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ON THE ORIGIN OF THE NAME OF THE MINOR PLANET (1441) BOLYAI

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Abstract: The nineteenth century mathematician János Bolyai was a founder of non-Euclidean geometry, and a minor planet discoverer wanted to honor him by naming an asteroid after him in 1939. However, most later sources give a mistaken justification for the origin of the name of minor planet (1441) Bolyai, claiming that it was named after his father, Farkas Bolyai. In this short paper we present a copy of the original naming of this minor planet after János Bolyai, and we explain why later scholars continued to erroneously associate it with Farkas Bolyai.

Keywords: minor planet names, (1441) Bolyai, János Bolyai, György Kulin

1 INTRODUCTION

Minor planet names reveal how the people who name them relate to our society and our world. These names identify not only the subjects of many scientific investigations, thus distinguishing one minor planet from another, but they also express many different things: our wish to honor different people; the discoverer's links to arts, sciences, nations and people; or the geographical distributions of the discoverers (because they like to name asteroids after their home towns, or well-known rivers, mountains or places, etc.). Sometimes they manage to smuggle politics into these minor planet names, or express what was important for the discoverer or the comittee which accepted the name-suggestion. We note that sometimes the naming is also important for nations, where members of the non-astronomical scientific community as well as the public are very happy to see the names of their scientists, actors, writers, places, etc. honored in the sky.

However, all of these require that the justifications for the names are the correct ones. Here we show that these justifications are not always correct, because sometimes—especially in the case of early discoveries—it is very hard to guess the real intention of the discoverer. In the case of minor planet (1441) Bolyai we found that an error has been repeated from source to source.

The excellent work *Dictionary of Minor Planet Names* (hereafter referred to simply as *Dictionary*), compiled by Lutz D. Schmadel, has the most complete list of the origin of the names of different minor planets. According to this work, the minor planet (1441) Bolyai was "Discovered 1937 Nov. 26 by G. Kulin at Budapest. Name proposed by the discoverer in honor of Farkas Wolfgang Bolyai (1775-1856), a Hungarian astronomer and computer." (Schmadel, 2003: 115-116). However, as we will document here, the claimed origin of this minor planet name is not correct. In the following Section we will show that in fact this minor planet was named after Farkas Bolyai's son, János Bolyai, a famous mathematician, who developed non-Euclidean geometry in the first half of the nineteenth century.

2 THE CORRECT ORIGIN OF THE NAME OF THE MINOR PLANET

György Kulin (Figure 1), the discoverer, published a note in the Hungarian language in *Csillagászati Lapok* (in English: *Astronomical Papers*) in 1939 (see Figure 2).

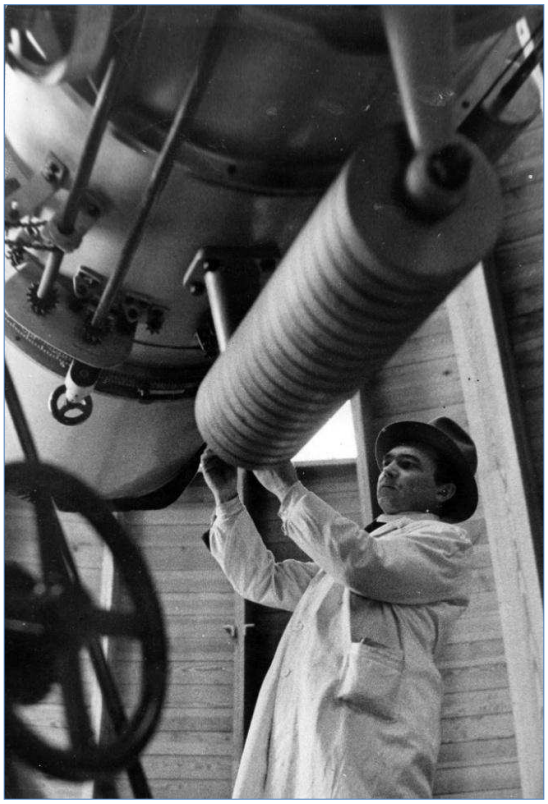

Figure 1: György Kulin using the 24-in reflector at the Konkoly Observatory. Kulin discovered (1441) Bolyai, and many other minor planets, with this telescope (courtesy: Hungarian Astronomical Association).

In this note, *Három új, magyarnevű kisbolygó* (translated as *Three new Hungarian named minor planets*) Kulin wrote clearly: "The minor planet numbered 1441, temporarily designated as 1937 WA, received the name *Bolyai* after the great Hungarian mathematician János Bolyai." (Kulin, 1939: 118; our English translation). Although various images purporting to be János Bolyai are on the web, these are suspect, and there are no known authentic portraits of him.

The former *Astronomischer Jahresbericht*, the annals of the Coppernicus-Institut Berlin, known as the Astronomisches Rechen-Institut today, listed the astronomical literature from year to year, and translated the titles of foreign language papers into German. In Volume 41 of *Astronomischer Jahresbericht* one finds the following title: "G. Kulin, Drei neue Kleine Planeten mit Ungarischen Namen. Csillagászati Lapok 2 118 (Ungarisch)." (*Astronomischer Jahresbericht*, 1941: 135). However, it

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Három új, magyarnevű kisbolygó. A svábhegyi Csillagvizsgálóban évek óta folyó kisbolygómegfigyelések eredményeképen számos új felfedezés történt. Az ezekre vonatkozó megfigyeléseket a Csillagvizsgáló Intézet külön kiadványban tette közzé. (7. sz. kiadvány.) A 40 új felfedezésű kisbolygó közül mindazoknak, melyeknél lehetséges volt, pályája is ki van számítva. Ezek között 8 olyan, melyeknek pályaelemei teljesen megbízhatóknak bizonyultak s így ezeket a berlini Copernicus Intézet a számozott, véglegesen elismert bolygók sorába felvette. Három kisbolygónak 1939-ben történt újraészlelésével — a szokás szerint — a felfedező elnyerte azt a jogot, hogy azoknak választása szerint nevet is adhatott. Ez volt az első alkalom, hogy magyar felfedezésű bolygó magyar vonatkozású nevet kapott.

Az 1441 sorszámú és 1937 WA ideiglenes jelzéssel ellátott bolygó a nagy magyar matematikus Bolyai János nevének megörökítésére a *Bolyai* nevet kapta. Ez a névadás egyrészt iránta érzett tiszteletünk és megbecsülésünk kifejezése, másrészt magyarságának büszke megvallása.

Az 1442 1937 YF kisbolygó Corvin Mátyásról nyerte a *Corvina* nevet. Arról a Mátyásról, akinek világszerte híres kódexei a Corvinák, a magyarság tudományos műveltségének jelképei.

Az 1445 1938 AF jelzésű kisbolygónak Wodetzky József professzorom javaslatára *Konkolya* nevet adtuk. Konkoly Thege Miklós nevét viseli a mai Svábhegyi Csillagvizsgáló Intézet is, minthogy ez az Ógyallai Csillagvizsgáló helyett és annak bizonyos mértékben utódaképen jött létre. Az Ógyallai Csillagvizsgáló megalapítása pedig Konkoly Thege Miklós áldozatos szellemének köszönhető. A névadás tehát reá vonatkozik és egyben annak a magyar nemesi szellemnek szól, amely saját ügyének ismeri el a magyar kultúra és művelődés ügyét s azért áldozatot hozni örömmel kész. *Kulin György.*

Figure 1: The discoverer György Kulin's (1939: 118) article in *Csillagászati Lapok*. Kulin wrote about the denomination of (1441) Bolyai in the second paragraph: "Az 1441 sorszámú és 1937 WA ideiglenes jelzéssel ellátott bolygó a nagy magyar matematikus Bolyai János nevének megörökítésére a *Bolyai* nevet kapta." This translates as: "The minor planet numbered 1441, temporarily designated as 1937 WA, received the name *Bolyai* after the great Hungarian mathematician János Bolyai."

seems that this reference was not used to find the original explanation of the name. In the following Section we will investigate how it was possible that we have the same incorrect name explanation in two other fundamental works on the origin of the minor planet names: Paul Herget's *The Names of the Minor Planets* (1968) and Antonio Paluzíe-Borrell's *The Names of the Minor Planets and their Meanings*? (1963).

3 FARKAS BOLYAI AND JÁNOS BOLYAI: WHY FARKAS?

It seems likely that neither Herget nor Paluzíe-Borrell, nor the *Dictionary*, used the original Kulin reference.

Therefore, they had no other way of finding the correct explanation. The *Astronomische Nachrichten* mentioned only that the name of this minor planet is 1441 Bolyai, without explanation (Stracke, 1940). The *Beobachtungs-Zirkulare der Astronomischen Nachrichten* (Benennungen, 1939) and the *Zirkular No. 2011* of the Astronomisches Rechen-Institut (Planetenbenennungen, 1939) wrote the same. These sources did not list the given name, so one cannot identify whether it was Farkas or János Bolyai on the basis of these publications. No more information is available, and the only place where Kulin specified which Bolyai he named the celestial body after was his Hungarian note. But this does not explain why the afore-mentioned astronomers thought that Farkas was the person to whom the credit should be given rather than János.

Farkas Bolyai appears as "... astronomer and computer ..." in the *Dictionary*. This quotation is suspicious because—although he was a polymath—Farkas Bolyai primarily was a mathematician. His connections to astronomy are quite limited: he taught astronomy at his college in Hungary, but he was never considered to be an astronomer. Overall, the quotation in the *Dictionary* magnifies a negligible part of his interest, while the essence of his life—his mathematical work and results—is all but ignored. Therefore it is worthwhile to investigate the associated reference given in the *Dictionary*, which is *The Names of the Minor Planets* by Paul Herget (1968). In this book on page 130 we find: "Name proposed by the discoverer in honor of Farkas Wolfgang Bolyai (1775–1856), a Hungarian astronomer and computer." This is repeated word by word in the *Dictionary*. Herget (ibid.) states only that the author of this note was "RC", i.e. Robert C. Cameron. For minor planet entries in his book Herget often gives more precise references and cites papers in various journals, or he cites the *Minor Planet Circulars*. But sometimes there is only a name code as the origin of the information, and this is the case for the minor planet Bolyai.

Herget mentions in the Introduction to his book that he and his co-authors relied heavily on the work of Antonio Paluzíe-Borrell, who also started to compile a similar work. Paluzíe-Borrell published his own book in 1963 under the title of *The Names of the Minor Planets and their Meanings.* The *Dictionary* also uses the work by Paluzíe-Borrell. Paluzíe-Borrell (1963: 110) wrote the following about the origin of the name of (1441) Bolyai: "Farkas Wolfgang Bolyai (1775–1856), Hungarian astronomer who computed cometary orbits." Note that the meaning of the German given name 'Wolfgang' is quite similar to, but not exactly the same as, the Hungarian given name 'Farkas'. Farkas means 'Wolf'. Like R.C. Cameron, Paluzíe-Borrell does not give any reference for this explanation.

The similarity between these two explanations is so striking that one might suppose that Paluzíe-Borrell and Cameron used the same source. But there are other possibilities: that Herget's book erroneously repeated Paluzíe-Borrell's data, taking directly the mistakenly information from his book, or that it was a personal communication from Paluzíe-Borrell to Cameron, who shortened the explanation a little and somehow forgot to mention the original source.

Whatever the source of this information, we decided to check a possible original source. We took into account the fact that these authors would have checked on hundreds of persons after whom different minor planets were named, and they were interested only in the most important data relating to their lives (nationalities, birth and death dates, and their most important scientific contributions or results etc.—all in just one or two sentences). That is why they probably used some well-known, widely-accepted and well-respected encyclopedia or lexicon. Because of the nature of the minor planet names, they needed one or more appropriate biographies of scientists. These biographies had to be published prior to 1963, the publication date of Paluzíe-Borrell's book.

Of course many such biographies exist, and we can only speculate that they worked in this way, and it is even more speculative what kind of biography or biographies they used because they did not give their references. However, one can consider the well-known, widely-accepted series of biographies of scientists that initially was edited by J.C. Poggendorff. After his death, this series continued and was associated with his name. This *Poggendorff's*-series is called the *Biographisch-Literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften*. The first two volumes did not contain any information about Farkas or János Bolyai (Poggendorff, 1863), but in the second volume Poggendorff listed the names of those people who will be mentioned in the subsequent supplementary volume, including "Bolyai, W." (i.e. Farkas Wolfgang Bolyai). Volume Three was published in 1898 as *J.C. Poggendorff's Biographisch-Literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften*, but it did not include an article about János Bolyai. Instead, after his name there was only the following short notice: "Bólyai, Joh., s. [siehe] Farkas Bólyai Anm. [Anmerkung]." The English translation is: " Bólyai, János [in German, Johannes, which is abbreviated to Joh.], see Farkas Bólyai remark." (Feddersen, von Oettingen, 1898: 156). Elsewhere in this volume there was a detailed article about Farkas (Wolfgang) Bolyai, listing basic data about his life and books, and closing with the comment that the father "... berechnete auch mehrere Cometen ...", i.e. "... also calculated many cometary orbits." (Feddersen, von Oettingen, 1898: 156; our English translation). This is very strange because we do not know about any cometary orbit element calculations by Farkas Bolyai. We checked what is probably the most complete list of his publications (Gazda, 2007) and Sragner, et al.'s (2012) authoritative bibliography, which contains data on more than 59,000 astronomical works that were published in Hungary between 1538 and 2012, and neither of these volumes lists any cometary orbit-related work by the two Bolyais. Unfor-tunately, *Poggendorff's* 1898 edition does not in-clude a relevant reference in the article about Farkas Bolyai.

Now we can summarize the reasons why we assume that Paluzíe-Borrell and Cameron based their respective accounts on the same source, namely *Poggendorff's* 1898 biography, or on other works which took their data directly from this source. Firstly, the texts are very similar to each other. *Poggendorff's* German-language notice about the cometary orbit calculations shows a very good agreement with the English-language texts of Cameron and particularly of Paluzíe-Borrell. Secondly, *Poggendorff's* article includes a very rare biographical element relating to Farkas Bolyai—his cometary orbit calculations—and very probably this is the only place where one can find this statement. And this statement also is cited by Cameron and Paluzíe-Borrell. There is a third argument, too. *Poggendorff's* volume did not leave any real option of choice between the two Bolyais, and in fact the son, János Bolyai, appears only in the article about his father. Our fourth and final argument as to why the latter authors chose Farkas instead of János Bolyai is that *Poggendorff's* book mentions astronomy-related biographical elements throughout, so Cameron and Paluzíe-Borrell would automatically think that the person Kulin named the minor planet after also worked in astronomy. But, as we have shown in Section 2, this is not true. In addition, no other biography supports the *Poggendorff* claim that Farkas Bolyai did any cometary orbital calculations.

Another similar and known case of mis-identification relates to the minor planet (87) Sylvia. Paluzíe-Borrell (1963) and Herget (1955) explain that (87) Sylvia was named after the first wife of Camille Flammarion (Schmadel, 2003), but in 1866 the discoverer, N.R. Pogson, published a paper in *Monthly Notices of the Royal Astronomical Society* where he stated that the name was chosen in reference to Rhea Sylvia, the mother of Romulus (see Schmadel, 2006).

4 CONCLUSION

Our conclusion is that the entry for the minor planet (1441) Bolyai that appears in the *Dictionary of Minor Planet Names* relied upon previously-published references that contained incorrect information, and was not based on a thorough review of the relevant original literature. However, this can be understood considering the work-load involved in researching and assembling this monumental work and because the critical article by Kulin's was not easy to find.

Cameron as well as Paluzíe-Borrell (1963) identified only the person's surname, and this was mistakenly associated with Farkas instead of János Bolyai. We say this because we could safely assume that they found and reproduced the notice about Farkas Bolyai in the third volume of *Poggendorff's Biographisch-Literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften*. Unfortunately, the short footnote in *Poggendorff's* biography, namely that János Bolyai would be mentioned in the following volume, did not prove helpful.

In spite of the approach adopted by Cameron and Paluzíe-Borrell, we searched for the naming-intention of the discoverer of minor planet 1441 and we found it. This was contained in an Hungarian article by György Kulin, where he published the names and their associated explanations of the three minor planets that he discovered. There he clearly stated that (1441) Bolyai = 1937 WA was named after the great mathematician János Bolyai. We present a facsimile of the original text and an English translation in this article.

The cases of (1441) Bolyai and (87) Sylvia are examples which illustrate that in some cases the currently-available name-explanations for certain minor planets do not follow the original intentions of their discoverers.

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