

WHO INVENTED THE WORD ASTEROID: WILLIAM HERSCHEL OR STEPHEN WESTON?

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Abstract: William Herschel made the first serious study of 1 Ceres and 2 Pallas in the year 1802. He was moved by their dissimilarities to the other planets to coin a new term to distinguish them. For this purpose he enlisted the aid of his good friends William Watson and Sir Joseph Banks. Watson gave him a long list of possible names, which Herschel rejected. With a lifetime of experience classifying and naming newly found objects in nature, Banks became the man both Erasmus Darwin (in 1781) and William Herschel (in 1802) turned to for sage advice in developing a new descriptive language. In the case of Ceres and Pallas, Banks turned the task over to his friend, the noted philologist Stephen Weston, FRS. It has recently been stated by a noted British historian that it was Weston—not Herschel—who coined the term ‘asteroid’ to collectively describe Ceres and Pallas. This claim is investigated, and parallels are drawn in the use of neologism in astronomy and botany.

Key words: Ceres, Pallas, Herschel, asteroids, minor planets, planets, botany



Figure 1: Sir William Herschel, 1738–1822 (after Holden, 1881).



Figure 2: 1794 etching of Stephen Weston, 1747–1820, by Harding, from a picture painted in Rome in 1775 (courtesy: Devon Libraries. Westcountry Studies Library).

1 INTRODUCTION

Employing his 20-foot telescope with a mirror 18.7 inches in diameter, William Herschel (Figure 1) made the first scientific study of Ceres and Pallas in 1802 (Cunningham, 1984). Ceres had been discovered on 1 January 1801 by Giuseppe Piazzi at Palermo Observatory in Sicily (Piazzi, 1802a), and Pallas had been found on 28 March 1802 by Wilhelm Olbers in Bremen, Germany (Zach, 1802). Herschel’s first night of observation of Ceres was 7 February 1802, and for Pallas 21 April 1802. In a paper describing his observations, Herschel was inspired to look at the ‘bigger picture’, trying to put the new discoveries into context (Herschel, 1802a). How did they fit into the age-old categories defined by planets and comets? In his estimation they did not fit, and thus a new category was required. He called the new category ‘asteroid’. Or did he? In a recent popular book, *The Age of Wonder*, British historian Richard Holmes (2008) refers to a 10 June 1802 letter from Herschel to Sir Joseph Banks, President of the Royal Society, and then states:

Herschel offers the term ‘asteroid’ reluctantly from a suggestion from the antiquary Rev Steven Weston, though fully aware that the recently discovered Pallas and Ceres were not ‘baby’ stars. The usage is nonetheless dated to Herschel 1802 by the OED (Oxford English Dictionary). (Holmes, 2008: 509, note 134).

2 STEPHEN WESTON

To begin analysing this claim, we must first inquire who Stephen Weston was. The spelling of his name is an initial step. Every source we have seen spells his given name Stephen, not Steven. Only in the book by Holmes does his name appear as Steven.

Rev. Stephen Weston (Figure 2) was a grandson of the Bishop of Exeter of the same name (1665–1741). He was born at Exeter in 1747; was educated at Eton; matriculated at Oxford in 1764, and became a Fellow of Exeter College. Through the friendship of Lord Lisburne, the then-owner of Mamhead (a civil parish in Devon), he was presented to the rectory of that parish as their minister in 1777. In 1790 Weston’s wife died, and he then resigned his position at Mamhead and moved to London. In 1792 he was elected a Fellow of the Royal Society, and in 1794 a Fellow of the Society of Antiquaries.

From the time that he left Devonshire, Weston's studies were principally directed towards the classics and oriental literature. In the latter area his knowledge was wide-ranging, with numerous translations of Persian poetry and Arabic works. His philological writings were also rather remarkable: he published a supplemental German Grammar, a set of notes on Shakespeare, and a specimen, as it is called, of a Chinese-English Dictionary.

His first work, in 1784, consisted of conjectures on the third century AD Greek grammarian Athenaeus, and from that time until 1830 scarcely a year passed without some fresh publication emerging from his busy pen. His name is to be found among the hundred or more scholars who have turned Thomas Gray's 'Elegy' of 1751 into Latin or Greek; and when he published a new edition of Horace, he added to it Greek versions of the odes 'o Fons', and 'Intermissa Venus'. The fame of Weston rests on his knowledge of the Asiatic tongues. He was a Hebrew scholar, and ventured on an attempt to explain by the aid of Benjamin Kennicott's collations the difficulties in the Biblical story of Deborah. He was also a Persian scholar, and edited a collection of 'Distichs' from Persian authors, and a volume of the annals of their kings (*Dictionary of National Biography, 1885-1900, Volume 60*).

Weston died at his house in Edward Street, Portman Square, London, on 8 January 1820, aged 82. An obituary in the *Gentleman's Magazine* (1830) states that he "... always retained the greatest partiality for the elegant amusements and lively society of the French capital."

3 HERSCHEL SEEKS ADVICE FROM BANKS

Continental astronomers were quite content to regard Ceres and Pallas as planets, but Herschel believed they were a separate class of object since they differed from planets in several respects, including size, inclination and orbital distances from one another (Herschel, 1802a; Hughes and Marsden, 2007). Since there was no international organization in place to decide such matters, Herschel took it upon himself to invent a word that could be used for this new class. He felt further empowered in this mission by his belief that his observations were superior to those being made on the Continent. His comparison here is with the telescope of Johann Schroeter in Lilienthal, as used by his assistant Karl Harding (and the observational conclusions of Herschel versus Schroeter are considered in detail in Cunningham and Orchiston, 2012).

On 17 February 1802 Herschel (1802b) wrote to his friend Sir Joseph Banks (Figure 3), the long-serving President of the Royal Society (of London):

I think that my determination of the magnitude of the new planet [Ceres] must be much more accurate than that of Mr. Harding of Lilienthal, both on account of the object with which I compared it, and of the magnifying power of my telescope.

At the time he was trying to develop the appropriate word for this newly-discovered object, and he had the field to himself. Piazzi did not suggest the word 'planetoid' to Herschel until 4 July 1802, as evidenced by a letter he wrote to Herschel on that date (Piazzi, 1802b), and no other appellation was forthcoming from any other astronomer.



Figure 3: Sir Joseph Banks, 1747–1830 (after Garran, 1887, Volume 1).

Not trusting his own capability to coin a suitable new word, he turned to Banks for advice on a name that would suitably describe Ceres and Pallas. One of the prime reasons for his choice of Banks was the fact that no one had a greater familiarity with the very problem Herschel was grappling with. In 1781 Erasmus Darwin (Figure 4) had begun a translation into English of *Systema Vegetabilium* by Carl Linnaeus (Figure 5), and he sent numerous letters to Banks for advice as he set out to establish a new botanic language, "... creating vernacular compounds in English as Linnaeus had done in Latin." (Uglow, 2002: 380).



Figure 4: Erasmus Darwin, 1731–1802, painted by Joseph Wright (courtesy: Wikipedia).

It is telling that when *System of Vegetables* was published in 1783 it was dedicated to Banks.

But why Banks? In fact he was the ideal candidate as he had established his reputation at age 23 by publishing the first Linnaean descriptions of the plants and animals of Newfoundland and Labrador, which he collected and classified on an expedition of 1766. Nearly three decades later he called Linnaeus "... the God of my adoration." (Banks, 1792). With a lifetime of experience classifying and naming newly-found objects, he was the man that both Darwin (in 1781) and Herschel (in 1802) could turn to for sage advice. And as Banks knew better than anyone, "... the seemingly simple function of naming objects does not present a simple connection between a thing and a word." (Goldstein, 1948: 196). Yet despite his vast experience, the seemingly simple task of creating the word needed to describe Ceres and Pallas eluded Banks.

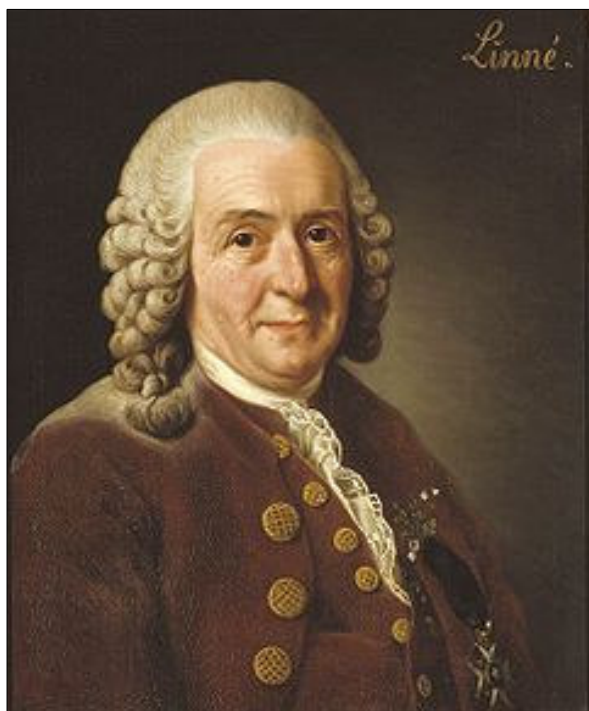


Figure 5: Carl Linnaeus, 1707–1778, painted by Alexander Roslin in 1775 (courtesy: Wikipedia).

Herschel's first attempt to solicit Banks' help came on 18 April 1802:

If any name should be fixed upon, by the President (Banks) and Council of our Society (The Royal Society), for the new planets, I shall be glad to know it, that I may call them accordingly; till when I continue to distinguish them by the names of the discoverers. (Herschel, 1802c).

Naming a discovery after its discoverer was another commensurable link with botany (Lemmon, 1878). Since no name was forthcoming, Herschel applied to Banks once again in early June 1802. Banks then turned to his philological expert, Stephen Weston, for help, before replying to Herschel on 7 June:

I applied to Mr. S. Weston as I always do in these occasions to tend God Father to your new species of mocking stars and [he] has sent me a card which I enclose. I really think Aorate a good name a much better [one] than any that has been hitherto suggested and the more so as it is not probable that any of this new kind of wanderers are visible to the naked eye. (Banks, 1802b).

With the invention of the word 'aorate' Weston was employing the suffix '-ate'. This suffix occurred originally in nouns borrowed from Latin, and it also occurs in Greek. The origin of 'aor' is less certain, but may have come from the origins of the word meteor. According to the *Online Etymology Dictionary*, meteor is the neuter of the Greek 'meteoros' (adj.), which means "high up", from meta- "over, beyond" + -aoros "lifted, hovering in air". Combined with the Latin definition of -ate, namely "... having the appearance or characteristics of ...", one may suggest 'aorate' to simply mean an object that has the appearance of being in the sky. Alternatively, 'aor' in Greek means a sword or dagger. So aorate would mean having the appearance of a sword, although this seems to make little sense. The most likely explanation is that Weston was using not the Latin but the Greek meaning on the suffix -ate. From this is derived the perfectly valid Greek word 'aoratos', which means either 'invisible' or 'never seen before.' Whatever Weston's intended meaning may have been, it did not pass muster with Herschel.

4 THE 10 JUNE 1802 LETTER

Since the substance of Holmes' argument rests on the content of the 10 June letter from Herschel to Banks, it is necessary to quote it here. This letter was Herschel's reply to the 7 June letter of Banks quoted in Section 3, above.¹

The names you have done me the favour to send I have carefully examined, and beg leave to give you my remarks on them. The title of them, "Names for the new Planet," shows immediately that none of them can possibly be used for the new species of bodies which we have to christen: for they are not planets.

If Mr. [Stephen] Weston were to have a definition of the thing we want a name for, he might possibly find a better one than that of asteroids, which is not exactly the thing we want, though still the most unexceptionable (sic) of any that have been offered by my learned friends. Will you do me the favour to consult him once more upon the subject, and mention to him that the bodies to be named are neither fixed stars, planets, nor comets, but have a great resemblance to all the three? With this view before him he will probably succeed in an appropriate appellation. (Herschel, 1802d).

From this it appears that none of Weston's suggestions were accepted by Herschel, and unfortunately no response to this plea of 10 June exists in the archives. Herschel did not correspond directly with Weston, so it appears they were not well acquainted, although they may have met. The mention he makes to names "... offered by my learned friends ..." certainly refers to Sir William Watson, who gave Herschel a suite of unhelpful names in a letter dated 27 April 1802 (Cunningham et al, 2009). There are no letters in the Herschel archives showing that anyone other than Watson gave Herschel any ideas in April or May (or at any other time) about the urgently-needed appellation.

That Herschel believed there was urgency in the matter is evident from his letter of 25 April to Watson. In it, Herschel (1802e) tells Watson that his paper about Ceres and Pallas is "... going to London by next Thursday ..." which will be 6 May, just 11 days hence. Even though Herschel tempers his immediate request by saying he is "... hardly willing to press you so

much for haste ...”, the implication is obvious and Watson responded to the letter just two days later. The temporal demand for a name before the paper was sent to the Royal Society forced Herschel’s hand. Thus we can date Herschel’s choice of ‘asteroid’ to somewhere between 27 April and 6 May, the date his paper was read before the Royal Society.

The use of the word ‘unexceptionable’ above is also interesting. Its first noted use in English was in 1664, with the meaning “... not open to objection.” Did Herschel anticipate there would be objections to his newly-coined word ‘asteroid’? If so, he was not to be disappointed, as virtually every astronomer in Europe rejected it in 1802 (Cunningham et al, 2009). He did, however, receive support from Banks in putting Ceres and Pallas in a separate class. Further observations, he wrote, “... will not consider these stars as Primary Planets but as another sort of revolving body such as have not before been discovered and of which more may hereafter be found.” (Banks, 1802a).

Herschel faced criticism from within The Royal Society itself. In his *History of the Royal Society*, Thomas Thomson, a Fellow of the Royal Society like Herschel himself, impertinently suggested Herschel’s reason for calling the new planets ‘asteroids’ was “... to deprive the discoverers of these bodies of any pretence for rating themselves as high in the list of astronomical discoverers as himself.” (Thomson, 1812).

“I should require nothing further,” wrote François Arago (1871) “... to annihilate such an imputation than to put it by the side of the following passage, extracted from a memoir by this celebrated astronomer (Herschel), published in the Philosophical Transactions of the year 1805.” Here is the passage in question:

The specific difference existing between planets and asteroids appears now, by the addition of a third individual of the latter species [Juno], to be more completely established, and that circumstance, in my opinion, has added more to the ornament of our system than the discovery of a new planet could have done. (Herschel, 1805).

Once Vesta, the fourth body between Mars and Jupiter had been discovered in 1807, Banks wrote a letter that Herschel must have considered some measure of vindication:

It gives me much pleasure that more of these singular bodies should be discovered, and that the Germans should so readily and properly have adopted the distinction which you have made between them and planets. (Banks, 1807).

5 CONCLUSION

That the book *The Age of Wonder* by Holmes is replete with misleading statements is a fact that has been noted by Susan Eilenberg (2010), Associate Professor of English at the University of Buffalo:

The Age of Wonder is not a book one ought to rely on for perfect factual accuracy. The footnotes, so reassuring in their mass, can one by one leave the curious reader stranded. Dates, victims presumably of transcription errors, are sometimes out by entire centuries. And sources sometimes fail to say what Holmes leads us to expect they will.

Such is certainly the case here, where the sources bear no resemblance to the claim about the word ast-

eroid. The sequence of events is sufficient to decide the merits of the case. William Watson gave Herschel his ideas for a name in April 1802. In early May, Herschel incorporated the word ‘asteroid’ in his paper read at a meeting of the Royal Society. Not entirely content with the word asteroid, Herschel sought advice on a better appellation from Sir Joseph Banks who then turned the task over to Stephen Weston. The suggestions for a name by Weston were given to Banks in early June. Thus, the word ‘asteroid’ was coined by Herschel one month before Weston was given the task of developing a word to describe Ceres and Pallas. In addition, we have the words of Herschel himself, who specifically rejected Weston’s offerings, as is made clear in his 10 June letter to Banks. Therefore, the claim by Richard Holmes that Stephen Weston coined the word asteroid can confidently be rejected.

6 NOTES

1. Note that in Cunningham et al. (2009), the name Weston was incorrectly transcribed as Watson.

7 ACKNOWLEDGEMENTS

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