

A TALE OF TWO CITIES:¹ FIRST RESULTS OF A COMPARISON BETWEEN AVARIS AND MEMPHIS

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As part of the synchronisation project SCIEM 2000 this venture attempts to tie the stratigraphies of the Delta site of Tell el-Dab^a, also known as Avaris, and the site of Kom Rabi^a lying on the soil of the old Egyptian capital Memphis. These two sites are situated about 130 km apart from each other.²

Although this distance is not great in terms of kilometres it turned out to be more difficult to compare the material of those two sites than first anticipated, because of different developments over time of even the most common so-called type fossils, especially the hemispherical cups³ and the beer/wine jars,⁴

¹ I am very grateful to Charles Dickens and Irene Kaplan for suggesting this title. Further thanks are due to D. Aston and J. Bourriau for reading versions of this text and giving valuable suggestions.

² Cf. J. BAINES, J. MALEK, *Atlas of Ancient Egypt*, Oxford 1980, 41, fig. on left hand side.

³ The parallels given here are only covering the period of the late Middle Kingdom and Second Intermediate Period. For earlier examples see DO. ARNOLD, The Pottery, in: DI. ARNOLD, *The Pyramid of Senwosret I, The South Cemeteries of Lisht*, vol. 1., New York, 1988, 140. Tell el-Dab^a: M. BIETAK, *Tell el-Dab^a V*, passim. Tell Ibrahim Awad: VAN DEN BRINK, Preliminary Report on the Excavations at Tell Ibrahim Awad, Seasons 1988–1990, in: E. VAN DEN BRINK (ed.), *The Nile Delta in Transition 4th–3rd Millennium B.C.*, Tel Aviv 1992, fig. 2.4. Serabit el-Khadim: J. BOURRIAU, Observations on the Pottery from Serabit el-Khadim (Zone Sud), *CRIPPEL* 18 (1996), fig. 4.1. Dahshur: DO. ARNOLD, Keramikbearbeitung in Dahshur 1976–1981, *MDAIK* 38, passim. Lisht: DO. ARNOLD, *The Pottery*, 128, fig. 65. Qasr el-Sagha: DI. and DO. ARNOLD, *Der Tempel von Qasr el-Sagha*, fig. 22.5–7. Lahun/Kahun: G. BRUNTON, *Lahun I*, London 1920, pl. XIX.46–48. W.M.F. PETRIE, *Kahun, Gurob and Hawara*, London 1890, pl. XII.2. Hawara: W.M.F. PETRIE, *The Labyrinth, Gerzeh and Mazghuneh*, London 1912, pl. XXX, top left, pl. XXXIII.9–11. Harageh, Riqqeh: R. ENGELBACH, B. GUNN, *Harageh*, London 1923, pl. XXXIV.7J2, K, M, N2, O. Gurob: G. BRUNTON, R. ENGELBACH, *Gurob*, London 1927, pl. XI.2.3.5. Rifeh: W.M.F. PETRIE, *Gizeh and Rifeh*, London 1907, pl. XIIIc.102, 104, 117, 118, 124, 126; XIIIId. 182, 184; XXV.27–40; XXVI.74–80. Beni Hassan: J. GARSTANG, *The Burial Customs of Ancient Egypt*, London 1907, pl. XV.57. Qau: G. BRUNTON, *Qau and Badari III*, London 1930, pl. XIII. 13L, 14F, 15J, F, H, L, 18F, K, M. Mostagedda: G. BRUNTON, *Mostagedda*, London 1937, pl. LXXIII. 18G. Abydos: J. WEGNER, V. SMITH, S. ROSSELL, The Organization of The Temple *Nfr-K3* of Senwosret III. in Abydos, *Ä&L* 10 (2000), fig. 8.1–2; fig. 16.1–3. Hu: W.M.F. PETRIE, *Diospolis Parva, The Cemeteries of Abadiyeh and Hu*, London 1901, pl. XXXV.122, 123. Denderah: R.A. SLATER, *The Archaeology of Denderah in the First Intermediate Period*, Univ. of Pennsylvania 1974, fig. 22.5–7. Thebes: W.M.F. PETRIE, *Qurneh*, London 1909, pl. XIII. 8, 9, 11. Do.

ARNOLD, Weiteres zur Keramik von el-Tarif, *MDAIK* 28 (1972), fig. 2.4. A. SEILER, Ein Keramikensemble aus dem Mittleren Reich, in: Bericht über die 6., 7. und 8. Grabungskampagne in der Nekropole von Dra^c Abu el Naga/Theben West, *MDAIK* 33 (1999), fig. 15.a, b. Armant: R. MOND, O.H. MYERS, *The Cemeteries of Armant I*, London 1937, pl. XXXII 8G, G1, K, L, L1, M, M1. Esna: D. DOWNES, *Excavations at Esna, 1905–1906*, Warminster 1974, 31, type 24A. El-Kab: J. QUIBELL, *El Kab*, London 1898, pl. XV.18. Kubaniyeh: H. JUNKER, *Bericht über die Grabungen der Akad. d. Wiss. in Wien auf den Friedhöfen von El-Kubanieh-Süd*, Wien 1919, 179, fig. 80, top. Elephantine: C. v. PILGRIM, *Elephantine XVIII*, fig. 143.a, e, f, 145.c, 146.h, 147.f, g, 148.k, n, 150.j–l, 152.d–f, l, m, 153.a, b, 159.f–j. Nubia: J. VERCOUTTER, et al., *Mirgissa I.*, Paris 1970, z.B., 218, fig. 26.b. D. DUNHAM, *Second Cataract Forts II, Uronarti, Shalfak and Mirgissa*, Cambridge, Mass. 1967, 179, nrs. 28/1/29, 32/1/18, 32/1/107. W. EMERY, H.S. SMITH, A. MILLARD, *The Fortress of Buhen. The Archaeological Report, EES* London 1979, pl. 64.69. G. STEINDORFF, *Aniba II*, Glückstadt, Hamburg, New York 1937, pl. 69, right. S. TYSON SMITH, *Askut in Nubia*, London, New York 1995, fig. 3.7.A. Oases: F. COLIN, D. LAISNEY, S. MARCHAND, Qaret el-Toub: Un fort romain et une nécropole pharaonique, *BIFAO* 100 (2000), 184, Nr.1. S. MARCHAND, *La céramique datée de la fin de la XIII^e Dynastie (Deuxième Période Intermédiaire) découverte en contexte artisanal à Ayn Asil*, fig. 1.a–c, in Press. P. BALLEST, La céramique du Kom I, *BIFAO* 90 (1990), 21, nr.6; 27, Nrs. 20–22, 24, 25.

⁴ Hawara: W.M.F. PETRIE, *The Labyrinth*, pl. XXXV. 100–103. Harageh, Riqqeh: R. ENGELBACH, B. GUNN, *Harageh*, pl. XXXVII. 41B, C, D, D, F2, G2, H, I, J, K, L, M, O, P, V, X. Rifeh: W.M.F. PETRIE, *Gizeh and Rifeh*, pl. XIIIId.177. Beni Hassan: J. GARSTANG, *Burial Customs*, pl. XIV.45. Abydos: J. WEGNER, V. SMITH, S. ROSSELL, *Ä&L* 10, fig. 9.28, 9.31, 17.38, 17.39. Hu: W.M.F. PETRIE, *Diospolis Parva*, pl. XXXIII.22. J. BOURRIAU, *Umm el-Ga^cab*, 70, cat.nr. 133. Thebes: W.M.F. PETRIE, *Qurneh*, pl. XIII.25–28. A. Seiler, Nub-Cheper-Re, Abb. 16, 19, 21–25. Asasif: DO. ARNOLD, *MDAIK* 28, fig. 4.9. Esna: D. DOWNES, *Excavations at Esna*, 40, type 89, 89A; 41, type 89B. El-Kab: J. QUIBELL, *El Kab*, pl. XVI.60. Kubaniyeh: H. JUNKER, *Kubanieh-Süd*, 178, fig. 78. Elephantine: C. v. PILGRIM, *Elephantine XVIII*, fig. 150.g. Nubia: S. TYSON

which are known from all over Egypt, Nubia and even the Oases.

The core of the comparison of these two sites are their settlement layers. At Tell el-Dab^a they were unearthed by the Austrian Archaeological Institute under the direction of Manfred Bietak.⁵ The site of Kom Rabi^a was excavated by David Jeffreys and Lisa Giddy on behalf of the Egypt Exploration Society in the years 1984 to 1990.⁶

The levels or phases, respectively, which are part of this study are Phases G/4 to D/2 at Tell el-Dab^a⁷ and Levels VIII to V at Memphis. The stratigraphy of the excavation of Memphis/RAT was worked out by Lisa Giddy and the final excavation report is currently in the process of being finished.⁸

It should briefly be mentioned that Level VIII was only excavated in a few contexts as the water table was reached and made further excavation impossible. Level VII was divided into Level VII East and VII West by the nature of the site and Level VI is subdivided into 5 major units Level VIa to VIe.⁹ Level V is a layer of sand and so far it is not entirely clear how it came into existence. It is thought by Janine Bourriau to mark the introduction of a New Kingdom pottery style and historical-

ly to correspond to the final phase of the Second Intermediate Period.¹⁰

I would like to present here the first result of the comparison of two type fossils of ceramic vessels, which are considered to be the backbone of fine dating in the field of ceramic studies in the Egyptian Middle Kingdom and Second Intermediate Period. These are the round-based hemispherical cups made of Nile B1 and B2 clays¹¹ and the large Nile C beer/wine bottles, or to be more precise the rims of such vessels.¹² The clay materials are classified according to the Vienna System.¹³

It should be mentioned, that the work on both sites, was undertaken with the help of a random sampling strategy developed by Nick Fieller, Head of the Department of Probability and Statistics, University of Sheffield, U.K., and Janine Bourriau, Research Fellow of the MacDonald Institute of Archaeological Research, University of Cambridge, U.K., in order to provide a firm methodological basis for applying statistical analyses.¹⁴ Thus we will be able to obtain a precise answer to questions like "which quantity of type x, y, z or fabric a, b, c does occur in level 1 in contrast to level 2." This random sampling system will not be discussed in this paper,¹⁵ because in the treat-

SMITH, *Askut*, fig. 3.6.C, 3.7.F. Oases: a fragment resembling beer bottle type 5: F. COLIN, D. LAISNEY, S. MARC-HAND, *BIFAO* 100 (2000), 184, nr. 6.

⁵ I would like to thank Manfred Bietak and Irmgard Hein, who placed unpublished ceramic material at my disposal. For a comprehensive overview of the site see M. BIETAK, *Avaris – The Capital of the Hyksos*, BM Press, London 1996. On areas A/IV and A/V see I. HEIN, *Two Excavation Areas from Tell el-Dab^a*, *Atti di Sesto Congresso Internazionale di Egittologia*, Turin 1992, Vol. 1, 249–253.

⁶ For the use of unpublished material thanks are due to J. Bourriau, L. Giddy, D.G. Jeffreys and above all the Egypt Exploration Society, London. For preliminary reports see H. S. SMITH, D.G. JEFFREYS, J. MALEK, *The Survey of Memphis*, 1981, *JEA* 69 (1983), 30–42. L.L. GIDDY, D.G. JEFFREYS, *Memphis 1990*, *JEA* 77 (1991), 1–6. L.L. GIDDY, D.G. JEFFREYS, *Memphis 1992*, *JEA* 78 (1992), 11–14. D.G. JEFFREYS, L.L. GIDDY, *Memphis 1988*, *JEA* 75 (1989), 1–12. D.G. JEFFREYS, L.L. GIDDY, *Looking for Memphis*, *Egyptian Archaeology* 1 (1993), 5–8. D.G. JEFFREYS, J. MALEK, *Memphis 1986, 1987*, *JEA* 74 (1988), 15–25. D.G. JEFFREYS, J. MALEK, H.S. SMITH, *Memphis 1985*, *JEA* 73 (1987), 11–20.

⁷ Most current stratigraphic chart in M. BIETAK, J. DORNER, P. JÁNOSI, *Ausgrabungen in dem Palastbezirk von Avaris. Vorbericht Tell el-Dab^a/Ezbet Helmi 1993–2000*, *Ä&L* 11 (2001), fig. 2.

⁸ L.L. GIDDY, *Kom Rabi^a: The Late Middle Kingdom Phases (Levels VI–VIII)*, in preparation.

⁹ J. Bourriau, personal communication.

¹⁰ J. BOURRIAU, *Beyond Avaris: The Second Intermediate Period in Egypt Outside the Delta*, in: E. OREN (ed.), *The Hyksos, New Historical and Archaeological Perspectives*, University Museum Monograph 96, Philadelphia 1997, 159–182. J. BOURRIAU, K.O. ERIKSSON, *A Late Minoan Sherd from an Early 18th Dynasty Context at Kom Rabi^a, Memphis*, in: J. PHILLIPS (ed.), *Ancient Egypt, The Aegean and the Near East: Studies in Honour of Martha Rhoads Bell*, San Antonio, 1998, 95–120.

¹¹ DO. ARNOLD, *Keramikbearbeitung in Dahschur 1976–1981*, *MDAIK* 38 (1982), 60–65. M. BIETAK, *Problems of Middle Bronze Age Chronology: New Evidence from Egypt*, *AJA* 88 (1984), 480–482. DO. ARNOLD, *The Pottery*, 140–141.

¹² Z. E. SZAFRANSKI, *Seriation and Aperture Index 2 of the Beer Bottles from Tell el-Dab^a*, *Ä&L* 7 (1998), 95–119.

¹³ H.Å. NORDSTRÖM, J. BOURRIAU, *Ceramic Technology: Clays and Fabrics*, in: ARNOLD, DO. BOURRIAU, J. (eds.), *An Introduction to Ancient Egyptian Pottery*, SDAIK 17, Mainz 1993, Fascicle 2, 168–182.

¹⁴ J. BOURRIAU, *The Memphis Pottery Project*, *CAJ* 1/2 (1991), 263–268.

¹⁵ A description and overview of random sampling strategies as well as a larger study on the procedures with actual sherd collections from Tell el-Dab^a will be provided by the author in the course of her Ph.D work. In general see C. ORTON, *Sampling in Archaeology*, Cambridge Manuals in Archaeology, Cambridge 2000. S. SHENNAN, *Quantifying Archaeology*², University of Iowa Press, Iowa City 1997.

ment of the two vessel categories undertaken here all available information had to be used, both that from the random and that from the purposive sample, in order to get the fullest picture possible.

1. HEMISPHERICAL CUPS

a) Vessel index

At the beginning of this treatise stands the very well known hemispherical cup seriation from Tell el-Dab'a,¹⁶ which very nicely shows, that the form of the cups changes in the Delta from wide and shallow to closed and deep (Fig. 1). This development has been made obvious with the aid of the vessel index, that is achieved by the division of the maximum width through the height of the vessel.¹⁷ As time passes with the strata the vessel index gradually becomes smaller.

Most of the complete Nile B1 hemispherical cups

from the excavations at Kom Rabi'a/Memphis were found in Level VII East. The vessel indices of these some 11 cups range between about 120 and 150, the average of this Level being 138, 9 (Fig. 2).¹⁸ A cross check with the Tell el-Dab'a chart (fig. 1) the closest numbers with most examples are to be found in Phase G/3-1. For the remaining 5 complete examples from Memphis it is hard to say anything definite (Fig. 2). The average of the vessel indices from Level VIe still resembles that of Phase G/3-1 very much. Thus, this vessel type seems to provide evidence for at least one sound synchronism in the time period considered here.¹⁹

A different character altogether is expressed by the complete examples of Nile B2 hemispherical cups from the excavation of RAT in Memphis. Before Level VI d no complete Nile B2 cup exists. The sherd material (i.e. the random sample) has shown though, that Nile B2 cups occur from Level VIII onwards,

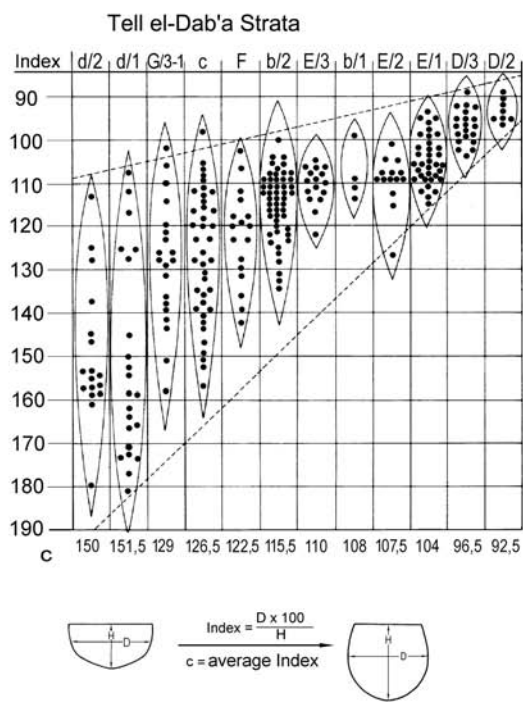


Fig. 1 Seriation of hemispherical cups in Nile B1 and B2 from Tell el-Dab'a, (after M. BIETAK, *AJA* 88, fig. 2)

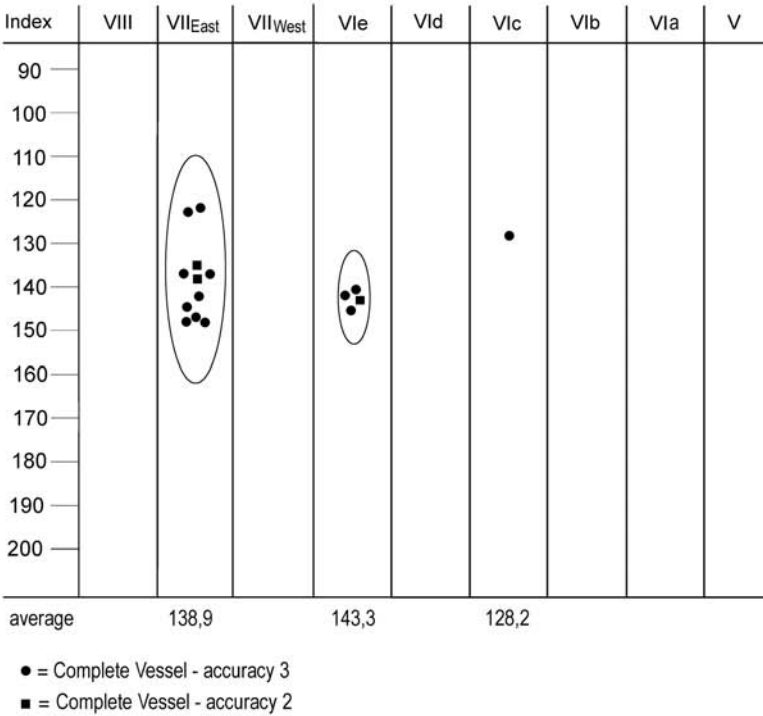


Fig. 2 Vessel indices of hemispherical cups made from Nile B1 from Kom Rabi'a/Memphis

¹⁶ M. BIETAK, Problems of Middle Bronze Age Chronology: New Evidence from Egypt, *AJA* 88 (1984), 480-482.

¹⁷ DO. ARNOLD, Keramikbearbeitung in Dahschur 1976-1981, *MDAIK* 38 (1982), 60-65. EADEM, *The Pottery*, 135-136.

¹⁸ Note that „accuracy 3“ means that a vessel/sherd was actually drawn, while „accuracy 2“ means that a vessel/sherd in

the same state of preservation was typed to an existing and identical drawing.

¹⁹ Further research by the author by means of the random sample has shown, however, that cups from Nile B1 cease to exist at Tell el-Dab'a from Phase E/1 onwards, while they continue happily at Memphis until Level V.

but only in small quantities. From Level VIe they become more frequent. The vessel index of the earliest three complete cups of Levels VIc and VIb lies between 125 and 140 (Fig. 3). In comparison with the Tell el-Dab^a chart: this is possible in almost all of the older phases from Phase H to E/3 and therefore not of much help in finding connecting points (cf. Fig. 1).

In the following Level VIb the difference in the development of the hemispherical cups from Kom Rabi^a/Memphis becomes apparent, because the vessel index increases instead of diminishing as at Tell el-Dab^a (cf. Fig. 1). Eight complete Nile B2 cups were found within Level VIb, whose vessel indices range from about 140 to 180, the average being 159,6 (fig. 3). This figure disagrees radically with any average figure known from the younger Phases of Tell el-Dab^a (ca. 110 (E/3)–92,5 (D/2), cf. Fig. 1). The same holds true for Level VIa, from which four complete Nile B2 cups were recovered. Their vessel indices vary

from ca. 150–180, as well with an average of 166,3. Level V, however, also contained one complete cup with a vessel index of 166,7 (Fig. 3).

The depiction of the vessel indices of hemispherical cups of Nile B1 and B2 combined (in order to be exactly comparable with the Tell el-Dab^a chart, where there are both Nile B1 and B2 cups in one diagram) shows that the clusters move rather to the bottom right corner of the chart (Fig. 4) than to the upper right corner (cf. Fig. 1).

This fact seems to be connected with the advent of a new type of hemispherical cup made from Nile B2 at Kom Rabi^a, which in contrast to Tell el-Dab^a is not closed but a remake of the old open-shaped hemispherical cup. It can be distinguished by thick vessel walls and by its very thick and rather carelessly made base with plenty of excess clay,²⁰ that would have been removed in previous times (Fig. 5).²¹ But this does not mean that the other, more delicate type would disappear completely.

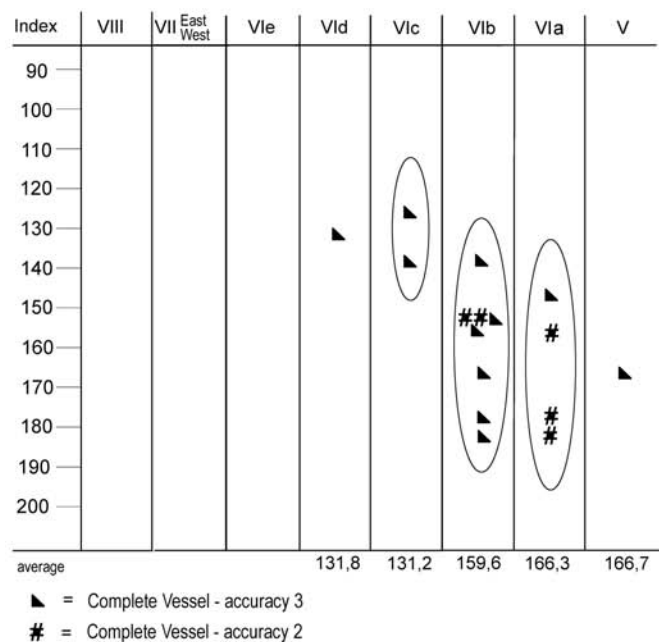


Fig. 3 Vessel indices of hemispherical cups from Nile B2 from Kom Rabi^a/Memphis

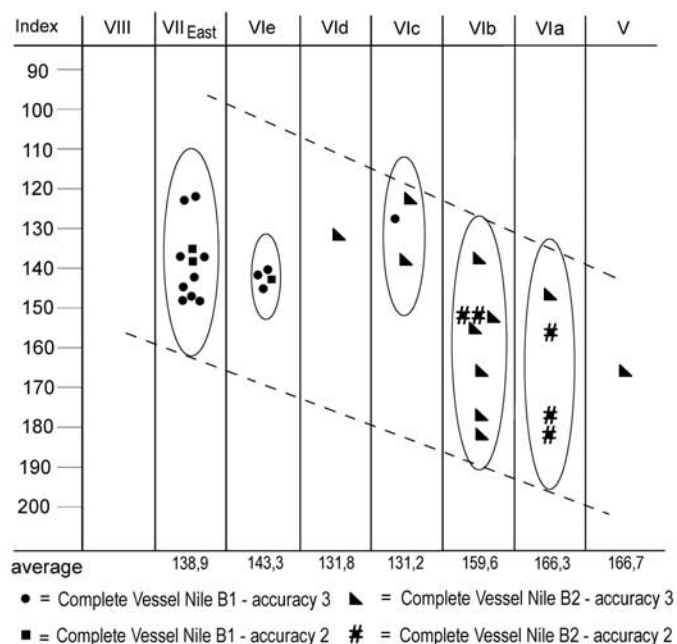


Fig. 4 Vessel indices of hemispherical cups made from Nile B1 and B2 combined from Kom Rabi^a/Memphis

²⁰ A similar cup type occurs in Elephantine, Bauschicht 11 with a vessel index of 157, 1. Cf. C. v. PILGRIM, *Elephantine XVIII*, Abb. 146.h.

²¹ For typical cups of Nile B2 with „thin“ base, see M. BIETAK, *Tell el-Dab^a V*, 55, Abb. 27.13, 14 – Phase F; 68, Abb. 35.28 – Phase F; 94, Abb. 52. 1, 2 – Phase E/3; 99, Abb.

56. 14–18, 20–21 – Phase E/3; 141, Abb. 98. 12–19 – Phase E/2; 185, Abb. 141.15 – Phase E/1; 195, Abb. 149.1 – Phase E/1; 211, Abb. 177.2 – Phase E/1; 217, Abb. 184.22–28 – Phase E/1; 247, Abb. 213.1–2 – Phase D/3; 249, Abb. 215.4–6 – Phase D/3; 265, Abb. 235.6, 10 – Phase D/3.

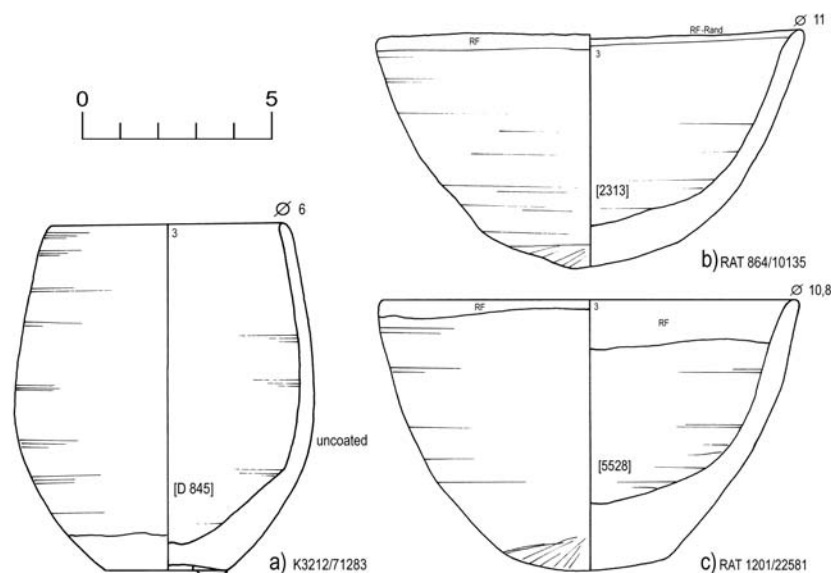


Fig. 5 New types of Nile B2 cups: a) with flat base at Tell el-Dab^a; b) and c) with round base at Kom Rabi^a. Scale 1:2

Another feature, so common at Tell el-Dab^a, are cups with flat bases, whereas at Kom Rabi^a the only known complete – and therefore securely identifiable – example of this type appears in Level VIb. The comparison of the relative date of the arrival of a new cup type at both sites, may provide another synchronism. At Tell el-Dab^a cups with flat bases first occur in Phase E/1,²² whereas at Memphis the new round based hemispherical cup type with high vessel index first appears in Level VIc. The quantity of both types increases in the next Phase or Level, respectively. Thus, Phase D/3 and Level VIb could be linked to one another. The fact, that the one and only complete flat-based cup made of Nile B2 also occurs in Level VIb at Memphis lends further corroboration to the argument.

b) Rim diameters of hemispherical cups

Closely connected with the general change of the shape of hemispherical cups as observed at Tell el-Dab^a from wide and shallow to closed and deep is the systematic decrease of the rim diameter.²³ Amongst the randomly selected sherd material at

Tell el-Dab^a this change was clearly represented in the average rim diameters from hemispherical cup sherds in both Nile B1 and Nile B2 (see Table 2).²⁴ At Memphis, on the other hand, the beginning of the sequence is approximately in accord with Tell el-Dab^a, but in the later Levels the average diameter of cups stays about the same, according to the shape development of hemispherical cups at Memphis (see Table 1). The comparison of the average rim diameters of the hemispherical cups also provides a few synchronisms, especially between the lowermost Levels of the two sites.

The average rim diameter of hemispherical cup rims, made of Nile B1, in the lowermost level at Memphis – Level VIII – is 11,7 cm and fits fairly well with that of Phase G/4 at Tell el-Dab^a, which is 11,5 cm. There is also a good correlation between the next two levels – VII East with 11,4 cm and Level VII West with 11,1 cm and Phase G/3–1 at Tell el-Dab^a with 11,0 cm. But analogous to the different developments of the cups' shape at the two sites as noticed in the complete cups (see above) in the next two levels the average rim diameters begin to diverge. While the

²² M. BIETAK, I. FORSTNER-MÜLLER, CH. MLINAR, The Beginning of the Hyksos Period at Tell el-Dab^a: A Subtle Change in Material Culture, in: P. FISCHER (ed.), *Contributions to the Archaeology and History of the Bronze and Iron Ages in the Eastern Mediterranean*, Festschrift für P. Aström, Sonderschriften des ÖAI 39, Wien 2001, fig. 3. For examples see M. BIETAK, *Tell el-Dab^a V*, 250, Abb. 217.5; 259, Abb. 226.2; 296, Abb. 276.2–4; 305, Abb. 282. 5–7

(Depot A), Abb. 282.5–7 (Depot B); 307, Abb. 283.3 (Depot D), Abb. 283.2 (Depot F). D. ASTON, *Tell el-Dab^a XII/2*, group 220, Cat.Nr. 838–844, pl. 212–213.

²³ As it becomes obvious in the explanatory drawing for the vessel index in Fig. 1.

²⁴ For all collected data see the Ph.D. dissertation of the author, chapter 6. Typologische Serien.

Kom Rabi'a/RAT (all available information)²⁵

RAT/Levels	VIII	VII (E)	VII(W)	VIe	VIId	VIc	VIb	728+851	VIa	V
Nile B1	11,7**	11,4	11,1	11,3	10,9	11,0	11,1	11,3**	11,3	11,1
Nile B2	11*	11,3	10,3	10,8	10,2	10,4	10,6	9,4	10,3	10,5**

*only 1 rim ZBRAT; ** less than 10 rims

Table 1 Average rim diameters of hemispherical cups made from Nile B1 and B2 from Memphis/RAT (BRAT + ZBRAT)

Tell el Dab'a (all information from randomly selected contexts)²⁶

TD/Phases	G/4	G/3–1	F	E/3	E/2	E/1	D/3	D/2
Nile B1	11,5 cm	11,0 cm	9,8 cm	9,5 cm	8,7 cm	–	–	–
Nile B2	11,4 cm	10,9 cm	9,8 cm	9,4 cm	8,5 cm	8,0 cm*	7,0 cm**	7,6 cm

*only 1 rim TDPUR; ** less than 10 rims

Table 2 Average rim diameters of hemispherical cups made from Nile B1 and B2 from Tell el-Dab'a (TDRAN + TDPUR)

cups show an average rim diameter of 11,3 cm in Level VIe at Kom Rabi'a/Memphis, it is in Phase F at Tell el-Dab'a 9,8 cm and therefore no longer similar. The difference becomes greater in the following Levels or Phases, respectively.

In the tables it also becomes clear that at Tell el-Dab'a hemispherical cups made from Nile B1 disappear after Phase E/2 while they continue at Kom Rabi'a.

The same development of diminishing average rim diameters can be observed in the group of Nile B2 hemispherical cups. While Level VIII is only represented by one single cup sherd with a rim diameter of 11,0 cm, that for this reason cannot build a firm basis for any conclusion, Level VII East and West show a more similar average rim diameter to Phase G/3–1 (10,9 cm in G/3–1 compared with 11,3 cm and 10,3 cm in Level VII East and West, respectively).

After this point the difference between the averages becomes greater the more time passes by.

c) Differences in the shape of hemispherical cups

The next feature of the cups to consider is their general shape. As there are not many cups with rim and base preserved I will concentrate in the following quantitative analysis on rim fragments of the cups regardless of the shape of the base.²⁷ This analysis is based on randomly selected sherds from both sites under consideration. The shape of the cups has been defined according to the following characteristics: open, straight-walled and closed (Fig. 6).

The random selection of sherds of both sites was used here in order to quantitatively show the development of the shape of the cups at Tell el-Dab'a as well as at Kom Rabi'a.²⁸ As measurement for the quantification the preserved sectors of the rims, that

²⁵ In the Kom Rabi'a/Memphis nomenclature the short cut BRAT stands for the randomly selected sherds from each context. The short cut ZBRAT represents those sherds, that were purposively selected, because they were interesting. For this table all information from both these sherd groups were collected.

²⁶ Analogous to Kom Rabi'a/Memphis I chose for the two groups of sherds from Tell el-Dab'a TDRAN for the randomly selected sherds from each context and TDPUR for the purposively selected sherds, that were chosen because of special interest in the type or similar reasons.

²⁷ This means that also rim fragments most probably belonging to the type of straight-based cups („S-Näpfe“) are included within this group.

²⁸ All contexts with pottery at Kom Rabi'a were analysed by using the random sampling procedure. These sherds are referred to as „all BRAT“. Out of those contexts were randomly chosen another set of contexts with their respective sherds. These are named „randomly selected sherds from randomly selected contexts“ = „BRAT, RS“. At Tell el-Dab'a the contexts used for this study are equivalent to the „randomly selected sherds from randomly selected contexts“. Please note, that in this paper I used all randomly selected sherds (all BRAT), not just the BRAT, RS as at Tell el-Dab'a. This decision was taken in order to provide a data set as large as possible in order to achieve a safe basis for our general assumptions. For procedure and theory see chapter 4. Methodologie of a PhD prepared by the author.

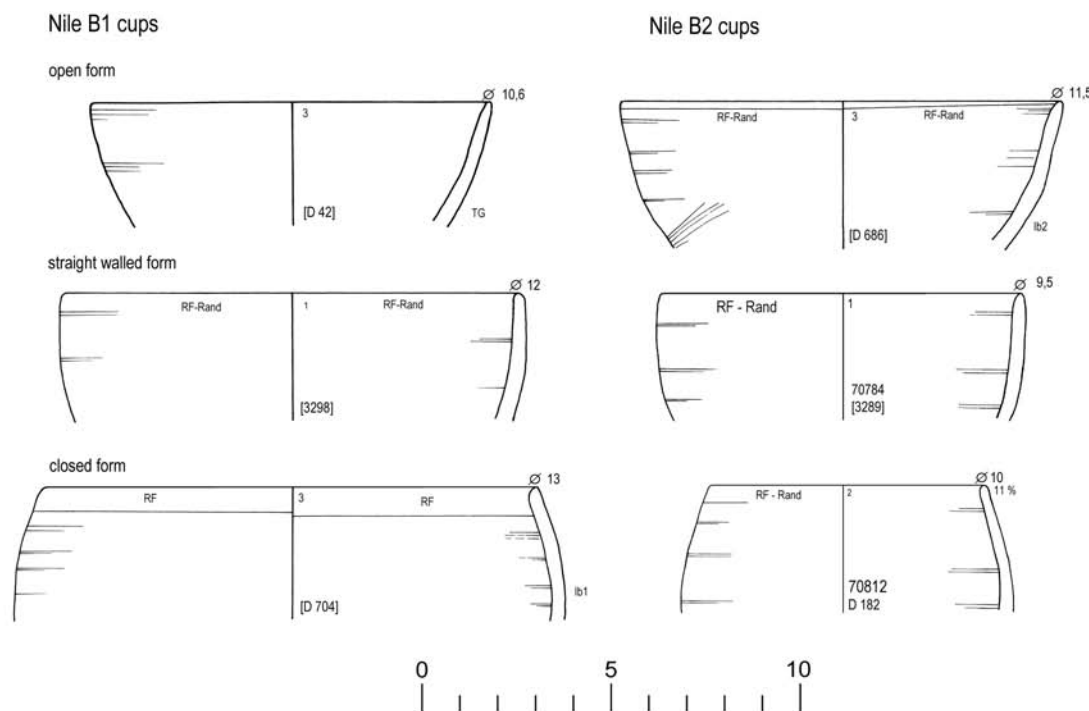


Fig. 6 Shape types of hemispherical cups from Nile B1 and B2 based on sherds from Tell el-Dab'a. Scale 1:2

were measured while recording the sherds, were used. The term applied to this measurement is following C. Orton's "*estimated vessel equivalent*" (*eve*), which is given here as a percentage.²⁹ Because I feel readers should have the immediate possibility of comparing the raw data between levels and sub groups as well as with other types of vessels the raw data has not been turned into a frequency table, in which the proportion of all subgroups always results in 100 %.³⁰ This is the reason why the percentages of the single type groups when added in this paper, will mostly result in more than 100 %.³¹

Fig. 7 shows that the proportion of open cups made of Nile B1 is rather small compared to the other shape groups, and moreover they disappear before the beginning of Phase E/2. The closed cups make their appearance already in Phase G/3–1, but rather rarely while they become more frequent in the younger phases with a peak in Phase E/2. Straight-walled cups occur in all Phases from G/4 to E/2, as well as being the dominating shape group in some of

them. The quantity of this sub group seems to be the most stable one.

Looking at the chart derived from Kom Rabi'a (Fig. 8) it becomes immediately apparent that there is a distinctly smaller quantity of closed Nile B1 cups. They are not entirely missing at Kom Rabi'a, but occur much less frequently.

At Kom Rabi'a the bulk of the Nile B1 cups are either of open or straight form. The open cups are only dominant in Level VII West³², while open and straight cups are almost equally frequent in Level VI d, VI b, VI a and V. The straight cups on the other hand are more numerous in Level VII East, VI e and VI c. Whereas Nile B1 cups are no longer found at Tell el-Dab'a after Phase E/2, at Kom Rabi'a they still persist in considerable quantities till Level VI c and in smaller numbers even later. Common to both sites is the dominance of the straight-walled cups most of the time.

The different distribution of the quantities and also the different preferences of open, straight-walled and closed cups made of Nile B1 in the stratigraphies

²⁹ C. ORTON, P. TYERS, A. VINCE, *Pottery in Archaeology*, Cambridge Manuals in Archaeology, Cambridge 1993, 21, 168–171. C.R. ORTON, Quantitative Pottery Studies: Some Progress, Problems and Prospects, *Science and Archaeology* 16 (1975), 30–35. A decimal number would also be possible, but percentages facilitate the use of computers.

³⁰ M. FLETCHER, G.R. LOCK, *Digging Numbers. Elementary Statistics for the Archaeologist*, Oxford University Committee for Archaeology Monograph 33, Oxford 1994², 14–16.

³¹ 100% rim *eves* are equivalent to one completely preserved rim of a vessel = 1/1. For relative proportions see the author's PhD, chapters 5 and 6, 100–265.

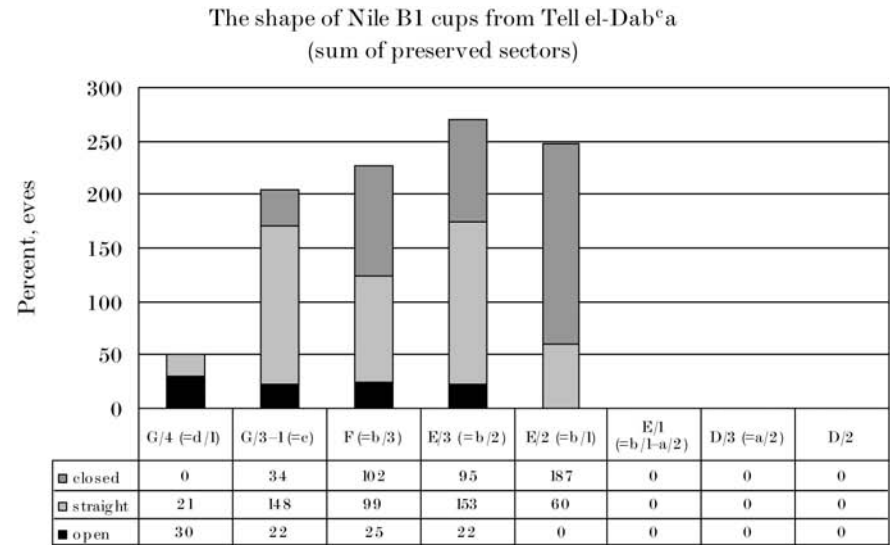


Fig. 7 The shape of hemispherical Nile B1-cups in the stratigraphy of Tell el-Dab^a (randomly selected sherds TDRAN) – raw data

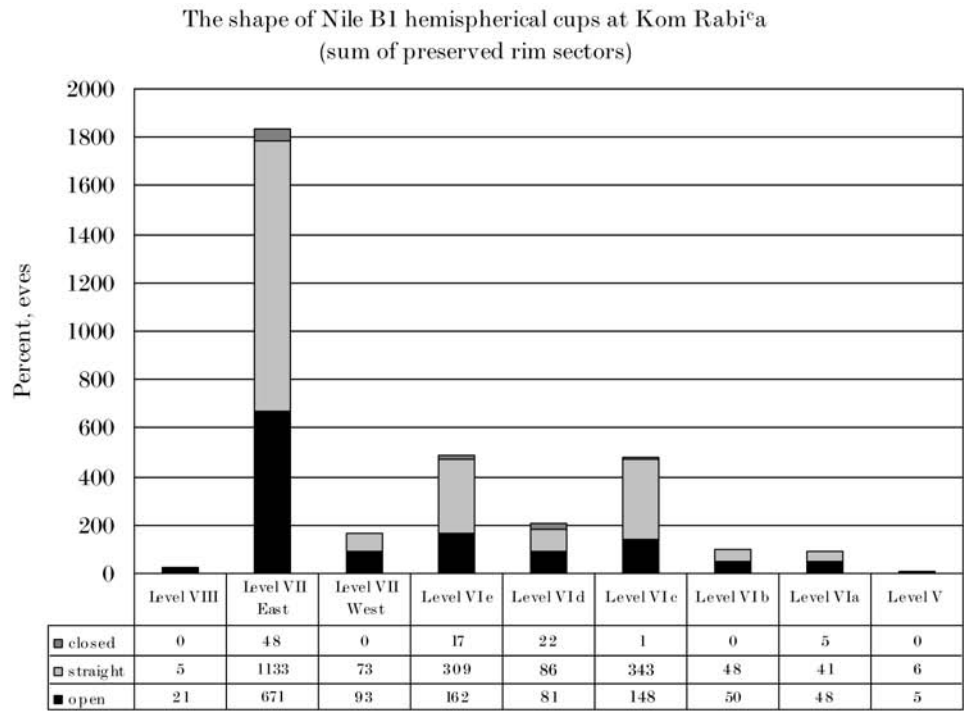


Fig. 8 The shape of the hemispherical Nile B1-cups in the stratigraphy of Kom Rabi^a (all randomly selected sherds BRAT) – raw data

of Tell el-Dab^a and Kom Rabi^a shows once more that the beginning of the sequence coincides fairly well (Phase G/3-1 with 22% eves open, 148% straight-walled, 34% closed and Level VII East with 671% open, 1133% straight-walled and 48 % closed). As time goes by the dissimilarities prevail and no longer is there any bridge between those two distribution patterns to be found.

In the earliest Phase of Tell el-Dab^a considered in this study, that is to say Phase G/4, the presence of

open hemispherical cups made of Nile B2 is at its highest (Fig. 9). In the succeeding Phases the proportion of this shape steadily decreases. This shape variant has completely disappeared by Phase E/2. Straight-walled cups also occur from Phase G/4 onwards, in small numbers at first, steadily increasing until they dominate in Phases F and E/3 and decline from Phase E/2 to E/1 until they vanish in Phase D/3.

The closed variety of Nile B2 cups, however, is first noticeable in Phase G/3-1 in a relatively low pro-

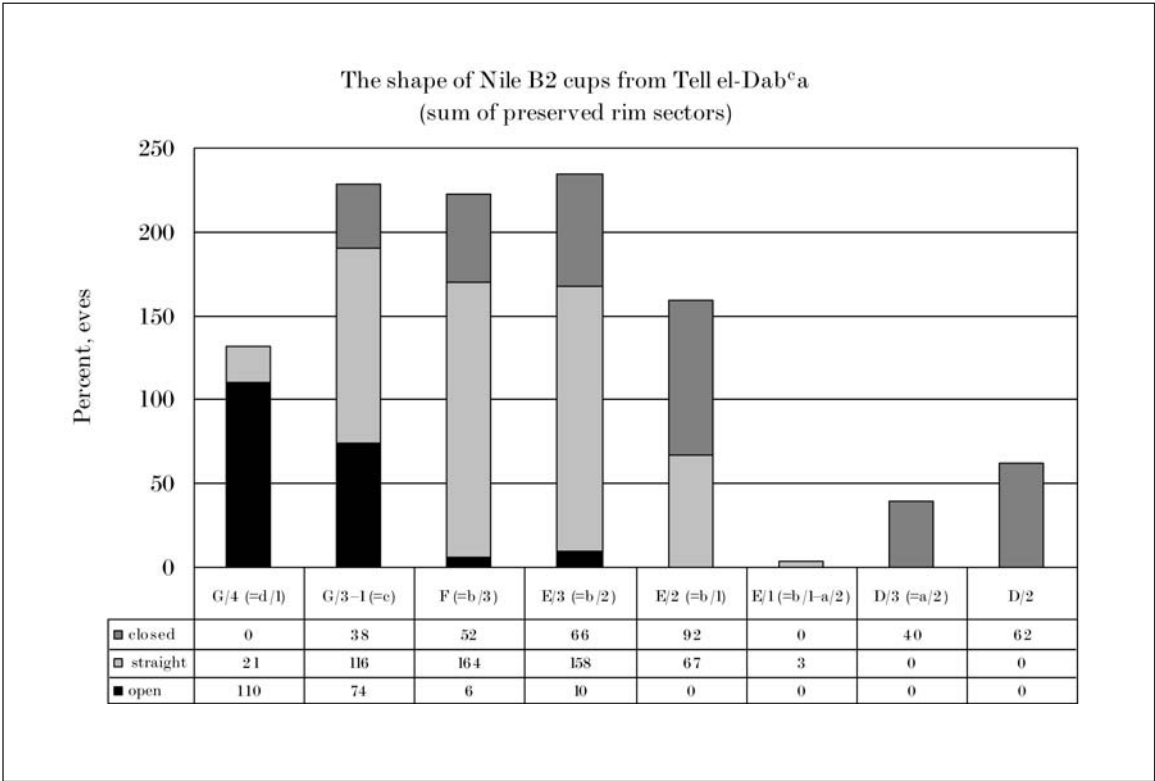


Fig. 9 The shape of hemispherical Nile B2-cups in the stratigraphy of Tell el-Dab^a (randomly selected sherds, TDRAN) – raw data

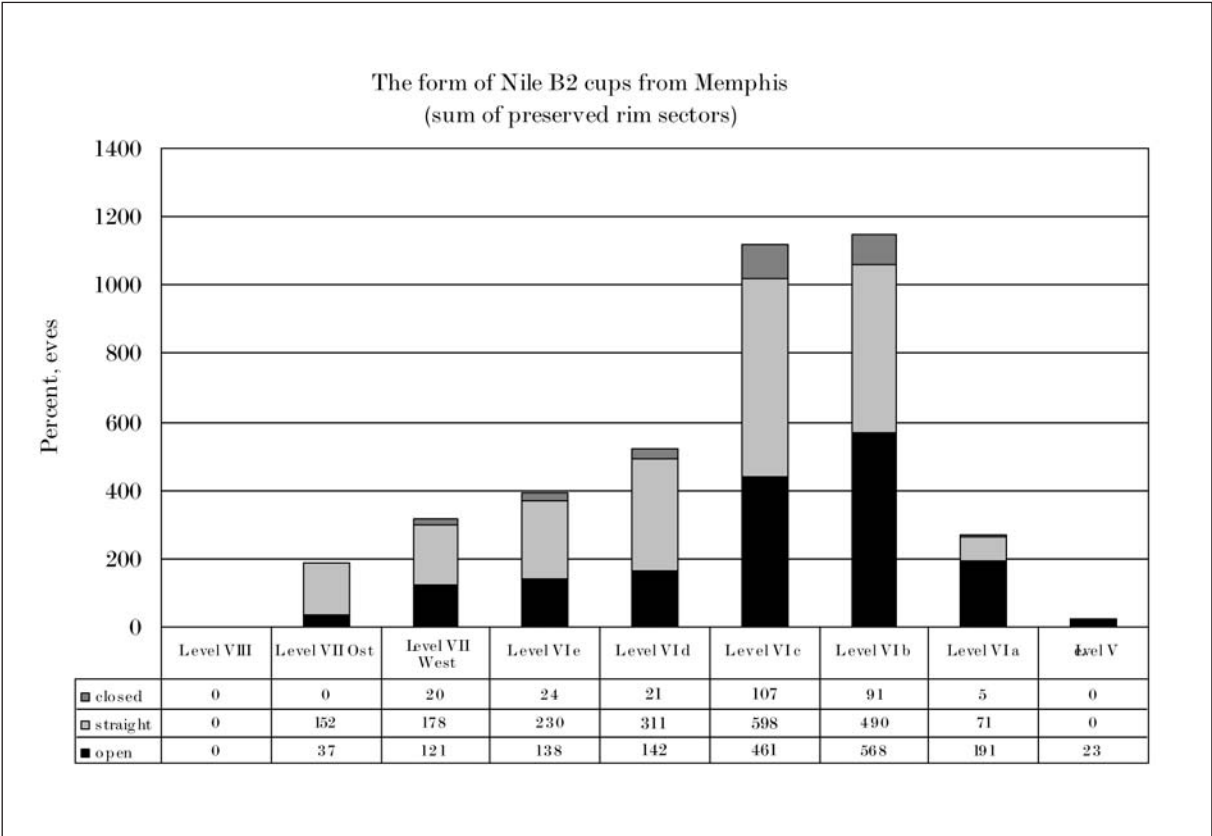


Fig. 10 The shape of the hemispherical Nile B2-cups in the stratigraphy of Kom Rabi^a (all randomly selected sherds BRAT) – raw data

Kom Rabi'a Levels	VIII	VII	VIe	VId	VIc	VIb	VIa	V
Tell el-Dab'a Phases	G/4?	G/3-1			E/1?	D/3		

Table 3 Synchronisms between the relative chronologies of Tell el-Dab'a and Kom Rabi'a

portion, which interestingly does not vary much over time, the biggest change in quantity occurring between Phases E/3 and E/2, and E/2 to E/1. From Phase D/3 onwards this is the only type found.

The quantitative situation of the same vessel type follows completely different rules at Kom Rabi'a. While the Nile B1 cups show an all-time high in Level VII East, the Nile B2 cups only gradually become more frequent and reach their main *floruit* in Levels VIc and VIb. After that the proportion falls rapidly. Among the Nile B2 cups from Memphis the closed shape is a little more frequent than among the Nile B1 cups, but nowhere near as prominent as at Tell el-Dab'a in the Hyksos-period and later from Phase E/1 onwards. In contrast to Tell el-Dab'a the open cups become more frequent in the later Levels of Memphis. This fact is in accordance with the result of the study of the vessel indices (see above). The straight-walled cups are common on both sites. The general pattern of hemispherical cups made of Nile B2 clay at Kom Rabi'a shows a gentle increase in quantity for all shape varieties up to Level VIc and VIb respectively (for open cups) and are afterwards proportionally speaking distinctly less common. By Level V this vessel type is practically no longer found.

Thus it can be shown in this instance, that the quantitative (raw) data of hemispherical cups made of Nile B1 and B2 when collected using controlled sampling methods, differ noticeably from each other from a certain point in time onwards, namely in the relative stratigraphies from Phase F and E/3 and VIe and VId, respectively.³²

Nevertheless it does seem possible to find some synchronisms – especially in the beginning of the two sequences – for this pottery type:

The vessel indices of Nile B1 cups indicate a con-

nection between Phase G/3–1 at Tell el-Dab'a and Level VII East at Kom Rabi'a. The advent of new cup types at the two sites may associate Phase E/1 and VIc as well as Phase D/3 with Level VIb. The study of the average rim diameters suggests a synchronism between Phase G/4 and Level VIII. Table 3 may help to visualise the connections.

2. BEER BOTTLES

a) Typology

This is another vessel type which has a wide distribution throughout Egypt.³⁴ The large Egyptian beer or wine bottles, made from a rough Nile C clay have already been the focus of attention of several scholars. First Do. Arnold studied the chronological alteration of the relation of the openness of the rim to the height of the necks for beer bottles from Lisht and found a chronologically sensitive index for the neck.³⁵ Z. Szafranski invented another Index, which sets in relation to each other the openness of the neck and the height of the outer bulge of the beer bottle rim fragments.³⁶ He studied the beer bottles, which preserved a complete profile, from Tell el-Dab'a. A typology of complete beer bottles at Tell el-Dab'a has been compiled by D. Aston.³⁷

Relevant to the period under consideration are bottles from the late 12th dynasty onwards to the 13th dynasty.³⁸ The definition of most of the bottle types from the 13th dynasty is based on their entire shape traits, which were not present in the sherd material with which this study is concerned. It should be said, that it was not possible to reconstruct a single complete profile, neither at Memphis nor amongst the randomly selected settlement contexts from Tell el-Dab'a, which I used for this project.

³² Please note, that Level VIII could not be entirely excavated because of the reaching of the water table and is thus not representative. It is given here for completeness' sake. Cf. L.L. GIDDY, D.G. JEFFREYS, Memphis 1992, *JEA* 78 (1992), 11–14.

³³ This is the case for the raw data as well as for the relative proportion thereof. There is, however, the – hypothetical – possibility that the actual time span covered by the two stratigraphical sequences is not the same, but at this stage

of the study of the material this seems extremely unlikely, because for this to be true on the other hand there are too many connections.

³⁴ See supra n. 4

³⁵ DO. ARNOLD, *The Pottery*, 141–143, the so-called Index 1.

³⁶ Z. SZAFRANSKI, *Ä&L* 7, 101, so-called Index 2.

³⁷ D. ASTON, *Tell el-Dab'a XII*, fig. 12.

³⁸ Cf. D. ASTON, *Tell el-Dab'a XII*, fig. 12, types 5 to 11.

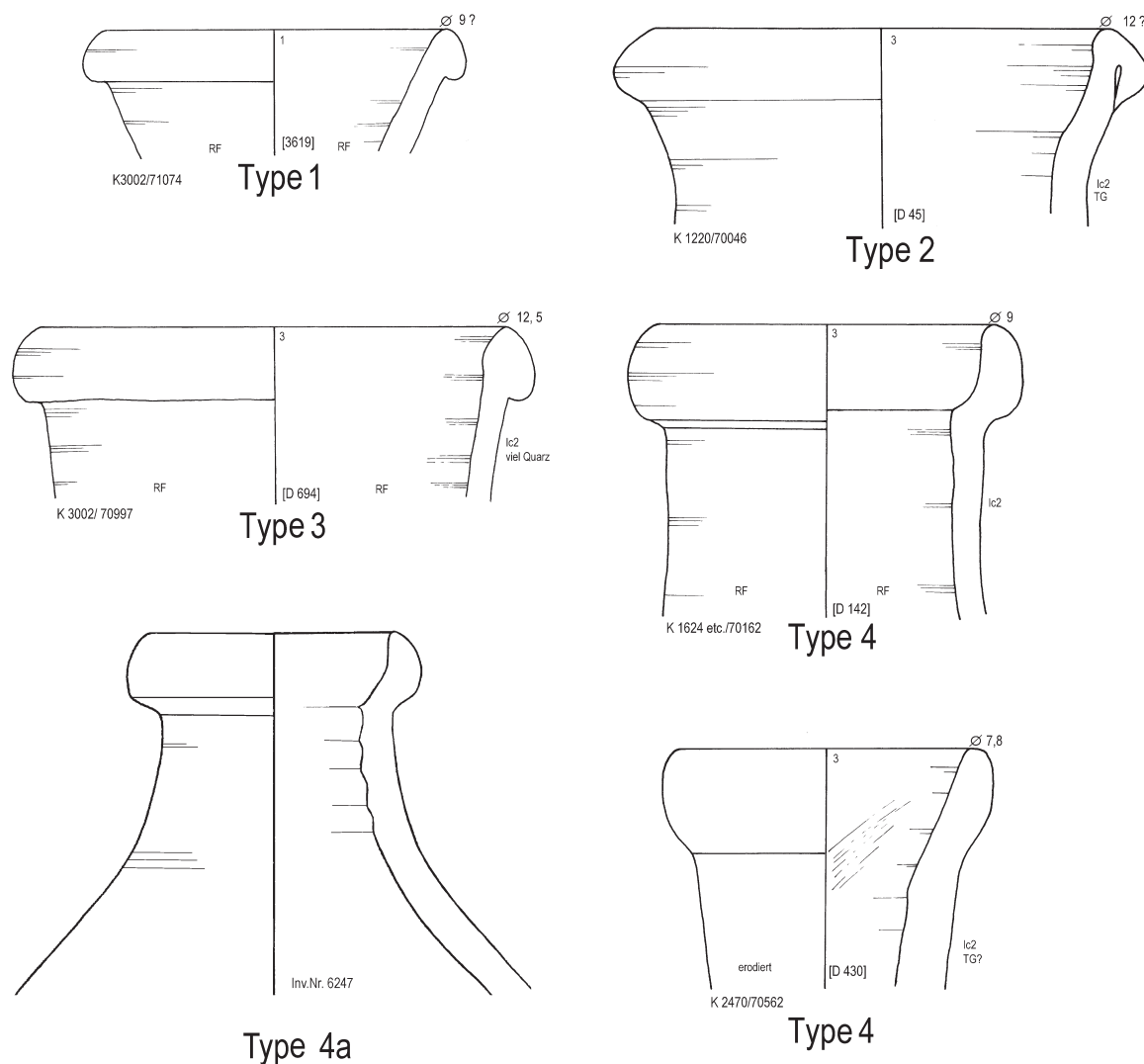


Fig. 11 Rim typology of beer bottles based on sherds from Tell el-Dab'a, scale 1:2

While this is not surprising, as the nature of settlement contexts usually yields only sherd material, the typology used here is almost entirely³⁹ assembled from rim fragments (Fig. 11). The same holds true for the typology of beer bottles at Kom Rabi'a (Fig. 12).

At Tell el-Dab'a, there is the great advantage of being able to use an existing seriation prepared by Z. Szafranski,⁴⁰ based on complete beer bottles deriving mainly from closed contexts, such as tombs and offering pits. This seriation reveals the development of the shape and the slight alterations this type undergoes through time. It will be tested here as well, if the difference in the nature of the contexts plays a role in the distribution of the index.

Mostly these two typologies (Figs. 11 and 12) are in accord with each other. A short description with the most characteristic traits is given below:

- Rims/necks of type 1 show the shape of a funnel with a simple external lip.
- Rims/necks of type 2 are also funnel-shaped, but have an indent or dimple on the inside.
- Rims/necks of type 3 display a straight neck with a more or less pronounced external lip.
- Rims/necks of type 4 have a straight neck as well, but are also equipped with an indent/dimple on the inside of the rim forming the so-called “kettle”-shaped mouth. This type sometimes looks less pro-

³⁹ Only type 4a was taken from a complete beer bottle of *Ä&L* 7, as it was not represented amongst the randomly

selected sherds from Tell el-Dab'a.

⁴⁰ See *supra* n. 13.

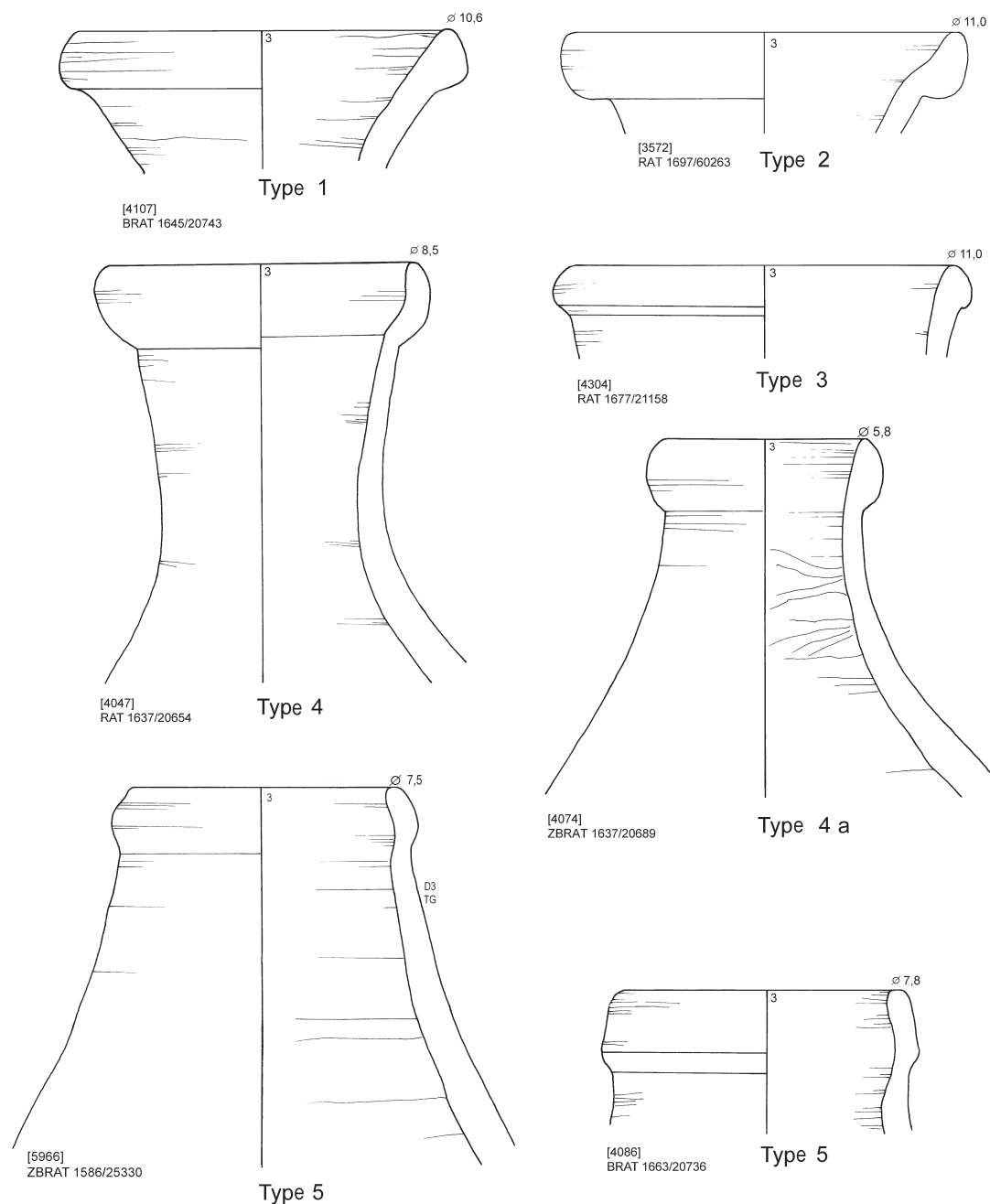


Fig. 12 Rim typology of beer bottles based on sherds from Kom Rabi'a, scale 1:2

nounced, like the second example of type 4 from Tell el-Dab'a (Fig. 11).

- Rims/necks of type 4a are provided with a relatively short, broad neck. They occur with “kettle”-shaped rim (like the Tell el-Dab'a example⁴¹) as well as with external lip (like the Kom Rabi'a example),

but they are generally so rare, that this type has not been further subdivided.

- Rims/necks of type 5 show a relatively thin-walled rim turned inwards and hollowed out on the inside. The neck is short and becoming broader, but some examples seem to have a straighter neck. No com-

⁴¹ Note that this rim is taken from a complete bottle from Szafranski's article, *ÄdL* 7, pl. 4, 16, nr. 6247. Among the randomly selected group of sherds this type statistically

plays no important role, because numerically it is extremely rare. As a type it provides a further connection between Tell el-Dab'a and Kom Rabi'a. See below.

plete example of this beer bottle type has been found. However, nothing similar exists at Tell el-Dab^a.

b) Aperture Index 2

As already mentioned, there are two indices describing certain shape details and their change over time. The first one (Index 1), introduced by Do. Arnold, is concerned with the height of the neck of the bottles.⁴² The second one (Index 2), developed by Z. Szafranski, detects the relation of the maximum diameter of the rim itself, to the height of its external lip.⁴³

As the required state of preservation of the beer bottle neck is less demanding for Index 2, I will present here Index 2 for beer bottles.⁴⁴ For the demonstration of the behaviour of Index 2 only beer bottle rims of sufficient preservation were used.⁴⁵ Szafranski's chart (Fig. 13, left) demonstrates, that the index is higher in the earlier phases and lower in the later phases. The reason for this pattern is that in the course of time the rim diameters become smaller, while the external lips become longer. This development is paralleled largely by the randomly selected settlement material from Tell el-Dab^a (fig. 13, right). It can be observed, though, that the ranges are more extensive in settlement layers than in the tomb contexts and offering pits Szafranski used for his study as is to be expected in "open" contexts.

Even a first glance at the charts (Fig. 14) shows, that the development of index 2 of beer bottle rims at the two sites under consideration is quite different.

At Tell el-Dab^a in Phase G/3–1 beer bottle types 1, 2, 3 and 4 are to be found. Amongst these – types 2 and 4 with "kettle"-shaped rim are most frequent. In the following Phase F the "kettle"-shaped rim of type 4 becomes even more dominant and after that the only rim type existing. After Phase E/2 in the randomly selected contexts no more beer bottle rims exist. Singular rim fragments may be found up to phase E/1 in other contexts at the site.⁴⁶

At Memphis/Kom Rabi^a Level VII East provides most clues in regard to the synchronisation of the two sites, because the same assemblage of types as mentioned above occurs there: 1, 2, 3 and 4. In addition to that types 4a and 5 appear, but they are rare. If we compare the beer bottles of type 4 in Phase G/3–1 and Level VII East, we see similar indices ranging between 300 and 450 at Tell el-Dab^a and between 300 and 500 at Kom Rabi^a. The other types also fall into several clusters, which are partly paralleled at Tell el-Dab^a, but show a wider range in indices and therefore a higher average.

The next phase, F, at Tell el-Dab^a only contains types 2 and 4, both of which show "kettle"-shaped rims, with indents on their insides. At Memphis the *floruit* of the new Type 5, which does not appear at Tell el-Dab^a at all, can be seen in Level VIe. This level also contains some examples of the other types, but they are nowhere near as numerous. This tendency is still noticeable in Level VId, where more type 5 rims are present than other rim types. After Level VIe the quantity of beer bottles diminishes altogether, while no clear dominance of one particular type makes itself obvious after Level VId.

The disappearance of beer bottles at the two sites cannot be correlated in a meaningful way, because in contrast to Tell el-Dab^a they do not vanish completely at Kom Rabi^a. However, they become noticeably rarer from Level VIb onwards (cf. Figs. 15 and 16). Perhaps this allows at least a very rough and tentative synchronism between Level VIb and Phases E/1–D/3. Finally there is a minor synchronism to be found with type 4a, since it appears very rarely at both sites. At Memphis it is found in Levels VII East and VIe, while at Tell el-Dab^a it occurs in Phase G/3–1 and F.⁴⁷

c) Quantitative distribution

The comparison of the quantity of beer bottles, regardless of their types for the time being, gives another clue for linking the sequences. Again the dia-

⁴² See note 36.

⁴³ See supra note 12 and 36.

⁴⁴ However, the study of the index 1 in the course of the author's PhD work resulted in yet another difference of development. While at Tell el-Dab^a the necks of the bottles in the younger Phases become longer, sometimes even grotesquely, (cf. SZAFRANSKI, *Ä&L* 7, 98–101 and fig. 2), the necks of the bottles at Kom Rabi^a become shorter in the younger Levels. While the clusters in Do. Arnold's seriation figure (Do. ARNOLD, *The Pottery*, fig. 76) seem to wander from the bottom right corner to the top left corner, the clusters derived from the index 1 applied to the later

Kom Rabi^a material moves from top left corner to bottom right corner. Resulting from this is a curving movement of neck heights in the Memphis/Fayum region. Cf. BADER, *op.cit.*, 199–205.

⁴⁵ The charts contain only rims with accuracy 3 (actually drawn) and 2 (typed to one given drawing in the same state of preservation).

⁴⁶ Z. SZAFRANSKI, *Ä&L* 7, 105, fig. 6.1; 110, Cat.nr. 43. I. FORSTNER-MÜLLER, *Die Gräber des Areals A/II*, vol. 2, 195, Inv.Nr. 8692 A – Phase D/3, body without rim. M. BIETAK, *Tell el-Dab^a V*, 238, fig. 202.47.

⁴⁷ Z. SZAFRANSKI, *Ä&L* 7, 107. K. Kopetzky, pers. comm.

Szafranski's Original Index 2 Chart for Beer Bottles

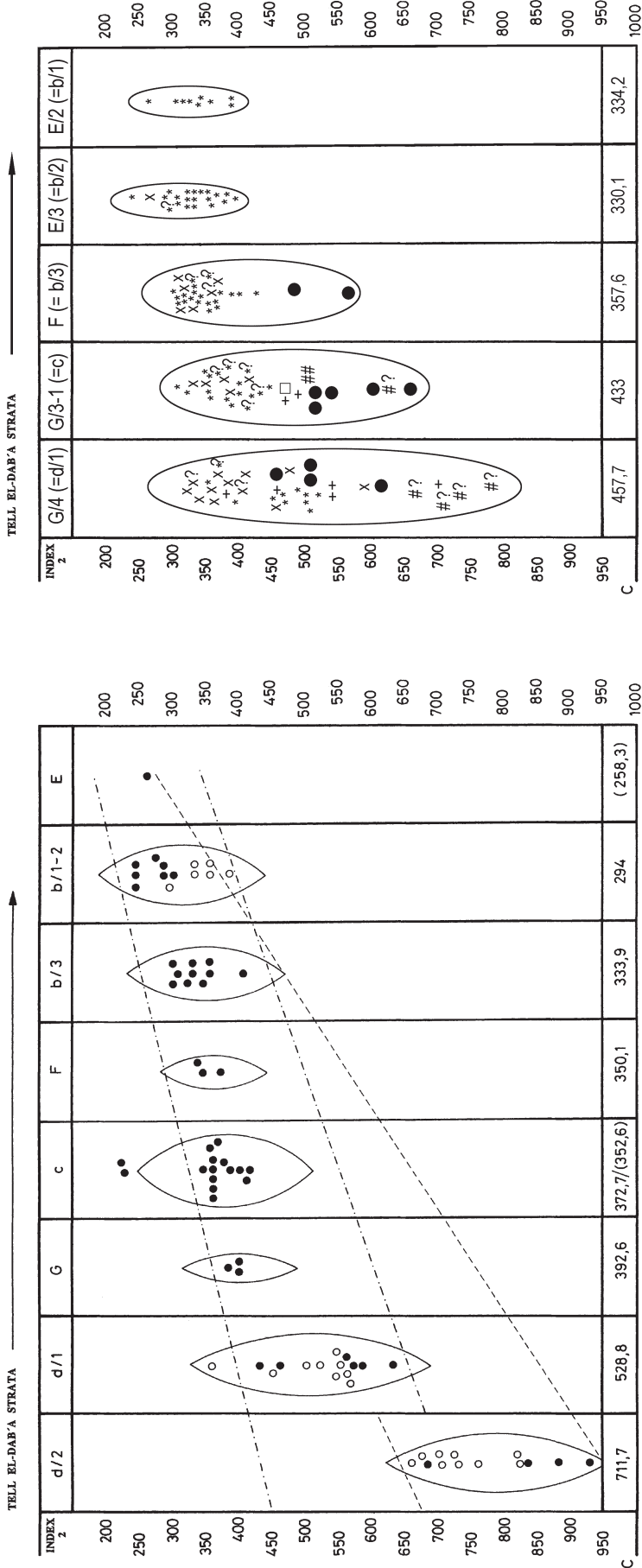
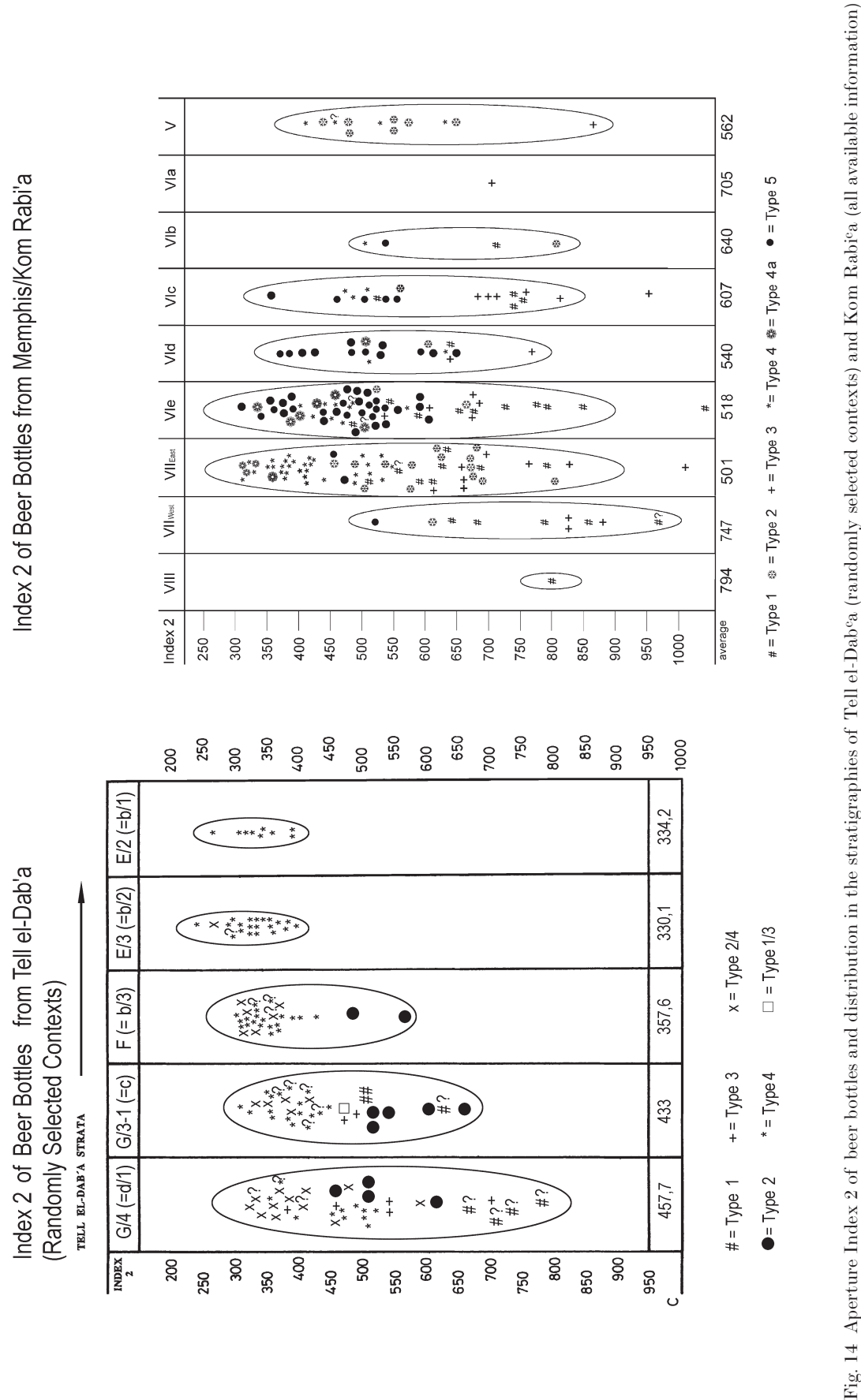


Fig. 13 Aperture index 2 of beer bottles and distribution in the stratigraphy of Tell el-Dab'a (after Z. SZANFRANSKI) opposite the randomly selected contexts from Tell el-Dab'a



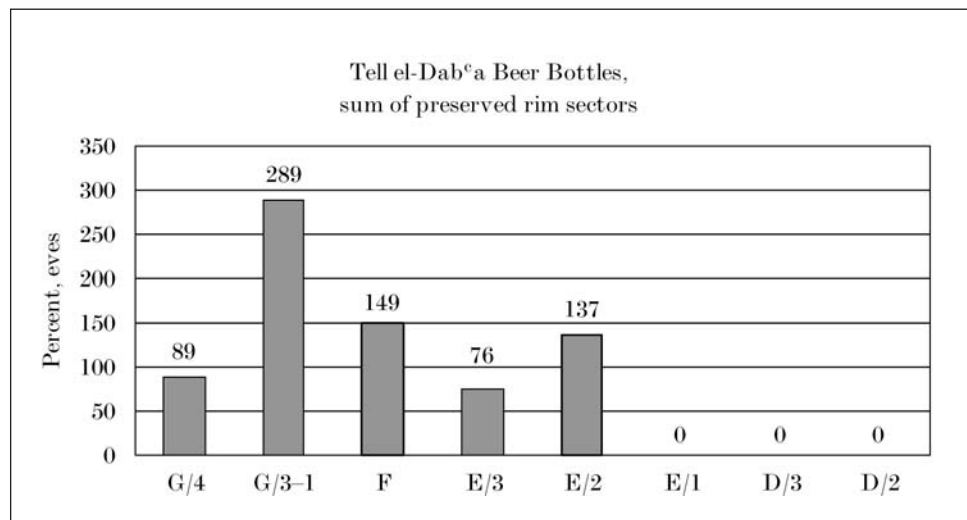


Fig. 15 The quantity of beer bottles from Tell el-Dab'a in the stratigraphy (randomly selected sherds TDRAN) – raw data

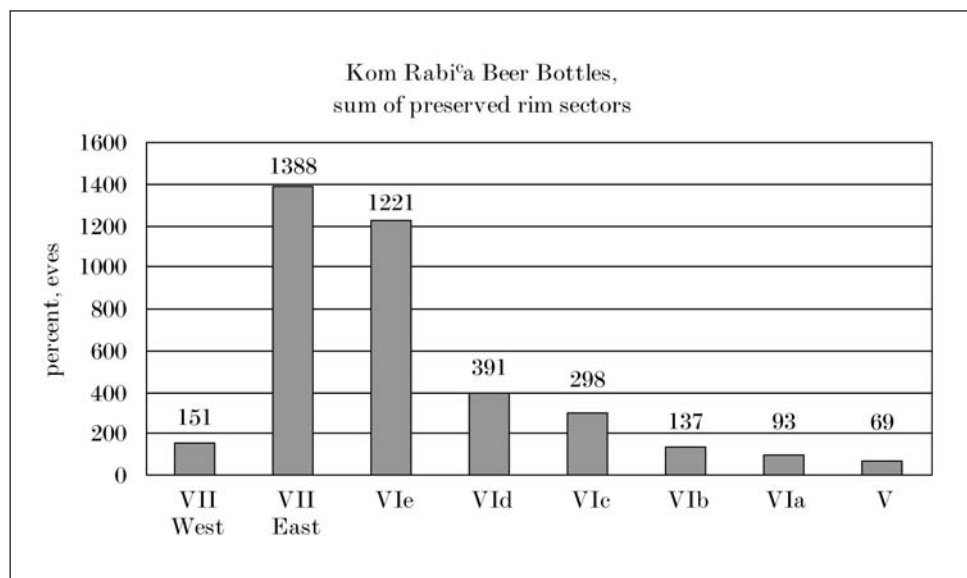


Fig. 16 The quantity of beer bottles from Kom Rabi'a in the stratigraphy (all randomly selected sherds BRAT) – raw data

grams (Figs. 15 and 16) represent the amount of rim *eves* (= estimated vessel equivalents, see above) of beer bottles in each Level or Phase, respectively, which were taken from the random selection of sherds.⁴⁸

The highest frequency of beer bottles can be observed in Phase G/3-1 and Level VII East and VIe, respectively. At both sites the quantity decreases afterwards. But while at Tell el-Dab'a this vessel type

comes to an end after Phase E/2, it continues to be found at Kom Rabi'a albeit in low quantities to Level V. There is always the possibility of residuality to be considered when working with settlement material. But why on one site there should be such a phenomenon, which can not be traced in this form on the other remains a problem, that can not easily be explained away. It seems safer at the moment and in

⁴⁸ Cf. the tabulation of relative proportions in BADER, *op.cit.*, 255–256, 260–262.

Kom Rabi'a Levels	VII	VIe	VIId	VIc	VIb	VIa	V
Tell el-Dab'a Phases	G/3-1	F			E/1-D/3		

Table 4 Synchronisms between the relative chronologies of Tell el-Dab'a and Kom Rabi'a gained from beer bottles

Kom Rabi'a Levels	VIII	VII	VIe	VIId	VIc	VIb	VIa	V
Tell el-Dab'a Phases	G/4?	G/3-1	F		E/1?	E/1-D/3		

Table 5 Synchronisms between the relative chronologies of Tell el-Dab'a and Kom Rabi'a gained from hemispherical cups and beer bottles

this case to note the differences between the two sites and see if more hints can be added to characterize these regional differences and pin them down in greater detail.

The analysis of beer bottles provides the following synchronisms: Level VII is best paralleled by Phase G/3-1, Level VIe by phase F and Level VIb perhaps by E/1-D/3 (Table 4).

This result is mostly congruent with connections gained by the analysis of hemispherical cups. Table 5 sums up what can be said to date with some certainty.

CONCLUSIONS

This paper clearly demonstrates that two widely spread and frequently occurring vessel types – hemispherical bowls and rims/necks of beer bottles – from Tell el-Dab'a and Kom Rabi'a undergo a different development of certain shape details from a distinct point in time onwards (in the Tell el-Dab'a stratigraphy from Phase F-E/3, in the Kom Rabi'a stratigra-

phy from Level VIe-VId),⁴⁹ while the beginnings of the relative sequences could be more or less well synchronized. It seems that this divergence at the current state of knowledge is best explained by regional differences in ceramic production, although the two sites are, in real terms, not very distant from each other. This further implies that some sort of “cultural” or “political” border began to exist between these two regions already before the actual Hyksos-Period in the Delta started in full bloom (Phases E/2-D/2). Thus two different regional developments/styles, the existence of which has been suggested in previous studies,⁵⁰ are clearly attested and with the aid of quantitative analysis shown in detail here for the first time.

Nevertheless it should be borne in mind, that the results presented here are but the beginning, and there is a lot more data to be processed, before a final conclusion can be reached, if there is, indeed, one hidden among the overwhelming amount of data.

⁴⁹ There are more vessel types, which are discussed in the author's PhD. thesis, showing the same phenomenon.

⁵⁰ Do. Arnold and J. Bourriau always maintained the opinion that different ceramic traditions are to be found in Upper

and Lower Egypt especially in the First and Second Intermediate Periods, as well as at the change of the 11th Dynasty to the 12th. Cf. DO. ARNOLD, *The Pottery*, 144-146. J. BOURRIAU, *Beyond Avaris*, 159.

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