Science in Poland | Studia Historiae Scientiarum

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An Update of the Paper, 'On known and less known relations of Leonhard Euler with Poland' (DOI: 10.4467/23921749SHS.16.005.6148)

Abstract

In this note we publish a short letter from Leonhard Euler's son, Johann Albrecht Euler, the Secretary of the Imperial Academy in St. Petersburg, to Marcin Poczobutt-Odlanicki, the Vilnius

PUBLICATION INFO	Studia Historiae Scientiarum	e-ISSN 2543-702X ISSN 2451-3202		DIAMOND OPEN ACCESS

CITATION

Girininkaitė, Veronika; Kleinert, Andreas; Sznajder, Roman 2023: An Update of the Paper, 'On known and less known relations of Leonhard Euler with Poland' (DOI: 10.4467/23921749SHS.16.005.6148). *Studia Historiae Scientiarum* 22, pp. 293–299. DOI: 10.4467/2543702XSHS.23.007.17698.

RECEIVED: 07.10.2022 ACCEPTED: 26.06.2023 PUBLISHED ONLINE: 05.10.2023	ARCHIVE POLICY Green SHERPA / RoMEO Colour	LICENSE CC BY	Crossref

WWW	https://ojs.ejournals.eu/SHS/; https://pau.krakow.pl/Studia-Historiae-Scientiarum/archiwum

astronomer. The fate of this letter seemed unknown, but we know its content now. The main news in this correspondence was the discovery of a comet by the astronomer Anders Johan Lexell.

Keywords: *J.A. Euler, M. Poczobutt-Odlanicki, A.J. Lexell, comets*

Uzupełnienie artykułu 'On known and less known relations of Leonhard Euler with Poland' (DOI: 10.4467/23921749SHS.16.005.6148)

Abstrakt

W tej nocie publikujemy krótki list Johanna Albrechta Eulera, sekretarza Rosyjskiej Akademii Nauk w St. Petersburgu do Marcina Poczobutta-Odlanickiego, astronoma wileńskiego. Los tego listu wydawał się być nieznany, ale obecnie list ten został zlokalizowany. Dokładnie znamy jego treść, której zasadniczą część stanowi informacja o odkryciu nowej komety przez astronoma Andersa Johana Lexella.

Słowa kluczowe: *J.A. Euler, M. Poczobutt-Odlanicki, A.J. Lexell, komety*

1. Introduction

In his paper (Sznajder 2016), the author highlighted connections between Leonhard Euler and Polish scientists of his era. The aim of that work was to put attention to less known relations of the Swiss mathematician and Polish mathematicians, physicists, astronomers, and geographers. Sznajder notes:

> Among individual Polish scholars, J.A. Euler corresponded with a Vilnius astronomer Marcin Poczobutt-Odlanicki (1728–1810), whom he informed in a letter of December 19, 1777, about the discovery of a new comet by A.J. Lexell[66] (Sznajder 2016, p. 100).

The 66 footnote states:

> Cf. Czerniakowska 2006, p. 20. Again, it is the only source where I found this information (Sznajder 2016, p. 100).

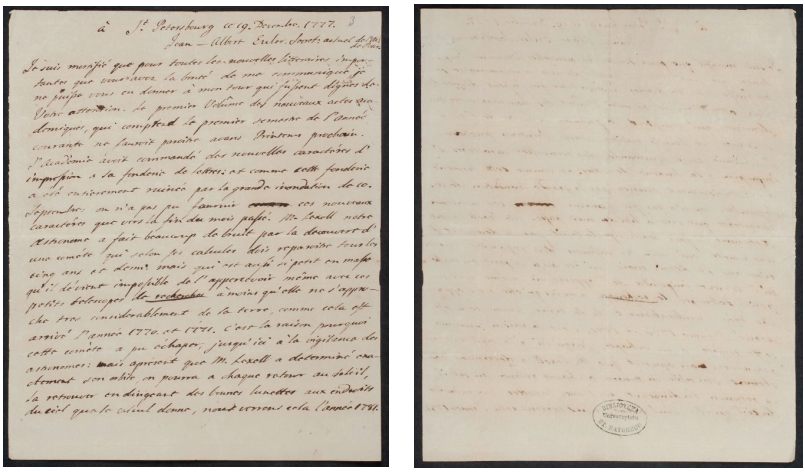
At that time, J. A. Euler (Leonhard Euler's son) was the secretary of the Imperial Academy in St. Petersburg.

This letter was recently found at the Vilnius University Library by Dr. Veronika Girininkaitė, the first author of this note. The letter, written in French, bears no salutation and was discovered in a folder dedicated to M. Poczobutt-Odlanicki, so he was presumably the addressee. It bears no signature, so it is not certain whether the letter was penned by Johann Albrecht Euler himself.

Handwriting comparison with copies of original letters written by J.A. Euler came out positive, so we may state with considerable certainty that the letter to M. Poczobutt-Odlanicki was indeed written by J.A. Euler.

Below, we present three documents. The first one is a copy of the original letter from J.A. Euler to M. Poczobutt-Odlanicki, the second is its transcribed version, and the third one is the English translation. Thus, we are now able to provide primary documentation for a statement made in the 2016 article.

2. The original letter



The letter was recently digitized by Vilnius University Library.[1]

[1] See Euler 1777.

3. Transcription

à St. Petersbourg ce 19. Decembr. 1777.
Jean-Albert Euler. Secret: actuel de l'ac: de Peter.

Je suis mortifié que pour toutes les nouvelles litteraires importantes que vous avez la bonté de me communiquer je ne puisse vous en donner à mon tour qui fussent dignes de Votre attention. Le premier Volûme des nouveaux actes academiques, qui comprend le premier semestre de l'année courante ne sauroit paroitre avans Printems prochain. L'Académie avoit commandé des nouvelles caractéres d' impression a la fonderie de lettres: et comme cette fonderie a été entièrement ruinée par la grande inondation de 10. Septembre; on n'a pas pu fournir ces noveaux caractéres que vers la fin du mois passé. Mr. Lexell notre astronome a fait beaucoup de bruit par la decouvert d' une cométe qui selon ses calcules dois reparoitre tous les cinq ans et demi: mais qui est aussi si petit en masse qu'il dévient impossible de l'appercevoir même avec ces petits telescopes de recherches à moins qu'elle ne s'approche tres considerablement de la terre, comme cela est arrivé l'année 1770 et 1771. C'est la raison pourquoi cette comète a pu échaper, jusqu'ici à la vigilance des astronomes: mais aprésent que Mr. Lexell a determiné exactement son orbite, on pourra a chaque retour au Soleil, la retrouver en dirigeant des bonnes lunettes aux endroits du ciel que le calcul donne, nous verrons cela l'année 1781.

4. English translation

I am mortified that for all the important new literary works that you have the kindness to communicate to me, I may not give you anything in my return which was worthy of your attention. The first volume of the new academic transactions[2], which includes that first half of the current year, will not appear before the upcoming Spring. The Academy

[2] "Acta Academiae Scientiarum Imperialis Petropolitanae" was the new title of the transactions of the Petersburg Academy as of 1777.

had ordered new types from the letter foundry, and as this foundry was completely ruined by the great flood of September 10, it was not possible to provide these new types until the end of last month. Mr. Lexell, our astronomer, has made a lot of noise by the discovery of a comet, which according to his calculations, should reappear every five and a half years, but which is also so small in mass that it seems impossible to see it even with these small research telescopes, unless it approaches the Earth very considerably, as it happened in the year 1770 and 1771. This is the reason why this comet has been, so far, able to escape the vigilance of the astronomers, but since Mr. Lexell has determined exactly its orbit, we can at each return to the Sun find it by directing good glasses to the places of the sky that calculation gives, we will see this in the year 1781.

5. A brief biography of Anders Johan Lexell

Anders Johan Lexell (1740–1784) was a Finnish-Swedish astronomer, mathematician, and physicist. He was born in Turku, Finland. At the age of 14, he matriculated at the Academy of Åbo (Turku) and in 1760, received the Doctor of Philosophy degree (dissertation: *Aphorismi mathematico-physici*). In 1763, he moved to Uppsala (Sweden) and worked at Uppsala University as a lecturer. Starting in 1766, Lexell served as a professor of mathematics at the Uppsala Nautical School.

Lexell spent 16 years of his professional life at the Imperial Academy in St. Petersburg, Russia. He was known for his work in celestial mechanics and polygonometry; one of the theorems in spherical trigonometry bears his name (Lexell 1781). Lexell applied his findings to research comets and planetary motion. He was one of the most prolific and prominent scientists of his time. During his stay at the Imperial Academy, Lexell authored 62 papers and authored four additional works; his co-authors were L. Euler, J.A. Euler, Wolfgang Ludwig Krafft and others. D. Bernoulli (1700–1782) and L. Euler had a very high opinion of Lexell's research achievements. Apparently, Euler wrote: "Besides Lexell, such a paper could only be written by D'Alembert or me" (Euler 1784).

Soon after his arrival from Berlin (1766), Euler interceded after A. J. Lexell, who in 1768 wrote a paper, *Methodus integrandi nonnulis aequationum exemplis illustrate* (Lexell 1769) to get accepted to the Imperial Academy of Sciences. Again, Euler praised this work highly. In the meantime, Lexell was granted permission by the Swedish king

to leave Sweden (that time, Finland was part of Sweden) and move to St. Petersburg, Russia. In 1771, Lexell became an Astronomy academician; in 1773, he became a member of the Academy of Stockholm and Academy of Uppsala. In 1774, Lexell became a corresponding member of the Paris Royal Academy of Sciences. Later, he became a corresponding member of the Turin Royal Academy.

The scope of Lexell's work was quite wide. He was interested in integrating nonlinear differential equations and using an integrating factor to solve higher order differential equations. Another field of Lexell's interest was polygonometry, considered as generalized trigonometry. These themes occupied a significant part of his work. The Lexell's continuator in this direction was a Geneva-born mathematician Simon Antoine Jean L'Huillier (1750–1840), see Sznajder 2016 for a list of some of the L'Huillier's works.

The third part of his research interests were celestial mechanics and astronomy. He studied parameters of several planets, members of the Solar System, including Uranus (Lexell was the first astronomer to calculate its orbit), Venus, Mars, and Jupiter. Most of all, he was interested in observation of comets.

In 1780–1781, Lexell visited Germany, England, and France on a scientific trip, and he then returned to St. Petersburg via Sweden. During this trip, he wrote 28 letters to Johann A. Euler, which have been archived in the Russian Academy of Sciences. Formal reports to the Director of the academy were lost. The private letters to J.A. Euler contain many interesting details regarding people and places Lexell had encountered, Lyubimienko 1936.

He was present at the deathbed of Euler in 1783 and succeeded him as the Chair of Mathematics at the Imperial Academy, but died just one year later at the young age of 44. The asteroid *2004 Lexell* and the lunar crater *Lexell* were named in his honor. For more bibliographic details, we refer to Stén 2014.

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