

HOW THE FIRST DWARF PLANET BECAME THE ASTEROID CERES

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Abstract: The discovery on 1 January 1801 of an object between Mars and Jupiter was the most remarkable astronomical discovery since the planet Uranus had been found in 1781. Its discoverer, Giuseppe Piazzi at Palermo Observatory in Sicily, was quick to name it Ceres Ferdinandea. But the discovery was considered so important that it sparked national rivalries. In Germany, the much anticipated planet had been dubbed Hera sixteen years previously, and other Germans quickly gave it their own names. Some leading French astronomers soundly rejected Ceres Ferdinandea, preferring to call it Piazzi, while others in Paris accepted the name Ceres, while at the same time objecting to Ferdinandea. Once another 'planet' dubbed Pallas was discovered in 1802, William Herschel realised that astronomers were dealing with a new class of object. He was uncertain what name should be employed however, so he canvassed his friends and colleagues for suggestions. Not content with the often ludicrous ideas put forward, he coined the word asteroid. This paper reveals these dual nomenclature issues through previously-unpublished private letters, an Italian journal, and the much more sedate language used in printed journals.

Key words: asteroids, minor planets, planets

1 INTRODUCTION

Until 1781 the Solar System, consisting of six planets revolving around a central star, seemed as immutable as the fixed stars themselves. On 13 March in that year William Herschel (Figure 1) discovered a seventh planet. Herschel, himself, was unsure what to call his epochal discovery, but he was quite certain what it should not be called:

In the fabulous ages of ancient times the appellations of Mercury, Venus, Mars, Jupiter and Saturn were given to the Planets, as being the names of their principal heroes and divinities. In the present more philosophical era, it would hardly be allowable to have recourse to the same method, and call on Juno, Pallas, Apollo or Minerva, for a name to our new heavenly body. (Herschel, 1783).



Figure 1: Sir William Herschel, 1738–1822 (courtesy Wikipedia).

The nomenclature issue arose soon after the discovery. In a letter written in November 1781, Joseph Banks (Figure 2) urged Herschel in November 1781 to name it quickly, otherwise "... our nimble neighbours, the French, will certainly save us the trouble of baptizing it." It was the German astronomer Johann Bode who dubbed it Uranus, but Herschel gave it the name Georgium Sidus. For many decades it was usually called in England 'the Georgian planet' as a tribute to King George III of England. Continental astronomers opted for the classical name, despite Herschel's opinions on the matter. Thus the stage was set for future controversy: should another new planet be named by its discoverer, and what should the astronomical community do if another royal patron is duly honoured?

That another planet could be lurking in the Solar System had been the subject of speculation for many years before Herschel's discovery. Johann Titius first expounded the 'law' of planetary distance in 1766, and his text was incorporated into books by Johann Bode (Figure 3) in the 1770s, a publicity coup that has usually given him the credit for the promotion of 'Bode's Law' (see Cunningham, 2001: 19). When the Italian astronomer Giuseppe Piazzi (Figure 4) found a new celestial body on the first day of the nineteenth century (see Cunningham, 2001; Foderà Serio et al., 2002) it was soon regarded by most astronomers throughout Europe as a new planet, and one that neatly fitted into the predictions of Bode's Law. The stage had indeed been set, now the curtain was about to rise.

2 THE CONTROVERSY IN GERMANY

The name given to the object discovered on 1 January 1801 generated huge controversy in Europe, and the debate raged throughout 1801 and into 1802.

On 7 May 1801 Piazzi wrote a letter to Barnaba Oriani in which he stated his intention to name his discovery Cerere Ferdinandea, the Italian version of Ceres Ferdinandea. This was reiterated in his first monograph on the discovery, *Results of the Observations of the New Star Discovered the 1st of January*

1801 at the Royal Observatory of Palermo.¹ Piazzi also made his choice known directly to Johann Bode, Director of the Berlin Observatory in a letter dated 1 August 1801:

I embrace you heartily that you have first announced my new planet, to which I would like bestowed the name Ceres Ferdinandea. (quoted in Bode, 1801).

Piazzi chose Ceres as the patron goddess of Sicily in the ancient Roman pantheon, and Ferdinandea in honour of Piazzi's patron King Ferdinand of Naples and Sicily.

The debate opened at once, but was initially confined to a squabble between German astronomers. First off the mark was Bode. As he related in a paper written in September 1801, it was in May that he wrote to Baron Franz Xaver von Zach in Gotha:

I would like to suggest the name Juno (Hera, in Greek), as I already informed Baron von Zach in Gotha in May. We must remain with mythology for the sake of analogy and to avoid flattery, and because the planets found over Jupiter carry the name of his ancestors and those standing closer to the Sun the names of his spouse and children. (Bode, 1801).

In 1801, Zach wrote to his close friend Oriani in Milan about the machinations of Bode, who is likened to a farm animal by the haughty French astronomers:

Bode wrote me confidentially that he had already thought about a name for the new planet and that it should be Junon (ed: Junon is the French name for Juno). But since I have been talking about this planet for 16 years now and been hoping to find it working on my zodiacal catalogue, the Duke [Ernst II; Figure 5] has already jokingly baptised this new hidden planet Hera or Ἥρα, which means Junon in Greek. Thus I did not mention anything of Bode's nice idea in my journal since he told me the secret, I only said that 16 years ago the Duke of Saxe-Gotha gave this planet between Mars and Jupiter the name Hera and that it absolutely and necessarily must be Hera and not Junon. Here is the demonstration: 1. the new planet cannot be called Juno since this name is already consecrated to Venus. Pliny *Hist. Nat. Lib. II* chap. VI said: Below the Sun walks the great star some call Venus ... others call it, however, Juno. L. Apuleius said at the beginning of *de Mundo*: Juno, which esteems to be the star of Venus, is ranked as the fifth. St. Augustine *De Civitate Dei Lib. VIII* c. 15 calls Venus *Stellam Junonis*. Hence it is against the rules to give this name to the new planet. 2. It must be Hera because Hera is the mother of Vulcan who resides in Sicily. (ed: it was believed Vulcan, the god of fire, had his smithy under the volcano Mt. Etna). This city of Hera is also named Hybla Minor, and it is of this which Cicero talks in *ad Atticum II.2*. and in Pausanias in *Elis Lib. VI* c.6, and which comes up in the Antonine Itinerary (ed: a register of stations and roads in the Roman Empire); this will conserve, perpetuate and bequeath at the same time the discovery made by a Sicilian astronomer in Sicily to posterity. 3. It must be the Greek name Hera and not the Latin Juno, because Herschel's planet also has a Greek name – Uranus, it should be Coelus in Latin, but it is very good, all the ancient planets will have Latin names, the modern Greek ones, this distinguishes them at a glance, so if a new planet beyond Uranus will be discovered, it needs a Greek name. And here is my poor Baudet (as La Lande called him writing to Gotha) fleeced of the honour to be the parent of the new planet, as well of the honour to have recognised the planet and to have said it was the one between Mars and Jupiter for it belongs to two fine Italians and not to a heavy German like Bau-



Figure 2: Sir Joseph Banks, 1743–1820 (courtesy Wikipedia).

det. (ed: in French, 'baudet' means donkey). (Zach, 1801a; his underlining and bolding).

The ink was scarcely dry on this letter before Zach became aware of other contenders for the nomenclature crown, as he wrote in the July issue of his journal *Monatliche Correspondenz* (*The Monthly Correspondence*), which was the world's first astronomical journal:

That a new planet would be conferred several new names was to be expected. In the *Leipziger Allgem. Literar. Anzeiger* no. 72, an unnamed source suggested the name Vulkan. He believed it would not be improper to give the god who forged the weapons of Achilles a place in the sky next to the god of war [Mars], the husband of Venus next to her lover. Vulkan would also not be able to complain that the honour was paid to him too late and that such an inconspicuous planet had been given his name, since he himself, due to a small mistake on the foot, is not fleet of foot or otherwise of splendid form. Vulkan, as the son of Jupiter, belongs to the family and has, in this respect, a well-founded claim to the honour intended for him. Doctor and Professor [Heinrich] Reimarus in Hamburg is of the opinion that it should be called Cupido. Because it was once established that planets be named according to the gods of dis, he would therefore be (counting from Venus down-

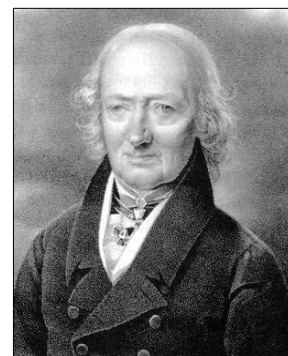


Figure 3: Johann Elert Bode, 1747–1826 (courtesy Wikipedia).

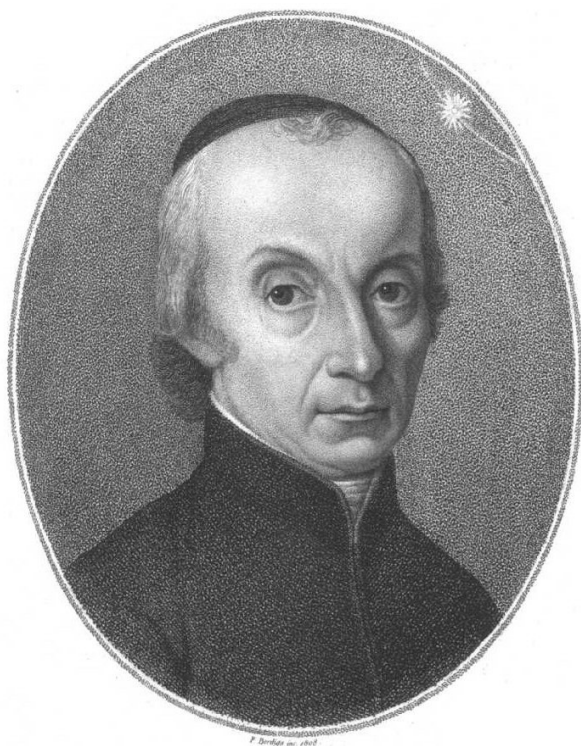


Figure 4: Giuseppe Piazzi, 1746–1826, the discoverer of Ceres (courtesy Wikipedia).

ward) the next from Mars, a lover of Venus. Others believe the name Cupido is fitting because the name is associated with the idea of blindness. The new planet appears only as a magnitude eight star and cannot be seen with the naked eye. But should the planet be confirmed, the question of a name will be decided by the majority, and perhaps even by chance. It is also possible that a general consensus will never come to be, as was the case with Uranus. [MC, July 1801: 56]. A known chemist [Martin Klaproth] wants to christen the new planet Titan after his newly discovered and named metal [titanium], because he had given shortly after the



Figure 5: Ernst II, Duke of Saxe-Gotha-Altenburg, 1745–1804 (courtesy Wikipedia).

discovery of Uranus the element discovered by him the name uranium. (cf. Bode, 1802b).

Oriani (1801) warned Piazzi of the naming situation in Germany:

I must tell you that the name Hera or Juno has been given universally by all of Germany, for which it will be very difficult now to rename it Ceres.

Piazzi (1801) was scathing in his response:

If the Germans think they have the right to name somebody else's discoveries they can keep calling the new star the way they want, for we will always call it Cerere. I will be very glad if you and your colleagues will do the same.

By the time Ceres had been recovered in December 1801 (by Zach) and January 1802 (by Olbers), Bode caved in to the pressure:

I accept with much pleasure the name Ceres Ferdinanda. You discovered it in Taurus, and it has been found again in Virgo, the Ceres of ancient times. These two constellations are the symbol of Agriculture. The chance is very singular. (Bode, 1802a).

3 THE CONTROVERSY IN FRANCE

Even before Ceres had been recovered, the French weighed in with their own views. We gain a unique insight into Joseph-Jerome Lalande (who held the Chair of Astronomy in the Collège de France) and the search for Ceres through a diary that was kept by L.V. Brugnatelli of Pavia. In 1801 he set out from Italy for Paris with the physicist and electrical pioneer Alessandro Volta, who had been invited there by Napoleon. The new object and its name were the topic of a memoir that Lalande presented at the opening ceremony at the Collège de France on 21 November 1801 in the presence of the Interior Minister. Brugnatelli (1801) writes:

Lalande invited us to the opening of the French College. His (Lalande's) memoir begins with the discovery of the new planet made by Piazzi about which he (Lalande) doesn't raise any doubt anymore. He said that this discovery had been made on the first of January. Lalande spoke about the name that was given to the new planet discovered by our Italian. Piazzi would call it 'Ferdinandum sidus', Bode and other astronomers named it Juno or Hera. For me (said Lalande) I always call it -Piazzi- and I think that most astronomers agree.

Early in 1802 Napoleon Bonaparte, who always took a keen interest in scientific matters, made his views known, through a letter Zach (1802a) wrote Oriani:

Senator [Pierre-Simon] Laplace writes me that Bonaparte would like the new planet to be called "Junon." Lalande wants to call it "Piazzi." As for me, I will continue to call it Ceres while begging Mr. Piazzi to dispense with "Ferdinanda," which is a bit long.

In his annual paper "History of astronomy" for 1802, Lalande leads off the list of accomplishments of the year 1801 with Piazzi's discovery, including his opinion on a suitable name:

As he hopes that this star will be acknowledged to be a planet, he has given it the name of Ceres Ferdinanda, in honour of the king of Naples; and Bode wishes it to be called Juno: as for my part, I shall call it Piazzi, as I gave the name Herschel to the planet discovered in 1781. The pagan deities are no longer interesting; and adulation pleases only the person who is the object of it.

Lalande amplified his opinion on the subject in a letter to Zach, the contents of which were then passed on in a letter to Carl Gauss:

La Lande really wrote: “Soon we will have all satisfaction. And the name Juno is being used. The senator La Place uses it exclusively.” Méchain plays the diplomat and is still manoeuvring. He neither writes Juno nor Ceres, but only “the new planet”; it is ridiculous to see how anxiously and world-wisely he tries to avoid the *nomen proprium* (proper name). La Lande who is French, too, with all his heart but still a respectable and honest soul with his own head, is different as he writes: “To me, it will always be *Piazzi* and nothing else, if someone wants to steal his treasure, I do not want to be part of this injustice”. That is great! But incompatible with the court and an affront to Bonaparte, who calls him (Lalande) his grandpa. (Zach, 1802b, his underlining and italics).

Within the next few weeks, Pierre Méchain (Figure 6) had softened his stance. In a letter to William Herschel, Méchain (1802) first uses the phrase “planete de Piazzi”, then the name Ceres a few lines later.

All of this was contained in private correspondence. When Zach went public with the controversy in his journal, *The Monthly Correspondence*, he presented a stoic face, likening it to a religious schism:

La Lande, true to his principle wants to name it Piazzi – just as he insists to call Uranus George's planet or Herschel. Some time ago he wrote regarding this matter: “I will never consent to rip off of this small planet the name of my student Piazzi and replace it by Ceres, who is nothing to me. The rural deities were something in former times but are nothing today. The names had a meaning once but none today.” Senator La Place wrote in his latest letter: “Bonaparte, to whom I talked about the new planet some days ago, and who has despite all his other obligations a vivid interest in science and especially astronomy and its progress, prefers the name Juno to Ceres, and I agree with him. It is only natural to place Juno close to Jupiter. The German astronomers were the first to give it the name of this Greek goddess, but it certainly is better to give it a Latin name.” Well, again a schism in the church of astronomy, just as with Uranus. (Zach, 1802c).

Piazzi (1802b) was determined to have his way, and wrote in very strong terms to Zach in late April 1802.

I’ve noted in one of your memoirs in your journal the desire of a few to give this new planet the name Juno instead of Ceres. I trust that these astronomers, who are peaceful people, will never consent to having their deities called the name of a goddess as anxious, jealous and vindictive as Juno. Jupiter finally chased her from the sky as he had threatened a number of times; in her place he had Ceres appear, who has so much more right to the homage of mankind, and whom he hid very close to himself, loving her passionately ... These questions should always be treated light-heartedly.

4 THE AFFIX FERDINANDEA

By the middle of 1802 the name Ceres had been adopted by everyone except Laplace and Lalande. But what of Ferdinandea? Piazzi had added this name to honour his patron, Ferdinand (Figure 7), who was King of Sicily as Ferdinand III and King of Naples as Ferdinand IV (Ferdinand I, King of the Two Sicilies from 1816-1825). Piazzi was strident in his claims, the raw emotion that the controversy had generated within him literally overflowing the page:



Figure 6: Pierre Méchain, 1744–1804 (courtesy Wikipedia).

Being the first in the discovery of this new planet, I thought to have the full right to name it in the most convenient way to me, like something I own. Thankful to my master, thankful to the Sicilian nation, willing to maintain a certain coherence with the other planetary names, it looked right to me to name it Ceres Ferdinandea. I will always use the name Ceres Ferdinandea, nor by giving it another name will I suffer to be reproached for ingratitude towards Sicily and its King, who with so much zeal, protects the sciences and arts, and without whose favour, perhaps we may never have arrived at this discovery. It is not adulation, but tribute, right and fair homage. (Piazzi, 1802a).

The double-barrelled name found few friends, as we learn in a letter from Wilhelm Olbers (1801) to Zach:

I like the name Ceres since it reminds one of Sicily. Piazzi has certainly earned the right to name the new



Figure 7: Piazzi's patron, King Ferdinand III of Sicily, 1751–1825 (courtesy Wikipedia).

planet. But the affix Ferdinanda will meet with as little luck as Herschel's George's planet.

Olbers was correct, but at least it met with a polite reception from the British Astronomer Royal, Nevil Maskelyne:

You had the right to name the planet, which you discovered, and you paid due homage to your King, patron of the Arts and Sciences and founder of your observatory. I will call, and it will be called in England, Ceres Ferdinanda. (Maskelyne, 1802).

Despite his lofty proclamation, the affix Ferdinanda was never used in England by Herschel in his published papers on Ceres. Zach (1801b) used 'Ceres Ferdinanda' in private correspondence and in his Journal:

Since Piazzi has baptised his own child and named it Ceres Ferdinanda, which is entirely within his right as the discoverer, and since all of his correspondents have been asked to use this designation, we on our part also subscribe to this fitting designation with genuine and therefore greater pleasure, because the King of Naples, being an eager protector and patron of astronomy, as well as the magnanimous founder of a new, splendid observatory, indisputably deserves our gratitude, since he not only started to build an observatory, but completed it; not only bought the most valuable and splendid English instruments and instead of keeping them in boxes and crates in junk rooms, put them where they belong, and entrusted these splendid instruments not to unskilled and lazy hands, but rather to a scholar of recognised merit and skilfulness, and placed him in a position to promote his work and observations to print at the expense of the king. Since then, in such a short time, the most helpful and brilliant fruits have come from the Palermo Observatory, the learned world has

been given several volumes of the most valuable observations, and this temple of Sicilian Urania has been immortalised, with its founder and priest, for millennia through the remarkable discovery with the coming new century. Piazzi therefore says in his discourse, and rightly so, that Ferdinand IV has more of a right a place in the heavens than some other protectors of astronomy.

Piazzi could hardly have asked for a more ringing endorsement, but this resolution did not last long, as the final appearance of Ferdinanda in the title of a paper in the *The Monthly Correspondence* appeared in March 1803. In Russia, N. Fuss wrote several short papers in Russian about Piazzi's discovery, but the affix Ferdinanda was never used (e.g. see Fuss, 1802). However, the name Piazzi continued to be used for a while, and even appears on a map of the Solar System (circa 1802; see Figure 8) and on a French-made orrery (circa 1809; see Figure 9).

5 SELECTION OF THE TERM ASTEROID

On 28 March 1802, only two months after Ceres has been recovered, Olbers discovered a second small 'planet' which he named Pallas. Just as the controversy had settled down about the proper name for Piazzi's discovery, William Herschel began a controversy that has continued to this day. Herschel had visited Paris in 1801, where he met Laplace and Napoleon, but he did not concern himself—as the French did—with the naming of the new planets individually. His concern was their collective appellation, and for this his choice was 'asteroids'.

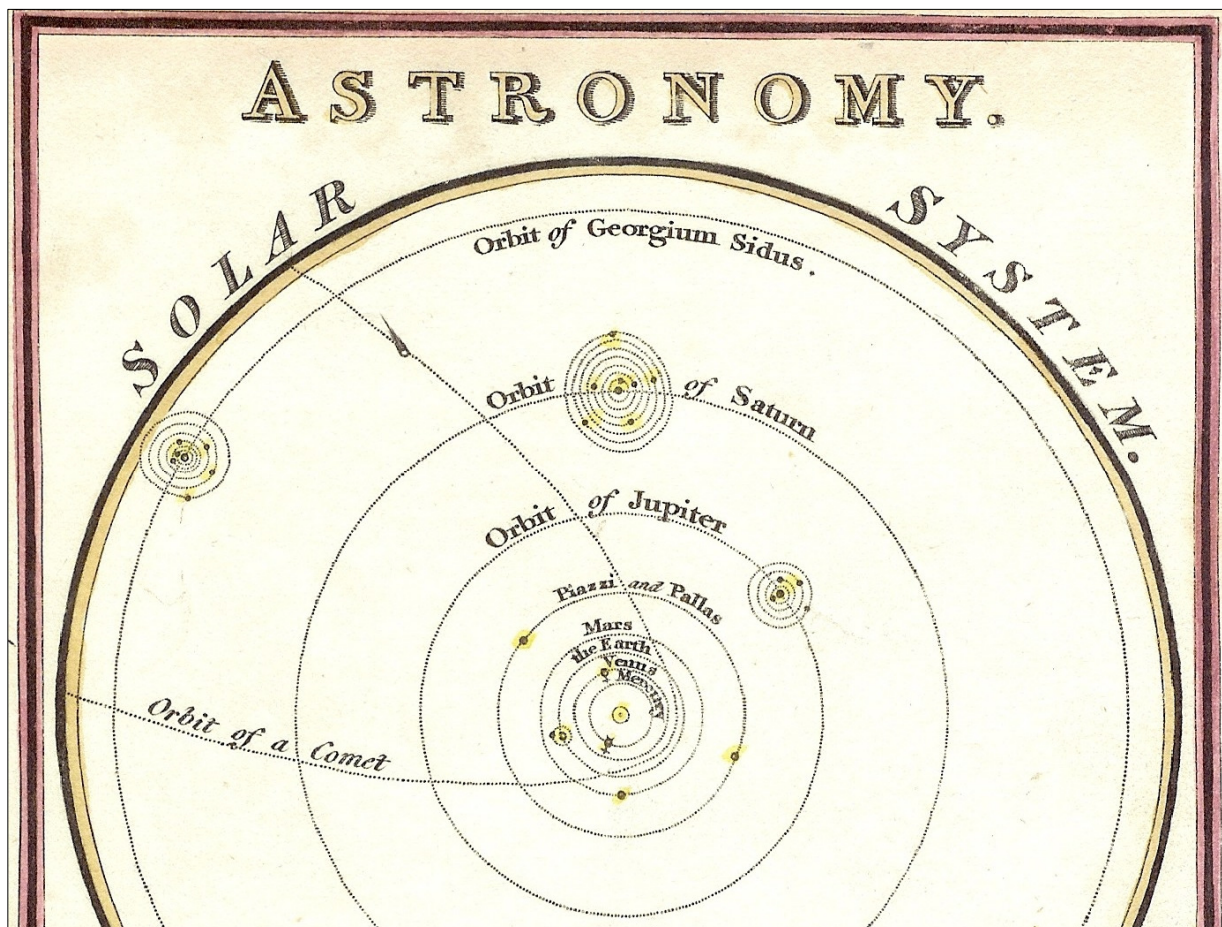


Figure 8: Part of a map printed in 1802/1803, showing the first dwarf planet named Piazzi, not Ceres (Cunningham Collection).



Figure 9: Close up of part of the French orrery in the inset, showing a roundel named both Piazzzi and Ceres (Photograph: C. Cunningham).

We must look into Herschel's private letters to discover how he arrived at the terminology that is widely used today. His letter to Sir Joseph Banks, President of the Royal Society, is a crucial piece of information. It was written just three months after the discovery of Pallas:

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. [William] Watson 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, 1802c).

In this extraordinarily frank letter, Herschel admits that the term asteroids is not optimal—merely the best of an unremarkable suite of options. Unfortunately the names suggested by Banks do not appear in the extant letters.

The search for a new name began two months earlier, when Herschel (1802a) turned to his friend Sir William Watson for help. In writing this, he was

certainly well aware that Newton (1687), wrote an analysis of the motion of comets in the third book of the *Principia*, in which he shows that comets "... are a sort of planet." He wrote:

I have now to request a favour of you, which is to help me to a new name. In order to give you what will be necessary I must enter into a sort of history. You know already that we have two newly discovered celestial bodies. Now by what I shall tell you of them it appears to me much more poor in language to call them planets than if we were to call a razor a knife, a cleaver a hatchet, etc. They certainly move round the Sun; so do comets. It is true they move in ellipses; so we know do some comets also. But the difference is this: they are extremely small, beyond all comparison less than planets; move in oblique orbits, so that, if we continue to call that the ecliptic in which we find them, we may perhaps, should one or two more of them be discovered still more oblique, have no ecliptic left; the whole heavens being converted into ecliptic, which would be absurd. I surmise [again] that in them to hurt one another by attraction, or to disturb the planets, may possibly be running through the great vacancies, left perhaps for them, between the other planets, especially Mars and Jupiter. But should there be only two, surely we can find a name for them. The diameter of the largest of them is not 400 miles, perhaps much less. Now as we already have Planets, Comets, Satellites, pray help me to another dignified name as soon as possible. If I could in any way express the condition of a nimble, small, interloper going obliquely through the majestic orbits of the great bodies of the Solar System it would be just what is required. But pray, if you can, help me soon. I am writing a paper in which if possible

I would propose a name, but as it should go to London by next Thursday I am hardly willing to press you so much for haste. However you will give it a thought, and if two or three names could be proposed it would give me some choice. Greek derivation such as planet from $\pi\lambda\alpha\nu\alpha\omega^2$ would probably be best.

Watson received Herschel's letter the next day and responded after a day of thought:

I received much gratification at the perusal of your letters — the discovery of a new species of heavenly bodies is truly surprising, and I agree with you that a new name ought to be given such bodies. The best name I can think of is Planetel as a diminutive of Planet, just as Pickerel or Cockerel (used by Shakespeare) is of a Pike and a Cock. The sportsmen too call a young stag stagerel. You may also use as the diminutive the word Planeret, as baronet is of the word Baron — so we say islet tartlet tablet cygnet, the respective diminutives of island, tart, table, tablet, Cygne the French for Swan. But as these are made by the mere addition of et, except tartlet, the word should be Planetet, and that does not sound well. Diminutives are also formed by adding -kin as manikin, lambkin, so you may say Planetkin — or better Erratkin — being the diminutive of Erratic. I should like Planetine (pronounced Planeteen) best of all, but I find no example of that way of diminishing in English. The diminutives formed by adding -ling such as duckling will not have place here — we cannot say Planetling. So upon the whole the word Planetel is the least objectionable. Perhaps you may be more happy in your research after a new name.

Since I wrote the above I reflected that after the Romans we make diminutives by adding -ule such as spherule, a little sphere. So Planetule may be a little Planet.

Herschel rejected all these suggestions, and came up with his own appellation within a month. In the modern equivalent of a multiple-address email, Herschel announced his choice of the term asteroid to every notable Continental astronomer with a stake in the subject. On 22 May 1802 he wrote to Gauss, Méchain, Lalande, Laplace, Bode, Zach, Olbers, Karl Seyffer, Johann Schroeter and Piazzi. He first makes clear that both Ceres and Pallas are "... a new species of celestial bodies ...", and then he gives his specific rationale for choosing the term asteroid. Here, by way of example, is what he wrote to Gauss (Herschel, 1802b; his underlining):

These new stars are mixed with the small fixed stars of the heavens and resemble them so much that even with a good telescope they cannot be distinguished from them. From this their asteroidal or starlike appearance I take my name, and call these new celestial bodies Asteroids.

What was Herschel trying to do with this letter? By targeting all the leading astronomers, he was trying to build a consensus, but his reputation as something of a rebel, combined with his apparent 'proclamation' of the term asteroid, foiled this approach and generated great controversy (see Cunningham, 1984; 1991; 2006; Hughes and Marsden, 2007). He likely could have quenched the firestorm that arose over his choice if he had accepted the suggestion of 'planetoid' made to him by Piazzi in a letter dated 4 July 1802. Piazzi (1802d) chose not to make his nomenclature choice public, and Herschel did not back away from his decision.

To understand the actual meaning of the word Herschel chose, we must look at its Greek etymology:

Greek has two words for "star": aster, which gives astero- in compound words, and astron, which gives astro- in compounds. The first means an individual star (usually a conspicuous one), whereas the second word is normally used in the plural to refer to "the stars" in general. This distinction is generally observed in compound words, whether by luck or design: thus asterisk means "a little star", and asteroids "like a star", whereas astrology, astrometry, astronomy and astrophysics all refer to study of "the stars" in general. (Fitch, 1987, his underlining).

In ancient Greek we find πλανήτης (*planētēs*), a variant of πλάνης (*planēs*, 'wanderer, planet'). The planets were called by the Greeks *asteres planetai* (wandering stars) or *planetai* (wanderers). The Latin term used in place of the Greek was *stellae errantes* (wandering stars); but Late Latin borrowed the Greek term in the plural form, *planetae*, while the singular was *planeta*. The English word planet comes directly from the Latin *planeta*.

The gender precedent had been set at the beginning when these two new objects were given female names, in contradistinction to that of names given to planets, which were male—except for Venus. There was a recent French trend to use the word *planete* as a feminine noun, "... contrary to analogy and to etymology, considering them as immediately derived from the Greek ..." in the words of the English amateur astronomer Capel Lofft (1798). By giving the name 'asteroid' to Ceres and Pallas, Herschel effectively countered this trend—the precedent to name the asteroids after female deities was one that would be followed into the twentieth century. Although the feminization of names (by adding an -a or -ia at the end of a word) continued until the mid-twentieth century, some names of asteroids were deliberately made masculine (starting notably with Eros in 1898 and then Achilles in 1906), if they were not in the main belt. The application of male names to new planets was followed with the selection of the names Neptune and Pluto. In the twenty-first century, Pluto joined Ceres in the select group of Solar System objects known as dwarf planets, generating yet another nomenclature controversy that has spread around the world (see Tyson, 2009).

6 EARLY USE OF THE TERM ASTEROID

Use of the term asteroid began to spread in the 1820s. In America it was mentioned by Blair (1821) in a natural philosophy book for the general reader: "Ceres, Pallas, Juno and Vesta are very small bodies, and called by Dr. Herschel *asteroids*." Hughes and Marsden (2007) quote from several astronomy books of the 1820s that mention the word, but a measure of how it truly reached popular culture can be gleaned from a satirical swipe at Ireland published in the review of a 'silly book' in the widely-read *London Magazine*. After noting that potatoes, a staple of the Irish diet, are 'anti-intellectual', the reviewer writes:

It seems hard to be "blown up sky-high" into an Asteroid, for a mistake in diet. And it is still far from certain that Ireland would fare better by becoming an Asteroid, for some of the little planets, the moon for example, are in want of bare necessities. (Notes on the various sciences, 1825).

In the professional realm, the term asteroid only came into regular use in the U.S.A. later in the nineteenth century when Benjamin Apthorp Gould (1848) employed it:

By the common consent of astronomers, they have received the name of “asteroids,” a name proposed by the elder Herschel, in consequence of a theory of his own. The word asteroid, in its present signification, may be defined as “a small planetary body, which revolves around the sun between the orbits of Mars and of Jupiter.”

It was Gould’s consistent use of ‘asteroid’ in the *Astronomical Journal* (which he founded in 1849) that strongly influenced the use of the word in the United States (though not in other countries). A British book of the same year uses the word asteroid interchangeably with meteor and shooting star (Thomson, 1849).

7 CONCLUDING REMARKS

For the first time this paper comprehensively traces the birth and evolution of the name ‘Ceres Ferdinandea’ from sources in English, German, French, Italian and Russian. It also traces the birth of the term ‘asteroid’, and makes the point that feminine names could be applied solely to this separate category of objects, leaving male names for any future (major) planets and unusual asteroids.

Despite his stature as the discoverer of the planet Uranus, the views of William Herschel were soundly rejected time and again by Continental astronomers. The very name he denounced for his own planetary discovery—Juno—became the name fought over so fiercely twenty years later as a contender for Piazzi’s discovery. Herschel’s attempt to honour his royal patron was rejected, and Piazzi’s similar attempt to honour *his* royal patron was widely ignored and quickly fell into disuse. Finally, Herschel’s use of the term asteroid met with widespread disapproval by his contemporaries, with the exception of Olbers. The term planetoid was coined by Piazzi (1802c), and first used in a letter by him to Oriani dated 2 July 1802. The word, which was first used in print by Henry Brougham (1803), achieved some currency but never rose to the level reached by yet another term, ‘minor planet’. This was introduced in 1835 for the 1837 issue of *The Nautical Almanac and Astronomical Ephemeris*. The term was introduced in *Monthly Notices of the Royal Astronomical Society* in 1853. Its use became official in the U.K. from the 1850s onwards, as well as in Germany (‘klein Planet’) and France (‘petite planète’) and other European countries around the same time. It was therefore natural that the IAU would use the term, and it did so as soon as it was itself established in 1919. Commission 20 was concerned with petites planètes or minor planets, in the two official languages, right from the start, with no mention of asteroids until 2006. When the IAU established a center to keep track of these bodies in 1947, it thus became The Minor Planet Center.

It was in 2006 that the IAU defined the new category of ‘dwarf planets’ which consists of Ceres, Pluto and the distant objects Eris, Makemake, and Haumea. There is a reluctance to apply the term asteroids to objects in the transneptunian region, although ‘planetoids’ or ‘minor planets’ are still acceptable there. So Ceres, entering its adolescence as a dwarf planet, can

look back on more than two centuries and marvel at all the fuss that was caused by its birth as the first asteroid. One can only imagine what it will be called when it reaches adulthood.

8 NOTES

1. The completion of this monograph can be dated to 25 August 1801, since Piazzi mailed a copy on that date to Oriani.
2. The word written in Greek, *planao*, is the verb of “to wander.”

9 REFERENCES

- Banks, J., 1781. Letter to W. Herschel, dated November. In the Herschel Papers, RAS Archives, London.
- Blair, D., 1821. *An Easy Grammar of Natural and Experimental Philosophy*, 5th edition. Philadelphia, Solomon W. Conrad.
- Bode, J., 1801. Regarding the comet (moving star) discovered by Herr Joseph Piazzi. *Memoirs of the Royal Academy*, (Paris), 132.
- Bode, J., 1802a. Letter to G. Piazzi, dated 26 January, quoted in Piazzi, 1802.
- Bode, J., 1802b. *Von dem neuen, zwischen Mars und Jupiter entdeckten achten Haupt planeten des Sonnensystems*. Berlin.
- Brougham, H., 1803. *The Edinburgh Review* Oct. 1802 ... Jan. 1803, second edition, Vol. 1, 426.
- Brugnatelli, X., 1801. Diario del viaggio compiuto in Svizzera e in Francia con nel 1801. Pavia (published in 1953 in Pavia by Antonio Pensa).
- Cunningham, C.J., 1984. William Herschel and the first two asteroids. *Minor Planet Bulletin*, 11, 3.
- Cunningham, C.J., 1991. The great asteroid nomenclature controversy of 1801. In Harris, A. and Bowell, E. (eds.). *Proceedings of the Asteroids Comets Meteors Conference*. Flagstaff. The Lunar and Planetary Institute. Pp. 141-143.
- Cunningham, C.J., 2001. *The First Asteroid: Ceres 1801-2001*. Surfside (Florida), Star Lab Press (Historical Studies in Asteroid Research, Volume 1).
- Cunningham, C.J., 2006. *Jousting for Celestial Glory: The Discovery and Study of Ceres and Pallas*. Surfside (Florida). Star Lab Press (Historical Studies in Asteroid Research, Volume 2).
- Fitch, J., 1987. Asteroids and astrophysics. Letter of 29 June to the editor of *Cassiopeia*, quarterly newsletter of the Canadian Astronomical Society.
- Foderà Serio, G., Manara, A., and Sicoli, P., 2002. Giuseppe Piazzi and the discovery of Ceres. In Bottke Jr., W.F., Cellino, A., Paolicchi, P., and Binzel, R.P. (eds.). *Asteroids III*. Tucson, University of Arizona Press. Pp. 17-24.
- Fuss, N., 1802. Scientific news. *St. Petersburg News Supplement*, 30.
- Gould, B.A., 1848. On the orbits of the asteroids. *American Journal of Science*, 6, 28.
- Herschel, W., 1783. A letter from William Herschel. *Philosophical Transactions*, 73, 1-3.
- Herschel, W., 1802a. Letter to William Watson, dated 25 April. Herschel Archives, Royal Astronomical Society.
- Herschel, W., 1802b. Letter to C. Gauss, dated 22 May. Herschel Archives, Royal Astronomical Society, G.13.
- Herschel, W., 1802c. Letter to Joseph Banks, dated 10 June. Dawson Turner Collection 13, 163-164, Natural History Museum, London.
- Hughes, D.W., and Marsden, B.G., 2007. Planet, asteroid, minor planet: a case study in astronomical nomenclature. *Journal of Astronomical History and Heritage*, 10, 21-30.
- Lalande, J.-J., 1802. History of astronomy for the year 1801. *Journal of Natural Philosophy*, 12, 112-121.
- Lofft, C., 1798. *The Monthly Magazine*, Part II, 406.
- Maskelyne, N., 1802. Letter to G. Piazzi, dated 11 March. Cited in Piazzi 1802a.

- Méchain, P., 1802. Letter to William Herschel, dated 4 June. Herschel Archives, Royal Astronomical Society, M.91 (1).
- Newton, I., 1687. *Philosophiæ Naturalis Principia Mathematica*. London, Royal Society.
- Notes on the various sciences. *The London Magazine*, new series, No. X, Vol. III, 174 (1825).
- Olbers, W., 1801. Letter to F.X. von Zach, dated 18 August. Brera Observatory Archives.
- Oriani, B., 1801. Letter to G. Piazzi, dated 25 July. In Brera Observatory Archives.
- Piazzi, G., 1801. Letter to B. Oriani, dated 25 August. In Brera Observatory Archives.
- Piazzi, G., 1802a. *Of the Discovery of the New Planet Ceres Ferdinandea, Eighth Among the Primaries of our Solar System*. Palermo.
- Piazzi, G., 1802b. Fortgesetzte Nachrichten ueber den neuen Haupt-Planeten unseres Sonnen-Systems Ceres Ferdinandea. *The Monthly Correspondence*, June, 590.
- Piazzi, G., 1802c. Letter to B. Oriani, dated 2 July. In Brera Observatory Archives.
- Piazzi, G., 1802d. Letter to W. Herschel, dated 4 July. Herschel Archives, Royal Astronomical Society.
- Thomson, D.P., 1849. *Introduction to Meteorology*. Edinburgh, William Blackwood and Sons.
- Tyson, N., 2009. *The Pluto Files*. New York, Norton.
- Watson, W., 1802. Letter to W. Herschel, dated 27 April. Herschel Archives, Royal Astronomical Society.
- Zach, F.X. von, 1801a. Letter to B. Oriani, dated 29 May. In Brera Observatory Archives, Milan.
- Zach, F.X. von, 1801b. Fortgesetzte Nachrichten ueber den neuen Haupt-Planeten unseres Sonnen-Systems Ceres Ferdinandea. *The Monthly Correspondence*, 577-578.
- Zach, F.X. von, 1802a. Letter to B. Oriani, dated 25 February. In Brera Observatory Archives, Milan.
- Zach, F.X. von, 1802b. Letter to C. Gauss, dated 20 March. Goettingen Archives.
- Zach, F.X. von, 1802c. Fortgesetzte Nachrichten ueber den neuen Haupt-Planeten unseres Sonnen-Systems Ceres Ferdinandea. *The Monthly Correspondence*, March, 280.

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