indicates and measures with great exactitude the various increases in the power or strength of the received electric current, the motion of the spot of light following every variation of the current, thus affording a record to the eye of the value of the current under circumstances and conditions in which ordinary instruments indicating the mere presence or absence of a given strength of current would be valueless.

In the *Syphon Recorder* about to be brought under notice, the same remarkable feature of presenting the ever-varying value of the received current at the end of the cable, or the strength of the current, is preserved, while at the same time a permanent automatic record is registered for reference.

The difficulty to be overcome in the construction of such a recording instrument has been chiefly that due to the mechanical problem of obtaining marks from a very light body in rapid motion without impeding or interfering with that motion. The combination of parts and principles employed in the syphon recorder will be found to be more or less previously well known; the merit of Sir William Thomson's beautiful instrument consists in that

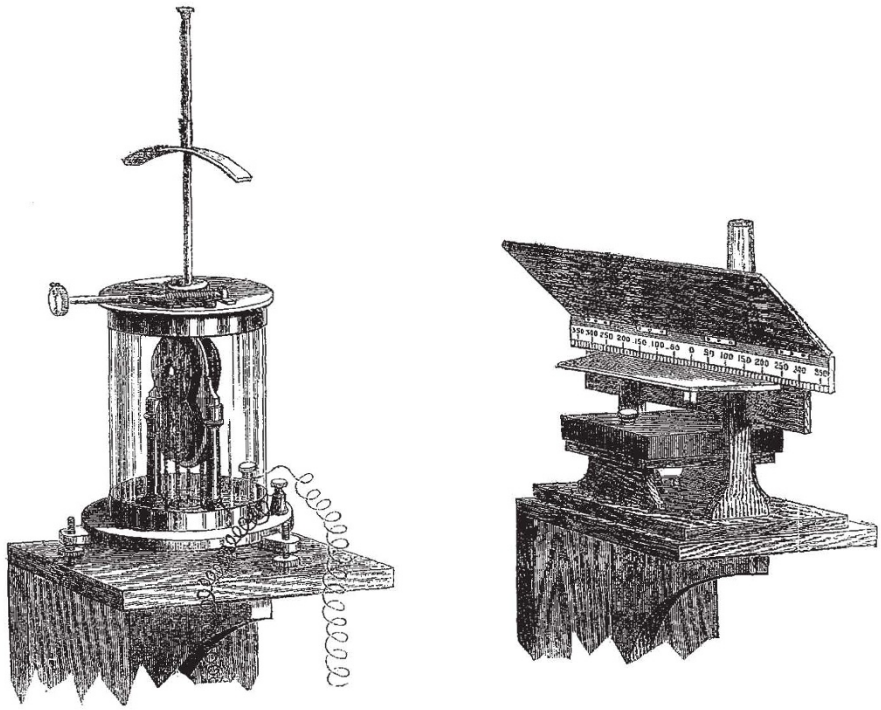


FIG. 17.—Sir William Thomson's "mirror" or reflecting galvanometer.

he has combined well-known forms and principles together in such an arrangement and combination of parts as to produce new and useful results. It is combinations such as those now to be described that constitute the value of scientific research in relation to mechanical applications.

It should be remembered that it is not possible to patent a principle, but only the application of a principle. If this axiom were more frequently remembered, the severe strictures upon patents in general that have already been made in these articles would have been rendered unnecessary. The "syphon recording" instrument fitly illustrates in what a good and valuable patent consists. With old and well-known parts and principles such as permanent-magnets, electro-magnets, coils, armatures, syphons, capillary attraction, and hydrostatic pressure and such like material, novel and practical results have been produced.

(*To be continued.*)

OUR ASTRONOMICAL COLUMN

THE SOLAR ECLIPSE OF 1900, MAY 28.—We refer to this eclipse with the view of correcting an error in Hallaschka's "Elementa Eclipsium," where it is stated to be *annular*. It is really the last *total* eclipse visible in Europe during the present century. The following elements may be expected to be pretty near the true ones :—

Conjunction in R.A. May 28, at 2h. 56m. 22s. G.M.T.

	°	′	″	
R.A.	64	56	49	
Moon's hourly motion in R.A.		37	17	
Sun's ,, ,, ...		2	32	
Moon's declination	21	50	17	N.
Sun's ,, ,, ...	21	27	15	N.
Moon's hourly motion in Decl.		2	39	N.
Sun's ,, ,, ...		0	24	N.
Moon's horizontal parallax		58	27	
Sun's ,, ,, ...		0	9	
Moon's true semidiameter		15	56	
Sun's ,, ,, ...		15	47	

The sidereal time at Greenwich mean noon, is 4h. 22m. 16s·8, and the equation of time 2m. 59s. additive to mean time.

The central eclipse enters Europe near Ovar, on the coast of Portugal, and passes off Spain a little south of Alicante. In longitude 0h. 34m. 0s. W. and latitude 40° 49′ N. on the Portuguese coast, totality commences at 3h. 27m. local mean time, and continues 1m. 30s., the sun at an altitude of about 43°. At Alicante it commences at 4h. 10m. 11s.

local time, and the duration is about 1m. 18s. The central eclipse begins in longitude 116°·6 W., latitude 18° N.; it takes place with the sun on the meridian in 44°·8 W. and 44°·9 N., and passes off the earth in 31°·8 E. and 25°·4 N. At Greenwich the magnitude of this eclipse will be less than 0·7.

WINNECKE'S COMET.—In NATURE, vol. xi. p. 349, it was stated that the identity of this comet with that found by Pons at Marseilles, 1808, February 6, A.M., suspected by Prof. Oppölzer, is open to doubt. There is contradiction in the only two accounts of this comet which we possess. In the first one, which will be found in Zach's *Monat. Corresp.* xviii., it is described as "very small;" the discovery was not made known to the astronomical public, partly because no regular observations were procured, and the strong moonlight prevented its being seen after the morning of Feb. 9. Schumacher having inquired of Pons whether amongst his papers some more definite account of this comet were to be found, received from him, through Inghirami, a communication which was printed (apparently long after its receipt) in *Astron. Nach.* vii., c. 113. Pons says the comet was one of those of which it was not possible to calculate the elements, because there were only procured some very doubtful positions by reference to nebulæ in the vicinity. He adds: "Elle était très-faible et difficile à voir. Sa nébulosité était ronde; elle s'étendait à peu près un dégré et on y soupçonnait par intervalle un très-faible noyau en deux parties. Son mouvement était assez rapid vers le sud. . . ." He then gives a sketch showing the configuration of the comet and two nebulæ, in a telescope with a field of nearly 3°. The nebulæ he describes as "sur le ventre d'Ophiuchus un peu au dessous de l'Equateur;" and Oppölzer identifies them with Nos. 10 and 12 of Messier's Catalogue. Hence we have an approximate place of the comet for Feb. 9 (at 5 A.M. at Marseilles), and Pons tells us it was moving pretty rapidly towards the south. If we now adopt Clausen's elements of Winnecke's Comet for 1819 (obtained by connecting the observations of that year with those of 1858, by calculation of the perturbations), and assume the date of perihelion passage in 1808 with Oppölzer on April 12·0, we have the following geocentric places:—

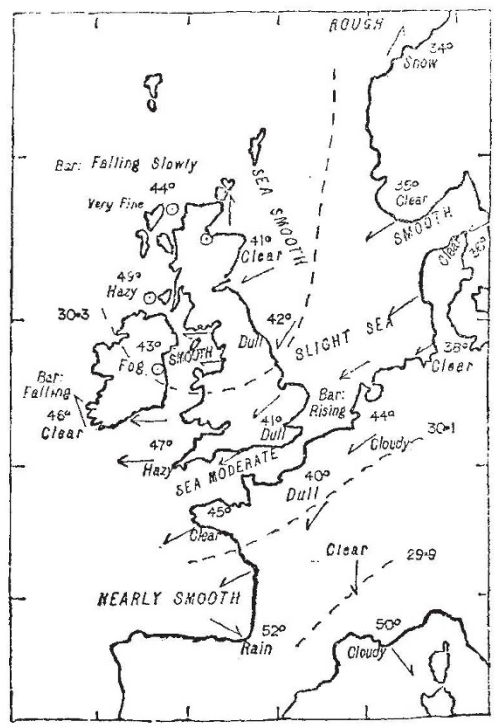
	D. H.		R.A. ° ′	N.P.D. °	Distance from Earth.
1808 Feb.	5.16	Marseilles	237 56	97 0	1·044
	6.17	,,	239 10	97 10	1·031
	8·17	,,	241 39	97 31	1·007

These positions do not indicate what could be termed a pretty rapid motion towards the south, and at a distance exceeding the mean distance of the earth from the sun it is very unlikely that a comet would present an apparent diameter approaching one degree. So far as can be judged from Pons's communication to Schumacher, we may rather infer that the object he observed was very near to the earth. Clausen's elements of Winnecke's Comet in 1819 show that it was then moving in an ellipse with a period of 2031·8 days: two such periods reckoned backward from the date of perihelion passage in 1819 would bring us to 1808, June 2·5, instead of April 12. It does not, therefore, appear that sufficient grounds exist for supposing the comet of February 1808 to have been identical with the one which now bears Prof. Winnecke's name. We may take this opportunity of stating that according to Clausen's calculation of the perturbations, Winnecke's Comet was in perihelion on the following dates between the appearances in 1819 and 1858, passing unobserved in each year: 1825, Feb. 5·5, G.M.T.; 1830, Aug. 21·4; 1836, March 3·4; 1841, Sept. 13·9; 1847, March 29·0; and 1852, Oct. 11·7.

THE STAR B. A. C. 2695.—This sixth-magnitude star of the British Association Catalogue was missed in August last by Mr. Tebbutt, of Windsor, N.S.W., being then invisible in a telescope of 4½ inches aperture. It is No. 1871 of the Paramatta Catalogue, where the place depends upon a single complete observation, the magnitude attributed to the star being 6. It is also No. 966 of the catalogue in the fifth volume of Taylor's Madras Observations, the position depending upon two observations in each element in 1838 or 1839, but the recorded magnitude is 10. So great a difference in the estimated brightness clearly points to variability, which is confirmed by Mr. Tebbutt's recent notice. The position for the beginning of 1875 is in R.A., 7h. 57m. 30s., N.P.D. 150° 9′·7; five minutes distant from this star, on an angle of 180°, is the sixth-magnitude B.A.C. 2694, which Mr. Tebbutt found "decidedly red." It may be remarked that the *fifth* volume of Taylor's Madras Observations, to which reference is made above, is by far the most valuable of his series to the astronomer in the southern hemisphere; but it is not, we believe, now easily procured.

THE "TIMES" WEATHER CHART

MANY of our readers will have noticed the unusual appearance of illustrations in the *Times* in the shape of the small charts which have been appended to the Daily Weather Reports since the 1st inst. This measure has been the long-postponed carrying out of the line of action indicated by the Meteorological Committee in their Report for last year, and the chart in its present form differs but little from that printed as a specimen in that Report. We subjoin the chart for the 13th inst., 8 A.M., published in yesterday's *Times*.



The dotted lines indicate the gradations of barometrical pressure, the figures at the end showing the height, with the words "Rising," "Falling," &c., as required. The temperature at the principal stations is marked by figures, the state of the sea and sky by words. The direction and force of the wind are shown by arrows, barbed and feathered according to its force. ⊙ denotes calm.

The method of preparation of the chart seems simple enough at present, but it has been the fruit of much thought, as the problem of producing, in the space of an hour, a stereotype fit for use in a Walter machine has not been solved without many and troublesome experiments.