

**CAMPO DEL CIELO: IDENTIFICATION OF A FRAGMENT FROM THE
LONG-LOST “MESÓN DE FIERRO” AT NATURHISTORISCHES MUSEUM WIEN**

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Introduction: “Mesón de Fierro”, a mass of Campo del Cielo, is the first recorded meteorite of the Americas, as early as 1576. In 1774, begun a sequence of four expeditions that measured the massive iron, estimated its weight between 14 and 23 metric tons (300 to 500 quintals), and extracted a considerable number of samples. During the last expedition, in 1783, on-site procedures were conducted which resulted in the meteorite being dumped into an excavated hole and abandoned. This was the last time it was ever seen.

Historical aspects: In 1786, Don Miguel Rubin de Celis, who led the last expedition, submitted a detailed report to the Royal Society of London, attaching some specimens chiseled off from the mass [1]. At the dawn of meteoritics science, his report contributed to convince Chladni that “Mesón de Fierro” was an iron fallen from the sky. In 1799, Prof. Proust, from Madrid, made the earliest detection of nickel in a meteorite, and in 1802, Howard used a Campo del Cielo specimen for his famous experiment on native irons. Both samples came from “Mesón de Fierro” [2]. The missing “Mesón de Fierro” became a legend, and was searched for with no success for more than 200 years.

Proposing a new approach: In 2008, we travelled to London in search of the samples submitted by Don Miguel Rubin de Celis. However, at the Royal Society, we came across unpublished pages from de Celis’ original manuscript and found out that the specimens had been given to the British Museum. After a thorough search in the collections and archives at the Natural History Museum of London, it was determined that these samples, inventoried as “König 9” and “König 10”, had vanished by 1904. It is important to note that by 1826 this institution received as a gift from Argentina a 1400 lb. specimen from the Campo del Cielo fall. This specimen was named “Otumpa”, and became the main source of Campo del Cielo material for research and exchange for at least a century. Most probably, all of the available Campo del Cielo samples before that year were obtained from “Mesón de Fierro”.

In 2017, at the meteorite collection of the Natural History Museum, in Vienna, we found a fragment that, we think could have been extracted from “Mesón de Fierro”. It is a well-documented specimen of 19.37 g, acquired in 1807 from Leopold Von Fichtel, a mineral trader from Madrid. It was originally labeled as “Tucuman” (synonym for Campo del Cielo), and later inventoried as “A.18”. The sample is morphologically different from any of the hundreds Campo del Cielo specimens we have seen before, as it does not have the appearance of a rock, crust, or a slab. It looks like a curl made of iron, with a shape that clearly conveys the force involved in a mechanical procedure. This shape is consistent with de Celis’ report of how samples had been chiseled off from “Mesón de Fierro” and also matches Proust’s descriptions about the specimens he analyzed in 1799 “...according to every appearance (my pieces) were taken off from a greater mass... where the chisel has passed” [3].

Conclusion: Based on the historical records of the different expeditions that reported “Mesón de Fierro”, we could sum 40 lb. of fragments extracted from the main mass. It is well documented how they were distributed and extensively analyzed, both in South America and Europe [4]. Most of those pieces were probably exhausted or ended up either being lost or mixed-up with the numerous samples of Campo del Cielo that became increasingly available from 1826 onwards. Our research suggests that “A.18” is likely to be a fragment of “Mesón de Fierro”, and that there might be more samples that could surface in other collections.

References: [1] De Celis M. Rubin (1788) *Philosophical Transactions of the Royal Society, London* 78:37-42 (in Spanish); 183-189 (in English). [2] Marvin U. (1994). *Geological Sciences in Latin America. Scientific Relations and Exchanges* 155-174. [3] Proust J. (1800) *Journal of Natural Philosophy, Chemistry and the Arts* 3:374-375. [4] Alvarez A. (1926) *El meteorito del Chaco*. 222p.

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