

# The case of János Sajnovics as a milestone in history of astronomy, the study of which was inspired by the lectures of Prof. K.V. Kholshchevnikov

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**Abstract.** Prof. K. V. Kholshchevnikov presented to us the subject of celestial mechanics in his lectures in a very broad cultural context, which subsequently inspired me to study a number of disciplines related to language - and to think about how one could use the methods of the exact sciences in studying linguistic phenomena (the opposite seems somewhat more difficult, because, paraphrasing Auguste Comte, ok, we now know what the stars are made of, but we will never know what they are really called). Below I will present some considerations and cases from the history of celestial mechanics and linguistics, which it might be interesting to present in courses on the history of the corresponding disciplines.

## 1. Precession and Assibilation

Precession in astronomy and assibilation in linguistics, though seemingly unrelated, can both serve as valuable "clocks" for pinpointing historical events. Precession, the gradual shift in the orientation of Earth's axis, allows astronomers to date ancient observations by calculating the position of celestial objects at specific times in history. Similarly, assibilation, a phonological change where sounds like "k" or "g" evolve into "ch" or "j" sounds, can help linguists trace the evolution of languages and, by extension, the timelines of linguistic and cultural shifts.

By comparing these two phenomena, one can see how both serve as tools for reconstructing the past. Just as precession helps us understand the chronological context of ancient texts and artifacts by aligning them with specific celestial configurations, assibilation offers insights into the temporal layers of language development, revealing when particular phonetic changes occurred. By using these methods in tandem, we can more accurately place historical events within a broader

temporal framework, deepening our understanding of both human history and the natural world.

## 2. Lapland Expedition

János Sajnovics, a Hungarian Jesuit priest and scientist, made significant contributions by merging celestial mechanics with historical linguistics during an 18th-century expedition to Lapland. In 1768, Sajnovics joined an astronomical expedition led by Maximilian Hell to observe the transit of Venus. While in Lapland, Sajnovics became interested in the Sámi language, noting its similarities to Hungarian. His interdisciplinary approach led to the publication of "Demonstratio. Idioma Hungarorum et Lapponum idem esse" in 1770, where he provided evidence of the relationship between these languages. Sajnovics' work is notable for being one of the first instances where historical linguistics and celestial mechanics intersected in a single research context, illustrating the potential for interdisciplinary collaboration to enhance scientific understanding. His findings laid the groundwork for future research in Finno-Ugric linguistics and demonstrated the value of cross-disciplinary approaches in advancing scientific knowledge.

## 3. Intersection

Sajnovics' research during the Lapland expedition was one of the first instances where historical linguistics and celestial mechanics concretely intersected on the same scientific journey. This intersection was influenced by the following factors:

1. **The Scientific Interdisciplinarity of the Expedition:** Although the main goal of the expedition was astronomical, the scientists involved, like Sajnovics, were also interested in other scientific questions. This allowed for an interdisciplinary approach, where observations from natural sciences and humanistic studies were combined.

2. **Cultural Encounter:** The journey to Lapland provided Sajnovics with the opportunity to learn about Sámi culture and language. He observed significant similarities between the Sámi and Hungarian languages, particularly in basic vocabulary and grammatical structures. This led him to investigate the common origin of these languages, which is a fundamental question in historical linguistics.

3. **Connections Between Disciplines:** Sajnovics' work demonstrated that the boundaries between sciences are not absolute and that different fields of study can benefit from each other's methods and findings. His observations on the connections between the Sámi and Hungarian languages were an important step in the study of Finno-Ugric languages and helped to strengthen the theory of their relatedness.

#### 4. Interdisciplinary Approach

János Sajnovics' journey to Lapland exemplifies how interdisciplinary approaches can unlock new methods for dating historical events, much like using precession in astronomy or assibilation in linguistics as a "clock." By observing and documenting the linguistic similarities between Sámi and Hungarian, Sajnovics not only advanced the study of Finno-Ugric languages but also laid the groundwork for using linguistic changes, such as assibilation, as temporal markers. Just as astronomers use precession to date ancient celestial observations, linguists can use phonological shifts to trace the evolution of languages and cultures, thereby refining our understanding of historical timelines.

In my presentation, I will also highlight a few more examples of how methods from celestial mechanics can be applied almost directly in historical linguistics, demonstrating the deep connections between these seemingly distinct fields.

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