insulated electrode of a quadrant electrometer. Through a second paraffin tunnel, at the other end of the filter, and a connecting pipe, the air is drawn off by an air-pump. All the metal of the apparatus, except the filter, and except the electrometer-vane, is connected with the metal case of the electrometer.

We were much interested to find, as we expected, that the steam gave up a large part of its electricity to be carried away by the air, while it itself was left behind in the Wolff's bottle and the sulphuric pumice. We tried the experiment both with positive and negative electrification, and found it equally successful in the two cases.

A full description of the experiment, with drawings representing the apparatus, is given in a paper, on the electrification of air and other gases, which we hope to communicate to the Royal Society at its first meeting in November.

THE NOVEMBER METEORS.

AS the lapse of time brings us nearer to the maximum of these phenomena, the interest in this branch of astronomy is intensified, and our liveliest expectations encouraged. These meteors only return in their richest abundance once in thirty-three years, so that the spectacle they afford can only be witnessed once in a generation. It is true that the shower may be manifested in a pretty conspicuous manner in several successive years, but only one really brilliant exhibition is usually seen, as on the mornings of November 13, 1799, and 1833, and November 14, 1866. Two years before the maximum and three years after it, striking displays have occurred, and show that the orbit of the meteors is very thickly strewn with these bodies over a considerable arc, since it takes six years for them to cross the earth's track, though travelling at the rate of about twenty-six miles per second.

Every one who has watched a great meteoric display, will admit that there is no other celestial spectacle which can compare with the striking aspect it presents. Those who have seen an event of this kind often recall its vivid characters, and look forward to the prospect of re-observing it. Others who have never witnessed it have heard or read the descriptions of people who have been more fortunate, and are anxious to behold so impressive and wonderful a phenomenon. Apart from being an attractive sight to the popular eye, it is a most important event from a scientific point of view, and the regular recurrence of this fine shower has been the means of largely augmenting our knowledge of meteoric astronomy.

The all-important question now is, "Will the display be repeated this year in an imposing form, and merit close attention from the casual observer as well as the professional astronomer?" A definite answer can scarcely be given, for our knowledge of this particular system of meteors is not sufficiently extensive to enable us to speak with certainty. Changes are doubtless affecting the stream, and the effects are cumulative; thus the circumstances attending the ensuing return will be somewhat different to those which controlled those of 1833 and 1866. The meteors are probably lengthening out along the orbit owing to the differences in periodic time amongst them, and the stream is widening as an effect of planetary perturbation. Thus in future ages the shower will probably return in many consecutive years near the epoch of maximum, while the maximum itself will be less brilliant than in former times, unless, indeed, on an occasion when the earth crosses the meteor orbit at a point very near the parent comet of Tempel (1866 I.) forming "the gem of the ring." The shower will probably last for several weeks in a feeble character, owing to the disturbances set up by the earth during its frequent immersions in the stream. The latter must evidently be undergoing a gradual process of thinning out, since our atmosphere destroys by combustion such of the particles as enter into it, and the number so destroyed must amount to many millions whenever a rich shower occurs. Still, in comparison with the enormous number of meteors comprised in the whole system, the proportion caught and vapourised by the earth must be extremely insignificant. After a long series of years the Leonid display, like that from Perseus in August, will probably become a pretty rich annual shower, and lose much of the grandeur which has attended it at intervals of about thirty-three years in the past.

From various observations obtained in November 1895, there was no sign of development in the Leonid meteor shower. The number seen did not exceed those counted in 1879 and 1888, when we were much further removed from the maximum. On the morning of November 14, not more than five Leonids per hour were counted at any station in England, and the display was therefore of very ordinary character. If, however, it failed as regards numbers, it exceeded expectation in respect to duration, for on the morning of November 17, Mr. Corder saw twelve Leonids out of twenty-two meteors counted in the two hours between 4h. 15m. and 6h. 15m. a.m., and on November 18, he observed eight Leonids out of thirty meteors seen in three hours between 2h. and 5h. a.m. Next month there is a far greater probability that we shall see a display at least much above the average, as we are twelve months nearer the maximum epoch, and this should make all the difference. But as we cannot expect the richest exhibition until 1899, we are still three years in advance of the important time, and are scarcely justified, from the prevailing conditions, in anticipating a brilliant revival of the shower this year. Conspicuous displays occurred in 1831 and 1864, two years before maxima, and in 1897 the shower is likely to develop considerable strength, increasing in 1898, and culminating in 1899. In 1863, three years prior to the magnificent return of 1866, not a great number of meteors were seen, but there is evidence that the Leonids formed a tolerably important shower. Mr. T. M. Simpkiss, of Wolverhampton, counted about ninety meteors in one and a half hours between midnight and 1h. 30m. a.m. on November 15, 1863, and from their streaks and directions it was evident the majority of them emanated from the constellation Leo. Very few were observed on the nights of the 12th and 13th, and during the hour from 11h. to 12h. on November 14, Mr. Simpkiss had only counted ten meteors.

The prospect is a fair one that the shower will return on the mornings of November 14 or 15. There appears, however, to be little probability that it will be very brilliant; but it is likely to furnish forty or fifty meteors an hour at the time of its best presentation, and to rival a fairly active return of the Perseid shower. It will be most important to watch its progress, to determine the degree of its activity and length of duration. From my observations in past years, the Leonid radiant appears to be feebly visible from November 9 to November 19, and may be extended beyond those dates. This year the moon will partly interfere with observation setting as follows:—

	h. m.	Age at noon. d. h.
November 12 ...	11 38 ...	7 5
,, 13 ...	12 50 ...	8 5
,, 14 ...	13 59 ...	9 5
,, 15 ...	15 9 ...	10 5
,, 16 ...	16 19 ...	11 5

Watches for shooting-stars should therefore be commenced at midnight on the morning of the 13th, at 1 a.m. on the 14th, at 2 a.m. on the 15th, and at 3 a.m. on the 16th. Amongst the features to be specially observed during the progress of the shower may be enumerated the following:—

(1) The time of maximum frequency.
(2) The horary number of Leonids visible.

(3) The position of the radiant point.

(4) The character of the radiation, whether sharply defined or diffuse and scattered over an area.

(5) If an area, find its diameter, and if possible its shape, whether elliptical or round.

(6) The apparent brightness of the meteors, how many are equal to, or brighter than, first magnitude stars.

(7) The duration of the active display.

(8) The duration of the entire shower.

(9) Does the radiant point, as derived on several nights of observation, retain a fixed position or move eastwards amongst the stars? In investigating this feature, it will be necessary to observe the place of the radiant on each night of the shower's visibility. Four or five meteors, if accurately recorded and in or near Leo, will generally be sufficient to indicate a correct position. On nights when the shower is very rich, it will be a good plan to get the radiant from successive half-hourly or hourly intervals, and then, from these independent observations, to derive a mean position for the night.

(10) The duration of the meteor flights in individual cases.

(11) The proportionate number of Leonids leaving streaks to the total number counted.

(12) The time of duration of the streaks. In the case of streaks lasting for some minutes, their drift amongst the stars should be noted.

(13) The colour of the meteors and of their streaks.

There are some other points, but these are among the most important.

As to the numerous minor showers of the period, these must be neglected if the desire is to specially observe the Leonids. Many Taurids are usually seen at the middle of November, but these are easily distinguished from the Leonids, as they move slowly and rarely leave streaks; moreover, their radiant point is placed in a different quarter of the heavens.

To adequately observe and record a meteor shower, at least two persons are necessary, for it is quite impossible for a single observer to give proper attention to all the features. He cannot register the apparent paths and count the number of meteors visible, as his attention will be frequently withdrawn from the sky, and many meteors will altogether elude him. To determine the maximum time of a shower, the observer's attention must be continuously directed to the heavens, and he must carefully note at intervals, say of five minutes, the number of meteors seen. To chart the observed tracts, to determine the radiant, and to note a few other features, quite monopolises one person's attention, and requires an extensive experience for the work to be done properly. Whenever a special meteoric display such as the Leonids is intended to be observed, the services of an assistant are necessary to reckon the visible number of meteors, and determine the time of their maximum frequency. Though the ensuing return of Leonids is not likely to be sufficiently important to call for special effort, there is need of our being prepared, as it may exceed expectation and should be suitably recorded, and it will be sure to offer many interesting facts for observation and discussion.

W. F. DENNING.

THE INTERNATIONAL METEOROLOGICAL CONFERENCE IN PARIS.

AS has already been announced, this meeting was held in September, under the presidency of Prof. Mascart, and lasted seven days (September 17–23, inclusive). The last meeting of a similar character had been held in Munich in 1891. The Paris meeting was attended by some forty members. Canada and Mexico were represented for the first time; neither Spain, Portugal, Brazil, nor the Argentine States were represented. The Weather Bureau, Washington, sent no one; Mr. Page came from the Hydrographic Office, Washington, but only in a private capacity.

Dr. Hann's absence from the meeting, on the ground of health, was universally regretted.

The programme for discussion consisted of over forty questions, and to these Mr. Wragge, of Brisbane, proposed to add more than a score; but several of his applications were ruled as *ultra vires* for the Conference. Some of the questions on the programme were set aside as either reopening discussions which had been closed years ago, or as being impossible of acceptance; as, for instance, one as to the adoption of a period of 26·67928 days for all meteorological and magnetical phenomena.

The business really done was, briefly, as follows:—

Committees were appointed, as already announced (NATURE, October 1), to carry on investigations into (1) terrestrial magnitudes and atmospheric electricity; (2) cloud observations; (3) balloon ascents; (4) sunshine and radiation.

It was recommended, at the suggestion of Mr. Symons, that systematic comparisons of different forms of thermometer exposure be carried out generally, Assmann's apparatus for ventilating thermometers to be one of the forms tested.

The Conference declined to make any recommendation as to a standard anemometer, or as to anemometer exposure.

Several applications were made to the Conference to exert, by resolutions, pressure on Governments with the view of the obtaining of grants for investigations; but these were all ruled as *ultra vires*. Mr. Wragge's requests for stations in Tasmania, and for observations on Mount Wellington, Tasmania, and also on Mount Kosciusko, in Australia, were met by the general declaration that the Conference must welcome the establishment of good stations all over the world.

Dr. Neumayer's proposals to modify existing systems of meteorological telegraphy in Europe were not accepted.

Four questions as to the discussion of phenomena in cyclones were held to be purely theoretical, and therefore unsuitable for discussion at a Conference.

Prof. Mohn submitted some proposals as to the use of the hypsometer. No discussion ensued, but Prof. Mohn's paper will be printed in the appendix to the Report of the Conference.

Dr. Paulsen, of Copenhagen, exhibited monthly ice charts of the North Atlantic, north of the 60th parallel, and received a promise of assistance in their completion from the members present, who were in a position to obtain observations of ice.

Dr. Snellen, of Utrecht, requested the Conference to take measures for convening a new Maritime Conference, to carry on further the work done at the London Conference of 1874. This matter was referred to the International Committee.

The chief feature of the Paris meeting was the attention paid to terrestrial magnetism and atmospheric electricity. The Committee appointed for these subjects held three meetings, of which the minutes will shortly appear; and, as has already been stated, a Committee has been nominated to carry on the discussion of various points which have been raised.

Finally, the International Meteorological Committee has been reappointed with a few modifications, owing to resignations, &c. Its members now are—

Dr. von Bezold (Germany).	Prof. Mohn (Norway).
Dr. Billwiller (Switzerland).	Prof. W. L. Moore (United States).
Admiral Capello (Portugal).	Dr. Paulsen (Denmark).
Mr. Davis (Argentine Republic).	Mr. Russell (New South Wales).
Mr. Eliot (India).	Major-General Rykatcheff (Russia).
Hofrath Hann (Austria).	Mr. Scott (England), *Secretary*.
M. Hepites (Roumania).	Dr. Snellen (Holland).
Prof. Hildebrandsson (Sweden).	Prof. Tacchini (Italy).
Prof. Mascart (France), *President*.	

ROBERT H. SCOTT, *Sec. Int. Met. Committee*.