



XXXII. On the newly discovered planet

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A sufficient and well-regulated supply of oxygen gas might perhaps remedy this defect.

Our apparatus consists of a copper lamp with two tubes lying close together, and each containing a wick formed of flat cotton rolled up into a cylinder; and a cylinder of lime, about three-eighths of an inch long and one-eighth of an inch in diameter, inclosed in a thin copper case. The pipe conveying the oxygen gas from the gasometer terminates in a small jet, inclining upwards, which lies between the two wicks slightly parted to receive it, and within rather less than one-eighth of an inch from the circular disc of lime, and about one-fourth of an inch above the lower edge of the copper case. We find that the common chalk of this neighbourhood furnishes a lime which gives a better light than that from the Bristol, or any other limestone we have tried*.

Mr. Collins, philosophical instrument-maker to the Royal Polytechnic Institution, makes lanterns for dissolving views and microscopes, fitted up with the spirit and camphine light, and will be happy to show its effect to any gentleman who may wish to see it. His address is "26 Francis Street, Tottenham Court Road," and at the Polytechnic Institution.

I am ever, my dear Sir, faithfully yours,

JOHN GEORGE CHILDREN.

XXXII. *On the Newly discovered Planet.* By M. ENCKE†.

THE new planet, the orbit and present position of which had been announced *à priori* by M. Le Verrier of Paris, was discovered almost immediately at the Berlin observatory by Dr. Galle: the very first night the Hora XXI. of the Academy's star-maps (which have been prepared with such extraordinary care and accuracy by Dr. Bremiker) was compared with the heavens, and thus afforded the most brilliant proof of the truth of theory, and the wonderful sagacity with which M. Le Verrier had made use of the existing data. With this confirmation, so far exceeding any expectations which could have been previously entertained, the name of M. Le Verrier will ever be connected, and acquire in consequence of it a celebrity as justly merited as it is unexampled in respect of the from in which it is gained.

From the slowness of the motion of the planet, the observations hitherto made at the Berlin observatory, although they extend to twenty-five days, may all be connected with a star occurring in Bessel's zones, the mean place of which was preliminarily assumed to be

$$327^{\circ} 56' 56''.4 - 13^{\circ} 26' 9''.6$$

* Drummond also obtained the most brilliant light from chalk lime.

† From the *Berichten des Akad. der Wissenschaften zu Berlin*, Oct. 22, 1846.

until more accurately determined. To estimate the distance of the planet, a circular orbit was assumed by Dr. Galle, which agrees so accurately with all the individual positions, that the tempt to determine an elliptic orbit must be deferred for some time. A comparison with the assumed orbit,—

Epoch Sept. 24.0 mean Berlin time

Mean longitude. . . . 326° 58' 29".5

Ascending node . . . 131 1 10.8

Inclination 1 52 51.5

Semidiameter 30.03885

Mean daily sidereal motion 21".55171

gave the following results:—

1846.	Mean Berlin time.	Observed AR.	Observed Declination.	Difference.	
				AR.	Declination.
Sept. 23.	^h 12 0 14.6	328 19 16.0	−13 24 8.2	+2.3	+0.9
24.	8 54 40.9	18 14.3	24 29.7	+0.1	+0.1
25.	9 41 45.0	16 59.8	24 55.4	0.0	−0.5
26.	10 11 54.3	15 48.3	25 22.2	−1.1	+0.9
27.	8 29 48.9	14 42.8	25 44.6	−0.6	+0.6
28.	11 31 28.8	13 25.5	26 11.5	−0.3	+0.5
29.	9 14 3.7	12 23.4	26 32.6	+1.2	+0.3
Oct. 2.	11 5 35.2	9 7.0	27 41.4	+0.3	+0.3
6.	8 0 54.2	5 16.2	29 1.9	−0.1	+0.4
10.	8 52 56.3	1 42.2	30 14.7	−1.4	−0.7
15.	7 27 25.7	327 57 52.8	31 33.8	0.0	−0.1
18.	7 37 43.7	55 51.8	32 15.2	+2.5	+1.0
...	7 58 47.6	55 55.0	32 14.2	−1.2	−0.1

The observations made at other observatories, as far as I have become acquainted with them, present a similar agreement, since a constant difference from the Berlin observations must most probably be referred to the assumed position of the star.

1846.	Mean Berlin time.	Observed AR.	Observed Declination.	Difference.		
				AR.	Declination.	
Sept. 27.	^h 9 41 46.1	328 14 35.8	−13 25 54.0	+2.9	− 8.9	Göttingen.
28.	9 37 37.9	13 28.2	26 15.0	+2.3	− 5.0	Hamburg.
29.	9 33 37.6	12 18.5	26 37.3	+5.3	− 4.7	Hamburg.
...	9 33 45.4	12 21.8	26 39.8	+1.9	− 7.2	Altona.
Oct. 1.	9 25 37.8	10 7.8	27 28.2	+6.4	−10.4	Hamburg.
...	9 25 45.0	10 11.7	27 24.5	+2.4	− 6.8	Altona.
3.	9 1 23.5	8 9.6	28 0.5	+0.2	0.0	Lond. (Hind).
4.	9 13 37.3	7 5.3	28 30.0	+4.4	− 8.4	Hamburg.
5.	8 26 20.5	28 41.4	+ 0.1	Lond. (Hind).
...	10 45 45.9	6 6.9	28 44.7	−0.3	− 1.4	Hamburg.
6.	9 5 37.8	5 10.5	29 9.6	+3.0	− 7.9	Hamburg.
...	9 5 45.5	5 12.6	29 6.3	+0.7	− 4.6	Göttingen.
8.	9 6 43.1	3 22.8	29 40.4	+0.9	+ 0.6	Turin.
9.	9 2 43.5	2 27.0	29 53.4	+4.3	− 4.5	Turin.
10.	8 58 43.9	1 32.2	30 17.9	+8.4	+ 2.5	Turin.

The elements are indeed merely approximative; but since a circular orbit, previously calculated by me from other observations, gave very nearly the same numbers, it may at least be concluded from them that the planet is much nearer than M. Le Verrier had assumed. Its distance from the sun should be 33 according to his elements, while according to the above it will not differ much from 30; consequently the period of revolution will also be shorter. If the orbit were actually circular, the period would be about 165 years.

In another point, however, with respect to which M. Le Verrier had only presumptions to go upon, he has hit the truth with most remarkable accuracy. According to him, the disc of the planet amounts to about $3''.3$, while the mean of the measurements gives $2''.7$.

I take this opportunity of expressing my views with regard to the name which I intend to assign to the planet for the next year, as I am compelled to come to some decision on account of the publication of the *Astronomical Jahrbuch*, in which the planet must be inserted as soon as its elements are more accurately determined. To every new planet, the astronomers who were countrymen of the discoverer at first added appellations, which were intended to call to mind some peculiar circumstance. Thus the English called and still call Uranus the *Georgian planet**, as a mark of gratitude to king George the Third, whose munificence enabled Herschel to construct his great reflectors; and the planet was detected, as is well known, by its disc. Piazzi named his planet Ceres *Ferdinandea*, in honour of the king of Naples, the founder of the observatory at Palermo. In the same manner Pallas was at first called *Olbersiana*, until Olbers himself pronounced strongly against the adjective. Subsequently the epithets have been disused by the German discoverers, Harding, Olbers and Hencke; and according to the suggestion of Bode, the name Uranus has been everywhere introduced except in England, and the name Ceres is now generally used without any addition.

The astronomers of Paris appear also to have had respect to this custom of naming the planets after the ancient divinities, principally of the Romans; since Le Verrier himself, in his first letter to Dr. Galle, Oct. 1, in answer to the announcement of the discovery of the planet, states at the conclusion, "the Bureau des Longitudes has pronounced for NEPTUNE, the sign a trident." This too appears to have been after some consideration; for as Dr. Galle had in his letter hinted at the name *Janus*, M. Le Verrier observes that "the name Janus

* In the Nautical Almanac only. Uranus is the name now in general use with British astronomers.—ED.

would indicate that this planet is the last of the solar system, which there is no reason whatever to suppose."

Moreover, this name [Neptune] has been widely bruited; for in a letter which I have received from Gauss, our first German authority in astronomy, dated Oct. 7, he says, "I consider the name Neptune chosen by M. Le Verrier to be very appropriate; perhaps a trident might be selected as the sign if it were not improper in any way to interfere with the rights of the discoverer."

Now in a letter which I have received from M. Le Verrier, dated Oct. 6, he states, "I requested my illustrious friend, M. Arago, to choose a name for the planet. I was somewhat startled at the decision (*j'ai été un peu confus*) which he made at a sitting of the Academy." This confirms the information we have received through other channels, that the name *Le Verrier* had been proposed by M. Arago.

Fortified by the high authority of Gauss, and the *Bureau des Longitudes* of Paris, I shall, under these circumstances, retain for the next year the name Neptune, and the sign of the trident, until public opinion in Germany has become sufficiently consolidated to establish a definitive appellation. Our German custom has prevailed in the case of four, we may even say five new planets, as Herschel was a German by birth; and as it cannot be in the least my intention to undervalue the great merits of M. Le Verrier, which I have most cordially admitted, so it is my opinion that his name will ever remain so firmly connected with Neptune, that it is not necessary, in order to keep up the recollection of the discovery, to introduce the somewhat incongruous collocation of the heathen gods with a modern name. Besides, in the present case, a German has the essential merit of having discovered the planet.

In letters which I have since received from Sir John Herschel, the planet is also called Neptune; and Struve, in Pulkowa, has pronounced decidedly for retaining this name. The first astronomical authorities, therefore, in Germany, France, England and Russia, have pronounced in favour of NEPTUNE.

Note.—A paper received by the Astronomer Royal from M. Struve, and inserted in the *Athenæum* for Feb. 20, assigns similar reasons for adopting the proposed name. We subjoin the following passage:—

"Far be it from us to have any intention of withholding our entire admiration from the eminent merit of M. Le Verrier. But impartial history will, in the future, make honourable mention also of the name of Mr. Adams, and recognise two individuals as having, independently of one another, discovered the planet beyond Uranus. In the same way, it attributes

the discovery of the infinitesimal calculus at once to Newton and to Leibnitz. Mr. Airy, the Astronomer Royal at Greenwich, has published a complete and authentic report on the labours of Mr. Adams relative to the existence of the Trans-Uranian planet. In that report, we see that in September 1845 Mr. Adams arrived at a result, and that in October he transmitted to Mr. Airy a paper containing elements of the present planet so nearly approximative that it might have been found in the heavens ten months before it actually was. But Mr. Adams's labours were unsuccessful, because the two astronomers (Mr. Challis of Cambridge and Mr. Airy of Greenwich) to whom they were known hesitated to admit them without further examination. Their doubts are explained by the importance and novelty of the object, and by the extraordinary difficulty of the research itself, which might well have been deemed beyond the powers of a young *savant* till then unknown. These doubts were accordingly not dissipated until the moment when M. Le Verrier published the results of his admirable investigations, which led to the most brilliant discovery in the astronomy of the solar system, while the other astronomers of Europe had no suspicion of the existence of Mr. Adams's labours. M. Galle of Berlin, was the first to find the planet indicated by M. Le Verrier. While we consider all these circumstances attendant on the discovery of the new planet, we at the same time conceive that we find the adhesion of M. Le Verrier to the name of Neptune, not only in his announcement to us of the 1st of October, but also in his later letters addressed to the Academy of Sciences and to two astronomers of the central observatory—letters which make no objection whatever to the name of Neptune chosen by the Bureau des Longitudes.

"Consequently, we will retain the name of Neptune; and will make no change unless hereafter the general voice shall determine in favour of another name.

"In the name of the astronomers of the Central Observatory,
Polkowa, 17 (29) Dec. 1846." W. STRUVE."

Mr. Airy adds, that he quite agrees with M. Struve in his reasons and in his conclusions.

XXXIII. On $\sqrt{-1}$. By H. S. WARNER, Esq.

[The following Note, appended to a communication received from Mr. Warner on the use of the symbol 0 (but not adopted for insertion), relates to a Paper signed "Shadow" in our Number for September 1846.]

IN relation to the article of "SHADOW," I may observe that I did not expect that my conclusions would be admitted
Phil. Mag. S. 3. Vol. 30. No. 200. March 1847. O