TRANSREGIONAL INTERACTIONS BETWEEN EGYPT AND THE SOUTHERN LEVANT IN THE 6TH MILLENNIUM calBC

*Katharina Streit**

Abstract: *In the mid-6th millennium calBC, ceramics appeared for the first time in the Fayum and Delta of Lower Egypt. A southern Levantine origin for these ceramic types was proposed over fifty years ago by Jacob Kaplan (Kaplan 1959) and several different cultural entities have since been considered as the possible origin, including the Yarmukian culture (Eiwanger 1984), the Qatifian culture (Smith 1989), the Lodian (Shirai 2010), the Nizzanim and the Wadi Rabah culture (Tassie 2014). This paper examines these five possible source cultures and reviews the archaeological data based on an absolute radiocarbon chronology. Preliminary results suggest that the Wadi Rabah culture played the most crucial role in the formation of the Neolithic of Lower Egypt, and that there were extensive cultural interactions between the Levant and Egypt. The interactions emerging in this period were embedded in an internationalism that connected most of the Near East. It can be envisaged that favourable climatic conditions in this period might also have enabled and facilitated interactions between the southern Levant and Egypt. The transregional interactions of the 6th millennium calBC can also be seen as a prelude to the better understood contacts of the Early Bronze Age, which also coincided with a climatic amelioration.*

Keywords: *Neolithic, Egypt, Wadi Rabah, transregional interaction, climate*

1. Introduction

The origin of the Pottery Neolithic of Lower Egypt has long been debated. Early attempts to synchronise parallels in the material culture between Lower Egypt and the southern Levant were made by Helene J. Kantor (Kantor 1942) and Jacob Kaplan (Kaplan 1959). Kantor (Kantor 1942, 174–175) paralleled Merimde Beni-Salame with the Ghassulian culture of the southern Levant based on specific ceramic shapes, such as chalices. Kaplan (Kaplan 1959, 134) correlated certain pottery shapes from the Badarian site of Hamadiya with finds from Ghassul and Wadi Rabah, further pointing out that the black burnished tradition from Lower Egypt appears to have been derived from a southern Levantine tradition (Kaplan 1959, 136). The herringbone pattern seen on ceramics from Merimde Beni-Salame also attracted some attention. Hjalmar Larsen (Larsen 1958, 45) suggested a possible foreign influence in the design, noting the similarity between the fishbone patterns on Merimde pottery and sherds from Jericho, Stratum VIII. The influence of the southern Levant was subsequently accepted in the literature (Baumgartel 1960, 140; Hayes 1965, 114, 122).

With improved refinement of the Protohistoric chronology in the following decades, this influence has been re-examined, and five possible cultural units have been proposed as having been the major influence on the Pottery Neolithic of Egypt: the Yarmukian (Eiwanger 1984, 62; Shirai 2010, 314); the Lodian (Shirai 2010, 315); the Nizzanim variant (Tassie 2014, 194); the Qatifian (Smith 1989, 75); and the Wadi Rabah (Warfe 2003, 190; Tassie 2014, 194). This study evaluates the evidence for the proposed cultural contribution of each of these southern Levantine cultural entities on the Pottery Neolithic of the Nile Delta and the Fayum region.

2. The Pottery Neolithic of the Nile Delta and the Fayum region

The term Pottery Neolithic indicates the earliest regular use of pottery in the ancient Middle East, and evidence for this period has been found in both the Nile Delta and the Fayum (Fig. 1). While both centres share many cultural traits, they also have many distinctive features.

2.1 The Nile Delta

Only two sites are currently known that represent the earliest phases of the Pottery Neolithic in the Nile Delta: Merimde Beni-Salame and Saïs (Fig. 1).

* katharin.streit@mail.huji.ac.il, The Martin Buber Society of Fellows, Hebrew University of Jerusalem, Israel

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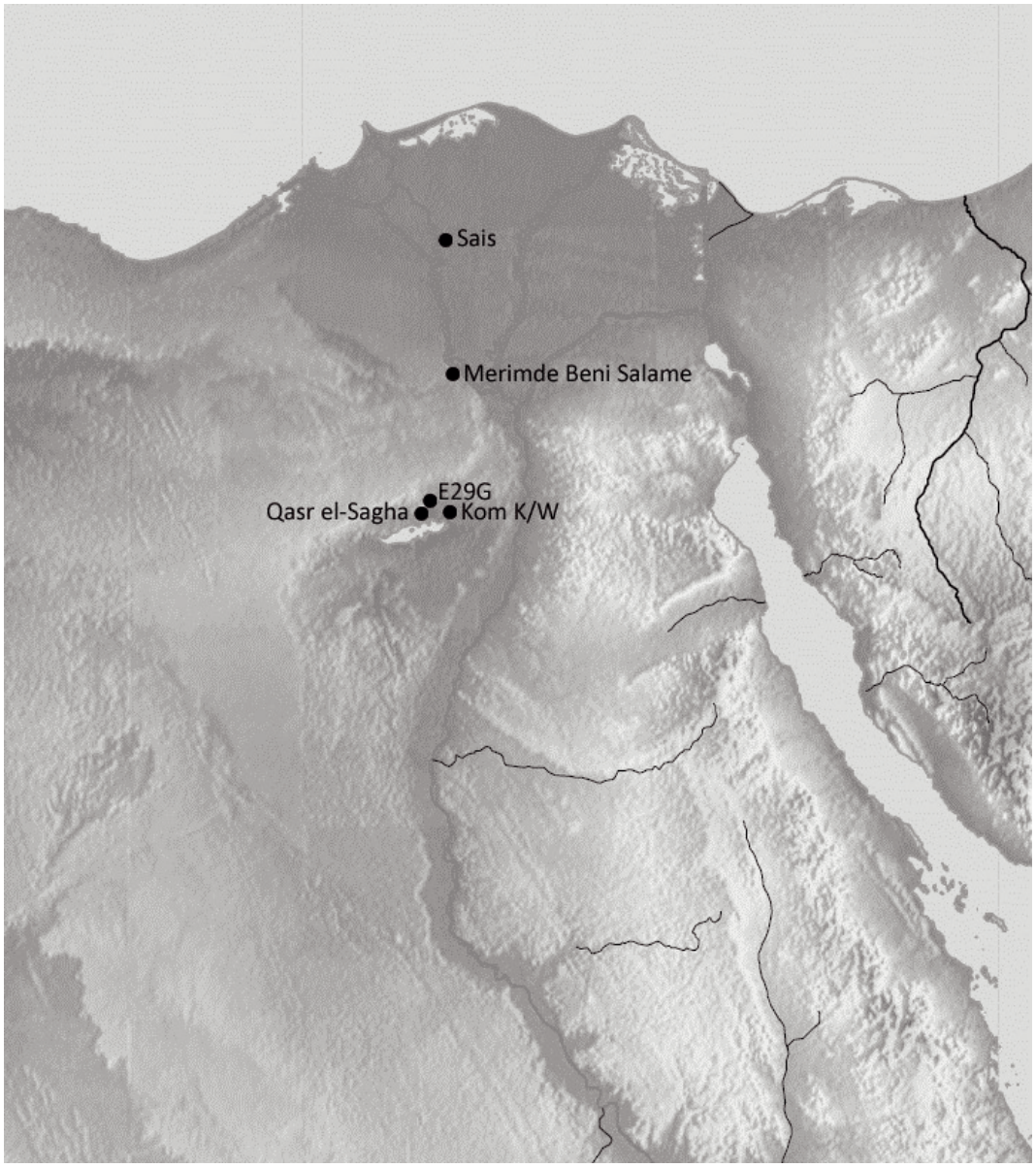

Fig. 1 Map of Lower Egypt Sites

The very limited data on this chronological phase can mainly be ascribed to the accumulation of Nile sediment and the resultant difficulties in recognising and excavating remains from early periods. Despite the limited dataset, the two sites of the Nile Delta provide valuable information on this era.

Merimde Beni-Salame was discovered by Hermann Junker in 1928 during a survey in the Western Delta, and was subsequently excavated over seven seasons, from 1929 to 1937 (Junker 1928; 1929; 1930; 1932; 1933; 1934; 1940), during which 6400 m² of the suggested 25 ha large settlement were uncovered (Eiwanger 1992, 7). Small scale survey projects have been conducted since by Egyptian (Hassan 1979) and British expeditions (Rowland and Bertini 2016).

The excavation by Junker was never fully published because the documentation was lost during the Second World War. Josef Eiwanger resumed the excavations from 1976 to 1982 and uncovered another 1200 m² north-east of Junker's excavation area; the results were published in three final reports (Eiwanger 1984; 1988; 1992). Junker (Junker 1940, 5–12) had observed three occupation phases, while Eiwanger (Eiwanger 1992, 10–12) identified five strata (I being the oldest, V the latest). Table 1 summarises the exposed stratigraphy and correlations suggested by Eiwanger (Eiwanger 1992, 34). The '*Urschicht*' mentioned in that table represents the earliest occupation detected at the site. The architecture of this earliest Pottery Neolithic stratum was concisely summarised by Geof-

Table 1: Summary of the stratigraphy at Merimde Beni Salame

Junker		Eiwanger	Period	Feature	Finds
III IV		V	Late Neolithic	Elliptical pisé structures, partially-sunken hearths, basket silos, pit burials	Red and black burnished ware, vegetal temper, tanged arrowheads
	II	III			
		II	Early Neolithic	Postholes of oval dwellings, hoard in a vessel sunk into a floor, pits (storage or dump), pit burials	Red burnished pottery (irregular), denticulated bifacial sickle blades, polished axes
		Hiatus		Sterile layer of aeolian sand	—
I		I		'*Urschicht*', postholes of oval structures, hearths and storage bins outside, pit burials	Non-tempered red burnished pottery, herringbone patterns, backed sickle blades, sheep bones

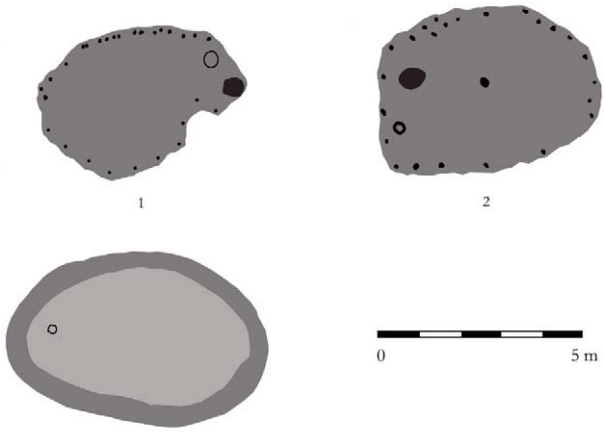

Fig. 2 Architecture of Merimde Beni Salame (after Tassie 2014: fig. 57)

frey John Tassie (Tassie 2014, 208–209). Eiwanger's Stratum I consisted of post holes that can be reconstructed to show the presence of elliptical huts, as well as hearths (Fig. 2), storage bins and pits in the open area. Pit burials of individuals in contracted position were located in an abandoned area of the settlement. The ceramics of this stratum were dominated by untampered, red- or orange burnished pottery, often with fishbone incisions below the rim (Larsen 1959) as well as unburnished red slip ware. Shapes included open bowls, hole-mouth jars, carinated vessels, pierced and loop handles, and footed stands (Eiwanger 1984, 18–39). The flint industry included backed blades, bifacial blades and borers, as well as one triangular bifacial adze (Eiwanger 1984, 40–52). Pierced pottery discs, clay zoomorphic figurines and ostrich eggshell beads are notable among the small finds (Eiwanger 1984, 53–55).

The second site ascribed to the earliest Pottery Neolithic of the Delta was discovered at Saïs in 1999 during a survey with drilled cores conducted by Penelope Wilson on behalf of the Durham University, and subsequently excavated as 'Excavation 8' (144m^2) in 2005 (Wilson, Gilbert and Tassie 2014, 4). Three main strata were discovered, the earlier two being ascribed to the Neolithic by the excavators: Saïs IA (Early Neolithic) and Saïs IB (Late Neolithic). The lower of these strata consisted of a midden of burned fish bones, and the upper of silty sand layers. The finds from Strata IA and IB included red-and-black burnished ware, red burnished pottery with herringbone incisions and bifacial flint tools (Wilson, Gilbert and Tassie 2014, Chapters 6 and 7).

2.2 The Fayum region

Gertrude Caton-Thompson and Elinor W. Gardner discovered several Neolithic sites in the Fayum depression in the 1920s that were subsequently excavated. Three locations (Kom K, Kom W and the K-pits) fall into the period covered by this paper. In the late 1970s further evidence of Pottery Neolithic occupations at the Fayum were uncovered at Qasr el Sagha and at Site E29G Area B; all of these sites are located north of Lake Qarun (Fig. 1).

Kom W consists of 246 fire pits ranging between 0.3 and 1.5 m in diameter, cut into the bedrock (Caton-Thompson and Gardner 1934, 25–36). Most of these fire pits were empty, but twelve contained complete or fragmentary ceramic vessels, and an additional 39 contained ceramic sherds. The ceramic assemblage was marked by red-and-black burnished wares, as well as undecorated vessels. Deep bowls and hole-mouth jars were common. Lithics were dominated by denticulated bifacial sickle blades, bifacial axes and adzes with polished edges, and barbed arrow heads.

Kom K consisted of 60 fire pits, which were similar to those of Kom W (Caton-Thompson and

Gardner 1934, 37–41). No architectural features were uncovered, but both the flint and the ceramic assemblages were virtually identical to those of Kom W. An area with further 174 pits was discovered about one kilometre north-east of Kom K: 67 in the upper area and 109 in the lower area. The preservation of carbonised organic material in the upper area was exceptional, with both grain and basketry perfectly preserved. 56 of the pits in the upper area were identified as silos, but the purpose of the other eleven was unclear, and were either unlined or lined with basketry (Wendrich and Holdaway in press). These silos mainly contained grain, but also held baskets, ceramics, woven linen and shell scoops, as well as sickle holders with sickle blades.

The 109 lower K-pits (also called the K-granaries) yielded similar finds, but their organic material was rather poorly preserved. The ceramic assemblage of the K-pits is comparable to that of Kom K and Kom W sites, marked by red-and-black burnished wares and undecorated ceramics.

In 1979, a joint mission of the University of Krakow and the German Archaeological Institute Cairo conducted one excavation season in the area of the Qasr el Sagha Temple, focusing on prehistoric settlements (Ginter *et al*. 1982; Kozlowski and Ginter 1989). Eleven locations were explored, dating from the Epipaleolithic to the Early Dynastic period. Five sites (QS X/81, QS V/79, QS XI/81, QS IX/81, QS III/79) covered the Early Neolithic period. These small-scale excavations yielded hearths as well as an assemblage of flint and pottery that paralleled the Fayumian sites of Kom W and Kom K. The individual find-spots have been dated with a number of stratified radiocarbon determinations (discussed below).

Site E29G Area B consists of a concentration of flint, pottery and bone fragments spread over an area of c. 60 × 10 m. At least seventeen hearths have been identified (Wendorf and Schild 1976, 199–211; Shirai 2010, 46–47). The ceramics found at the site are similar to those from Kom W and Kom K. No architectural remains have been discovered. The site is possibly Caton-Thomson and Gardner's Site R (Caton-Thompson and Gardner 1934, pl. CIX), but its finds have not been published in detail.

2.3 Defining the Pottery Neolithic of Lower Egypt

The Pottery Neolithic remains an elusive period in the cultural sequence of Egypt. This is due both to the lack of excavated settlement sites of this period and often to unsecure dating. The following overview focuses on finds from stratigraphic contexts that can be ascribed to the Pottery Neolithic period with reasonable certainty.

The period discussed here witnessed the first appearance of ceramics in Lower Egypt (Fig. 3:1–6; Tassie 2014, 184). These first assemblages were characterised by slip and burnish. At Merimde Beni-Salame, Stratum I, ceramics were further decorated with herringbone patterns incised into the burnished vessels, along the rim (Fig. 3:3; Eiwanger 1984, 18–19). The shapes were predominantly deep and shallow bowls (Fig. 3:1, 2, 5; Merimde Beni-Salame, Stratum I: Eiwanger 1984, pl. 11:I.186; pl. 9:I.142–I.151; Kom W: Caton-Thompson and Gardner 1934, pl. XVIII:10, 11, 12, 23; pl. XVIII:3, 4), though hole-mouth jars are well-represented in the assemblage (Fig. 3:3, 6; Caton-Thompson and Gardner 1934, pls. XVIII:24–30, XIX:32–33, 35–43, XX:44–45; Eiwanger 1984: pls. 16, 17, 33). Chalices and stands occur only rarely (Fig. 3:4; Caton-Thompson and Gardner 1934, pl. XX:47, 48, 49; Eiwanger 1984, pls. 22:I.447, I.448, 35:I.638). Pithoi and necked jars are absent; their function appears to have been taken by basketry-lined silos that were excavated into the ground (Caton-Thompson and Gardner 1934, 41–59).

The flint assemblage includes the first appearance of sickle blades in Egypt (Fig. 3:8; Caton-Thompson and Gardner 1934, pl. X:33–53; pl. XXII:11–34; Eiwanger 1984, pl. 49:I.951; Shirai 2010, 315). Bifaces such as axes and adzes occur (Fig. 3:9; Caton-Thompson and Gardner 1934, pl. XXIX:13, 14; Eiwanger 1984, pl. 62), as well as a wide range of choppers, scrapers, and perforators (Fig. 3:10–12; Eiwanger 1984, pl. 45:I.843–I.869; Kozlowski and Ginter 1989, 165, fig. 3:6–8). A single side-notched arrow head was discovered in the lowest stratum of Merimde Beni-Salame (Fig. 3:7; Eiwanger 1984, pl. 57), which stands out in an assemblage otherwise devoid of them.

The stone tool assemblage is rather simple, dominated by grinding slabs (Fig. 3:11; Caton-Thompson and Gardner 1934, pl. VII; Eiwanger 1984, 58, tabs. 67–69; Wilson, Gilbert, and Tassie 2014, pl. 49:S0774, S0823, S0829) and pounders. Mace heads occur occasionally (Fig. 3:13; Caton-Thompson and Gardner 1934, pl. XXIX:10–12; pls. XII:5, 26, XXX:2). Pierced ceramic discs, which were possibly used as spindle whorls, appear to have been manufactured from pottery

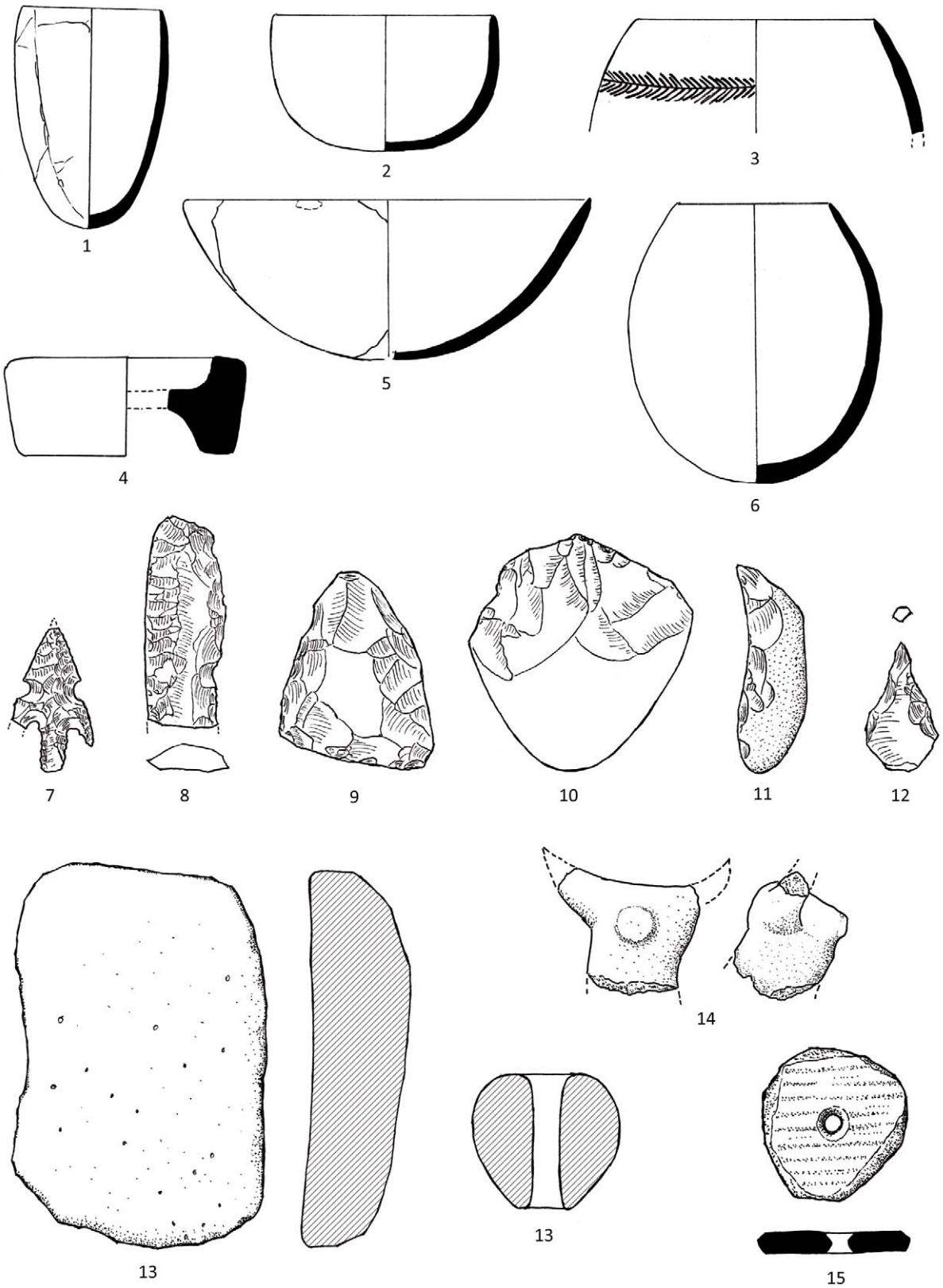

Fig. 3 Egyptian Neolithic Material Culture – 1. Deep bowl (Merimde Beni-Salame; Eiwanger 1984: fig. I.186); 2. Straight walled bowl (Merimde Beni-Salame; Eiwanger 1984: fig. I.167); 3. Holemouth jar (Merimde Beni-Salame; Eiwanger 1984: fig. I.1279); 4. Chalice (Merimde Beni-Salame; Eiwanger 1984: fig. I.1280); 5. Round open bowl (Merimde Beni-Salame; Eiwanger 1984: fig. I.19); 6. Holemouth jar (Merimde Beni-Salame; Eiwanger 1984: fig. I.279); 7. Arrowhead (Merimde Beni-Salame; Eiwanger 1984: fig. I.1106); 8. Sickle blade (Merimde Beni-Salame; Eiwanger 1984: fig. I.951); 9. Axe (Merimde Beni-Salame; Eiwanger 1984: fig. I.1169); 10. Chopper (Merimde Beni-Salame; Eiwanger 1984: fig. I.1146); 11. Pebble-butted tool (Merimde Beni-Salame; Eiwanger 1984: fig. I.1006); 12. Borer (Merimde Beni-Salame; Eiwanger 1984: fig. I.1058); 13. Grinding slab (Merimde Beni-Salame; Eiwanger 1984: fig. I.1255); 14. Macehead (Kom K; Caton-Thompson and Gardner 1934: pl. XXIX:10); 15. Horned animal (Merimde Beni-Salame; Eiwanger 1984: fig. I.1174); 16. Pierced pottery disc (Merimde Beni-Salame; Eiwanger 1984: fig. I.1186)

sherds (Fig. 3:15; Eiwanger 1984, pl. 63:I.1186, I.1187).

The subsistence pattern of this period appears to have been predominantly Neolithic. While South-East Asian domesticates first entered the Egyptian Eastern Desert as early as the 7th millennium calBC, as evidenced by sites such as the Sodmein Cave and the Tree Shelter (Linseele *et al*. 2009; Vermeersch *et al*. 2015), they started appearing elsewhere in the 6th millennium (Linseele *et al* . 2014; Linseele, Holdaway and Wendrich 2016). Sheep, goats, barley and emmer wheat, and possibly cattle and pigs, were reared in the Delta from the late 6th millennium calBC onwards, as remains were found at both Merimde Beni-Salame, Stratum I (Von den Driesch 1985), and Saïs, Stratum I (Wilson, Gilbert and Tassie 2014, 137, tab. 34). Fishing was practised in lacustrine areas (Linseele in Wilson, Gilbert and Tassie 2014, 138, tab. 35).

2.4 Chronological considerations

To date, seven sites in Lower Egypt and the Fayum that have been ascribed to the early Neolithic based on their stratigraphic position and find assemblage (Table 2) have produced radiocarbon dates. While these samples are not always from the earliest strata (e. g. at Saïs), they still provide a *terminus post quem* for the earlier strata and are thus considered in this study. Nevertheless, the absolute chronology of the 6th and 5th millennia calBC in Lower Egypt and the Fayum remains poorly defined. There are two main reasons for this: many of the available radiocarbon dates were measured in the early years of the radiocarbon method (Olsson 1959; Libby 1955) and can no longer be considered reliable; and little information is available concerning the stratigraphic association of most samples. The key site of Merimde Beni-Salame, for example, yielded 17 determinations that cover the late 6th and most of the 5th millennium calBC. No dates are available from the earliest Stratum I ('*Urschicht*'), which has a different material culture to the later strata, and is separated from them by a hiatus. It is likely, however, that the site reaches quite far back into the mid-6th millennium calBC (Eiwanger 1984, 63; Larsen 1958, 48–50).

The early excavations in the Fayum were chronologically assessed in the 1950s by Libby himself. Two short-lived samples from the K-pits, Pit 13 (C-457) and Pit 59 (C-550), resulted in two consistent determinations in the second half of the

Table 2: Radiocarbon dates for the Pottery Neolithic of Lower Egypt

Site	Stratum	Lab. Code	Material	BP	68.2	95.4	Reference
Merimde Beni-Salame	T4: −0.6 m BS	U-10A	Grain	5430 ±120	4369–4060	4493–3987	(Olsson 1959)
	T4: −0.6 m BS	U-10B	Grain	5550 ± 100	4499–4271	4681–4083	
	T4: −0.6 m BS	U-73	Grain	5640 ± 100	4580–4357	4717–4328	
	T4: −1.8 m BS	U-31	Bone apatite	3630 ± 100	2191–1882	2290–1700	
	T4: −1.8 m BS	U-32	Bone collagen	4560 ± 140	3507–3031	3632–2921	
	−1.8 m BS	U-6	Charcoal	6130 ± 110	5217–4937	5315–4795	
	R1: −1.8 m BS	U-7	Charcoal	5710 ± 700	5460–3806	6102–3020	
	A18	U-8	Charcoal	5580 ± 230	4716–4081	4999–3951	
	?	U-9A	Charcoal	5970 ± 120	5016–4711	5211–4583	
	?	U-9B	Charcoal	5940 ± 100	4951–4707	5195–4550	
	TT2: −0.75 m	WSU-1846	Grain	5260 ± 90	4229–3983	4331–3821	(Hassan 1985)
	TT2: −1.02 m	W-4355	Charcoal	5750 ± 100	4712–4492	4826–4367	
	I.1	KN-3275	Charcoal	5830 ± 60	4771–4612	4834–4541	
	I.2	KN-3276	Charcoal	5790 ± 60	4710–4557	4782–4502	
	I.3	KN-3277	Charcoal	4750 ± 105	3640–3377	3774–3136	
	V.1	KN-3278	Charcoal	5590 ± 60	4463–4356	4541–4338	
	V.2	KN-3279	Charcoal	5760 ± 60	4688–4545	4728–4461	
Saïs	Saïs IB: L8022	Beta-228941	Charcoal	5090 ± 40	3958–3805	3969–3794	(Wilson, Gilbert and Tassie 2014)
	Saïs IB: L8023	Beta-228938	Charcoal	5260 ± 40	4225–3992	4231–3979	
	Saïs IB: L8024	Beta-228940	Charcoal	5100 ± 50	3964–3804	3990–3775	
	Saïs II: L8013	Beta-228939	Charcoal	4970 ± 60	3892–3662	3942–3647	

Site	Stratum	Lab. Code	Material	BP	68.2	95.4	Reference
Kom W	?	I-4127	Charcoal	5810 ± 115	4795–4528	4946–4374	(Wendorf and Schild 1976)
	Trench 1	UCIAMS-33835	Charcoal	5710 ± 20	4556–4499	4612–4486	(Wendrich, Taylor and Southon 2010)
	Trench 1	UCIAMS-33836	Charcoal	5665 ± 20	4517–4462	4540–4457	
	Trench 1	UCIAMS-33838	Charcoal	5660 ± 20	4504–4460	4537–4456	
	Trench 1	UCIAMS-33839	Charcoal	5670 ± 15	4520–4465	4536–4460	
	Trench 1	UCIAMS-33837	Charcoal	1755 ± 15	249–325	240–334	
Kom K	Trench 2	UCIAMS-34422	Charcoal	5620 ± 20	4490–4400	4498–4369	
	Trench 2	UCIAMS-33840	Charcoal	5680 ± 20	4540–4488	4546–4460	
	Trench 2	UCIAMS-22841	Charcoal	5640 ±15	4491–4456	4522–4406	
	Trench 2	UCIAMS-45069	Charcoal	5645 ± 20	4497–4456	4537–4405	
	Trench 2	UCIAMS-45070	Charcoal	5670 ± 25	4523–4464	4547–4455	
	Trench 2	UCIAMS-45068	Charcoal	5650 ± 20	4500–4457	4537–4450	
	Trench 2	UCIAMS-45071	Charcoal	5680 ± 20	4540–4488	4546–4460	
	Trench 3	UCIAMS-45074	Charcoal	5640 ± 25	4502–4450	4539–4374	
	Trench 3	UCIAMS-45072	Charcoal	5655 ± 20	4502–4458	4537–4453	
	Trench 3	UCIAMS-45073	Charcoal	5660 ± 25	4516–4460	4546–4451	
	Trench 4	UCIAMS-45075	Charcoal	5720 ± 30	4600–4504	4682–4486	
	Trench 4	UCIAMS-45076	Charcoal	5680 ± 25	4541–4466	4558–4455	
	Trench 4	UCIAMS-45077	Charcoal	5675 ± 25	4533–4466	4551–4454	
	Trench 5	UCIAMS-45078	Charcoal	5675 ± 25	4533–4466	4551–4454	
	Trench 5	UCIAMS-45080	Charcoal	5685 ± 45	4578–4458	4683–4400	
	Trench 5	UCIAMS-45079	Charcoal	5690 ± 25	4546–4489	4584–4458	
	Trench 6	UCIAMS-45081	Charcoal	5570 ± 30	4447–4365	4457–4352	
	Trench 6	UCIAMS-45082	Charcoal	5615 ± 25	4486–4374	4496–4366	
	Trench 6	UCIAMS-45083	Charcoal	5670 ± 25	4523–4464	4547–4455	
	Trench 6	UCIAMS-45084	Charcoal	5600 ± 25	4458–4372	4487–4361	
	Trench 7	UCIAMS-45085	Charcoal	5590 ± 25	4453–4371	4462–4357	
	Trench 7	UCIAMS-45086	Charcoal	5610 ± 25	4464–4372	4491–4366	
	Trench 7	UCIAMS-45088	Charcoal	5655 ± 25	4516–4458	4546–4406	
Upper K pits	Pit 13	C-457	Grain	6095 ± 250	5306–4729	5514–4463	(Libby 1955)
	Pit 59	C-550	Grain	6391 ± 180	5545–5081	5666–4936	
QS X/81	Hearth No.6[1]	Gd-978	Charcoal	5330 ± 100	4314–4046	4349–3966	(Kozlowski and Ginter 1989)
	Hearth No.1	Gd-1497	Charcoal	6320 ± 60	5357–5226	5472–5081	
	Hearth No.2	Gd-979	Charcoal	6290 ± 100	5372–5077	5474–5022	
	Hearth No.5	Gd-980	Charcoal	6290 ± 110	5375–5072	5478–4998	
QS I/79	1.45–1.50 m[2]	Bln-2333	Charcoal	5555 ± 60	4449–4351	4519–4270	
	1.75–1.85 m	Bln-2334	Charcoal	5645 ± 55	4542–4375	4606–4355	
	1.70–1.75 m	Gd-1140	Charcoal	5540 ± 70	4451–4339	4523–4259	
	Lowest level	Gd-708	Charcoal	6035 ± 650	5632–4264	6386–3637	
QS V/79	Hearth No.1?	Bln-2335	Charcoal	6075 ± 50	5055–4859	5207–4843	
	Hearth No.1	Gd-695	Charcoal	5990 ± 60	4946–4796	5020–4726	
QS XI/81	Hearth No.2	Gd-2021	Charcoal	6480 ± 170	5616–5305	5721–5056	
QS IX/81	Hearth No.1	Gd-149	Charcoal	6380 ± 60	5466–5312	5476–5227	
E29G Area B	Trench 4, layer 2	I-4131	Charcoal	5860 ± 115	4845–4556	5006–4458	(Shirai 2010)

[1] Hearths were numbered from the bottom to the top, i.e. Hearth no. 6 is the youngest and Hearth no. 1 is the oldest.

[2] Below surface.

Table 3: Bayesian phase models for Lower Egypt

Site	Model	Boundary	Phase	Model 68.2	Model 95.4
QS X/81	2 phase	Start 1	Phase 1	5436–5241	5772–5125
		End 1		5306–5038	5365–4688
		Start 2	Phase 2	4676–4116	5101–4039
		End 2		4305–4382	4439–2909
QS I/79	2 phase	Start 1	Phase 1	4982–4385	6035–4358
		End 1		4721–4381	5299–4358
		Start 2	Phase 2	4512–4381	4665–4354
		End 2		4442–4335	4490–4181

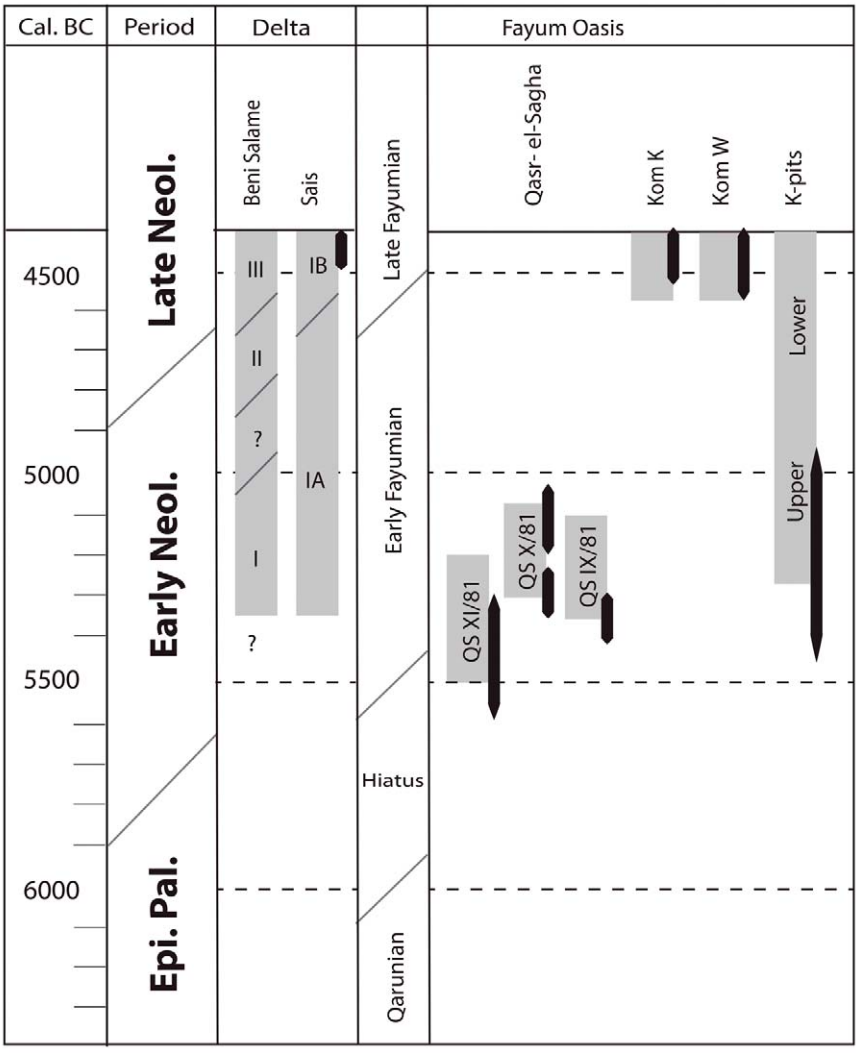

Fig. 4 Chronology of Lower Egypt Neolithic

6th millennium calBC (Libby 1955). A charcoal sample from Kom W (I-4127), suggested a younger date in the mid-5th millennium calBC (Wendorf and Schild 1976). A recent dating project on organic material from Kom W and Kom K, now stored in the Petrie Museum in London, confirmed this date (Wendrich, Taylor and Southon 2010).

Two sites near Qasr el Sagha (QS I/79, QS X/81) yielded sequences of radiocarbon dates, permitting Bayesian modelling of the results (Table 3). A model for site QS I/79 begins with the lowest sample (Gd-708), followed by a gap and then a sequence of dates from three further samples (Bln-2334, Gd-1140, Bln-2333). The model calculates the beginning of the phase to 4982–4385 BC at 68.2%, and 6035–4358 BC at 95.4%. A sequence of three samples from site QS X/81 were taken from the earliest Neolithic stratum.

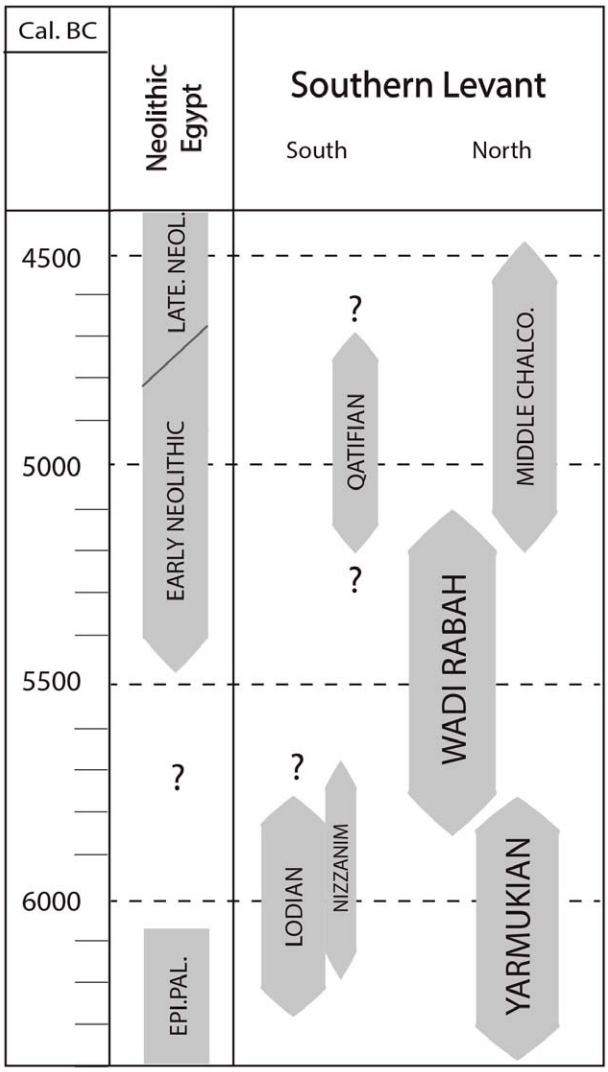

Fig. 5 Chronology of Southern Levantine Cultural Entities

These superposed one another (Gd-1497, Gd-979 and Gd-980), and were followed by a younger sample (Gd-978) from a hearth in a level above. The start boundary (and thus the earliest occupation at the site) can, therefore, be calculated to 5436–5241 BC at 68.2 %, and to 5772–5125 BC at 95.4 %.

The radiocarbon evidence from QS X/81 can be considered reliable and serves as a chronological anchor (Fig. 4). Similarly, the individual dates from Kom K, Kom W, Saïs, QS IX/81 and QS XI/81 are reasonably reliable chronological pegs. The dating of Saïs IA and Merimde Stratum I ('*Urschicht*') remains speculative. Based on the radiocarbon data that are currently available, it is possible that the Fayum Neolithic predates the Delta Neolithic, but as Eiwanger (Eiwanger 1984, 63) observed, it is highly unlikely that the Neolithic started independently in the oasis while 'skipping' the Delta.

3 Cultural entities of the Southern Levant

The Levantine cultural entities of the 6th to 5th millennia are little-studied, in comparison to those that followed them in the Bronze Age, and require some description. It should be noted that while the cultural entities now known as the Yarmukian and Wadi Rabah are relatively well defined, the Lodian, Qatifian and particularly the Nizzanim are not. The various entities have been discussed in detail by Avi Gopher (Gopher and Gophna 1993; Gopher 2012b) and Yosef Garfinkel (Garfinkel 1999a).

3.1 Yarmukian

The Yarmukian culture was first described in the late 1940s by Moshe Stekelis, based on his excavation at Sha'ar Hagolan (Fig. 6), where he observed a distinct assemblage characterised by herringbone-patterned ceramics and sickle blades with coarse denticulation. Based on these features, he defined the 'Yarmuk culture', named after the nearby Yarmuk river (Stekelis 1951). The Yarmukian is the earliest pottery-bearing culture in the southern Levant (Garfinkel 1993) and its remains have been uncovered at over 20 sites (Gopher 2012b, fig. 41.2a), though the major sites of this period are at Sha'ar Hagolan (Stekelis 1951; 1952; 1972), which was also later excavated by Garfinkel (Garfinkel and Miller 2002; Garfinkel and Ben-Shlomo 2009; Garfinkel, Ben-Shlomo and Korn 2010), and at Munhata (Gopher 1989; Garfinkel 1992). Extensive architectural remains have been uncovered at both these sites, including rectilinear courtyard houses and circular structures.

Yarmukian ceramics are surprisingly coherent in typology and decoration, given that they represent the first appearance of pottery in the southern Levant. Vessel shapes are dominated by deep bowls that are often decorated, along with footed vessels, hole-mouth jars, and necked jars (Fig. 7:1–6), but forms also include footed spoons, pithoi and miniature vessels. The herringbone decoration pattern is framed by two incised lines and is very common, becoming the *fossile directeur* of this cultural entity (Fig. 8: 5–8; Garfinkel 1999a, 19–67). The flint assemblage includes a large number of bifacially retouched sickle blades with heavy denticulation, Haparsa and Herzliya arrowheads, axes and adzes, perforators and scrapers (Fig. 7:7–13; Gopher and Gophna 1993, 309–311).

Yarmukian people relied on a Neolithic subsistence strategy, rearing domestic animals such as

sheep, goats, pigs, and cattle. Based on the faunal analysis, hunting was uncommon, possibly only being practised on a seasonal basis (Gopher 2012b, 1553–1554).

Extraordinarily rich imagery is notable in the Yarmukian material culture, including large numbers of clay figurines of plump seated women, frequently with 'coffee-bean' or 'cowrie-shell' shaped eyes (sometimes also called 'mother goddess' figurines), as well as pebble figurines with incised eyes (Fig. 7:14,15; Garfinkel, Ben-Shlomo and Korn 2010).

The Yarmukian culture can be firmly dated due to two extensive sequences of radiocarbon dates from Sha'ar Hagolan (Garfinkel 1999b; Garfinkel and Ben-Shlomo 2009, 16–20) and Nahal Zehora II (Gopher 2012b, Appendix 41.A). Based on these results as well as additional single samples from other sites, the Yarmukian culture falls into a range of c. 6350–5800 calBC (Gopher 2012b, 1532).

Following Larsen (Larsen 1958, 45), Eiwanger (Eiwanger 1984, 61–62) saw parallels for the herringbone patterns discovered at Merimde Beni-

Fig. 6 Map of Sites in the Southern Levant Mentioned in the Text

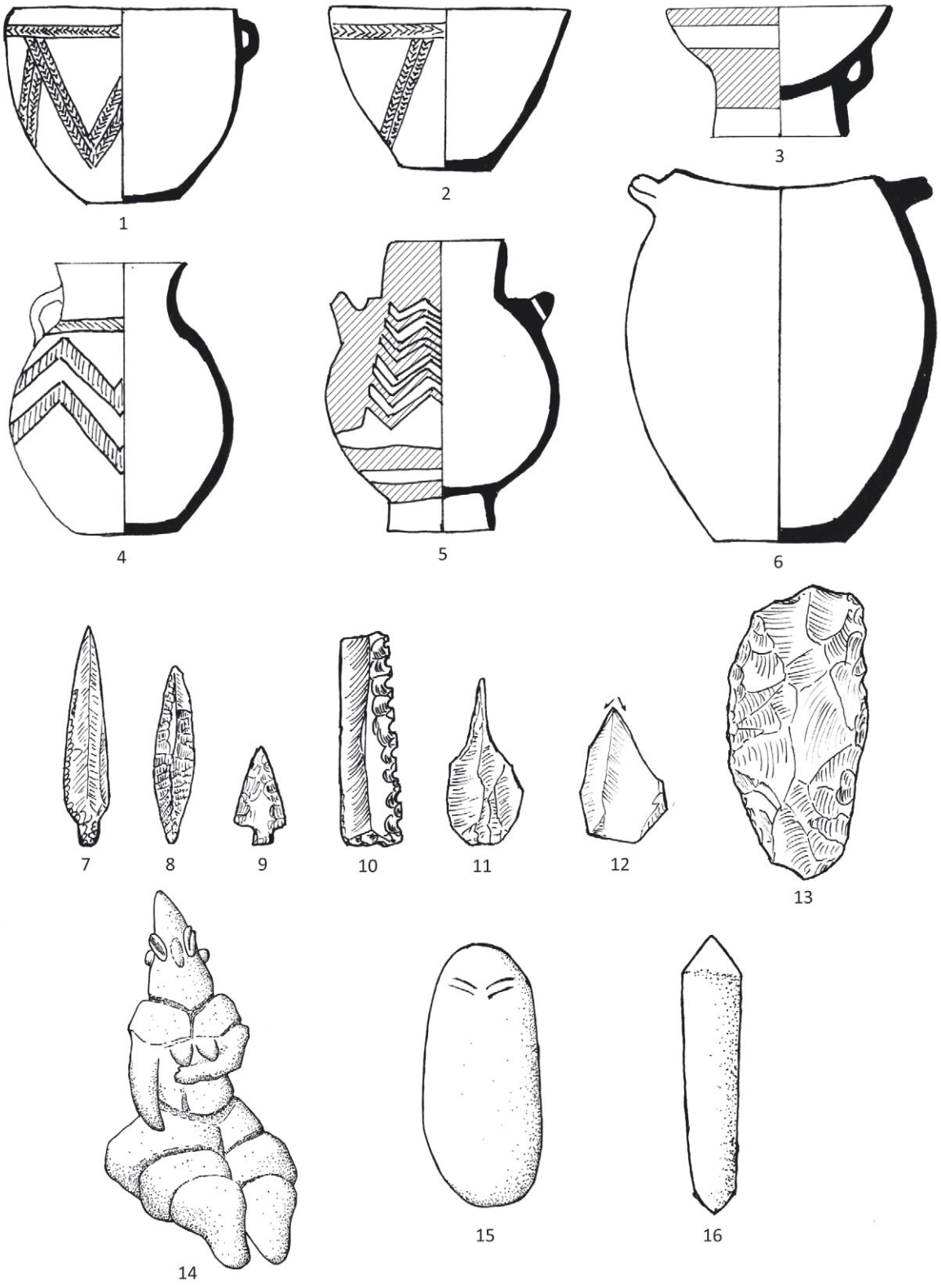

Fig. 7 Yarmukian Material – 1. Deep bowl (Munhata 2b; Garfinkel 1999: fig. 12:3); 2. Deep bowl (Munhata 2b; Garfinkel 1999: fig. 12:5); 3. Chalice (Megiddo XX; Garfinkel 1999: fig. 9:6); 4. Jar (Sha'ar Hagolan; Garfinkel 1999: fig. 26:4); 5. Jar (Nahal Qanah Cave; Garfinkel 1999: fig. 30:2); 6. Holemouth jar (Sha'ar Hagolan; Garfinkel 1999: fig. 31:3); 7. Arrowhead (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 2); 8. Arrowhead (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 2); 9. Arrowhead (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 2); 10. Sickleblade (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 2); 11. Perforator (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 2); 12. Burin (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 3); 13. Bifacial (Sha'ar Hagolan; Gopher and Gophna 1993: fig. 3); 14. Female figurine ((Sha'ar Hagolan; Garfinkel 1993: fig. 9:2); 15. Pebble fiurine (Sha'ar Hagolan; Garfinkel 1993: fig. 12); 16. Cylindrical clay pestles (Garfinkel 1999: fig. 5:b)

Salame in the Yarmukian wares found at Sha'ar Hagolan. He (1984, 62) argued that "die Gefäßformen sind meist nicht vergleichbar. Trotz vieler Unterschiede kann an einer ganz allgemeinen Beziehung jedoch kaum gezweifelt werden, ohne das angesichts des gegenwärtigen Forschungsstandes Frage der Priorität und des gegenseitigen Einflusses beantwortet werden können." More recently, Noriyuki Shirai (Shirai 2010) conducted an in-depth analysis of the Fayumian Epipalaeolithic and Neolithic assemblages. He argued that while some features of Fayumian ceramics might originate from the eastern Western Desert tradition, the typological variety of the assemblage from Lower Egypt was likely to have been influenced mainly by the southern Levant (Shirai 2010, 314). He particularly observed the resemblance between the flat plates, bowls and jars with flat bases, and miniature vessels with pedestals from the Fayum Neolithic, and those of the Yarmukian (Shirai 2010, 314).

However, chronological considerations render such an influence to be highly unlikely: the Yarmukian culture is firmly dated to the end of the 7th and early 6th millennium calBC, but radiocarbon dates for the Fayumian and Delta Neolithic do not suggest a date earlier than the mid-6th millennium, as noted above. This indicates that the two cultural entities were hundreds of years apart.

Further, Eiwanger pointed out that while the herringbone pattern of the Merimde Beni-Salame resembles that of the Yarmukian culture, the ceramic shapes were very different. I would also add that while both cultures used herringbone patterns, their execution differs drastically, as will be elaborated below.

3.2 Lodian (Jericho IX/Pottery Neolithic A)

This cultural group has been referred to by three different terms, which essentially describe the same typological characteristics: Jericho IX, based on the sequence first uncovered at Jericho by John Garstang (Garstang, Droop and Crawfoot 1935; Garstang, Ben-Dor and Fitzgerald 1936; Garfinkel 1999a: 68); Pottery Neolithic A, based on the sequence described by Kathleen Kenyon at Jericho (Kenyon 1957; Kenyon 1960); and Lodian, based on the excavation of the toponymous site of Lod (Gopher 1995; Gopher 2012b, 1532, 1539–1541). I use the latter in this paper.

Gopher (Gopher 2012b, fig. 41.2b) identified 22 Lodian sites that cover the entire southern Levant,

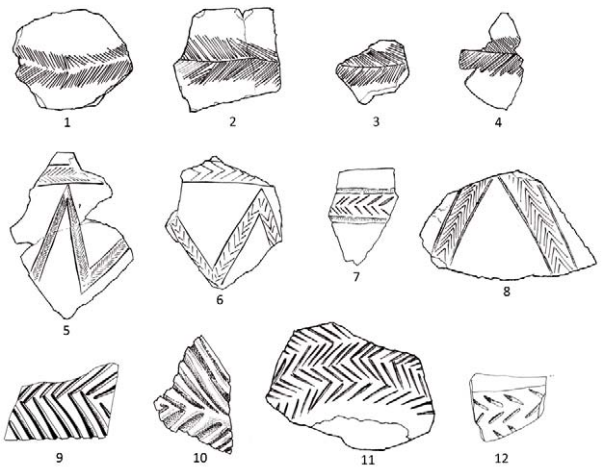

Fig. 8 Fishbone Pattern Decoration
1.–4. Merimde Beni Salame (Eiwanger 1984: figs. I.330; I.341; I.355; I.347);
5.–6. Munhata (Garfinkel 1999: photo 40);
7.–8. Megiddo (Garfinkel 1999: photo 41);
9.–10. Ein el Jarba (Streit et al. in press: fig. 9:5,6);
11. Munhata (Garfinkel 1999: photo 73);
12. Ein el Jarba (Streit et al. in press: fig. 9:1)

extending east and west of the Jordan River and as far north as the Hula Valley. There are some discrepancies regarding the sites of Nizzanim, Giva't Haparsa, Ziqmim, which have led to them being called the Nizzanim variant by Garfinkel, and which will be discussed in the following section.

Only scant wall remains of rectilinear and curved architecture have been uncovered at Lodian sites, such as at Nahal Zehora II (Gopher 2012c) or Tel Te'o (Eisenberg, Gopher and Greenberg 2001, 18–23), while Lod yielded pit structures that have been interpreted as dwellings (Gopher and Blockman 2004, 4).

The ceramic assemblage of the Lodian contains shapes similar to those of the Yarmukian (Garfinkel 1999, 75) yet differs in its decoration. Instead of the Yarmukian herringbone pattern, vessels are decorated with a painted decoration of reddish brown colour on a cream-coloured slip (Fig. 8:1–6). Zigzag lines and horizontal bands were popular, and the painted section of a vessel was often burnished as well (Garfinkel 1999a, 96). Notable features of the lithic assemblage are wide sickle blades that bear intensive bifacial retouching and have a curved or trapezoidal shape, though classic Yarmukian sickle blades are also part of the assemblage. Other aspects of the assemblage include small arrowheads of the Haparsa, Nizzanim and Herzeliya types, axes, bifacial knives, perforators, scrapers, and notched

and denticulated items (Fig. 8:7–14; Gopher and Gophna 1993, 319).

The subsistence pattern observed at Lodian occupation sites such as Nahal Zehora II does not differ from that seen in Yarmukian strata (Davis 2012), being based on domesticate species such as sheep/goats, cattle, and semi-domesticated pigs. Hunting was not a major subsistence strategy of this cultural entity.

The chronological position of the Lodian is still being debated. While Garfinkel suggested that the Lodian was a regional variant, contemporary to the Yarmukian Neolithic (Garfinkel 1999a, 102), Gopher argued that the Lodian immediately followed the Yarmukian (Gopher 2012b, 1532). Both radiocarbon dating and stratigraphic assessments are inconclusive on this point. Typological similarities between Yarmukian and Lodian pottery are evident (Garfinkel 1999, tab. 11), and it is likely that the Lodian formed under the influence of the Yarmukian Neolithic, but how far the Lodian overlapped other early cultural entities, such as the Wadi Rabah, remains unresolved. Gopher and Noga Blockman have argued for a chronological overlap between the Wadi Rabah and the Lodian cultures (Gopher and Blockman 2004, 47), but Edward Banning (Banning 2007, 88) suggested that there was either no overlap or only a very short one, based on a Bayesian analysis of the available radiocarbon data. Only two samples were available to him (one from Hagoshrim, one from Drah), but since then additional samples have been published, providing nine determinations in total (Gopher 2012b, Appendix 41.a). An in-depth discussion of Lodian dating is pending, but the available radiocarbon dates from these determinations cover approximately 6200–5800 calBC, supporting Banning's suggestion. Considering that the geographic spread of the Wadi Rabah predominantly encompasses the central and northern parts of the southern Levant, it is possible that the Lodian complex could have continued into the mid-6th millennium in the more southerly reaches of the southern Levant.

In his analysis of the lithic assemblage of the Fayumian Epipalaeolithic and Neolithic, Shirai observed (Shirai 2010, 315) strong parallels between the intensely bifacially retouched and serrated sickle blades of the Fayum with those typical of the Lodian culture, which he viewed as a later phase of the Yarmukian. He further noted that this type became less common in the following Wadi Rabah culture, while it persisted in Egypt, and pointed out parallels between the bifacially-flaked and polished axes of triangular shape common to the Yarmukian and Lodian culture and those of the Egyptian Neolithic (Shirai 2010, 317).

That said, it is difficult to envisage how the Lodian made a feasible contribution to the Egyptian Neolithic. Based on the available radiocarbon data, the Lodian (like the Yarmukian) appears to pre-date the onset of the Pottery Neolithic in Egypt by at least 300 years.

3.3 Nizzanim variant

The Nizzanim variant is an ambiguous entity, even in the protohistory of the southern Levant. The term refers to remains found at only three sites, all located on the southern coastal plain: Nizzanim (Yeivin and Olami 1979); Giva't Haparsa (Olami, Burian and Friedman 1977); and Ziqmim (Garfinkel *et al*. 2002). None of these sites yielded architectural remains. Ceramics have only been found in small quantities and seem to differ from the Yarmukian and Lodian traditions. In comparison to other Neolithic wares, the pottery has been regarded as being crudely manufactured, of simple shapes, and having a low proportion of decorations (Garfinkel 1999a, 97; Garfinkel *et al*. 2002, 88). The flint assemblage shows a strong resemblance to that of earlier pre-Pottery Neolithic C sites and features a relative abundance of arrowheads, sickle blades (Yarmukian and Lodian types) and perforators, while bifaces are relatively scarce (Garfinkel 1999a, 117; Garfinkel *et al*. 2002, 96–117).

The chronological position of the Nizzanim group is unclear, particularly as no direct stratigraphic relationships to other cultural entities have been observed to date. While Garfinkel (1999, 97) proposed that it coexisted with the Yarmukian and Lodian, Gopher and Gophna (Gopher and Gophna 1993, 317–318) considered it to be a variant of the Lodian tradition. Absolute dating also remains problematic. Three radiocarbon dates are available – two from Giv'at Haparsa and one from Nizzanim (Garfinkel 1999, tab. 24) – but only that from Nizzanim (Hv-8509: 6790 ± 90 BP) was undertaken on a short-lived bone sample. It calibrates to 5767–5619 calBC at 68.2 % or 5878–5541 calBC at 95.4 %. This would suggest a chronological position parallel to the Wadi Rabah culture, but is contradicted by the lithic assemblage.

As such, the exact nature of the Nizzanim group remains unresolved, but an interpretation of Nizzanim sites as seasonal hunting or fishing

camps (Garfinkel 1999, 97) appears feasible. Both the ceramic and the lithic assemblages show strong affinities with the Pottery Neolithic rather than the Early Chalcolithic, suggesting that the single radiocarbon determination might not reflect the accurate date of its site. Further, it should be borne in mind that only three sites, each with very restricted horizontal exposures, have been ascribed to this group. It is, therefore, questionable whether there is sufficient data to distinguish a cultural group. I share the position of Gopher (Gopher 2012b, 1539), who does not accept the Nizzanim as a separate group, but rather interprets it as a variant of the Lodian.

Tassie (Tassie 2014, 194) argued on chronological terms that farmer-herders of the Wadi Rabah or possibly the Nizzanim culture migrated to Lower Egypt. The former option will be discussed in a later section, but based on the currently available data, and regardless of whether it should be considered a distinct group or rather part of the Lodian culture, the Nizzanim variant appears to have closer affinities to the Levantine cultural entities of the early 6th millennium than to later Egyptian ones. It is, therefore, likely that the Nizzanim, like the Yarmukian and Lodian, pre-dates the Egyptian Neolithic by a considerable margin.

3.4 Qatifian

The term 'Qatifian culture' was coined by Izik Gilead (Gilead and Alon 1988) and later further defined by Garfinkel (Garfinkel 1999, 189–199) and Goren (Goren 1990), based on remains from Qatif (Gilead 1993) and four other sites: Nahal Besor (Gilead and Alon 1988); Herzeliya (Praus-nitz 1970); Teluliyot Batashi (Kaplan 1958b); and Tell Wadi Feinan (Najjar *et al*. 1990). 'Ain Waida, on the eastern bank of the Jordan (Kujit and Chesson 2002), has also been considered another Qatifian site. This wide geographic spread of sites is misleading, because only about 200 diagnostic sherds from ten locations form the basis for describing this culture. Although Gilead (Gilead 2007, 44) insists that the Qatifian is a distinct cultural entity, little definitive data can be found to support this.

Rectilinear architectural remains are currently only known from 'Ain Waida (Kujit and Chesson 2002). Qatafian ceramics appear to have been rather crude and of simple typological shapes (bowls, hole-mouth jars and necked jars), which were only rarely decorated (Fig. 10:1–5; Garfinkel 1999a, 189–197). The flint assemblages from these sites have only been discussed for each site individually and general trends are thus difficult to define. Sickle blades were typically broad and flat, and had one finely denticulated working edge. Axes and adzes are also common, as were scrapers, perforators, and notched items (Fig. 10:6–9; Gilead and Alon 1988, 115*–124*). The similarity between Wadi Rabah sickle blades and Qatifian blades should be noted.

The chronological position of the Qatifian sites, and particularly their relation to main cultural entities such as the Wadi Rabah, remains elusive. At Teluliyot Batashi, Stratum IIIH was believed by the excavator to have had certain characteristics parallel to those of Site H at Nahal Besor (Kaplan 1958b, 12), and it superposed the Wadi Rabah phases of the same Stratum III. At other sites, such as 'Ain Waida, the assemblage is too restricted for conclusions to be reached (Kujit and Chesson 2002, 115). Consequently, two opposing chronological models for the Qatifian have been proposed: Garfinkel (Garfinkel 1999a, 189) believes that this group postdates the Wadi Rabah and places it in the Middle Chalcolithic; Gopher (Gopher 2012b, 1533) argues that the Qatifian parallels the later phase of the Wadi Rabah.

The only two radiocarbon dates available are from Qatif (Pta-2968: 6040 ± 80 BP), dating to 5047–4836 calBC at 68.2% or 5209–4771 calBC at 95.4% (Gilead 1988, tab. 1), and from 'Ain Waida (AA-29771: 6170 ± 55 BP), dating to 5210–5055 calBC at 68.2% or 5296–4986 calBC at 95.4% (Kujit and Chesson 2002, tab. 1). These results support Garfinkel's chronological model, and place this group parallel to Middle Chalcolithic sites such as Tel Tsaf (Streit and Garfinkel 2015).

Andrew B. Smith (Smith 1989) explored the interaction between the southern Levant and Lower Egypt in both pre-Pottery Neolithic and Pottery Neolithic times. He drew attention to the similarly crude execution of ceramics at Merimde Beni-Salame and at Qatif, and concluded that this could reflect "the idea of ceramic manufacture being introduced through pastoral contacts with North Africa" (Smith 1989, 75). Smith's argument is weak. The Qatifian appears to date to the very end of the 6th and the 5th millennium calBC, and thus postdates the onset of the Pottery Neolithic in Egypt. And while both ceramic traditions are indeed rather crude, the Qatifian lacks the red-and-black burnish that dominates the ceramic assemblages of the Merimde Beni-Salame and the

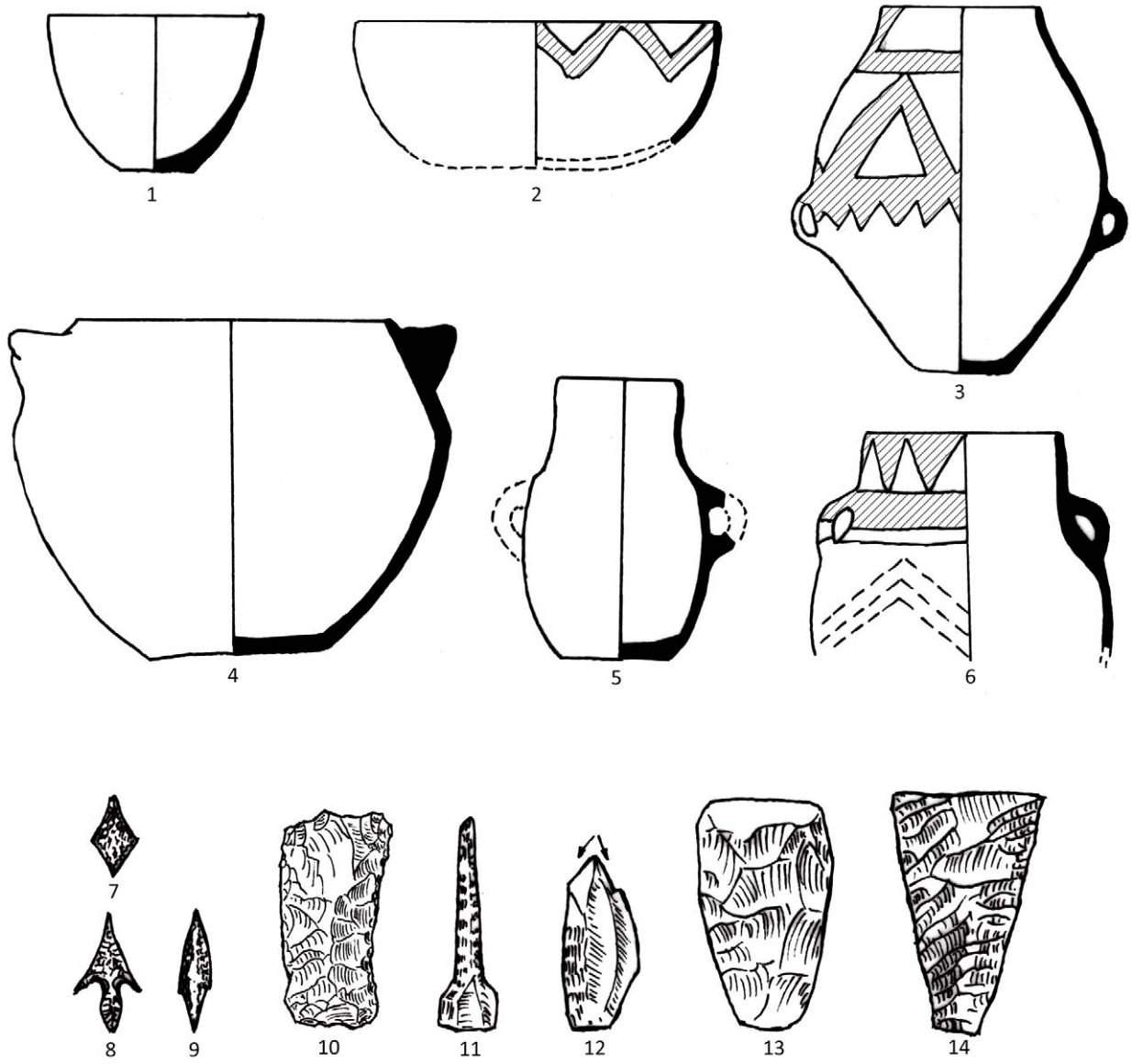

Fig. 9 Lodian Material – 1. Bowl (Kh. Ed-Dharih; Garfinkel 1999: fig. 47:5); 2. Bowl (Ghrubba; Garfinkel 1999: fig. 48:10); 3. Jar (Ghrubba; Garfinkel 1999: fig. 60:2); 4. Holemouthjar (Jericho; Garfinkel 1999: fig. 57:1); 5. Jar (Jericho; Garfinkel 1999: fig. 60:1); 6. Jar (Jericho; Garfinkel 1999: fig. 55:3); 7. Arrowhead (Givat Haparsa; Gopher and Gophna 1993: fig. 8); 8. Haparsa point (Givat Haparsa; Gopher and Gophna 1993: fig. 8); 9. Nizzanim point (Givat Haparsa; Gopher and Gophna 1993: fig. 8); 10. Lodian sickle blade (Nizzanim; Gopher and Gophna 1993: fig. 7); 11. Perforator (Nizzanim; Gopher and Gophna 1993: fig. 7); 12. Burin (Givat Haparsa; Gopher and Gophna 1993: fig. 8); 13. Bifacial (Nizzanim; Gopher and Gophna 1993: fig. 7); 14. Bifacial knife (Nizzanim; Gopher and Gophna 1993: fig. 7)

Fayumian tradition, and no parallels are evident in their lithic assemblages.

3.5 Wadi Rabah

The Wadi Rabah culture was first defined by Jacob Kaplan in the late 1950s and 1960s based on his excavations at Wadi Rabah (Kaplan 1958a), Tel-uliyot Batashi (Kaplan 1958b), Lod (Kaplan 1977), Habashan Street (Kaplan and Ritter-Kaplan 1993), Kefar Gil'adi (Kaplan 1958b) and Ein el-Jarba (Kaplan 1969). It appears to have occupied most of the southern Levant: 42 sites have been identified for the Wadi Rabah cultural entity (Streit 2016, tab. 6.2; Gopher 2012b, fig. 41.2c).

Ceramics are dominated by wares with red-and-black burnished decoration as well as incised, impressed, or combed patterns. Typological shapes include deep and shallow bowls, tubular stands, chalices, pithoi with thumb-impressed ledge handles, hole-mouth jars of varying sizes, and necked

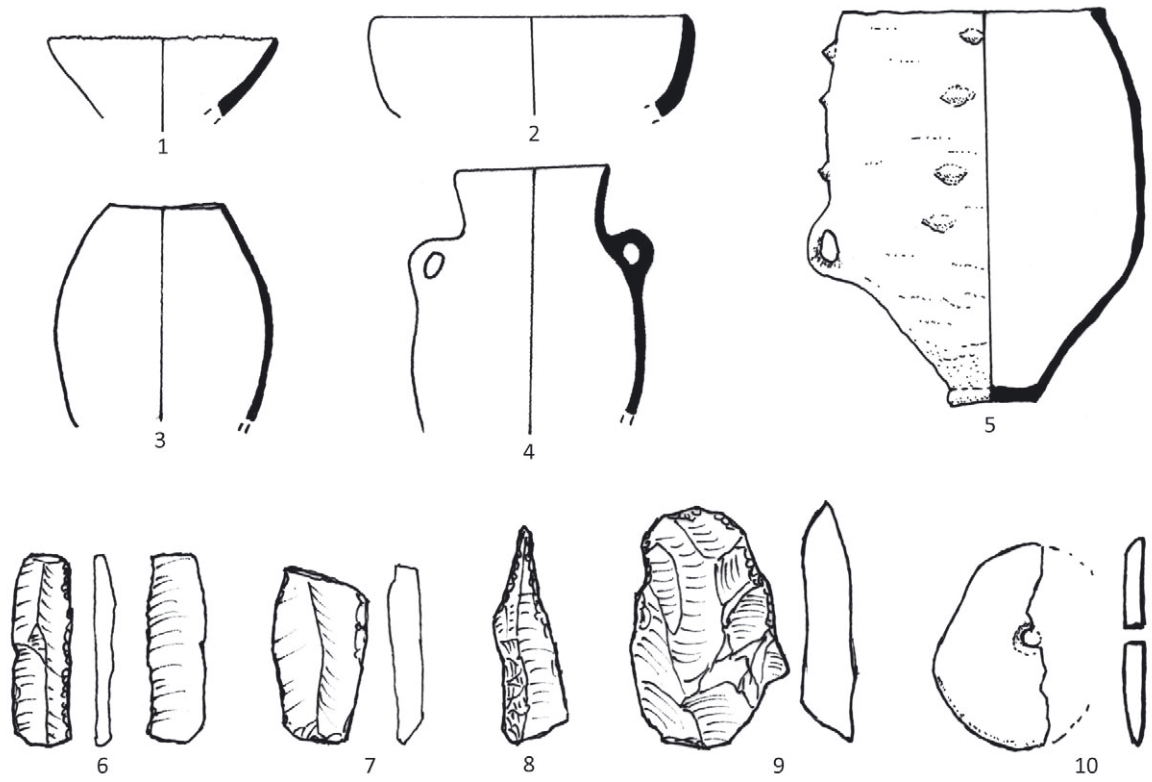

Fig. 10 Qatifian – 1. Shallow bowl (Tell Wadi Feinan; Garfinkel 1999: fig. 117: 5); 2. Shallow bowls (Nahal Besor; Garfinkel 1999: fig. 117: 15); 3. Holemouth jar (Nahal Besor; Garfinkel 1999: fig. 118: 1); 4. Necked jar (Qatif; Garfinkel 1999: fig. 121: 1); 5. Holemouth pithos (Qatif; Garfinkel 1999: fig. 119); 6.–7. Sickle blades (Ain Waida; Chesson and Kuijt 2002: fig. 11:c,a); 8. Perforator (Ain Waida; Chesson and Kuijt 2002: fig. 12:b); 9. Adze (Ain Waida; Chesson and Kuijt 2002: fig. 12:e); 10. Pierced pottery disc (Ain Waida; Chesson and Kuijt 2002: fig. 14:d)

jars with bow and flaring rims (Fig. 11:1–7; Garfinkel 1999, 108–141). A wide variety of decoration is common on Wadi Rabah ware. Red and black slip and burnish are most common, though the assemblage also includes incised or combed decoration of dots, parallel lines, wavy and zigzag lines, net patterns and herringbone patterns as well as applied and occasionally painted decorations (Garfinkel 1999, 142–147).

The flint assemblage is characterised by a flake-oriented industry. The *fossile directeur* of the Wadi Rabah assemblage are sickle blades with a heavy triangular section, straight back and fine denticulation. Perforators and bifaces, such as adzes and axes, are common, while arrow heads are significantly less frequent than in earlier cultural assemblages (Fig. 11:8–16; Gopher 1989). Arrowheads might have been replaced by biconical sling stones, which are particularly characteristic for a Wadi Rabah ground stone tool assemblage (Fig. 11:19; Rosenberg 2009) that otherwise shows many features common to the Pottery Neolithic (Gopher 2012a; Gopher and Orrelle 1995b).

Architecture was predominantly rectilinear with broad-room houses, for example at Munhata (Garfinkel 1992, 15–18; Gopher and Orrelle 1995b, 212, pl. 4) and Hagoshrim (Getzov 2011, 1–5). Floors were either made of beaten earth or were plastered, notably at Nahal Zehora II (Gopher 2012c, 279–282, 284) and Ein el-Jarba (Streit 2015, 25–26). Storage facilities were commonly circular bins lined with stone slabs of various sizes, such as at Abu Zureiq (Oshri 2000, 34–36) and Tel Te'o (Eisenberg, Gopher and Greenberg 2001, 23–27). A grille structure with many parallel walls was found at Munhata, and should probably be interpreted as the foundation of a granary (Gopher and Orrelle 1995b, 212, pl. 4). Hearths and installations have been found both inside and outside buildings.

The subsistence pattern was based mainly on sheep and goats, though with some cattle and pigs (Horwitz 2002; Davis 2012; Haber and Dayan 2004). Emmer wheat and barley were the most common food crops (Kislev and Hartmann 2012, 1322, tab. 32.1; Miller Rosen 2001, 155, tab. 10.2). Olives were exploited for oil for the first time, as

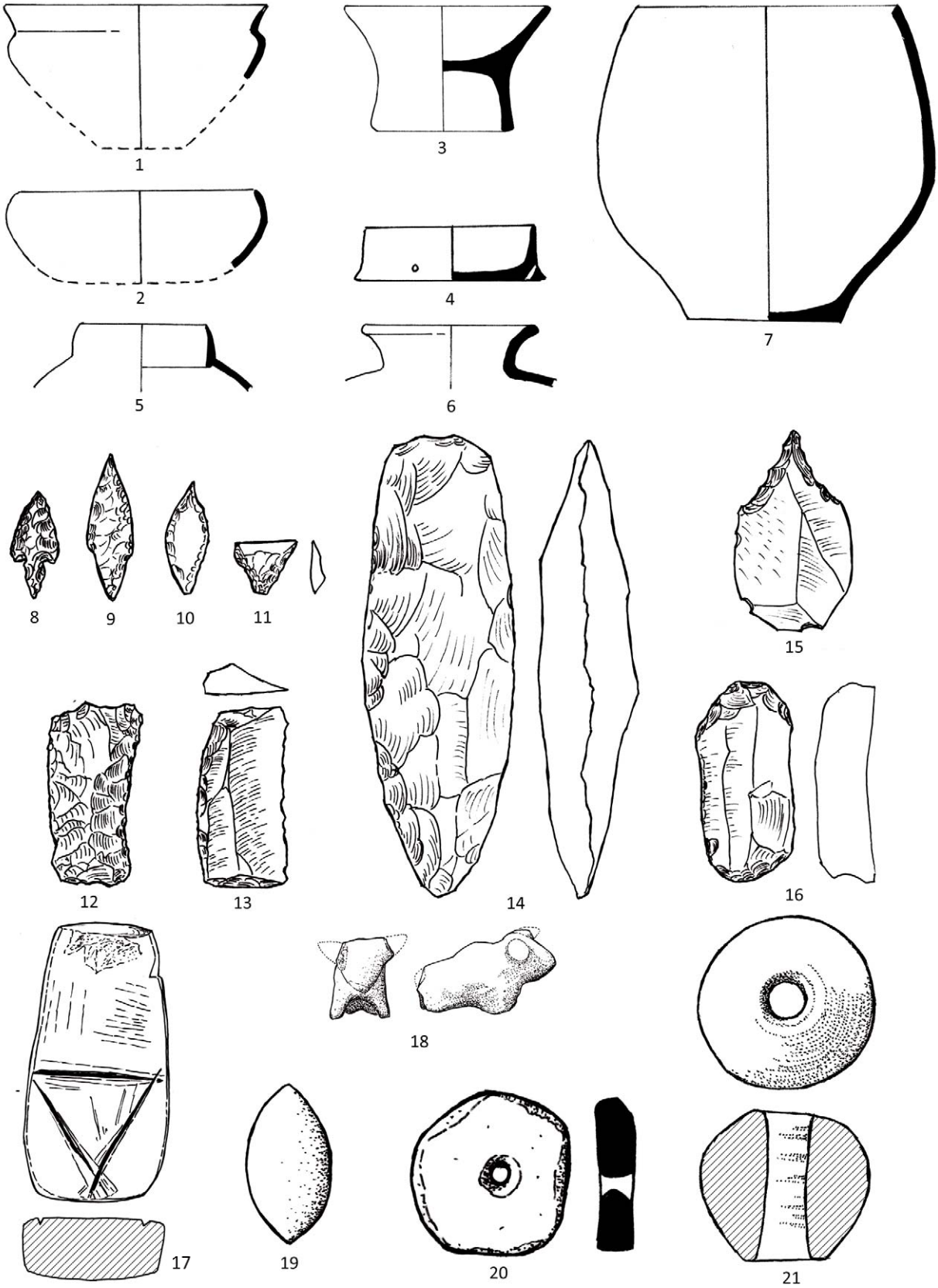

Fig. 11 Wadi Rabah Material – 1. Carinated deep bowl; 2. Shallow rounded bowl; 3. Chalice; 4. Lid; 5. Bow-rim jar; 6. Flaring neck jar; 7. Holemouth jar (Munhata; Garfinkel 1999: fig. 66); 8. Haparsa arrowhead (Nahal Zehora II; Barkai and Gopher 2012: fig.19.14:3); 9. Nizzanim arrowhead (Munhata; Gopher 1989: fig. 37:4); 10. Herzeliya arrowhead (Munhata; Gopher 1989: fig. 38:1); 11. Transversal arrowhead (Nahal Zehora II; Barkai and Gopher 2012: fig. 19.14:5); 12. Lodian sickle blade (Nahal Zehora II; Barkai and Gopher 2012: fig.19.26:7); 13. Wadi Rabah sickleblade (Munhata; Gopher 1989: fig. 41:9); 14. Axe (Munhata; Gopher 1989: fig. 45:1); 15. Borer (Munhata; Gopher 1989: fig. 49:2); 16. Scraper (Munhata; Gopher 1989: fig. 51:2); 17. Trapezoid figurine (Nahal Zehora II; Gopher and Eyal 2012: fig. 29.18a:1); 18. Horned animal (Munhata; Garfinkel 1995: fig. 38:2); 19. Sling stone (Nahal Zehora II; Gopher 2012a: fig. 24.29:7); 20. Pierced pottery disc (Nahal Zehora II; Orrelle, Eyal, and Gopher 2012: fig. 15.4:8); 21. Macehead (Munahata; Gopher and Orrelle 1995: fig.33:15)

shown in both pollen cores and the archaeological record (Namdar *et al*. 2014).

Altogether, 38 radiocarbon dates are available from Wadi Rabah contexts, from twelve sites, and indicate that the Wadi Rabah cultural entity lasted between approximately 5700 and 5200 calBC (Streit 2016, section 6.3.2).

Ashten R. Warfe (Warfe 2003) undertook a detailed study of the cultural origin of the Egyptian Pottery Neolithic. While emphasising the cultural contribution of the Western Desert groups to the Neolithic of Lower Egypt (Warfe 2003, 196–197), he (Warfe 2003, 193) identified burnished ware and sickle blades as possible foreign influences, which might have been imported along with new crops from the southern Levant. He observed (Warfe 2003, 190) that red burnished ware, occasionally decorated with herringbone patterns, was found in the Jericho Pottery Neolithic B, and that it represented the Wadi Rabah occupation at the site. Similarly, Tassie wrote, without further elaboration, that the ceramic styles of the Nizzanim or the Wadi Rabah groups are "concordant with possible progenitors of Lower Egyptian pottery styles" (Tassie 2014, 194). Noting that the sickle blades typical for the Wadi Rabah culture differ from those observed in Lower Egypt (rectangular, backed and truncated, rather than bifacial intensely retouched blade), he proposed that Lodian blades continued to be used, alongside Wadi Rabah blades (Tassie 2014, 194).

The Wadi Rabah culture chronologically overlaps that of the Neolithic of Egypt, which by itself makes it the most likely candidate to have contributed to the Neolithisation process of the Delta and the Fayum. Further, the Wadi Rabah culture produced red-and-black burnished ceramics of the sort common in the Delta and Fayum, and occasionally produced incised herringbone patterns that closely resemble the Delta and Fayum styles, as already noted by Warfe (Warfe 2003, 190). Many further parallels can be observed on closer examination of both assemblages, as discussed in the next section.

4 Similarities between Wadi Rabah and Egyptian material culture

Of the five cultural entities discussed above, the Yarmukian, Lodian, and Qatifian are unlikely to have contributed to the Pottery Neolithic of Egypt, as they either pre- or post-dated the onset of this phase in the Fayum and the Delta. The assemblage of the so-called Nizzanim variant remains ill-defined and it's dating is uncertain, but because it was probably part of, or contemporaneous with, the Lodian culture it is unlikely to have contributed to the Pottery Neolithic of Egypt. Consequently, the Wadi Rabah culture is the most likely influence based on chronological considerations alone. Possible parallels in the material culture of both regions were briefly suggested by Warfe (Warfe 2003, 190) and Tassie (Tassie 2014, 194), but have not yet been examined in detail. A more detailed comparison of both assemblages and possible influences is presented here.

4.1 Pottery

Several parallels can be observed between the typological shapes of the Wadi Rabah culture and the Pottery Neolithic of Egypt. For example, both assemblages show very high frequencies of hole-mouth jars and simple bowls (Eiwanger 1984, 27–31; Garfinkel 1999a, 127–128), while chalices have been singled out as a non-local shape in Egypt (Kantor 1942, 174–175) and regularly occur in the Wadi Rabah assemblage (Garfinkel 1999a, 123–125). However, the necked jars, pithoi, and carinated shapes of Wadi Rabah ceramics are absent from the Egyptian assemblage.

4.2 Decoration

At Merimde Beni-Salame, Stratum I, vessels finished with burnishing made up nearly two-thirds (62.5 %) of the entire assemblage, and the smoothened, non-burnished variety about one-third (33.7 %). The slip and burnish shows numerous shades of red, ranging from dark red to nearly black shades. No quantitative data is available for the Fayumian assemblages, but a high frequency of slip and burnish is evident (Caton-Thompson and Gardner 1934, pls. XVIII–XX). Red-and-black slip and burnish is the most frequent style found at Wadi Rabah sites, and ranges from 56 % of the decorated assemblage at Nahal Zehora II Stratum I, through 82.5 % (Munhata 2B) to 89 % (Nahal Zehora I, Stratum B). Among the Wadi Rabah culture, as in Lower Egypt but unlike any of the other cultural entities proposed as influences, red-and-black slip and burnish is the most popular decoration technique.

About 2.3 % of the assemblage at Merimde Beni-Salame (Eiwanger 1984, 22–24, fig. 5) had also been decorated with a herringbone pattern (Fig. 8:1–4). This motif has been paralleled with

herringbone patterns on Yarmukian ware (Fig. 8:5–8; Eiwanger 1984, 62; Shirai 2010, 314), but the chronological position of the Yarmukian makes direct stylistic influence highly unlikely. As described above, Larsen (Larsen 1958, 45) observed parallels between the Merimde decoration with Yarmukian sherds from Jericho, Stratum VIII, but this stratum was later attributed to the Wadi Rabah culture, and the Yarmukian sherds have been identified as intrusive (Garfinkel 1999, 148). Larsen was right to observe Levantine influence in Egyptian material culture, but he got the influencing culture wrong.

In addition to the chronological issues, a stylistic comparison shows clear dissimilarities: the Merimde Beni-Salame herringbone decoration consists of thin, rather irregular chevron-like lines running outwards (often from a central line); the Yarmukian patterns are narrow, very regular, confined by two lines that were rarely wider than 2 cm apart, and without a central line (Fig. 8:5–8). Herringbone patterns frequently appear as an incised motif on Wadi Rabah ware, and are quite dissimilar to Yarmukian herringbones. Wadi Rabah herringbone patterns are not framed by two lines, and the width of the pattern is typically twice that found on Yarmukian ceramics (Fig. 8:9–12; Garfinkel 1999a, 145). Such Wadi Rabah herringbone patterns have been recorded at Munhata 2A (Garfinkel 1992, fig. 137:1, 8, 12), Jericho (Kenyon and Holland 1982, fig. 33:6–7; Garstang, Ben-Dor and Fitzgerald 1936, pl. XXXIII:18), Tel Qiri (Baruch 1987, fig. 66:13), Neve Yam (Prausnitz 1977), Wadi Rabah (Kaplan 1958a, fig. 6:2, 6), Lod (Kaplan 1977, fig. 6:10), Telulyot Batashi (Kaplan 1958b, fig. 10:11, 14), and Nahal Zehora II Stratum II (Gopher and Eyal 2012a, fig. 10.66:8, 9, 15, 18). Rather than deriving from the Yarmukian ceramic tradition, the Merimde Beni-Salame herringbone pattern seems to derive from the very similar and contemporary Wadi Rabah incised decoration.

4.3 Flint

The sickle blades of Neolithic Egypt are predominantly a bifacial, intensely retouched type (Fig. 3:8), which have been paralleled with Lodian sickle blades (Fig. 9:10; Shirai 2010, 315; Tassie 2014, 239). While an influence of the Lodian culture in Neolithic Egypt is rather unlikely based on chronological considerations, it is possible that this sickle blade tradition continued well into the Wadi Rabah phase, particularly in the northern Negev (Tassie 2014, 194).

Bifacially retouched axes and adzes were uncovered in the K-pits of the Fayum Neolithic (Fig. 3:9; Caton-Thompson and Gardner 1934, pl. XXIX:13, 14) as well as in the Delta region at Merimde Beni-Salame, Stratum I (Eiwanger 1984, pl. 62). Bifaces continued in the slightly later Kom W (Caton-Thompson and Gardner 1934, pl. IX:1–15) and Kom K (Caton-Thompson and Gardner 1934, pl. XXIII:5–15). Shirai (Shirai 2010, 317) has pointed out their similarity with Yarmukian/Lodian examples, but this type was also very common in the Wadi Rabah culture (Fig. 11:14).

The side-notched, tanged arrowhead uncovered in the lowest stratum at Beni-Salame (Fig. 3:7; Eiwanger 1984, pl. 57), and six similar specimens found in the Fayum during surface collections by Caton-Thompson and Shirai (Shirai 2010, 321–323), have attracted attention. Another 343 small arrowheads of the Haparsa and Nizzanim types were collected on the surface by Caton-Thomson at the Fayum sites Camp II, Site V, and the Z-basin slope (Shirai 2010, 327–329, tabs. 8.2, 8.3, fig. 8.7). While dating finds is impossible without a stratigraphic context, it is known that these two types of small arrowheads appear in the Pottery Neolithic (Yarmukian, Lodian and Nizzanim variant) of the southern Levant (Gopher 1994, 265). Shirai (Shirai 2010, 329–330) is undecided whether to date these arrowheads to the late Fayumian Epipalaeolithic (late 7th millennium calBC), or rather to the early Fayumian Pottery Neolithic (mid-6th millennium calBC). Both these options pose some difficulties. An early date in the Epipalaeolithic of the Fayum poses the question of why only the arrowheads were adopted, without the ceramic technology practised by the Lodian or Nizzanim cultural entities. A later date in the 6th millennium is also problematic, as the use of arrowheads declined drastically after the initial Pottery Neolithic. At present, it can be only suggested that the arrowheads under discussion likely represent an influence from the southern Levant, which might have pre-dated the introduction of pottery but post-dated the first pre-Pottery Neolithic contacts, as evidenced by Helwan Points (Shirai 2010, 317–318; Bar-Yosef 2013, 242–243).

4.4 Small finds

Two pierced pottery discs were discovered at Merimde Beni-Salame, Stratum I (Fig. 3:15; Eiwanger

1984, pl. 63:I.1186, I.1187). Such pierced pottery discs occur at most Pottery Neolithic and Chalcolithic sites of the Near East. The high number of pottery discs found in domestic contexts suggests that they were used for a very common activity, of which spinning is the most likely candidate (Gibbs 2008; Rooijakkers 2012; Orrelle, Eyal and Gopher 2012). Pierced pottery discs used as spindle whorls are also supported by ethnographic observations (Crowfoot 1931). C. Tineke Rooijakkers (Rooijakkers 2012, 105) argued that plant fibres, such as flax, could have been spun by hand, but that animal fibres (hair and wool) would require the use of spindles. She (Rooijakkers 2012, 105), therefore, argued that the appearance of large and noticeably standardised assemblages of spindle whorls might indicate a shift in subsistence strategy to an increasing reliance on ovocaprid herding and the subsequent exploitation of their secondary products. The pottery discs found at Merimde are a good indicator that Lower Egypt was, at least, a peripheral area to the wider cultural practise of using animal hair and wool, which was likely introduced by migrating agro-pastoralists, bringing their herds.

Two bovine figurines of baked clay, and probable fragments of two others, were uncovered from Merimde Beni-Salame, Stratum I (Fig. 3:14; Eiwanger 1984, 53–54, pl. 63:I.1174, I.1176, I.1175, I.1177). Of these, I.1174 is the head of a horned animal (c. 2.5 cm high) with wide horns, resembling a bovine. I.1176 is a small figurine only 2 cm long, with short legs, a wide head with horns and a lifted (broken) tail. Fragments I.1175 and I.1177 are horns that were likely broken off from baked clay figurines, such as that in example I.1174. This iconography fits well with the osteological evidence at the site, which yielded numerous cattle bones (Von den Driesch 1985).

Such figurines also occur in large quantities in contexts of the later 7th and 6th millennium calBC in the Levant and northern Mesopotamia. In the southern Levant, animal figurines have been found at Pottery Neolithic sites such as Sha'ar Hagolan (Freikman and Garfinkel 2009), but also at Wadi Rabah sites including Abu Zureiq (Garfinkel and Matskevich 2002, fig. 18:2), Munhata, Stratum 2A (Fig. 11:18; Garfinkel 1995, fig. 38:1,2) and Nahal Zehora II, Stratum II (Gopher and Eyal 2012b, fig. 29.7:1–3). The clay animal figurines of Merimde Beni Salame are currently the oldest of their kind known from Egypt. The cattle were a local species that was possibly domesticated in the eastern Western Desert in the 8th millennium calBC (Gautier 2007; Linseele 2013, 98), but a contribution of domesticated Asian cattle is evident in the genetic dataset (Decker *et al.* 2014). Clay bovine figurines from Merimde Beni-Salame might, therefore, have been imported alongside domesticated Levantine cattle, which interbred with the African species.

4.5 Subsistence

While the subsistence patterns of northern Mesopotamia and the Levant in the 6th millennium calBC can be regarded as a continuation of Pottery Neolithic practise, Egypt witnessed a dramatic change. Sheep and goats seem to have been introduced to Africa from the Sinai as early as the 7th millennium calBC (Wengrow 2006, 23–24; Mączyńska 2015, 281–282), but they do not appear as domesticates in Lower Egypt until much later. Rather, it seems probable that a substantial population influx from the southern Levant introduced livestock and domesticated food plants to the Delta and the Fayum during the 6th millennium calBC (Bar-Yosef 2013, 243; Tassie 2014, 194). The predominantly fishing-oriented economy of Lower Egypt was thus permanently altered and the first Neolithic sites appeared in the Delta. The chronological data indicates that the immigrants who settled in Lower Egypt likely came from the Wadi Rabah cultural tradition, though ongoing contacts over time mean that some elements of the exchange might have come from its earliest phases, before the 'classic' Wadi Rabah suite had fully formed.

5 Discussion

While the dating of the Neolithic in Egypt, particularly in the Delta region, is still problematic, it is likely that the Pottery Neolithic arrived in the mid-6th millennium calBC. Chronologically, the rise of the Pottery Neolithic of Egypt correlates with the Wadi Rabah culture of the southern Levant. Several features in the assemblage of Neolithic Egypt, such as ceramic shapes (bowls, holemouth jars, chalices) and decorations (burnish, herringbone patter incisions), and pierced pottery discs are typical for the Wadi Rabah culture and are evidence of cultural influence. Other finds, such as the sickle blades and the arrowheads, are not typical for the Wadi Rabah culture, but do occur as part of that assemblage. The 6th millennium calBC was a transformative period, which saw the consolidation of the Neolithic lifestyle and its

accompanying suite of material culture in the Levant and its spread to Egypt. This interaction does not stand by itself, but should be understood as a prelude to the mutual influences observed between the southern Levant and Egypt in the Bronze Age (Sowada 2009; Brink and Levy 2002).

5.1 Driving and enabling factors

The intensified interactions between the southern Levant and Egypt might have been enabled by climatic changes in this period. Most reconstructed climatic records indicate a period of warm and wet climate for the 6th millennium calBC (see Table 4). This phase was called the Holocene Wet Phase by Robinson *et al*. (Robinson *et al*. 2006, 1536), who described this period as the wettest phase of the last 25,000 years. It lasted from c. 9000–5300 calBC. In Africa it is known as the African Humid Period, and is characterised by a "green Sahara" (Claussen and Gayler 1997). The level of the Mediterranean Sea was lower and the Levantine coastline was further to the west. Present day arid areas were likely to have been at least partially inhabitable in the 6th millennium calBC.

It is likely, in this period, that migrations and cultural interchanges between the Levant and Africa were facilitated by these favourable climatic conditions. Water and feeding grounds for livestock were more readily available in the Negev and Sinai, and movement between the two continents posed less of a risk than in dry periods. Presumably no ecological border was perceived between Levant and Egypt, with the landscape rather being viewed as a continuum. While a basic climate-deterministic explanation for the transregional interaction of the 6th millennium calBC is probably overly simplistic, it should be noted that the next phase of intensified interaction between these two regions, in the Early Bronze Age, again corresponds with a period of favourable climate (Rosen 2007; Issar and Zohar 2007; Langgut *et al*. 2015). In this scenario, climate probably enabled a period of interaction that was culturally driven. The Wadi Rabah culture was marked by intensive transregional interactions with the Halaf culture to the north, from which it imported notions of ceramic typology and iconography, raw materials such as obsidian and chlorite, and finished Halaf seals and ceramics into the southern Levant (Rosenberg, Getzov and Assaf 2010; Gopher, Marder and Barkai 2011; Getzov 2011). This early internationalism could have also have been reflected in a more audacious exploration of the south-eastern perimeters of the Levant.

5.2 Mechanisms of cultural spread

Cultural features of the southern Levant were likely imported into Egypt by mobile farmer-herders or other migrating groups (Mączyńska 2015, 284). The migration could have been the result of individuals or small groups from the southern Levant exploring the landscape for new pastures, and consequently merging with the local population. Tassie (Tassie 2014, 187) has already pointed out that this concept is supported by DNA studies, which saw a genetic influx from the Middle East to northern Africa. Arredi *et al*. (Arredi *et al*. 2004) mapped the genome of 275 men of northern Africa, tracing variations in Y-chromosomes, and hapolgroups J* and E3b2 are believed to have been

Table 4: Summary of environmental records of the 6th millennium cal BC

Type of evidence	Sample	Proxy data	Climate	Reference
stable isotope	GISP2	$\delta^{18}O$	wet and warm	(Grootes et al. 1993)
	Site 967	$\delta^{18}O$	wet	(Emeis et al. 2003)
	MD84641	$\delta^{18}O$	wet	(Fontugne and Calvert 1992)
	Jeita Cave	$\delta^{18}O$, $\delta^{13}C$	wet and warm	(Verheydena et al. 2008)
	Soreq Cave	$\delta^{18}O$, $\delta^{13}C$	wet and warm	(Bar-Matthews et al. 2003)
	Red Sea	$\delta^{18}O$	wet	(Arz et al. 2003)
pollen cores	Hula and Ghrab	*Pistacia*, *Quercus*	wet and warm	(Rossignol-Strick 1995)
	Hula	*Olea*	wet	(Baruch and Bottema 1999)
	Feynan	tree pollen	wet	(Hunt et al. 2004)
	Burullus	*Cyperaceae*	wet	(Bernhardt, Horton and Stanley 2012)
Dead Sea		sea levels	unclear	(Hemming 2004); (Migowski et al. 2006)
sea levels	Levantine coast	morphology	13.5 and 16.5 m lower	(Sivan et al. 2001)

introduced to Egypt from the Middle East. The authors suggest a Neolithic date for this genetic influx, based on the calculation of mutation rates between father-son pairs and an assumed 25 or 30 years per generation. These results corroborate the notion of a demic expansion from the southern Levant into Egypt, introducing ceramic and lithic technology and domesticates to the local subsistence strategy.

6 Conclusion

The examination of the available radiocarbon dates from Egypt shows that the Pottery Neolithic likely started around the mid-6th millennium calBC. Influence from the southern Levant has long been suggested, and parallels sought in the material culture of the Yarmukian, Lodian, Nizzanim variant, Qatifian, and Wadi Rabah cultural entities. However, the analysis of the Neolithic and Early Chalcolithic cultures in this paper shows that only the Wadi Rabah complex overlapped with the onset of the Egyptian Neolithic to a significant degree. Subsequently, a range of parallels in the material culture assemblages of the Wadi Rabah and Egyptian Neolithic entities can be discerned. The interactions discussed in this paper should be seen as a prelude to the closer interaction between the southern Levant and Egypt during the Early Bronze Age (van den Brink and Levy 2002), adding a further chapter to the *longue durée* of connections in the Eastern Mediterranean (Fig. 12).

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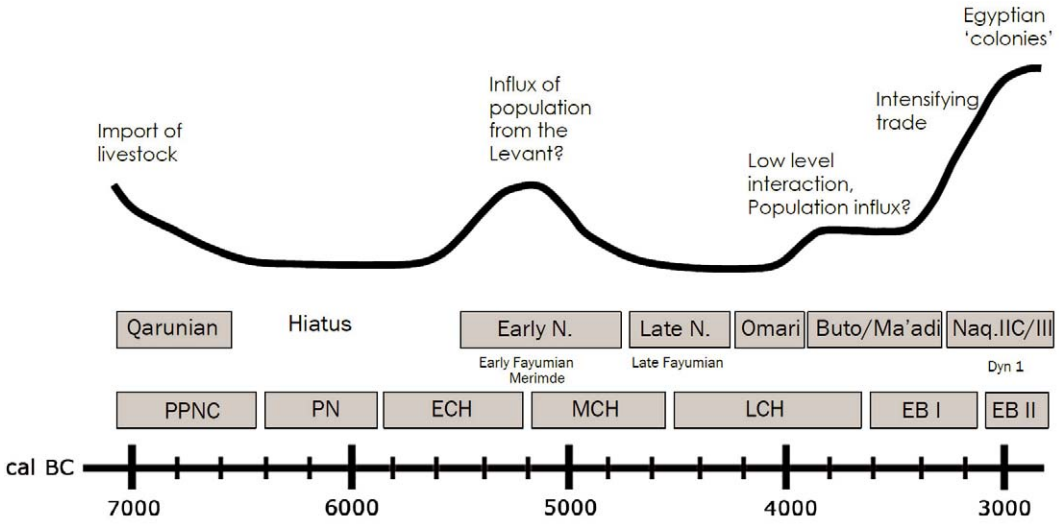

Fig. 12 Fluctuating Interactions

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