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What Did Cardano that Had not Done Khayyām?

Amir Asghari

Omar Khayyām (1048-1131) and Girolamo Cardano (1501-1576) are both well known for “solving” cubic equations. The common understanding is that Khayyām solved the cubic equations geometrically while Cardano did it algebraically. In this short article, we see the fates of their approaches by reviewing their similarities and differences alongside each other.

The Geometrical Pattern *Chār Toranj*

Mohammad Bagheri

The pattern called *chār toranj* is frequently seen in the geometrical tilings of old buildings, especially in Isfahan (Iran). It consists of four kite shaped quadrilaterals plus a small square which altogether constitute a bigger square. The oldest known sample, preserved in Hermitage museum of Petersburg, dated around the 6th century B. C., is found in the common border point of Russia, Mongolia and China.

In this paper several samples of this pattern from Iran, Tajikistan, Uzbekistan and Iraq are presented. Moreover, the geometrical properties and implications of this pattern are discussed.

A Survey of the Contents of *Majmū' al-Murabba'āt* by Muḥammad Bāqir Yazdī (17th century)

Zahra Pournajaf

Majmū' al-Murabba'āt or *The sum of square numbers* is an unknown treatise of Muḥammad Bāqir Yazdī (alive in 1638 A.D.). It was believed to be a part of his '*Uyūn al-Ḥisāb*, but it became clear to the researchers that it is an independent one. This treatise contains introduction and analysis of some propositions about the sum of odd and even square numbers and examines the sum of how many of these square numbers results in a square number. Evidently this mathematical problem was an issue of interest for Islamic scientists such as Naṣīr al-Dīn al-Ṭūsī, Abū Ja'far al-Khāzin and Kamāl al-Dīn ibn Yūnus.

Abstracts of Persian Articles

The Sources and the References of *Lubb al-Ḥisāb*

Narges Assar zadegan

Alī ibn Yūsuf, the author of *Lubb al-Ḥisāb*, survived in a unique Persian manuscript of 12th century, used several important sources in this treatise. He gathered a collection of theoretical and empirical arithmetic and geometric issues. There are some references in *Lubb al-Ḥisāb* to the preceding mathematicians such as Abū Barza Ḥāsib, Khwārizmi, Abū Kāmil, Būzjānī, Karajī, Abū Maṣūūr Baghdādī, Ibn Khawwām Baghdādī, and Naṣīr al-Dīn al-Ṭūsī. Moreover, a vast majority of its content is close to *Ghunīyat al-Ḥussāb fī ‘Ilm al-Ḥisāb* by Aḥmad ibn Thābit. The chapter on Geometry is similar to two treatises of codex 772 of Bibliothèque Nationale de France. In this article, we aim to shed light on the relationships between *Lubb al-Ḥisāb* and the above-mentioned treatises.

A History of the Names of the Week Days and the Weekend

Ali-Naghi Monzavi

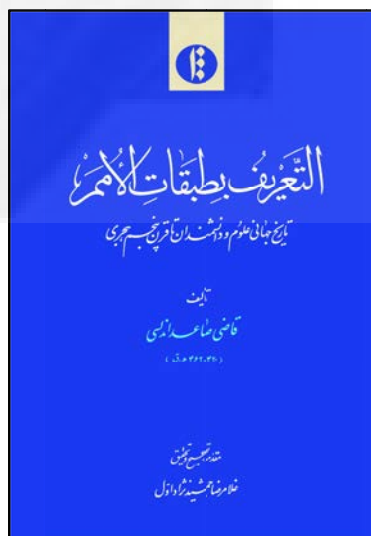
Using weeks as time intervals became popular in Mesopotamia in the second millennium BC, and there have been two systems for naming the week days. Among the Semitic nations, the days were numbered and the week day names were formed by a number (1, 2, 3, ...) and a single suffix. Indians used the names of the sun, moon, and the five known planets for the week day names. This is the way week days are also named in the West. The author explains the logic of naming week days consecutively related to the sun, moon, Mars, Mercury, Jupiter and Venus, in Europe.

Meanwhile, it should be noted that the pandemic had some positive side effects that may continue and enhance when the pandemic is ended or sufficiently controlled. One aspect is the urged acceleration of the widespread application of virtual facilities in education and in scientific-cultural events. The old system had already proved to be insufficient and backwarded in our new model of life. However, it takes time to transfer into the new system and to solve the new troubles with which we come across. Another positive aspect is the development in organizing gatherings which by using virtual facilities, we get rid, to some extent, of many financial, bureaucratic and even political engagements. Let's hope that the pandemic ends soon!

Mohammad Bagheri
July 2021-Tehran

Editorial

The present issue (consecutive no. 17) of our journal is being published with universal delay due to the constraints caused by covid-19 pandemic. Apart from the limitations relating to prevention of the disease, it was sometimes difficult to concentrate on our job due to the very sad news, from near and far, of the losses. We lost one of our very knowledgeable and active colleagues in the Written Heritage Research Institute, Gholamreza Jamshidnezhad-Aval (1945-2021), who among other things, had translated Qāḍī Šāʿd Andalusī's Arabic treatise on "Knowing the different types of nation" (التعريف بطبقات الامم) into Persian. His translation of al-Kindī's Arabic treatise on cryptanalysis (استخراج المعتمى) was published in the issue no.12 (autumn 2017 & winter 2018) of our journal. Some of our colleagues also lost their close relatives or family members. We offer our hearty condolences to those colleagues. We hope that this worldwide calamity will end soon. And we sincerely thank those who work in hospitals and medical research organizations fighting against Covid-19 with admirable devotion and sacrifices.



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Cover photo: *Chār Toranj* geometrical pattern in the mausoleum
Hārūn Wilāyat (Isfahan) (photo by: Hadi Malekian)

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