

How G. B. Halsted contributed to the international recognition of János Bolyai and Nikolai Lobachevsky¹

Hogyan járult hozzá G. B. Halsted Bolyai János és Nyikolaj Lobacsevszkij nemzetközi elismertségéhez

Zoltán KÁSA

Sapientia Hungarian University of Transylvania, Cluj-Napoca
Department of Mathematics and Informatics, Târgu Mureş
kasa@ms.sapientia.ro

In the period when American mathematics had few distinguished names, the eccentric and sometimes spectacular Halsted established himself as an internationally known scholar, creative teacher and promoter and popularizer of mathematics.
(H. S. Tropp)

INTRODUCTION

George Bruce Halsted was born on November 23, 1853, in Newark, New Jersey, USA as son of Adela Meeker and Oliver Spencer Halsted. His father was a lawyer. Halsted studied at Princeton University, as did his father, grandfather and great-grandfather. He completed his bachelor's degree in 1875 and his master's degree in 1878. He received his doctorate in 1879 from Johns Hopkins University with his thesis *Basis for a Dual Logic*. In the meantime, he also studied in Berlin. He remained an intern at Princeton for a time and then taught mathematics at the University of Texas from 1884 to 1903. It was during this time that his professional work was completed. Despite his eccentric behavior, he was a popular teacher among his students. He studied, explained and translated into English the works of Lobachevsky, János Bolyai, Saccheri and Poincaré.

After a clash with the university management over a teacher competition when hiring a candidate with better connections rather than the more talented one, he had to leave the university. He then taught in several places: St. John's College, Annapolis, Maryland (1903); Kenyon College, Gambier, Ohio (1903–1906) and Colorado State Teachers' College, Greeley (1906–1912). He then retired, continuing to study mathematics while working as an electrician in the family business. He died March 16, 1922, in New York. He was mourned by his wife, Margaret Swearingen (whom he married in 1886) and his three sons.

The fact that this genius mathematician and noble-minded man ended his life as an electrician reminds us of the words of the Hungarian poet, János Batsányi, which can be found on the memorial plaque of his former residential building in Linz:

*“The present can be envious and ungrateful,
but the future will be fair.”*

This paper is a tribute to the memory of George Bruce Halsted.

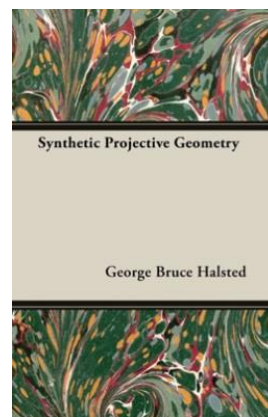
¹ This paper is a translation with some additions from Hungarian of a paper presented at the 16th Conference of History of Sciences and Techniques, Aiud, Romania, 2022, pp. 35–40. <https://ojs.emt.ro/TTK/article/view/971>



The young Halsted



With his grandson in 1920



2007 edition of one of his books

IN THE MAGIC OF NON-EUCLIDES GEOMETRY

Halsted's greatest merit is that he translated the works of Lobachevsky, János Bolyai, Saccheri and Poincaré on non-Euclidean geometry into English. Lobachevsky's *Geometrical Researches on the Theory of Parallels* and János Bolyai's *The Science Absolute of Space* (originally in Latin), were published in the short-lived scientific journal *Scientiae Baccalaureus*. The first appeared in number 3 in 1891, while the second in number 4 (Figure 2).

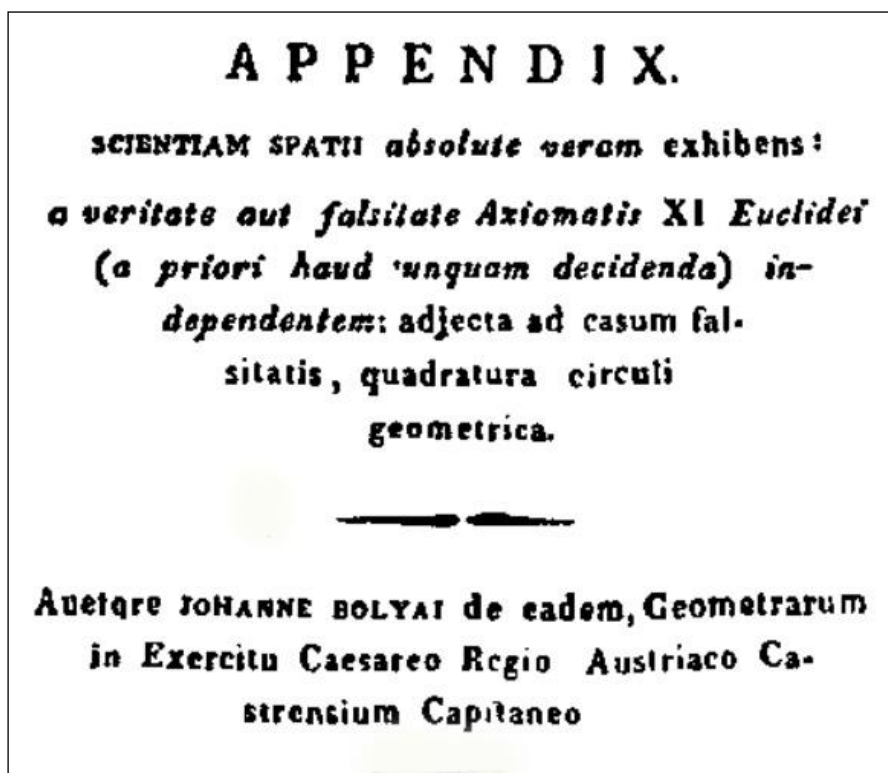


Figure 1.
The original title page of the Appendix

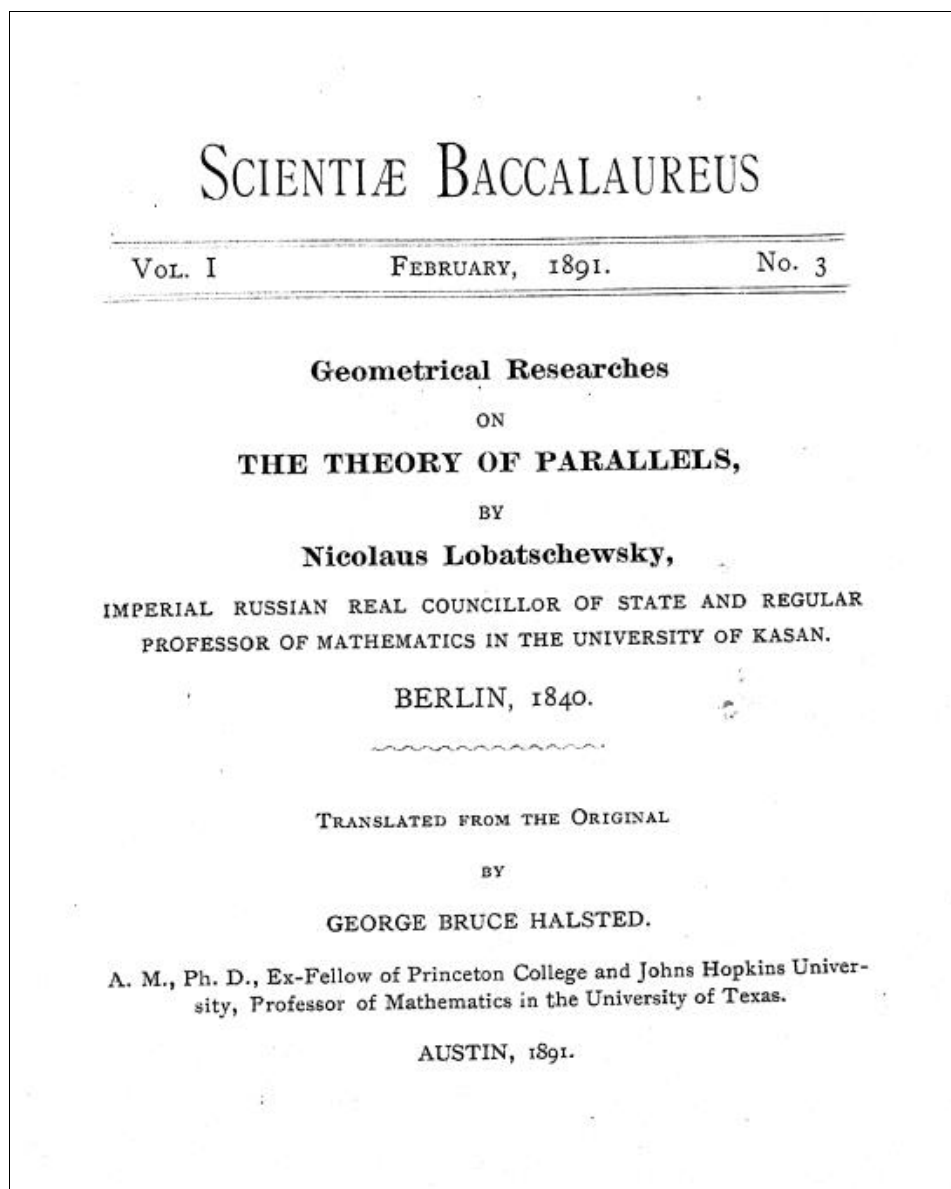


Figure 2.

*The first English translation of Lobachevsky's work
and the Appendix by János Bolyai in Scientiæ Baccalaureus*

<https://dl.mospace.umsystem.edu/mu/islandora/object/mu%3A417667>

Bolyai's *Appendix* (a well-known name for the *Absolute Science of Space*, as it appeared as an appendix to Bolyai Farkas's book *Tentamen*) was also published in 1896 in book form, with an improved translation. One copy of this book can be found in the mathematics library of the University of Cluj-Napoca (signed by Gyula Vályi) and in the Teleki-Bolyai Library in Târgu Mureş (dedicated to István Biás, a librarian) (Figures 3 and 4).

Halsted was a critical person, never silencing his opinion, even if the consequences were detrimental to him. While others are mostly tolerant of Gauss' behavior in refraining from publicizing János Bolyai's merits and praising the "brilliant young man" only in his letter to Farkas Bolyai, and in private conversations, Halsted stated bluntly: "*I have always gloried as showing the magnificent verve of the young Hungarian hero, victim of the meanness of Gauss, as was also his own son who passed his life in exile here in Colorado.*" [5]

Halsted has published several biographical articles in *The American Mathematical Monthly*, including Farkas Bolyai and János Bolyai (Figure 5).

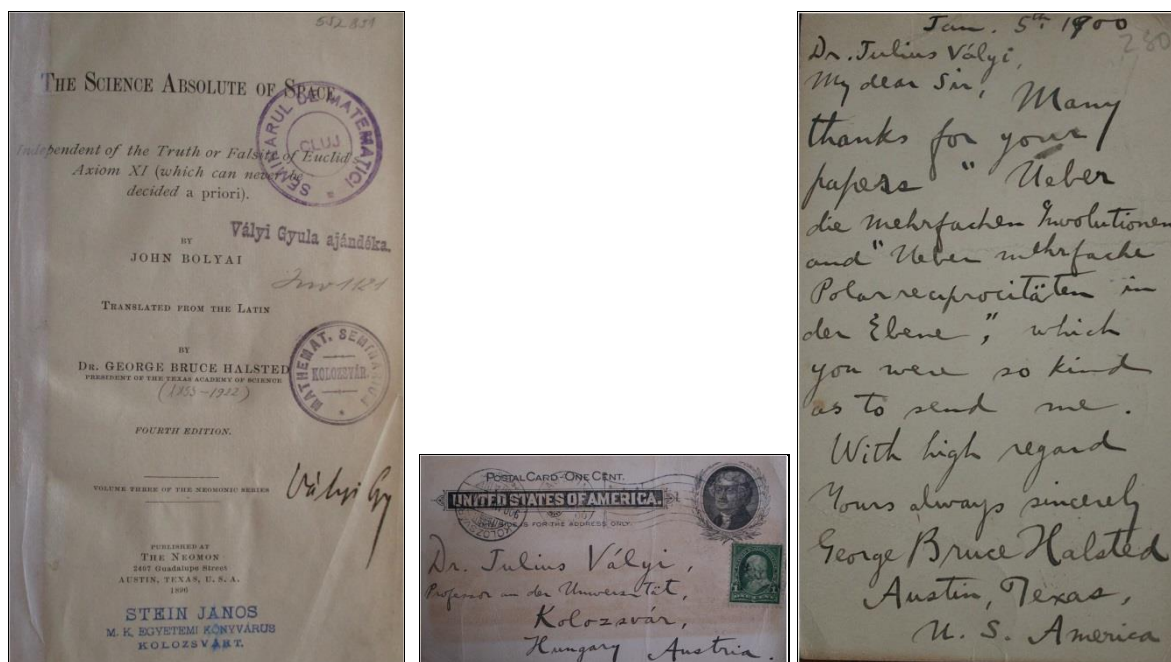


Figure 3.
 English translation of the Appendix, donated by Gyula Vályi to the university's mathematics library.
 Halsted's letter (and envelope) to Gyula Vályi in 1900, thanking him for one of Vályi's articles.
 The letter was written on January 5 and arrived in Kolozsvár (Cluj) on January 23.

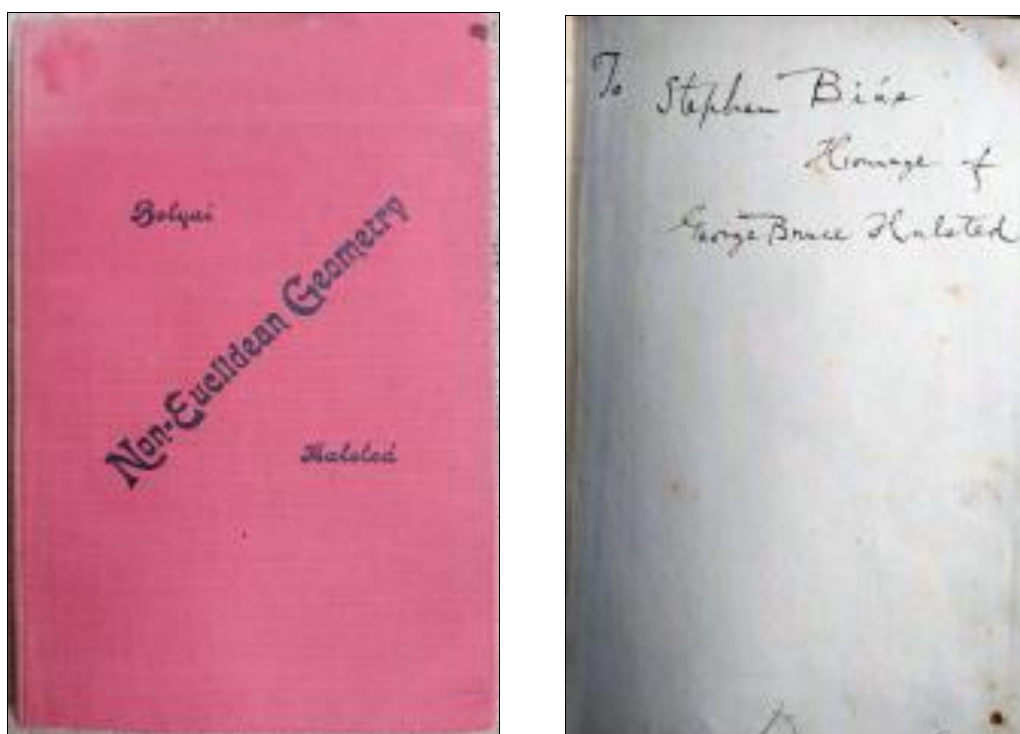


Figure 4.
 A translation of the Appendix dedicated to István Biás, which is kept in Teleki-Bolyai Library

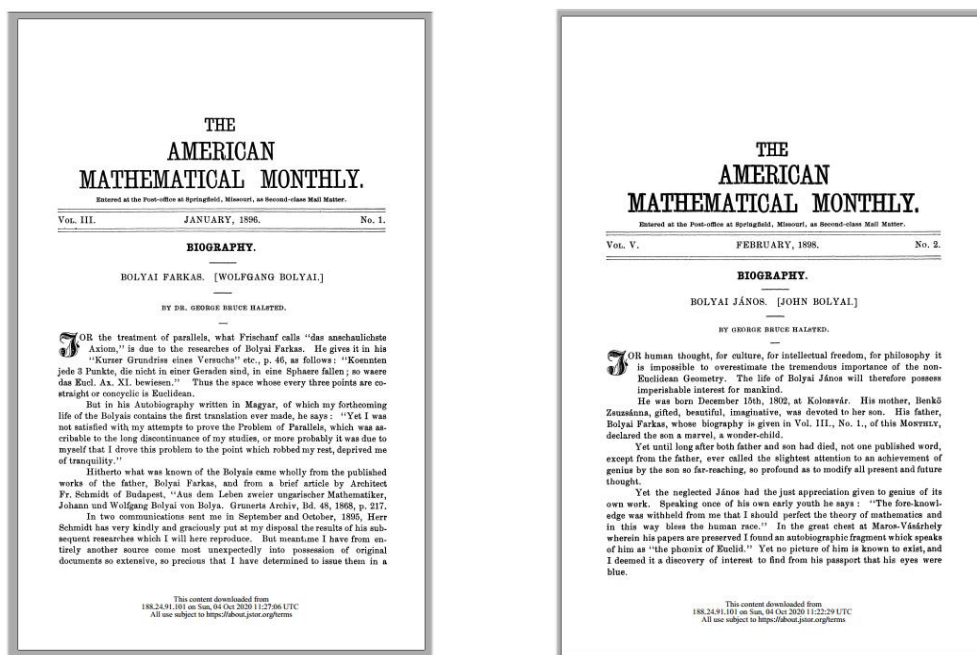


Figure 5.

Halsted's articles about Farkas Bolyai and János Bolyai

https://archive.org/details/pub_american-mathematical-monthly?tab=collection

HALSTED'S VISIT TO TRANSYLVANIA

In July 1896, Halsted travelled to Kolozsvár (now Cluj-Napoca) and Marosvásárhely (now Târgu Mureş) to see the places where János Bolyai was born and lived. The local press in Marosvásárhely and Kolozsvár finds traces of this. Halsted visited Marosvásárhely on July 18 and 19 and Kolozsvár on July 20–23. Halsted is on the guest list of the New York Hotel on July 21 and 23 in the *Erdélyi Híradó* (Transylvanian News). On the 21st of July, János Bedőházi, a Reformed grammar school teacher from Marosvásárhely, can also be found on the guest list, he accompanied Halsted. An article about the visit to Transylvania was published in the Texas University Journal [4]. In the same issue, Halsted also publishes two articles on Kolozsvár. During his visit to Kolozsvár, he was honored by the English Conversation Club with a gala dinner attended also by mathematician Gyula Farkas, a university professor. Halsted's toast [6] deserves to be reported here:

„Mr. President and Gentlemen of the English Conversation Club: I welcome with great pleasure this opportunity of expressing my gratitude for the cordial hospitality with which I have been received in Hungary. I knew that the Hungarians were renowned for hospitality, but the reality has exceeded the picture. I came from a far distant part of America to visit in Hungary the birthplace of a scientific idea so profound that though published at Maros-Vásárhely more than half a century ago it is only now that the world is beginning to appreciate and assimilate it. The Hungarians Bolyai Farkas and Bolyai János are today renowned in the most distant west in Texas and in the most distant east in Japan; and are studied in the Universities of both these countries. I come here in homage to Hungarian genius, and I find a land brilliantly picturesque, a capital, Budapest, wonderful for the charm of its situation, rich in achievement and in promise, its attractions heightened by the grand millennial exposition. Here in Kolozsvár I find a veritable new Athens, a capital in the realm of mind, a community which may be justly proud of its exceptional educational advantages and intellectual life. But wherever I go in this lovely land, so worthily to have inspired the splendid patriotism of 1848, I am dazzled by the striking beauty of the Hungarian ladies. Of my own country it is difficult to speak to you because of the extreme diversity of its different parts. We have with us tonight in Mr. Chester a representative of Boston, of our North and East. Boston is a city of Unitarians, where life is strict, where all the people are white and good, but where I fear that the delicious Hungarian wines are not duly appreciated. I myself am here from an utterly different region, from Texas, in our South and West, where races of four distinct colours are intertwined in the struggle for existence. There besides the dominant whites are the cruel red Indians, the treacherous yellow Mexicans, and the superstitious black

Negroes. No Unitarians are there, and human life is not held sacred. In Texas to steal a horse is worse than to murder a man. So you see how difficult is to judge America. But when we have endured not nearly a hundred but a thousand years and celebrate our millennium we may be as homogeneous as your own happy land.

I propose a toast to the English Conversation Club, and to Hungary.”²

In Marosvásárhely, he encouraged János Bedőházi, the college's mathematics teacher, to write a book about the two Bolyais. This book has been completed, unfortunately filled with quite a few uncontrolled rumors. Halsted writes reprehensibly about the Hungarian scientific world at that time, which is enough to mark the collapsed tomb of János Bolyai in Marosvásárhely 34 years after his death, and does not make a worthy memory of one of the most brilliant mathematicians of the age.

After the visit, he will send books to the English Conversation Club in Kolozsvár. We know about this from a letter written to Unitarian teacher János Kovács (Figure 6), in which he also thanks his kind reception in Kolozsvár. Unfortunately, it is not possible to know what kind of books they were because the library of the English Conversation Club was scattered after the First World War. Books with the club's seal were later found in the antique shops in the city.

Halsted agreed with József Koncz, Reformed teacher in Marosvásárhely about his visit to Transylvania. The legacy of József Koncz cannot be researched in the state archives of Cluj-Napoca, only letter readings are available in the Teleki-Bolyai Library. They met in person during Halsted's visit to Transylvania, and in the letter (Figure 6) thanking István Biás for notifying him of the death of József Koncz, he called him his friend.

It is surprising how much Halsted makes sure that he spells Hungarian personal and city names correctly in all his letters and articles.

After his visit to Kolozsvár, Halsted traveled to Kazan (Russia), where Lobachevsky lived and taught at the university in the first half of the century, and was even rector. In Moscow, Halsted arranged for the tsar to pay a life annuity to Lobachevsky daughter, who lived in very humble circumstances, and interceded for the release of the exiled son of the great mathematician to Siberia.

The Hungarian and Russian scientific society cannot be grateful enough to this noble-minded, self-sacrificing man.

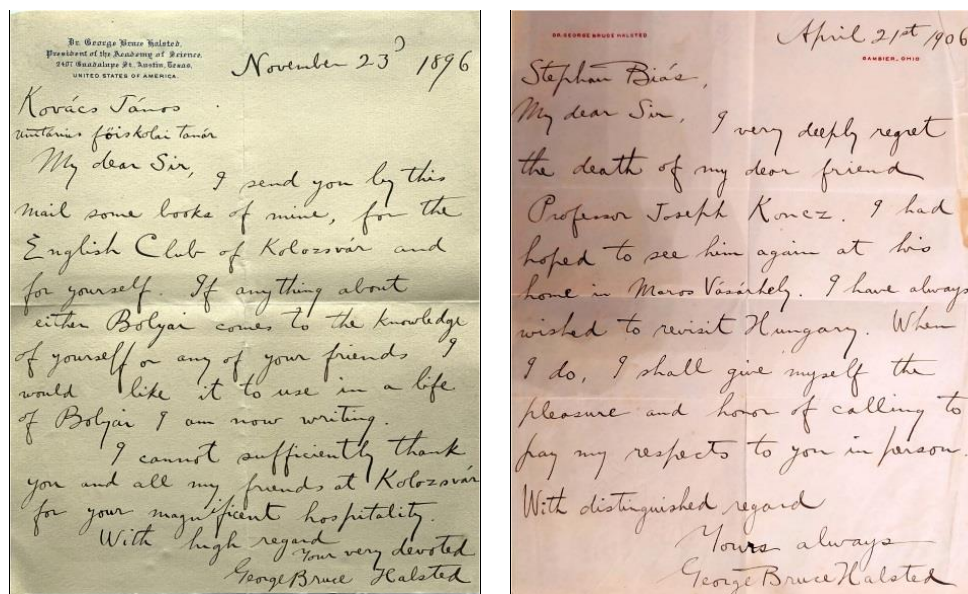


Figure 6.

Halsted's two letters. The first one he sent to János Kovács, in which he thanks the kind hospitality during his visit to Kolozsvár. The other letter was sent to István Biás, a librarian, thanking for notifying him of the death of his dear friend József Koncz.

² Kovács Sándor: Angolszász–magyar unitárius érintkezések a 19. században, *Erdélyi Tudományos Füzetek*, 269, Erdélyi-Múzeum Egyesület, Kolozsvár, 2011. p. 163. https://eda.eme.ro/bitstream/handle/10598/29014/EME_ETF269_KovacsSandor_AngolszaszUnitarius.pdf

In conclusion, we quote G. B. Halsted's two famous sentences: “*The treatise itself, therefore, contains only twenty-four pages—the most extraordinary two dozen pages in the whole history of thought!*”³ and “*The immortal János, the most perfect case of genius in the world’s history.*”⁴

ACKNOWLEDGMENTS

The location of the letters published here are: the letter to István Biás is in the Teleki-Bolyai Library, the letter to Gyula Vályi in the State Archives of Cluj-Napoca, the letter to János Kovács in the Unitarian Archives of Cluj-Napoca. I would like to thank Klára Lázok, Róbert Oláh-Gál and Lehel Molnár for allowing me to communicate these. Thanks are also due to JSTOR for the opportunity to use Early Journal Content.

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- [5] Jonathan Sondow: Gauss and the eccentric Halsted, <https://arxiv.org/pdf/1405.4198.pdf>
- [6] Amerikai tudósok ünneplése Kolozsvártt – in Hungarian (Celebration of American scientists in Kolozsvár) *Kolozsvár*, 1896. július 24. <https://digiteka.ro/readme/276/19413/1>

*The spirit of Halsted has fled—
gone to meet face to face
the great masters he admired—
Saccheri, Lobachevsky, Bolyai.
(Florian Cajori)*

³ Hyperbolic Quotes about Hyperbolic Geometry, *Scientific American*, <https://blogs.scientificamerican.com/roots-of-unity/hyperbolic-quotes-about-hyperbolic-geometry/>

⁴ The Amer. Math. Monthly, 1901. VIII. p. 110.