

III, 19 *Accounts of Abraham Ben Yijū's Workshop for Bronze Vessels*

India {apparently 1132–39, 1145–49}

ULC Or. 1080 J 95

The paper is woolly and dark brown and in a bad state of preservation: corrugated, stained, and covered in various places with a dark substance, which cannot be removed without destroying the writing beneath it. The sheet was folded into extremely narrow strips, between ½ and 1 cm wide, as people do still in Yemen with their accounts and other documents. The accounts III, 21, written on the verso, were certainly not made in India, but in Aden. Presently we cannot ascertain whether or not III, 19 preceded III, 21.

Out text is of considerable interest for the history of the copper industry in India. The following facts, which are partly confirmed by other documents, emerge from it:

- 1) The workmen did not receive wages, but were remunerated for piecework. Ben Yijū was assisted by slaves and a local Jew, whose status is not specified {see III, 18, sec. B1, line 5}.
- 2) The craftsmen were paid according to the weight of the vessels produced—see here lines 4 and 26—a system, which was in use also with the Jewish silversmiths in Yemen.
- 3) The weight of the finished product did not differ much from that of the metals put into it. In lines 19–27, we find that out of 116½ *fills* of bronze and two *fills* of tin, the master cast a table jug of 45 *fills* and an ingot of 70 *fills* = 115 *fills*.
- 4) The coppersmith certainly used the same procedure of 'cire perdue,' which is applied in India in the traditional copper industry today {known today as lost-wax casting}.<sup>1</sup> The Arabic word 'asal, lit., 'honey,' in line 10, must denote 'wax,' as it is mentioned together with 'rice husks for fuel' in line 11. The Sanskrit word for wax, *makshikaja* or *makshikamala* is derived from *makshika*, 'honey.' Thus, the use of the Arabic word honey for wax may be simply the translation of a local term.<sup>2</sup>

<sup>1</sup> See *Census of India* (28), 448.

<sup>2</sup> Cf. also Dozy, *Supplément*, 2:128b: *sham* 'asalī, 'chandelle de cire'—modern usage—where 'asal' also stands for 'wax.' {In III, 8, line 12, 'asal' appears together with wheat and oil; in III, 20, line 12, together with sugar; and in III, 27, line 6, together with *dādhi* (lichen). For wax and honey as trade commodities in medieval southern India, see Abraham, *Merchants Guilds*, 180–81.

- 5) As the small quantity of tin (less than one fiftieth; see lines 19–27) indicates, it was not copper which was melted here, but bronze that was recast. Although the Adenese merchants writing to Ben Yijū use the words *sufī* ('yellow,' namely copper) and *naḥās* (copper) indiscriminately, *sufī* must designate here bronze or even brass.<sup>3</sup>
- 6) Borax was used in the brass industry, as it is today; see line 25.
- 7) It is also interesting to note that one man working for Ben Yijū is called 'Iyārī. 'Iyār means marking or assaying measures and weights. Thus, the artisan obviously had been—or perhaps still was—an officer of a mint or of the market police. Another man is called Ibn al-'Iyārī (see lines 16 and 19), which shows that such a connection was quite natural.<sup>4</sup>

The account is subdivided into two parts by a line drawn beneath line 18. {For the dates see the introduction to III, 21.}

## Translation

(1) Owed by the {add: smelters}<sup>5</sup> //...// al-'Iyārī [rī] (2) and his son Lnby<sup>6</sup> four M[aliki]<sup>7</sup> dinars (3) and a half.

Due them: the balance of the account and a *fill* [...] (4) Due them: //four *fills* more than in the account// payment for the manufacture of one *farāsila* and eighty (5) *fills*. The price of one *farāsila*: five *rawbajs*. (6) Total: nine *rawbajs*, which is the equivalent of (7) 31 dirhem and one *fāj*.<sup>8</sup> Balance: (8) 5 dirhems less one *fāj* and half a [dirhem]. (9) Altogether five dirhems (10) and a *fāj*.

<sup>3</sup> For the meaning of Arabic *sufī*, see 555, n. 11.

<sup>4</sup> According to A. Ghosh, *Antique*, 385, note to 279, 'Iyārī appears to be a variant of the Tamil Brahmin name Ayyar.

<sup>5</sup> The decipherment of the word is doubtful. [I read *sabbākīn*, 'smelters'; cf. III, 18, sec. D, line 2.] Before al-'Iyārī, several letters were inserted above the line, which, for the time being, defy decipherment, perhaps al-'Iyārī's first name. [It looks like two words, *al-arjal li-nāthān*, 'the legs for Nathan'; probably the legs are a stand for a lamp or the like.

<sup>6</sup> The name Lnby appears also in lines 13, 15, 24, and in III, 18, sec. B, line 8 (see 639, n. 20).

<sup>7</sup> For M[aliki], one could read, of course, also M[īṣrī], i.e., Egyptian. However, in these papers Maliki dinars and Egyptian *mithqāls* are always mentioned as being in use in India.

<sup>8</sup> These lines prove that one *farāsila* contained 100 *fills*. One *rawbaj* was evidently equal to about three and a half (Indian) dirhems. {For the *rawbaj* see 637, n. 8. For the *fāj*, see there, 638, n. 16.}

His debit: one *fāj* for wax<sup>9</sup> (11) and one *fāj* for rice husks for fuel<sup>10</sup> (12) and one dirhem cash.

(13) Al-'Iyārī and his son Lnby received (14) a bar,<sup>11</sup> one *farāsila* and three *fills* less one quarter (15) of tin.<sup>12</sup> Lnby received also 10 *fills*, (16) which he handed over to Ibn al-'Iyārī (17) and another 20 *fills*. Altogether his debit: one *farāsila* (18) and 23 *fills*.<sup>13</sup>

(19) Ibn al-'Iyārī received also (20) one *farāsila* and six *fills* and a half (21) *sufr* in a bar, as well as two *fills* (22) tin. Altogether one *farāsila* and eight *fills* (23) and a half. His debit: 10 *fills*, which were handed over to him (24) by Lnby al-'Iyārī. (25) His debit: two dirhems and for one dirhem borax.<sup>14</sup>

(26) He manufactured {alt. tr.: his credit: manufactured items}<sup>15</sup> a table jug<sup>16</sup> of 45 *fills* (27) and an ingot<sup>17</sup> of 70 *fills*.

<sup>9</sup> See the introduction to this document.

<sup>10</sup> See III, 18, sec. B, line 4.

<sup>11</sup> Of bronze; see lines 19–23.

<sup>12</sup> Arabic *qal'ī* also in line 22. See 558, n. 27.

<sup>13</sup> The addition checks out: Out of a total of 33 *fills*, Lnby had delivered to Ibn al-'Iyārī 10 *fills*. These 10 *fills* are referred to in lines 23–24.

<sup>14</sup> Arabic *ṭinkār*. See 575, n. 7.

<sup>15</sup> {Arabic *labu ma'mūl*.}

<sup>16</sup> Arabic *zūr ikhwān*. See 555, n. 13.

<sup>17</sup> Arabic *masbūk*; cf. *naḥās sabīka*, mentioned in Bodl. MS. Heb. a. 3 (Cat. 2873), fol. 26v, line 11. {Shy, "Terms," 204, 206, explains *masbūk* (usually in the plural, *masbūkāt*), 'metal'; see ib., 207 for *sabīka*.}

### III, 20 *Similar Accounts, not in Ben Yijū's Hand*

India

ENA 1822A, f. 66

Accounts similar to III, 19, perhaps with one of Ben Yijū's workers, but not in his handwriting.

{The account was clearly written in India, as the prices are given in Indian coinage, Kūlamī *fills*, i.e., from the famous port city Quilon on the Malabar Coast, and *fanam*.<sup>1</sup> The latter has been found in the India Book papers, only in VI, 49; as the calculation shows, it was worth a quarter of a *filī*.<sup>2</sup> The writer's anonymous associate, whose account is registered here, was charged for the receipt of various commodities, including both Indian products and items usually imported for personal use from Yemen and the West. He must have been a Yemenite or from elsewhere in the West, who was staying in India.}

<sup>1</sup> {A common small gold coin (*paṇam*) in southern India. See Chattopadhyaya, *Coins*, 336 (index).

<sup>2</sup> On this coin, see III, 18, sec. A, line 11.}