

ON THE HISTORY OF WILHELM VON BIELA AND HIS COMET

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ABSTRACT

A brief account is given of the life of Wilhelm von Biela and of the history of the comet associated with his name.

As the most famous Halley's comet is once again approaching its perihelion and has already been sighted as a very faint object, it is timely to consider another comet, now extinct – Biela's. It vanished with a most spectacular meteor shower on 27th November 1872. Indeed Luboš Kohoutek states¹ that his work on the discovery of comets 1973e and particularly 1973f started much earlier, actually in autumn 1971, and is closely related to the search for possible remnants of Biela's comet. About the time when the Bielid or Andromedid meteors were due to recur, Luboš Kohoutek was inspecting at Bergedorf Observatory the appropriate region of the sky for any possible sight of some fragment of the historical comet. In his classical volume *Meteors*, Charles P. Olivier² opens the seventh chapter as follows: "The history of meteors which are connected with Biela's Comet and that body itself forms one of the most fascinating and important chapters in the development of meteoric astronomy." The extent of the investigation of Biela's comet throughout no less than half of the nineteenth century actually involved all the leading cultural centres of the world. Thus Olivier's statement shows that Biela's comet also represents an early example of the creative international cooperation that marks the spirit and role of scientific work, above all in astronomy. As Biela's comet was most instrumental in tracing the affinity of periodically recurrent meteoric showers with the orbits of comets, it is interesting to examine some little known facts about that dedicated early cometary observer Wilhelm von Biela.

The generally little known personality of Biela is in itself a colourful and adventurous example of the changing historical destinies of Europeans that are met with even in the latter part of our twentieth century. Captain Wilhelm von Biela was born in Rossla, Saxony, 19th March, 1782, and died on 18th February, 1856, in Venice which then belonged to the Austrian empire. He was the last descendant of the old Czech Protestant nobility of the Lords of Bílá, with estates near Děčín in northern Bohemia. Wilhelm's ancestor, Frederick of Bílá, in 1621 during the anti-reformation wars, together with 27 leading Czech noblemen, was executed in



FIG. 1—Wilhelm von Biela (1782–1856).

the old plaza in Prague. Astronomically, it is interesting to comment that this took place on the spot facing Týnský cathedral, where twenty years earlier, 1601, still in the time of liberal Emperor Rudolf II, the refugee astronomer Tycho Brahe, had his glorious funeral. The Family of Biela, after the tragedy of 1621, emigrated to the region of Erfurt in Saxony, remaining mindful of its ancestral origin and family tradition.³ After his training in the Saxonian military school in Dresden, Wilhelm volunteered for the Austrian army and distinguished himself in the Napoleonic wars. With peace concluded, in 1815, then in his 34th year and nearly 190 years

after his ancestors had left their homeland, Biela returned to Prague. To his military career he added the study of astronomy at Charles University in Prague under the direction of Canon Prof. M. A. David, director of Prague Observatory.⁴ He made many observations when stationed with his garrison in Josefov, a little fortress town in eastern Bohemia. It was also in this town that he discovered the history-making comet on 27th February, 1826.

Biela was not the first discoverer of his comet. The memory of the discovery of the first predicted return of Halley's Comet, in 1758, still rung vividly throughout the civilized world when on the 8th March, 1772, Montaigne in Limoges, France, discovered a small comet that was to play another historical role. There was nothing unusual in this comet, nor in the comet that Pons of Marseille added on 10th November, 1805, to the large list he had already discovered. In view of the general interest then current, various astronomers occupied themselves with the computation of the orbit from all observational data available. Thus, for instance, Gauss, using Bessel's elements of the comet 1772, obtained a period of 4.7 years. Observations of the Pons comet of 1805 enabled the determination of a period of about 6.75 years. By that time the Prague amateur astronomer, Josef Morstadt of Kolín, Bohemia, owner of a private observatory at Prague and friend of Biela, undertook the study of comets, including those of 1772 and 1805.⁵ When after twenty years of study Morstadt reached the opinion that Comet Pons of 1805 and that of Montaigne of 1772 both had an approximate period of 6.75 years and could be expected to return by 1826, then Biela likewise decided to investigate the comet.

Biela was fortunate to recover the comet himself at its perihelion return on 27th February, 1826, the perihelion passage actually occurring on 18th March of that year, and thereupon he undertook the computation of his comet's orbit in which he proved Morstadt's supposition. Biela first made two brief announcements in the *Astronomische Nachrichten*.⁶ The comet became an object of unusual interest because of its passage within a close proximity to our planet. All this encouraged Biela to complete his computation which, together with a comprehensive explanation, he submitted in a report to the Royal Bohemian Society of Science, dated 29th March, 1826 in Josefov, Bohemia.⁷ This report with an extensive commentary by the director of Prague Observatory, Canon David, was later published by the Society.⁸ Herein Biela leaves no doubt as to the identity of the comet of 1826 with that of Pons in 1805 and Montaigne in 1772, and David, teacher of Biela, verifies this identity with his judicious analysis of Biela's report. It was this computation by Biela together with his recovery that permanently associated the comet with his name.

Even though relatively faint, nevertheless by this time Biela's Comet entered the world scene. Several eager astronomers computed the orbit and predicted with some variations the time of the comet's return. When Olbers, the famous Bremen

astronomer, announced that Biela's comet would cross the earth's orbit on 29th October, 1832, at only 11 million miles from our planet, rising panic among a wide public throughout Europe prompted the venerable Viennese astronomer, Littrow, to publish a calming explanation. When the comet actually reappeared on November 26.6, 1832, within twelve hours of Santini's computation for the recovery observation, the widespread excitement seemed to have no limits. Of the vast amount of published comments that followed this reappearance, the very revealing and historical letter of the astronomer J. H. v. Maedler of Berlin, dated 22nd October, 1837, inevitably draws our attention.⁹ Maedler therein refers to Morstadt's hypothesis on the relation of the meteors of November 13th to Biela's Comet. He also reports on his own visit to Prague, where the subject was discussed at an astronomical conference with Morstadt himself who submitted the report. Although it was found later that meteors of 13th November were actually Leonids, this is indeed a significant development long before Schiaparelli's announcement in 1866 of a relation between periodic meteors and comets' orbits.

At the predicted 1839 perihelion passage, Biela's comet was unobservable because of the unfavourable position of the perihelion in the twilight zone. The course of events in relation to this comet, however, reached its climax at the comet's predicted return in 1846.

Again with only slightly varying values in the computed time of return, it appears that this time it was Di Vico in Rome who was first to sight Biela's Comet on 26th November, 1845. The comet reappeared in its normal form and was soon observed by a series of European astronomers. On 29th December, 1845, however, Bradley and Herrick of Yale University seem to have made the first announcement that Biela's Comet appeared to display a companion. This was followed by the same observation made by Lt. Mathew F. Maury, the first director of the newly founded Naval Observatory in Washington, an assiduous observer of Biela's Comet. The story of the strange splitting of the comet was then first published in the *American Journal of Science*,¹⁰ followed by Maury's report in the *Monthly Notices of the Royal Astronomical Society* of London.¹¹ There is no doubt that the disintegration of Biela's comet, first sceptically criticized by such erudite observers as J. C. Challis of Cambridge, England, aroused an unprecedented interest and rehabilitated the ancient story of Ephorus of 371 B.C., relating to a comet that broke into two sections. The separation of both components of Biela's comet were increasing daily within two months of comet's appearance, until the end of February, 1846, when it reached 16 minutes of arc, more than half of the Moon's apparent diameter. Wilhelm v. Biela now followed these exciting celestial events from Venice whither he had retired after being afflicted with an ailing heart in 1844. There he passed away 18th February, 1856.

On its next return in 1852, following the break-up in 1846, Biela's comet was this time first discovered by Father Secchi in Rome. The comet's companion was noted later, also by Secchi, on 26th August, 1852, then separated by some 1.5

million miles. After this final appearance in 1852, the comet was seen no more. The echo of the appearances and behaviour of Biela's comet continued to reverberate and various speculations circulated until they achieved a definite form in Schiaparelli's publication in 1866. This was followed two years later by Littrow's further exposition that included the role of Biela's comet in this celestial exploration.¹²

The climax of the existence of Biela's comet occurred on 27th November, 1872, on one of the comet's expected returns, when a most spectacular meteor shower appeared with radiant in the constellation of Andromeda. There are varied opinions as to the number of meteors per hour. It is not surprising that exaggerations run up to 100,000 per hour. However A. C. B. Lovell in his *Meteor Astronomy*¹³ gives for 1872 the maximum rate near 6,000 per hour but he indicates 75,000 per hour for 1885 shower of Bielids with a subsequent decline in their activity. This prompted Schiaparelli and Denza of Brera Observatory in Milan to publish a vivid report.¹⁴ Thus the origin of periodic meteors could have no more dramatic, impressive and final confirmation of Schiaparelli's findings than that provided by the phenomenon of Biela's comet which helped to accomplish another milestone in the advancement of cosmology.

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