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BERENJ “BRASS”

BERENJ (Mid. Pets. *brinǰ* and *bring*) “brass,” an alloy of copper and zinc.

i. General

The earliest dated reference in lexicography to *berenj* occurs in Adīb Kordī Nīšāpūrī’s Arabic-Persian dictionary *Ketāb al-balāḡa*, completed in 438/1046-47 (ed. M. Mīnovī and F. Ḥarīṛčī, Tehran, 2535 = 1355 Š./1976, p. 283). It renders Arabic *šabah*, literally “simile, resemblance.” Bīrūnī comments in the *Ketāb al-jamāher fī maʿrefat al-jawāher* (Hyderabad, 1355/1937, pp. 262-63) that *šabah* is copper made yellow by adding zinc (*tūtīā*) until it resembles gold, so much so that it has been called “simile.” The equivalency of Persian *berenj* and Arabic *šabah* is confirmed by all later dictionaries, notably Maydānī’s *Sāmī fi’l-asāmī* (facs. by J. Šahīdī, Tehran, 1345 Š./1966, p. 216). In the mid-7th/13th century, Ḵᵛāja Naṣīr-al-Dīn Ṭūsī specifies that *berenj* is made of purified copper, “to give it a thoroughly yellow color,” and zinc (*Tansūḵ-nāma-ye īlḵānī*, ed. T. Modarres Rażawī, Tehran, 1348 Š./1969, p. 227). The historian and polymath Abu’l-Qāsem Kāšānī (early 5th/14th century) adds that it has a sheen (*jalā*) and glitter (*āb*) like gold (*ʿArāʾes al-jawāher wa nafāyes al-aṭāyeb*, ed. Ī. Afšār, Tehran, 1345 Š./1966, p. 244) and that the best *berenj* is the *šāmī* (Syrian/Damascene), which

resembles gold. Kāšānī puts brass after gold and silver in the hierarchy of "substances that can be smelted," i.e., metals and alloys, saying that whatever can be made of gold can be made of brass, utensils, vessels, furniture.

Very few proper analyses have been carried out on Iranian metalwork. It would seem that brass was used for making many of the wares executed from sheet metal hammered into shape and then engraved and inlaid with silver that have recently been shown to be the products of the Khorasan school in the later 6th/12th and early 7th/13th century (A. S. Melikian-Chirvani, *Islamic Metalwork from the Iranian World*, London, 1982). These include ewers (pp. 114-18, *āftāba* no. 45), rose-water sprinklers (pp. 120-21, *golābzan*, *golābpāš* no. 58), etc. In the middle Safavid period, beautifully cast vessels with thick walls covered with engraved patterns were made of brass. Lexical information also makes it possible to identify objects preferably made of brass. *Bring* is recorded in Manichean Middle Persian (D. N. MacKenzie, *A Concise Pahlavi Dictionary*, London, 1969, p. 20). Around 1300 the form *bereng* is glossed *jaras* (bell) by Mobārakšāh Qawwās (*Farhang-e Qawwās*, ed. Naḏīr Aḥmad, Tehran, 1353 Š./1974, p. 175). From this it may be inferred that bells were at that period largely made from brass. Similarly *berenjīn* or *berenjan* means "bracelet" or "ankle-ring" (Enjū Šīrāzī, *Farhang-e jahāngīrī*, ed. R. ʿAfīfī, 3 vols., Mašhad, 1351 Š./1972, Tehran, 1354 Š./1975, I, p. 864b). Although Enjū Šīrāzī writes that these are made of gold, silver, and other metals, the derivation leaves no doubt that in early times bracelets were made chiefly from *berenj*. The word also occurs in Bīrūnī's *Ketāb al-tafhīm* (ed. J. Homāʾī, Tehran, 1362 Š./1983, p. 389). Both bells and bracelets were intended to ring and Bīrūnī associates the *dast-baranjan* and *pāy-baranjan* with *jalājel* in the iconography of the moon depicted as a seated woman. This would seem to confirm that *bereng* is a pre-Islamic onomatopoeia (compare Persian *tarang* and old German *dringen*, English *ring*) coined to describe brass as the "ringing metal," rather as German *Glockenmetall* and English *bell metal* have described a multiple alloy with a ringing sound since the Middle Ages.

In modem times *berenj* has continued to be used in a variety of household objects, ranging from bowls and beakers to ewers and basins (*āftāba-lagan*); samovars (*samāvar*), of a type borrowed from Russia some time in the 13th/19th century, are also made of brass. In the eastern Iranian world, particularly in Afghan Khorasan, Kābolestān, and the area of Ḡazna, teapots (*čāynak*, corresponding to *ḡūrī/qūrī* in Iran) are often made of an alloy that resembles brass (laboratory analyses have yet to be carried out to determine

the exact nature or the alloys used).

Equally important is the use in traditional architecture of openwork plaques in the shape of rosettes and a wide assortment of studs used as door fittings. In contemporary architecture taps, the pipes of public fountains, and spouts in garden pools are often made of brass, translating into modern terms a tradition that is centuries old. Spouts in pools are invariably depicted in book painting in the golden color associated with *berenj*. Brass is used extensively for making bangles, rings, seal rings, and bells (*zangūla*), as well as for a variety of studs and mounts for horse trappings. It is also common in Turkmen and other tribal jewelry.

For the thriving brass industry serving the tourist market, see crafts. One aspect of this industry that has been little studied is the trade in forged antiquities, for example, the manufacture of “old” brass astrolabes in Isfahan (see L. D. Loeb, “Creating Antiques for Fun and Profit. Encounters between Iranian Jewish Merchants and Touring Coreligionists,” in *Hosts and Guests. The Anthropology of Tourism*, ed. V. L. Smith, Philadelphia, 1977, pp. 185-92).

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ii. In the Islamic Period

In the Islamic period copper and zinc, both mined in Iran, were used in the manufacture of two particular alloys, *berenj* or *šabah* (brass) and *šabah mofraḡ* (cast brass).

There were numerous Iranian sources for the copper used in these alloys, but, according to the texts (e.g., Moqaddasī, p. 470; Kāšānī, p. 188), the zinc came exclusively from the province of Kermān. The methods used to obtain *tūtīā* (zinc oxide) from ores are described in medieval sources (Allan, 1979, pp. 39-42): The ore was smelted and the resulting zinc-oxide vapor allowed to

condense on baked-clay pegs protruding from the walls in the upper part of the furnace. Such pegs have been found at a variety of sites in Kermān; they also occur elsewhere in Iran, suggesting a more widespread exploitation of zinc than the texts indicate, though the dating of such sites is problematic.

The purest brass alloy used, *berenj* (or *šabah*), was a mixture of approximately 80 percent copper and 20 percent zinc and was beaten into sheets, from which vessels were then manufactured (for analyses, see Allan, 1979, table 21). Inexpensive objects of this type must always have been in use in Islamic Iran. The most impressive surviving examples, however, are ewers and candlesticks produced in Khorasan (probably in Herat) in the late 6th/12th and early 7th/13th centuries. The workmanship is of such high quality, especially considering that the material is a base alloy, that it has been suggested that the craftsmen must have been silversmiths forced for economic reasons to work in a less expensive medium (Allan, 1976-77, pp. 5-21). Particularly noteworthy are the carefully disguised joints between the various sheets used, the quality of the inlaid designs in silver and copper, and above all the outstanding repoussé work. Associated objects in beaten brass include jugs with lids and small table tops.

Beaten brass was also produced in Sīstān during this period and manufactured into objects of relatively good quality, especially basins and trays. Inlays of silver, copper, or both were often used to enhance the pieces. One particular school practiced the art of repoussé on objects that may be bucklers (Melikian-Chirvani).

This same alloy seems to have been used for casting one highly specialized group of objects, astrolabes. No systematic study has yet been published, however, and provisional analyses of a variety of examples suggest some variation in the ratio of copper to zinc. Small amounts of lead, presumably added to facilitate casting, are also recorded.

The alloy known in Arabic texts as *šabah mofraḡ*, often called a "quaternary alloy" in contemporary publications, was widely used for a variety of cast metal objects. It consisted of copper, lead, zinc, and tin in descending quantitative order and was presumably made from melted-down scrap metal, with extra lead added to facilitate casting (see Allan, 1979, pp. 45-46 and table 21). Typical products of the early Islamic period are pestles and mortars, incense burners, cauldrons, ablution buckets, lamps and lampstands, and bottles and ewers. All these types occurred in a wide variety of forms before

the 16th/12th century, and examples from eastern Iran and Afghanistan are numerous in museum collections and on the art market. From about 500/1100 onward the surviving objects are distinguished by less variety of form and greater richness of decoration, including inlay. Two famous examples may be cited: the so-called “Bobrinski bucket” in the Hermitage Museum, dated 559/1163 , and in the same collection an aquamanile in the form of a zebu and nursing calf, dated 603/1206 (*Arts of Islam*, nos. 178, 180). The latter was made by means of the lost-wax process (for a description of this process, see Untracht, pp. 338-77). The inscription on each piece records that the casters and inlayers were different individuals, indicating division of labor within the industry. Occasional pieces made for members of the ruling class have survived, but most of those with owners’ names belonged to merchants or other members of the bourgeoisie.

There were minor changes in the use of brass alloys between the 7th/13th century and the Safavid period (907-1145/1501-1732), reflecting changes in fashion and taste. Up to about 750/1350 fine inlaid brass was produced in northwestern Iran and in Fārs for both royal and courtly patrons, but from the 8th/14th century onward tinned copper became increasingly popular for less expensive objects, and in the 16th and 17th centuries a taste for heavily incised brasses became widespread. Inlay work was by then comparatively rare, being confined to a group of late Timurid and early Safavid jugs produced in Herat (Komaroff, pp. 11-16) and to an occasional Safavid piece of later date,(e.g., an “anchor” in the David collection, Copenhagen; see “Art from the World of Islam,” no. 228). Instead objects are usually heavily decorated with incised designs drawn from the court styles of the period. Particularly striking are torch stands.

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PLATE VIII. Ewer, beaten brass (ca. 80 percent copper, 20 percent zinc) inlaid with silver and copper, ht. 40 cm, Herat, ca. 600/1200 (British Museum, 1848.8-5.2)

PLATE IX. Bucket, cast quaternary alloy of copper, lead, zinc, and tin, inlaid with copper, diam. 19 cm, Khorasan, 6th/12th or early 7th/13th century (Ashmolean Museum, Oxford, 1969.8)

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