·10
†	18·29	17·93	17·18	15·94	14·24	15·57	15·12	15·42	17·66	15·58	16·18	17·87	15·47	17·70	16·92	14·61	14·20	11·12	15·12	..	16·43	14·64		..	15·97	14·55

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm. (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·13	·17	·13	·12	·14	·13	·15	·14	·18	·15	·16	·15	·14	·15	·15	·15	·11	·13			·12	·11	·12	·12	·13	·13
2	·25	·31	·31	·31	·32	·29	·25	·26	·29	·26	·26	·26	·28	·28	·40	·40	·40	·47			·40	·36	·33	·36	·32	·47
3	·09	·13	·11	·11	·08	·08	·08	·10	·08	·07	·09	·15	·20	·10	·06	·07	·06	·03			·06	·09	·06	·06	·02	·04
4	..	..	·01	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..			..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
6	·01	..	..	·05	·03	·02	·01	·01	·01	·01	·02	·04	..	·04	·04	·06	·03	..			·01	..	..	·07	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	·03	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	·03	·02	·01	RECORD CEASED.	RECORD CEASED.	·03	..	·03	·02	..	·02
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
27	·44	·67	·81	·85	·72	·54	·46	·44	·48	·44	·50	·42	·47	·39	·42	·39	·35	·32			·36	·36	·35	·63	·18	·40
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
29	·19	·06	·06	·04	·06	·06	·05	·05	·06	·05	·04	·05	·04	·03	·05	·04	·11	·10			·16	·04	·15	·03	..	·01
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
*	1·11	1·34	1·43	1·49	1·35	1·12	1·00	1·00	1·11	·98	1·07	1·08	1·13	·99	1·13	1·14	1·08	1·06			1·14	·96	1·04	1·29	·68	1·07
†	13·11	17·39	15·50	14·01	14·77	14·55	13·61	12·16	15·97	14·77	14·94	15·27	14·59	13·82	14·46	15·95	15·91	15·03			15·04	13·90	14·44	13·53	10·97	14·40

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for July is 2·60 in.* **July, 1900.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·14	·13	·15	·18	·14	·14	·13	·12	·12	·10	·13	·12	·12	·14	·13	·14	·13	·13	·13	·14	·11	·13	·13	·13	·11	·12
2	·40	·42	·41	·24	·26	·27	·26	·21	·17	·13	·18	·20	·24	·28	·23	·27	·30	·29	·29	·42	·33	·38	·35	·29	·25	·25
3	·06	·13	·07	·09	·15	·20	·18	·12	·23	·16	·09	·08	·15	·11	·04	·04	·05	·06	·09	·05	·04	·03	·06	·12	·06	·05
4	..	..	..	..	..	..	..	..	·02	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	·02	·02	·01	..	..	·04	·06	..	·02	·02	..	..	·02	..	..	..	..	·01	·01	·01	·03	·03	·01	·02	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·01	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·03	..	·01	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·43	·25	·42	·44	·36	·46	·49	·50	·64	·50	·71	·67	·52	·40	·65	·85	·80	·71	·73	·43	·36	·38	·51	·84	·48	·77
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
29	·02	·03	·02	·03	·04	·06	·06	·10	·14	·08	·15	·08	·03	·03	·04	·03	·02	·01	·02	·02	·02	..	..	·01	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
*	1·08	1·00	1·09	·98	·95	1·17	1·18	1·05	1·34	·99	1·26	1·15	1·08	·96	1·10	1·33	1·30	1·21	1·27	1·10	·89	·96	1·06	1·41	·90	1·19
†	14·05	14·23	13·87	12·86	10·26	13·29	12·98	10·30	13·12	13·22	12·83	13·79	11·60	12·40	12·21	14·16	13·44	13·16	11·83	14·23	12·18	12·04	12·12	13·29	10·77	10·28

* The figures in this row give the totals for the month. † The totals from January 1st.

July, 1900.

Day of Mo.	Brixton	Battersea	Worcester Park	Richmond
	IN.	IN.	IN.	IN.
1	·13	·11	·12	·10
2	·26	·24	·28	·16
3	·19	·25	·13	·24
4	..	..	..	..
5	..	..	..	..
6	..	..	..	·04
7	..	..	..	..
8	..	..	..	..
9	..	..	..	..
10	..	..	..	..
11	..	..	..	..
12	..	..	..	..
13	..	..	..	..
14	..	..	..	..
15	..	..	..	..
16	..	..	..	..
17	..	..	..	..
18	..	..	..	..
19	·01	..	..	..
20	..	..	..	..
21	..	..	..	..
22	..	..	..	..
23	..	..	..	..
24	..	..	..	..
25	..	..	..	..
26	..	..	..	..
27	·62	·44	·48	·52
28	..	..	..	..
29	·01	·02	·14	·11
30	..	..	..	..
31	..	..	..	..
*	1·22	1·06	1·15	1·17
†	12·55	9·31	12·94	12·28

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

Note.—New Gauges.

Warlingham, Surrey. Observer, H. Rogers. Height above sea-level, 614 ft.
Worcester Park, ,, Observer, F. D. Outram. Height above sea-level, 120 ft.
Richmond, ,, Observer, J. H. Brierley. Height above sea-level, 109 ft.

NOTES.

(July, 1900.)

The month has been an exceedingly hot sunny month. At Greenwich, and indeed at most stations throughout the district, the maximum in the shade rose to over 90° on the 16th, 19th, 20th, and 25th, and at several places the minimum in the shade exceeded 60° on the 20th, 21st, 22nd, 23rd, 24th, 25th, and 26th, the night of the 23rd being the warmest. The month has also been unhealthy, diphtheria and scarlet fever being especially prevalent. The great heat has also done a good deal of damage, roses and plums especially suffering. Hay was cut at Beddington on the 2nd, and oats at Nutfield at the end of the month. The observer at Redhill reports the occurrence of remarkable massive white clouds on a grey cloud at 7 p.m. on the 20th, on which day there was a great storm at Northampton. Thunderstorms occurred throughout the district on the 3rd, 27th, and 29th, and lightning and thunder on other days. The rainfall is about one-half the July average. The mean temperature of the month is about 4·5° above the July average, and was at Croydon (Duppas House) 67·5°, at Chipstead 67·4°, at Croydon (Whitgift) 66·5°, at Wallington and Worcester Park 66·4°, at Waddon 66°, and at Redhill 65·2°. A solar halo was seen at Upper Gatton on the 8th. There were recorded at Greenwich 294·8 hours of bright sunshine, and at Wallington 290·9 hours of sunlight; which latter is 21 per cent. above the July mean of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·40	·40	·33	·28	·25	·25	·25	·26	·29	·30	..	·29
2	·10	·15	·08	·03	·03	·03	·01	·04	·08	·04	·36	·10
3	·30	·27	·38	·50	·53	·54	·34	·49	·52	·52	·55	·54
4	..	..	..	..	..	..	..	..	..	..	..	..
5	·23	·26	·19	·14	·11	·11	·09	·12	·14	·10	·14	·14
6	·54	·54	·45	·36	·39	·38	·36	·35	·37	·36	·35	·41
7	·25	·19	·31	·07	·05	·07	·10	·09	·10	·06	·10	·23
8	..	..	..	..	..	..	..	..	..	..	·01	..
9	·53	·52	·47	·41	·37	·38	·35	·37	·41	·44	·41	·42
10	·02	..	·04	·01	·01	·02	·09	·03	·03	·05	·02	·03
11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	·12	·29	..	..	·01	·54	·75	·03	·50	·96
18	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..
20	·47	·21	·34	·40	·71	·42	..	·52	·44	·75	·31	·19
21	·09	·09	·05	·01	·01	·01	..	·01	·01	·02	·01	·01
22	·63	..	·62	·19	·57	·49	·07	·11	·08	·44	·24	·07
23	·30	·80	·15	·28	·17	·20	·08	·21	·15	·25	·26	·16
24	..	..	..	..	..	..	..	..	..	..	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..
27	·23	·24	·20	·18	·18	·18	·16	·18	·21	·23	·20	·20
28	·04	·06	·05	·01	·02	·02	·01	·02	·03	·04	·02	·03
29	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..
31	·10	·26	·12	·03	·13	·11	·10	·03	·11	·11	·08	·16
*	4·23	3·99	3·90	3·19	3·53	3·21	2·02	3·37	3·72	3·74	3·56	3·94
†	22·52	21·92	21·08	19·13	17·77	18·78	17·14	18·79	21·38	19·32	19·74	21·81

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·13	·33	·24	·22			·25	·30	·26	·21			·20	·23
2	·30	·06	·04	·11			·05	·06	·08	·07			·04	·05
3	·15	·13	·58	·12			·46	·67	·53	·51			·40	·40
4	..	..	..	·35			..	..	·01	..			..	..
5	·19	·11	·07	·10			·09	·10	·10	·11			·16	·12
6	·32	·42	·37	·09			·32	·37	·30	·27			·39	·29
7	·08	·05	·05	·21			·04	·09	·11	·07			·12	·23
8	·04	..	..	·11			..	..	..	..			..	..
9	·37	·48	·48	·31			·41	·47	·38	·32			·30	·21
10	·05	·10	·03	..			·06	·03	·12	·05			·11	·24
11	..	..	..	..			..	..	..	..			..	..
12	..	..	..	..			..	..	..	..			..	..
13	..	..	..	..			..	..	..	..			..	..
14	..	..	..	..			..	..	..	..			..	..
15	..	..	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	RECORD CEASED.	MONTHLY GAUGE.	..	..
16	..	..	..	..			..	..	..	..			..	..
17	·02	..	..	..			..	..	·01	..			·11	..
18	..	..	..	..			..	..	..	..			..	..
19	..	..	..	..			..	..	..	..			..	..
20	·16	·64	·19	·23			·39	·67	·06	·02			·04	·06
21	·02	·03	·15	..			·13	·07	·02	·01			..	·04
22	·47	·40	·51	·19			·13	·22	·36	·21			·36	·23
23	·18	·23	·14	·26			·07	·10	·27	·24			·30	·34
24	..	..	..	..			..	..	..	..			..	..
25	..	..	..	..			..	..	..	·01			..	·07
26	..	..	..	..			..	..	..	..			..	..
27	·23	·26	·30	·22			·21	·25	·21	·19			·14	·10
28	·03	·05	·09	..			·04	·03	·02	·02			..	..
29	..	..	..	..			..	..	..	..			..	..
30	..	..	..	..			..	..	..	..			..	..
31	·18	·10	·13	·04			·19	·17	·33	·17			..	·18
*	2·92	3·39	3·37	2·56	3·55	2·89	2·84	3·60	3·17	2·48		..	2·67	2·79
†	18·39	21·09	20·29	17·17	17·75	14·01	17·96	..	19·60	17·12		..	18·64	17·34

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1900.**

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·23	·34	·32	·37	·34	·32	·32	·34	·37	·30	·31	·33	·37	·20	·24	·32	·26	·31	RECORD CEASED.	RECORD CEASED.	·27	·24	·20	·18	·24	·25
2	·02	·07	·07	·08	·05	·07	·05	·07	·07	·07	·04	·08	·06	·03	·06	·09	·08	·06			·07	·07	·06	·05	·04	·03
3	·39	·50	·50	·47	·50	·47	·46	·45	·55	·39	·46	·47	·42	·26	·47	·54	·50	·52			·44	·42	·30	·32	·17	·39
4	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
5	·11	·17	·04	·05	·08	·07	·06	·04	·06	·06	·05	·06	·04	·05	·11	·10	·12	·09			·08	·06	·08	·08	·03	·03
6	·29	·40	·25	·22	·27	·26	·26	·18	·24	·27	·27	·24	·22	·20	·26	·29	·31	·31			·31	·27	·27	·12	·19	·23
7	·20	·08	·21	·11	·11	·10	·06	·09	·06	·06	·05	·09	·10	·04	·04	·06	·10	·05			·12	·14	·14	·17	·05	·09
8	..	..	·01	·01	..	..	..	..	..	..	..	·01	·01	..	..	..	..	..			..	..	..	..	..	..
9	·20	·35	·25	·22	·28	·26	·26	·16	·28	·27	·26	·26	·24	·25	·28	·32	·38	·33			·41	·34	·32	·22	·18	·25
10	·12	·04	·06	·08	·07	·07	·08	·08	·08	·10	·08	·08	·09	·05	·03	·02	·01	·03			·09	·05	·02	·03	·02	·07
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
17	..	..	·07	·67	1·10	·66	·71	·30	·43	·34	·33	·33	·32	·20	·09	..	..	..			..	..	..	..	..	..
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
20	·02	·05	·01	·01	·05	·03	·01	..	·02	·02	·03	·02	·02	·23	·01	·02	·06	·03			·05	·18	·10	·03	·05	·04
21	·05	·01	·02	..	..	..	..	..	·01	·02	..	·01	..	·02	·02	·05	·07	·06			·05	·18	·11	·03	·03	·04
22	·24	·24	·19	·15	·19	·24	·21	·20	·22	·22	·25	·13	·18	·18	·17	·12	·17	·14			·09	·23	·08	·04	·18	·09
23	·70	·24	·28	·25	·25	·47	·41	·37	·48	·49	·60	·67	·54	·24	·21	·19	·14	·16			·27	·30	·15	·40	·17	·24
24	..	..	·02	·01	..	..	..	..	..	·01	..	..	..	..	·02	..	..	..			..	..	..	..	..	..
25	·03	..	·06	..	..	..	·01	..	·01	·03	·04	·02	..	·05	·02	·03	·02	·04			·02	·04	..	·04	..	·22
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
27	·01	·15	·07	·07	·07	·09	·08	·09	·11	·10	·11	·11	·09	·12	·21	·24	·23	·25			·25	·24	·23	·14	·15	·18
28	..	·01	..	..	..	..	·01	..	·01	·01	..	..	..	·01	·02	·03	·02	·01			·03	·03	·04	·03	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·01	..	..	..	..	..
30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
31	..	·21	·22	·01	·25	·23	·22	·29	·22	·25	·25	·22	·27	·23	·24	·07	·18	·23			·17	·05	·19	·33	·18	·29
*	2·61	2·86	2·66	2·78	3·61	3·34	3·21	2·66	3·22	3·01	3·13	3·13	2·97	2·36	2·50	2·49	2·65	2·62			2·73	2·84	2·29	2·21	1·68	2·44
†	15·72	20·25	18·16	16·79	18·38	17·89	16·82	14·82	19·19	17·78	18·07	18·40	17·56	16·18	16·96	18·44	18·56	17·65			17·77	16·74	16·73	15·74	12·65	16·84

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for August is 2·33 in.* **August, 1900.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·23	·23	·03	·30	·37	OBSERVER DEAD. RECORD CEASED.	·30	·29	·38	·35	·37	·43	·29	·31	·31	·34	·30	·32	·37	·28	..	·23	·25	·28	·03	·29
2	·04	·05	·03	·04	·05		·05	·04	·06	·10	·26	·09	·02	·05	·06	·09	·08	·07	·05	·08	·30	·03	·02	·01	..	·01
3	·41	·36	·44	·43	·35		·38	·22	·43	·50	·49	·54	·39	·32	·30	·41	·43	·40	·33	·28	·29	·24	·27	·28	·23	·30
4	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	·04	·05	·03	..	·06		·09	·04	·06	·07	·07	·11	·25	·16	·11	·06	·06	·08	·09	·04	·01	·02	·06	·12	·12	·18
6	·22	·22	·23	·21	·12		·17	·16	·20	·21	·16	·18	·16	·16	·15	·19	·21	·18	·18	·21	·19	·14	·17	·20	·15	·10
7	·14	·04	·09	·07	·24		·22	·18	·05	·04	·14	·14	·07	·16	·12	·17	·17	·16	·16	·19	·02	·08	·05	·11	·09	·09
8	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	·08	..	..	..	·02	..	..	..	..
9	·23	·22	·29	·24	·19		·24	·23	·28	·28	·19	·26	·23	·24	·25	·26	·27	·19	·25	·28	·27	·24	·26	·26	·25	·22
10	·10	·09	·07	..	·09		·01	·08	·11	·09	·07	·18	·02	·23	·10	·06	·04	·04	·05	·04	·02	..	·02	·05	·07	·04
11	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	·03	·07	·70		·61	·18	..	..	..	..	..	·56	1·89	·51	·05	..	·15	..	..	..	..	·05	·19	·98
18	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·03	·02	·03	·06	·01		·02	..	·12	·15	·06	·17	·04	·01	·01	·04	·01	..	·01	·04	·01	·04	..	..	..	..
21	·05	·05	..	·03	·01		·03	·03	·02	·05	·10	·10	·01	·02	..	·01	..	·03	·02	·05	·08	·07	·05	·01	..	·01
22	·07	·13	·10	·25	·10		·17	·18	·11	·18	·17	·20	·15	·01	·12	·16	·29	·22	·23	·13	·12	·30	·04	·25	·21	·16
23	·20	·36	·10	·12	·34		·34	·36	·62	·40	·44	·50	·37	·28	·45	·55	·56	·21	·28	·23	·44	·31	·14	·31	·54	·33
24	..	..	..	..	·01		·04	..	·02	·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01
25	·06	·10	·07	..	·41		·23	·35	·02	·05	·04	·06	·41	·57	·22	·08	·03	..	..	..	·02	..	·01	..	..	·06
26	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	·17	·21	·15	·10	·04		·06	·03	·06	·05	·04	·04	·04	·04	·08	·09	·12	·12	·08	·18	·19	·20	·17	·10	·08	·06
28	·01	·02	..	..	..		..	..	..	..	..	..	..	..	·01	..	..	..	·01	·01	·01	·01	..	..	..	..
29	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	·27	·21	·31	..	·21		·25	·24	·21	·25	·26	·32	·27	·26	·31	·32	..	·31	·31	·31	·12	·33	·36	·41	·39	·31
*	2·27	2·36	2·20	1·92	3·30		3·21	2·61	2·75	2·80	2·86	3·32	2·72	3·38	4·49	3·34	2·62	2·41	2·57	2·35	2·09	2·26	1·87	2·44	2·35	3·05
†	16·32	16·59	16·07	14·78	13·56		16·19	12·91	15·87	16·02	15·69	17·11	14·32	15·78	16·70	17·50	16·06	15·57	14·40	16·58	14·27	14·30	13·99	15·73	13·12	13·33

* The figures in this row give the totals for the month. † The totals from January 1st.

Day of Mo.	Brixton	Battersea	Worcester Park	Richmond
	IN.	IN.	IN.	IN.
1	·26	·22	·24	·31
2	..	..	·05	·03
3	·34	·22	·41	·29
4	..	..	..	..
5	·16	·17	·05	·17
6	·22	·12	·18	·21
7	·18	·06	·05	·06
8	..	..	..	..
9	·22	·24	·22	·25
10	·10	·08	·07	·10
11	..	..	..	..
12	..	..	..	..
13	..	..	..	..
14	..	..	..	..
15	..	..	..	..
16	..	..	..	..
17	·40	..	·28	..
18	..	..	..	..
19	..	..	..	..
20	·01	..	·03	·14
21	·01	..	·01	·18
22	·03	·05	·18	·19
23	·58	·37	·40	·47
24	..	..	·05	..
25	·40	·17	·13	·15
26	..	..	..	..
27	·06	·01	·04	·04
28	..	..	..	·01
29	..	..	..	..
30	..	..	..	..
31	·28	..	·27	·31
*	3·25	1·71	2·66	2·91
†	15·80	11·02	15·60	15·19

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

Note.—New Gauges.

Warlingham, Surrey.	Observer,	H. Rogers.	Height above sea-level,	614 ft.
Worcester Park, ,,	,,	F. D. Outram	,, ,, ,,	120 ft.
Richmond, ,,	,,	J. H. Brierley	,, ,, ,,	109 ft.

NOTES.

(August, 1900.)

The month was wet and cold till the 10th, then fine and warm till the 20th, and then again cold and wet. The rainfall has been very variable, owing to the numerous thunderstorms, those on the 17th and 20th being very remarkable, as a perusal of the observations will show. A good deal of damage was done by the gales on the 3rd and 6th. As a rule, the corn harvest was not up to the average, and both ears and straw were discoloured by the wet. Apples are a poor crop owing to maggots, but pears and plums are plentiful and good. The month has been a healthy one as a whole. Solar halos were seen at Upper Gatton on the 21st, and at Croydon on the 11th, 19th, and 21st. The mean temperature of the month is about the average, and was at Chipstead, Waddon, and Croydon (Duppas House) 61·8°, at Croydon (Whitgift) 61·5°, at Wallington 61·4°, at Worcester Park 61·3°, at Sevenoaks 61°, and at Redhill 59·9°. There were recorded at Wallington 187·7 hours of sunlight, which is one per cent. below the August average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·18	·24	·13	·29	·20	·21	·14	·31	·16	·17	·20	·15	·13
2	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..
10	·01	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·01	..	·03	·03	·02	·02	·01	·03	·03	·02	·02	·02	·02
17	..	..	..	..	..	..	..	..	·01	..	..	..	..
18	..	..	..	·01	·01	·01	·01	·02	·02	·03	·03	..	..
19	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	·01	..	..	..	..	..	..
23	..	..	..	..	..	..	·01	..	..	..	..	..	..
24	·03	·06	·05	·07	·08	·09	·03	·06	·09	·07	·08	·09	·09
25	..	..	..	..	..	..	..	..	..	..	..	..	..
26	·10	·18	·11	·03	·03	·03	·08	·03	·12	·06	·08	·09	·16
27	·42	·47	·43	·54	·53	·55	·48	·53	·52	·48	·54	·45	·36
28	..	·01	·03	·02	·01	·01	..	·02	·02	·02	·02	..	..
29	·01	..	..	..	·01	..	..	..	..	..	..	..	..
30	·20	·33	·24	·34	·35	·30	·33	·35	·41	·28	·42	·32	·49
*	·96	1·29	1·02	1·33	1·24	1·22	1·10	1·35	1·38	1·13	1·39	1·12	1·25
†	23·48	23·21	22·10	20·46	19·01	20·00	18·24	20·14	22·76	20·45	21·13	22·93	19·64

Day of Mo.	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·22	·18	..			·06	·15	·02	·14			·28	·10
2	·02	..	..			..	..	..	..			..	..
3	..	..	..			..	..	..	..			..	..
4	·01	..	..			..	..	..	..			..	..
5	..	..	..			..	..	..	..			..	..
6	..	..	..			..	..	..	..			..	..
7	..	..	..			..	..	..	..			..	..
8	..	..	..			..	..	..	..			..	..
9	..	..	..			..	..	..	..			..	..
10	·02	..	..			..	..	·01	..			..	..
11	..	..	..			..	..	..	..			..	..
12	..	..	..			..	..	..	..			..	..
13	..	..	..			..	..	..	..			..	..
14	..	..	..			..	..	..	..			..	..
15	..	..	..			..	..	..	..			..	..
16	·03	·07	·09	MONTHLY GAUGE.	MONTHLY GAUGE.	·05	·04	·03	·03	RECORD CEASED.	MONTHLY GAUGE.	·02	·04
17	..	..	..			..	..	..	..			..	..
18	·02	..	..			..	·04	·03	..			..	..
19	..	..	..			..	..	..	..			..	..
20	..	..	..			..	..	..	..			..	..
21	..	..	..			..	..	..	..			..	..
22	..	..	..			..	..	..	..			..	..
23	..	..	..			..	..	..	..			..	..
24	·10	·14	..			·22	·09	·06	·05			·08	·09
25	..	..	..			..	..	..	..			..	..
26	·06	·04	..			·02	·09	·05	·05			·03	·03
27	·65	·57	·42			·74	·58	·40	·28			·37	·25
28	·02	..	..			..	..	..	·02			..	·04
29	..	..	·02			..	..	..	..			..	..
30	·43	·41	·28			·20	·52	·30	·18			·20	·12
*	1·58	1·41	·81	1·38	·72	1·29	1·51	·90	·75		..	·98	·67
†	22·67	21·70	17·98	19·13	14·73	19·25	..	20·50	17·87		..	19·62	18·01

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1900.**

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W.Wickham (Wick.Ct.)	Hayes Common	Keston (Bradfield)	Farnborough	Orpington	Farningham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·26	·14	·14	·23	·14	·15	·16	..	·16	·13	·12	·20	·12	·13	·16	·39	·16	·17	RECORD CEASED.	RECORD CEASED.	·15	·28	·15	·15	·05	·12
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·01	..	..	..	..	..
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
7	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
15	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..			·01	..	..	..	..	..
16	·02	·02	·05	·03	·03	·03	·03	·03	·05	·03	·04	·03	·03	·03	·03	·01	·03	·03			·06	·03	·04	·03	·04	·06
17	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01			..	..	..	..	..	..
18	..	·03	·03	..	·05	·04	·03	·04	·05	·05	·05	·05	·04	·05	·03	·01	·02	..			·04	..	·02	..	·02	·03
19	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..			..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
21	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
24	·08	·09	·09	·07	·08	·09	·07	·06	·09	·07	·08	·08	·07	·07	·06	·04	·06	·04			·03	..	·02	·02	·04	·05
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
26	..	·06	·02	·02	·02	·03	..	..	·02	·02	·02	·02	·02	·02	·02	·05	·03	·02			·01	·03	..	..	..	..
27	·25	·41	·26	·22	·31	·32	·31	·30	·35	·32	·30	·30	·30	·26	·26	·31	·38	·40			·31	·36	·31	·29	·10	·20
28	·02	·02	·03	·02	·02	·01	·01	..	·02	·01	..	·01	·01	·02	·04	·01	..	..			..	..	..	..	..	·03
29	..	·01	·02	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	·01			..	..	..	..	..	..
30	·11	·21	·12	·14	·15	·16	·16	·14	·17	·15	·16	·18	·17	·17	·17	·21	·26	·23			·25	·28	·32	·23	·08	·17
*	·74	1·02	·76	·73	·80	·83	·77	·57	·93	·79	·77	·87	·76	·75	·79	1·03	·94	·91			·87	·98	·86	·72	·33	·66
†	16·46	21·27	18·92	17·52	19·18	18·72	17·59	15·39	20·12	18·57	18·84	19·27	18·32	16·93	17·75	19·47	19·50	18·56			18·64	17·72	17·59	16·46	12·98	17·50

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for September is 2·30 in.* **September, 1900.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·12	·14	·12	·42	·08	RECORD CEASED.	·12	·08	·09	·09	·09	·05	·10	·15	·07	·09	·42	·10	·12	·11	·27	·23	·14	·11	·11	·09
2	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..		..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·06	·07	·04	·04	·02		·04	·01	·02	·02	·02	·03	·02	·03	·02	·05	·01	·06	·06	·07	·01	·04	·07	·06	·05	·06
17	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·03	·03	·02	·06	·02		·02	..	..	..	..	..	..	·04	..	·01	..	..	..	·03	·01	..	·03	..	·01	..
19	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..
22	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·06	·06	·08	·06	·08		·10	·07	·04	·08	·07	·07	·05	·06	·09	·09	·10	·08	·09	·06	·01	·04	·07	·06	·05	·04
25	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	..	·01	·01	..	..		·01	..	·02	..	..	..	..	·01	·02	·01	..	·03	·01	·02	..	..	..	·01	..	·01
27	·22	·21	·27	·31	·20		·23	·20	·21	·24	·24	·27	·25	·27	·24	·27	·29	·23	·27	·20	·21	..	·28	·29	·25	·19
28	·03	·02	·02	..	·02		..	..	..	..	·01	·10	·11	·01	·04	..	·02	..	·01	..	..	..	..	..	·01	·01
29	..	·01	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	·16	·15	·18	·15	·10		·13	·09	·12	·12	·11	·12	·12	·13	·11	·16	·19	·19	·18	·15	·14	·15	·17	·19	·15	·10
*	·68	·70	·74	1·04	·52		·65	·45	·50	·55	·54	·64	·65	·70	·59	·69	1·03	·69	·74	·64	·65	·46	·76	·73	·63	·50
†	17·00	17·29	16·81	15·82	14·08		16·84	13·36	16·37	16·57	16·23	17·75	14·97	16·48	17·29	18·19	17·09	16·26	15·14	17·22	14·92	14·76	14·75	16·46	13·75	13·83

* The figures in this row give the totals for the month. † The totals from January 1st.

September, 1900.

Day of Mo.	Brixton	Battersea	Worcester Park	Richmond
	IN.	IN.	IN.	IN.
1	·13	·35	·06	·03
2	..	..	..	..
3	..	·01	..	..
4	..	..	..	..
5	..	..	..	..
6	..	..	..	..
7	..	..	..	·02
8	..	..	..	..
9	..	..	..	..
10	..	..	..	..
11	..	..	..	..
12	..	..	..	..
13	..	..	..	..
14	..	..	..	..
15	..	..	..	..
16	·04	·03	·01	·01
17	..	..	..	..
18	·01	..	..	..
19	..	..	..	..
20	..	·02	..	..
21	..	..	..	..
22	..	..	..	..
23	..	..	..	..
24	·05	·03	·07	·06
25	..	..	..	..
26	..	..	..	..
27	·26	·26	·25	·22
28	..	..	..	..
29	..	..	..	..
30	·14	·26	·13	·12
*	·63	·96	·52	·46
†	16·43	11·98	16·12	15·65

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

Note.—New Gauges.

Warlingham, Surrey.	Observer,	H. Rogers.	Height above sea-level,	614 ft.
Worcester Park, ,,	,,	F. D. Outram	,, ,, ,,	120 ft.
Richmond, ,,	,,	J. H. Brierley	,, ,, ,,	109 ft.

NOTES.

(September, 1900.)

The month has been warm, but on the whole very dry, so much so tha at Nutfield the observer reports that "many of the whitethorns have died, and many of the oaks are following suit." This cause has probably adversely affected the health of the district, there being rather more than the usual number of cases of diphtheria and scarlet fever. Pears and apples have been plentiful, and on the whole good. Night fogs have been somewhat numerous. The 16th will be remembered as an unusually hot day, the temperature in the shade being in the majority of cases over 80°. The rainfall is only about one-third of the average. A solar halo was seen at Upper Gatton and Croydon on the 4th, and lightning was seen at the same places on the 16th. The mean temperature of the month is between one and two degrees above the average, and was at Croydon (Duppas House) 59°, at Croydon (Whitgift) and Worcester Park 58·3°, at Wallington and Chipstead 58°, at Waddon 56·3°, and at Redhill 55·8°. There were recorded at Wallington 194·1 hours of sunlight, which is eight per cent. above the September average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	·01	..	..	..	..
2	..	..	·03	·02	·01	·02	..	..	..	·05	..	·01
3	..	..	..	..	..	..	..	..	..	..	..	..
4	·51	·50	·46	·43	·39	·43	·42	·35	·39	·39	·37	·44
5	·10	·13	·11	·16	·16	·20	·16	·16	·18	·14	·14	·11
6	·01	·01	..	·06	·02	·02	·03	·03	..	·08	·01	..
7	..	..	..	..	..	..	..	..	..	..	..	..
8	..	..	..	..	..	·01	..	..	..	..	..	..
9	·03	·02	·03	·02	·02	·01	..	·01	·02	..	·02	·02
10	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	·01	·01	·01	·01	..	..	..	..	..
14	..	..	..	..	..	..	..	·01	·01	·03	·01	·02
15	..	..	..	..	..	..	..	..	..	..	..	..
16	·03	·04	·04	·02	·03	·03	·02	·03	·04	·04	·03	·04
17	..	·01	..	·01	..	..	..	·01	·01	·01	·01	..
18	·09	·09	·08	·06	·06	·06	·04	·06	·05	·08	·05	·05
19	..	..	..	..	..	..	..	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..
21	..	..	..	..	..	..	·01	..	..	..	..	..
22	·07	·06	·05	·01	·02	·02	·02	·02	·02	·03	·01	·02
23	..	·01	..	·01	·01	·01	·01	·01	·01	·01	·01	·02
24	·04	·02	·04	·03	·06	·06	·02	·03	·02	·03	·03	·01
25	·03	·06	·05	..	·05	·05	·02	·05	·06	·06	·05	·05
26	·23	·26	·27	·19	·20	·20	·19	·25	·28	·25	·31	·26
27	·01	·01	·05	·09	·10	·10	·05	·08	·10	·09	·06	·08
28	·25	·25	·25	·18	·17	·16	·16	·19	·36	·18	·26	·32
29	·40	·42	·50	·50	·51	·47	·44	·41	·46	·46	·47	·43
30	·17	·16	·18	·20	·18	·19	·18	·22	·15	·14	·16	·15
31	·14	·09	·10	·04	·04	·04	·02	·02	·06	·05	·07	·08
*	2·11	2·14	2·24	2·04	2·04	2·09	1·80	1·95	2·22	2·12	2·09	2·11
†	25·59	25·35	24·34	22·50	21·05	22·09	20·04	22·09	24·98	22·57	23·22	25·04

Day of Mo.	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..			..	..	·01	..			..	..
2	·03	·04	·03	..			·03	·05	..	..			..	..
3	..	..	..	..			..	..	..	..			..	..
4	·50	·49	·33	·39			·32	·43	·36	·34			·41	·47
5	·12	·12	·18	·18			·16	·10	·14	·10			·14	·15
6	..	..	..	..			..	·01	..	..			..	..
7	..	..	..	..			..	..	..	..			..	..
8	..	..	..	..			..	..	..	..			..	..
9	..	·04	..	..			·01	·02	·01	·01			..	..
10	..	..	..	..			..	..	..	..			..	..
11	..	..	..	..			..	..	..	..			..	..
12	..	..	..	..			..	..	..	..			..	..
13	..	..	..	..			..	..	·01	..			..	..
14	..	..	·08	..			·03	·03	·03	·05			·04	·04
15	..	..	..	..			..	..	..	..			..	..
16	·07	·04	·02	..	MONTHLY GAUGE.	MONTHLY GAUGE.	·01	·03	·03	·03	RECORD CEASED.	MONTHLY GAUGE.	..	·03
17	..	·03	..	..			..	·01	·02	..			..	..
18	·05	·10	·11	..			·06	·09	·06	·06			·06	..
19	..	..	..	..			·01	..	..	..			..	..
20	..	..	..	..			..	..	..	..			..	..
21	..	..	·02	..			·04	..	..	..			..	..
22	·04	·04	..	..			..	·03	·03	·01			·05	·05
23	..	·03	..	..			..	·01	·01	..			..	..
24	..	..	·12	·04			·05	·04	..	·03			·03	·02
25	·08	·06	·06	·11			·10	·09	·08	..			·07	·05
26	·15	·26	·31	·25			·22	·26	·27	·29			·24	·19
27	·25	·06	·06	..			·03	·05	·03	·04			·04	·10
28	·22	·25	·22	·17			·26	·27	·33	·21			·24	·24
29	·50	·48	·48	·53			·53	·55	·48	·44			·46	·47
30	·12	·18	·14	·18			·14	·12	·12	·10			·16	·14
31	..	·05	·15	..			·26	·07	·07	·05			·10	·09
*	2·13	2·27	2·31	1·85	2·28	1·79	2·26	2·26	2·09	1·76		..	2·04	2·04
†	21·77	24·94	24·01	19·83	21·41	16·52	21·51	..	22·59	19·63		..	21·66	20·05

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* October, 1900.

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickhm (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	RECORD CEASED.	RECORD CEASED.	..	..	..	..	..	..
2	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	·01			·02	..	..	..	..	..
3	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
4	·40	·48	·41	·40	·44	·41	·40	·34	·44	·39	·40	·38	·37	·34	·37	·48	·51	·48			·33	·25	·30	·26	·13	·46
5	·15	·08	·13	·10	·09	·09	·07	·08	·09	·08	·08	·09	·09	·07	·10	·13	·11	·10			·09	·09	·08	·02	·04	·08
6	..	·01	..	..	..	..	·01	..	..	·01	..	·01	·01	·01	..	..	..	..			..	..	·01	·03	..	..
7	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..			..	..	..	..	..	..
8	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..			..	..	..	..	..	..
9	·03	·02	..	..	·01	·02	·02	·01	..	..	·02	·02	·02	·01	·01	..	·01	..			·02	·01	..	·01	·02	·02
10	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..			..	..	..	..	..	..
11	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
13	..	..	·04	..	..	..	·01	..	·03	..	..	..	..	..	·01	·02	·01	..			..	..	·03	·01	..	·04
14	·01	..	..	·04	·05	·03	·02	..	·02	·02	·02	·01	..	·01	·01	·03	·01	·03			·04	..	·02	·01	·06	·01
15	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01			..	..	..	..	..	..
16	·02	·04	·03	·03	·03	·03	·03	·02	·03	·02	·03	·03	·03	·03	·03	·02	·02	..			·02	..	..	..	·01	·03
17	..	·01	..	·01	·01	·01	·01	·01	·01	·02	·01	·01	..	·01	·01	..	..	..			..	..	..	·01	..	..
18	..	·05	·04	·03	·04	·03	·04	·03	·04	·04	·04	·05	·04	·05	·05	·07	·07	·05			·06	..	·01	·03	..	·03
19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..			·01	..	..	..	..	..
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	·01	..	..	..
21	·02	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	·01	..			·03	·05	·05	·01	..	·03
22	·05	·03	·02	·02	·03	·02	·02	·01	·02	·01	·02	·02	·02	·01	·02	·02	·01	..			·01	..	..	..	..	·01
23	·01	·01	..	·01	·01	..	·01	..	·01	·01	..	..	..	..	·01	·03	·01	·04			·01	..	..	..	..	..
24	..	·06	·05	·03	·05	·05	·04	·05	·04	·05	·04	·06	·06	·03	·03	·02	·02	..			·03	·03	·02	·02	·02	·02
25	·04	·09	·05	..	·06	·06	·06	·05	·07	·06	·06	·07	·05	·05	·07	·09	·09	..			·11	·08	·08	·04	·05	·05
26	·18	·19	·19	·20	·21	·21	·21	·18	·24	·20	·21	·20	·19	·19	·24	·24	·21	·27			·22	·25	·22	·22	·04	·18
27	·08	·06	·05	·05	·05	·04	·04	·04	·04	·04	·04	·03	·02	·01	·03	·05	·03	·04			·04	·02	·01	·01	..	·03
28	·22	·21	·15	·14	·17	·19	·18	·11	·22	·18	·19	·18	·17	·17	·25	·28	·27	·30			·21	·22	·20	·13	·14	·19
29	·48	·49	·52	·53	·53	·54	·53	·45	·66	·51	·54	·50	·51	·49	·53	·46	·49	·57			·49	·48	·54	·52	·35	·52
30	·12	·12	·10	·09	·10	·10	·10	·09	·12	·11	·11	·14	·12	·09	·11	·19	·10	·10			·10	·10	·09	·06	·05	·09
31	·08	·11	·10	·08	·09	·07	·05	·04	·05	·05	·04	·05	·04	·03	·05	..	·05	·03			·09	·09	..	·01	·02	·03
*	1·89	2·10	1·89	1·76	1·97	1·90	1·85	1·51	2·14	1·81	1·85	1·86	1·74	1·60	1·97	2·14	2·03	2·03			1·93	1·67	1·67	1·40	·93	1·82
†	18·35	23·37	20·81	19·28	21·15	20·62	19·44	16·90	22·26	20·38	20·69	21·13	20·06	18·53	19·72	21·61	21·53	20·59			20·57	19·39	19·26	17·86	13·91	19·32

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for October is 2·82 in.* **October, 1900.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm. rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	..	..	·01	..	..		..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
2	..	..	..	..	·01		..	..	·02	..	..	..	..	·02	..	..	..	..	..	·01	..	·02	..	..	..	..
3	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	·41	·42	·37	·30	·30		·37	·40	·35	·35	·43	·44	·39	·33	·29	·35	·33	·29	·27	·28	·31	·24	·36	·24	·24	·25
5	·10	·10	·10	·08	·08		·08	·10	·09	·09	·08	·09	·09	·08	·09	·10	·12	·14	·10	·10	·05	·07	·06	·11	·09	·07
6	..	..	·01	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	..	..	..	..	..		·01	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
8	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	·03	·02	·03	..	·02		·01	·02	·02	·03	·02	·03	·02	·01	·03	·07	·05	·04	·03	·04	·02	..	·02	·01	·01	..
10	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	..	..	..	..	..		·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	·01	·01	·01	..	·01		·02	..	·01	..	..	..	..	..	·01	·01	..	·03	·03	·02	..	·07	·02	·02	·02	·01
14	·02	·03	·04	·05	·02		·03	·01	·02	·04	·02	·03	·03	·04	·06	·11	·06	·04	·02	..	·01	..	..	·01	·01	..
15	..	..	..	..	..	RECORD CEASED.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	·03	·03	·03	..	·02		·03	·02	·02	·02	·02	·02	·02	·02	·03	·02	·03	·03	·02	·04	·01	..	·04	·02	·02	·01
17	..	..	..	..	·01		·01	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	·02	·01	·01	..
18	·04	·03	·03	..	·03		·03	..	·01	..	·01	·01	·03	·03	·04	·03	·04	..	·01	·03	..	·06	·03	·01	·01	..
19	..	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	·01	..	..	..	..		..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	..
21	·03	..	·03	..	..		·01	..	..	..	..	..	..	..	..	..	..	..	·01	·01	·04	..	·02	·04	..	..
22	·02	·04	·01	..	·02		·02	·02	·04	·04	·02	·02	·02	·02	·02	·02	·02	·02	·01	..	..	..	·01	·01	·02	..
23	..	..	·01	..	..		·01	·02	..	..	..	..	..	..	..	..	..	·01	..	..	..	..	·01	·01	..	..
24	·03	·03	·05	..	·02		·02	..	·02	·04	·03	·02	·05	·05	·05	·06	·10	·08	·06	·03	·02	·02	·06	·04	·04	..
25	·06	·07	·06	..	·05		·07	·05	·04	·03	·05	·03	·04	·06	·06	·07	·08	·09	·07	·09	·05	·06	·05	·07	·06	..
26	·20	·24	·21	·30	·15		·17	·11	·14	·16	·12	·15	·15	·16	·13	·14	·14	·15	·14	·21	·19	·20	·16	·14	·12	·17
27	·04	·04	·03	·03	·03		·05	·05	·04	·05	·04	·06	·04	·04	·04	·03	·04	·08	·03	·01	..	..	..	..	·01	·04
28	·21	·12	·19	·15	·14		·19	·18	·24	·17	·20	·26	·20	·23	·18	·19	·17	·15	·20	·18	·13	·14	·17	·22	·18	·64
29	·49	·50	·51	·45	·37		·44	·40	·46	·41	·45	·45	·45	·47	·44	·45	·48	·51	·54	·47	·46	·48	·52	·52	·51	·17
30	·09	·10	·09	·10	·07		·11	·10	·10	·11	·10	·10	·09	·10	·09	·10	·09	·10	·08	·08	·06	·07	·07	·07	·06	·05
31	·05	·03	·03	..	·06		·07	·01	·15	·06	·07	·03	·06	·05	·10	·10	·06	·02	·06	·04	·01	·03	·03	·05	·05	·06
*	1·87	1·81	1·85	1·46	1·41		1·76	1·49	1·78	1·60	1·66	1·74	1·68	1·72	1·66	1·85	1·81	1·78	1·70	1·64	1·37	1·46	1·65	1·60	1·46	1·47
†	18·87	19·10	18·66	17·28	15·49		18·60	14·85	18·15	18·17	17·89	19·49	16·65	18·20	18·95	20·04	18·90	18·04	16·84	18·86	16·29	16·22	16·40	18·06	15·21	15·30

* The figures in this row give the totals for the month. † The totals from January 1st.

r, 1900.

Day	Brixton	Battersea	Worcester Park	Richmond
	IN.	IN.	IN.	IN.
1	..	..	..	..
2	..	..	..	..
3	..	..	..	..
4	·30	·27	·36	·34
5	·07	·06	·09	·07
6	..	..	..	..
7	..	..	..	..
8	..	..	..	..
9	·01	·02	·01	..
10	..	..	..	..
11	..	..	..	..
12	..	..	..	..
13	·02	·02	..	·01
14	·03	·01	·01	..
15	..	..	..	..
16	·02	·02	·02	·02
17	..	..	..	..
18	·03	..	·01	·01
19	..	·02	..	..
20	..	..	..	..
21	..	..	..	..
22	·01	·01	·07	·02
23	..	..	..	..
24	·04	·03	·02	·03
25	·05	..	·05	·04
26	·15	·13	·15	·13
27	·03	·02	·03	·02
28	·21	·18	·16	·20
29	·51	·46	·53	·43
30	·07	·06	·11	·10
31	..	·05	·08	·04
*	1·55	1·36	1·70	1·46
†	17·98	13·34	17·82	17·11

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

Note.—New Gauges.

Warlingham, Surrey.	Observer,	H. Rogers.	Height above sea-level,	614 ft.
Worcester Park, ,,	,,	F. D. Outram	,, ,, ,,	120 ft.
Richmond, ,,	,,	J. H. Brierley	,, ,, ,,	109 ft.

NOTES.

(October, 1900.)

The month has been dry and very warm. The maximum temperature in the shade was unusually high, being at Greenwich 74·2°. The month has been rather unhealthy, there being the usual autumnal increase of scarlet fever, diphtheria, and enteric fever, whilst measles and influenza have been very prevalent in some parts of the district. The absence of frost has been very remarkable, and at only one place, *viz.* Abinger, was there sufficient to kill such delicate plants as dahlias, geraniums, calceolarias, lantanas, begonias, and even gourds. At Abinger the observer reports that he saw a most brilliant meteor at 8.35 p.m. on the 21st in the north-west, and that everything was bathed in a white light as it descended nearly straight down. A few flakes of snow were seen at Croydon on the 14th. At Upper Gatton hail was observed on the 14th and 26th, at Croydon on the 14th, and at Nutfield on the 26th. Lightning was seen at Upper Gatton on the 17th, and at Sidcup on the 21st. Thunder was heard at Nutfield on the 5th. Lunar halos were seen at Nutfield on the 4th and 27th, and a solar one at Upper Gatton on the 28th. The rainfall is about $1\frac{1}{4}$ inch below the average. The mean temperature of the month is about 2° above the mean, and was at Wallington and Croydon (Whitgift) 51·3°, at Croydon (Duppas House) 51·2°, at Worcester Park 51°, at Waddon 50·9°, at Chipstead 50·3°, and at Redhill 49·7°. There were recorded at Wallington 114·8 hours of sunlight, which is three per cent. above the October average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·20	·24	·10	·26	·17	·23	·42	·21	·15	·22	·16	·12	·10
2	·01	·01	·02	·01	·01	·01	..	·01	·01	·01	·01	·01	·09
3	..	..	..	..	..	..	..	..	..	..	..	..	·04
4	·13	·14	·15	·09	·07	·07	·13	·07	·09	·05	·05	·06	·09
5	·06	..	·06	·04	·05	·06	·02	·06	·04	·03	·05	·01	·03
6	·50	·06	·35	·17	·34	·26	·20	·16	·17	·31	·15	·21	·26
7	·05	·03	·06	·04	·04	·04	·01	·05	·05	·04	·05	·04	·04
8	·13	·19	·13	·15	·12	·12	·15	·14	·17	·17	·16	·12	·17
9	·02	·01	..	·01	·02	·02	·01	..	·01	..	·02	·01	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·07	·07	·05	·01	·03	·03	·03	·01	·02	·02	·02	..	·02
12	·25	·33	·22	·31	·22	·22	·20	·29	·29	·23	·28	·27	·28
13	·07	·10	·09	·10	·10	·09	·08	·09	·11	·08	·11	·11	·14
14	·08	·08	·08	·06	·05	·05	·05	·06	·12	·05	·06	·07	..
15	·27	·30	·23	·18	·22	·25	·14	·16	·11	·16	·16	·22	·34
16	·24	·29	·40	·74	·63	·63	·63	·72	·75	·51	·50	·53	·48
17	·08	·09	·06	·13	·12	·12	·15	·14	·14	·10	·11	·10	·16
18	..	..	..	..	..	..	·01	·01	..	..	..	..	..
19	·03	·03	·04	·04	·06	·06	·03	·04	·07	·10	·07	·07	·13
20	·02	·02	·02	·03	·02	·02	..	·04	·02	·02	·02	·03	..
21	·01	·01	..	..	..	..	..	..	..	..	·01	·01	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	·01	·01	..	..	·01	..	..	..	..
24	·18	·18	·17	·21	·19	·21	·19	·20	·22	·22	·24	·25	·24
25	..	..	..	..	..	..	..	·01	..	..	·01	..	..
26	·09	·08	·07	·07	·06	·06	·06	·05	·08	·06	·09	·06	·08
27	·22	·14	·08	·10	·11	·11	·15	·07	·09	·09	·09	·08	·18
28	·25	·24	·23	·29	·27	·27	·22	·23	·27	·32	·29	·26	·20
29	·04	·03	·04	·02	·02	·02	·01	·05	·02	·01	·02	·02	·07
30	·01	..	..	..	..	..	..	·01	..	..	..	..	..
*	3·01	2·67	2·65	3·06	2·93	2·96	2·89	2·88	3·01	2·80	2·73	2·66	3·14
†	28·60	28·02	26·99	25·56	23·98	25·05	22·93	24·97	27·99	25·37	25·95	27·70	24·91

Day of Mo.	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·19	·28	·40			·17	·19	·15	·16			..	·09
2	·02	..	..			..	..	..	·02			..	..
3	..	..	..			·01	..	·01	..			..	..
4	·07	·05	..			·09	·06	·04	·02			·13	·02
5	·05	·09	..			·03	·03	·03	·02			·02	·13
6	·30	·29	·37			·46	·19	·29	·22			·28	·22
7	·04	·03	..			·03	·03	·07	·10			·09	·16
8	·16	·14	·10			·03	·15	·10	·09			·05	·04
9	..	·01	..			..	..	..	..			·02	..
10	..	..	..			..	..	..	..			..	..
11	·02	..	..			·02	..	..	·01			..	·03
12	·34	·29	·14			·17	·31	·22	·17			·21	·11
13	·12	·10	·17			·15	·10	·11	·09			·06	·10
14	·06	·05	·06			·08	·06	·07	·05			·08	·06
15	·25	·27	·17	MONTHLY GAUGE.	MONTHLY GAUGE.	·28	·33	·25	·28	RECORD CEASED.	MONTHLY GAUGE.	·25	·24
16	·54	·68	·72			·54	·53	·38	·52			·32	·30
17	·10	·06	·07			·01	·10	·09	·08			·05	·05
18	..	..	·09			..	..	..	..			..	..
19	·10	·24	·03			·21	·12	·11	·09			..	·01
20	·06	·06	·11			·03	·04	·06	·04			·05	·02
21	·02	..	..			·03	·02	·03	·01			..	..
22	..	..	..			..	..	..	..			..	..
23	·02	..	..			..	·01	..	·01			..	..
24	·25	·30	·32			·25	·22	·19	·15			·20	·16
25	..	..	..			..	..	..	..			..	..
26	·10	·13	·06			·15	·06	·07	·09			·07	·04
27	·13	·12	·08			·25	·07	·08	·06			·11	·14
28	·29	·28	·24			·19	·25	·26	·24			·18	·19
29	·04	·01	..			..	..	·01	·01			·02	·01
30	..	..	..			·03	·01	·02	·01			..	..
*	3·27	3·48	3·13	3·07	2·33	3·21	2·88	2·64	2·54		..	2·19	2·12
†	28·21	27·49	22·96	24·48	18·85	24·72	..	25·23	22·17		..	23·85	22·17

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1900.**

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Beddington	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump.St.)	W. Wickham (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farnborough	Orpington	Farningham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·08	·09	·08	·09	·11	·10	·11	·09	·13	·11	·10	·11	·08	·10	·14	·23	·17	·22			·15	·15	·27	·19	·04	·06
2	..	·02	..	..	·02	·01	·01	·01	·01	·01	·01	·01	·01	·01	·01	..	..	..			..	..	..	..	..	·01
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			·01	·02	..	·01	..	..
4	·02	·05	·01	..	·02	·02	·02	·01	·02	·02	·02	·02	·02	·01	·03	·02	·04	·03			·02	·02	·01	·02	..	·02
5	·04	·05	·03	·03	·03	·03	·03	·03	·03	·05	·04	·05	·04	·03	·02	..	·01	·27			·01	..	·01	·01	..	·02
6	·26	·23	·14	·11	·18	·16	·18	·37	·18	·18	·18	·18	·15	·19	·20	·27	·29	·05			·21	·36	·48	·33	·08	·14
7	·16	·12	·03	·21	·19	·20	·19	·21	·22	·20	·21	·22	·22	·17	·13	·14	·10	·14			·09	·08	·10	·12	·15	·27
8	·02	·08	·05	·03	·05	·05	·04	·04	·04	·04	·04	·05	·04	·05	·06	·07	·10	·08			·08	·10	·10	·08	·03	·03
9	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	·02	..	..
10	..	..	..	..	..	..	..	..	·01	..	..	..	..	..	·01	..	..	..			..	..	..	..	..	..
11	·02	·02	·02	..	..	·01	·01	..	..	·01	·01	..	..	..	..	..	..	..			..	..	..	..	..	·01
12	·10	·19	·09	·08	·09	·12	·10	·09	·13	·12	·12	·12	·11	·11	·14	·15	·17	·13			·14	·14	·15	·10	..	·10
13	·10	·05	·09	·08	·07	·07	·06	·07	·07	·06	·05	·08	·09	·06	·09	·09	·11	·11			·09	·09	·08	·05	·05	·07
14	·05	·07	·07	·06	·06	·06	·06	·04	·06	·06	·06	·06	·06	·04	·05	·05	·05	·04	RECORD CEASED.	RECORD CEASED.	·04	·04	·08	·06	·03	·05
15	·24	·25	·19	·19	·22	·21	·21	·13	·22	·20	·20	·21	·21	·14	·26	·22	·25	·19			·17	·16	·21	·20	·08	·23
16	·28	·50	·34	·40	·39	·46	·49	·45	·57	·52	·47	·47	·46	·40	·42	·50	·52	·78			·40	·36	·40	·40	·15	·35
17	·04	·08	·05	·04	·07	·07	·06	·06	·07	·08	·11	·09	·08	·09	·06	·08	·07	·02			·07	·05	·01	·03	·04	·05
18	..	..	..	·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	·04			·01	..	..	..	..	..
19	..	·06	·02	..	·01	·01	·02	..	·01	·02	·02	..	·02	·02	·06	·04	·12	·10			·16	·18	·22	·16	·20	·04
20	·03	·02	·03	·02	·04	·04	·04	·05	·04	·04	·04	·05	·05	·04	·04	·14	·05	·05			·08	·06	·09	·08	..	·07
21	..	·01	·03	·03	·02	·01	·01	·01	·01	·01	·01	·01	·01	·01	·01	..	·01	..			..	·01	·02	·02	·04	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	·01	..			..	..	..	..	..	..
23	..	·01	·02	..	..	..	..	..	..	·01	..	..	..	·01	·01	..	·01	..			..	..	·01	..	..	..
24	·16	·18	·17	·17	·16	·18	·17	·15	·21	·19	·21	·20	·20	·17	·15	·15	·14	·17			·17	·15	·16	·19	·13	·27
25	..	..	·01	..	..	..	·01	..	..	..	..	·01	..	..	..	..	..	..			·01	..	·01	..	..	..
26	·04	·09	·04	·03	·05	·06	·07	·04	·06	·07	·07	·06	..	·07	·07	·10	·10	·08			·10	·10	·07	·06	·05	·06
27	·09	·08	·06	·05	·05	·04	·04	·03	·04	·04	·04	·03	·08	·05	·06	·04	·07	·05			·08	·15	·07	·09	·04	·03
28	·20	·24	·18	·16	·19	·20	·20	·19	·23	·21	·22	·20	·18	·20	·24	·25	·23	·25			·22	·17	·26	·20	·12	·21
29	·03	·02	·01	·01	..	..	·05	..	..	..	..	·01	..	·01	·01	..	·01	..			..	..	..	..	·01	..
30	..	·01	·01	·01	·02	·01	·01	..	·02	·01	·02	·01	·01	·02	·02	..	·02	..			·02	·03	·03	·03	..	·02
*	1·96	2·52	1·77	1·82	2·04	2·12	2·19	2·07	2·38	2·26	2·25	2·26	2·12	2·00	2·29	2·54	2·65	2·80			2·33	2·42	2·84	2·45	1·24	2·11
†	20·31	25·89	22·58	21·10	23·19	22·74	21·63	18·97	24·64	22·64	22·94	23·39	22·18	20·53	22·01	24·15	24·18	23·39			22·90	21·81	22·10	20·31	15·15	21·43

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for November is 2·37 in.* **November, 1900.**

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·12	·09	·15	·08		·13	·16	·08	·07	·10
2	·01	..	·01	..	..		..	..	·01	..	..
3	·03	..	·01	·02	..		..	..	..	..	..
4	..	·03	·03	..	·02		·02	·01	..	·03	·01
5	·03	·02	·03	..	·02		·03	·03	·02	·06	·01
6	·18	·14	·15	·06	·11		·13	·12	·23	·20	·14
7	·23	·13	·24	·25	·13		·17	·13	·14	·13	·16
8	·04	·06	·05	·04	·01		·02	·01	·03	·01	·02
9	..	..	..	..	..		..	..	..	..	..
10	..	..	..	..	..		..	..	..	..	..
11	..	·01	..	..	·01		·02	..	·03	..	·02
12	·10	·10	·10	·09	·07		·10	·10	·03	·12	·12
13	·07	·08	·07	·07	·14		·14	·10	·11	·10	·11
14	·05	·04	·06	·05	·05		·06	·06	·08	·06	·07
15	·22	·19	·21	·09	·09	RECORD CEASED.	·09	·05	·16	·12	·11
16	·39	·39	·41	·47	·25		·35	·42	·27	·27	·32
17	·06	·09	·07	·08	·03		·06	·03	·03	·02	·05
18	..	..	·01	..	..		·01	..	..	..	..
19	·03	·06	·02	·02	..		·01	..	..	..	..
20	·08	·07	·06	·05	·03		·04	·02	·01	..	·03
21	..	..	·01	..	..		·02	·01	..	·02	..
22	..	..	..	..	..		..	..	..	..	..
23	..	..	..	..	·01		·01	..	..	..	..
24	·26	·20	·27	·20	·22		·23	·23	·32	·22	·22
25	..	..	..	..	..		·01	..	..	..	..
26	·05	·07	·06	..	·01		·03	·02	·04	·04	·03
27	·02	·03	·03	·05	·04		·06	·10	·06	·04	·06
28	·19	·19	·19	·17	·15		·19	·15	·18	·16	·14
29	..	..	..	·02	..		·01	·01	·02	..	·01
30	·02	·03	·02	·01	·01		·02	·01	·01	..	..
*	2·16	2·05	2·20	1·89	1·48		1·96	1·77	1·86	1·67	1·73
†	21·03	21·15	20·86	19·17	16·97		20·56	16·62	20·01	19·84	19·62

Day of Mo.	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·10	·07	·10	·09	·07	·08	·06	·05	·06	·21	·15	·03	·06	·04	·03
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	..	·01	·02	..	·02	..	·03	·01	..	·01	..	..	..	..	..
4	·01	·04	·05	·05	·04	·05	·02	·03	·04	·01	·02	·04	·03	·04	·04
5	·02	·04	·03	·02	·02	·02	·03	·02	·05	·02	·02	·03	·04	·02	·01
6	·15	·12	·13	·13	·15	·17	·27	·27	·24	·42	·43	·11	·18	·13	·25
7	·16	·17	·16	·15	·18	·22	·19	·18	·20	·15	·14	·22	·16	·17	·14
8	·01	·01	·01	·02	·02	·02	·02	·02	·05	·03	·03	·03	·01	·01	..
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	·02	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
12	·13	·13	·10	·09	·11	·08	·12	·11	·11	·10	·09	·10	·12	·10	·08
13	·10	·10	·13	·14	·15	·11	·11	·15	·07	·08	·07	·09	·18	·16	·16
14	·07	·07	·07	·10	·05	·04	·06	·10	·10	·07	·08	·08	·09	·08	·03
15	·08	·07	·06	·10	·10	·10	·06	·07	·16	·16	·15	·08	·05	·04	·08
16	·42	·28	·31	·32	·37	·42	·38	·33	·32	·33	·33	·32	·28	·22	·27
17	·04	·06	·04	·05	·06	·07	·09	·08	·07	·01	·03	·05	·09	·09	·03
18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	..	..	..	·01	·01	..	·02	·01	·06	·06	·02	..	·01	·01	..
20	·02	·02	·04	·06	·05	·05	·05	·04	·08	·11	·09	·06	·06	·07	·06
21	..	..	·01	·01	·01	·01	..	·01	·02	·03	·02	·02	·02	·01	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	·26	·26	·27	·30	·30	·30	·31	·29	·31	·22	·27	·27	·27	·26	·27
25	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..
26	·06	·02	·02	·02	·03	·02	·03	·02	·07	·07	·07	·03	·02	·02	..
27	·07	·09	·05	·04	·03	·03	·02	·02	·05	·02	·03	·02	·03	·03	·04
28	·16	·17	·18	·17	·18	·20	·20	·17	·23	·23	·21	·27	·27	·21	·15
29	·01	·01	·01	·01	·01	·01	..	·01	..	..	..	..	..	..	..
30	..	·01	·02	·02	·01	·02	..	·01	·04	..	·02	·01	·02	·02	·01
*	1·89	1·75	1·81	1·90	1·97	2·02	2·07	2·02	2·33	2·34	2·27	1·86	1·99	1·73	1·65
†	21·38	18·40	20·01	20·85	22·01	20·92	20·11	18·86	21·19	18·63	18·49	18·26	20·05	16·94	16·95

* The figures in this row give the totals for the month. † The totals from January 1st.

November, 1900.

Day of Mo.	Brixton	Battersea	Worcester Park	Richmond
	IN.	IN.	IN.	IN.
1	·21	·05	·07	·08
2	..	..	..	..
3	..	..	..	..
4	·04	·04	..	·03
5	·01	·03	·02	·06
6	·15	·10	·13	·16
7	·19	·10	·19	·14
8	·01	..	·01	·01
9	..	..	..	..
10	..	..	..	..
11	..	..	·01	..
12	·11	·07	·10	·14
13	·15	·07	·14	·08
14	·07	·08	·09	·07
15	·05	·02	·13	·06
16	·36	·20	·42	·27
17	·05	·02	·06	·05
18	..	..	..	..
19	..	..	..	..
20	·04	..	·05	..
21	..	..	..	·02
22	..	..	..	..
23	..	..	..	..
24	·28	·20	·21	·29
25	..	..	..	..
26	·01	·01	·02	·02
27	·01	·03	·08	·08
28	·21	·15	·19	·17
29	..	·01	..	·02
30	..	..	·01	·01
*	1·95	1·18	1·93	1·76
†	19·93	14·52	19·75	18·87

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

Note.—New Gauges.

Warlingham, Surrey.	Observer,	H. Rogers.	Height above sea-level,	614 ft.
Worcester Park, ,,	,,	F. D. Outram	,, ,, ,,	120 ft.
Richmond, ,,	,,	J. H. Brierley	,, ,, ,,	109 ft.

NOTES.

(November, 1900.)

The month has been cloudy, wet, and very warm, but the amount of rain has been small. It has been an unhealthy month, scarlet fever, measles, and whooping cough being prevalent throughout the district. The absence of frost has been remarkable, and Mr. Mennell, of Park Hill, Croydon, writes that on November 4th he counted seventy good species of plants in full flower in his garden, all in splendid condition; and on the 18th, after the severe frost of the 11th, there were still forty-two plants in flower, but that the quality of the blooms was much impaired. The observer at Nutfield remarks on the prevalence of fog at that place, which is noteworthy, as there was comparatively none elsewhere. At Upper Gatton a lunar halo was seen on the 10th, and a solar one, with mock suns, on the 22nd; and at Nutfield solar haloes were seen on the 17th and 27th. The rainfall is about a quarter of an inch below the average. The mean temperature of the month is nearly 3° above the average, and was at Croydon (Whitgift) 46·3°, at Croydon (Duppas House) and Wallington 46·2°, at Worcester Park 46°, at Waddon 45·8°, at Chipstead 44·7°, and at Warlingham 44·1°. Hail fell at Croydon and Wallington on the 15th. There were recorded at Wallington 41·7 hours of sunlight, which is three per cent. above the November average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1900.**

Day of Mo.	Abinger (The Hall)	Abinger (Rectory)	Dorking (Denbies)	Redhill	Nutfield (old gauge)	Nutfield (newgauge)	Buckland	ReigateHill	Upper Gatton	Merstham	Harp's Oak Cottage	Chipstead	Chaldon	Caterham	Westerham (Hill Est.)	Westerham (Town)	Knockholt (field gau.)	Knockholt (tower ga.)	Sevenoaks	Warling-ham	Kenley	Sander-stead	Purley	Burgh Heath	Leather-head	D'Abernon Chase
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·04	·05	·04	·02	·02	·02	·02	·02	·01	·01	·01	·02	·21	·04	..	..			·01	·02	·04	·04			·03	·03
2	·02	·01	·02	..	..	..	·01	·01	..	..	..	..	·05	·22	..	..			·01	..	·01	·01			·01	..
3	·08	·11	·08	·08	·06	·08	·10	·06	·10	·08	·09	·09	..	·11	·13	·07			·09	·11	·10	·08			·07	·05
4	·18	·15	·15	·17	·19	·18	·15	·16	·18	·18	·18	·15	·25	·20	·20	·24			·20	·16	·15	·13			·11	·16
5	·34	·35	·46	·49	·47	·50	·44	·49	·41	·46	·41	·40	·60	·41	·52	·53			·42	·39	·38	·36			·37	·32
6	·15	·17	·16	·19	·22	·22	·18	·17	·17	·22	·19	·19	..	·20	·21	·26			·33	·16	·14	·12			·10	·09
7	·01	..	..	..	..	..	..	·01	..	..	..	..	..	·02	·01	..			·02	..	·01	·02			..	..
8	·07	·14	·06	·03	·01	·01	·03	·02	·08	·04	·05	·05	·03	·05	·05	·06			·03	·06	·04	·03			·02	..
9	·01	·02	·02	·02	..	..	·01	·01	·02	·01	·01	·02	·03	·04	·01	..			·01	..	..	..			·01	..
10	..	·01	..	..	·01	·01	..	..	..	..	..	..	..	..	..	..			..	..	..	..			..	..
11	..	..	..	·02	·02	·03	·01	·01	·01	·02	·02	..	..	·02	..	..			·01	..	..	..			..	..
12	·13	·22	·15	·15	·12	·12	·14	·13	·20	·15	·17	·18	·28	·21	·23	·20			·22	·21	·11	·09			·15	·04
13	·20	·16	·19	·15	·18	·20	·15	·16	·16	·16	·14	·15	·08	·18	·22	·15			·09	·15	·12	·10			·17	·12
14	..	..	..	..	..	..	..	·01	..	..	·01	..	..	·02	..	..			..	..	..	..			..	·01
15	·04	·06	·05	·03	·04	·03	·05	·02	·04	·04	·04	·03	·05	·08	..	..			·04	·05	·02	·02			·01	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	·22	·17	..	..	MONTHLY GAUGE.	MONTHLY GAUGE.	..	..	..	..	RECORD CEASED.	MONTHLY GAUGE.	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	·07	·02	..	..			..	..	..	..			..	..
18	·35	·39	·36	·19	·14	·14	·14	·21	·31	·20	·26	·41	·06	·29	·14	·14			·09	·30	·39	·34			·30	·19
19	·01	..	..	..	..	..	..	·01	..	..	..	..	·04	..	..	..			·01	..	·01	..			..	..
20	·29	·32	·29	·31	·26	·32	·31	·32	·31	·31	·30	·28	·16	·32	·39	·31			·28	·27	·20	·15			·19	·12
21	·06	·09	·05	·03	·05	·05	·03	·04	·03	·03	·03	·03	·10	·05	·04	·04			·03	·04	·05	·06			·05	·04
22	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..			..	..	·01	..			..	..
23	..	·01	·12	·01	·01	·01	·02	..	..	..	·01	..	..	..	..	..			·01	..	·01	·02			..	..
24	·03	·02	·03	·02	·03	·05	·04	·03	·04	·03	..	·03	..	·04	·07	·03			·05	·04	..	·02			·02	·03
25	·05	·08	·06	·06	·05	·06	·05	·05	·06	·07	·09	·06	·08	·08	·08	·09			·05	·07	·06	·03			·06	·04
26	·28	·28	·35	·29	·28	·30	·32	·28	·36	·30	·32	·37	·34	·30	·35	·34			·42	·33	·35	·34			·29	·24
27	·18	·23	·20	·18	·08	·11	·10	·19	·16	·13	·18	·17	·14	·17	·14	·08			·13	·12	·14	·13			·17	·08
28	·05	·07	·08	·06	·05	·05	·06	·06	·06	·07	·08	·07	·08	·09	·07	..			·10	·08	·08	·06			·04	·06
29	..	..	..	·01	·01	·01	..	..	..	..	·01	..	..	..	..	..			·01	..	..	..			..	..
30	·89	·94	·88	·73	·66	·75	·67	·71	·74	·79	·79	·88	·85	·88	·78	·60			·78	·88	·83	·78			·80	·65
31	·07	·05	·10	·05	·03	·01	·04	·05	·05	·03	·05	·04	·02	·08	·04	·01			·02	..	·03	·01			·05	·04
*	3·53	4·03	3·90	3·29	3·00	3·26	3·07	3·23	3·50	3·33	3·44	3·62	3·74	4·29	3·68	3·15	3·95	2·52	3·46	3·44	3·28	2·92		..	3·02	2·32
†	32·13	32·05	30·89	28·85	26·98	28·31	26·00	28·20	31·49	28·70	29·39	31·32	28·65	32·50	31·17	26·11	28·43	21·37	28·18	..	28·51	25·09		..	26·87	24·49

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* **December, 1900.**

Day of Mo.	Oxshott	Banstead	Sutton	Carshalton	Wallington	Bedding-ton	Waddon	Croydon (Brim. Bn.)	Croydon (Wn.N.rd.)	Croydon (Dup. H.)	Croydon (Whitgift)	Croydon (Wob. rd.)	Croydon (Wdml.rd.)
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·03	·02	·04	·03	·05	·06	·06	·06	·06	·07	·05	·05	·05
2	..	..	..	..	..	..	..	..	..	·01	..	·01	..
3	·05	·08	·06	·04	·05	·06	·05	·03	·05	·05	·05	·05	·06
4	·10	·14	·11	·11	·10	·11	·11	·10	·12	·11	·12	·11	·12
5	·38	·37	·36	·39	·36	·37	·38	·36	·44	·36	·38	·41	·38
6	·05	·17	·12	·11	·11	·11	·11	·10	·12	·11	·11	·11	·10
7	..	·01	·01	·01	..	·01	·02	·02	·04	·03	·01	·01	..
8	·01	·03	..	..	..	·01	·01	..	·01	·01	·01	·01	..
9	·01	·01	·01	..	..	..	..	·01	..	·01	·01	..	..
10	..	·01	..	..	..	..	..	..	..	·01	..	..	..
11	..	·01	..	..	..	..	·01	..	..	..	..	..	..
12	·03	·08	·04	·02	·04	·06	·05	·04	·05	·05	·05	·05	·05
13	·15	·13	·10	·10	·10	·11	·12	·10	·12	·11	·12	·12	·10
14	..	·01	·01	..	..	..	..	..	..	..	..	·01	..
15	·01	·01	·02	·02	·01	·02	·02	..	·02	·01	·02	·02	·01
16	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..	..	..	..	..	..	..	..	..
18	·17	·36	·27	·24	·29	·31	·32	·30	·37	·31	·32	·32	·28
19	..	·01	·01	·01	..	..	·01	..	·01	·01	·01	..	..
20	·13	·21	·14	·10	·13	·14	·12	·10	·12	·13	·14	·13	·12
21	·03	·04	·06	·05	·06	·05	·05	·03	·05	·04	·05	·04	·04
22	..	·01	..	..	·01	..	·01	..	·01	·01	·01	·01	..
23	..	·01	·03	·02	..	·01	·01	..	..	·01	·01	..	..
24	·03	·01	·01	..	·01	·01	·01	..	·02	·01	·01	·01	..
25	·03	·04	·01	..	·01	·02	·02	·03	·02	·03	·03	·02	..
26	·21	·33	·24	·21	·28	·28	·30	·31	·35	·29	·27	·26	·30
27	·10	·18	·10	·07	·11	·11	·12	·08	·12	·12	·15	·11	·11
28	·05	·07	·06	·06	·06	·07	·06	·06	·08	·05	·07	·08	·07
29	..	..	..	..	..	..	..	..	..	..	·01	..	..
30	·52	·79	·64	·55	·71	·70	·67	·42	·78	·65	·68	·60	·64
31	·05	·06	·06	·05	·05	·03	·03	·03	·01	·02	·01	·06	..
*	2·14	3·20	2·51	2·19	2·54	2·65	2·67	2·18	2·97	2·62	2·70	2·60	2·43
†	22·45	29·09	25·09	23·29	25·73	25·39	24·30	21·15	27·61	25·26	25·64	25·99	24·61

Day of Mo.	Croydon (Park Hill)	Addington Hills	Addington (Park Fm.)	Addington (Pump. St.)	W. Wickhm. (Wick. Ct.)	Hayes Common	Keston (Bradfield)	Farn-borough	Orpington	Farning-ham Hill	Southfleet	Chislehurst	Bickley
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·04	·06	·04	·05			·03	·03	·04	·04	..	·04
2	..	..	..	·01	..			·01	..	..	..	..	..
3	·05	·06	·09	·10	·05			·06	·07	·07	·06	·04	·06
4	·12	·13	·13	·14	·13			·14	·13	·10	·10	·11	·13
5	·36	·36	·40	·38	·42			·38	·37	·36	·32	·09	·47
6	·10	·11	·13	·12	·15			·18	·18	·20	·16	·09	·17
7	·01	·02	·01	·03	·02			·03	..	·01	..	..	·02
8	·01	·02	·02	·02	·01			·01	·03	·01	..	..	..
9	·01	·01	..	·01	..			..	..	..	..	..	..
10	..	..	..	..	..			..	..	..	..	..	..
11	..	..	..	..	..			..	..	..	..	..	..
12	·05	·06	·05	·11	·07			·08	·09	·07	·03	·04	·05
13	·10	·11	·12	·12	·10			·09	·09	·09	·04	·08	·09
14	..	..	·01	..	..			·01	..	..	..	..	..
15	·02	·02	·03	·03	·01	RECORD CEASED.	RECORD CEASED.	·01	..	·01	..	..	·02
16	..	..	..	..	..			..	..	..	..	..	..
17	..	..	..	..	..			..	..	..	..	..	..
18	·28	·31	·35	·35	·35			·27	·26	·21	·17	·15	·32
19	..	·01	..	..	..			..	..	·02	..	..	..
20	·14	·16	·18	·19	·16			·14	·21	·23	·12	·10	·14
21	·04	·04	·05	·04	·04			·04	·03	·05	·03	·03	·04
22	·01	·01	..	..	..			·01	..	·02	..	..	..
23	·01	·01	..	·02	..			..	..	..	..	..	..
24	·01	·02	·03	·02	·01			·01	·01	·01	·01	..	·02
25	·01	·03	·04	·04	·02			·01	·03	·04	·02	·01	·01
26	·26	·31	·27	·32	·36			·38	·38	·35	·25	·14	·24
27	·06	·10	·15	·11	·09			·12	·11	·11	·04	·03	·07
28	·08	·07	·08	·08	·07			·07	·06	·05	·01	·04	·08
29	..	..	..	..	..			..	..	..	·02	..	..
30	·57	·69	·71	·79	·80			·77	·67	·66	·62	·12	·61
31	·01	·01	·03	·01	·02			·01	·01	·02	..	..	·01
*	2·36	2·71	2·94	3·08	2·93			2·86	2·76	2·73	2·04	1·07	2·59
†	22·89	24·72	27·09	27·26	26·32			25·76	24·57	24·83	22·35	16·22	24·02

* The figures in this row give the totals for the month. † The totals from January 1st.

Daily Rainfall. *The 80 years (1816–95) mean at Greenwich for December is 1·94 in.* December, 1900.

Day of Mo.	Bromley	Bromley Common	Beckenham	South Norwood	Wimbledon (Sew. Wks.)	Wimbledon (Mt. Ararat)	Raynes Park	New Malden	Esher	West Molesey	Surbiton	Kingston	Putney Heath	Wandswth. Common	Streatham	West Norwood	Upper Norwood	Forest Hill (Dartm.rd.)	Forest Hill (S&VWC)	Sidcup	Wilming-ton	Dartford	Eltham	Greenwich	Deptford	Nunhead
	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.
1	·05	·04	·04	·04	·03		·04	·04	·04	·05	·04	·05	·05	·04	·04	·05	·04	·02	·03	·04	·05	·03	·05	·04	·03	·02
2	·01	..	·01	..	..		·01	..	..	·02	..	..	..	..	·01	·01	·01	..	·01	..	·02	..	..	..	..	..
3	·06	·06	·06	·05	·03		·05	·03	·06	·06	·05	·05	·05	·05	·04	·06	·04	·09	·06	·08	·05	·05	·07	·09	·07	·07
4	·13	·13	·13	·13	·09		·10	·08	·10	·08	·09	·09	·14	·13	·17	·13	·12	·04	·18	·11	·09	·02	·11	·12	·10	·17
5	·40	·37	·41	·35	·38		·41	·40	·40	·42	·36	·45	·41	·45	·34	·42	·40	·52	·38	·43	·37	·43	·41	·43	·39	·40
6	·17	·12	·16	·11	·08		·11	·10	·07	·08	·11	·10	·08	·09	·10	·11	·13	·12	·20	·14	·18	·21	·14	·11	·16	·16
7	·03	·03	·02	·02	·01		·01	..	..	..	..	..	·01	..	·02	·01	·02	·05	·03	·01	·01	..	·01	·01	·01	·02
8	·01	·02	..	..	..		·01	..	·01	..	..	..	..	..	·01	..	..	·02	·01	..	..	..	·01	·01	..	·02
9	..	..	..	..	·01		·02	..	·02	..	·01	·10	·01	·01	·02	·01	·02	..	·02	..	..	..	·01	·01	·01	..
10	..	..	..	..	..		..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	..	..	..	..	..		·01	..	..	..	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
12	·05	..	·05	·05	·02		·04	·01	·06	·05	·05	·06	·05	·04	·04	·04	·03	·03	·03	·07	·06	·03	·05	·05	·04	..
13	·10	·13	·13	·01	·16		·18	·20	·23	·19	·20	·24	·22	·21	·13	·13	·13	·14	·14	·08	·04	·04	·07	·15	·14	·11
14	..	..	..	..	..		..	·01	..	·01	..	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..
15	·01	·02	·01	·10	·01		·01	..	·01	..	·01	..	..	..	·01	·01	·01	·03	·02	·02	..	..	·02	·01	·01	..
16	..	..	..	..	..	RECORD CEASED.	..	..	..	·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	..	..	..	..	..		..	..	..	..	..	..	..	..	·01	..	..	..	·01	..	..	..	..	..	..	..
18	·33	·30	·31	·35	·16		·16	·16	·18	·23	·17	·21	·22	·17	·17	·21	·24	·23	·20	·34	·27	·34	·33	·17	·17	·15
19	..	·02	..	·01	..		·01	..	·02	..	..	..	..	..	..	..	·01	..	·01	·02	..	..	..	..	..	..
20	·14	·13	·13	..	·08		·11	·07	·15	·14	·12	·13	·10	·11	·12	·13	·08	·11	·11	·12	·11	·08	·10	·11	·11	·06
21	·04	·04	·05	·13	·06		·05	·03	·05	·05	·02	·05	·08	·09	·06	·05	·06	·07	·09	·07	·04	·06	·05	·10	·10	·07
22	..	..	..	..	·01		·01	..	..	..	..	..	·01	..	·01	·01	..	..	·01	..	·02	·02	·01	·01	..	..
23	·01	..	..	·01	·01		·01	..	·02	·01	..	..	·01	..	·01	·01	..	..	·01	·02	·01	..	·01	·01	..	..
24	..	..	·01	·01	·01		·01	·02	·01	..	·01	..	..	·01	·01	..	·02	·02	·01	..	..	..	·01	..	·01	..
25	·02	·04	·01	..	·01		·03	..	·03	·01	·02	·04	·04	·03	·02	·02	·01	..	·01	·01	·01	..	·01	·01	·01	..
26	·23	·27	·23	·22	·10		·15	·05	·18	·22	·05	·20	·16	·14	·15	·17	·13	·02	·16	·22	·23	·20	·15	·15	·15	·12
27	·06	·08	·06	·06	·04		·07	·16	·09	·10	·07	..	·07	·08	·08	·08	·05	·19	·06	·08	·07	·04	·05	·06	·05	·04
28	·08	·06	·08	·08	·07		·07	·03	·06	·06	·05	·14	·08	·07	·09	·09	·09	·09	·09	·09	·07	·07	·07	·09	·08	·04
29	..	..	·01	..	..		..	..	·01	..	..	..	·01	·01	·01	·01	..	..	..	..	..	..	..	..	·01	..
30	·62	·63	·60	·47	·35		·44	·47	·53	·52	·55	·61	·54	·47	·40	·51	·46	·49	·46	·55	·59	·55	·46	·51	·46	·47
31	·01	·01	..	..	·02		·04	·05	·02	·01	·04	·04	·04	·05	..	·05	·03	·04	·02	·01	..	·01	·01	·02	·02	·03
*	2·56	2·50	2·51	2·20	1·74		2·16	1·91	2·36	2·32	2·02	2·56	2·38	2·25	2·09	2·32	2·13	2·32	2·36	2·51	2·29	2·18	2·21	2·27	2·13	1·95
†	23·59	23·65	23·37	21·37	18·71		22·72	18·53	22·37	22·16	21·64	23·94	20·78	22·26	22·94	24·33	23·05	22·43	21·22	23·70	20·92	20·67	20·47	22·32	19·07	18·90

* The figures in this row give the totals for the month. † The totals from January 1st.

December, 1900.

Day of Mo.	Brixton	Battersea	Worcester Park	Richmond
	IN.	IN.	IN.	IN.
1	·02	·01	·03	·06
2	..	..	..	..
3	·05	·03	·04	·05
4	·12	·08	·10	·11
5	·43	·35	·38	·48
6	·11	·11	·12	·06
7	·02	·03	..	..
8	..	..	..	..
9	..	..	..	..
10	..	..	..	..
11	..	..	..	..
12	·05	·01	·04	·05
13	·20	·18	·13	·14
14	..	..	..	..
15	..	..	·01	..
16	..	..	..	..
17	..	..	..	..
18	·16	·20	·17	·22
19	..	..	..	..
20	·11	·05	·13	·11
21	·08	·07	..	·08
22	..	..	·01	..
23	..	·01	..	..
24	·01	..	·01	..
25	·02	·01	·02	·04
26	·14	·11	·16	·19
27	·08	·04	·06	·06
28	·10	·06	·05	·06
29	..	..	..	..
30	·51	·46	·46	·58
31	·03	·01	·04	..
*	2·24	1·82	1·96	2·29
†	22·17	16·34	21·71	21·16

Note.—The observations are taken at 9 a.m., except at Redhill, Reigate Hill, Addington (Park Farm), and Brixton (8 a.m.), Croydon (Woburn Road) (8.30 a.m.), and Sevenoaks (10 a.m.).

Note.—New Gauges.

Warlingham, Surrey.	Observer, H. Rogers.	Height above sea-level,	614 ft.
Worcester Park, ,,	,, F. D. Outram	,, ,, ,,	120 ft.
Richmond, ,,	,, J. H. Brierley	,, ,, ,,	109 ft.

NOTES.

(December, 1900.)

The month has been exceedingly warm, and it would seem as if it was the warmest December for more than thirty years, though December, 1898, very closely approaches, if it does not in some parts exceed it. It has been very unhealthy, owing mainly to the damp warm weather, and rheumatic affections have been prevalent. Owing to the warmth many species of flowers are in blossom, and at Croydon (Park Hill) the observer had twenty-five species in blossom at the end of the month in his garden; at Abinger Hall there were several kinds of alpine plants and some primroses out; and at Sanderstead cornflowers and chrysanthemums and an occasional rosebud (full, but not expanding) were out during the month. Solar haloes were seen on the 22nd at Upper Gatton, Beddington, and Croydon, and on the 26th at Upper Gatton; and a lunar halo was seen at Upper Gatton on the 27th. The rainfall of the month is rather more than a quarter of an inch above the average. The mean temperature of the month is nearly 6° above the average, and was at Croydon (Whitgift) 45·4°, at Wallington 45·2°, at Croydon (Duppas House) 45·1°, at Worcester Park 44·8°, at Waddon 44·5°, at Chipstead 41·5°, and at Warlingham 41·1°. There were recorded at Wallington 37·4 hours of sunlight, which is the December average of the ten years 1886–95.

F. Campbell-Bayard, F.R.Met.Soc., *Hon. Sec.*

APPENDIX II.

Falls of 1·00 in. and upwards.

January 6th. — Dorking (Denbies) 1·30 in.; Abinger (The Hall) 1·20 in.; Abinger (Rectory) 1·09 in.

February 2nd. — Sanderstead 1·36 in.; Croydon (Waddon New Road) 1·09 in.; Chipstead 1·04 in.; Caterham 1·02 in.; Streatham and West Norwood 1·01 in.

February 13th.—Upper Gatton 1·04 in.

February 15th.—Morden 2·25 in.; Abinger (The Hall) 1·52 in.; Dorking (Denbies) 1·39 in.; Abinger (Rectory) 1·35 in.; D'Abernon Chase 1·30 in.; Warlingham 1·24 in.; Leatherhead 1·22 in.; Chipstead 1·21 in.; Banstead 1·16 in.; Addington (Park Farm) 1·15 in.; Croydon (Waddon New Road) 1·08 in.; Croydon (Whitgift) 1·06 in.; Caterham, Westerham (Hill Estate), and Kenley 1·04 in.; Croydon (Woburn Road) 1·03 in.; Upper Gatton 1·01 in.; Beddington 1·00 in.

August 17th. — Streatham 1·89 in.; Clapham Park 1·50 in.; Wallington 1·10 in.

August 20th.—Chevening Park 1·09 in.

APPENDIX III.

Mean Monthly and Annual Rainfall for the Ten Years 1891–1900.

Stations.	Height of Gauge Above Sea.	Height of Gauge Above Ground.		Diam. of Gauge.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
	Ft.	Ft.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Knockholt	785	1	0	5	2·35	1·88	2·15	1·51	1·57	2·34	2·25	2·73	2·16	3·63	3·45	2·99	29·01
Dorking	610	1	0	5	2·51	2·18	2·14	1·40	1·62	1·78	2·47	2·65	2·32	3·83	3·57	3·55	30·02
Caterham	610	1	0	5	2·65	2·11	2·10	1·53	1·59	2·17	2·69	2·65	2·36	3·84	3·69	3·49	30·87
Banstead	488	1	0	8	2·15	2·07	1·94	1·39	1·53	1·80	2·19	2·56	2·26	3·57	3·32	3·07	27·85
Addington Hills	473	0	9½	8	1·83	1·80	1·71	1·19	1·55	1·95	2·15	2·40	2·10	3·52	2·98	2·65	25·83
Nutfield	468	1	2	8	2·20	1·82	1·74	1·43	1·41	2·13	2·40	2·53	2·18	3·46	3·22	2·61	27·13
Reigate Hill	440	1	0	5	2·31	1·93	1·90	1·38	1·45	1·95	2·62	2·34	2·26	3·44	3·37	2·95	27·90
Sevenoaks	380	1	10	5	2·55	2·01	2·00	1·52	1·48	2·43	2·55	2·37	2·43	3·84	3·43	2·98	29·59
Keston	350	1	0	5	1·77	1·77	1·72	1·19	1·43	1·93	2·14	2·22	2·05	3·43	2·97	2·49	25·11
Forest Hill (S. & V. W. Co.)	344	1	0	5	1·62	1·43	1·40	1·13	1·43	1·65	2·10	2·31	1·81	3·03	2·36	2·18	22·45
Addington (Pumping Stn.)...	331	0	9½	8	2·03	1·89	1·81	1·30	1·55	2·10	2·23	2·41	2·13	3·53	3·19	2·90	27·07
Abinger (The Hall)...........	320	2	0	8	2·44	2·23	2·14	1·48	1·56	1·96	2·50	2·85	2·39	3·90	3·67	3·36	30·48
Farningham Hill..............	300	3	0	5	1·75	1·69	1·76	1·28	1·43	2·04	2·11	2·11	2·08	3·24	2·85	2·40	24·74
Redhill	300	1	0	5	2·42	1·97	1·95	1·38	1·44	2·01	2·57	2·60	2·21	3·55	3·50	3·02	28·62
Hayes Common	296	1	5	5	1·92	1·80	1·80	1·33	1·48	1·93	2·12	2·26	2·09	3·40	3·00	2·69	25·82
Bickley	295	1	2	5	1·75	1·75	1·76	1·28	1·39	2·02	1·98	2·28	1·79	3·36	2·83	2·46	24·65
D'Abernon Chase	280	1	0	5	1·89	1·69	1·66	1·20	1·60	1·67	2·12	2·56	2·05	3·35	2·89	2·51	25·19
Addington Park	268	1	0	5	2·06	1·99	1·96	1·32	1·64	2·11	2·23	2·38	2·27	3·63	3·17	2·90	27·66
Leatherhead.....................	250	1	0	5	1·81	1·91	1·72	1·14	1·44	1·73	2·10	2·12	1·98	3·45	3·02	2·81	25·23
Sutton	230	5	6	5	1·92	1·78	1·68	1·17	1·45	1·78	2·06	2·34	2·07	3·25	2·81	2·56	24·87
Forest Hill (Newfield House)	220	1	0	5	1·64	1·59	1·52	1·19	1·51	1·70	2·19	2·35	1·84	3·11	2·42	2·11	23·17
Orpington.....................	220	1	0	5	1·76	1·72	1·71	1·16	1·31	2·00	2·09	2·18	1·96	3·32	2·94	2·47	24·62
West Norwood	220	1	0	8	1·69	1·68	1·58	1·23	1·42	1·75	2·21	2·48	1·85	3·13	2·52	2·27	23·81
Oxshott.....................	212	1	0	5	1·72	1·61	1·51	1·09	1·44	1·60	1·96	2·50	1·97	3·12	2·62	2·25	23·39

Mean Monthly and Annual Rainfall for the Ten Years 1891–1900 (*contd.*).

Stations.	Height of Gauge Above Sea.	Height of Gauge Above Ground.		Diam. of Gauge.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
	Ft.	Ft.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Croydon (Whitgift)............	191	1	0	5	1·90	1·85	1·88	1·25	1·46	1·76	2·21	2·33	2·04	3·33	2·86	2·53	25·40
Beckenham	184	1	0	5	1·69	1·59	1·56	1·19	1·36	1·78	1·85	2·07	1·73	3·03	2·60	2·29	22·74
Nunhead	176	4	0	5	1·24	1·21	1·11	0·95	1·14	1·35	1·78	2·05	1·53	2·52	2·02	1·79	18·64
Sidcup	160	1	2	5	1·66	1·71	1·57	1·25	1·42	1·99	1·92	2·26	1·75	3·40	2·54	2·31	23·78
Croydon (Duppas House) ...	158	1	0	8	1·82	1·78	1·69	1·18	1·47	1·74	2·13	2·35	1·97	3·26	2·81	2·50	24·70
Wimbledon Hill (Mt. Ararat)	157	3	0	12	1·69	1·58	1·45	1·13	1·41	1·73	2·13	2·55	1·98	3·24	2·56	2·15	23·60
Waddon	156	1	0	5	1·70	1·64	1·60	1·15	1·42	1·73	2·16	2·27	1·93	3·14	2·72	2·44	23·90
Greenwich	155	0	5	8	1·62	1·54	1·50	1·19	1·43	1·58	2·05	2·22	1·74	2·94	2·24	2·16	22·21
Croydon (Waddon New Road)	146	1	0	5	1·76	1·79	1·65	1·16	1·42	1·72	2·16	2·31	1·96	3·21	2·74	2·47	24·35
Wallington	140	4	1	5	1·80	1·71	1·71	1·25	1·45	1·71	2·08	2·40	1·93	3·29	2·83	2·54	24·70
Croydon (Brimstone Barn)...	130	1	0	5	1·56	1·54	1·53	1·13	1·34	1·65	2·17	2·23	1·84	2·94	2·65	2·21	22·79
South Norwood	125	1	0	5	1·60	1·60	1·50	1·13	1·34	1·77	2·12	2·23	1·76	3·03	2·54	2·15	22·77
Beddington	120	1	0	5	1·80	1·76	1·72	1·20	1·44	1·70	2·16	2·32	1·96	3·27	2·85	2·58	24·76
Richmond........................	109	1	6	8	1·77	1·58	1·51	1·25	1·43	1·67	2·06	2·53	1·82	3·09	2·37	2·26	23·34
Brixton...........................	77	1	0	8	1·74	1·58	1·49	1·17	1·28	1·49	1·99	2·53	1·88	3·04	2·43	2·23	22·85
Wimbledon (Sewage Works)	58	1	0	5	1·60	1·45	1·38	1·14	1·32	1·55	2·11	2·57	1·86	2·96	2·30	1·99	22·23
Raynes Park	47	1	0	5	1·92	1·75	1·76	1·28	1·48	1·85	2·22	2·72	2·14	3·27	2·70	2·41	25·50
New Malden.....................	45	1	0	5	1·44	1·30	1·28	1·05	1·20	1·63	1·96	2·22	1·99	2·84	2·20	1·94	21·05
Esher	40	1	0	5	1·59	1·45	1·32	1·07	1·37	1·89	1·89	2·27	1·75	2·79	2·24	2·09	21·72
Kingston	25	1	0	5	1·81	1·63	1·52	1·28	1·45	1·85	2·32	2·80	2·18	3·28	2·61	2·40	25·13
Surbiton	25	0	6	10	1·63	1·46	1·44	1·16	1·36	1·85	1·99	2·49	1·91	2·97	2·36	2·06	22·68
Wilmington	25	1	0	5	1·35	1·41	1·37	1·06	1·22	1·82	2·00	1·88	1·72	2·70	2·37	2·01	20·91
Battersea	21	3	6	5	1·27	1·17	1·10	0·94	0·99	1·18	1·80	1·97	1·80	2·54	1·88	1·83	18·47
Deptford	20	1	0	5	1·45	1·38	1·34	1·02	1·24	1·38	1·96	2·01	1·62	2·76	2·06	1·99	20·21

CONTENTS.

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