

Extended Abstract

The Historic Death of Ali Khan Nazem al-Oloom and His Mathematics

Original article information

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Original language: Persian

Journal: *Mathematical Culture and Thought*, Vol. 44, No. 2, Autumn/Winter 2025, pp. 37–66

DOI: [10.30504/mct.2025.1552.2089](https://doi.org/10.30504/mct.2025.1552.2089)

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Figure 1: Ali Khan Nazem al-Oloom

Ali Khan Nazem al-Oloom (1850–1899) was one of the most remarkable yet understudied figures in the history of mathematics and science education in modern Iran. A top graduate of the engineering class in the second cohort of Dar al-Fonun, he later returned there as a teacher. Although his physics textbook has already drawn some attention as the first authored physics textbook in Persian, his life, his educational role, and above all his arithmetic book *Hekmat-e Riyaziyat: Osoul-e Elm-e Hesab*, widely known as *Hesab-e Ali Khan*, have not previously received the sustained historical treatment they deserve.

The article reconstructs his life against the educational and political setting of the late Qajar

period and, in doing so, corrects several repeated claims that have entered later summaries of his biography. Ali Khan was born in 1850 and travelled to Europe with the entourage of Naser al-Din Shah during the shah's first European journey in 1873. He remained in France for about two and a half years. The article argues that the familiar claim that he was a graduate of Saint-Cyr is not historically persuasive. What emerges instead is a more precise and more plausible account: Ali Khan appears to have passed through preparatory study associated with Saint-Louis, to have had substantial contact with the artillery school at Fontainebleau, and to have attended classes at the École Polytechnique. Archival evidence from Polytechnique shows that he was admitted to attend classes in June 1874, that the classes began in November 1874, and that he attended courses taught by figures such as Joseph Bertrand. The article therefore replaces a legendary educational trajectory with a documented one.

When Ali Khan returned to Iran in 1875, he re-entered Dar al-Fonun. Yet the article shows that his role there has often been overstated. He was not the uncontested head of all mathematical instruction in the institution. Rather, he mainly taught mathematics and physics within the artillery section, while the broader mathematical authority of the school remained with Najm al-Dowleh. This distinction matters, because it reveals both Ali Khan's ability and the structural limits placed upon him. His French training gave him unusual intellectual resources, but the educational order to which he returned offered him only a partial field of action.

A major turning point came in 1881, when Ali Khan went to Isfahan and took up a leading role in the newly opened *Madrash-ye Homayouni* in the Hasht Behesht palace complex. The article insists, however, that this move should not be romanticized. The school project was soon overshadowed by the political and military priorities of Mass'oud Mirza Zell-e Soltan, the governor of Isfahan. Ali Khan's name gradually became attached less to the educational mission of the school than to the artillery establishment of Zell-e Soltan. The article challenges the repeated claim that he was the architect of Zell-e Soltan's military power or that Wagner's report directly led to his exile. Instead, it presents a slower and more disappointing history, one in which Ali Khan's talents were repeatedly diverted away from the work for which he was most suited.

This section of the paper also restores the human cost of that period. In 1887, during his years in Isfahan, his very young daughter was given in marriage in a politically charged arrangement tied to the local balance of power. The article reads such episodes not as incidental biographical curiosities but as signs of the world in which Ali Khan lived: a world in which education, patronage, bureaucracy, and coercion were deeply entangled.

After the forced resignation of Zell-e Soltan in 1888, Ali Khan returned to Tehran. The paper then clarifies another point often obscured in later accounts: "Nazem al-Oloom" was not originally a formal royal title bestowed upon him. Rather, it arose from his supervisory role in a school setting and gradually became the name by which he was remembered. This close attention to naming is typical of the article's wider method, which repeatedly separates contemporary documentation from later repetition.

In 1893 Ali Khan was sent to Khoy, not as an immediate punishment following the Isfahan episode, as is often claimed, but several years later and after a renewed period of service in Tehran. The paper shows that much of his work there consisted not in great educational or military reforms but in mundane administrative tasks. Only after the assassination of Naser al-Din Shah in 1896 did another opening appear. Ali Khan returned to Tehran at a moment when new educational energies were gathering around the *Anjoman-e Ma'aref*. In 1898 he became

centrally involved in the founding of the *Madrased-ye Elmiyeh*, presented in the article as the first Iranian secondary school after Dar al-Fonun. For a brief moment, it seemed that he might finally find an institutional setting equal to his abilities. Yet this promise was short-lived. He resigned from the school in May 1899, and he died on 29 Mehr 1278 Shamsi (1899).

The article interprets this death historically as well as biographically. It does not reduce it to a private event detached from context. At the same time, it is careful about the evidence: what is explicitly recorded is excess in the use of *teriak* (opium), and not alcohol alone as a distinct explanatory focus. In the paper's larger reading, Ali Khan's self-destruction belongs to a broader story of intellectual frustration, institutional mismatch, and repeated failure on the part of the surrounding order to make proper use of his gifts.

The mathematical heart of the article lies in its reading of *Hesab-e Ali Khan*, first printed in 1879. The author argues that this book eventually became the most geographically widespread mathematics textbook in the modern history of Iran, especially before the emergence of a tightly graded national school system. But the significance of the book is not merely its circulation. Its pedagogical conception is also striking. As the article emphasizes, the book does not treat arithmetic as a collection of disconnected procedures. Instead, it gives priority to mathematical meaning. In particular, it presents a fraction *as a number for measuring a given quantity by a known unit*. This is one of the key interpretive claims of the paper. In comparison with rival textbook traditions, especially those associated with Najm al-Dowleh, Ali Khan's text appears more conceptually organized and more attentive to meaning within mathematics itself.

For that reason, the article is not only a biographical recovery. It is also a contribution to the history of mathematics education. It suggests that the later dominance of other textbook traditions helped normalize a more procedural approach to school mathematics in Iran, while Ali Khan's more meaning-based approach did not become the main line of development. In that sense, *Hesab-e Ali Khan* represents not simply a successful old textbook, but a different pedagogical possibility—one that achieved broad circulation without securing a lasting institutional victory for its underlying view of mathematics.

Overall, the article presents Ali Khan Nazem al-Oloom as a tragic but intellectually substantial figure of nineteenth-century Iran: a Dar al-Fonun graduate, a partially documented participant in the French mathematical world of the 1870s, the author of pioneering scientific and mathematical textbooks in Persian, and an educator whose strongest ideas were never fully matched by the institutions in which he was forced to work. By combining archival reconstruction, correction of repeated errors, and a serious reading of a foundational school mathematics text, the paper makes an important contribution to the history of mathematics, education, and intellectual life in modern Iran.