

# Nasuh Al-Matrakî, A Noteworthy Ottoman Artist-Mathematician of the Sixteenth Century

By: Salim Ayduz

Matrakci Nasuh was a famous Ottoman polymath, writer and knight who produced important books in several fields. He made contributions in the fields of mathematics, geography, history and calligraphy. He also invented a military lawn game called "Matrak", a kind of animation of battle.

**Nasûh b. Karagöz al-Bosnawî or Nasûh b. Abdullah al-Silahî al-Matrakî or for short Matrakçi Nasuh Bey** came from a Bosnian family. Either his father or grandfather was drafted into the state service. He was renowned in the 16th century as a mathematician, historian, geographer, cartographer, topographer, musketeer, and was an outstanding knight, calligrapher and engineer. Because he was a musketeer, he was also called al-Silâhî (the musketeer or gunman). He was a polymath thinker, writer, an artist (he pioneered a particular artistic style for depicting cities) and a theoretician. He wrote books in these fields, all in Turkish. A brief discussion of these books follows. He received the nickname "Matrakçi" after he created the game called Matrak. Matrak means 'amazing' in Turkish and 'çi' is a suffix. Therefore **his nickname means "who plays (invents) the amazing game [1]."**

Matrakçi Nasuh was educated and trained in the Palace school during the reign of Bayezid II (1481-1512) and studied with Sâî Çelebi, one of Sultan Bayezid II's teachers. During the reign of Sultan Selim I (1512-1520), he started to distinguish himself as a knight. He went to Egypt in 1520, for advanced studies and attended military games, at which he became unrivalled. He was given a decree on war games indicating his outstanding talent.

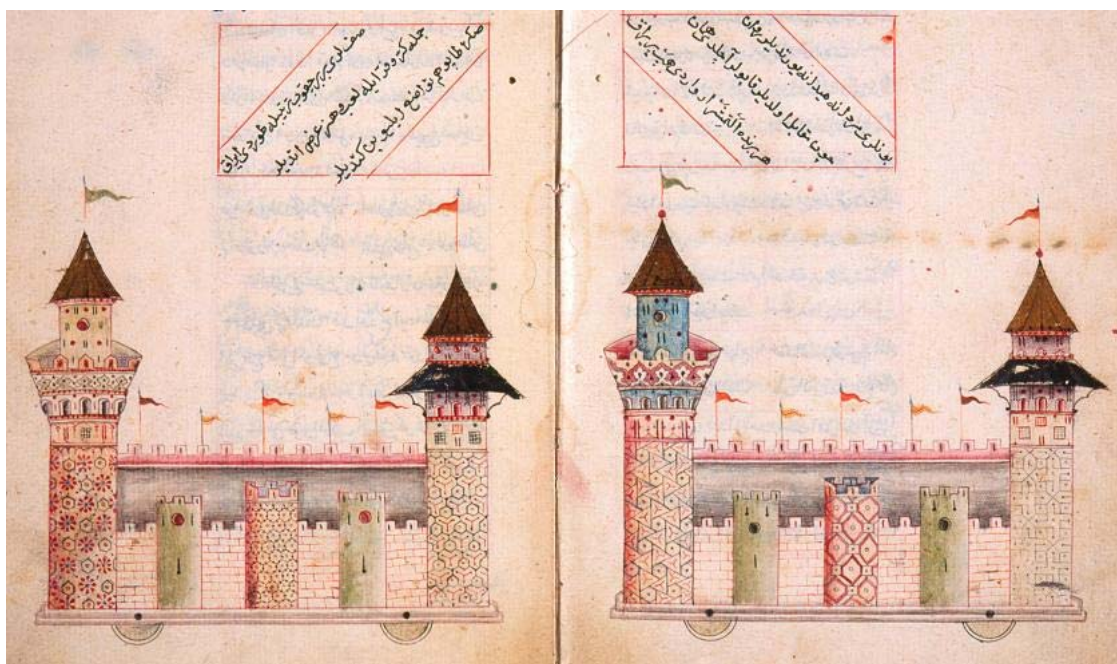
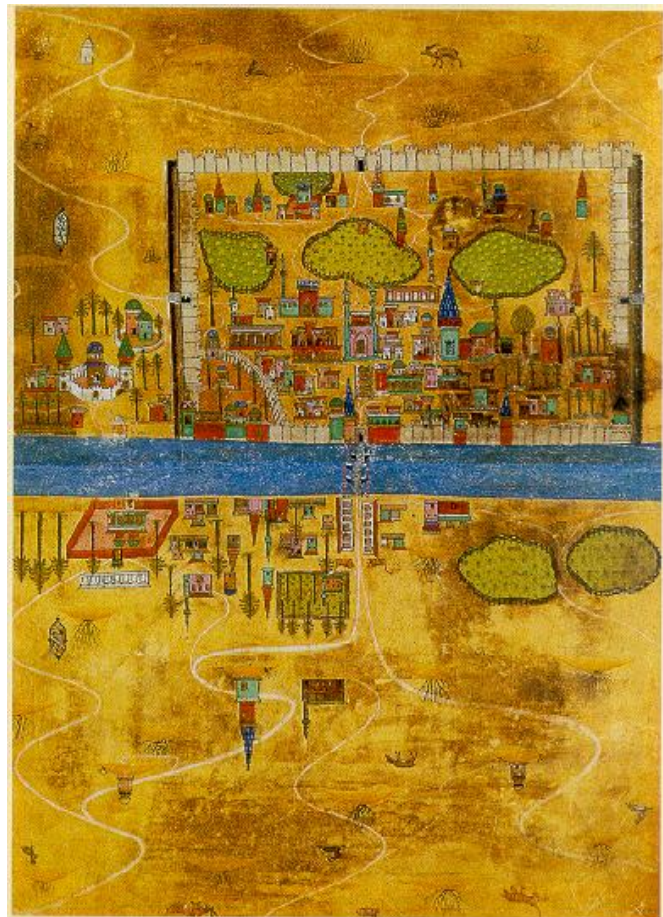


Figure 1: The paper fortresses of Matrakçi depicted in his book *Tuhfat al-Ghuzat* (Süleymaniye Library, Esad Efendi, MS 2206).

## **Inventor of the game called "*Matrak*"**

Matrakçi Nasuh was known as *al-Matrakî* because he invented a war game called *matrak* which was a contest with either a stick, called a *labut*, or a cudgel or rapier. The purpose of this widely used game was training for war. He also wrote a drill-book for it and taught it to the soldiers. A decree of 1529 of Sultan Süleyman Kanuni praises *al-Matrakî* as the master knight –"ustad" or "raîs"– of his time, incomparable in the whole Ottoman Empire in the art of war and methods of using the lance. He copied this decree into his book *Umdat al-Hussab*. According to the decree, he used to play war games while he was in Egypt during governorship of Hayr Bey.

Matrakçi Nasuh worked on the engineering aspects of weapon production, demonstrating his talent as a technical builder of machines when he constructed two moving fortresses made of paper for a celebration to mark the circumcision of Mustafa, Mehmed and Selim, the sons of Sultan Süleyman the Magnificent in Sultanahmed Atmeydani on 21st June 1529 (see figure 1). According to his description, each fortress had five towers and four gates. The walls were decorated, guns and muskets were mounted on the walls and each fortress contained sixty armed men. The fortresses advanced towards each other from different sides of the arena when the first gate was opened, soldiers with swords came out, followed by soldiers with maces from the second, armoured soldiers with lances and white caps from the third and finally archers from the fourth gate.



**Figure 2: Matrakçi's plan of Baghdad showing the city plan with its great walls, buildings and streets (Topkapi collection). Reproduced on the website of Bilkent University. (Source)**

Following this success, in 1529 Matrakçi Nasuh completed his five-chaptered book *Tuhfat al-Ghuzât* on the art of using and making weapons. In this illustrated work, he writes about arrows, bows, swords and maces, and gives information on military tactics and chivalry. He also mentions war games, military education, practices, and horsemanship with particular reference to the cavalryman. In one of the illustrations for the book, he drew his two moving fortresses.

### **Miniaturist, Calligrapher and Painter**

Matrakçi Nasuh Bey was also a skilled illuminator and painter working with a group of other artists. He took part in several expeditions and sketched at least the outlines of his documentary paintings of townscapes from life. He drew relief type land maps for his *Bayân-i Manâzil-i Safar-i Iraqayn-i Sultan Süleyman Khan*. This book contains detailed information about Sultan Süleyman's first expedition against Safavid Iran between 1533 and 1536. Matrakçi's illustration drew every place where the royal army encamped during the expedition. He also described every city visited on the route from Istanbul to Baghdad via Tabriz including those cities captured from the Safavids. The army took a different route on the outward and return journeys. They went to Baghdad from Istanbul through Sivas-Erzurum, and returned by way of Diyarbakir-Aleppo [2]. The distance between each encampment was given in miles instead of hours of travel.



**Figure 3: Plan of Tabriz, Iran (from Matrakçi's *Beyân-i Menâzil-i Sefer-i 'Iraqeyn*). (Source).**

Matrakçı invented a new type of *ta'lik* style calligraphic script (see figure 5) called "*kalem-i dîvânî*" for the "*Dîvânî*" (or *cep*) in the central bureaucracy at the *Dîvân*, where he was head of the *kalem-i divan* clerks. Until that time, the Ottomans had used Iranian *ta'lik* style calligraphy.

### Matrakçı as Historian

In 1520, Matrakçı began his career as a historian by making the first translation from Arabic into Turkish of al-Tabarî's famous history *Târih al-Rasûl wa al-Mulûk*. The title of this translation was *Madjma' al-tawârih*, and the manuscript comprises three huge volumes. He also wrote a Turkish supplement to his translation as the fourth volume of the work. This includes the history of the Ottomans from their beginning to the year of 1551. But we have manuscripts from this period dealing only with the time of Bâyezid II, Selim I and Süleyman I, such as *Ta'rih-i Sultan Bâyezid wa-Sultan Selim*, the illuminated *Ta'rih-i Sultan Selim*, the illuminated *Ta'rih Sultan Bayezid*, the illuminated *Bayân-i Manâzil-i Safar-i Iraqayn-i Sultan Süleyman Khan*. (also known as *Majmua'-i Manâzil*) (1537), *Süleyman-nâme* (between years 1520-1537), *Fath-nâme-i Karabughdan* (1538), the illuminated *Ta'rih-i Feth-i Shiklos wa Estergon wa Istolnibelgrad* (contain years between 1542-1543), and the second part of the *Suleymân-nâme* (contains years between 1543-51). Finally, in 1550, with the encouragement of Rüstem Pasha, the famous Grand Vizier of Süleyman, he produced a second version of al-Tabarî's history, the *Djâmi' al-tawârih*,

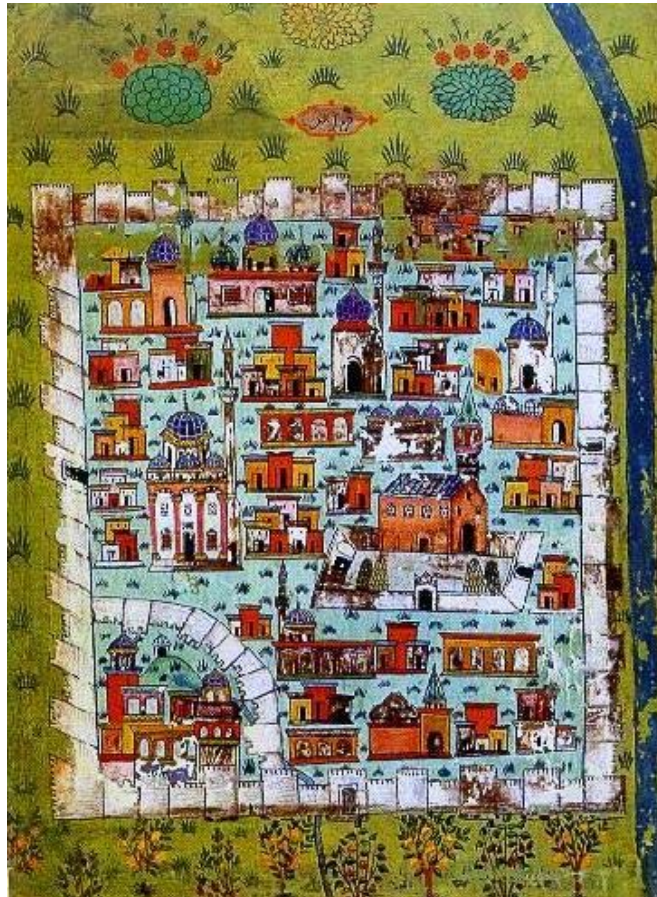


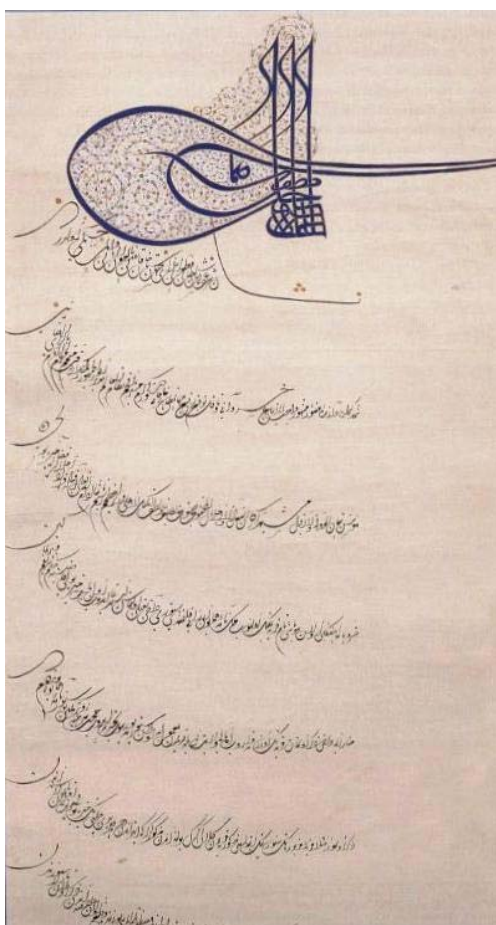
Figure 4: City of Diyarbakir illumination (from Matrakçı's *Beyân-i Menâzil-i Sefer-i 'Irakeyn*).

by abridging the original. The part of the one large volume of *Djâmi' al-tawârikh*, containing the events of the reign of Süleyman up to 1561, is attributed to Rüstem Pasha himself.

### Achievements in Mathematics

In the field of mathematics, Matrakçi wrote two books in Turkish with the purpose of facilitating the work of clerks of the imperial council (*Divan kâtipleri*) and the state accountants (*muhasibeciler*). These two books are important in understanding the development of Ottoman Turkish language to a level where it was suitable for use as a mathematical language. They are also important in following the history of the Ottoman solution of accountant's mathematical problems. It is the second most important book after Atmacaoglu's work in this field.

Matrakçi wrote his first book, *Jamâl al-Kuttâb wa Kamâl al-Hussâb* in 1517 and dedicated it to Sultan Selim I (1512-1520). His second book entitled *Umdat al-Hussab fi'l-furûz al-mukaddar bi'l-kulliyat* written in 1533, was an expanded version of the first.



**Figure 5: Süleyman the Magnificent Tughra and one of his decrees written in Jeli Divani style. Museum of Turkish and Islamic Arts, Istanbul. Photo taken from Muhittin Serin's book *Hat Sanati ve Meshur Hattalar* by his permission.**

*Jamâl al-Kuttâb* included two chapters. The first one on Indian numerals, mathematical operations, fractions, scales, and measurements. Although he says that the second chapter is devoted to "miscellaneous matters", we do not find it in any extant manuscript.

On the other hand, *Umdat al-Hussab* is an expanded version of the previous book in two chapters. The title of the first chapter is "miscellaneous subjects", it has twenty-two sub chapters (*fasl*). The second chapter is entitled "solution of the 50 problems". Some figures and diagrams were added in this version. In addition to the subjects mentioned, this book also contains weights, measurements (*zira, endaze, kilejât, qantar, misqal, dirham*), ratio, division with proportion and geometric methods, all essential for accountants. After every subject, Matrakçi gives examples offering new measurement divisions which were unknown before. In the first part, the six fundamental operations of classical arithmetic are extensively investigated for positive integers and rational numbers. In

addition, the "double-false" rule used to find an exact solution for a linear equation is analysed. In the second part, several issues are explored. According to Matrakçi, these issues were rarely mentioned in previous manuscripts; but accountants should definitely learn them. The book deals with various subjects, such as inheritance and tax, essential to accountants; they are studied through examples of calculations. When Matrakçi wrote the second book, the first one had been almost forgotten. While we have about fifteen copies of the second book, only four copies remain of the first one. This indicates how common and well used by accountants the second book was.

## **Descriptive Geography**

Matrakçi Nasuh was an important figure in the field of descriptive geography. His first noteworthy book *Bayân-i Manâzil-i Safar Iraqayn* (*Explanation of encamping places of two expeditions of Iraq*) was in Turkish. His miniatures showing the roads connecting Istanbul, Tabriz and Baghdad are like maps. His history of the 1534-36 campaign to Iran and Iraq includes a double folio depicting Istanbul with all the contemporary structures of the city shown in remarkable detail (see figure 6). The Golden Horn runs vertically in the centre, separating the Galata section with its famous tower (on the left) from the city proper (on the right), which includes such major structures as the Topkapi Palace, Hagia Sophia, At Meydani (Hippodrome), Grand Bazaar, Old Palace, and the complex (*kulliya*) of Mehmed II. A major document for the study of Istanbul in the 1530's, the illustration is an example of the topographic genre of painting initiated by Nasuh that continued for centuries.



**Figure 6: City of Istanbul and Develi illumination from Matrakçi's *Beyân-i Menâzil-i Sefer-i 'Irakeyn*. (Source).**

As a result, Matraçî's land maps are considered equal with Piri Reis' Portland maritime maps to be found in his *Kitâb-i Bahriye*. Two other works of Matrakçi containing miniatures are important from a geographical perspective. In one called *Ta'rih-i Feth-i Shiklos wa Estergon wa Istolnibelgrad*, Matrakçi drew the inns between Istanbul and Budapest as well as the cities of Nice, Toulon and Marseilles during Barbaros' visits and the Ottoman fleet with which he came (see figures 7 and 9). The other book called *Tarih-i Sultan Bayezid* includes miniature paintings of the places mentioned in the text.

As a member of the administration, Nasuh accompanied Süleyman the Magnificent on various campaigns and carefully recorded the events and illustrated the cities and ports conquered by the Ottomans. He participated in the Mohac campaign (1526) and the two Baghdad expeditions of Kanuni. He illuminated the picture of every city where the army was billeted or passed by. Turkish history institution (Turk Tarih Kurumu) published the city paintings he made during the expedition (edited and published by H. G. Yurdaydin, in 1976).

When he passed away on 28 April 1564, he was the head of the office of the *kethüda-yi bargir* (*kethüdây-i istabl-i 'âmire* /Chamberlain of the royal horses).

Matrakçi Nasuh may be compared with Leonardo da Vinci. A documentary film about him was produced by the Turkish Radio and Television in 1979.



Figure 7: Ottoman fleet in the French port Toulon in 1543 (from Matrakçi's *Beyân-i Menâzil-i Sefer-i 'Irakeyn*). Reproduced on the website of Bilkent University . (Source).

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## End Notes

[1] "Matrikçi Nasuh" from Wikipedia, the free encyclopedia. Online here.

[2] For illuminations see figure 2 for Baghdad, figure 3 for Tabriz, and figure 4 for Diyarbakir.