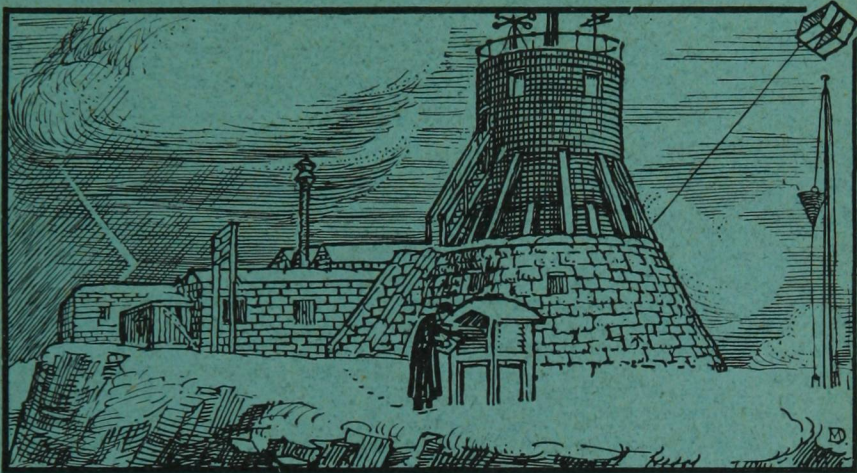


NO. 546 SYMONS'S VOL. 46
 METEOROLOGICAL
 ❄️ · MAGAZINE · ❄️
 EDITED BY HUGH ROBERT MILL



JULY, 1911.

· CONTENTS ·

	PAGE
The Disappearance of Cloud at Full Moon. By WM. ELLIS, F.R.S.	105
Fall of Temperature in Bright Weather. By A. O. WALKER	106
Weather in the Seventeenth Century, Part II.; Summer. By WALTER SEDGWICK, M.A.	107
CORRESPONDENCE:—	
Movement of Rain in Thunderstorms. By J. FAIRGRIEVE	112
Destruction of Wind Vane by Lightning. B. J. HOPKINSON	113
Drought in the East of Scotland. Col. C. McINROY, C.B.	114
Black Haze. By W. PIFFE BROWN	115
Curious Long-enduring Cloud. By W. F. DENNING, F.R.A.S.	115
Rothsay Rainfall in Spring and Summer. By A. B. M.	116
Heavy Rainfall in the North of England. By Hon. and Rev. W. ELLIS and W. F. VINT	116
Diurnal Range of Barometer in S. Nigeria. By C. A. A. BARNES	117
Balloon Ascents, Nov.—Dec., 1908. By W. H. DINES, F.R.S.	118
Royal Meteorological Society	119
High July Temperature in London	120
Meteorological News and Notes	122
Rainfall Tables for June, 1911	124
Meteorological Notes on June, 1911	127
Climatological Table for the British Empire, January, 1910	128

LONDON: EDWARD STANFORD, 12, 13 & 14, LONG ACRE, W.C.

Published on the 16th of each Month.

[Price 4d., or 5s. per Annum, Post Free.]

NOTICES.

It is requested that all Books for Review and Communications for the Editor be addressed to 62, Camden Square, London, N.W.

The responsibility for all facts and opinions expressed in the signed articles and letters published in this Magazine rests with their respective authors.

AN IMPORTANT NEW WORK.

WEATHER SCIENCE.

An Elementary Introduction to Meteorology.

By F. W. Henkel, B.A., F.R.A.S., Member of the British Astronomical Association, etc. Illustrated. Large Crown 8vo., cloth, 6s. net. (Inland postage 4d.)

This work deals in a popular yet scientific manner with weather problems and prognostics, theories of atmospheric circulation, clouds, their various forms and movements, the winds, atmospheric electricity, local and seasonal variations, etc. An account is given of the principal instruments made use of by meteorologists, and the work of a "Second Order" Observatory, as well as some reference to standard and self-recording instruments. The author also deals with the results of recent research in the upper regions of the vast atmospheric ocean. The book is illustrated by photographs of cloud forms, drawings of instruments and apparatus, maps and diagrams, views of observatories, etc.

ON SALE AT ALL BOOKSELLERS.

T. FISHER UNWIN, 1, ADELPHI TERRACE, LONDON.

DARTON'S HYGROGRAPH

(SELF-RECORDING HYGROMETER)

Showing at a glance on a revolving weekly chart the differences of temperature readings between the wet and dry bulbs, and the percentage of aqueous vapour held in suspense by the atmosphere.

The point of each pen of this instrument is set precisely on the same temperature-line and the same time-line on the chart—a great advantage over other Hygrometers.

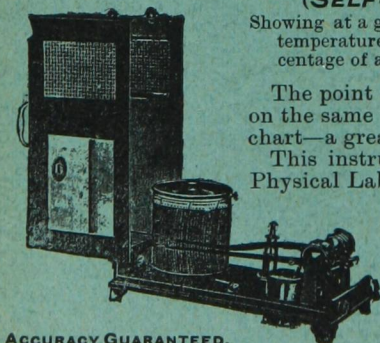
This instrument has been approved of by the National Physical Laboratory, Colonial Observatories and others.

It is compact, self-contained, without any projections liable to injury, and very portable.

Complete, with One Year's supply of Charts, 10° to 110° F., and Hygrometrical Tables,

£7 : 15 : 0

This instrument is a Thermograph as well as a Hygrometer.



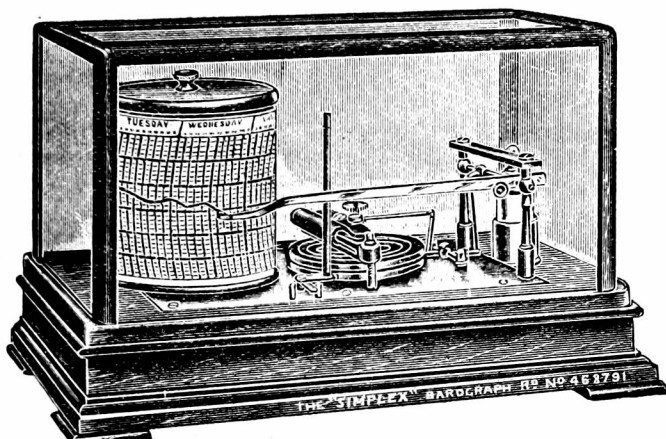
ACCURACY GUARANTEED.

Illustrated List of Standard Meteorological Instruments, post free.

F. DARTON & Co., 142, St. John Street, London, E.C.

GIFTS OF LASTING INTEREST.

ABSOLUTELY ACCURATE.

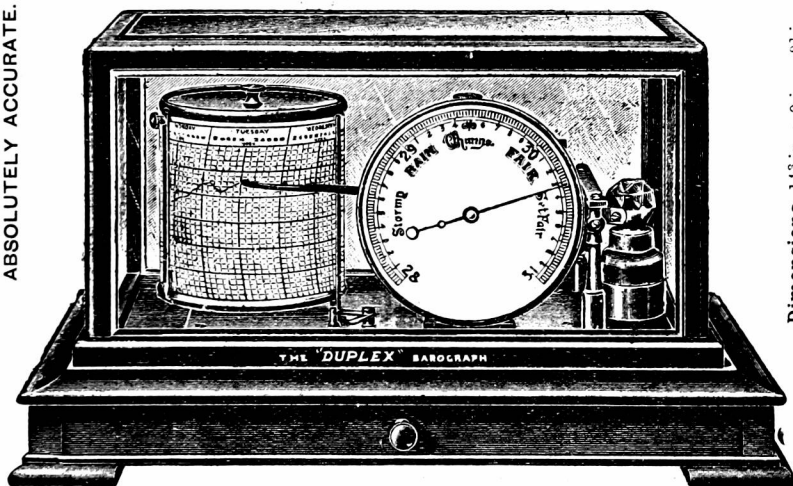


Dimensions, 13½ in. x 7½ in. x 8½ in.

The "SIMPLEX" BAROGRAPH,

In Oak Case, glazed top and sides. Records on a Weekly Chart
Price, with a year's supply of Charts, Ink and Instructions, complete, **£3 18 6.**

ABSOLUTELY ACCURATE.



Dimensions, 14½ in. x 9 in. x 8½ in.

The "DUPLEX" BAROGRAPH,

With our new Opal glass dial attachment, showing present reading of the Barometer in addition to the record on the chart. Very best quality, in solid oak, walnut, or mahogany case, with bevelled edge plate glasses and chart drawer.

Price complete, with a year's supply of Charts, Ink, and Instructions, **£6 2 6.**

The BARO-THERMOGRAPH.

(COMBINATION SELF-RECORDING BAROMETER AND THERMOMETER.)

☛ Special Illustrated List of Barographs and Thermographs (covering various patterns, from **£3 10s.**), post free.

PASTORELLI & RAPKIN, LTD. (ESTAB. 1750.)

ACTUAL MAKERS of *all kinds* of Meteorological Instruments.

CONTRACTORS TO H.M. GOVT.

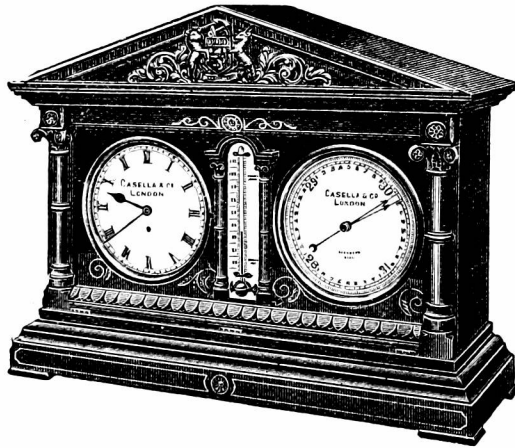
46, HATTON GARDEN, LONDON, E.C.

☛ Illustrated List of STANDARD INSTRUMENTS Post Free.

** We pay carriage and guarantee safe delivery within U.K. on all our Instruments.

C. F. CASELLA & Co., LTD.,
MAKERS OF
Meteorological, Surveying and Scientific Instruments

To the Admiralty, Ordnance and other Home Departments, and to the
Indian, Canadian, and all Foreign Governments.



INSTRUMENTS FOR PRESENTATION.

C. F. CASELLA & Co. make a special feature of instruments of good design, sound material and first-class workmanship for presentation purposes. Inquiries on this subject are invited.

The illustration above depicts a combined clock and barometer designed and made by us for use in one of the Colonial Houses of Parliament.

**11-15 ROCHESTER ROW, VICTORIA STREET,
LONDON, S.W.**

Telegraphic Address: "ESCUTCHEON, LONDON." *Telephone:* WESTMINSTER 5599.

Symons's Meteorological Magazine.

No. 546.

JULY, 1911.

VOL. XLVI.

THE DISAPPEARANCE OF EVENING CLOUD AT FULL MOON.

By WILLIAM ELLIS, F.R.S.

IN your magazine for December last Mr. Denning, in an account of his observation of the lunar eclipse of the preceding month, makes reference to "the opinion held by Sir J. Herschel and others that the full moon possesses the faculty of clearing away clouds." Humboldt and Arago both held the same view. When first I became acquainted with these statements I felt that many years' experience as an astronomical observer at Greenwich had not given me the impression that evening tendency to clearance of the sky was in any way peculiar to the period of full moon, but rather that it existed in equal degree at all times, a conclusion that received confirmation from the statement of Admiral Fitzroy in his "Weather Book," to the effect that in fine weather there is a general tendency towards a disappearance of clouds soon after evening, "whether the moon is visible or not, whether full, or near any other period."

It then occurred to me to test the question by employing the observations of the amount of cloud made each two hours (twelve observations daily) at the Royal Observatory, Greenwich, in the years 1841 to 1847. Grouping together, during this period, the observations on the five days about full moon, and similarly the five days about new moon, there was found in both cases to be, on the average, a maximum amount of cloud in the forenoon, and a minimum amount in the evening. Now, if from any cause there was found to be a greater dispersion of evening cloud under a full moon than at the time of new moon, the evening amount of cloud at full moon should be considerably less than that at new moon, but there was no significant difference, the amount at the time of full moon being indeed slightly greater than that at new moon; thus giving no support to the supposition of lunar influence to disperse evening cloud. The result thus arrived at was given at length in a communication to the "Philosophical Magazine" for July, 1867.

Some years afterwards the Rev. S. J. Johnson (in the "Monthly Notice" of the Royal Astronomical Society for January, 1894) dealt

also with this question in a different but very practical way. He says that he noted "the state of the sky at moonrise and at midnight on the day of full moon for the past fifteen years [1879 to 1893] with the result that there is no foundation for the theory referred to." What he found is that of 186 occasions of full moon during the period mentioned, in 126 cases there was a similar sky "when full moon rose and at midnight," in 33 cases the sky was "clearer about midnight than at moonrise," and in 27 cases was "more overcast about midnight."

The two methods thus employed cannot be said in any way to support the view that there is greater tendency of the evening cloud to disperse under a full moon rather than at any other period, or indeed that the moon has any concern therewith. It may be asked how has belief in the existence of such tendency arisen. An attempted explanation that I gave in the before-mentioned "Philosophical Magazine" paper may be here reproduced. The Greenwich observations of amount of cloud show, as before mentioned, a maximum in the forenoon and a minimum in the evening, and this presumably represents the usual climatic variation. Thus diminishing evening cloud at or near full moon coincides with the rising of the moon and her advance towards the meridian, the ascent of the moon and the diminishing cloud giving an appearance and, indeed, an impression of *cause and effect*. Now, the change from a cloudy to a clear state of the evening sky is much more likely to attract attention when occurring near to full moon, for with no moon the disappearance of cloud, though making visible the stars, does little to change the general aspect of the evening, but under a full moon the disappearance of evening cloud, especially in the winter, entirely changes the whole appearance of nature, the splendour of the night in comparison with the previous dulness attracting the attention of even the most casual observer.

From what has been said it follows that the disappearance of evening cloud is not more prevalent at full moon than at other parts of the lunation. But when it occurs at full moon the circumstance is more open to general observation, although otherwise it has no significance. On the other hand, clouded nightly skies are quite as prevalent at full moon as at any other period. In both cases being atmospheric variations with which the moon seemingly can have no concern.

~~~~~ FALL OF TEMPERATURE IN BRIGHT WEATHER.

THE remarkable fall in the temperature shown by the following figures, *with practically continuous sunshine* during the daylight hours, seems worth recording. The change began on the afternoon of the 6th, with a N.E. wind increasing from 4 to 8, Beaufort scale.

	June	5th	6th	7th.
Max. in shade.....	82°·1	.....	74°·0	..... 60°·0

ALFRED O. WALKER.

Ulcombe Place, nr. Maidstone, 3rd July, 1911.

WEATHER IN THE SEVENTEENTH CENTURY.

By WALTER SEDGWICK, M.A.

PART II.—SUMMER.

IN Part I. (see this Magazine for May, 1911) extracts were given from the diaries of John Evelyn, F.R.S., and Samuel Pepys, F.R.S., describing the spring weather in and near London in the second half of the Seventeenth Century, and the question was considered whether these extracts indicated a permanent change in the climate of London between that era and the present time. In this number extracts are given from these diaries describing the weather of summer (June, July, August) with a view to considering further the same question. In order to make a true comparison between the weather in the time of Evelyn and the weather of to-day, allowance must be made, as explained in the Introduction to this series of articles, for the alteration of the Calendar from the Julian, or Old Style, to the Gregorian, or New Style, and the quotations from the diaries have to be post-dated 10 or 11 days. It is further necessary to bear in mind that the diarists would be disposed to chronicle all the occurrences in the weather which were of an exceptional character, but to say little about weather of a normal type, and that they had not the use of instruments such as the barometer, thermometer and rain gauge, without which absolute accuracy in comparisons between the weather of different years cannot be obtained.

The observations on the summer weather, which are found in the two diaries, are more numerous than those on the spring weather, but as many of the former relate only to severe thunderstorms, or other weather conditions of a purely temporary character, it is more difficult to form an opinion as to the general type of summer weather which occurred during the lifetime of the diarists than it was in the case of the spring weather. It is, nevertheless, apparent that the summers in the Seventeenth Century were neither consistently fine and dry nor consistently cold and wet, and presented as great contrasts in weather as do the summers of the Twentieth Century. The most noticeable event was the great drought of 1684. This followed an exceptionally severe winter and a cold late spring, and was succeeded by another severe winter and early summer drought. In fact, for a period of eighteen months (January, 1684, to June, 1685) weather of a Continental type, with a large annual variation of temperature and a very small rainfall, prevailed over London and its neighbourhood.

It is, however, in years of bad summers that assertions of a change of climate are most frequently heard, and attention is principally directed to the years in which bad summers were experienced in the time of Evelyn. The worst summer was doubtless that of 1692, but prolonged bad weather also occurred in the summers of 1648, 1658, 1663, 1686, 1687 (June), 1693 (June), 1695 (August), 1696 and 1703, and excessive cold is referred to on several occasions, *e.g.*, on 12th

June, 1658. During the 54 years which elapsed between the return of Evelyn from his continental travels in 1652 and his death in 1706, there are two periods during which fairly continuous weather observations are given either by him or by Pepys, *i.e.*, 1656 to 1669 and 1681 to 1705. In the former period, covering 14 years, there were two noticeably bad summers, 1658 and 1663, and one which was certainly very fine, 1665, the plague year; of the others it is impossible to form any reliable opinion, but the presumption is that they were of a normal type as, had they been abnormally fine or bad, the fact would probably have been recorded. In the latter period, covering 25 years, bad summers appear to have been more frequent. Four were altogether bad, 1686, 1692, 1696 and 1703, and three others bad at any rate for a month, 1687, 1693 and 1695, but it is necessary to remember that during this period Evelyn was an old man, and would have been more inclined to classify a summer as cold and ungenial than he would have been in his younger years. So far as information is given, the summer weather of this period may be briefly described as follows:—

1681—June, prolonged drought.	1693—Early wet, late fine.
1684—Prolonged drought.	1694—Fine.
1685—June, prolonged drought.	1695—August wet and cold.
1686—Very wet.	1696—Very wet and unsettled
1687—June stormy.	1699—Hot and dry.
1689—June fine.	1700—June fine.
1690—August, early fine, late cold and wet.	1701—Early hot, late unsettled.
1691—August hot and thundery.	1703—Wet and cold.
1692—Very wet.	1705—June dry and hot.

The accounts given of the summers in this period of 25 years indicate a marked oscillation of climate, as in the first five years there was a tendency to prolonged drought, in the next eleven years to rain and bad weather, and in the last nine years to warmth and fine weather, but when the description of the weather over the whole period covered by the two diaries is considered, it appears that good and bad summers and dry and wet summers occurred with about the same frequency as in the present age, and, not only is there no evidence to justify any positive assertion that the climate of London has changed since the Seventeenth Century, but considerable reason for thinking that the summer weather occurring in a long period of years was, on the whole, much the same then as it is now.

Note.—In the following extracts the dates *have been corrected* to New Style, except where (O.S.) occurs.

Extracts from Pepys's diary are distinguished thus—(P.); all other extracts are from Evelyn's diary.

1636. This year being extremely dry the pestilence much increased in London and divers parts of England.
1648. A most exceeding wet year.

1652. 21 June.—Weather hot.
 5 July.—After a drought of near four months, there fell so violent a tempest of hail, rain, wind, thunder and lightning, as no man had seen the like in his age; the hail being in some places 4 or 5 inches about, broke all glass about London, especially at Deptford, and more at Greenwich.
1656. 17 to 21 July.—Excessive hot.
1657. 31 August.—A most prodigious rain in London, the year was very sickly in the country.
1658. (a) 12 June.—An extraordinary storm of hail and rain, the season as cold as winter, the wind northerly near six months. (13th). A large whale was taken near Greenwich . . . length 58 ft., height 16.
 (b) 28 August.—A tempestuous wind which threw down my greatest trees at Sayes Court, and did much mischief all over England. It continued the whole night and till three in the afternoon of the next in the south-west and destroyed all our winter fruit.
1660. 3 July.—Rain all the morning. (P.)
 (c) 15 „ —Exceeding rain all day. (E.) Rain all the morning. (P.)
1662. 29 July.—It raining hard upon the water [the Thames] . . . the King came by in his barge going down towards the Downes . . . but methought it lessened my esteem of a king, that he should not be able to command the rain. (P.)
 30 „ —A great storm on the Downes; damage to shipping. (P.)
1663. 26 July.—A most extraordinary wet and cold season.
 31 „ —This day the Parliament kept a fast for the present unseasonable weather. (P.)
1664. 11 June.—A storm of hail. (P.)
 21 „ —Very warm and pleasant. (P.)
 26 August.—2.0 a.m.—A severe thunderstorm, with such continued lightnings, not flashes but flames, that all the sky and air was light . . . not a minute's space between, new flames all the time . . . with such a storm of rain as I never heard in my life. (P.)
1665. (d) 17 June.—The hottest day that ever I felt in my life. (P.)
 (d) 26 July.—Most extraordinary hot that ever I knew it. (P.)
1666. 26 July.—A wonderful dark sky, and shower of rain this morning. At Harwich a shower of hail as big as walnuts. (P.)
1667. 6 August.—It raining hard this day all day to our great joy, it having not rained, I think this month [July O.S.] before. (P.)
1668. 1 June.—It rained very hard all this day. (P.)
 2 „ —To Bishop Stortford. The ways are mighty full of water, so as hardly to be passed. (P.)
 4 „ —To Cambridge. The waters not being now so high as before. (P.)
1669. 9 June.—To the Park whence the rain sent us suddenly home. (P.)
1675. An exceeding dry summer.

1681. 4 June.—There had scarcely fallen any rain since Christmas.
 22 „ —It still continued so great a drought as had never been known in England, and it was said to be universal.
- 1684(e) 12 July.—There had been an excessive hot and dry spring and such a drought still continued as never was in my memory.
 23 „ —Some small sprinkling of rain, the leaves dropping from the trees as in autumn.
 20 August.—We had now rain after such a drought as no man in England had known.
1685. 3 June.—We had hitherto not any rain for many months, so as the caterpillars had already devoured all the winter fruit through the whole land, and even killed several greater old trees. Such two winters and summers I had never known.
 24 „ —Such a dearth for want of rain as never was in my memory.
 27 „ —The exceeding drought still continues.
 8 July.—We had now plentiful rain after two years' excessive drought and severe winters.
1686. 12 June.—Such storms, rain and foul weather seldom known at this time of the year. The storms being succeeded by excessive hot weather.
 30 „ —An extraordinary season of violent and sudden rain.
 23 July.—The season very rainy.
1687. 3 July.—Hitherto a very windy and tempestuous summer.
1689. 3 July.—An extraordinary drought.
 21 „ —An unusual and violent storm of thunder, rain and wind . . . such was the impetuosity of the wind as to carry up the waves [on the Thames] in pillars and spouts most dreadful to behold, rooting up trees and ruining some houses.
1690. August.—Hitherto (25th August, O.S.) it had been a most seasonable summer. A very extraordinary fine season.
 22 „ —A very great storm of thunder and lightning.
 25 „ —The season much changed to wet and cold. Unseasonable and most tempestuous weather.
 27 „ —An extraordinary sharp cold east wind.
1691. 5 August.—An extraordinary hot season, yet refreshed by some thunder showers.
 23 „ —Thunderstorm, rain and wind very violent.
1692. 19 June.—An exceeding great storm of wind and rain, in some places stripping the trees of their fruit and leaves as if it had been winter, and an extraordinary wet season with great floods.
 5 July.—This whole summer was exceeding wet and rainy; the like had not been known since the year 1648, whilst in Ireland there had not been known so great a drought.
 24 August.—Still an exceeding wet season.

1693. 4 July.—A very wet hay harvest and little summer as yet.
 16 August.—Very lovely harvest weather . . . but no garden fruit.
1694. 13 June.—Seasonable showers.
 11 July.—Glorious steady weather, corn and all fruits in extraordinary plenty generally.
 15 August.—Stormy and unseasonable wet weather this week.
1695. 7 August.—A very wet season.
 21 „ —The weather now so cold that greater frosts were not always seen in the midst of winter; this succeeded much wet and set harvest extremely back.
1696. 1 July.—An exceeding rainy cold unseasonable summer.
 17 „ —A northern wind altering the weather with a continual and impetuous rain of three days and nights changed it into perfect weather.
 22 „ —Very unseasonable and uncertain weather.
1699. 21 June.—After a long drought, we had a refreshing shower.
 5 July.—The heat has been so great almost all this month (June O.S.) that I do not remember to have felt much greater in Italy, and this after a winter the wettest, though not the coldest, that I remember for fifty years last past.
 2 August.—Seasonable showers after a continuance of excessive drought and heat.
1700. 13 June.—A sweet season with a mixture of refreshing showers.
1701. August.—The weather changed from heat not much less than in Italy or Spain for some few days to wet, dripping and cold, with intermissions of fair.
1703. 24 June.—Rains have been great and continued, and now near Midsummer cold and wet.
 5 August.—The last week in this month (July O.S.) an uncommon long continued rain, and the Sunday following thunder and lightning.
1705. June.—The season very dry and hot.

NOTES.—(a). Another occasion when a whale came up the Thames is mentioned by Evelyn in April, 1699.

(b). Possibly there is some mistake in this date, and the gale referred to is that which occurred on the 30th August (O.S.), 1658, and is associated with the last illness of Oliver Cromwell, who died 3rd September (O.S), 1658.

(c). The day of the state visit of Charles II. to the City after the Restoration.

(d). The summer of the great plague in London.

(e). This summer followed the severe winter of Frost Fair. Evelyn describes great cold up to the 14th April.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

MOVEMENT OF RAIN IN THE THUNDERSTORM OF MAY 31st, 1911.

THE thunderstorm which occurred on Derby Day, May 31st, in and around London was so severe that very many people, who otherwise take little note when rain falls, were compelled to fix in their memory the time at which the rain began and ended. It seemed therefore a convenient opportunity to make some attempt to trace the course of the rainstorm, as distinct from the total rainfall, in a more accurate way than has been done hitherto, as far as the writer knows. The preliminary results are given below; the account of the methods adopted and the discussion of the meaning of the results are reserved till later.

Soon after mid-day rain began to fall over two districts which lie to the north and to the south-east of Hertford respectively. The former fall gradually moved westwards and south-westwards. By 2 o'clock the rain was falling over an area which was some four or five miles wide, the longer axis of which lay north-east from St. Albans.

Then developments took place quickly. In another quarter-of-an-hour the longer axis of the storm had moved so that it lay about north and south, and rain was falling over an area that extended from beyond Hitchin on the north for some twenty miles to the south of that town. By 2.30 the rain was falling three or four miles farther south still. Meantime, the rainstorm which originally was south-east of Hertford, seems to have moved westward, and about this time coalesced with what had developed into the main storm. By 3 o'clock rain had reached Acton and was falling on an area more than 30 miles long from north to south, and about eight miles wide.

After this time the disturbance ceased to expand, but continued to move slowly southwards, the axis turning slightly anticlockwise. By 3.15 rain had ceased to fall over Hitchin, but had reached the Thames. By 4 o'clock Wimbledon was reached, the axis of the storm now extending from that town to King's Langley.

Shortly after this there was a fresh development. Rain appears to have begun to fall at Crowborough Beacon, in Sussex, and on the area to the north-west of it; this, it will be noticed, lies on a prolongation south-eastwards of the axis of what may be called the main storm. By 5 o'clock the rain of the main storm had reached the North Downs a little to the east of Epsom, the axis of the rain area now lying from Banstead to Watford.

Then the storm appears to have entered on another phase. Without extending much farther southward than the southern edge of the North Downs, the main area broadened out to the north-west-

ward, so that by 6 o'clock rain was falling over a rhomboid-shaped area, two sides of which roughly lay parallel to the North Downs and two sides parallel to a line from Caterham to Harrow. Simultaneously with this development, or perhaps a little earlier, rain began to fall on well-defined small areas in north and south London. As these grew, the general movement of the main storm, which till this time had been on the whole somewhat S.S.W., appears to have been reversed. The rain over the areas north and east of Guildford, which had never been heavy, ceased entirely. Over the rest of the south-west area on which rain was still falling, that rain was light. At 7 o'clock the distribution of rainfall was very complicated, but, speaking roughly, the isolated patches of rainfall over London had "run together" and become the main storm. Thereafter the rain extended north-westwards and north-eastwards. The eastward advance reached, on the whole, its farthest limit about 7.30, when the front of the storm lay along an irregular line north-west and south-east through the City.

From that time onwards the rain for the most part decreased in volume, and the rain area broke up into patches and then decreased in size. By 8.15 the most considerable of these patches extended for some three miles round the south of Hampstead. This gradually shrank, and though by 8.45 it was the only important area on which rain still fell, the rain there was slight. Shortly thereafter rain ceased entirely.

I should be glad if further information could be sent by anyone who remembers any periods, however short, on Derby Day on which either (1) rain fell, or (2) rain did not fall, the one fact being as important as the other. The exact place of observation should be stated.

J. FAIRGRIEVE.

3, Friern Barnet Road, New Southgate, London, N., 1st July, 1911.

[From Mr. Fairgrieve's position as the master of a large day school to which pupils come from all parts of London, he had special facilities for obtaining particulars as to the hour of occurrence of rain in the great thunderstorm to which he referred, and he has set out the facts on a number of interesting sketch maps. We hope that many of our readers may be able to help him in completing his interesting investigation. — Ed. S.M.M.]

DESTRUCTION OF A WIND VANE BY LIGHTNING.

A LARCH planted here in 1874 was cut down in 1900 owing to overcrowding, and made into a pole for a wind-vane, mounted on an iron tube 4 feet long, with the usual letters below the vane denoting the four points of the compass. It was set up in the far corner of a tennis lawn, divided from a meadow of $4\frac{1}{2}$ acres by a continuous iron fence, the pole standing 35 feet high about 100 yards from my house

in a very open position. In the thunderstorm of Thursday, 11th May, it was struck by lightning and destroyed.

I was in London at the time, but was informed that the storm was the most terrific ever known to have occurred here. It commenced soon after 3 p.m., with rain and hail from about 3.30, and lasted until 5 p.m., and in the hour and a half 1.90 in. of rain fell, nearly all between 3.30 and 4.30, described as at one time like a solid sheet of water rather than drops, and doing much damage to flowers and immature fruit. The vane was struck at 3.35 p.m. My gardener describes the noise made as first a crackling, followed immediately by a crash like a large sheet of glass being smashed to atoms. The vane itself does not show any sign of damage from the lightning; it was broken to pieces by being thrown to the ground, damaging the iron fence in its fall; nor does the pole for two feet below the iron cap on its summit into which the tube supporting the vane was screwed, for which distance there is an old split in the centre. The break, commencing at the close of this split, but from the outside of the pole, caused a total length of 17 feet from the top of the vane to be thrown down; another piece, 12 feet long, was thrown a few yards away, and smaller pieces were scattered in an irregular ellipse about 190 feet long and 100 feet wide, the pole being nearly in the centre. About 20 feet of the pole is standing, with a narrow piece cut out down to the ground, the broken length mentioned overlapping. Small pieces were driven into the ground like arrows shot from a bow.

During the worst of the storm two horses (not mine) which were in my meadow, stood in the centre, as far as possible away from fence or tree. A neighbour saw a ball of fire roll along his lawn, and felt a queer momentary burning sensation at the time.

JOHN HOPKINSON.

Wreetwood, Watford, 25th May, 1911.

DROUGHT IN THE EAST OF SCOTLAND.

I THINK it worth while to record that on the 15th May .01 in. of rain was recorded here, and since that date the only rainfall until 15th June (inclusive) were .13 in. on 26th May (a heavy plump occurring about 3 a.m. of 27th) and .02 in. on 13th June, *i.e.*, .15 in. in a full month.

I may add that at a distance of less than two miles from this to the north-east not even the .13 in. shower was experienced.

On the morning of the 17th I took off .15 in., which fell after 4 a.m., and yesterday .21 in. For the 18th *nil*. We are quite burnt up, and the nights of the 14th and 15th being frosty (5° of frost recorded in a district four miles from this), potatoes were blackened.

CHAS. MCINROY.

The Burn, Edzell, Brechin, 19th June, 1911.

BLACK HAZE.

REFERRING to Mr. G. Dawson Lewis's observations on "Black Haze and Lancashire Smoke" in the May number, black haze is common here during the prevalence of north-easterly winds. In the country one often hears the remark, "Oh, it is blight," but if you ask what sort of blight could produce such obscurity, of course no explanation is ever forthcoming. In his book on "Weather Forecasting" Mr. Grainger devotes a short chapter to the subject, but does not suggest that it arises from smoke. On p. 61 he says, "The air becoming calm and the cold northerly air pressing forward, condensation takes place, the haze will form and slowly advance from the north." And, again, on p. 62, "This haze must be caused by the pressure of a cold northerly or easterly air current upon a warmer atmosphere."

If the black haze of North Wales is caused by the smoke from the Lancashire chimnies, the smoke from the chimnies of the "Black Country"—Staffordshire and neighbourhood (distant in a north-easterly direction only about 60 miles)—may be accountable for that which occurs in this direction, but it would be interesting to know if there are *any* favoured spots in this country where black haze is *unknown*. Perhaps some of your readers can say?

W. PIFFE BROWN.

Belgrave Road, Gloucester, 22nd May, 1911.

CURIOUS LONG-ENDURING CLOUD.

On Good Friday evening, April 14th, at 8.30, I saw in due E. a faint pillar-shaped cloud, looking much like a comet's broad tail. Its position was 12° S.S.E. of Arcturus, the centre of the streak being in about $218^{\circ} + 10^{\circ}$, and it was some 6° long and 1° broad. It moved very slowly, the upper part travelling faster than the lower. At about 9.25 the cloud crossed the upper part of the moon and pointed directly to the bright planet Jupiter then shining a few degrees E.N.E.

The cloud had travelled 25° in 55 minutes from above E. to E.S.E. and had rotated through 90° , the major axis being vertical at 8.30 and horizontal at 9.25. When the cloud encountered the moon's upper side, that region of our satellite assumed a brilliant turquoise blue colour, and this showed for some time afterwards.

I do not think the cloud band was formed by the luminous residue of a meteor-streak. But it was noticed as a special object by many people here who thought it might be a comet's train. If any meteorological observers at Bath, or places east of Bristol, noticed the cloud and recorded the positions, I should be glad to have details for the purpose of calculating the height and direction of motion.

W. F. DENNING, F.R.A.S.

Bristol, 15th April, 1911.

ROTHESAY RAINFALL IN SPRING AND SUMMER.

THE rainfall of spring and summer (March to August) in Rothesay shows an average of about 20.30 in., reckoning from 1800 to 1906 (spring 9.00 in., summer 11.30 in.).

It may be of some interest to know that the total fall of the last five spring-summer seasons (1906-10) "breaks the record," apparently. That is, it is the wettest group of five consecutive spring-summer seasons since 1800. The amount is 125.00 in.; the highest before was 121.70 in. in the group about 1860. All five springs were wet, also summers, except 1906. The springs since 1903, indeed, all show excess, this year included. The smoothed curve of those five season values shows gradual rise on the whole since 1885, the group about which had only 86.30 in. A.B.M.

HEAVY RAINFALL IN THE NORTH OF ENGLAND.

FROM midnight on Friday to midnight on Saturday, the 24th, there fell 3.45 in. of rain here. I happened to be out at that hour each night, and measured the fall. This is a record for 24 hours here for 34 years. The next highest was 3.22 in. on October 26th, 1900, and October 8th, 1903. In 1903 .54 in. fell the following day; in 1900 .17 in. fell the preceding day; but in each of those days the measurement was taken as usual at 9 o'clock.

The total rainfall for the month of June in the low gardens, 35 ft. above the sea level, was 5.19 in., as against 4.79 in. at the higher level, 137 ft., and for the two days, June 23rd and 24th, it was 1.20 in. and 2.53 in., total 3.73 in., against 3.56 in. As 3.45 in. fell on the higher level in the 24 hours, we may deduct about the same from the lower level measurement; so about 3.62 in. fell in the 24 hours from midnight to midnight. It was by my fortunate measurement of the gauge at midnight that I could deduct what fell afterwards during the night. In most returns the fall will seem to have been spread over two days. I have two sets of rain gauges of three each on the different levels, so there can be no mistake.

WILLIAM ELLIS.

Bothalhaugh, Morpeth, July 3rd, 1911.

I SEND note of rainfall which began here at 7.35 p.m. on Friday, June 23rd, the day having been up to that hour a very charming summer's day. The persistency and severity of the rain-storm has not been equalled in this district for many years, probably not since October, 1900.

24th—9.0 a.m. gave	1.36 in.
10.0 a.m. „	.31 in.
noon „	.27 in.
7.35 p.m. „	.96 in.
25th—9.0 a.m. gave	.32 in.
	1.86 in.

Thus it will be seen that for 24 hours ending 7.35 p.m. on the 24th 2.90 in. had fallen, or early this morning, for the rain temporarily ceased, 3.22 in. for 36 hours.

W. F. VINT.

The Cedars, Sunderland, June 25th, 1911.

[The daring forecast by Mr. Mossman of a wet summer in the north of England, given in our last number, lends a special interest to the foregoing letters. The storm beginning on June 23rd, after the Royal Progress through the London streets, brought a rainfall of more than an inch in the south of England, increasing along the east coast to the north, exceeding 2 inches in Lincolnshire, exceeding 3 inches in Durham, and culminating in an area with more than 4 inches for the three days, June 23rd to June 25th, in Northumberland and Berwickshire. So far as we can interpret the weather charts, the depression producing this deluge came from the north-west, but on the 24th, at 7 a.m., when the centre was over the Wash, it doubled back to the north-east, the area to the left of the track getting the heaviest rain both times, being the east of Northumberland, Durham and Berwickshire. Less than an inch fell on the west coast of the north of England and south of Scotland.—Ed. *S.M.M.*]

DIURNAL RANGE OF BAROMETER IN SOUTHERN NIGERIA.

REGULAR observations are being made here to determine the mean position and variations of the barometric wave, of which results will be submitted later. In the interim, it may be of interest to know of the following approximate mean corrections which have been obtained by Mercurial No. C 885 (J. Hicks), at an elevation of about 15 feet above mean sea level, viz :—

At 6 a.m.	+0.016 in.	At 1 p.m.	+0.008 in.
7 „	—0.015 „	2 „	+0.030 „
8 „	—0.037 „	3 „	+0.044 „
9 „	—0.047 „	4 „	+0.049 „
10 „	—0.047 „	5 „	+0.046 „
11 „	—0.036 „	6 „	+0.035 „
12 noon	—0.018 „		

The maximum and minimum readings, it will be observed, occur at about 9.30 a.m. and 4 p.m. respectively ; whilst the daily mean occurs about 6.30 a.m. and 1 p.m. The above results cover a period of about 2 years (1908-1910).

CHAS. A. ALBERT BARNES, Assoc.M.Inst.,C.E.

Lagos Observatory, 4th May, 1911.

BALLOON ASCENTS, NOVEMBER—DECEMBER, 1908.

By W. H. DINES, F.R.S.

November 5th, 1908.

Starting Point.	Country	A miles.	B ° F.	C miles.	D ° F.	E miles.	F
Pyrton Hill....	England	6·5	—53	10·9	—48	26	S.E. by E.
Brussels	Belgium	7·9	—89	18·1	—	50	S.S.E.
Hamburg.....	Germany....	7·3	—71	8·6	—62	109	S.S.E.
Lindenberg....	„	6·9	—78	12·9	—74	58	S.E. by S.
Paris.....	France.....	—	—	11·3	—71	26	S.
Strassburg	Germany....	7·4	—81	10·9	—76	67	
Vienna	Austria.....	6·8	—71	11·3	—69	59	S.E. by E,
Pavlovsk	Russia	7·7	—54	9·4	—60	31	S.E. by E.

A remarkably uniform and extensive air current from the N.W. prevailed over Europe on this occasion. The temperatures seem to have been very irregular, the large difference of 36° F. being shown between the comparatively near stations of Pyrton Hill and Brussels. With regard to the extreme height of 18·1 miles recorded at Brussels it should be remembered that a very small error in the pressure, the element that is measured, involves at such a height a very large error in the height. An error of 1·5 mm., or ·06 in. makes a difference of 1 km., or $\frac{5}{8}$ of a mile. On the actual trace drawn on smoked metal this is about $\frac{1}{250}$ part of an inch, and this statement shows how difficult an even approximate determination of such heights is.

A high pressure area lay to the north and north-west, and a low pressure area to the south and east.

December 3rd, 1908.

Starting Point.	Country.	A miles.	B ° F.	C miles.	D ° F.	E miles.	F
Manchester....	England	6·9	—88	9·4	—70	50	S.E.
Brussels	Belgium	7·6	—96	8·4	—88	125	S.E.
Paris	France.....	7·3	—85	9·6	—76	17	S.E. by E.
Strassburg	Germany....	7·6	—96	11·2	—88	45	S.E. by E.
Munich	„	7·9	—87	8·6	—78	38	S.E. by E.
Vienna.....	Austria	8·3	—85	11·4	—80	85	S.E. by E.
NizhniOlchidaeff	Russia	7·7 ?	—78	—	—	81	E.S.E.

A=Height in miles of commencement of isothermal column.

B=Temperature, F°, at bottom of column.

C=Greatest height of reliable record in miles.

D=Temperature, F°, at greatest height.

E=Distance in miles of point where balloon fell.

F=Bearing of falling point from starting point.

As on November 5th an extensive north-west current of air is shown. An extensive high pressure area, united with the Atlantic anticyclone, lay over Central Europe, while a depression was passing in the north from Iceland to Russia.

~~~~~

## ROYAL METEOROLOGICAL SOCIETY.

THE second afternoon Meeting for the present session was held on Wednesday, June 14th, at the Society's rooms, 70, Victoria Street, Westminster, Dr. H. N. Dickson, President, in the chair.

Dr. C. Chree, F.R.S., read a paper on "The Diurnal Inequality of Barometric Pressure at Castle O'er, Dumfriesshire," in which he gave the results of a discussion of the barograph records kept by the late Mr. R. Bell during the seven years 1902 to 1908. These results show a well marked principal maximum and minimum at 10 p.m. and 5 a.m. respectively. Every single year agrees in this except 1908, which puts the maximum at 7 a.m. The existence of a secondary maximum and minimum is unmistakable, but while the hour of occurrence of the former is clearly 11 a.m., that of the latter is less distinct. It seems to be 4 p.m., but a longer series of observations would have been necessary to confirm this.

Mr. W. W. Bryant said that there were distinct differences between the curves at Castle O'er and at Greenwich, especially in the relative importance of the maxima and minima. The Greenwich principal minimum was always in the afternoon, except in January, and the principal maximum nearly always at 10 a.m.

Dr. W. N. Shaw hoped the paper would encourage other Fellows to do something in the way of discussing barograph records. It was desirable to find out whether any of the diurnal variation of the pressure was due to variation in the temperature and the want of accurate compensation in the barograph for temperature.

Mr. E. Gold said that the diurnal variation in the lower part of the atmosphere decreased as one went upwards, so that, as Castle O'er was higher than many other stations, it would be expected on this account to have a smaller amplitude for the diurnal variation; the semi-diurnal variation would decrease to some extent, and the phase angle become less.

Dr. C. Chree, in reply, said that with regard to the amplitude of the 8-hour term, the suggestion that its large size in winter was due to the day making a closer approach to one-third of the 24 hours had something to be said for it. In the case of the 12-hour term at the British stations, the amplitude did appear to be the largest near the equinoxes.

Mr. Spencer C. Russell read a paper on "Rain Drop Experiments," in which he gave an account of a number of interesting experiments which he had carried out at Epsom during the last two years in order to obtain a permanent record of the variations in the size of rain-drops as they occurred. The first method employed was the exposure of a number of ruled slates, divided into quarter-inch sections, and gently brushed over with an even coating of oil. This was not altogether satisfactory, as, during heavy rain, the drops impinged upon the slate with such force as to become broken up into a series of drops composed of one large and a number of small ones. The most

satisfactory results have been given by the use of plaster of Paris. Mr. Russell exhibited to the Meeting a number of rain-drop models obtained by letting the drops fall into dry plaster of Paris. He stated that the sizes of the drops which he had already collected were, 7 of 6 mm., 44 of 5 mm., 73 of 4 mm., 222 of 3 mm., 257 of 2 mm., 175 of 1 mm., and 107 of less than 1 mm.

Mr. E. Gold said that the Society was indebted to Mr. Russell for his investigations into what might be called the details of Meteorology.

A joint paper by Mr. A. J. Makower, Dr. W. Makower, Mr. W. M. Gregory and Mr. H. Robinson was also read, describing the experiments which they carried out last August at Ditcham Park, near Petersfield, in Hampshire, to investigate the electrical state of the air at different heights above the ground by means of kites and balloons.

The following gentlemen were elected Fellows of the Society:—Mr. J. Dunn, Assoc.M.Inst.C.E., Prof. W. W. Holland, Ph.D., Mr. M. T. Oung, and Mr. M. H. Tagg.

~~~~~

HIGH JULY TEMPERATURE IN LONDON.

JULY opened under cloudy conditions with low temperature, but before the close of the first week the newspaper press of the country was loudly acclaiming the unprecedented nature of the heat which was held to account for many deaths in those parts of the country where its intensity was most keenly felt. The shade maximum temperature at Camden Square showed a continuous rise from the 1st to the 8th, each day being warmer than its predecessor. Temperature exceeded 80° on each day from the 5th to the 8th, the highest reading being 90°·0 on the 8th. This temperature has not been reached since the great heat of September, 1906, during which 94°·0 was registered on the 2nd. It is a striking fact that, although July is normally the warmest month of the year, the thermometer has not registered 90° in that month since 1900. In that year July was a month of great heat, with 5 days showing a record of 90° or above. On the 16th of July, 1900, the thermometer registered 95°·2, which is the highest shade temperature recorded in 54 years. It must be explained that the temperatures dealt with here are those recorded on the Glaisher stand, which is usually held to give extreme temperatures rather more extreme than those recorded in a Stevenson screen.

The following table shows, in striking contrast, the difference between the maximum temperatures on July 5th—8th, and those recorded in the corresponding days of last year, which were unusually cool.



ALTITUDE
SCALE

Below 250 feet 250 to 500 feet 500 to 1000 feet Above 1000 feet

SCALE OF MILES

0 5 10 15 20

Maximum shade temperature.

	1910.	1911.	Difference
July 5th	67 ^o ·7	81 ^o ·4	13 ^o ·7
„ 6th	66·2	83·3	17·1
„ 7th	61·5	88·5	27·0
„ 8th	65·6	90·0	24·4
Mean Max (5—8th)	65·3	85·8	20·5

On the 9th and 10th the shade temperature only reached 77°·3 and 75°·6 respectively, but rose rapidly on the morning of the 11th to a maximum of 84°·5. Almost cloudless skies continued throughout that and the two following days, on which maximum temperatures of 84°·3 and 83°·8 were recorded. The extreme dryness of the air, which made the heat less oppressive on these three days, is shown in the following table giving the relative humidity calculated from the hygrometric observations made at 3 p.m. alongside the corresponding figures for the same days in 1910. The average difference of 30 per cent. for the three days is extremely rare if not altogether unprecedented.

Relative humidity at 3 p.m.

	1910.	1911.	Difference.
July 11th	56	34	22
„ 12th	66	38	28
„ 13th	77	37	40
Average, 11th—13th	66	36	30

THE RAINFALL OF JUNE, 1911, IN THE THAMES VALLEY.

THE map of the rainfall during June in the Thames Valley and surrounding districts, for which our monthly map is prepared, owes its chief interest to the fact that the distribution resembles more close the type of a winter month than that of June, which is commonly of quite a different character. It will be observed that the area over which the rainfall was more than two inches corresponded in a general way with the outline of the more elevated land forming the Cotteswold Hills in the west, the North Downs on the south, and the Chiltern Hills in the east of the valley. A great tongue with less than two inches lay in the lower land between, and another cut out the Thames estuary, the two nearly meeting on the south of London. In the north-east part of the area dealt with local rainfalls brought the month's total to over three inches in one or two spots. Over the whole of the area practically the whole of the rainfall during June fell during the latter half, an absolute drought occurring in the first fortnight in most places.

The wettest part of the British Isles in relation to the average rainfall for the month was undoubtedly the north-east of England and south-east of Scotland, as explained in the correspondence on pp. 116, 117, but no less remarkable was the extreme dryness of the east of Scotland north of the Tay, where a considerable area had less than 1 inch of rain for the month ; thus bearing out Colonel McInroy's letter on p. 114.

METEOROLOGICAL NEWS AND NOTES.

THE UTILITY OF WEATHER FORECASTS is still so much a matter of opinion in this country that the Council of the Royal Meteorological Society deserves every encouragement in the step they have taken in suggesting a more convenient period for the daily forecast of the Meteorological Office, and a wider publicity than is the case at present. In a letter to *The Times* of July 6th, Dr. H. N. Dickson, the President of the Society, shows that, as issued in the morning newspapers, the forecasts are too late to allow of the work of public bodies being planned in accordance with the probable weather of the day. He points out that the special forecasts for agricultural purposes, prepared at 2.30 p.m. from June 1st to September 30th, refer to the fifteen hours, 6 a.m. to 9 p.m., of the following day, and adds, "Presumably they could be issued all the year round, and they could easily reach the general public before the arrangements for next day's work were finally completed, provided proper facilities for distribution were given. Early editions of evening papers are obviously useful only in towns, but the systems employed in some countries whereby forecasts are displayed (say about 3.30 p.m.) at local telegraph offices, or even their contents made known by signals affixed to railway trains, do not seem impracticable." We look forward hopefully to the matter being considered by the Meteorological Committee.

THE INTERNATIONAL BALLOON ASCENTS for meteorological research in the upper air, usually made in the first week of each month, have been changed for September, in order to prevent clashing with the British Association Meeting at Portsmouth. Under the new arrangement the ascents will take place from the 11th to the 16th of September, 1911.


BRITISH RAINFALL, 1910, is now in so forward a state of preparation that any returns to be inserted in the General Table must be in the hands of the Editor by July 20th. The general discussions of rainfall are practically completed, and any additional records which may be received will be too late to be taken account of in the forthcoming volume, which is the fiftieth of the series.

THE FIRING OF GUNS AS A CAUSE OF RAIN was the subject of a question in the House of Commons on March 8th, when Viscount Dalrymple asked the First Lord of the Admiralty whether he would arrange for the Fleet to carry out their heavy gun-firing practice round the coast at some other period of the year than in the middle of harvest time, when the resultant heavy rain may cause serious loss to the farming community. "The resultant heavy rain" has a highly scientific sound: one thinks of some parallelogram of aerial forces disturbing the aqueous molecules; but it is plain that Lord Dalrymple is not a reader of this Magazine. Mr. Mackenna, no doubt advised by the proper authority, very wisely replied that there is no evidence that the firing causes heavy rain, and went on to explain that the winter season was unsuitable for firing practice with heavy guns at sea. In connection with the question our readers will remember Mr. Gaster's letter published on p. 35 in the March number. Superstition dies hard, and despite the common-sense reply to the recent question in the House of Commons, we find, if we can trust the following paragraph from the *Daily Mail*, a member of the House of Lords suggesting that that ancient and honourable body, the Highland and Agricultural Society of Edinburgh, should make a fool of itself. The paragraph is from a London paper, hence its misconception of the somewhat unexpected title of the Society it refers to.

"In moving that the Admiralty be petitioned to discontinue heavy gunfire round the coasts during August and September when clouds were about, the Earl of Stair, at a meeting of the Highland Agricultural Society in Edinburgh yesterday, said that firing was apt to bring down rain, and at that time of the year fine weather was desirable."

ERRATUM.—So many of our readers have pounced gleefully on the statement that $58^{\circ}\cdot 0$ was $40^{\circ}\cdot 1$ above the average temperature, in the note on the month of May at Camden-square (p. 103), that it hardly seems necessary to explain that a mistake was made, and that the correct figure was " $4^{\circ}\cdot 1$ above the average," but we owe it to ourselves to explain that the difficulty of getting so large an amount of observational material, the last reading of which is made on the first of the month, in the printing press by the 14th, makes it impossible to see the final proof in all cases, and we have to pass for press subject to the corrections on the paged-proof sent to the printer. If, as in the present case, our correction is not noticed, we can only say that a very rare error is a less fault than chronic unpunctuality.

WE REGRET that this number must appear without the usual article on the Weather of the Month, which has not reached us up to the date of going to press.



RAINFALL TABLE FOR JUNE, 1911.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH.	
					Aver. 1875— 1909. in.	1911. in.
Camden Square.....	London.....	51 32	0 8	111	2'28	2'69
Tenterden.....	Kent.....	51 4	*0 41	190	2'03	1'93
Arundel (Patching).....	Sussex.....	50 51	0 27	130	2'13	1'90
Southampton (Cadland) ..	Hampshire.....	50 50	1 22	52	2'17	2'34
Oxford (Magdalen College).	Oxfordshire.....	51 45	1 15	186	2'27	1'08
Wellingborough (Croyland Abbey).	Northampton.....	52 18	0 41	174	2'10	1'62
Shoeburyness.....	Essex.....	51 31	*0 48	13	1'77	1'97
Bury St. Edmunds (Westley)	Suffolk.....	52 15	*0 40	226	2'21	3'09
Geldeston [Beccles].....	Norfolk.....	52 27	*1 31	38	1'77	2'25
Polapit Tamar [Launceston]	Devon.....	50 40	4 22	315	2'18	4'17
Rousdon [Lyme Regis]	".....	50 41	3 0	516	2'18	1'62
Stroud (Upfield)	Gloucestershire.....	51 44	2 13	226	2'43	2'87
Church Stretton (Wolstaston)..	Shropshire.....	52 35	2 48	800	2'59	2'98
Coventry (Kingswood)	Warwickshire.....	52 24	1 30	340	2'52	2'01
Boston.....	Lincolnshire.....	52 58	0 1	25	1'95	2'59
Worksop (Hodsock Priory).	Nottinghamshire.....	53 22	1 5	56	2'06	2'52
Macclesfield.....	Cheshire.....	53 15	2 7	501	2'85	3'64
Southport (Hesketh Park)..	Lancashire.....	53 38	2 59	38	2'26	2'31
Wetherby (Ribston Hall) ...	Yorkshire, W.R.....	53 59	1 24	130	2'17	3'60
Arnccliffe Vicarage	".....	54 8	2 6	732	3'63	4'84
Hull (Pearson Park)	"..... E.R.....	53 45	0 20	6	2'09	3'15
Newcastle (Town Moor) ..	Northumberland.....	54 59	1 38	201	2'04	4'62
Borrowdale (Seathwaite) ...	Cumberland.....	54 30	3 10	423	6'94	10'74
Cardiff (Ely).....	Glamorgan.....	51 29	3 13	53	2'55	2'13
Haverfordwest.....	Pembroke.....	51 48	4 58	95	2'74	2'42
Aberystwyth (Gogerddan)..	Cardigan.....	52 26	4 1	83	2'97	3'34
Llandudno.....	Caernarvon.....	53 20	3 50	72	1'97	2'63
Cargen [Dumtries]	Kirkcudbright.....	55 2	3 37	80	2'84	4'24
Marchmont House	Berwick.....	55 44	2 24	498	2'38	5'11
Girvan (Pinmore).....	Ayr.....	55 10	4 49	207	3'04	3'62
Glasgow (Queen's Park) ..	Renfrew.....	55 53	4 18	144	2'41	2'03
Inveraray (Newtown)	Argyll.....	56 14	5 4	17	3'64	3'91
Mull (Quinish).....	".....	56 34	6 13	35	3'30	2'62
Dundee (Eastern Necropolis)	Forfar.....	56 28	2 57	199	2'06	'88
Braemar.....	Aberdeen.....	57 0	3 24	1114	2'18	1'91
Aberdeen (Cranford)	".....	57 8	2 7	120	2'02	2'29
Cawdor.....	Nairn.....	57 31	3 57	250	2'13	2'99
Fort Augustus (S. Benedict's)	E. Inverness.....	57 9	4 41	68	2'07	1'94
Loch Torridon (Bendamph)	W. Ross.....	57 32	5 32	20	4'07	5'42
Dunrobin Castle.....	Sutherland.....	57 59	3 56	14	2'10	1'04
Wick.....	Cuithness.....	58 26	3 6	77	1'83	3'19
Killarney (District Asylum)	Kerry.....	52 4	9 31	178	2'92	4'01
Waterford (Brook Lodge)...	Waterford.....	52 15	7 7	104	2'79	3'46
Nenagh (Castle Lough).....	Tipperary.....	52 54	8 24	120	2'70	2'39
Miltown Malbay.....	Clare.....	52 52	9 26	400	3'12	2'33
Gorey (Courtown House) ..	Wexford.....	52 40	6 13	80	2'59	1'43
Abbey Leix (Blandsfort)...	Queen's County.....	52 56	7 17	532	2'58	1'72
Dublin (Fitz William Square)	Dublin.....	53 21	6 14	54	2'00	1'74
Mullingar (Belvedere)	Westmeath.....	53 29	7 22	367	2'72	3'04
Ballinasloe.....	Galway.....	53 20	8 15	160	2'69	2'29
Crossmolina (Enniscoe).....	Mayo.....	54 4	9 18	74	3'17	3'37
Collooney (Markree Obsy.).	Sligo.....	54 11	8 27	127	3'11	2'27
Seaforde.....	Down.....	54 19	5 50	180	2'88	2'83
Bushmills (Dundarave)	Antrim.....	55 12	6 30	162	2'56	2'41
Omagh (Edenfel).....	Tyrone.....	54 36	7 18	280	2'82	2'42

RAINFALL TABLE FOR JUNE, 1911—*continued.*

RAINFALL OF MONTH (con.)					RAINFALL FROM JAN. 1.				Mean Annual 1875- 1909.	STATION.	
Diff. from Av. in.	% of Av.	Max. in 24 hours.		No. of Days	Aver. 1875- 1909. in.	1911. in.	Diff. from Aver. in.	% of Av.			
		in.	Date.						in.		
+	41	118	92	23	11	10·96	10·88	—	08	99	Camden Square
—	10	95	71	23	12	11·44	9·71	—	1·73	85	Tenterden
—	23	89	76	23	10	12·46	10·06	—	2·40	81	Patching
+	17	108	56	16	11	13·31	10·68	—	2·63	80	Cadland
—	19	48	23	24	11	10·60	7·87	—	2·73	74	Oxford
—	48	77	69	23	11	11·14	8·68	—	2·46	78	Croyland Abbey
+	20	111	130	23	9	8·00	7·18	—	82	90	Shoeburyness
+	88	140	129	23	14	10·76	10·28	—	48	96	Westley
+	48	127	62	23	12	9·61	9·08	—	53	94	Geldeston
+	99	191	99	1	16	15·88	13·62	—	2·26	86	Polapit Tamar
—	56	74	49	16	12	14·33	9·87	—	4·46	69	Rousdon
+	44	118	88	24	12	13·08	10·01	—	3·07	77	Stroud
+	39	115	88	17	10	14·30	10·83	—	3·47	76	Wolstaston.
—	51	80	47	24	13	12·75	7·84	—	4·91	61	Coventry
+	64	133	116	23	15	9·86	8·48	—	1·38	86	Boston
+	46	122	113	24	9	10·80	6·78	—	4·02	63	Hodsock Priory
+	79	128	139	24	14	14·76	13·19	—	1·57	89	Macclesfield
+	05	102	88	24	14	12·96	11·14	—	1·82	86	Southport
+	143	166	126	24	13	11·63	10·51	—	1·12	90	Ribston Hall
+	121	133	116	24	16	27·22	34·50	+	7·28	127	Arneliffe
+	106	151	103	24	16	11·08	9·89	—	1·19	89	Hull
+	258	227	207	24	14	11·55	11·50	—	05	100	Newcastle
+	380	155	254	21	15	56·38	69·94	+	13·56	124	Seathwaite
—	42	84	74	29	11	17·22	15·54	—	1·68	90	Cardiff
—	32	88	79	24	10	19·45	16·89	—	2·56	87	Haverfordwest.
+	37	112	81	18	14	18·12	17·21	—	91	95	Gogerddan
+	66	134	127	24	15	12·37	10·18	—	2·19	82	Llandudno
+	140	149	144	17	11	19·06	21·82	+	2·76	114	Cargen
+	273	215	271	24	11	14·38	13·54	—	84	94	Marchmont
+	58	119	85	24	16	21·10	21·93	+	83	104	Girvan
—	38	84	58	17	8	15·51	17·06	+	1·55	110	Glasgow
+	27	107	136	21	15	29·32	38·91	+	9·59	133	Inveraray
—	68	79	112	21	14	23·55	25·56	+	2·01	108	Quinish
—	18	43	22	17	11	12·02	5·33	—	6·69	45	Dundee
—	27	88	...	...	...	15·15	13·25	—	1·90	88	Braemar
+	27	113	145	24	14	14·02	10·88	—	3·14	78	Aberdeen
+	86	140	170	24	6	12·51	12·46	—	05	100	Cawdor
—	13	94	38	21	16	20·22	19·85	—	37	98	Fort Augustus
+	135	133	162	21	18	37·39	44·65	+	7·26	119	Bendampf
—	06	50	43	24	9	14·28	12·85	—	1·43	90	Dunrobin Castle
+	136	174	118	24	15	12·71	13·38	+	67	105	Wick
+	109	137	146	18	16	24·87	21·57	—	3·30	87	Killarney
+	67	124	122	16	12	17·40	13·97	—	3·43	80	Waterford
—	31	89	83	2	13	17·51	14·60	—	2·91	83	Castle Lough
—	79	75	65	16	16	18·71	15·57	—	3·14	83	Miltown Malbay
—	16	55	70	16	8	15·42	9·67	—	5·75	63	Courtown Ho.
—	86	67	49	19	15	15·84	13·21	—	2·63	83	Abbey Leix
—	26	87	41	16	12	12·15	7·73	—	4·42	64	Dublin
+	32	112	73	17	12	16·01	15·45	—	56	97	Mullingar
—	40	85	82	19	14	16·15	14·95	—	1·20	93	Ballinasloe
+	20	106	72	2	15	23·38	19·26	—	4·12	82	Enniscoe
—	84	73	51	21	16	18·83	15·43	—	3·40	82	Markree
—	05	98	84	22	11	17·42	13·80	—	3·62	79	Seaforde
—	15	94	90	17	11	15·49	12·85	—	2·64	83	Dundarave
—	40	86	50	21	14	17·10	15·30	—	1·80	89	Omagh

SUPPLEMENTARY RAINFALL, JUNE, 1911.

Div.	STATION.	Rain inches	Div.	STATION.	Rain. inches
II.	Warlingham, Redvers Road	2.33	XI.	Lligwy	2.26
„	Ramsgate	1.66	„	Douglas .....	...
„	Hailsham	2.21	XII.	Stoneykirk, Ardwell House	3.25
„	Totland Bay, Aston House.	1.48	„	Dalry, The Old Garroch ...	2.78
„	Stockbridge, Ashley	1.98	„	Langholm, Drove Road.....	3.15
„	Grayshott	2.09	„	Beattock, Kinnelhead.....	4.10
„	Reading, Calcot Place.....	1.86	XIII.	St Mary's Loch, Cramilt Ldge	3.06
III.	Harrow Weald, Hill House.	2.27	„	North Berwick Reservoir ...	2.34
„	Pitsford, Sedgebrook	1.47	„	Edinburgh, Royal Observty.	2.50
„	Somersham Vicarage.....	1.72	XIV.	Maybole, Knockdon Farm..	3.13
„	Woburn, Milton Bryant.....	...	XV.	Campbeltown, Witchburn...	2.23
IV.	Colchester, Lexden.....	2.23	„	Glenreadell Mains.....	1.95
„	Newport	2.65	„	Holy Loch, Ardnadam.....	4.23
„	Rendlesham	1.68	„	Ballachulish House.....	2.05
„	Swaffham	4.69	„	Islay, Ballabus	1.92
„	Blakeney	2.67	XVI.	Dollar Academy .....	...
V.	Bishops Cannings	1.84	„	Balquhider, Stronvar	4.74
„	Winterbourne Steepleton ...	2.10	„	Coupar Angus .....	.72
„	Ashburton, Druid House ..	2.98	„	Glenlyon, Meggernie Castle.	2.98
„	Okehampton, Oaklands.....	3.64	„	Blair Atholl	1.75
„	Cullompton	2.22	„	Montrose, Sunnyside Asylum	1.25
„	Hartland Abbey	2.76	XVII.	Alford, Lynturk Manse ...	2.38
„	Lynmouth, Rock House ...	3.44	„	Fyvie Castle.....	3.55
„	Probus, Lamellyn	2.54	„	Keith Station	3.55
„	North Cadbury Rectory ...	2.08	XVIII.	Glenquoich, Loan	9.10
VI.	Clifton, Pembroke Road ...	3.09	„	Skye, Dunvegan.....	3.02
„	Ross, The Graig	1.09	„	N. Uist, Lochmaddy .....	...
„	Shifnal, Hatton Grange.....	2.52	„	Alvey Manse	1.69
„	Blockley, Upton Wold	2.27	„	Loch Ness, Drumnadrochit.	3.49
„	Droitwich	1.39	„	Glencarron Lodge	5.45
VII.	Market Overton.....	1.90	XIX.	Invershin	1.43
„	Market Rasen	3.42	„	Loch Stack, Ardchullin.....	4.07
„	Bawtry, Hesley Hall.....	2.76	„	Melvich.....	2.79
„	Derby, Midland Railway ...	2.35	XX.	Skibbereen Rectory.....	2.26
„	Buxton	2.88	„	Dunmanway, The Rectory..	2.21
VIII.	Nantwich, Dorfold Hall.....	2.44	„	Cork	2.94
„	Chatburn, Middlewood	4.52	„	Mitchelstown Castle	3.09
„	Cartmel, Flookburgh	3.05	„	Darrynane Abbey	2.47
IX.	Langsett Moor, Up. Midhope	3.41	„	Glenam [Clonmel]	1.77
„	Scarborough, Scalby	4.49	„	Newmarket-on-Fergus, Fenloe	2.26
„	Ingleby Greenhow	4.48	XXI.	Laragh, Glendalough	3.44
„	Mickleton	2.54	„	Balbriggan, Ardgillan.....	3.09
X.	Bellingham, High Green Manor	3.94	„	Moynalty, Westland .....	...
„	Ilderton, Lilburn Cottage... 5.44	6.21	XXII.	Cong, The Glebe	2.89
„	Keswick, The Bank	2.35	„	Westport, St. Helens	3.55
XI.	Llanfrecifa Grange.....	6.30	„	Achill Island, Dugort	3.11
„	Treherbert, Tyn-y-waun ...	3.84	„	Mohill	1.60
„	Carmarthen, The Friary....	3.20	XXIII.	Enniskillen, Portora	1.55
„	Castle Malgwyn [Llechryd].	8.20	„	Dartrey [Cootehill].....	2.17
„	Plynlimon.....	2.66	„	Warrenpoint, Manor House	2.72
„	New Radnor, Ednol	4.76	„	Banbridge, Milltown	2.29
„	Rhayader, Tyrmynydd	3.82	„	Belfast, Cave Hill Road.....	1.68
„	Lake Vyrnwy	3.82	„	Glenarm Castle.....	2.39
„	Llangyhanfal, Plâs Draw....	3.20	„	Londonderry, Creggan. Res.	2.34
„	Dolgelly, Bryntirion	3.70	„	Killybegs	2.73
„	Bettws-y-Coed, Tyn-y-bryn	...	„	Horn Head ...	2.07

METEOROLOGICAL NOTES ON JUNE, 1911.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow; F for number of days Frost in Screen; f on Grass.

LONDON, CAMDEN SQUARE.—Beautiful sunny and dry weather prevailed in the first half, accompanied by high temp. in the first week, 80° being exceeded on 5 days. In the latter half fair weather predominated, but with a good deal of R. Duration of sunshine 193·3* hours, and of R 39·6 hours. Mean temp. 61°·4 or 1°·1 above the average. Evaporation 3·34 in. The shade max., 87°·6 on 5th, was the highest temp. registered since 3rd September, 1906; min. 41°·8 on 15th. F 0, f 0.

TENTERDEN.—Warm and sunny till 9th; then a week of cold nights and the rest of the month mostly dull, especially in the mornings. Duration of sunshine 226·0† hours. Shade max. 82°·0 on 5th; min. 38°·0 on 14th. F 0, f 0.

TOTLAND BAY.—Duration of sunshine 261·0* hours, or 50·6 hours above the average. Shade max. 80°·2 on 6th; min. 42°·1 on 11th. F 0, f 0.

COLCHESTER, LEXDEN.—Very cool after the first 6 days of heat. An absolute drought of 16 days ended on 13th, and a partial drought of 32 days with ·07 in. of R ended on 16th.

HARTLAND ABBEY.—Very hot and dry weather in the first half of the month following 20 dry days in May, making 34 days without R. T was heard several times but without R.

ROSS.—Shade max. 82°·6 on 8th; min. 39°·0 on 15th. F 0, f 0.

HODSOCK PRIORY.—The long dry period which had lasted from the beginning of the year was brought to a close by a TS on 17th, followed by a splendid R on 23rd and 24th, which was most welcome, though rather late for corn and hay. Shade max. 82°·6 on 5th; min. 34°·0 on 15th. F 0, f 4.

SOUTHPORT.—Duration of sunshine 238·6* hours, and of R 45·8 hours. Mean temp. 57°·4, or 0°·5 above the average. Shade max. 81°·4 on 1st; min. 37°·8 on 10th. F 0, f 3.

HULL.—Fine and dry to 12th. Afterwards cloudy with welcome showers to the end of month. About 30 hours R on 23rd and 24th. Shade max. 81°·0 on 8th; min. 55°·0 on 13th. F 0, f 0.

HAVERFORDWEST.—Very warm to 10th, but cold afterwards with moderate R. Duration of sunshine 261·0* hours. Shade max. 79°·3 on 8th; min. 40°·3 on 15th.

LLANDUDNO.—Shade max. 80°·2 on 1st; min. 43°·0 on 15th.

CARGEN.—A dry spell lasting for 33 days ended on 15th and was followed by two consecutive days of heavy R, 2·21 in. being registered on 16th and 17th. The temp. of the first 8 days was very high, the shade max. averaging 80°, but during the rest of the month it only once reached 70°. Shade max. 81°·0 on 1st; min. 36°·5 on 15th. F 0.

EDINBURGH.—Shade max. 77°·9 on 7th; min. 39°·4 on 14th. F 0, f 0.

COUPAR ANGUS.—The sixth successive month with deficient R. The high temp. of May continued during the first week when it gave way to cold, dry and barren N. winds, which continued, more or less, to the close. Shade max. 80°·5 on 7th; min. 34°·0 on 16th. F 0, f 0.

FORT AUGUSTUS.—Shade max. 77°·4 on 2nd; min. 35°·1 on 15th. F 0.

CORK.—R ·54 in. above the average. Shade max. 72°·0 on 2nd; min. 45°·0 on 20th. F 0, f 0.

DUBLIN.—An absolute drought began on May 16th, and lasted until June 14th. After that date the weather was unsettled, cool, cloudy and showery. Mean temp. 58°·4, or 0°·5 above the average. Shade max. 72°·9 on 2nd; min. 43°·0 on 15th. F 0, f 0.

MARKREE.—Shade max. 78°·4 on 8th; min. 30°·8 on 14th. F (?), f 4.

WARRENPOINT.—Shade max. 71°·0 on 1st and 7th; min. 45°·0 on 13th. F 0, f 0.

* Campbell-Stokes.

† Jordan.

Climatological Table for the British Empire, January, 1911.

STATIONS (Those in italics are South of the Equator.)	Absolute.				Average.				Absolute.		Total Rain		Aver. Cloud.
	Maximum.		Minimum.		Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	
	Temp.	Date.	Temp.	Date.									
London, CamdenSquare	52 ¹	26	25 ⁶	14	42 ⁴	34 ⁶	36 ⁰	90	78 ¹	22 ⁰	1 ³⁸	12	7.8
Malta	62 ²	15	43 ⁰	4	56 ⁸	49 ⁹	46 ⁹	82	123 ⁰	...	4 ⁸⁷	17	6.7
Lagos	89 ⁰	26	65 ⁰	27	85 ¹	67 ⁵	72 ³	72	141 ⁰	62 ⁰	4 ⁵⁷	3	...
Cape Town	92 ⁴	29	54 ⁵	18	78 ³	61 ⁶	62 ²	71	...	...	6 ³	4	3.5
Durban, Natal ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Johannesburg	82 ³	28	48 ⁰	19	76 ²	55 ³	57 ²	79	151 ³	46 ⁴	5 ⁷³	14	4.3
Mauritius	87 ⁶	30*	68 ⁷	15	85 ³	72 ³	71 ⁴	80	165 ³	62 ⁴	8 ⁰⁹	21	6.5
Calcutta... ..	86 ⁵	27	48 ⁰	29	81 ⁷	58 ⁷	57 ⁶	66	...	40 ⁶	0 ²	1	1.7
Bombay... ..	90 ⁷	22	61 ³	28	83 ⁰	69 ⁵	65 ²	71	132 ⁹	53 ⁴	0 ⁶	2	1.9
Madras	89 ⁵	28	63 ¹	30	85 ⁸	67 ⁹	67 ³	76	138 ¹	58 ⁹	...	...	2.4
Kodaikanal ... ..	...	...	...	...	...	...	...	...	...	...	...	...	...
Colombo, Ceylon	89 ⁷	21	66 ⁴	13	86 ⁵	70 ⁸	70 ⁵	78	137 ⁷	63 ²	5 ⁴⁷	11	4.6
Hongkong	74 ⁴	5	47 ⁵	19	63 ¹	55 ⁵	51 ²	74	117 ⁸	...	7 ⁴	6	6.6
Sydney	94 ⁰	7	61 ⁸	25	75 ⁹	64 ⁷	60 ⁵	71	148 ⁵	55 ⁴	15 ²⁶	24	7.1
Melbourne	96 ⁷	5	51 ⁰	10	77 ⁶	57 ⁸	53 ⁰	59	158 ⁴	45 ¹	1 ³	7	4.9
Hobart, Tasmania	89 ⁸	5	43 ²	21	70 ⁴	52 ⁵	48 ⁷	67	148 ⁰	40 ⁰	4 ⁴	8	5.0
Adelaide	100 ⁵	23	52 ³	20	85 ⁹	63 ⁷	52 ⁷	47	162 ¹	44 ⁰	1 ⁷	2	2.9
Perth	97 ⁵	17	56 ⁰	5	83 ⁹	62 ⁷	58 ¹	61	152 ⁹	45 ⁹	...	...	2.6
Coolgardie	108 ⁶	25	51 ²	11	95 ⁸	64 ⁸	51 ⁸	43	176 ⁰	50 ⁰	2 ¹	3	3.5
Wellington	76 ⁰	24	47 ²	15	68 ³	56 ⁰	52 ⁸	72	127 ⁰	41 ⁰	2 ⁹⁹	8	7.0
Auckland	80 ⁰	22	52 ⁰	14	73 ⁸	58 ⁷	61 ⁷	85	148 ⁰	49 ⁰	1 ²⁵	8	4.5
Jamaica, Kingston	90 ¹	1	62 ⁷	11	86 ⁶	66 ⁴	64 ⁹	75	...	...	1 ³	6	3.6
Grenada	84 ⁰	8	69 ⁰	†	81 ⁰	71 ²	65 ³	73	140 ⁰	...	5 ⁰⁰	28	5.0
Toronto	44 ¹	2	—1 ⁷	16	33 ⁰	18 ⁸	...	...	50 ⁷	—4 ⁷	2 ⁰⁸	19	7.1
Fredericton	48 ²	2, 3	—31 ⁰	18	25 ⁹	—0 ⁵	...	85	...	...	3 ⁴⁵	11	5.7
St. John, N.B.	47 ⁰	2, 3	—14 ⁰	17	31 ⁷	11 ²	...	77	...	...	3 ²⁹	17	5.6
Victoria, B.C.	50 ²	6	14 ⁹	13	39 ⁹	32 ⁵	...	89	...	...	4 ³⁰	22	9.0
Dawson	2 ⁰	4	—62 ⁰	25	—29 ²	—41 ⁰	...	...	...	...	1 ⁵²	12	8.7

* and 31. † Several.

MALTA.—Mean temp. of air 52°·7. Average bright sunshine 5·6 hours per day.

Johannesburg.—Bright sunshine 267·5 hours.

Mauritius.—Mean temp. of air 0°·4, dew point 1°·1, and R 48 in., above averages. Mean hourly velocity of wind 7·3 miles, or 2·3 below average.

COLOMBO.—Mean temp. of air 76°·5, or 2°·5 below, of dew point 0°·1 below, and R 2·00 in. above, averages. Mean hourly velocity of wind 6·8 miles. TSS on 5 days.

HONGKONG.—Mean temp. of air 58°·9, or 1°·2 below, R 72 in. below, averages. Bright sunshine 139·2 hours. Mean hourly velocity of wind 13·7 miles.

Sydney.—Mean temp. of air 1°·3 below, and R 11·59 in., above, averages.

Melbourne.—Mean temp. of air 0°·2 above, and R 59 in. below, averages.

Hobart.—Mean temp. of air 0°·6 and R 1·41 in. below averages.

Adelaide.—Mean temp. of air 0°·6 above, R 59 in. below, averages.

Perth.—Mean temp. of air 0°·2, and R 39 in. below averages.

Coolgardie.—Mean temp. of air 3°·3 above, and R 18 in. below averages.

Wellington.—Mean temp. of air 0°·3, and R 39 in. below, averages. Bright sunshine 279·5 hours.

Auckland.—Dry month. R considerably under average of 44 years, and temp. slightly under average.

JAMES J. HICKS

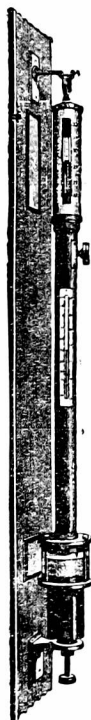
Meteorological & Scientific Instruments

MANUFACTORY:—

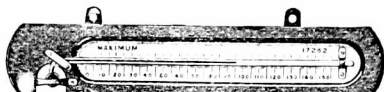
8, 9 & 10, HATTON GARDEN, LONDON, E.C.

Awarded Grand Prix Franco-British Exhibition, 1908; Nine Medals at the Paris Exhibition, 1900; London, 1862; Paris, 1867; London, 1885; Philadelphia, 1876; Rio de Janeiro, 1909.

Standard "Fortin" Barometers.
Standard Mercurial Thermometers.
Standard Maximum Thermometers.
Standard Minimum Thermometers.
Standard Mason's Hygrometers.
Standard "Solar Maximum" Thermometers.
Standard Terrestrial Radiation Thermometers.
Standard "Earth Temperature" Thermometers.
Standard Symons's Rain Gauges.
Standard Meteorological Office Rain Gauges.
Standard Sunshine Recorders.
Improved Beckley Anemometers.
Improved Beckley Self-Recording Rain Gauge.
Self-Registering Aneroid Barometers.
Self-Registering Mercurial Barometers.
Meteorological Office Thermometer Screens.
Mountaineering Aneroid Barometers.
Aneroid Barometers.



STANDARD BAROMETER, diameter of Tube, 0.5 in., on Mahogany Board.



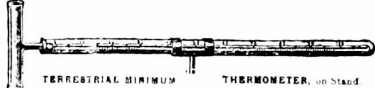
STANDARD MAXIMUM THERMOMETER, in Oak Frame, Tube divided on Stem, figured on Opal Glass Scale.



STANDARD MINIMUM THERMOMETER, in Oak Frame, Tube divided on Stem, figured on Opal Glass Scale.



MAXIMUM THERMOMETER, Black Bulb in Vacuum, on Stand.



TERRESTRIAL MINIMUM THERMOMETER, on Stand.

BECKLEY



RAIN GAUGE.



CAMPBELL-STOKES
SUNSHINE RECORDER,
With Curtis's Improvements.

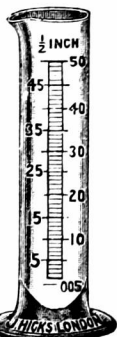
As supplied to the Meteorological Office for the Standard Pattern, and noted on S.S. "Discovery," National Antarctic Expedition, 1901.

NEW OBSERVATORY CERTIFICATES SUPPLIED IF DESIRED.

WILSON'S PATENT RADIO-INTEGRATOR.

THE "CAMDEN" Pattern

RAIN



GLASS

Price
2s. 6d.

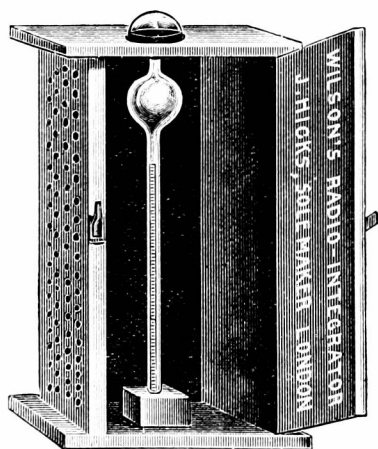
Not
Verified

Price
3s. 6d.

Verified.

Designed by
the late
DR. W. E.
WILSON, F.R.S.,
to record the
total amount of
Solar Radiation
daily received
by the ground.

Sole Maker—
J. J. HICKS.



Special Prices are given to Fellows of all Scientific Societies.

(v.)



A Monthly Record of Science in all its Branches.

Each number consists of at least forty large quarto pages of Articles and Notes, by Authorities in their respective subjects.

Profusely Illustrated.

CONTENTS OF JULY ISSUE

On Loading Telephone Cables.—Plant Hairs.—The Goldschmidt Reaction.—The Political importance of Astronomy as a Peace Promoter.—Radio-Active Recoil.—Spring and Summer Shooting Stars.—An Antediluvian Zoological Garden.—On drawing Ellipses.—A Notable Record: Capture of a New Species of Mymar.—Unique American Steam Motor Car.—Solar Disturbances during May, 1911.—The Face of the Sky for the Month.—Notes (Astronomy; Botany; Chemistry; Geology; Meteorology; Ornithology; Photography; Physics; Zoology).—**Microscopy.**—Reviews of Books.—Correspondence.—Queries & Answers.—&c.

THROUGH ANY BOOKSELLER.

MONTHLY—ONE SHILLING, net.

Annual Subscription, **15/-**, post free anywhere.

Offices: **42, BLOOMSBURY SQUARE, LONDON.**

THE OBSERVATORY:

A Monthly Review of Astronomy.

EDITED BY

H. P. HOLLIS, B.A., F.R.A.S., AND T. LEWIS, F.R.A.S.

~~~~~

Contains full Reports of the Meetings of the Royal Astronomical and Royal Meteorological Societies, and of the British Astronomical Association; Articles by various eminent Astronomers, English, American and Continental; Correspondence on topics of interest connected with the Science; Notices of Observatories, Publications and current Discoveries. The "Oxford Note Book" is a special feature of the Magazine.

*The Observatory* was founded in 1877, and has become an established and very valuable publication.—*Prof. Young*, in "*Ten Years' progress in Astronomy.*"

Annual Subscription (for the "Companion" and twelve Monthly Numbers), 13s.

*All communications should be addressed to the Editors of "The Observatory,"*  
*Royal Observatory, Greenwich, S. E.*



# Royal Geographical Society's Publications.

---

## THE GEOGRAPHICAL JOURNAL.

Monthly. Illustrated. Edited by the Secretary. Price (to non-Fellows), 2s.

## HINTS TO TRAVELLERS.

Edited for the Council of the Royal Geographical Society by E. A. REEVES, F.R.G.S., F.R.A.S. Ninth Edition, revised and enlarged. In two volumes, illustrated. Price 15s. net. (To Fellows at the Office of the Society, 10s. net).

Vol. I.—Surveying and Practical Astronomy.

Vol. II.—Meteorology and Climate (by DR. H. R. MILL);  
Photography, Geology, Natural History, Anthropology, Industry and Commerce, Medical Hints, &c.

## THE DISTRIBUTION OF RAINFALL OVER THE LAND.

By DR. A. J. HERBERTSON. With monthly maps of Rainfall. Price 5s. net. (To Fellows, 2s. 6d.)

## ON THE RESULTS OF A DEEP-SEA SOUNDING EXPEDITION,

In the North Atlantic in the summer of 1899, by R. E. PEAKE, M.Inst.C.E.; with notes on Temperature, Deep-Sea Deposits, &c., by SIR JOHN MURRAY, K.C.B., F.R.S. *Charts.* Price 5s. net. (To Fellows, 2s. 6d.)

## THE ANTARCTIC MANUAL,

For the use of the Expedition of 1901. Edited by GEORGE MURRAY, F.R.S., 1901. Pp. 586. *With a new chart of the Antarctic Regions.* Price, 15s. (To Fellows, 10s.)

~~~~~  
ROYAL GEOGRAPHICAL SOCIETY, 1, Savile Row, W.
AND ALL BOOKSELLERS.

RATES FOR ADVERTISEMENTS IN THIS MAGAZINE.

		One Insertion.	Six Insertions.	Twelve Insertions.	
WHOLE PAGE	...	30/-	26/-	22/6	} All Net.
HALF	„	16/6	14/6	12/6	
QUARTER	„	9/-	8/-	7/-	
EIGHTH	„	5/-	4/6	4/-	

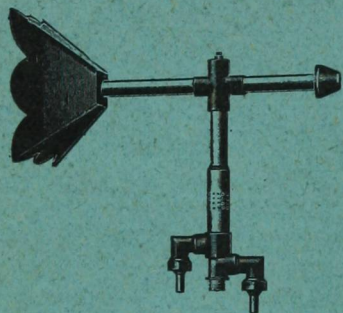
All applications for space to be made to

MR. H. A. COLLINS, 32, BIRDHURST ROAD, CROYDON

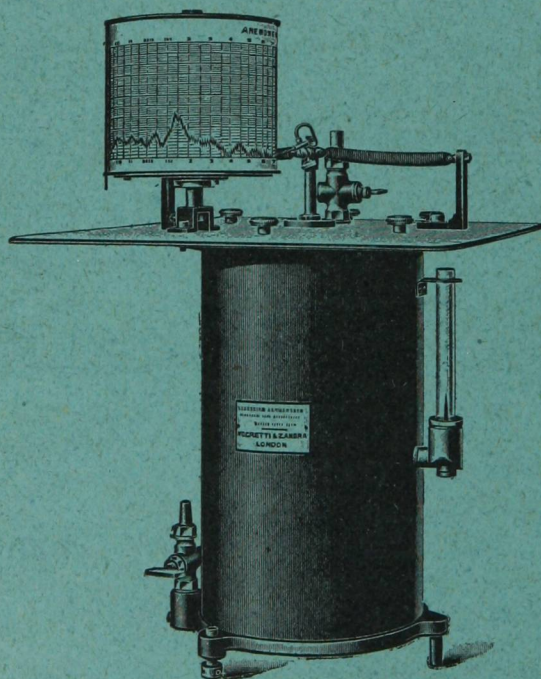
The ANEMO-BIAGRAPH.

(Wind Force Recorder.)

HALLIWELL-DINES PRINCIPLE.



PATENT
No. 21973,
1910.



Price £20 . 0 . 0.

FULL PARTICULARS POST FREE on application to the
SOLE MAKERS:

NEGRETTI & ZAMBRA,
Scientific Instrument Makers,
38, HOLBORN VIADUCT, E.C.

Branches: 45, CORNHILL, E.C., and
122, REGENT STREET, W., LONDON.

Telegraphic Address: "NEGRETTI, LONDON."

Telephone No. 583 HOLBORN.

SHIELD & SPRING, Lancelot Place, Brompton Road, S.W.