



ČORTKA

ČORTKA (or *čortaka*, *čotka* < Russ. *schëty* “abacus”), an ancient calculation device, a rectangle strung with parallel metal wires along which clay, metal, or wooden beads can be moved. It is still used in the Middle East. There appears to be no reference to such abacuses in surviving early Persian writings, but Ḥamd-Allāh Mostawfī (13th-14th centuries; *Nozhat al-qolūb*, p. 42) made reference to a calculating device called *taḳta-ye farangī* that may have been similar to the *čortka*. According to him, it was **Avicenna** who introduced the use of “finger calculations” (*ḥesāb al-‘oqūd*), which relieved mathematicians of the inconvenience of counting beads (*mohra-šomārī*) and the use of other devices (*dīgar maṣūbahā*) like the *taḳta-ye farangī*. The term *taḳta-ye farangī* suggests that the device was probably introduced from the West; it is not, however, found in any early Persian encyclopedia or dictionary.

Although it is slowly being replaced by modern calculators, the *čortka* is still in use among shopkeepers, cashiers, and farmers in rural villages. It is used in some government offices and agencies as well. Normally the rectangular frame is strung with twelve horizontal wires. The first wire on the right is strung with four wooden beads, the second and third with ten each, the fourth with four, and the other eight with ten each. Normally the color of the two central beads on each wire (the second and third beads on the wires with four beads and the fifth and sixth beads on those with ten) is black, in order to assist in rapid and correct manipulation during calculations. On some smaller examples colored rings are used instead of beads. Generally the frame is open on both sides, but in some smaller *čortkas* a thin sheet of wood closes one side,



as in a shallow box.

Before the adoption of the riyal as the Persian monetary unit five beads on the second string were equal to 1 *šāhī* (= 50 dinars, each bead equaling 10 dinars), and each bead on the third string to a *šannār* (= 2 *šāhīs* = 100 dinars); the ten beads on the third string totaled 1 *qeran* (= 1,000 dinars = 1 toman). One bead on the fifth string was equivalent to the total of the third string, and the remaining strings were equivalent to quantities of tomans: 10, 100, 1,000, 10,000, 100,000, 1 million, and 100 million respectively. It was thus possible to add and subtract up to 100 million tomans. This old system of measurement is now becoming obsolete. Since the adoption of the riyal 5- and 10-dinar coins are no longer in use; the 50-dinar coin (= 10 *šāhīs* or half a riyal) is used only rarely.

In Persia today a decimal system is most often used as the basis for calculation on the *čortka*, and the four-beaded strings are less often employed. Recently, however, the fourth string has been used to separate the strings on the right, used for fractions, from those to the left, used for integers. The ten beads on the third string are equal to a riyal (five of them = 50 dinars) which is represented by one bead on the fifth string. The ten 1-riyal beads on the fifth string are equivalent to one bead on the sixth string, and so on.

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(Yaḥyā Ḍokā')