SYMONS'S

MONTHLY

METEOROLOGICAL MAGAZINE.

CCXXI.] JUNE, 1884. [PRICE FOURPENCE, *or 5s. per ann. post free.*

EASTER AT THE SORBONNE.

THE gatherings at Paris this year have been overshadowed by a loss which is one not merely to France but to Science. Though M. Dumas had passed beyond the allotted fourscore years, his mind was still clear; it is but a short time since he delivered an address lasting an hour without a single written note, and his presence and Presidency of the Congress of Electricians had been looked forward to with great interest.

The very morning fixed for the opening of the Sorbonne Réunion had to be appropriated to the obsequies of the great chemist, and it is not often that such a gathering of French savans is possible as was formed round his bier in the Church of Ste. Clothilde.

An attempt was made this year to systematize the communications, and a programme of special subjects for discussion had been prepared and printed. Although we heard little or nothing of the programme, it was by no means a bad one, and may be useful elsewhere or at another time, so we give it here.

Section for the Mathematical, Physical, Chemical and Meteorological Sciences.

1. Studies of the mistral.
2. Observations on earthquakes by registering instruments.
3. Heat lightning: frequency of storms in a single day.
4. Study of phenological phenomena.
5. Of what use, as regards weather forecasting, would be the data furnished by electrical and magnetical observations?
6. Researches on the presence of watery vapour in the atmosphere, made by actinometers and spectroscopes.
7. Comparison of the climates of the south, and of the south-west of France.

In proof of our statement that the programme produced no effect, we subjoin the list of the only papers upon meteorology announced for reading:—

1. M. COULON.—*On a new pluviograph and actinograph.*
2. M. LANGLOIS.—*On a hygrometer giving directly the tension of vapour in the atmosphere.*
3. M. MAC CARTHY.—*On the distribution of rainfall over Algeria.*
4. DR. ROUYER.—*Clouds on the earth's surface.*

Of these only two of the authors attended the meetings, and therefore papers Nos. 3 and 4 were not read. Owing to papers running short on the Thursday afternoon, two extempore communications were made—one by M. Angot and one by M. Renou, of each of which we give a report.

M. RAIMOND COULON.—*Description of a new pluviograph and actinograph.*—M. Coulon began his paper by referring to a popular idea that there is some sort of connection between the tides of the ocean (or at any rate between them when they enter rivers) and the weather experienced on the shores of those rivers. In order to test this, he had designed two instruments, neither aiming at precision, but each intended to give a general notion of the state of the weather. The former was composed of a wheel with buckets at the end of its spokes, and a water pipe from any roof was led over the buckets; therefore, whenever rain was running off the roof, the wheel would turn. Upon the wheel is a stud which, at each revolution, strikes a spring, and thereby completes an electric circuit and draws a pencil about a quarter of an inch along a paper-covered cylinder, which is, by a clock, rotated once in 24 hours; if the rain is very heavy, the lines are too close together to be counted, and as the fall decreases they separate, and thus the amount of shading is roughly proportional to the heaviness of the fall. Thus far the result is not very different from that given by the pattern designed by Dr. Fines, of Perpignan, many years ago. But here we come upon a novelty which may be useful in other cases, and which, therefore, we describe fully.

The paper-covered cylinder is, as we have said, rotated once in 24 hours, but we have also stated that the trace occupies about a quarter of an inch. The paper is, however, about 2½ inches broad, and therefore there is room for 10 traces, each clear of the other; and as the cylinder can be clamped upon its axle in any position, it is merely necessary each day to slide the cylinder a quarter of an inch forward, and thereby ensure that the record shall fall clear of the previous one. Few arrangements could be more handy than this for showing the prevalence, or absence, of periodicity in any phenomenon; for one at once has on a single narrow strip the records of the same instants of civil time precisely under one another. (And the three strips for the 30 days of a month are, when mounted together, not taller than this page). And as regards tidal phenomena, lunar positions, &c., it is merely necessary to plot on the sheets the time of their occurrence each day, and to join them by a strongly marked line, in order to see if any relation exists between the indications of the pluviograph and the phenomena under examination.

M. Coulon, considering that there may be cloudiness and *almost* rain without any indication being given by his pluviograph, has designed an actinograph, which seems to us a more useful instrument than the now fashionable sunshine recorder. The actinograph has several points in common with the pluviograph, the clockwork sliding cylinder, and the dimensions thereof being similar; it is very small, all being contained in an iron box (with ground glass front) about 10 in. by 6 in. by 5 in. The author considered that the choice of a photographic paper should be based upon the facility with which the fixing could be effected by persons not acquainted with photographic manipulation, nor provided with complete apparatus. He had therefore chosen a ferro-prussiate paper, which, while sufficiently sensitive, required for its fixing nothing more elaborate than dipping in a basin of warm water. The author did not appear to have decided whether the window of his actinograph was to be kept turned towards the position of the sun or not—obviously to do so it must be put upon an equatorial mounting with a driving clock. M. Faye, who was presiding, suggested the simpler and more desirable plan of merely exposing the plate to light coming direct from the zenith.

M. LANGLOIS.—*On a hygrometer giving directly the tension of vapour in the atmosphere.*—This was a notice of two arrangements for determining the decrease in the volume of confined atmosphere consequent upon the extraction of its vapour by contact with concentrated sulphuric acid. It was pointed out by M. Angot that this method is by no means new, and that far better and more accurate forms have been invented and described—*e.g.*, Schwackhöfer's and Dines's.

M. LÉON VIDAL.—*On a pocket photographic apparatus.*—This, though not a meteorological paper, claims notice here as a very useful equipment for the inspectors of meteorological stations. M. Vidal produced from his pockets the whole of the apparatus except the tripod stand, which goes in a bamboo scarcely thicker than an ordinary walking stick. M. Vidal claims for the apparatus that it is of far better quality than any of the many small ones yet brought out, and is lighter and more portable than any of them. The dry plates used are $2\frac{1}{2}$ inches by $2\frac{1}{2}$, but the lenses are so good that the photographs will bear considerable enlargement. It is obvious that if this or some similar apparatus of extreme simplicity and portability can be brought out at a moderate price, there should be a considerable demand for it by geologists and physical geographers. Take for instance the sites of some of our rain gauges, and think how much light would be thrown on discordant records by a series of four or six views of the country in different directions as viewed from the gauge. We have in our mind one instance in which the shape of some hills raises the mean annual rainfall, at absolutely the same elevation, from 66 to 100.

At the request of M. Faye,

M. RENOU, gave a brief abstract of his recent investigation into *The relation of the amount of cloud to that of the daily oscillation of the barometer.*—M. Renou began by stating that inasmuch as the hour of both the morning maximum and the afternoon minimum of atmospheric pressure varied with the seasons, the true amplitude was not that between the mean for any two constant hours, but between the hours of highest and lowest mean for each month, assuming, of course, that hourly values alone were being dealt with. He said that at the observatory at Parc St. Maur, in the suburbs of Paris, the mean time of the morning maximum was 8 a.m. in the summer and nearly 11 a.m. in the winter, and the time of afternoon minimum about 5 p.m. in summer, and between 2 and 3 p.m. in winter. M. Renou stated that the amount of the daily oscillation rose from a minimum in November to a maximum in April, and that the curve of the amount of cloud ran almost parallel with it, but in the reverse direction, the decrease of cloud agreeing with increase of barometric range. But there was one remarkable fact, namely that the cloud curve was a month later than the range curve, so that the minimum of cloud fell in May and the maximum in December. M. Renou said that it was very important to make such comparisons for long periods, but at present there were few stations for which hourly records of the amount of cloud as well as of barometric pressure had been published.

M. ANGOT, being also called upon by M. Faye, gave a brief abstract of the report of phenological phenomena in France, which is about to appear in one of the volumes of the *Bureau Central Météorologique.* In a country like France embracing not only a considerable area, but also land differing greatly in altitude, and with about 1500 observers, it soon became evident that curves representing phenological records would really be almost orographical ones. M. Angot therefore found himself confronted by the necessity of determining the nature and amount of correction required by stations at heights of 300 feet and upwards.

As regards plants he found that each 82 ft. of additional altitude above sea level caused a lateness of one day in the leafing, flowering, &c., and M. Angot exhibited to the meeting two maps, one in which the observations were entered as recorded, the other in which they had been corrected for the altitude of the various stations. The necessity for applying some correction of this kind is indisputable, the only uncertainty is as to its amount, and M. Angot's maps seem to show that he has reached it very nearly. Possibly it will eventually be found that the correction varies, according to the inclination of the ground, *e.g.*, that stations open to the south require corrections of 150 ft. for each day, and those on northern slopes of 50 ft. for each day. Soil also will probably have its effect, but these are minor details to be worked out subsequently.

As regards the arrival and departure of migratory birds, M. Angot finds a correction to be also necessary, but not so large a one as for plants. Birds seem to arrive one day later for each 164 ft., and to depart one day earlier for each 328 ft.

ROYAL METEOROLOGICAL SOCIETY.

THE usual monthly meeting of this Society was held on Wednesday evening, April 16th, at the Institution of Civil Engineers, 25, Great George Street, Mr. J. K. Laughton, M.A., F.R.A S., Vice-President, in the chair; Messrs. J. Y. Davidson and T. Wright were elected Fellows of the Society.

The following papers were read :—

(1.) "On the origin and course of the Squall which capsized H.M.S. *Eurydice*, March 24th, 1878," by the Hon. Ralph Abercromby, F.R. Met. Soc. It will be remembered that the *Eurydice*, which was a full-rigged corvette, when passing Ventnor, in the Isle of Wight, running free before a westerly wind, with all sails set, was struck by a sudden squall from the north-west; and before sail could be shortened, she went on her beam ends, and the lee ports being open, she filled and foundered. The author has investigated the character of the weather preceding and following the day in question, and finds that the squall was one belonging to the class which is associated with the trough of V-shaped depressions. This squall, which originated in the north of England, swept across the Isle of Wight at a rate of about 38 miles an hour. The V-depression was of an uncommon class, in which the rain occurs after the passage of the trough, and not in front of it, as is usually the case. The weather generally for March 24th was unusually complex, and of exceptional intensity, and for this reason some of the details of the changes cannot be explained. [For another paper on this subject with two maps see *Met. Mag.*, Vol. XIII., p. 33. ED.]

(2.) "Waterspouts and their formation," by Captain J. W. C. Martyr.

(3.) "The Weather Forecasts for October, November and December, 1883," by C. E. Peek, M.A., F.R. Met. Soc. This is a comparison of the weather indicated in the Forecasts of the Meteorological Office with that actually experienced at Rousdon, in Dorset.

(4.) "On certain effects which may have been produced in the atmosphere by floating particles of volcanic matter from the eruptions of Krakatoa and of Mount St. Augustin," by W. F. Stanley, F.R. Met. Soc. The author having obtained specimens of volcanic dust from Krakatoa, which was collected on board some vessels in the neighbourhood of the eruption, and having examined them under the microscope, is of opinion that such dust, suspended in the atmosphere, was quite capable of producing the recent remarkable sunrises and sunsets and other effects.

At the meeting on May 21st, Mr. R. H. Scott, F.R.S., President, in the chair, Captain W. W. Hampton and C. D. F. Phillips, M.D., F.R.C.S., F.R.S.E., were elected Fellows of the Society.

The following papers were read :—

(1.) "Notes on the Proceedings of the International Polar Conference, held at Vienna, April 17th to 24th, 1884," by R. H. Scott, F.R.S., President. This Conference was held to welcome the several expeditions on their return from the Arctic regions, and to discuss the best mode of utilizing their labours.

(2.) "Meteorological Observations on the Maloja Plateau, Upper Engadine, 6,000 feet above the Sea," by Dr. A. T. Wise, F.R. Met. Soc. The Maloja Plateau is situated at the higher extremity of the Upper Engadine, and is protected from northerly, easterly and southerly winds. The author gives some account of the meteorology of this plateau, and also the observations made during the four months, November, 1883, to February, 1884.

(3.) "On some Results of an examination of the barometric variations in Western India," by A. N. Pearson, F.R. Met. Soc.

(4.) "Illustrations of the mode of taking meteorological averages by the method of weighing paper diagrams," by R. Inwards, F.R. Met. Soc., F.R.A.S.

(5.) "Ten Years' Weather in the Midlands," by Rupert T. Smith, F.R. Met. Soc.

VISITATION DAY AT GREENWICH.

EVERYBODY does not know what the above implies, we therefore preface our usual extract from the Astronomer Royal's report, with a brief explanation, the absolute accuracy of which we do not guarantee, but which is as nearly correct as we can make it.

The Royal Observatory was founded in 1675, *i.e.*, in the reign of Charles II., expressly with the object of facilitating the discovery of the longitude at sea, hence naturally the observatory is regarded and charged as a branch of the Admiralty.

On the first Saturday in June of each year, there is a meeting held at the Observatory of a sort of council, called the Board of Visitors, to whom the Astronomer Royal submits a report on the work done during the previous year, and any important proposals which he desires to bring before the Admiralty. This Board of Visitors is almost as venerable an institution as the Observatory itself, for it was in existence in 1748, and how long before that date we are not aware. The Board consists chiefly of *ex-officio* members, *e.g.*, President Royal Society, President Royal Astronomical Society, Hydrographer to the Admiralty, Directors of the Observatories at Cambridge and at Oxford, &c. But besides the actual members of the Board, many leading astronomers and some meteorologists are invited to inspect the observatory, every part of which is on that day thrown open to them. This gathering is that known as visitation day.

The following are the principal paragraphs in the report which deal with meteorology:—

"The meteorological instruments and the Thomson electrometer have been maintained in good order. In the gale of Jan. 23 [1884] the short connecting chain attached to the pressure plate of Osler's anemometer gave way, having perished in course of many years' exposure to the weather. After some delay through our having to wait for a quiet day before the pressure plate could be examined, a new chain was substituted on Feb. 26. The flexible brass chain connecting the external chain with the recording pencil continues to give very satisfactory results.

"A new photographic thermometer apparatus, in which I have arranged that the dry and wet bulb traces shall fall on the same part of the photographic cylinder as regards time-scale, is being made by Messrs. Negretti and Zambra, and, after many delays, is now nearly finished. By means of a long air bubble in the wet-bulb thermometer, with a column of mercury above, the degrees and decades of degrees are registered for this thermometer, just below the trace of the dry-bulb thermometer, and without any interference of the two records. The scale of time for the thermometers will in this arrangement be the same as for all the other registers, both magnetical and meteorological.

"A slight shift has been made in the positions of the rain gauges in the Magnetic ground.

"The observations of the temperature of the Thames made at the Deptford Cattle Market are regularly communicated to the Royal Observatory, and appear to be quite satisfactory."

"The mean temperature of the year 1883 was 49°·3, being 0°·4 lower than the average. The highest air temperature was 85°·1 on August 21, and the lowest 20°·6 on March 24. The mean monthly temperature was above the average in January and February, and below in March and July. In the other months it differed little from the average.

"The mean daily motion of the air in 1883 was 291 miles, being 12 miles greater than the average. The greatest daily motion was 842 miles on December 12, and the least 62 miles on December 26. The pressures exceeding 20 lbs. in 1883 were 28·0 lbs. on January 27, 28·5 lbs. on February 2, 24·4 lbs. on March 6th, 20·5 lbs. on October 17, and 26·5 lbs. on December 12.

"During the year 1883 Osler's anemometer showed an excess of 16 revolutions of the vane in the positive direction N, E, S, W, N, if all the turnings are counted; or of 19 revolutions in the positive direction if the turnings which are evidently accidental are excluded.

"The number of hours of bright sunshine recorded by Campbell's sunshine instrument during 1883 was 1241, which is about 30 hours above the average of the six preceding years. The aggregate number of hours during which the Sun was above the horizon was 4454, so that the mean proportion of sunshine for the year was 0·280 constant sunshine being represented by 1.

"The rainfall in 1883 was 21·9 inches, being about 3 inches below the average.

"Tracings of the barometer registers for the days following the Krakatoa eruption have been sent to Mr. R. H. Scott and to M. Paul Schreiber. Two series of atmospheric disturbances recurring at intervals of about 36 hours are recorded from August 27 to September 1.

"We remarked no definite connexion between magnetic or electrical disturbances and the phenomena of the remarkable sunsets of the past winter."

A HEAVY INDIAN RAINFALL AND ITS RESULT.

WE have been favoured by Mr. W. M. Beaufort with the report recently adopted by the Great Indian Peninsular Railway Company containing the following details of the rainfall of July 1st and 2nd, 1883:—

"I must, however, refer to the serious interruption of traffic during the half-year on the North-East extension, through damage to the line between 284 and 298 miles, and two large bridges, each of seven 30 feet girder openings at the *Ajunta* and *Bookree* rivers at mileages 295¾ and 298 being destroyed by heavy floods on the night of 1st and 2nd July, regarding which I have already fully reported. Through traffic could not be restored over these rivers before the 2nd August, but the line, where damaged, was quickly repaired, and traffic resumed working to each side of the rivers on the 7th July.

"From the commencement I had determined to erect a temporary wooden bridge of full width of river, and to same level as the old bridge over the *Ajunta*, and this was immediately put in hand, and successfully carried through, without cessation, to completion. At the *Bookree*, recognising the greater difficulties of erecting quickly a similar bridge there, I decided to put in a diversion of the line, and a temporary bridge on a low level, which would, in all ordinary cases, have been sufficient, but on the night of the 14th July, a second flood swept along the river, and carried away all the work done in the channel of the river. It was then apparent that nothing short of a work of a much more substantial character would be required, and this was at once commenced, and traffic worked over it on the 2nd August.

"The rainfall which gave rise to the flood on the night of July 1st and 2nd, was confined to the south of the *Sautpura* range, and the wind and rain seem to have been of a cyclonic character, and in fact the meteorological records showed that a cyclone was travelling across the country from the central provinces towards *Indore*. The register of rainfall at *Bhosawul*, gives the very high record for the plains of India of 18·25 inches in 24 hours, of which 15·15 inches fell between 6 p.m. of the 1st, and 6 a.m. of the 2nd July, a rainfall which I believe to be without precedent; whereas at *Khundwa* the quantity of rain which was registered for the same time measured only 1·82 inches.

"The rivers *Taptee* and *Waghur* on either side of *Bhosawul* and the *Sookee Nullah*, which the line of railway crosses, and their tributaries were also in great flood, and between *Bhadli* and *Bhosawul* the way and works were considerably damaged by the heavy rain.

"I am happy to say that the vigilance of the permanent way inspectors, their platelaying muccadums and patrolmen, on the night of July 1st, effectually secured the safety of the traffic, and there is no casualty to trains or loss of life to record."—WILSON BELL, C.E.

By the courtesy of the Managing Director of the Company we have obtained some further particulars, which, with our own comments, may be epitomized as follows:—The site of the accident is about 290 miles N.E. of Bombay (about Longitude 76° E., and Latitude 21° N.), between the Sautpoor (or Satpura) mountains, and the river Tapty (or Taptee). The rivers mentioned by Mr. Bell are not marked on all maps, but are northern tributaries of the Tapty. A rainfall of 15 inches in twelve hours in the wet districts of India

would scarcely claim notice in these pages, but Ravere is in a dry district, the mean rainfall being, according to Mr. C. Chambers' *Meteorology of the Bombay Presidency*, scarcely 20 inches.

Moreover, it appears improbable that the fall can be explained away by the rather old hypothesis of a waterspout, for though a waterspout might easily have produced the 18·25 inches recorded at Bhosawul it would go but a little way towards filling and flooding two Indian rivers. Possibly Mr. Chambers may favour us with some notes upon the subject.

THE MILDNESS OF THE WINTER 1883-4.

For the following remarkable particulars as to the temperature of the past quarter at Greenwich, as prepared by Mr. Glaisher, F.R.S., we are indebted to the Quarterly Return of the Registrar General :

January.—The mean temperature of January was 43°·9, being 7°·4 and 5°·3 above the averages of 113 years and 43 years respectively. Back to 1771 there have been only two instances of a mean temperature for January being as warm as 43°·9, viz. :—

1796	.....	45°·3	1834	.....	44°·4

February.—The mean temperature of February was 41°·9, being 3°·2 and 2°·4 above the averages of 113 years and 43 years respectively. Back to 1771 there have been twenty-four previous instances of a mean temperature as high as 41°·9, viz. :—

1775	.....	41°·9	1846	.....	43°·9	1867	.....	44°·7
1779	.....	45·3	1848	.....	43·4	1868	.....	43·0
1794	.....	44·7	1849	.....	43·2	1869	.....	45·3
1809	.....	44·1	1850	.....	44·7	1871	.....	42·4
1817	.....	42·6	1856	.....	42·0	1872	.....	44·8
1822	.....	43·3	1859	.....	43·1	1877	.....	43·5
1826	.....	42·2	1861	.....	42·1	1878	.....	42·2
1833	.....	42·4	1863	.....	42·1	1883	.....	42·6

March.—The mean temperature of March was 44°·5, being 3°·4 and 2°·8 above the averages of 113 years and 43 years respectively. Back to 1771 there have been eleven previous instances, viz. :—

1777	.....	44°·6	1822	.....	47°·3	1871	.....	44°·9
1779	.....	47·0	1830	.....	45·8	1872	.....	44·6
1780	.....	49·2	1841	.....	46·2	1882	.....	46·0
1815	.....	45·0	1842	.....	44·9			

January to March.—The mean temperature for the quarter ending March was 43°·4, being 4°·7 and 3°·5 above the averages of 113 years and 43 years respectively. there have been only three instances of a mean temperature of a quarter as high as this, viz. :—

1822	.....	43°·5	1846	.....	43°·6	1872	.....	43°·6

October to March.—The mean temperature of the six months from October, 1883, to March, 1884, was 44°·2, being 3° above the average of 113 years, there being only six instances of a temperature as warm or warmer, viz. :—

1819	.....	44°·3	1834	.....	44°·2	1849	.....	44°·2
1822	.....	45°·5	1846	.....	44°·7	1877	.....	44°·6

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, OCT., 1883.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Maximum. Date.	Minimum. Temp.	Minimum. Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	TotalRain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0–100	°	°	inches		0–10
England, London	64·6	15	36·9	22	57·7	45·0	45·9	86	103·6	28·4	1·75	14	5·9
Malta	81·8	1	54·8	27	73·0	62·8	58·9	76	138·2	...	2·67	12	3·4
Cape of Good Hope	...	...	...	...	...	...	...	...	...	...	...	...	...
Mauritius	80·3	24	62·0	8	76·9	66·2	61·2	72	...	...	1·89	13	5·9
Calcutta	92·4	6	65·2	26	87·8	73·9	73·2	80	156·4	55·6	·75	3	3·1
Bombay	90·4	12	72·8	30	86·0	75·6	74·4	81	148·6	60·4	10·40	12	4·1
Ceylon, Colombo	87·7	3	71·8	15	85·5	75·4	71·5	74	147·0	68·5	14·05	21	8·4
Melbourne	86·2	20	41·7	6	66·7	47·9	45·7	69	143·1	32·0	2·79	19	6·3
Adelaide	87·3	23	40·5	27	69·2	50·1	45·7	59	145·0	36·2	1·79	15	5·4
Wellington	70·0	5	35·0	1	59·7	45·5	...	...	128·0	33·0	4·73	14	...
Auckland	66·5	26*	42·0	14	61·4	50·5	47·1	73	139·0	38·5	4·16	22	7·9
Falkland Isles	61·4	9	28·3	3	51·2	35·9	38·5	76	121·7	22·2	·55	9	6·1
Jamaica	90·3	4	70·8	8	87·7	72·9	72·9	84	...	65·1	4·46	...	7·1
Barbados	84·0	21	69·0	17	81·0	73·0	73·6	87	145·0	62·0	14·72	21	6·0
Toronto	71·0	10	27·1	27	52·1	37·6	39·8	77	128·0	21·5	·96	14	6·7
New Brunswick, Fredericton	72·8	10†	16·9	23	52·1	30·9	34·2	76	...	...	4·06	12	5·1
Manitoba, St. Andrews	66·3	7	14·7	20	45·9	26·8	32·3	86	...	...	2·54	11	6·8
British Columbia, Yale	...	...	...	...	...	...	...	...	...	...	...	...	...

* And 29. † And 14.

REMARKS, OCTOBER, 1883.

MALTA.—Mean temp. 67°·0; mean pressure 30·065 in.; average velocity of wind 8·4 miles per hour; temp. of sea ranged from 74° to 70°, the mean being 72°; L on 7 days, T on 5.

J. SCOLES.

Mauritius.—Rainfall ·56 in. above the average; mean temp. 0°·5 below it; mean pressure 30·139 in.; mean hourly velocity of wind 11·1 miles, extremes 25°·8 miles and 1·6 miles, prevailing direction E.S.E. Unusually prolonged and intense colorations of the sky before sunrise and after sunset every day, lasting 1h. 15m.

C. MELDRUM, F.R.S.

Melbourne.—Mean temp. of air and of dew point below the average; mean pressure, amount of cloud, humidity and rainfall all very near the average; prevailing direction of wind S.W. and W.; strong breezes on 7 days; heavy dew on 7 days; T and L on 3 days. Zodiacal light very bright throughout, and beautiful glows of light visible in the western sky, by many mistaken for the auroral light.

R. L. J. ELLERY, F.R.S.

Adelaide.—Mean pressure 30·064, slightly above the average; mean temp. 59°·6, 2°·5 below the average; the month was unusually cold, in fact, with one exception, the coldest since 1857; the mean diurnal range 19°·1 is also very small; rainfall just the average; amount of cloud ·6 above it. On every clear evening during this month, and the last fortnight of September, a peculiar phenomenon has been apparent in the western sky. Shortly after sunset, a red glow will make its appearance at an altitude of about 50°, being very faint at first; but as the brightness of the sky near the horizon dies away with the receding sun, the red glow will expand downwards, becoming at the same time more brilliant, until at last the whole western sky will be lit up with a beautiful light, varying in colour, from a delicate pink to a most intense scarlet, and the spectacle presents a most brilliant appearance. The upper

part will then gradually fade away, until the colour is noticeable only 7° or 8° above the horizon, at which time the light is at its brightest. Afterwards a secondary glow will sometimes make its appearance, at an altitude of about 50°, and gradually spread downwards until the sky is again lit up. In the secondary phenomenon, the colours are generally more delicate. The whole thing will fade away about 8 p.m. This phenomenon has been noticed all over the south eastern portion of this continent, from Pt. Augusta (lat. 32° S.) to Melbourne ; and in India, the sun has at times presented a most peculiar appearance, being green at rising, then gradually changing to a blue at noon, and inversely from noon to sunset. Various theories have been started to account for the phenomena.

Wellington.—Fine, with northerly winds up to the 9th, on which night it changed to S.E. with heavy R, and continued showery and squally up to 23rd ; N.W. gale, 16th, 17th, and 18th ; very wet on 19th, with strong wind at night ; from 24th to 29th, fine ; on 29th, stormy from N.W., with heavy R at night ; remainder of month fine ; mean pressure above, and mean temp. below the average. R. B. GORE.

Auckland.—Showery and variable weather throughout ; mean pressure above, and mean temp. considerably below the average ; rainfall much in excess.
T. F. CHEESEMAN.

Falkland Isles.—A very dry month ; rainfall 1·20 in. below the average of 7 years.
F. E. COBB.

BARBADOS.—Mean temp. 76°·5, 0°·5 below the average ; N.E. winds on 30 days ; average velocity 7·3 miles per hour, extremes 13·4 miles and 2·8 miles ; rainfall 36 per cent. above the average ; evaporation the same as the average ; 11 days were overcast ; TSS on 15th and 17th. R. BOWIE WALCOTT.

CLIMATOLOGICAL TABLE FOR THE BRITISH EMPIRE, NOV., 1883.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute.				Average.				Absolute.		TotalRain.		Aver.
	Maximum.		Minimum.										
	Temp.	Date.	Temp.	Date.	Max.	Min.	Dew Point.	Humidity.	Max. in Sun.	Min. on Grass.	Depth.	Days.	Cloud.
	°		°		°	°	°	0–100	°	°	inches		
England, London	55·8	28	28·7	13	49·9	37·2	39·4	92	77·3	20·3	2·78	16	6·7
Malta	73·1	8	51·2	27	67·5	57·1	53·6	77	128·2	...	6·24	11	4·4
Cape of Good Hope	..	...	...	...	...	...	...	...	...	...	...	...	...
Mauritius	...	...	...	...	...	...	...	...	...	...	...	...	...
Calcutta	87·1	13	51·1	22	81·2	61·0	59·5	71	150·3	38·0	·00	0	1·8
Bombay	89·3	5	66·1	26†	85·6	71·8	67·7	70	145·8	53·6	·86	1	·9
Ceylon, Colombo	86·7	16	71·3	21	84·1	73·3	70·5	76	146·0	67·0	9·12	18	8·4
Melbourne	93·0	23	38·1	2	73·0	51·9	49·6	67	156·1	29·1	3·22	12	6·5
Adelaide	99·0	23	45·6	15	77·7	56·6	49·0	52	159·9	39·6	1·83	15	4·8
Wellington	71·0	14	40·3	5	61·5	48·3	...	...	140·0	35·0	3·40	16	...
Auckland	74·0	28	45·5	6	65·8	51·7	48·0	69	147·0	39·0	3·49	18	7·0
Falkland Isles	62·8	4	31·2	8	5·17	38·0	39·9	75	121·7	24·2	2·07	21	6·2
Jamaica, Kingston	88·8	6*	65·0	26	86·0	70·3	70·5	83	...	59·0	3·67	...	4·4
Barbados	83·0	1,7	70·0	24	80·0	72·0	73·6	89	146·0	71·0	7·34	19	6·0
Toronto	60·1	22	13·4	16	44·6	29·7	32·9	77	97·0	5·0	2·47	17	7·1
New Brunswick, Fredericton	62·7	6	3·5	17	42·0	23·2	28·9	81	...	...	2·83	12	6·0
Manitoba, Winnipeg	...	...	...	...	...	...	...	...	...	...	...	...	...
British Columbia, Yale	..	...	...	...	...	...	...	...		...	...	...	...

* And 10, 11. † And 30.

REMARKS, NOVEMBER, 1883.

MALTA.—Mean temp. 61°·2; mean hourly velocity of wind 9·4 miles; mean temp. of sea 68°·0; TSS on four days, and L on two other days. J. SCOLES.

COLOMBO.—TSS occurred on three days, and L was seen on five other days. J. H. SYMONDS.

Melbourne.—Mean temp. of air and of dew point, both about one degree above the average; pressure and humidity average; rainfall ·81 in. and amount of cloud 0·5 above the average; prevailing direction of wind S. and S.W., strong breezes occurring on four days, L on five days, T on three days, H on one day, Aurora Australis on 22nd. R. L. J. ELLERY, F.R.S.

Adelaide.—Mean pressure about the average; mean temp. (67°·2) 0°·8 above the average, the max reached 90°·0 on five days. The state of the atmosphere was very peculiar and unseasonable from 20th to 25th (inclusive) there was a TS or L every day and the weather throughout the period was unseasonably sultry and oppressive. The rainfall of the month was nearly double the average of 26 years, and the total for the 11 months of this year is the greatest (except 1875) during that period being 6½ inches in excess of the average. The peculiar red glow described in last month's remarks was very bright at the commencement of the month, but towards the end it had become fainter, and the zodiacal light which had not been noticed at the beginning began to be visible, being rather bright at times. C. TODD.

Wellington.—The weather was unsettled till the 5th, on which day 1·10 in. of R fell, it was then fine with moderate wind, chiefly southerly, till 12th; the 13th was very oppressive, with severe T and heavy R, and the weather continued showery and unsettled, and at times squally, till 25th; the remainder of the month was fine. Mean temp. 2° below the average; rainfall nearly one inch below it. R. B. GORE.

Auckland.—The weather was variable and unsettled during the whole month; mean temp. and pressure both below the average; rainfall in excess, but no heavy fall in one day. T. F. CHEESEMAN.

BARBADOS.—Mean pressure about the average; mean temp. (75°·8) 0°·7 below the average of 25 years; average velocity of wind 9·1 miles per hour, extremes 18 miles and 1 mile; rainfall 10 per cent. below the average; evaporation 18 per cent. above the average; 7 days were overcast. R. BOWIE WALCOTT.

CUTTINGS.

A CLOUD OF CARBON.—The black cloud, which recently passed over a part of Lancashire, and darkened certain neighbourhoods for about an hour, appears to have been caused by an accumulation of finely-divided carbon. The Rev. S. J. Perry, Stonyhurst Observatory, writes:—"At 11.30 the darkness was so great that it was found impossible to read even bold print (small pica) close by the window, and at this time a dense black cloud, with a slightly yellowish tinge, hung over the south-west sky; the blackness being most intense at 10° above the horizon. At 11.35 it became somewhat lighter, and 11.40 the rain began to fall, and in forty minutes 0·114 inch of rain-water was collected in our rain-gauges, the whole being almost as black as ink, and full of fine carbon in suspension. Hail that fell a mile off to the south-west by south, and snow that fell on the hills two miles to the west, were also black."—*Public Opinion.*

THE CLIMATE OF MANITOBA.—A correspondent says:—"As to the climate, it is far more enjoyable than Ontario; the winter, although cold, is not unpleasant; we were able to work out nearly every day with very little inconvenience; the depth of snow never exceeded twelve inches at any one time, and the roads consequently were excellent for sleighing; we had no rainfall the whole winter, so that stacks were left open without any fear of injury. The summer is all that could be desired; perhaps I should draw attention to the fact that there is a very heavy dew each night, which appears to be sufficient to ensure a luxuriant growth of all kinds of vegetation, and there is also a very large proportion of sunshine, which is another important element in farming.—*The Colonies.*

SUPPLEMENTARY TABLE OF RAINFALL, MAY, 1884.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger	·35	XI.	Carno, Tybrith	2·74
,,	Margate, Birchington...	·20	,,	Corwen, Rhug	...
,,	Littlehampton	·43	,,	Port Madoc	3·62
,,	Hailsham	·48	,,	I. of Man, Douglas	1·26
,,	I. of W., St. Lawrence.	1·15	XII.	Stoneykirk, Ardwell Ho.	2·05
,,	Alton, Ashdell.....	·76	,,	Melrose, Abbey Gate...	2·00
III.	Winslow, Addington ...	·95	XIII.	N. Esk Res. [Penicuick]	4·15
,,	Oxford, Magdalen Col...	·80	XIV.	Ayr, Cassillis House ...	3·80
,,	Northampton	·90	,,	Glasgow, Queen's Park.	2·92
,,	Cambridge, Beech Ho...	·81	XV.	Islay, Gruinart School..	2·47
IV.	Southend	·27	XVI.	St. Andrews, Newton Bk	1·87
,,	Harlow, Sheering	·52	,,	Balquhidder, Stronvar..	6·85
,,	Diss	1·20	,,	Dunkeld, Inver Braan..	2·89
,,	Swaffham	·76	,,	Dalnaspidal H.R.S. ...	4·39
,,	Hindringham	...	XVII.	Keith H.R.S.	1·72
V.	Salisbury, Alderbury...	·89	,,	Forres H.R.S.	1·11
,,	Warminster	1·53	XVIII.	Strome Ferry H.R.S....	4·34
,,	Calne, Compton Bassett	1·59	,,	Lochbroom	4·30
,,	Ashburton, Holne Vic..	2·64	,,	Tain, Springfield.....	2·03
,,	Holsworthy, Clawton...	1·16	,,	Loch Shiel, Glenaladale	8·67
,,	Lynmouth, Glenthorne.	2·13	,,	Invergarry	4·64
,,	Probus, Lamellyn	1·08	XIX.	Lairg H.R.S.	...
,,	Wincanton, Stowell Rec.	1·62	,,	Forsinard H.R.S.	2·86
,,	Taunton, Fullands	·94	,,	Watten H.R.S.	2·25
VI.	Bristol, Clifton	2·50	XX.	Dunmanway, Coolkelure	4·63
,,	Ross	·57	,,	Fermoy, Gas Works ...	1·10
,,	Wem, Sansaw Hall.....	...	,,	Tralee, Castlemorris ...	2·62
,,	Cheadle, The Heath Ho.	1·41	,,	Tipperary, Henry Street	2·08
,,	Worcester, Diglis Lock	1·25	,,	Newcastle West	2·14
,,	Coventry, Coundon	1·14	,,	Miltown Malbay.....	4·02
VII.	Melton, Coston	1·20	,,	Corofin	2·19
,,	Ketton Hall [Stamford]	1·28	XXI.	Carlow, Browne's Hill..	1·52
,,	Horncastle, Bucknall ...	1·04	,,	Navan, Balrath	1·73
,,	Mansfield, St. John's St.	·80	,,	Mullingar, Belvedere ...	2·97
VIII.	Macclesfield, The Park.	2·23	,,	Athlone, Twyford	3·95
,,	Walton-on-the-Hill.....	1·27	XXII.	Galway, Queen's Col....	4·29
,,	Lancaster, South Road.	2·65	,,	Clifden, Kylemore	...
,,	Broughton-in-Furness ..	4·08	,,	Crossmolina, Enniscoe..	3·14
IX.	Wakefield, Stanley Vic.	·99	,,	Carrick-on-Shannon ...	2·74
,,	Ripon, Mickley	·91	XXIII.	Dowra	...
,,	Scarborough.....	...	,,	Rockcorry.....	2·73
,,	East Layton [Darlington]	·60	,,	Warrenpoint	2·30
,,	Middleton, Mickleton ..	1·43	,,	Newtownards	2·33
X.	Haltwhistle, Unthank..	3·43	,,	Belfast, New Barnsley .	3·52
,,	Shap, Copy Hill	4·22	,,	Cushendun	3·27
XI,	Llanfrechfa Grange	1·95	,,	Bushmills	2·45
,,	Llandovery	2·82	,,	Stewartstown	3·08
,,	Solva	...	,,	Donegal, Revelin Ho....	...
,,	Castle Malgwyn	1·69	,,	Buncrana	2·88
,,	Rhayader, Nantgwillt..	3·12	,,	Carndonagh	3·12

MAY, 1884.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Table to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1870–9	Greatest Fall in 24 hours. Dpth	Date.	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date	Min. Deg	Date.	No. of Nights below 32° In shade	On grass
			inches	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	·78	— 1·14	·15	12	11	81·3	24	35·0	1	0	1
II.		Maidstone (Hunton Court)...	·30	— 1·72	·08	3	8	...	...	...	...	...	...
,,		Strathfield Turgiss	·67	— 1·01	·16	5	8	82·5	24	32·4	1	0	4
III.		Hitchin	·55	— 1·44	·21	2	9	74·0	24	33·0	6	0	...
,,		Banbury	1·24	— ·89	·28	12	10	76·5	12	33·0	1	0	...
IV.		Bury St. Edmunds (Culford)	1·03	— ·87	·33	2	10	79·0	10*a*	31·0	6	2	...
,,		Norwich (Cossey)	·86	— ·95	·33	2	7	78·0	11	33·0	7	0	4
V.		Weymouth(LangtonHerring)	·77	...	·20	19	10	...	...	...	...	...	...
,,		Barnstaple	1·31	— ·79	·45	2	10	81·0	25	37·5	1	0	...
,,		Bodmin	1·26	— 1·58	·27	7	11	73·0	24	38·0	1	0	6
VI.		Cirencester	·78	— 1·40	·16	4	9	..	...	...	...	...	...
,,		ChurchStretton(Woolstaston)	1·34	— 1·05	·43	2	12	75·0	23	35·0	7	0	2
,,		Tenbury (Orleton)	·71	— 1·72	·23	2	10	78·5	11	30·5	21	2	7
VII.		Leicester	1·10	...	·38	2	12	80·0	23	34·9	5	0	11
,,		Boston	1·11	— ·66	·40	2	8	80·0	12	35·0	1	0	...
,,		Grimsby (Killingholme).....	·81	— ·84	·24	5	12	69·0	22	36·0	1,7	0	...
,,		Hesley Hall [Tickhill].....	·79	...	·12	19	11	83·0	11	34·0	7*c*	0	...
VIII.		Manchester (Ardwick).....	...	...	...	...	...	...	...	...	...	...	...
IX.		Wetherby (Ribston Hall) ...	·71	— 1·11	·32	4	5	...	...	...	...	...	...
,,		Skipton (Arncliffe)	4·53	+ 1·41	1·15	15	15	76·0	11	33·0	18*c*	0	...
X.		North Shields	·58	— 1·27	·24	4	7	72·5	16	31·2	7	1	1
,,		Borrowdale (Seathwaite).....	17·30	+10·32	6·78	8	15	76·5	23	31·5	1	1	...
XI.	WALES.	Cardiff (Ely).....	2·79	+ ·19	·54	15	13	...	...	...	...	...	...
,,		Haverfordwest	1·76	— ·93	·39	2,7	11	77·0	24	31·0	20	1	7
,,		Plinlimmon (Cwmsymlog) ...	3·45	...	1·40	2	13	...	...	...	..	...	...
,,		Llandudno.....	1·35	— ·27	·50	14	7	75·2	11	40·0	3,7	0	0
XII.	SCOTLAND.	Cargen [Dumfries]	3·62	+ 1·09	1·09	8	16	73·8	23	30·0	7	1	...
,,		Hawick (Wilton Hill).....	...	...	...	...	...	...	...	...	...	...	...
XIV.		Douglas Castle (Newmains)	4·05	+ 1·71	·52	8	19	...	...	...	...	...	...
XV.		Lochgilphead (Kilmory).....	5·07	+ 2·31	·92	7	15	78·0	23	28·0	6	1	...
,,		Oban (Craigvarren)	3·73	...	·65	15	16	73·0	24	35·0	7	0	...
,,		Mull (Quinish).....	3·53	...	·42	21	18	...	...	...	...	...	...
XVI.		Loch Leven Sluices	3·60	+ 1·31	·60	2	13	...	...	...	...	...	...
,,		Arbroath	1·65	— ·12	·27	8	12	69·0	22	32·0	4	1	...
XVII.		Braemar	1·80	— ·62	·56	1	16	71·8	23	26·0	4	4	14
,,		Aberdeen	1·42	...	·25	14	13	73·0	22	29·0	6	2	...
XVIII		Skye (Sligachan)	...	...	...	...	...	...	...	...	...	...	..
,,		Culloden	1·82	+ ·04	·49	2	9	71·0	23	30·0	7	1	11
XIX.		Dunrobin	2·74	...	·42	2	12	69·0	23	37·0	19*d*	0	...
,,		Orkney (Sandwick)..... ..	2·08	+ ·21	·36	17	17	59·6	11	33·8	6	0	3
XX.	IRELAND.	Cork (Blackrock)	1·70	— ·46	·55	13	14	79·0	24	35·0	17*e*	0	0
,,		Dromore Castle	4·63	...	·81	8	14	71·0	27	35·0	20	0	...
,,		Waterford (Brook Lodge) ...	1·29	...	·51	24	15	73·5	24	33·0	19	0	4
,,		Killaloe	3·21	...	·61	8	16	78·0	29*b*	34·0	18	0	...
XXI.		Portarlington	1·63	— ·22	·29	25	18	75·0	24	37·0	5	0	...
,,		Dublin (FitzWilliam Square)	1·36	— ·36	·26	14	16	69·4	11	37·2	6	0	0
XXII.		Ballinasloe	3·22	+ ·81	·82	8	16	69·0	24	35·0	6	0	...
XXI I		Waringstown	2·36	+ ·25	·38	3,8	17	76·0	24	32·0	2	1	5
,,		Londonderry (Creggan Res.).	3·48	...	·90	8	18	...	...	...	...	...	...
,,		Omagh (Edenfel)	3·50	+ 1·15	·65	8	21	69·0	..	37·0	...	0	...

+ Shows that the fall was above the average; — that it was below it.

a And 11. *b* And 30, 31. *c* And 21, 27. *d* And 21. *e* And 19.

METEOROLOGICAL NOTES ON MAY.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

STRATHFIELD TURGISS.—The continued dry weather forced on the wheat, and rain was badly needed at the end of the month. Lilac in flower on 1st, mountain ash on 6th, horse chestnut on 20th; corncrake heard on 1st, orange tip butterfly seen on 17th.

BANBURY.—Mean temp. of the month 53°·3; no R fell after the 14th, L on four days, H on three days, high wind on five days, The oak was in leaf much before the ash; whitethorn remarkably full of blossom.

CULFORD.—The month was remarkably dry, and R was much needed at the close.

LANGTON HERRING.—A fine, dry, warm month; the temp. generally was higher than that of any May of the preceding twelve. T and L on 24th.

BODMIN.—Mean temp. of the month 56°·7.

WOOLSTASTON.—A dry month with much E. wind; mean temp. 51°·5.

ORLETON.—A very dry and fine month; the rainfall was less than one-third of the average, and nearly all of it fell in the first week. There were great fluctuations of temp., but the mean was about 1°·3 above the average of 23 years; on 11th, 23rd and 24th the temp. rose higher than it did on any day during last year. There were many days of brilliant sunshine, and a few frosty nights. Distant T was heard on 5th and 19th, and L was seen on 19th and 24th. The wind was generally strong, and frequently very rough. Apple trees were generally in blossom before the middle of the month.

LEICESTER.—The month was dry, no R falling (except a slight shower on 19th) after the 15th, and at the close of the month all vegetation much needed it. N. or N.E. winds prevailed almost without intermission after the 18th.

KILLINGHOLME.—The latter part of the month was cloudy and cold, with steady polar wind. Strong lands, both pasture and arable, and gardens were suffering much from drought at the close of the month, there having been no previous frosts to pulverize the soil.

ARNCLIFFE.—The month was unusually dry, E. winds prevailing.

SEATHWAITE.—The first part of the month was wild and very wet; the latter part hot and dry. During the first 17 days R fell daily with two exceptions: there were seven falls exceeding 1 in. in 24 hours, H fell on three days, S on one day, and L was seen on one day.

WALES.

HAVERFORDWEST.—The weather during the first 16 days was variable, sometimes wet and often chilly and cold; the oak was in leaf on the 5th, the ash not until the 24th. On the whole the temp of the month was rather above the average; on 17 days the temp. did not reach 60°, it rose above 60° on 11 days, and above 70° on three days. The rainfall was disastrously small. Prevailing winds N.W. and E.N.E.; from 17th to 23rd a strong polar current prevailed, with much bright sky and sharp white frosts. A TS occurred on the evening of the 24th, and a man and some cattle were killed by L in this county. Cuckoo heard on 5th; whitethorn in blossom on 26th, unusually early for this locality.

SCOTLAND.

CARGEN.—Wet and stormy up to the 17th, afterwards fine and dry, with prevailing E. winds; mean temp. about the average; duration of sunshine 23 hours less than the average. H on 2nd and 4th, L on 3rd and 5th, T on 5th and 19th.

CRAIGVARREN.—The month was dry and seasonable, and warmer than usual, in consequence trees and plants are more luxuriant than for many previous years, but grass is not so forward. There were two distinct periods of gales and rain, viz., from 1st to 3rd, and from 15th to 18th. T, L, and H on 1st.

ABERDEEN.—Weather very dry during the month ; rainfall nearly half an inch below the average.

CULLODEN.—The weather generally was cold, but the frosts were not severe enough to do any material damage.

SANDWICK.—The first seven days of May were cold with H and sleet showers, and Hoy Hill (1,500 feet) was white with S on 3rd ; it was generally wet till the 17th, but after that date little R fell, and the temp. being warmer vegetation made great progress.

IRELAND.

CORK.—The month for the most part was cold and ungenial ; dry weather and cold winds made vegetation very backward.

DROMORE CASTLE.—No storms ; vegetation good and crops very promising.

KILLALOE.—The first half of the month was chilly, showery, and gusty, but from the 16th to the close the weather was brilliant ; no frosts ; T on 17th.

DUBLIN.—In most respects this was a favourable month ; mean temp. 52°·5, rather above the average, but there was a prevalence of low temperatures at night. The rainy days were one more than the average ; there was no S or sleet, but H fell on six days ; distant T on two days ; L on 24th ; solar halos on 12th, 21st, and 23rd. Mean humidity 75 : mean amount of cloud 5·5.

EDENFEL.—The weather for the first fortnight was continuously wet, with strong westerly winds ; the remainder of the month was fine, the last week being clear and warm.

HYDROLOGY AND HYDRO-GEOLOGY.

IN a review of the late General Belgrand's excellent work, *La Seine*, in Met. Mag., Vol. viii. (1873), p. 91, we expressed surprise at his defining the word "hydrologiques" as a new word, and pointed out that Beardmore had issued his *Manual of Hydrology* eleven years before. General Belgrand then wrote, pointing out that he had used the word in 1846, in an article in the *Annales des ponts et chaussées*, entitled "*Etudes hydrologiques dans les granits, &c., du bassin de la Seine.*" Can any one quote an earlier use of the word? It is quite clear that we were right in protesting against hydrology being regarded as a new word in 1873, for the above carries it back to 1846.

Hydro-geology is by many persons supposed to be a new term, but it is nearly a century old, as may be seen from the following title :—

"Lamarck, J. B. *Hydrogéologie ou Recherches sur l'influence qu'ont les eaux sur la surface du globe terrestre, &c.*, par J. B. Lamarck. 8vo. Paris, An. X. [1802]."

Lamarck's work, however, treats chiefly of the action of water on the surface—of subjects which, formerly were grouped as physical geography but, are now called physiographical, rather than of underground waters, to which the term hydro-geology has lately been applied.