

THE NAMING OF NEPTUNE

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Abstract: Le Verrier chose the name of Neptune immediately after hearing of the correctness of his prediction. This fact soon became obscured by François Arago's pledge made before the French Académie des Sciences, claiming that Le Verrier had entrusted him with the naming of the new planet. Then, British and German sources weighed in with differing names, and Britain's claim to co-prediction of the planet's position was expressed by their proposal of the name, 'Oceanus'. Eventually in February of 1847 Airy urged upon Le Verrier that the name he had originally proposed, namely 'Neptune', should be accepted, because it was the only one that could secure consensus.

Keywords: Neptune, Urbain Le Verrier, Sir John Herschel, François Arago

"And what do you think of Le Verrier's sudden determination to call Uranus by no other name than 'Herschel?'" (Richarda Airy to Adam Sedgwick, January 1847).

1 INTRODUCTION

The discovery of Neptune in Berlin in September 1846 was hailed as a triumph of theoretical astronomy, and the predictor, Urbain Le Verrier (Figure 1),¹ was soon showered with honours. A crisis arose over the naming of the new sphere, finally requiring a consensus of European astronomers to agree. Its predictor, who had located it by theoretical calculations to within one degree, found himself in an emotional crisis and was strangely paralysed when asked for his opinion over what the name ought to be, while a plethora of classical names were propounded by other astronomers. When a consensus did finally start to emerge, it impinged upon the name which astronomers had given to another new planet, 'Herschel' (Uranus). The belated British claim to have co-predicted the new sphere, which took place in the months following its discovery, also contributed to Le Verrier's stress and the complications in agreeing upon a name.

Concerning the name of the planet Uranus, discovered in 1781 by William Herschel, the annual French *Connaissance des Temps* called the new sphere 'Herschel' until 1813, when it changed over to the name, 'Uranus.' The Royal Astronomical Society's *Monthly Notices* had used the latter name from 1836, whereas the *Nautical Almanac* called it 'The Georgian' right up until 1851, when it finally switched over to 'Uranus'.

2 THE DISCOVERY

Neptune's discovery generated a sense of wonder unmatched in the annals of astronomy, as the following account by Benjamin Gould (1850: 21) indicates:

The remembrance of the enthusiasm excited by the discovery, of the amazement with which the tidings were received, not only by astronomers, but by almost all classes of the community, and of the homage paid to the genius of Le Verrier, is still fresh in the memory of all. Nations vied with one another in the expressions of their admiration.

But, there swiftly followed challenges to Le Verrier's achievement, both from the English claim of co-prediction by John Couch Adams at Cambridge (Kollerstrom, 2006a) and the growing American scepticism over the computations:

The strange series of wonderful occurrences of which I am to speak is utterly unparalleled in the whole history of science; - the brilliant analysis which was the direct occasion of the search for a trans-Uranian planet, - the

actual detection of an exterior planet in almost precisely the direction indicated, - the immediate and most unexpected claim to an equal share of merit in the investigation, made on behalf of a mathematician till then unknown to the scientific world, - and finally the startling discovery, that, in spite of all this, the orbit of the new planet was totally irreconcilable with those computations which had led immediately to its detection, and that, although found in the direction predicted, it was by no means in the predicted place, nor yet in the predicted orb. (Gould, 1850: 3).

The turbulent national rivalries here involved played a part in the endeavour to choose a name that would generate consensus.

On the evening of 25 September, 1846, a euphoric astronomer, Johann Galle at the Berlin Observatory, sat down to pen a letter to Urbain Le Verrier in Paris. "La planète, dont vous avez signalé la position, *réellement existe ...*", it began. He had spotted it just after midnight on the night of the 23/24 September, and then confirmed it on the next night's viewing with the Berlin Observatory's telescope. As the person who had had the honour of first seeing it, Galle evidently felt that he had a right to propose a name: let it be *Janus*, he wrote, "... the most ancient deity of the Romans, whose double face signifies its position at the frontier of the solar system." (Galle, 1846).

Le Verrier received Galle's letter on 28 September, but he was just too late to announce it at the weekly Académie des Sciences meeting that same day (Foucault, 1846a). Instead, he at once gave his story to two French newspapers, the *National* and the *Journal des Débats*, which published it on 30 September (Foucault, 1846b). In his report Le Verrier proposed the name, 'Neptune'. He thus proposed and published its name before anyone in England (with the sole exception of John Hind) had even heard of its discovery. This primary nomenclatural act seems to have been omitted from all English-language histories of the discovery. Léon Foucault (of pendulum fame) was the young reporter working for the *Journal des Débats* whose story carried this name. The news broke in England on 1 October when Hind's letter about 'Le Verrier's planet' was published in *The Times* newspaper.

The term 'discovery' was at once attributed to Le Verrier: Galle in his letter merely said he had 'found' ('trouvé') the planet, while a letter dated 28 September from Heinrich Schumacher (1846: 22), editor of *Astronomische Nachrichten*, to Le Verrier alluded to

“... votre brillante découverte. C’est le triomphe le plus noble de la théorie que je connaisse.”

3 LE VERRIER CHOOSES A NAME

On 1 October, Le Verrier sent letters to three European observatories, proposing this name *and* the symbol of the Trident for the new planet. His letter of gratitude to Galle in Berlin rejected the name Janus: “... the name of Janus would indicate that this planet is the last of the solar system, which there is no reason to believe ...”. He wrote similar letters to George Biddell Airy and to Wilhelm Struve, Directors of the Greenwich and Pulkovo Observatories. In these letters Le Verrier averred rather strangely that the Bureau des Longitudes had already made the decision: “Le Bureau des Longitudes s’est prononcé ici pour Neptune. Le signe un trident.”²

The Bureau des Longitudes published the yearly *Connaissance des Temps*, and to that extent decisions over nomenclature did fall within its provenance. But it had no occasion to meet, let alone reach any such decision, during those three days. It may not have been in Le Verrier’s nature to say “I have decided ...” or “What I want is ...”, which would have been the truth, and he sought instead for a more impersonal phrase. This caused trouble later, with the Bureau explicitly repudiating Le Verrier’s statement at a subsequent meeting (Grosser, 1962: 124) and insisting that it had had nothing to do with the name, and it even threatened legal action on this matter.³ Le Verrier’s initial suggestion, published in the two French newspapers, made no mention of the Bureau.

Sir Henry Holland paid a visit to the Berlin Observatory after the discovery, and spent an evening in conversation with Encke, the Director of the Observatory, and with Galle (who first saw the new planet). He was fortunate enough to be present when the letter from Le Verrier arrived:

Among other things discussed while thus sitting together in a sort of tremulous impatience, was the name to be given to the new planet. Encke told me he had thought of Vulcan, but deemed it right to remit the choice to Le Verrier, then supposed the sole indicator of the planet and its place in the heavens; adding that he expected Le Verrier’s answer by the first post. Not an hour had elapsed before a knock at the door of the observatory announced the letter expected. Encke read it aloud; and, coming to the passage where Le Verrier proposed the name of ‘Neptune’, exclaimed, ‘*So lass den Namen Neptun sein*’ It was a midnight scene not easily to be forgotten. A royal baptism, with its long array of titles, would ill compare with this simple naming of the remote and solitary planet thus wonderfully discovered. (Holland, 1872: 298-299).

4 THE PLEDGE OF ARAGO

In Paris, the following week’s dramatic meeting of the Académie des Sciences (on 5 October) was packed with crowds endeavouring to catch a glimpse of Le Verrier, and the new planet was debated. The most eminent of French astronomers, François Arago, rather ruined the prospect of scientific debate with a pledge that he made. As Director of the Paris Observatory and perpetual Secretary of the Académie, he had received from LeVerrier “... une délégation très-flatteuse: le droit de nommer la planète nouvelle”⁴—a

rather startling claim as the latter had already sent out letters and given newspaper reports suggesting a name for the new planet. As comets are named after their discoverers, such as Halley, Encke or Biela, Arago explained, how much more should planets be so nameable. “Herschel détronera Uranus ...” he exclaimed: the name of ‘Herschel’ would replace that of Uranus. Dramatically, he pledged “... de ne jamais appeler la nouvelle planète, que du nom de Planète de Le Verrier.”



Figure 1: Urbain Jean Joseph Le Verrier, 1811-1877 (courtesy Observatoire de Paris).

This was, he averred, “... a legitimate national sentiment.” (Arago, 1846). Arago was not proposing a name to the French Académie des Sciences as a basis for discussion, he was imperiously informing them that he would use no name other than one which he personally chose, irrespective of anyone else’s view!

Scholars have surmised that LeVerrier had requested Arago to adopt this position (e.g. see Danjon, 1946: 273; Grosser, 1962: 125 and Standage, 2000: 111), but one may doubt this for two reasons. Firstly, the account of the Académie des Sciences’ meeting has Arago describing how *of his own volition*, he reached this decision; and, secondly, when, after some months, it was becoming evident across Europe that his name was not going to be accepted, and even when a row may have taken place between Arago and Le Verrier (the substance of which we are, alas, unable to apprehend),⁵ Arago does not ever blame Le Verrier, or even hint that it was anything other than his own initiative. During the few months that Le Verrier was a member of the Bureau des Longitudes, it evidently decided in favour of Arago’s chosen name, ‘Le Verrier’, and its symbol (which combined an ‘L’ and ‘V’ design) appeared in its early-1847 volume (tables for the year 1849). This symbol is also depicted here in Figure 1.

5 THE BRITISH PROPOSAL

On 14 October, Professor James Challis, Director of the Cambridge Observatory, and his young Cambridge protégé, John Couch Adams, wrote to *The Athenaeum* proposing the name 'Oceanus'. Their letter was published on 17 October, at which time the world had yet to be informed of the predictions supposedly made by Adams concerning the new planet's position, and how near they might have been (see Kollerstrom, 2006a). This London weekly subsequently served as the central forum for British debate over the priority dispute. On the same day of this publication, the Astronomer Royal, Airy, wrote to Le Verrier objecting that the name he had proposed, 'Neptune', "... somewhat disturbs my mythological ideas". The name 'Oceanus' would, he explained, be better received! (Airy, 1846a).⁶ At the stormy meeting of the Académie on the following Monday, Arago (1846c) responded with sarcasm to this British proposal:

M. Challis s'exagère tellement le mérite du travail *clandestin* de M. Adams, qu'il attribue, jusqu'à un certain point, au jeune géomètre de Cambridge le droit de nommer le nouvel astre. Cette prétention ne sera pas accueillie. La public ne doit rien à qui ne lui a rien appris, à qui ne lui a rendu aucun service. Quoi! (Arago, 1846c).

Airy exerted an extraordinarily wide influence upon European astronomy and there was no person living for whom Le Verrier had greater respect. Following this letter, one is perplexed to find Le Verrier behaving as if he had never proposed the name of 'Neptune'.

In their *Athenaeum* letter, Challis and Adams published the first realistic estimate of the distance of the planet from the Sun as 30.05 astronomical units, which was considerably less than Adams and Le Verrier had earlier assumed. From a six-week sky-search which Challis had made with the Cambridge Observatory telescope, two pre-discovery observations of Neptune were identified, and these enabled Adams to compute the planet's speed and thus its "... present distance." This, presumably, gave the two astronomers enough confidence to propose a name. Meanwhile, John Hind (whose observatory was located in Regent's Park, London) objected: "... it appears to me intrusive in the Cambridge people to urge a name for the planet on astronomers, and one too which is no more likely to succeed with the French (who have the only right to name it) than if it had been dubbed 'Wellington'." (Hind, 1846).

6 THE DILEMMA OF LE VERRIER

Some light upon the dilemma faced by Le Verrier is cast by a letter he wrote to Schumacher on 25 November 1846:

I have been valiantly defended by M. Arago. In another epoch I would perhaps have fended off the honour which he wanted me to have in giving my name to the planet; but the singular pretensions of the British have decided me to accept his friendly gesture. I would assure you that even the adoption by the Board of Longitude, to which I was not party, of the name of Neptune which I had not proposed, has not a little contributed to making me find this name detestable. (Le Verrier, 1846b, my translation).

Le Verrier here appears to be trapped in a Hamlet-like paralysis of indecision. This letter does not, I suggest,

support the thesis that he had asked Arago to make the proposal in the first place.

Three days later, on 28 November 1846, Le Verrier (1846c) wrote a letter to John Herschel, signing it as being from "U J LeVerrier and Mr Thomas of Hell No 5", as if some tormented *alter ego* were appearing. This letter concerned Herschel's agreement to represent him at a forthcoming Royal Society meeting and receive on his behalf its prestigious Copley Medal, a cheerful enough occasion, one would have thought. Le Verrier also presented Herschel with a memoir entitled 'Researches on the Movements of Uranus', but he changed its title so that it read 'Herschel' instead of 'Uranus' (in honour of John Herschel's father William, who was the discoverer of Uranus). In the Introduction, Le Verrier (1846d) explained:

In my future publications, I shall consider it my strict duty to eliminate the name Uranus completely, and to call the planet only by the name Herschel. I deeply regret that the printing of this work is already so far advanced that I am unable to adhere to a vow that I shall observe religiously in the future.

It is noteworthy that 'Uranus' is used throughout the text of this memoir and it is only on the title page that the name of the planet has been changed! An inappropriate degree of fervour has crept in here, where Le Verrier and Arago appear to be trying to put the clock back by several decades, 1812 being the last time that the *Connaissance des Temps* had alluded to this outer planet as 'Herschel'. Sir John thanked Le Verrier for the volume, and whilst appreciating the honour intended for his father he declined to concur because "I have personally committed myself to a mythological name, a few years ago, on the occasion of the reform of our Nautical Almanac." (Herschel, 1847a; cf. Kollerstrom, 2006b).

On 7 January 1847, Le Verrier confided to Airy about his state of depression: "I have been completely unaware of all that was done and said, in France or elsewhere, about the poor planet. I have been troubled here in many ways. I would not advise anyone who likes peace to deal with astronomy in France." He was not able to comment upon the 'Account' which Airy had read out at the RAS—this being the main British statement concerning the discovery of Neptune—because, "... having withdrawn myself from the matter I have not seen the communications or documents." (Le Verrier, 1847a). The combination of having an Englishman steal his glory, having Arago proclaim that the planet be named after him, and *then* having that name be not accepted by European astronomers, was all just too much!

In his reply, Airy (1847a) discreetly indicated that the name proposed by Arago was not being well received and begged him to accept the name of Neptune. Was Le Verrier glad at hearing the name proposed, which he himself had originally advocated? He sent off a tormented reply on 26 February, after a two-week delay, signed as being from "U J Le Verrier and Mr Thomas of Hell no. 6." (Le Verrier, 1847b) This infernal concordance of two of his letters to England has not hitherto been noticed, except by the present writer in the process of collating the letters. What caused the man who found Neptune, then receiving supreme accolades from kings, learned societies and astronomical observatories around the

world, to descend in his moods thus, through the circles of Hell? This letter added that he had "... finally resigned from being a functioning member of the Bureau of Longitude [which he joined in October]. I am no longer part of the Observatory." This does not sound quite like glory being awarded to France's greatest astronomer. In this reply, Le Verrier makes a last-ditch plea to have the new planet named after himself. The two letters expressing hellish angst are about nomenclature and Le Verrier's own involvement therein, both being concerned with name-changes to "... this unfortunate planet." (Le Verrier, 1847a).

James Challis received a letter dated 4 February 1847 from Wilhelm Struve declaring that the name 'Le Verrier' would be "... against historical truth, as it cannot be denied that Mr Adams has been the first theoretical discoverer of that body ..." (Struve, 1847). Thus the claim for joint co-prediction of the new planet worked against its being named after an individual. Tactfully, Sir John Herschel (1847b) proposed a diplomatic exit from Arago's pledge:

I observe that Arago calls the new Planet not 'Le Verrier' but 'Planète de Le Verrier' ... Now this is rather a description than a name. Those who think it 'Le Verrier's Planet' may yet call it Neptune without compromise ...

Sir John was quite forthcoming with suitable names: 'Demogorgon' and 'Minerva' (Herschel, 1846a). Later he suggested 'Hyperion' (Herschel, 1846b), which in Greek, meant "... the transcendent ...", a son of Uranus and Terra, "... the inhabitants of terra having come to its knowledge by means of Uranus." (Herschel, 1847b; for further details see Kollerstrom, 2006b). But as the Edinburgh Professor of Latin, J. Pillans (1847a) pointed out, some questioned the right of a Frenchman to name the planet because, had not a German, Johann Galle, first seen it? Meanwhile, Pillans found literary reasons for preferring 'Janus' to 'Neptune' (cf. Pillans, 1847b). Thus, by the end of 1847 a plethora of different names had been proposed for 'Neptune', mirroring the variety of names then in use for Uranus ('Herschel', 'The Georgian', '*Georgium Sidus*', and 'Uranus').

7 AIRY'S DECISION

Airy broke the stalemate of nomenclature in his letter of 28 February 1847 to Le Verrier: after explaining "... the difficulty in which I found myself, and in which nearly all the astronomers of Europe found themselves, with regard to the name of the new planet ..."—viz, there was no-one who liked Arago's proposal—he then added, "I had hoped that perhaps you might give me some sanction for the adoption of a mythological name" (Airy, 1847c). Because Le Verrier was, for whatever reason, unable to do this, Airy felt compelled to act: he had received "... the reports of the principal astronomers of the North of Europe ... [and] I therefore definitely adopted the name of Neptune." It would seem, therefore, that 28 February 1847 is a key date for the accepting of the new planet's name. No-one especially liked the new name, but it emerged as a default position, others being too partisan.

The letter of 28 February echoed Airy's note a week earlier to *The Athenaeum*, based on the view that Le

Verrier had not *himself* expressed approval of any name, for the new planet: "It is proper, however, to add, that M Le Verrier himself did not distinctively express either approval or disapproval of the name Neptune." As for Arago's proposal, Airy (1847b) propounded a somewhat subtle argument, whereby "... the decision of a deputy is far less binding than that of the original discoverer." He described Arago's proposal—in a move which he acutely regretted, as soon as he had put the letter in the post—as "... an attempt (which I must characterise as indelicate) ..."

This single word fractured his good relations with Arago, for as Sir Roderick Murchison (1847) explained, use of such a term was "...an unpardonable offence in the eyes of a Frenchman." Ten months later, Airy alluded to "... the grief which I have felt ever since ..." (Airy, 1847d) over this (indelicate, one might say) phrase. A published apology turned out to be the only answer; even though this, he explained to George Peacock the Dean of Ely, would

... probably be interpreted as retracting a great deal more than I have any intention to retract. [After all, there was no doubt that] ... Arago had done grievously wrong: he had mingled great violence with a sort of craftiness entirely setting aside common rules of propriety, and it was necessary that an objection should be made by the proper persons.

It was hard for Airy to put his finger on exactly what was wrong, whereby Arago had named the planet after the person who had assigned to him the right to choose the name. Nor are we, alas, able to clarify for the reader, in what way Arago had perpetrated 'great violence' and 'craftiness.' The *Athenaeum* eventually published his apology. (Airy, 1847e).

In the British debate, a widely-held consensus emerged that comets could be named after their discoverers, whereas planets needed more Olympian names.⁷ This (we may conjecture) obliged British astronomers to re-examine their own preferences for national names for Uranus. On 28 April 1847, Adams wrote to Airy that this would be an appropriate time for the name of the 'Georgian' in the *Nautical Almanac* to be changed to 'Uranus', "... in order to conform to the general usage among astronomers." Usage of the name 'Herschel' may have persisted for some more years out of respect for the Herschel family. On both sides of the Channel, personal names for the two outermost planets came to be renounced, with their connotations of national prestige, in favour of those from Graeco-Roman mythology.

In the summer of 1847, the Bureau des Longitudes wanted to clarify its position, and stated:

Le Bureau des Longitudes n'avait pas jusqu'à présent aucune décision relativement au nom qu'il conviendrait de donner à la nouvelle planète: celui de Neptune ayant aujourd'hui prévalu parmi les astronomes, le Bureau se décide à l'adopter. (*Connaissance des Temps*, 1847).

Arago had, it added, refrained from voting on this matter. It there employed the trident glyph of Neptune, instead of the earlier 'LV' symbol; Le Verrier's name had remained attached to the planet for one year!

8 CONCLUDING REMARKS

French theory and British data were married together in the quest for Neptune. Sir John Herschel wrote:

I regard the discovery whether made by Leverrier or Adams or both as in the main of French origin. The analytical theory of the Planetary Perturbation which alone render it *possible* is almost exclusively French. Clairaut, Laplace, Lagrange, Pontécoulant and Poisson are the authors of those formulae which, used as tools or as *telescopes of the intellect* have done the thing and we owe them this national recognition. (Herschel, 1847b).

Both parties, Adams and Le Verrier, used a similar theory of planetary perturbations—indeed, they used the same textbook on perturbation theory (Pontécoulant, 1840). The theory describing planetary perturbations was largely French in formation, by the late eighteenth century, because French use of the Leibnizian differential calculus in that century had been more productive than the rather abortive British endeavour to use Newtonian fluxions (see Grattan-Guinness, 1990). But equally, both parties used British data, Greenwich being the source of the best positional-astronomy data for Uranus.⁸ The discovery thus involved Anglo-French collaboration, and it is therefore appropriate that its name should have emerged from a sometimes stormy cross-Channel debate.

9 NOTES

1. To inspect the Leverrier correspondence, on which this article is based, go to www.dioi.org/search.php. Inserting 'Le Verrier' will bring up a couple of dozen letters from him, and a similar number to him. For other Neptune articles by the author of this paper, see www.dioi.org/kn/index.htm.
2. At the time Le Verrier was not even a member of the Bureau. He was only nominated on 14 October, and remained a member for just four months. However, as early as 1841 one finds Le Verrier being alluded to as a member ("... on songeait à lui comme membre du Bureau des Longitudes ...") with J-B. Biot (1841) writing to the Bureau's President requesting that he be affiliated.
3. Danjon (1946: 273) notes that "Le fait [i.e. that the Bureau de Longitude had chosen the name] fut contesté formellement dans la suite et les procès-verbaux des séances n'en conservent aucune trace."
4. Le Verrier (1846a) said: "J'ai prié mon illustre ami M Arago de se charger du soin de choisir un nom pour la planète. J'ai été un peu confus de la décision qu'il a prise dans le sein de l'Académie."
5. In his 1846b letter to Herschel, Arago refers to Le Verrier as "... my young friend ..." with no hint of a falling-out, so any possible row between these two scientists must have occurred at a later date.
6. Rawlins (1999) expressed the opinion that "The Oceanus letter to Le Verrier has got to be THE nuttiest notion of Airy's long and illustrious career."
7. For instance, J. Lee wrote to Airy (1847) reporting on the RAS's dinner-club discussion of 13 January 1847, where the majority wished that "... a mythological or archetypal name should be given to the new planet ..."
8. Airy had sent his Greenwich Uranus positional data to Eugène Bouvard in Paris, in a series of five letters dated 1838-1844, which the latter used for improving his uncle Alexis Bouvard's tables of Uranus, to which Le Verrier had access. Also, both parties used the seventeen pre-discovery observations of Uranus published in Bouvard's *Tables* (Paris, 1821), derived from Flamsteed and Le Monnier.

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The following abbreviations are used:

IoA = The Institute of Astronomy (Challis' Collection) at the University Library, Cambridge.
 McA = The McAlister Collection at St John's College, Cambridge (copies of originals).
 RAS MSS = The Royal Astronomical Society's manuscript collection.
 RGON = The RGO's Neptune File at the University of Cambridge Library.
 RS:HS = The Royal Society's Herschel Collection.

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