ACTA ORIENTALIA

ACADEMIAE SCIENTIARUM HUNGARICAE

VOL. 51 (1998) NO. 3

OFFPRINT

AKADÉMIAI KIADÓ, BUDAPEST

Acta Orientalia Academiae Scientiarum Hung. Volume 51 (3), 297–301 (1998)

SIYĀQAT ACCOUNTING

ITS ORIGIN, HISTORY, AND PRINCIPLES

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Siyāqat was a popular system for keeping financial accounts in some Middle-Eastern countries in the Islamic period. In this article, the origin of *Siyāqat* and of its name is mentioned. Based on historical references, it is shown that *Siyāqat* was an arabicized form of the pre-Islamic Iranian accounting system. This fact is reconfirmed by showing the similarity between the mathematical structures of *Siyāqat* and the pre-Islamic Iranian numeration system. Two main branches of *Siyāqat*, cash and kind, are described. Information on the earliest extant samples of *Siyāqat*, and on modern researches and publications on the subject is provided.

Introduction

Siyāqat or *Sīāq* was a particular method used in Iran and some other Middle-East countries for writing numbers in financial records to represent amounts in cash or in kind. There remain many historical documents containing accounts registered in *Sīāq* from the Qājār dynasty who ruled Iran for about one and half century down to 1925, and from the Ottoman Empire that lasted about six and half centuries, ending in 1922. *Sīāq* was used to keep the financial accounts of everyday business of ordinary people, merchants, and the courts.

Sīāq used to be taught in Iranian old-fashioned elementary schools, and it continued to be taught in modern schools down to the 1930s. It is no longer taught now. However, some old merchants and a few scholars dealing with historical documents are familiar with it. There are many manuscripts about the *Sīāq* method in the libraries of Iran, some of which were lithographed, mainly in the Qājār period.

In 1915, an Iranian scholar, Hossein Kazem-zadeh Iranshahr published a French article on *Sīāq* entitled "Les chiffres Siyâk et la comptabilité persane" in RMM. In 1952, Prof. Walther Hinz (1906–1992) published in Wiesbaden a Persian work on *Sīāq* entitled *Risāla-yi falakiyya*, composed by ᶜAbd-Allāh b. Muḥammad b. Kīā al-Māzandarānī around 865/1460. Under Prof. Hinz's supervision, other treatises on the subject entitled *Shams al-ḥisāb*, *Qānūn al-saᶜāda* and *Saᶜādat-nāma,* were edited and published by his students. A major contribution to *Sīāq* was by the Hungarian

0001-6446 /98/ $ 5.00

scholar Lajos Fekete who published a precious work in German on Ottoman *Sīāq*, in 1955. During World War I, Fekete was captured and sent to concentration camps, where he learned Turkish from other captives. After freedom, he began his research on the Ottoman period financial documents in Hungary and other European countries. His two-volume work contains photos of about one hundred documents with their transliterations and translations. A facsimile publication of an 18th-century treatise entitled *Majmaᶜ al-arqām* ("Collection of numerals") by Mīrzā Badīᶜ-Dīwān, containing ample data about the use of *Sīāq* at the court of Bukhara, edited and commented with a Russian translation by A. B. Vildanova, appeared in 1981 (see References).

History

After the Arabs' conquest of Iran in the 1st/7th century, they needed the help of Iranian experts to run their administrative affairs. On the other hand, the Iranians intended to penetrate the Arab administration in order to save the Iranian civilization legacy, as much as possible, and to assimilate the new rulers. Apparently this design turned out to be more efficient than local armed resistance to Arabs. Until the last decades of the 1st/7th century, the Arab government's financial accounts were kept by Iranians and according to the pre-Islamic Sasanian methods. Then, the Arabs, after having firmly established their sway, decided to convert the financial accounts from Persian into Arabic. Even for this purpose, they needed Iranian experts who were familiar enough with the Arabic language.

According to the 3rd/9th century Arab historian Balādhurī in his *Futūḥ al-buldān*, this conversion was carried out by Ṣāliḥ b. ᶜAbd al-Raḥmān (d. about 90/708–9), an Iranian scribe in the service of Ḥajjāj b. Yūsuf (d. 95/713–4) whom ᶜAbd al-Malik Marwān had nominated as the ruler of ᶜIrāq. An Iranian scribe, Zādān Farrukh son of Pīrī, who had introduced Ṣāliḥ to Ḥajjāj, strongly opposed this conversion. After Zādān Farrukh died in 84/703–4, his son Mardānshāh argued with Ṣāliḥ that the conversion was impossible; further, some Iranians wanted to pay 100,000 dirhams to Ṣāliḥ in order to prevent him from executing his plan. However, he insisted on carrying out the ruler's scheme. After Ṣāliḥ accomplished his mission, Mardānshāh cursed him for his treacherous anti-Iranian attempt (Balādhurī, pp. 300–1). The official accounts of Syria under the Caliph ᶜAbd al-Malik Marwān were converted from Greek into Arabic around the same time (Balādhurī, p. 193). The similar conversion was made much later in other districts of the Islamic territory; for example, it took place in the province of Khurāsān in eastern Iran 40 years later, i.e., in 124 /741–2 (Jahshiyārī, p. 67), and even later in Isfahān by an agent of Abū Muslim Khurāsānī (d. 137/754–5) (Ibn Rustah, pp. 196–7). The earliest records of *Sīāq* relate to the financial accounts written by ᶜAlī b. ᶜĪsā for the Abbasid Caliph al-Muqtadir bi'llāh in 306/918–8 (Kremer).

Sīāq or *Siyāqat* is an Arabic word, originally meaning "style", "method" and also "to drive, to lead and to arrange". The earliest extant reference to this term is

found in *al-Fihrist* (composed in 377/987–8) by Ibn al-Nadīm, who just mentions "Sīāq", besides the religious books written by reed pens (Ibn al-Nadīm, p. 22). Elsewhere (ibid., p. 303) he repeats the story related by Balādhurī. The description of the nature of *Sīāq* is given in the *Taʾrīkh-i Fakhrī* ("Fakhrī History") by Ibn Ṭiqṭaqā who flourished in the second half of the 7th/13th century. He says that the Mongol rulers supported the sciences of *Siyāqat*, medicine, and astronomy – in his own words: ʿilm al-siyāqat wa ʾl-ḥisāb li-żabṭ al-mamlakat wa ḥaṣr al-dakht wa ʾl-kharj ("the science of *Siyāqat* and accounting to keep the country and to determine the incomes and expenses") (Ibn Ṭiqṭiqā, p. 22). Elsewhere (p. 146), he writes that in the time of the Umayyad caliph ʿAbd al-Malik Marwān (gov. 65/684–5), the official accounts were converted from Persian into Arabic and the style of *Mustaʿrabīn* was innovated. This term refers to non-Arab peoples who had adopted the language and customs of the Arabs, and imitated their characteristic manners. Ibn Ṭiqṭaqā refers to the new method as *Siyāqat al-mustaʿrabīn* which was later abbreviated as *Siyāqat* and *Sīāq*.

Nāṣir-i Khusraw (1003–1088), the great Iranian poet, prose writer and Ismāʿīlī thinker, has a reference to *Sīāq* in his *Safarnāma* ("Travel account"). He narrates that in 437/1045–6, he once attended a lecture by ʿAlī Nasawī in Simnān, east of Tehran. ʿAlī Nasawī said: "I know nothing about *Sīāq* and I would like to learn some arithmetic". Nāṣir was astonished, and thought: "Knowing nothing, how can he teach?" (Nāṣir-e Khusraw, p. 3).

An early example of *Sīāq* is found in a treatise entitled *Dastūr-i dabīrī* ("The rules of secrataryship") by Muḥammad b. ʿAbd al-Khāliq Mīhanī, composed in 585/1188–9, during the Seljukid period (ms. Fatih 4074, fol. 99b, Istanbul). In an encyclopedic work entitled *Nafāʾis al-funūn fī ʿarāʾis al-ʿuyūn* by Shams al-Dīn Muḥammad b. Maḥmūd Āmulī (8th/14th century), there is a short chapter on writing the integers and fractions in *Sīāq* (Āmulī, vol. 1, pp. 303–11). Ghiyāth al-Dīn Jamshīd al-Kāshī, a prominent Iranian mathematician of the 9th/15th century, has referred to the official accountants who used *Sīāq*, in the first and 12th sections of the second book of his great mathematical work *Miftāḥ al-ḥisāb*, where he describes the multiplication of the fractions *dāng* (1/6), *ṭasūj* (1/24), and *shaʿīr* (1/96) (al-Kāshī, pp. 42, 59). Again, in the fifth book, where he gives forty examples of miscellaneous mathematical problems, he also gives the solutions in *Sīāq*, in the 21th, 28th, 29th, and 30th examples which deal with cash quantities (id., pp. 219, 231, 234, and 235). This list of the works written in *Sīāq* or about the *Sīāq* method is by no means exhaustive.

Sīāq continued to be used and improved in Iran, and it was transmitted to some Arab countries, Egypt, Asia Minor, India and China. In China, it was called *istī-fī*, probably from Arabic *istīfāʾ* ("administration"). The Indian official records were converted from Indian into *Sīāq* in the 16th century. In Iran, after the revolution of 1906 which led to the establishment of a constitutional regime *Sīāq* was officially abolished.

Structure

In the conversion of official accounts from Persian into Arabic, the Sasanian Pahlavi numerals were substituted by relevant Arabic words in their stenographic form. However, the mathematical structure of the numeration system was preserved. The Pahlavi numeration system belonged to the group of the ciphered numeration systems which are essentially different from Hindu-Arabic positional numeration system, presently used all over the world. In the ordinary Hindu–Arabic decimal system, all numbers are registered using just 10 symbols or digits, and each digit has a value depending on its position or order in the whole number. In the ciphered numeration systems, there are symbols for 1, 2 ...up to 9, then for 10, 20 ...up to 90, then for 100, 200 ...up to 900, and so on. In these systems, the value of a number is merely the sum of the absolute values of the symbols that constitute it. The Pahlavi numeration system was actually an incomplete ciphered system in which, e.g., 12 was written as  and 6 was written as twice the symbol for 3:  . The same additive system is used in *Sīāq* where 12 is written as  . Moreover, in *Sīāq* as in Pahlavi numeration, the symbols used for multiples of 100 and 1000 are formed by multiplicative combinations of the symbols for 100 or 1000, and the relevant coefficient. For example, in Pahlavi, 200 is written as  where stands for 2 and for 100. By a similar combination, 2000 is written as  where stands for 1000. Similarly, in *Sīāq*, the multiples of 100 and 1000 are written by using the symbols  and  , with the relevant coefficients.

Another point of similarity is the form of the symbols for 1000 in Pahlavi and in *Sīāq*, which are written as  and  , respectively. Both are possibly related to the Arabic word *alf*  for thousand, because of the Semitic origin of the Pahlavi alphabet. Therefore, mathematical similarity confirms the historical accounts of the pre-Islamic Iranian origin of *Sīāq*.

Sīāq was divided into two branches: Sīāq for cash amounts (siyāq-i naqdī) and *Sīāq* for amounts in kind (siyāq-i jinsī). In *Sīāq* for cash amounts, the numbers actually showed dinars. For showing other quantities, such as weights, a slight change was made in their left end. For example, 10 dinars was written as  , while 10 *man*s (30 kilograms) was written as  , and 10 *kharvār*s (3,000 kilograms) was written  .

As it is well known, the Iranian mathematicians played an important role in transmission, advancement and propagation of the Hindu-Arabic numerals. This rises the following question: Why did they not use it for financial and administrational affairs? The same phenomenon is observed down to World War II, in the case of the Iranian *zīj*es and calendars which were written in *abjad* numerals taken from the Arabic alphabet in their original Phoenician order which is still kept in Hebrew alphabet. The answer may be found in the reason given by recent advocates of *Sīāq* that, when documents and books were written by hand, the ciphered systems of *Sīāq* and *abjad*, were less subject to deliberate or unintentional alterations, while in working with the Hindu-Arabic numerals, for example, by simply adding a zero, a noticeable change in the registered amount was possible. In the *Risāla-yi falakiyya*, there is a chapter on

Hindu-Arabic numerals. However, the author mentions that this system is not used in accounts, because it is dependent on "points", so some flaws may occur in it (al-Māzandarānī, p. 24).

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