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AN INSCRIBED STIRRUP JAR OF CRETAN ORIGIN FROM
BAMBOULA, CYPRUS*

Aegean stirrup jars with incised or painted linear signs (ISJs) have received considerable attention in recent years.¹ These inscribed vases provide fundamental data for such topics as Aegean trade, the organization of regional industries, the development of scripts, and the chronology of Crete and the mainland in the late Bronze Age.² Studies have properly concentrated on the provenience of the ISJs (using elemental analysis [OES] or stylistic considerations) and on the linear signs them-

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The abbreviations used in the footnotes are those recommended in *AJA* 82, 1978, 3–10 together with the following:

Bamboula: J. L. Benson, *Bamboula at Kourion*, Philadelphia 1972.

Cyprus-Crete: Acts of the International Archaeological Symposium "The Relations between Cyprus and Crete," Nicosia 1979.

Proleg.: J. F. Daniel, "Prolegomena to the Cypro-Minoan Script," *AJA* 45, 1941, 249–82.

VIP: J. Raison, *Les Vases à inscriptions peintes de l'âge mycénien et leur contexte archéologique*, Rome, 1968.

¹ Recent discussions, with earlier bibliography, include A. Kanta, *The Late Minoan III Period in Crete. A Survey of Sites, Pottery and their Distribution*, Göteborg 1980, 249, 294–96; H. W. Catling, J. F. Cherry, R. E. Jones, J. T. Killen, "The Linear B Inscribed Stirrup Jars and West Crete," *BSA* 75, 1980, 49–113; P. Åström, *Excavations at Kalopsidha and Ayios Iakovas in Cyprus*, Lund 1966, 149–92; P. Åström, "Pot-Marks of the Late Bronze Age from Cyprus," *Opuscula Atheniensia* 9, 1969, 151–59.

² All these topics are interrelated. The most comprehensive treatment is Catling et al. (*supra* n. 1). See also W.-D. Niemeier, "Mycenaean Knossos and the Age of Linear B," *SMEA* 23, 1982, 223–24 and n. 22. On the trade and manufacture of Myc. wares found in Cyprus, see E. Coche de la Ferté, *Essai de classification de la céramique mycénienne d'Enkomi*, Paris 1951, 43–46.

selves, in order to understand the source, use, conveyance and distribution of the jars.³ In this article we shall discuss a coarse-ware ISJ from Bamboula, Cyprus. Its inscription and provenience present intriguing problems relating to the larger issue of contacts between Crete, Cyprus and the Mycenaean mainland in LM III B. Moreover, since this ISJ, and other stirrup jars of the same stylistic class, have been alternatively attributed by standard methods to Mycenaean and Minoan, not to mention local Cypriote, workshops, we shall use this ISJ to illustrate an effective scientific method, petrography, for determining probable provenience.

1. The Jar

Our ISJ (B1129; University Museum no. 54–12–99; Pl. I) is a well-preserved example of a group of large coarse-ware stirrup jars, mostly fragmentary, recovered from the cemetery of Bamboula at Kourion, Cyprus.⁴ Its restored height is 33.8 cm; its maximum diameter 25.7 cm. It has an ovoid, biconical shape with a distinctive deep depression at the top of the disc over the false mouth. The base is not preserved. Decoration, in matt-brown to light orange on a very pale brown surface, consists of a schematized octopus body with double wavy lines for tentacles (Furumark type 53.14) in a broad main zone formed by three bands above and two below. Interlocking curved lines are on the handle and disc, and a band is around the base of the false neck. Lines also set off the handle and spout. A single sign is incised into one handle (see § 2, below).

a. Context and date:

B1129 comes from Area D, cellar, which is not firmly dated but appears to be LC II C. Benson therefore assigns the ISJ to the thirteenth century B.C.⁵

³ For the Linear B inscribed stirrup jars, see VIP, 193–209. For stirrup jars, inscribed and uninscribed, in the region of Cyprus, see V. Hankey, “Crete, Cyprus and the Southeast Mediterranean, 1400–1200 B. C.,” *Cyprus-Crete*, 146–55; T. Dothan, “Minoan Elements and Influence at Athienou, Cyprus,” *Cyprus-Crete*, 174–75; and G. Cadogan, “Patterns in the Distribution of Mycenaean Pottery in the Eastern Mediterranean,” *Acts of the International Archaeological Symposium “The Mycenaean in the Eastern Mediterranean,”* Nicosia 1973, 172–73.

⁴ Bamboula, 117–18. For the room with the jar see S. S. Weinberg, *Bamboula at Kourion: the Architecture*, Philadelphia 1983, 34–35 and fig. 17.

⁵ J. L. Benson, “Coarse Ware Stirrup Jars of the Aegean,” *Berytus* 14, 1961–63, 46–47. This date is accepted by Raison on stylistic grounds, *VIP* 34, n. 125.

b. Problems of determining provenience:

Benson classifies B1129 among twenty-five coarse-ware stirrup jars from Bamboula which he identifies as Mycenaean.⁶ However, the identification of this class of stirrup jars as Mycenaean is far from certain. The jar itself has been published before as both Minoan and Mycenaean.⁷ Benson stressed in regard to the whole class of coarse 'oatmeal ware' stirrup jars that "it is not possible to look for one impugnable 'center' from which all vases of this type must have emanated."⁸ Indeed, Hankey in a more recent survey suggests the possibility of participation by both Minoans and Mycenaeans in the manufacture and trade of this pottery.⁹ Stubbings does not even rule out local, that is non-Mycenaean and non-Minoan, imitations.¹⁰

When one considers the more narrowly defined stylistic class to which B1129 belongs, the question of provenience becomes even more complicated. Raison catalogued examples of such 'sinusoide' stirrup jars from Prosymna, Mycenae (House of the Oil Merchant [HOM]), Cyprus (Enkomi, Bamboula), Syria (Minet-el-Beida), Egypt (Sedment), and Crete (Gortyn, Chania, Rhethymnon, Mallia and Knossos).¹¹ Haskell has examined the specific group from the HOM within which B1129 finds a nearly exact parallel.¹² The latest OES analysis, of two jars from this HOM group and of a parallel from the Unexplored Mansion at Knossos, favors local manufacture for the pottery.¹³ This would suggest

⁶ Benson (*supra* n. 5) 40–47; Bamboula 117–18.

⁷ Minoan: Proleg. 267–68, 277–78, figs. 11 and 16 no. 82; H. W. Catling and V. Karageorghis, "Minoika in Cyprus," *BSA* 55, 1960, 119 no. 26. Mycenaean: J. L. Benson and O. Masson, "Cypro-Minoan Inscriptions from Bamboula, Kourion," *AJA* 64, 1960, 148–49.

⁸ Benson (*supra* n. 5) 41 where B1130, also from Area D, cellar, is classified as Cretan on the basis of ornamentation.

⁹ Hankey (*supra* n. 3) 154.

¹⁰ F. H. Stubbings, *Mycenaean Pottery from the Levant*, Cambridge 1951, 52. The same point is stressed by S. Casson, *Ancient Cyprus*, London 1937, 48–53, about which Benson, *Bamboula*, 109, remarks, "Such considerations lend great probability to the observation of Casson that vases indistinguishable in clay and paint from mainland Mycenaean wares could have been produced in Cyprus."

¹¹ *VIP* 33–37.

¹² H. W. Haskell, "Coarse-Ware Stirrup Jars at Mycenae," *BSA* 76, 1981, 225–37. The parallel in terms of decoration (degenerate octopus motif; three bands above, two below; lines on handle and disc and setting off false spout) and shape (especially deep depression in top of disc over false spout) is Haskell Group 4 no. 5362b (50–508). See *VIP* plate XVI. 41.

¹³ Catling et al. (*supra* n. 1) 79, table 11, nos. 73, 104, 106.

that coarse-ware jars, which by shape and decoration are typically Cretan,¹⁴ were being imitated elsewhere after exportation. Haskell rightly questions whether one should expect such careful imitation of coarse-wares which were valued not for aesthetic reasons but for their contents.¹⁵ It is safest to conclude that no general assumption can be made about the provenience of any single jar of this kind. However, because of the inscription on B1129, it is crucial to know its probable place of manufacture.

c. Petrographic analysis:

A characteristic of stirrup jars which has received scant attention is the mineralogical composition of their clay fabrics. This feature is best investigated by petrographic thin section. Petrography, which has been applied for many years in both geological and ceramic studies, offers a measurable and objective system for characterizing clay fabrics, and possibly for identifying provenience.¹⁶

A sample of B1129 was examined in the Petrographic Laboratory, Temple University, and the ensuing report was as follows:

The surface color is very pale brown (Munsell color 10 YR 7–8/4), while the interior is darker. Thin sections show a matrix containing several inclusions, chiefly fragments in the schist-phyllite series.

The matrix is composed of particles in the under-20 micrometer size range with color and texture differences indicating the presence of several phases. As a whole, the matrix has a foliated appearance. Its colors are mostly in the yellow to orange range.

The largest and most numerous inclusions are fragments of a metamorphic rock in the phyllite end of the schist-phyllite series. Most fragments are elongate, and many have angular shapes. They are up to a millimeter or larger in size. The rock is composed chiefly of a chlorite, but it contains several additional minerals: quartz, actinolite, plagioclase, a potassium feldspar, epidote, and an unidentified carbonate mineral. The schist-phyllite is lepidoblastic to nematoblastic in texture, which is typical of chlorite-amphibole schists.¹⁷ The chlorite is greenish and has pale yellow/yellow green pleochroism and normal first order white to yellow interference colors. It is in selvages and sheafs and is sometimes kink-banded from metamorphism.

¹⁴ For the Cretan characteristics of this group see Popham, *The Last Days of the Palace at Knossos*, Lund 1964, fig. 3 and pls. 3–4; Kanta (*supra* n. 1) 294–96.

¹⁵ Haskell (*supra* n. 12) 236.

¹⁶ On this method see H. Williams, F. J. Turner, and G. M. Gilbert, *Petrography. An Introduction to the Study of Rocks in Thin Sections*, San Francisco 1954, and D. P. S. Peacock, "The Scientific Analysis of Ancient Ceramics: A Review," *World Archaeology* 1, 1970, 375–89.

¹⁷ Williams et al. (*supra* n. 16) 169–70.

The other minerals in the phyllite are not as abundant as the chlorite. Both green and orange oxidized actinolite are present; they often fill the interstices between other grains. Quartz grains show extensive pressure solution sutures. The epidote is a low iron epidote. Deformation twinning is visible in the plagioclase, and it exhibits growth twins as well. The carbonate mineral, which could not be identified, is granoblastic. An iron oxide/hydroxide phase is also included within the chlorite phyllite. Its colors, which are zonal, suggest goethite/lepidocrite.

Other inclusions are present in smaller quantities. Cryptocrystalline quartz grains are found as separate particles. Basalt fragments are also not a part of the chlorite phyllite. The basalt shows skeletal plagioclase crystals. These particles are not as elongated as the schist-phyllite, and they are less angular.

This assemblage is compatible with a low grade phyllite source rock with some development of transposition schistosity. The angular shapes of the fragments are not natural, indicating that the rock was crushed and deliberately added to the clay as a temper.

The use of phyllite as a temper suggests central or western Crete as the source of the vessel. Phyllite is used as a temper in samples found at Knossos, and it was commonly added to coarse wares in the region of Khania and elsewhere in the western part of the island.¹⁸ It has also been recognized in Cretan stirrup jars found at Mycenae.¹⁹

The clay sample examined here displays many individual characteristics. This is usual for Crete, and other studies of Minoan tempers have shown that Cretan fabrics are often localized and distinctive.²⁰ The complex character of this fabric suggests that a similar program with other members of this important class of jars could provide a useful method of grouping into classes, with great potential for provenience and related studies.

Having established the probable west to central Cretan provenience of B1129, let us now consider the inscription.

¹⁸ For Knossos see J. A. Riley, D. P. S. Peacock, and A. C. Renfrew, "The Petrological Characterization of Late Bronze Age Ceramics from Knossos and Mycenae," *Actes du XX Symposium International d'Archéométrie III, Revue d'Archéométrie, sup.* (1981) 247. P. Betancourt thanks Iannis Tzedakis and Jennifer Moody for the opportunity to examine fabrics from western Crete.

¹⁹ J. A. Riley, "Petrological Examination of Coarse-ware Stirrup-jars from Mycenae," *BSA* 76, 1981, 335–340.

²⁰ D. F. Williams, "A Petrological Examination of Pottery from Thera," *Thera and the Aegean World I*, London 1978, 507–14; G. Myer in P. P. Betancourt et al., *Vasilike Ware, Göteborg* 1979, 6 and Table I; W. Noll, *Mineralogie und Technik der Keramiken Altkretas, Neues Jahrbuch für Mineralogie. Abhandlungen* 143, 1982, 150–99; J. A. Riley et al. (*supra* n. 18) 247.

2. The Inscription (Pl. I)

Since B1129 is most probably an import from Crete, it is important to identify the writing system, if any, to which the inscribed sign relates. Fortunately the sign is distinctive enough to make its identification as Cypro-Minoan virtually certain (see below). We have then a vessel manufactured in Crete, discovered in Cyprus, bearing a Cypro-Minoan inscription. Any interpretation of the purpose of the inscription must depend on knowing when and how the inscription was actually made. This, however, is no easy matter. It is notoriously difficult to determine whether an inscription was made before firing while the fabric was still leather hard (and therefore at the site of manufacture), or after firing (in this case, given the identification of the inscription as Cypro-Minoan, most likely in Cyprus, whether at Bamboula or somewhere else along the trade network from Crete).²¹ The significance of the mark varies correspondingly. Made before firing, the sign would serve as a bona fide potter's mark or trademark. In the case of B1129, this would require in Crete a potter with a knowledge of Cypro-Minoan, or at least familiar with the limited number of Cypro-Minoan signs used in Cypriote trade. Made after firing, the sign could have served any of a number of conjectured purposes: filing, distribution or destination, merchant, ownership, contents.²² On this question we shall take account of three considerations: (a) identification of the sign; (b) technique of inscription; (c) general pattern of pottery inscriptions in LC II–III, particularly at Bamboula and, in the context of B1129, Area D, cellar.

a. Identification:

The Cypro-Minoan identity of the sign is made certain by comparanda. Here the distinctive feature is the dot, normally impressed, above the horizontal cross-stroke. The same character appears in isolation on Cypriote wares from Bamboula.²³ More important, however, is the appearance of this distinctive sign in actual sign-sequences both in

²¹ VIP 213 n. 4: "Le détail . . . n'est pas toujours facile à préciser, tant pour les caractères peints que pour les caractères incisés." Proleg. 275 n. 5: "It is sometimes difficult to distinguish between incisions made while leather hard and those made after firing." Stubbings (supra n. 10) 45.

²² The various possible reasons for these marks found predominantly on Cypriote, but also on foreign wares are discussed in Åström, Excavations (supra n. 1) 189–92.

²³ Proleg. 274–75, nos. 34–37, fig. 14. J. L. Benson and O. Masson (supra n. 7) nos. B393, B792, B799, B886, pls. 35–37.

formal scribal contexts on tablets from Ras Shamra and on pottery.²⁴ The feature of the isolated dot also occurs on the clay balls inscribed in Cypro-Minoan from Enkomi and Hala Sultan Tekke.²⁵

b. Technique of inscription:

The sign (Pl. I), composed of four linear elements and a dot, was inscribed at the maximum point of arc and in the middle of the width of the handle. The extreme left portion of the sign and the bottom of the central staff cut cleanly into the painted decoration. This in itself indicates that the sign was incised after the decoration was applied, that is when the clay surface had hardened sufficiently to receive the decorative slip. Moreover, the linear strokes and the dot lack the characteristics observable when made by a stylus into moist clay, namely curvature, puncture, extruding ridges at the sides of strokes (particularly where strokes cross), a uniform depth of incision, and often a pushing of clay at the start or finish of a bold stroke.²⁶

On B 1129 the sign appears to have been incised with a blade or hard straight-edged cutting tool. The vertical strokes show traces at their bottoms of several passes of such an instrument, and the depth of the vertical strokes varies with the contour of the handle. The horizontal was incised much shallower, but again completely straight, as with a blade. Most diagnostic is the dot. It is not impressed into moist clay or even drilled into leather-hard or fired clay, but rather it has been irregularly picked into the hardened clay surface as if by the point of a blade.

²⁴ For example, tablet RS 17.06 and silver cup RS 389 in E. Masson, *Cyprominoica: Répertoires. Documents de Ras Shamra. Essais d'interprétation*, Göteborg 1974, 19–20, 25–29, figs. 5, 12, 14. Also on a plain white jug from Katydhata, Aström, *Op. Ath.* (supra n. 1) 156–59, and O. Masson, “*Répertoires des inscriptions chyprominoennes*,” *Minos* 5, 1957, fig. 2, where the signs are definitely incised while the clay was still moist.

²⁵ E. Masson, *Étude de vingt-six boules d'argile inscrites trouvées à Enkomi et Hala Sultan Tekke (Chypre)*, Göteborg 1971, fig. 27, no. 36. There are no examples of the sign with this distinctive dot in Linear B. In Linear A sign 52 is found occasionally with an isolated abbreviated stroke, a form which is perhaps the prototype of our Cypro-Minoan sign, e. g., ARKH 4a.2 in J.-P. Olivier, L. Godart, *Recueil des inscriptions en linéaire A*, 3, Paris 1976, 12–13. On KN Zb 5 sign 52 is made on a clay vase with an impressed dot.

²⁶ These characteristics are discernible in pottery inscriptions made into moist clay: Benson and Masson (supra n. 23) B759, B802, B803, B962, B980, B981, pls. 36–38; and O. Masson (supra n. 24) fig. 2.

Can we then decide by physical observation whether the inscription was made before or after firing? Daniel provides some criteria: "Inscriptions made after firing often have many successive strokes of the knife within the incision. Inscriptions cut while leather hard are cleaner, and the surface coloration of the vase often continues into the incision."²⁷ The sign on B 1129 lacks the definitive features of inscription after firing and possesses those of inscription while leather-hard.

c. Pattern of inscribed pottery:

Inscriptions on pottery in the LC period at Bamboula and elsewhere in Cyprus follow a consistent pattern. The overwhelming majority of inscriptions are found on native Cypriote wares, mostly on jug handles and pithos rims of plain white ware, and are generally made after firing.²⁸ This would seem to indicate a practical significance for the inscriptions within the sphere of Cyprus itself, with the imported wares consequently receiving requisite marks upon their arrival.²⁹ However, if B 1129 were inscribed while leather-hard – and perhaps a close re-examination of all inscribed imports is called for – we might re-evaluate these assumptions. What would preclude the marking of west Cretan stirrup jars, bound for Cypriote markets, on the spot in Crete? Such marks need not designate destination, but could specify individual traders or the types or grades of oil contained or to be contained in particular jars, etc. A pot marked Cypro-Minoan while leather-hard would indicate that the potter or someone at hand knew that a particular lot of vessels was meant for a Cypriote merchant or market. The same principle applies to the stirrup jars with painted Linear B inscriptions. These were circulated, so far as the finds indicate, exclusively in Greek-speaking markets.

The sign on B 1129 is also found at Bamboula on four Cypriote plain- and wash-ware jug handles (LC IIB – III) from two other areas of the settlement (Areas C and A).³⁰ This distribution seems to rule out marks of personal ownership; and since all pieces are handle fragments, we have no clue as to the contents and use of the jugs. If this sign were

²⁷ Proleg. 273 n. 56. For clear examples of the after-firing characteristics, see J. Chadwick, "The Mycenaean Tablets III," TAPS 52, 1962, 73, nos. 1–4.

²⁸ Benson and Masson (*supra* n. 7) 148–49; Åström, Excavations (*supra* n. 1) 190–91.

²⁹ The examples of Myc.-Min. stirrup jars from the Levant with Cypro-Minoan inscriptions would seem to support this point. Hankey (*supra* n. 3) 149–51, 154, nos. 10, 12, 13. Dothan (*supra* n. 3) 174–75.

³⁰ Proleg. nos. 34–37 (B393, B799, B792, B886). Three incised after baking, one (B792) while leather hard.

the mark of a local potter, one would have to explain its appearance on the Minoan import.

The inscribed pottery from Area D, cellar, shows a marked variety: eight local pieces, five Myc.-Min. imports. No two of the local wares (plain-ware jugs and pithoi and one painted-ware bowl) have the same inscription.³¹ Two were inscribed while leather-hard. The five imported pieces (three fine-ware handles and two stirrup jars) each have yet different signs on their handles, all considered by Daniel to have been inscribed after firing.³² Such diversity might be easiest to explain as marks of personal ownership, especially given the relative rarity of Myc.-Min. wares at Bamboula.³³

3. Conclusion

We hope through our detailed treatment of B1129 to have called attention to several key problems regarding stirrup jar manufacture and trade in the late Bronze Age. Scientific methods to determine the provenience of these jars should be applied on a far more extensive scale, especially where inscribed finds from outside Crete and the mainland are concerned. Our petrographic analysis indicates that a particular style of jar with widely distributed parallels should probably be considered Minoan, not Mycenaean.

Second, the whole group of inscribed stirrup jars, including the Cypro-Minoan examples, needs re-examination in order to establish the repertory of inscribed marks and to discover, if possible, the stage in the manufacture and distribution of the pottery when the marks were placed upon the pots. The inscribed mark on B1129 may indicate Cypriote presence in western Crete, or at least an awareness of trade with Cyprus during the initial stages of the production and distribution of these jars and their contents. We have mentioned already that a similar awareness of the intended market is suggested for the stirrup jars inscribed in Linear B, which were eventually circulated exclusively in markets capable of understanding the inscriptions. A first step toward understanding the trade of these vessels in the region of Cyprus and the Levant would be the preparation of a complete analytical corpus of all Cypro-Minoan inscribed pottery.

³¹ Proleg. nos. 1, 2, 8, 9, 24, 40, 58, 62 (B804, B960, B279, B438, B806, B959, B961, B770).

³² Proleg. nos. 72, 73, 75, 81, 82 (B1113, B1114, B1115, B1140, B1129).

³³ The percentage of Mycenaean pottery at Bamboula ($\pm 1\%$ of all pottery) suggests that it was probably an imported luxury ware and might consequently be marked by owners as special possessions. Bamboula 107.



Pl. I. Stirrup jar from Bamboula, and inscription