small mast with a halliard fitted on the port quarter-deck. I saw that it was useless to attempt to notice the first moment of the entry of Venus, for I did not want to fatigue myself and run the risk of not being able to observe the total immersion. Indeed, I had sufficient trouble to fix the sun, on account of the movement of the ship.

"When Venus had half entered, or nearly so, on the disk of the sun, which I recognised by my reflecting quadrant, I attached myself, so to speak, to the telescope of 15 ft. to try to catch the moment of total entry. As my watch was none of the best, and as I could not take the height of the sun precisely at the moment when Venus appeared to me to be totally immersed, it occurred to me to make use of the sand-glass, by means of which the way of the vessel was measured, and I had by my side a man well up to turning the glass at the instant in such a way that it was impossible to have an error of more than a quarter of a second each time.

"The weather having become overcast, and the rain having shown itself, I did not think it would be possible to notice the exit of Venus. Consequently I did not cause the mast to be changed, as I ought to have done, for we had tacked since half-past 11.

"At 2 o'clock it cleared a little, and shortly after the weather cleared so that I could see Venus very distinctly with my green objective, and without the help of any other coloured glass, and I was not incommoded. I saw, from this observation, that it was not impossible for a person used to the movement of a vessel, and accustomed to the use of large instruments, to observe, especially when the sea is calm, the immersions of the satellites of Jupiter with a telescope of 12 or 15 ft., which would have a large field, and to determine the time of those immersions in the above manner; for I believe myself safe in asserting that I did not make from them from 15 to 20 seconds in time of error on an immersion of the first satellite of Jupiter."

The observations made under these extraordinary circumstances, give for the total immersion of Venus, 8h. 27m. 56½s.; the commencement of the exit, 2h. 22m. 53s.; the total exit, 2h. 38m. 52½s., which gives for the duration, 6h. 10m. 55¾s., and for the time taken by the diameter to cross the limb of the sun, 15m. 59s. As M. de Seligny had observed at the Isle of France the exit of Venus, Le Gentil formed, for the meridian of his observation, 88° 20′ 15″. The log-book gave 87° 14′ 0″.

As there was to be another transit of Venus on June 3, 1769, Le Gentil resolved to spend eight years in the southern hemisphere in wait for it. He had the devotion to carry this resolution into effect, spending his time in making a series of curious and interesting observations in the Mascarene Islands, Madagascar, Marianne Islands, the Philippines, and the coasts of India. He had fixed on Manilla as his place of observation, and reached it about August 1866, but he was ordered to return to Pondicherry. By what must seem a cruel fatality, this patient devotee of science, when the day of the Transit arrived, found his view of the sun completely shut out by clouds during the whole phenomenon, although for many days previous the sky had been cloudless. On the other hand, two friends whom he had left at Manilla were fortunate enough to witness the transit without obstruction. Le Gentil died on October 22, 1792.

ON THE TEMPORARY FADING OF SOME LEAVES WHEN EXPOSED TO THE SUN

FOR some time past I have taken much interest in this subject, since it at first seemed to indicate that chlorophyll in living plants could be decomposed by light in the same manner as when dissolved out from them by alcohol or other solvents. It also seemed to agree with the fact which I had established by comparative quantitative analysis, that leaves grown much exposed to the sun contain a relatively less amount of chlorophyll than those somewhat more shaded, in some cases even only one-third the quantity. My attention was first called to a diurnal change in the colour of a kind of moss commonly grown in hothouses, by Mr. Ewing, of the Sheffield Botanical Gardens, and subsequently to a similar change in a tropical species of maiden-hair fern, by Dr. Branson of Baslow. In both cases the colour of the fronds, after the darkness of night, was deep green, but after exposure to the bright sun of day it was a far paler and whiter green, which was again restored by the subsequent absence of light. I was particularly anxious to ascertain whether this change was due to a diminution in the amount of chlorophyll, but was unable to detect any well-marked difference by careful comparative quantitative analyses. I therefore came to the conclusion that, at all events in the case of the moss, the change in colour was due to some sort of mechanical alteration in the structure of the fronds, but did not examine the question more fully. The true explanation appears to be that adopted by Prillieux, who describes his observations in *Comptes Rendus*, t. lxxviii. p. 506. According to him and to the previous experiments of Famintzin and Borodin, exposure to bright light causes both granular and amorphous chlorophyll to collect together at the sides of the cells, instead of being more evenly distributed. The result of this is that a much larger relative proportion of white light is reflected, and the leaves or fronds appear of a paler and whiter green. These conclusions are thus in perfect agreement with my own quantitative analyses, and we may, I think, look upon this combined evidence of two independent methods as furnishing a satisfactory explanation of the greater part, if not of the whole, of the temporary change in colour.

H. C. SORBY

THE COMET

AFTER a very unusual amount of difficulty in the determination of the orbit I have succeeded in deducing a set of parabolic elements which appear to possess considerable precision. They are as follows:—

Perihelion passage, July, 8·83652 Greenwich M.T.

Longitude of Perihelion ...	271 3 51·5	Mean equinox
,, Ascending node ...	118 43 25·5	July 0
Inclination to ecliptic ...	66 21 16·0	
Log. Perihelion distance ...	9·8298719	

Motion direct.

Our last observation, a very good one, gives this position:—

June 22, at 10h. 4m. 21s. M. T. at Twickenham.

R.A. ... 7h. 21m. 58·05s.

D. ... +68° 9′ 34″·5

which compared with the above orbit (parallax and aberration allowed for) shows only the following insignificant differences—in R.A. −2″; in D. +14″.

This close agreement with parabolic motion is not favourable to identity of the comet with that of 1737, notwithstanding similarity of elements, but we must look to observers in the southern hemisphere to enable us to decide this point. The comet may certainly be there observed till October or November in the Antarctic circumpolar heavens.

The subjoined ephemeris will suffice to indicate the course of the comet, while it continues visible in our latitudes:—

AT GREENWICH—*Midnight.*

	R.A.	N.P.D.	Distance.	Intensity of light.
	h. m.	° ′		
June 25	7 27·3	22 33	0·816	2·4
27	7 30·6	23 11	0·769	2·8
29	7 33·7	24 3	0·721	3·3
July 1	7 36·5	25 10	0·673	3·9
3	7 39·1	26 34	0·624	4·6
5	7 41·3	28 24	0·575	5·5
7	7 43·2	30 46	0·528	6·6
9	7 44·8	33 48	0·482	7·9
11	7 46·2	37 39	0·437	9·6
13	7 47·5	42 30	0·396	11·5
15	7 48·6	48 33	0·359	13·7