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# Migrations, Transfers, Exchanges, Convergences?

## Assessing Similarities and Differences among the Earliest Farmers Between the Daulatabad and Kachi Plains (Southern Iran and Pakistan)

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### Introduction

The question of the origin and development of agriculture in Middle Asia and South Asia remains a topic of significant debate. Many scholars agree on the view that plant cultivation and animal breeding in the Middle East were first developed in the Fertile Crescent, between the Mediterranean Sea, southern Anatolia and the Zagros Mountains in western Iran, around 12,000 to 11,000 years ago, and then spread eastward through the Iranian Plateau to southern Central Asia and South Asia. Many data indeed tend to support this view; however, at the same time, other pieces of evidence do not contradict the possibility that agriculture may have developed locally and potentially early in certain regions east of the Fertile Crescent. At a minimum, they leave this question open.

Recent DNA analysis of ancient human remains tends to support the hypothesis that sees farmers spreading eastwards and bringing with them new agricultural technologies (Narasimhan et al. 2019). Similarly, most radiocarbon dates show that the earliest Neolithic sites are in the Fertile Crescent, whereas most Neolithic sites known at present and located further to the east (or indeed, further west, in Europe) appear to be later, dating to between 10,000 (at the earliest) and 7000 years ago. With regard to the results from the DNA analysis, however, one may object that the sample of analysed human remains is both unrepresentative of, and too small when compared to, the vast and complex landscape of Neolithic Middle Asia. In terms of the absolute dates, it is important to remember that comparatively less field research has thus far been conducted in the areas east of the Fertile Crescent compared to within the Fertile Crescent itself, and it is therefore possible that we are missing Early Neolithic sites in these areas — sites where we potentially could observe early and local, independent developments of agriculture. This has been suggested in the case of the famous Neolithic site of Mehrgarh in Pakistan (Fig. 9.1). Based on a selection of radiocarbon dates and parallels for their material remains, J.-F. Jarrige et al. (2013: 151–52) have argued that the Neolithic settlement at this site may be dated to as early as the beginning of the eighth millennium bce, or that 'At least it can safely be assumed that the early levels of Mehrgarh are not posterior to the eighth millennium bc' et al. Additionally, J.-F. Jarrige (2008: 152–53) wrote that '[...] The Neolithic of Balochistan cannot be interpreted as the "backwater" of the Neolithic culture of the Near-East [...] We have now evidence that, in the north-western part of the subcontinent, communities were involved as early as the eighth millennium bc in more or less incipient farming activities, based on the domestication of cereals such as barley and of local wild animals'. Furthermore, to him (2008: 152), 'The Neolithic of Mehrgarh displays enough original features to imply an earlier local background which has so far not been documented' (see also C. Jarrige et al. 1995: 9–19).

Regardless of the position one takes on the controversial topic of Mehrgarh's chronology (see below), it seems rational to think that, with more fieldwork, more evidence for early plant cultivation and animal breeding in Middle Asia might emerge. Recent discoveries in Fars Province, south-western Iran, at Tepe Rahmatabad and in the Tang-e Bolaghi region, illustrate this. Indeed, until recently, a gap in occupation

was suggested in this province during the Early Holocene, and, in contrast to the Central Zagros region further to the north-west, no clear evidence for an aceramic Neolithic settlement had been identified. The Neolithic period was mostly known through pottery Neolithic sites that are no older than the mid-to-late seventh millennium bce, excavated in the Marv Dasht. However, at a site not very far from the Marv Dasht, recent investigations in Cave TB75 in the Tang-e Bolaghi have led to new data. A shift in hunting strategies was observed in this cave, in which communities dating to between the tenth and eighth millennia bce increasingly focused on the exploitation of wild sheep and especially wild goat — both future animal domesticates — moving away from gazelle, which had been the predominant focus of hunts based on the evidence of the previous Epi-Paleolithic levels excavated in that cave. This change has evident potential implications for understanding the initial process of animal management and later domestication in the region. Meanwhile, excavations at Tepe Rahmatabad revealed a sequence of Neolithic pottery deposits overlaying more than two metres of aceramic deposits. These aceramic deposits date to 7047–6744 cal. bce, considerably pushing back the beginning of the Neolithic period in Fars (Tsuneki et al. 2007; Azizi Kharanaghi et al. 2013; Nishiaki et al. 2013; Weeks 2013).

An important line of reasoning in this debate is whether the wild forms of the major plants and animals that characterize the early farming communities of Middle Asia, southern Central Asia and north-western South Asia (i.e. wheat, barley, sheep and goats, as well as cattle) were present in these regions when agriculture emerged. Domesticated plants and animals with no wild ancestors in these regions must have been introduced from outside, and this probably took place via Southwest Asia where wild ancestors were present. Yet, with the exception of zebu cattle (*Bos Indicus*) which was domesticated locally in north-western South Asia, this question cannot be answered as clearly as one may think (see Bellwood 2005: 84–86; Harris 2010; Kingwell-Banham et al. 2015: 267–73; Patel & Meadow 2017). In the opinion of Eleanor Kingwell-Banham and her colleagues (2015: 270), 'At a fundamental level, [the transition from mobile hunter-gatherer subsistence to sedentary farmer-herder subsistence] was characterized by a diffusion of practices into South Asia via the Iranian plateau or Afghanistan, initially into western Pakistan'. Again, not everybody agrees on this statement, and the lack of data on this topic from east of the Fertile Crescent hinders a proper appreciation. As the same scholars (2015: 207) rightly emphasize, 'The precise pattern of this process is [...] unclear. It is not readily apparent whether there was demic diffusion, involving movement of agropastoralist populations; cultural diffusion, involving the adoption of agropastoralism by populations previously using other subsistence strategies; or nuanced combinations of the two'. One should add that this situation is rendered even more complex given that we should probably not exclude the possibility of agriculture arising locally out of local experimentation and via a western influence in certain cases. Moreover, the chronology of the Neolithization and Neolithic period across Middle Asia needs considerable clarification.

In this chapter, we attempt to contribute to this discussion with a focus on current data from south-eastern Iran and Pakistan. More specifically, we explore the themes of similarities and differences as observed in the archaeological record in these regions during the Neolithic period. We examine these themes with regard to chronology, aspects of the material culture and funerary practices, as well as to the relationships that this examination allows us to delineate, leaving open the question as to whether these relationships reflect convergences, cultural or economic exchange between contemporary groups, transfers of techniques and technologies, or migrations from one area to another. Located halfway between the Fertile Crescent and India, south-eastern Iran is a key area to investigate the questions raised above relating to the Neolithization of Middle Asia and South Asia. Yet, this period remains poorly

known in this region, since only some four or five Neolithic sites have so far been excavated, or initially sounded. Further east, Mehrgarh remains the only Neolithic settlement in Pakistan to have been excavated over an extensive area. In this chapter, we present results from an excavation that we conducted in 2017 and 2018 at Tell-e Atashi, a Neolithic site located east of the city of Bam (Kerman province), within the southern margin of the Lut Desert. Tell-e Atashi is the easternmost Neolithic site known thus far in south-eastern Iran. It is located east of the Jebel Barez Mountains, in contrast to all other Neolithic sites except for Tal-i Iblis so far studied in south-eastern Iran, which are located west of these mountains. As such, and combined with previous fieldwork in south-eastern Iran, this excavation contributes to a better, albeit preliminary, sense of the interregional similarities and differences among the early farming communities of this area, and between them and those of Mehrgarh in Pakistan. We present aspects of the discoveries and radiocarbon dates from Tell-e Atashi and compare them with those of the neighboring Neolithic sites in south-eastern Iran and Pakistan. Implications from these comparisons are then discussed. Firstly, however, we recapitulate current available data on the Neolithic period in south-eastern Iran and Pakistan.

### **Current Knowledge on the Neolithic Period in South-Eastern Iran and Pakistan**

The Neolithic period in south-eastern Iran and Pakistan is known from less than a dozen excavated sites, or sites at which only trial-trenches have been opened, including only a handful of settlements with relatively extensive excavations (Fig. 9.1). These sites are: Tal-i Iblis in the Bardsir Plain (Caldwell 1967); Tepe Yahya in the Soghun Valley (Beale & Lamberg-Karlovsky 1986a); Tepe Gaz Tavila in the Daulatabad Plain (Prickett 1986a); Tell-e Atashi in Darestan (Garazhian 2009; Garazhian & Shakooie 2013); and Tepe Gav Koshi in the Esfandagheh Plain (Soleimani & Fazeli Nashli 2018), all of which are located in Kerman Province in south-eastern Iran; as well as Kili Ghul Mohammed in the Quetta Valley (Fairservis, 1956); Mehrgarh in the Kachi Plain (C. Jarrige et al. 1995; J.-F. Jarrige 2008; J.-F. Jarrige et al. 2013); Miri Qalat (Besenval 1997) and Shahi-Tump in the Kech Valley (Besenval et al. 2005; Desse et al. 2008), all located in Balochistan Province in Pakistan. Surveys have complemented records of Neolithic sites in Kerman in the Daulatabad Plain (Prickett 1986a; 1986b), the Esfandagheh Plain (Soleimani & Fazeli Nashli 2018), the Bardsir Plain (Sajjadi 1987), Darestan (see Adle 2006; Mutin et al. in preparation), and in south-eastern Balochistan and Sindh Provinces in southern Pakistan (Biagi et al. 2019). It is important to note, however, that the sites reported in southern Pakistan are coastal sites relating to the exploitation of mangrove and marine resources with no evidence for food production. Some twenty additional aceramic Neolithic sites have been reported in western Pakistan (see Possehl 2002: 24–34, 32 Tab. 2.3), although, as noted by Kingwell-Banham et al. (2015: 268), '[...] Some of the identifications are speculative [...] and at least some sites listed as being villages have in fact previously been identified as Mesolithic/hunter-gatherer sites on the basis of the lithics found on the surface, and are effectively undated'.

#### ***Tepe Gav Koshi***

In south-eastern Iran, besides the remains of a campsite identified in the Soghun Valley, radiocarbon dated to between the mid-seventh and early-sixth millennia cal. bce (Snead & Durgin 1975: 6, 11, 13; Prickett 1986a: 541–42; Prickett 1986b: 219), the earliest Neolithic levels were excavated at Tepe Gav Koshi. This site is less than one hectare and consists of two main occupation phases. The oldest one (Phase 1) has been radiocarbon dated to around 7100–6700 cal. bce, and, the pottery from this phase parallels material from the Formative Mushki period in Fars, a period dated to 7000–6400 cal. bce (Khanipour & Niknami 2017). This aspect, however, needs clarification, since these radiocarbon dates

also make this phase contemporary with the aceramic levels from Tepe Rahmatabad in the same province. The pottery of the second phase (Phase 2) connects to the Mushki (and early Jari) period in Fars, dated to c. 6400–6000 cal. bce (Khanipour & Niknami 2017).<sup>1</sup> Both phases correspond to domestic occupations with mudbrick houses with floors covered with red ochre and roofs made of reed. In the oldest one, however, one room is larger and contains a raised floor and red painted walls, and as such it is thought to have potentially been used as a ritual space. Obsidian lithics were found at Tepe Gav Koshi (Soleimani & Fazeli Nashli 2018: 72, fig. 15), a material usually associated with sources in Anatolia.

### ***Tepe Yahya and Tepe Gaz Tavila***

We are not discussing Tal-i Iblis here for the reason that there is disagreement as to whether this site was occupied during the Neolithic period, and this question would require longer and more detailed examination than the format of this chapter permits. However, clear Neolithic remains were excavated at Tepe Yahya, a mounded site whose visible part measures less than 2.5 ha (see Beale and Lamberg-Karlovsky 1986a for an extensive description of this site). The Neolithic period at Tepe Yahya consists of four main architectural levels labelled Periods VIID to VIIA. The building material in most of these levels consists of 'thumb-impressed' mudbricks. Similar types of mudbricks have been recorded at other Neolithic sites in Iran including Chogha Mish (Delougaz & Kantor 1996, pl. 55 D), Sang-e Chakhmaq (Roustaei et al. 2015: 587 fig. 9), and Tell-e Atashi (see below), as well as Mehrgarh (see below); in Chalcolithic levels at Tepe Yahya and Tal-i- Iblis (see Evett 1967: 219, 222; Caldwell & Sarraf 1967: 283, 304 pl. 7 lower, 306; Beale 1986c: 101–65; Beale & Lamberg-Karlovsky 1986b: 248–49); and as far as Jericho (Kenyon 1981, pl 115–116a). Different categories of constructions were found across the Neolithic sequence at Tepe Yahya. Perhaps the most impressive of these was the building complex of Period VIIB, which contains over forty small rooms. This level has been interpreted as 'a storage complex for hay, grain, or other organic materials', or as 'sheep or goat pens during the winter months' (Beale 1986c: 109). Burials were also found in these levels (see below).

The Neolithic material culture at Tepe Yahya is characterized by 'Chaff-Tempered Coarse Ware', which also remained the most abundant pottery type during the subsequent Chalcolithic Periods VI–VB at this site. A few obsidian lithics deserve mention, as they point to a distant source in Anatolia. Chlorite/steatite items, made from regionally available sources, were also recorded in these Neolithic levels, and included a unique female figurine from Period VIIB (Beale 1986c: 110 fig. 6.6; 114 fig. 6.7). The rest of the material assemblage includes various types of beads, pendants, labrets, bracelets, bone needles, ochre stones, lithics, whetstones, shaft straighteners, mortars, spatulas, perforated sherds, clay balls and cones, stone vessels and shells (see Beale 1986d: 167–214).

The Daulatabad Plain is located c. 25 km west of Tepe Yahya. The Neolithic settlement in this plain includes thirteen mounded sites, four of which were probably originally part of a single site covering 9.9 ha, Tepe Gaz Tavila (R35, R36, R36A, R37). One test-trench opened at this site yielded six architectural levels with features very similar to those recorded at Tepe Yahya, including the same type of thumb-impressed mudbricks. Prickett, who studied this site, also recorded over a hundred buildings from just a surface analysis. Among these buildings, she noted one that has 'a central hallway with somewhat symmetrically arranged, lateral rooms', very similar to the numerous Neolithic storage structures

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<sup>1</sup> Based on the sites reported in the Kur River Basin, Weeks (2013: 64) dates the Fars sequence as follows: Mushki Period: c. 6300–6100 cal. bce; Bashi Period: c. 6100–6000 cal. bce; Jari Period: c. 6000–5600 cal. bce; and Shamsabad Period: c. 5600–5000/4800 cal. Bce.

excavated at Mehrgarh (Prickett 1986a: 544–75, 831–77; see below). The material culture from Tepe Gaz Tavila includes: a chaff-tempered pottery of the variety observed at Period VII at Tepe Yahya; unbaked or lightly baked clay balls, cones, cylinders, pellets and figurines; perforated sherds; copper points; shell pendants and beads; bone beads and worked spatula and ribs; stone balls, sharpeners, palettes, vessels, bangles, and discs; and turquoise beads (Prickett 1986a: 1009–17: 1059–1104).

As for the subsistence economy in the Soghun Valley and Daulatabad Plain, domesticated oats (*Avena*) and einkorn and emmer wheat (*Triticum*) as well as milk vetch (*Astragalus*), are all recorded at Tepe Yahya VII. Pistachio (*Pistacia*), caper (*Capparis*), milk vetch (*Astragalus*), and date palm (*Phoenix*), as well as domesticated barley (*Hordeum*), millet (*Panicum*), and einkorn and emmer wheat (*Triticum*) are recorded at Tepe Gaz Tavila (R37). Domesticated cattle (*Bos* sp.), sheep (*Ovis aries*), and goat (*Capra hircus*), as well as half-ass (*Equus hemionus*), boar (*Sus scrofa*), gazelle (*Gazella* sp.), dog (*Canis familiaris*), tortoise (*Testudo graeca*), chukar (*Alectoris chukar*) or francolin (*Francolinus* sp.), and eagle owl (*Bubo bubo*) have been observed at Tepe Yahya Period VII. Domestic cattle (*Bos* sp.), sheep (*Ovis aries*), and goat (*Capra hircus*), as well as hare (*Lepus capensis*), fox (*Vulpes vulpes*), boar (*Sus scrofa*), gazelle (*Gazella* sp.) and dog (*Canis familiaris*) were found at Tepe Gaz Tavila (R37). Goats were the most abundant find at both Tepe Gaz Tavila (R37) and Tepe Yahya VII (about 60 per cent and 50 per cent respectively), followed by sheep and cattle (Meadow 1986).

These Neolithic settlements are all more recent than the site of Tepe Gav Koshi. Considering the low number of available radiocarbon dates (Beale 1986a: 12 Tab. 2.1), parallels in the material culture and stratigraphy, Prickett (1986a: 410 Tab. 3.1, 416–29, 544–45, 576–79) has dated Tepe Yahya Period VII to between c. 5600–4600 cal. bce, while she dated the Neolithic sites from the Daulatabad Plain to c. 5800–5400 cal. bce. More generally, she also assigned the Neolithic sites in the Daulatabad Plain as 'mid-to-late sixth to early fifth millennia BC', and writes that 'the Tepe Yahya settlement began [...] perhaps as much as 500 years or more later' than Tepe Gaz Tavila (Prickett 1986a: 544–45).

The question of the origin of the Neolithic settlement in the Daulatabad Plain and at Tepe Yahya is of considerable importance. Farming-based food production and elements of the material culture from Tepe Yahya and Tepe Gaz Tavila are comparable to those observed at other Iranian Neolithic sites (Meadow 1986; Lamberg-Karlovsky & Beale 1986b: 265–66). Prickett (1986a: 762–63) sees a 'fairly close cultural connection' between the Neolithic settlements of Kerman and those of eastern Fars, but she also notes differences between the lithic industry of Tepe Gaz Tavila and that of the western Iranian sites, while emphasizing links in the lithic industry and architecture with the Neolithic site of Mehrgarh in Pakistan. Piperno (1973) notes similarities in the lithic industry from Tepe Yahya with other sites in Iran. The typical chaff-tempered pottery from Tepe Yahya and Tepe Gaz Tavila is comparable to the Iranian Neolithic 'Soft-Ware Horizon' (Dyson 1965; see Weeks 2013: 57–66), and particularly to assemblages dating to the end of this horizon in Fars such as the mid-late-sixth/early fifth millennia bce Shamsabad ware from Tal-i Bakun (Beale 1986b: 86; Chase et al. 1967: 150). Prickett (1986a: 762) also compares this material to the older Mushki ceramics from Fars.

Additionally, the vessels from Tepe Yahya were built using sequential slab construction, a technique identified at Neolithic sites in western Iran and at Mehrgarh (Vandiver 1987; 1995). Parallels in Iran can also be seen in the hammered copper technology (Heskel and Lamberg-Karlovsky 1986), in objects interpreted as 'labrets', in 'two-hole' ornaments, and in balls and cones interpreted as counting devices that have been recorded at Tepe Yahya (Beale 1986d: 177–90: 174, fig. 7.5, 175, fig. 7.6 a, e, 176, fig. 7.7

left, 177, fig. 7.8 a, 179, fig. 7.10 b-c, 192, fig. 7.18 a-h, 193, fig. 7.19 e). Beale (1986d: 178-79) sees parallels at Ali Kosh for the two-hole objects (Hole et al. 1969: 232, fig. 100 a-b) and at Ali Kosh and Tepe Sabz for the labrets and the balls and cones (Hole et al. 1969: 200, 230, 236-37, 236, fig. 102). This last category of objects is comparable in form to materials found in several Neolithic levels in Fars, Khuzistan, Mesopotamia and the Persian Gulf (Weeks et al. 2006: 64-65, 438, fig. 3.189). Two-hole ornaments and thirty-five clay cones were also found at Tepe Gaz Tavila (Prickett 1986a: 1065, Pl I.8-I.9). Prickett reports a T-shaped figurine from the same site, which parallels specimens found in the early ceramic phases in the Deh Luran Plain in western Iran, at Jarmo in northeastern Iraq, and at Sang-e Chakhmaq in northeastern Iran (Roustaei et al. 2015: 579, fig. 4). She also notes that the worked bone spatulas found at Tepe Gaz Tavila and Tepe Yahya have parallels at Ganj Dareh Tepe, Jarmo, and Zawi Chemi Shanidar (Prickett 1986a: 576-77). Long-distance contact is illustrated by the above-mentioned obsidian items from Tepe Yahya VII, which are thought to come from Anatolia (Beale 1986d: 182-83, fig. 7.19 f.). Meanwhile, local specificities are illustrated by the chlorite objects from Tepe Yahya, including the distinctive female figurine discussed above (Beale 1986d: 186 fig. 7.17, 199, 200-01, figs 7.25-7.28). That this set of similarities must result from cultural diffusion seems to be the most logical explanation, although one cannot completely discard the existence of independent inventions. Lamberg-Karlovsky and Beale (1986: 266) reach the following conclusions: 'We are unable to answer the question whether these techniques of production, so similar at different sites, are the result of a common shared technology or are of independent invention. It is likely, however, given the overall comparability of the adaptive patterns of these early farming communities, that these shared attributes of production technology reflect some degree of communication and diffusion'.

### **Mehrgarh**

Mehrgarh, located about 1050 km east of Tepe Yahya, is undoubtedly one of the most impressive Neolithic sites of Middle Asia (see C. Jarrige et al. 1995; J.-F. Jarrige 2008; J.-F. Jarrige et al. 2013). In total, this site expands over an area of about 300 ha. The Neolithic settlement divides into two periods: aceramic Period I, estimated to cover over 15 ha; and Period II, during which pottery appeared, and which probably covered about 45 ha. Period I has been documented over about seven metres of deposits, found beneath additional deposits assigned to Period II. Finds from the first period comprise almost eighty excavated mudbrick houses and a few granaries, whereas the second period is characterized by many granaries. The Neolithic mudbricks are long and usually have thumb-impressions comparable to those recorded in Iran (J.-F. Jarrige 2008: 140, fig. 6). More than 300 burials dating to the Neolithic period were also excavated at Mehrgarh.

The subsistence economy in Period I was based on cultivation, and on the hunting or domestication of animals. Ninety per cent of the plant remains are domesticated barley (*Hordeum*), while einkorn and emmer wheat (*Triticum monococcum*, *Triticum turgidum dicossum* and *Triticum durum*) have also been identified in much smaller quantities. Wild animals dominate early Period I fauna. They include wild sheep (*Ovis orientalis*), goats (*Capra aegragrus*), gazelle (*Gazella bennetti*), asses (*Equus hemionus*), deer (*Cervus*[?] *duvauceli* and *Axis*[?] *axis*), boar (*Sus scrofa*), water buffalo (*Bubalus arnee*) and cattle (*Bos namadicus*). However, domesticated goats, or goats in the process of domestication, have been identified in both domestic and funerary contexts from the earliest levels of Period I. There was a clear shift over the course of Period I, however, with remains of domesticated sheep and cattle coming to be the most numerous, and cattle representing more than half of all animal remains by the end of Period I. Zebu cattle (*Bos indicus*), a species local to South Asia, was locally domesticated during Period I.

As noted above, Period II is characterized by many granaries, which likely reflects a successful agriculture economy, and this is also indicated by finds. Domesticated barley and wheat are recorded from this period. Wild animals almost completely disappeared from the faunal record at this time, while finds of domesticated animals consisted essentially of cattle, as well as sheep and goats (see Costantini 1984; Meadow 1993; C. Jarrige et al. 1995: 9–19; Meadow 1996; J.-F. Jarrige 2008: 142–43; Patel & Meadow 2017).

As detailed by Catherine Jarrige and Jean-François Jarrige (C. Jarrige et al. 1995, J.-F. Jarrige 2008, and J.-F. Jarrige et al. 2013), the material culture from Mehrgarh reflects materials available from the Kachi Plain and surrounding areas, such as flint and bitumen, as well as materials from more distant sources such as lapis lazuli from northeastern Afghanistan, and shells from the Indian Ocean. The Neolithic assemblage includes lithics (see, e.g., C. Jarrige et al. 1995: 261, fig. 5.8) as well as sickles shafted in bitumen (J.-F. Jarrige 2008: 145, fig. 14). Baskets coated with bitumen were also found (C. Jarrige et al. 1995: 223, fig. 4.5), as well as clay figurines (C. Jarrige 2008) and ornaments from shell, steatite, calcite, as well as few from lapis-lazuli, turquoise, and carnelian (J.-F. Jarrige 2008: 145, fig. 16, 147, figs 18–19). Copper beads are also recorded (J.-F. Jarrige 2008: 148, fig. 20). Pottery appeared in Period II; it is vegetal-tempered, comparable to the Neolithic pottery found in Iran including at the site of Tepe Yahya and in the Daulatabad Plain. Some Period II vessels display applied decorations, a feature observable on vegetal-tempered vessels from Tal-i Iblis (e.g., Chase et al. 1967: 120, fig. 3). Jean-François Jarrige, however, has compared these decorations more specifically with those from Umm Dabaghiyah in northern Iraq (J.-F. Jarrige 2008: 149, fig. 21, 150; see Kirkbride 1972, pl. XI). Additionally, the technique used to create this pottery, namely sequential slab construction, has also been identified on Neolithic vessels from Iran as well as at Umm Dabaghiyah (Vandiver 1987; 1995).

The chronology of the Neolithic settlement at Mehrgarh remains open to debate. Jean-François Jarrige and his colleagues have emphasized the length and complexity of the Period I sequence, which consists of nine main levels. In each of these levels, mudbrick buildings were built first; these were later abandoned and filled up with trash; and the area was then used as a burial ground (J.-F. Jarrige 2008: 139–40; see also C. Jarrige et al. 1995: 10–11, which discusses this in more detail). Jean-François Jarrige (2008: 140) concluded that ‘the formation of the mound could easily have lasted for about a millennium’. He (2008: 151) added that ‘it can be rather securely assessed that the first occupation of Mehrgarh has to be put in a context probably earlier than 7000 bc’. He has dated the appearance of the first pottery fragments at Mehrgarh to ‘probably around 6000 bc’ (2008: 149), while he assigns the period in which this same type of pottery became more abundant and a new type of finer, burnished red pottery also began to appear (Periods IIA–IIB) to between the second-half of the sixth and the beginning of the fifth millennium bce (C. Jarrige et al. 1995: 13–14). Jarrige acknowledges the fact that many radiocarbon dates from Neolithic contexts are given as around 5000 cal. bce, or more broadly, between 6000–4000 cal. bce; however, he has argued that these dates are inconsistent with the long and complex sequence, made up of the human activities outlined above, and natural alluvial deposits, that he and his team have studied in detail. He suggests that a few radiocarbon dates placed within the eighth and seventh millennia bce would be more consistent with this sequence (C. Jarrige et al. 1995: 9–11, see the radiocarbon dates at 555–56; see also J.-F. Jarrige et al. 2013: 151–52).

Jarrige and his colleagues have also emphasized the originality of the Neolithic settlement at Mehrgarh and the view that a number of developments occurred locally at this site, independent of any outside influence. At the same time, the team has noted parallels with other Neolithic sites from across Middle



Asia and southern Central Asia, either in the fact that the sequence of developments observed at these sites were similar to that at Mehrgarh, or in that they share similar material cultures. For example, Jean-François Jarrige (2008: 142) has pointed out the layout of the Period I settlement, which, '[...] with its symmetrically disposed houses, with rather regular open spaces in-between, forms a marked contrast with the plans of several Neolithic settlements from Western and Central Asia, where the houses cluster tightly together and where there is no evidence for alleys, doorways or large open spaces. The plans of the houses from early villages so far recorded in the Neolithic of Western or Central Asia often show rather irregular combinations of small cubicles of various sizes'. He (2008: 151) writes: 'The circular houses of the earliest Neolithic villages have not been found at Mehrgarh. But quadrangular houses built with about 60 cm long narrow bricks with a herringbone pattern of impressions of thumbs [...] have been uncovered at several aceramic Neolithic sites in the Zagros, such as Ganj Dareh or Ali Kosh in the Deh Luran region of Iran, where, like at Mehrgarh, traces of red paint have also been noticed on the walls'. Similarities with Neolithic sites in Iran have also been noted in the lithic assemblage, stone axes, grave goods, and clay figurines, as well as in the positions of the buried dead (Jarrige 2008: 152). As noted above, the earliest pottery from Mehrgarh is comparable to material from Iran and Umm Dabaghiyah in Iraq, while Catherine Jarrige et al. (1995: 63) also emphasize the '[parallels] between the evolution of the Neolithic through the chalcolithic of Mehrgarh and of sites such as Tepe Sang-e Chakhmaq[, where] the aceramic period is followed by a phase in which a very limited number of sherds of a crude heavily chaff-tempered pottery appear'.

Jarrige (2008: 152) summarizes this equivocal situation in the following way: 'The similarities noticed between Neolithic sites from [...] Mesopotamia to [...] the Indus valley are highly significant. A sort of cultural continuum between sites sharing a rather similar geographical context marked with an also rather similar pattern of evolution and transformation becomes more and more evident. But the Neolithic of Mehrgarh displays enough original features to imply an earlier local background which has so far not been documented. [...] The Neolithic of Balochistan cannot be interpreted as the "backwater" of the Neolithic culture of the Near-East'. One of the central questions concerning the relationships of Mehrgarh is whether plants and animals were domesticated locally. This question is not entirely resolved. For example, Catherine Jarrige et al. (1995: 63) have noted that: 'solid arguments [...] support the hypothesis of a local process of domestication from foundations in the earliest aceramic neolithic in which hunting provided most of the meat'. Yet, '[b]esides hunting activities, there is also evidence of pastoralism first limited to goat. In a few graves from the earliest levels (2 and 3), five complete skeletons of kids had been disposed in a semi-circle around the legs of young women [...], and t]he presence of bones of relatively small subadult and adult animals in the trash deposits of the early levels confirms, according to R. H. Meadow, the domestic status of at least some of the goats'. (Jarrige 2008: 143). Patel and Meadow (2017: 285) believe that 'at least some goats were managed, in the process of domestication, or domesticated'. They also write that one interpretation of the body-mass reduction observed throughout Period I is that 'during the course of the Period I, kill-off in a single population of increasingly managed goats shifted from being non-targeted to being focused on young males [...] Another is that two populations of goats are represented in the faunal assemblage, namely, a husbanded one and a hunted one. Domestic stock might have been brought to the site by its original settlers, who also hunted local wild goats along with the eleven other ungulates that have been identified from the site'. (2017: 285). Similarly, on the barley records at Mehrgarh, Jarrige (2008: 142) wrote: '[...] The distribution of wild barley extends today to the head of the Bolan Pass. It is therefore likely that local wild barleys could have been brought under cultivation in the Mehrgarh area'. Yet, in relation to this

suggestion, Kingwell-Banham et al. (2015: 269) write that: 'The presence of some modern wild barley in parts of Pakistan and Afghanistan has fuelled speculation that there may have been local domestication at or near Mehrgarh. Recent genetic research on barley suggests multiple origins, including an eastern barley group that differs from the Levantine and main European barleys, and could have originated in Iran or somewhere further east. However, an archaeological sequence documenting a domestication process is lacking and the crop package that dominated the Indus region during the third millennium bce is West Asian in character (pulses, flax, wheat, and barley) with a limited indigenous South Asian component. This points to the predominance of this early crop dispersal from the west'. As noted above, these scholars (2015: 270) favour the view that the development of agriculture in South Asia resulted from 'a diffusion of practices [...] via the Iranian plateau or Afghanistan, initially into western Pakistan'.

### ***Kili Ghul Mohammed***

Kili Ghul Mohammed is located about 100 km north-west of Mehrgarh in the mountainous Quetta region. Walter Fairservis excavated archaeological layers from this site that were about five metres in thickness, directly overlying virgin soil, and that yielded no pottery and very few stone and bone objects. The layers from this site were all assigned to a single period, Period I (Fairservis 1956: 220–21, figs 14–15: 222–23). One charcoal sample from the middle of this sequence was radiocarbon dated (Fairservis 1956: 356: Sample 1, 5300 +/- 200 bp). Recalibration using Oxcal (<https://c14.arch.ox.ac.uk/oxcal/OxCal.html>) yielded a date of 4537–3695 cal. bce (95.4 per cent). Although this is a single date and the possibility remains that the tested sample may have been intrusive, this result nonetheless may suggest that half of the aceramic deposits found at Kili Ghul Mohammed (i.e., those found below this sample) are older than the mid-fifth and early-fourth millennia bce. However, the limited exposure of these aceramic levels hinders detailed comparison with those from Mehrgarh (C. Jarrige et al. 1995: 15–16).

### ***Southern Pakistan***

The earliest archaeological levels from the sites of Miri Qalat and Shahi-Tump, in the Kech-Makran region of south-western Pakistan, are assigned to a local late aceramic Neolithic-type settlement that dates to the mid-late-fifth millennium bce. This material goes beyond the primary focus of the present chapter and so will not be explored in detail here, but nonetheless merits mention (see Besenval 2005: 2; Desse et al. 2008; Mutin 2012).

Further east, the coastal sites surveyed by Paolo Biagi and his colleagues largely consist of shell middens resulting from the exploitation of mangrove and marine species. The subsistence economy (shellfish) and material culture (lithics) of the communities at these sites point to configurations different from those recorded at the Neolithic sites of Iran and Pakistan mentioned above, including Mehrgarh. Members of these communities apparently knew how to navigate, since some of these sites were at that time located on islands, especially in the delta of the Indus River, before this delta progressively advanced onto the sea. Like the farmers further north, albeit in a quite different way, these communities were not necessarily isolated. Biagi and his colleagues (2014: 44) write: 'The inhabitants of Mehrgarh undoubtedly entertained relationships with the northern coasts of the Arabian Sea since the beginning of the Neolithic, as indicated by the great quantity of marine shell ornaments in the aceramic Neolithic graves goods'. This is also consistent with the fact that some of the sites they surveyed date to the sixth and fifth millennia bce (Biagi et al. 2019). As such, these coastal sites illustrate potential contacts between distant groups that seemingly had very different configurations within the wider context of Neolithic Pakistan.

However, there is nothing to contradict the alternative possibility that these sites were in fact settled on a temporary basis by groups from the north.

Finally, while the focus of this chapter is the Neolithic evidence between the Daulatabad Plain and Mehrgarh, it is also worth taking a broader view, and remembering that, just east of the sites in Pakistan discussed above, '[f]rom at least as early as the eighth millennium cal. bc, in steppic and semi-arid areas of North Gujarat, southern Rajasthan, and eastern parts of Sindh, mobile hunter-gatherer communities with microlithic tool technologies often occupied stabilized sand dunes, where they took advantage of the fauna attracted to the water and vegetation in the interdunal depressions' (Patel & Meadow 2017: 281, 288–89, 292, 294, 297).

### **Recent Excavation at Tell-e Atashi (2017–2018)**

The archaeological area of Tell-e Atashi covers over c. 12 ha. It consists of a mounded site that is c. 5.7 ha, and between 4 and 5 m in height relative to the ground surface, and is surrounded by its related 'scatter site'. A scatter site is 'a ground surface accumulation of sherds [or other types of artifacts] lacking both mounding and architectural debris' (Prickett 1986b: 216). The mounded area is shaped as a ring, which surrounds a flat area in its centre (Fig. 9.2) (Garazhian & Shakooie 2013: 274).

### ***Fieldwork and Chronology***

Tell-e Atashi was first sounded in 2008. The 2008 test-trench studied the uppermost deposits of the site in its south-western portion and yielded several superimposed levels of mudbrick architecture, radiocarbon dated to between the late-sixth and mid-fifth millennia bce (see Garazhian 2016). In 2017 and 2018, as part of a new Iranian-French collaborative research project (Bam Archaeological Mission [BAM]), we opened seven new test-trenches (TT1–7) in various locations of the site; a longer and deeper stratigraphic trench (Excavation 1); and a more extensive planimetric excavation (Excavation 2). Results from the test-trenches will be detailed elsewhere, and, for the purpose of this chapter, we highlight some of the results from Excavations 1 and 2. Excavation 1 is orientated north–south and expands the 2008 test-trench to the south. In total, including the 2008 test-trench, Excavation 1 covers an area of 33 × 2 m. While the 2008 test-trench studied the uppermost deposits of Tell-e Atashi, the extension downslope as part of the BAM project aimed to reach the oldest deposits at the site, and to get a complete view of the stratigraphy in this area. We reached the virgin soil in two locations in this excavation, in both cases about nine metres deep relative to the surface of the 2008 test-trench. The excavations revealed successive levels of mudbrick architecture, while new radiocarbon dates confirmed those from the 2008 field-season, as they cluster within the late sixth millennium bce.<sup>2</sup> Taken together, the radiocarbon dates derived from Tell-e Atashi overlap with the above-mentioned dating of the Neolithic settlement at Tepe Yahya as estimated by Prickett (c. 5600–4600 cal. bce). They are slightly more recent than those reckoned for Tepe Gaz Tavila (c. 5800–5400 cal. bce) (Prickett 1986a: 410 Tab. 3.1, 416–29, 544–45, 576–79; see Beale 1986a). They are also comparable to most radiocarbon dates from the Neolithic settlement at Mehrgarh (around 5000 cal. bce broadly speaking), including dates from its aceramic levels.

We opened Excavation 2 c. 50 m north of Excavation 1, within the north-western part of Tell-e Atashi's mound. This location was selected after) well-preserved mudbrick architectural remains just below the

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<sup>2</sup> Beta 500073: 6160 +/- 30 bp, 5214–5022 cal. bc (95.4 per cent); Beta 500074: 6240 +/- 30 bp, 5306–5204 cal. bc (74.7 per cent), 5167–5076 cal. bc (20.7 per cent).

surface of the site when a test-trench (TT6) was opened in 2017. In 2018, we expanded this test-trench over an area 15 × 10 m, orientated north–south/east-west (with an additional extension of c. 15 m<sup>2</sup>) in order to study the architecture over a greater area and get a better sense than could be revealed from Excavation 1 as to how the communities of Tell-e Atashi built and organized their space. We found the remains of mudbrick dwellings, including rooms with fireplaces and chimneys, and rooms that probably served as storage spaces. Although we have no radiocarbon dates from Excavation 2 yet, both the architectural features and material culture from this excavation are very similar to those from Excavation 1, so there is little doubt that they date to somewhere between the mid-sixth and mid-fifth millennia bce.

What does our fieldwork at Tell-e Atashi add to the current picture of the Neolithic period between south-eastern Iran and Pakistan? At the present time, based on ongoing analysis, and combined with the above-mentioned radiocarbon dates, certain elements seem worthy of mention.

### ***Subsistence Economy***

It is important to note that the animal remains from the site have not yet been fully studied, so we cannot at this time provide any information on this aspect. However, and thanks to the study of the botanical remains from the 2017 field-season (TT1–7, Excavation 1) conducted by Z. Shirazi (Archaeobotanical Laboratory, World Heritage base at Shahr-i Sokhta), it is possible to state that the communities who settled at Tell-e Atashi were Neolithic groups who cultivated wheat (*Triticum dicoccum*) and barley (*Hordeum vulgare*) and collected wild grasses (*Gramineae*, wild rye, bromes, oats), wild pulses (*Astragalus*, *Fabaceae*) and oil seeds (flax).

### ***Thumb-Impressed Mudbricks***

The bricks from Excavations 1 and 2 are all ‘thumb-impressed’ (Fig. 9.3). They bear a series of cavities on their surfaces that allowed for a better bonding with the mortar that was applied in between them. As noted above, similar thumb-impressed bricks have been recorded across Neolithic Iran and as far west as Jericho. Closer to the site of Tell-e Atashi, similar types of mudbricks have been recorded at Tepe Yahya Periods VII-VB, Tal-i Iblis Period I, and Mehrgarh Period I. It is certainly not possible to conclude from this evidence alone that direct connections must have existed between all sites in the Middle East that have yielded such thumb-impressed mudbricks. On the other hand, however, such a connection does seem to be more plausible with regard to the sites of Tell-e Atashi, Tal-i Iblis, Tepe Yahya (and Tepe Gaz Tavila), especially if we consider the relative chronological and geographical proximity between these sites (Tepe Yahya and Tal-i Iblis are located roughly 200 km as the crow flies to the south-west and north-west respectively of Tell-e Atashi) and the fact that the mudbricks from all three sites are indeed very similar.

### ***Absence of Pottery***

A remarkable characteristic of the material assemblage from Tell-e Atashi is the total absence of pottery. Current radiocarbon dates from this site are again between the mid-sixth and mid-fifth millennia bce, at which time the use of pottery in Iran had already been known for hundreds of years, with finds from sites including just west of the Jebal Barez at Tepe Yahya and in the Daulatabad Plain. Moreover, Tell-e Atashi is not the only aceramic site to have existed in the Bam-Narmashir region; we identified over twenty such sites in Darestan. This absence of pottery is particularly surprising given both the background of pottery making in Iran and the possibility that relationships — either diachronic or synchronic — seem likely to have existed between the Neolithic communities of Tell-e Atashi and other groups who used pottery in

south-eastern Iran. We noted above that the thumb-impressed mudbricks might potentially provide some kind of evidence for the existence of such relationships, and a few other categories of items that we discuss below also do not seem to contradict this possibility.

The existence of aceramic communities long after the invention of pottery has been observed in Kech-Makran and in the coastal regions of the Persian Gulf and Oman. The evidence from Kech-Makran, a site dating to the mid-late-fifth millennium bce, has been instrumental in hypothesizing that late aceramic Neolithic groups may have existed more broadly throughout the southern regions of south-eastern Iran and Pakistan (see Mutin 2012: 176–77). The evidence from Darestan does not contradict this hypothesis, as it shows that other earlier (but not Early) Neolithic groups who were settled north of the coastal regions of south-eastern Iran were also aceramic. This evidence is also consistent with the radiocarbon dates of around 5000 cal. bce from the aceramic settlement at Mehrgarh.

### ***Unbaked Clay Objects***

The communities at Tell-e Atashi did not make pottery, and instead used unbaked clay to build their living spaces and make various types of objects. Indeed, unbaked clay objects are the most abundant category of finds from Excavation 2.<sup>3</sup> These items include: animal and human figurines; small size discs ('pawns'), balls, cylindrical objects and cones; miniature vessels; beads; and fragments of clay that seemed to have been worked and left aside. Unbaked clay objects have been recorded at many sites across the Middle East from the Neolithic period onwards; however, their apparently relative abundance at Tell-e Atashi is noteworthy. Nonetheless, clay objects such as balls, cones, cylinders, and discs are by no means rare in the Middle East, where they are often interpreted as devices for counting or record keeping (e.g., Schmandt-Besserat 1974; Beale 1986d: 190). For instance, several of these categories of objects have parallels in Fars, such as at Tol-e Nurabad (Weeks et al. 2006: 438, fig. 3.189 TN-113, TN-163, TN-226, TN-268) and Tappeh Mianroud (Ebrahimi et al. 2016: 47, fig. 19). Closer to Tell-e Atashi, a number of clay objects were recorded at Tepe Yahya, including beads, balls, cones, discs and cylinders (see Beale 1986d: 190–99), and clay balls were also recorded at Mehrgarh (J.-F. Jarrige et al. 2013: 267, fig. 69 A-C). In a similar vein, the discovery of clay animal figurines at Tell-e Atashi is hardly surprising; these are ubiquitous in the Middle East. Virtually all of the miniature vessels from Tell-e Atashi consist of a single type of dish, typified by flat bases and low walls (Fig. 9.4). These are typically poorly built, possibly made by children. There is no apparent record of miniature unbaked clay vessels from either Tepe Yahya or Tal-i Iblis. On the other hand, one example, which was perforated, was found in a child's burial at Mehrgarh (J.-F. Jarrige et al. 2013: 87, 379, fig. 180).

Perhaps a more surprising find is the discovery from Excavation 2 of a clay figurine that is very similar to the typical medium or large sized 'sitting' figurines from Mehrgarh (Fig. 9.5: 7; Jarrige 2008: 158, fig. 7). Some seventy-eight specimens have been recorded from this latter site, all from Periods I–II, with 27 being of small size and 44 of medium or large size (Jarrige 2008: 157–58, figs 6–7). A clay figurine of a somewhat similar shape was also found at Tepe Sarab (Schmandt-Besserat 1974), but the parallels noted with the specimens from Mehrgarh are more striking. Two additional fragments, one found in Excavation 1 and one in Excavation 2, also resemble the 'sitting' figurines from Mehrgarh, although both these fragments come from figurines of smaller sizes (Fig. 9.5: 5–6). All three of the figurines from Tell-e Atashi

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<sup>3</sup> Save perhaps for the lithics; these have not yet been fully studied, so we do not know exactly how many were found in Excavation 2.

have incomplete perforations, and one also has a complete perforation. Complete perforations can also be observed on the finds from Mehrgarh (Jarrige 2008: 160, 161 fig. 13), and it would appear — although it remains uncertain — that incomplete perforations have also been identified (e.g., Jarrige 2008: 159, fig. 7?). An additional series of figurines, of a smaller, size, are reminiscent of those from the small-size category from Mehrgarh (e.g., Fig. 9.5: 1–4). We have observed applied small circular pellets and coils in several instances (e.g., Fig. 9.5: 2–3), a characteristic also noted at Mehrgarh (Jarrige 2008: 157–58). Finally, a few figurines from Tell-e Atashi parallel or evoke some of the sixteen ‘standing’ figurines recorded in the Neolithic levels at Mehrgarh (Jarrige 2008: 157–58, fig. 5).<sup>4</sup>

### ***Infant Burial***

We found one burial at Tell-e Atashi. This burial is that of an infant estimated to be between three and six months old, according to O. Munoz (CNRS), based on observations and measurements that she made using photographs. This burial was found in Excavation 2, and it was placed inside a room of the main building complex that was studied during this excavation after the building had been abandoned. We did not observe any pit. The body was laid on a surface, with its lower limbs flexed, apparently placed on its back, but possibly originally placed on its right side. It was orientated north-east–south-west, with the head placed at the western side and looking eastward. This infant was buried with one bracelet made of tiny, apparently ‘bony’ disc-shaped beads (fish vertebrae, bone?)<sup>5</sup> at each wrist and one anklet around the left leg. We found two drop-shaped beads, one in turquoise and one in chlorite/steatite, on the left side, near to (but not touching) the infant’s ribs and left arm. It is unclear whether these beads were part of a necklace or a bracelet, or just placed near the body. In any case, rodents disturbed parts of this burial, moving bones around and carrying bones away, so it is possible that more beads were originally present but were dispersed. The bones and wrist and leg bracelets bore traces of ochre.

The study of just one burial does not provide sufficient evidence to draw conclusions about funerary practices in Darestan during the Neolithic period. Nonetheless, attempting to compare this single burial to other available and geographically and chronologically consistent data (i.e. data from Mehrgarh and Tepe Yahya, in particular) can prove informative. The *modus operandi* observed at Tell-e Atashi has little in common with burials from Mehrgarh, where graves typically consisted of pits with a side chamber at the bottom sealed by a mudbrick wall (J.-F. Jarrige et al. 2013: 132, 322, fig. 115). Available data from anthropological analysis shows that, at this site, ‘[i]n most of the burials, the skeletons were laid on one side, more than 63% on the left side and a little less than 16% on the right side, with lower limbs always flexed and in many cases in very tightly way. The bodies of the newborns are lying on the back with their limbs extended. The 1999–2000 report mentions that almost 20% of their skeletons, though in flexed position, were in dorsal position. In fact, considering that the chambers were empty, the torsos of the individuals lying on their sides are likely to have collapsed on their back in the course of their decomposition process’. (J.-F. Jarrige et al. 2013: 134). As noted above, a similar collapse of the body from the right side on to the back might have happened in the case of the burial from Tell-e Atashi. The other possibility is that the body may just have been laid flat on the back, like the newborns at Mehrgarh, but its lower limbs are flexed, unlike at Mehrgarh. Additionally, the body’s orientation is different from most

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<sup>4</sup> Illustrations of Neolithic figurines from Mehrgarh are in J.-F. Jarrige et al. 2013: 215 fig. 23, 243 fig. 48, 244 fig. 49, 266 fig. 68, 273 fig. 75, 289 fig. 89, 292 fig. 92, 295 fig. 95, 371 fig. 170; C. Jarrige et al. 1995: 265 fig. 5.12 d, e, 294 fig. 6.6 g, 433 Fi. 9.3 a-d, 479 fig. 10.11 a-d, 539 fig. 11.14 a.

<sup>5</sup> We are leaving open the possibility that these beads were made of shell too.

burials at Mehrgarh: 'more than 81% of the burials have an east-west orientation. The heads are in 79% of the cases facing east and in 2% facing west. Other burials (7.03%) are north-south oriented' (J.-F. Jarrige et al. 2013: 132). As far as grave goods are concerned, with the exception of the usage of red ochre, which is not really diagnostic, we have not seen any striking parallels for the burial from Tell-e Atashi in the two comprehensive publications of Mehrgarh (C. Jarrige et al. 1995; J.-F. Jarrige et al. 2013). The only items from Mehrgarh that recall the Tell-e Atashi burial are disc-shaped shell beads which seem to be quite common at this site (e.g., J.-F. Jarrige et al. 2013: 374, fig. 173 D, 378, fig. 179 up, 383, fig. 186). However, we believe that the disc-shaped beads we found at Tell-e Atashi are made of bone rather than shell, although we leave the latter possibility open. One should probably also mention a child burial at Mehrgarh that contained a necklace, bracelets, anklets and a belt made with shell and steatite beads, including disc-shaped beads similar to those from Tell-e Atashi. The body from this burial had extended upper limbs, with one leg extended and the other flexed. One turquoise bead was found in this burial, and one was also found in another child burial from Mehrgarh (J.-F. Jarrige et al. 1995: 276, 281, 290–91, figs 6.2–6.3, 298, fig. 6.10).

Comparisons between Tell-e Atashi and Tepe Yahya have been more productive. Six Neolithic burials are recorded at this latter site: a child aged between six and twelve in Period VIID; two adults, one child, and a fourth individual who was not excavated in Period VIIC; and one adult in a context probably dating to Periods VII–VI and possibly more specifically to Period VIIC. It is difficult to discern a clear burial pattern, although it can be noted that, in all the burials that were excavated, the bodies were laid on a surface, and no evidence for pits was observed. In addition, all bodies were placed in a flexed position, and in four out of the five excavated graves, the bodies lay on their right side, while in one, it was lying on its left side. Three burials were orientated east–west, with the head at the west end; in two cases, the face was turned towards the south, while in one case, that of the individual placed on their left side, the face was turned towards the north. Two burials were orientated north–south, with the head at the south end in one, and the north end in the other. Traces of ochre were noted, and a fragment of turquoise and a necklace made of small fish vertebrae were recorded in one of the two adult burials from Period VIIC, while fragments of vegetal-tempered pottery and a few bones of *Bos* species were found in the other. A vegetal-tempered jar was recovered in the burial dated to the Periods VII–VI (see Beale 1986c: 102, fig. 6.1, 104, 109, 153, fig. 6.29, 156). Certainly, and despite obvious differences, elements of these burials recall the grave from Tell-e Atashi. An additional parallel can be found in a necklace from Period VC (estimated to date to c. 4500–4300 cal. bce according to Prickett 1986a: 410, Tab. 3.1). This is made from 64 turquoise beads including 44 'droplet-shaped' beads similar to the two turquoise and chlorite/steatite beads recorded from the Tell-e Atashi grave (Beale 1986d: 171, 174, fig. 7.4, 178, fig. 7.9).

## Conclusions

With pottery Neolithic levels dated to the seventh millennium cal. bce, Tepe Gav Koshi is, to the best of our knowledge, the earliest Neolithic site recorded in south-eastern Iran. This dating does, however, raise questions as to the relationship of this site to both aceramic and pottery Neolithic settlements in Fars. This is followed chronologically by the pottery Neolithic settlements at Tepe Yahya and in the Daulatabad Plain, estimated to date to the sixth–fifth millennia cal. bce. The aceramic settlement at Tell-e Atashi has been ascribed similar dates. In Pakistan, most radiocarbon dates from the aceramic and pottery Neolithic levels at Mehrgarh are also from between the sixth and fifth millennia cal. bce and are consistent with those from the Neolithic settlements at Tepe Yahya and in the Daulatabad Plain, as well as with those from Tell-e Atashi. However, there are also older radiocarbon dates at Mehrgarh, and, in

this regard, Jean-François Jarrige (et al. 2013: 151) has noted: 'There is indeed no reason not to keep into account the early radiocarbon dates, even if several other dates provide later datings, which are in total contradiction with the stratigraphic sequence of the site and the comparisons that we have established between Mehrgarh and several other West-Asian Neolithic sites'. Jarrige (et al. 2013: 151) has also rightly emphasized the many perturbations that have been observed across this sequence, which may have been responsible for 'the discrepancies between dates from samples often collected in the same level'. These include floods, irrigation, grazing, plant roots and tunnels made by rodents and insects.

It is not only the absolute dating of Mehrgarh, but also those from Tepe Yahya and the sites in the Daulatabad Plain that require clarification or verification. Similarly, the radiocarbon dates from Tell-e Atashi need to be analysed alongside the wider data we have collected from this site, including its stratigraphy, material culture, and subsistence economy. New radiocarbon analyses should help clarify the chronology of the Neolithic period in south-eastern Iran and Pakistan. However, radiocarbon analysis alone does not solve everything, and Jean-François Jarrige's comments cited above should be kept in mind, as should the need to carefully select and treat samples, and document their context (see Bar-Yosef 2000), and the detailed stratigraphic observations made by Jarrige and his team at Mehrgarh. Yet given our present state of knowledge, it would equally be inappropriate to ignore the radiocarbon dates from Tell-e Atashi (all of which give similar results) and the fact that they are consistent with most of those from Neolithic Mehrgarh. In other words, a reevaluation of the chronology of the Neolithization and Neolithic period in south-eastern Iran and Pakistan would not be comprehensive if one omitted to think about whether an alternate scenario, which saw the over-one-millennium-long Neolithic sequence recorded at Mehrgarh shifted to the sixth and fifth millennia bce,<sup>6</sup> in fact agreed with all types of evidence.

As far as material culture is concerned, it remains difficult to distinguish between those general similarities that appear to have been shared by all or many of the Neolithic communities across the Middle East, and more particular convergences and similarities that could reflect more specific relationships — either migrations, transfers or exchange — between communities and areas across the Daulatabad and Kachi Plains. There are technologies in lithic or pottery production (e.g., sequential slab construction) that are widely observed both chronologically and spatially, for example, and as such do not help to identify any kind of relationships that seem to be specific to groups of sites, or regions. As noted above, there are also examples of items with similar shapes that are recorded from western to eastern Iran, and even beyond, and from the Early Neolithic period onward. In Fars, we have a better sense of the chronological and intra- and inter- regional relationships (regardless of how they are interpreted), thanks to the various painted pottery styles that emerged during the Neolithic period. In Kerman, this is less evident at Tepe Yahya and in the Daulatabad Plain, where Neolithic pottery is plain, and at Tell-e Atashi, where there is no pottery.

The topic of material culture studies, and their limitations, is vast and certainly cannot be addressed here (e.g., Hicks & Beaudry 2010). In this conclusion, therefore, it is sufficient simply to summarize the various aspects of the archaeological record, explored in more detail above, in which we have observed similarities and differences between sites and regions, as these imply similarities and differences within certain spheres of activity. It is emphasized that this summary should only be conceived as a first step,

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<sup>6</sup> Instead of the eighth and seventh millennia bce as currently suggested.



based on our present state of knowledge, towards a more comprehensive analysis that of necessity would need to incorporate more data.

Beginning with the oldest ceramic evidence, Tepe Gav Koshi appears to be connected to Fars pottery traditions. This connection to Fars seems to continue at the later site of Tepe Yahya, as well as at sites in the Daulatabad Plain. Additional aspects of the material assemblage at these sites are considered to be local (e.g., chlorite figurine), although other finds have been compared to items from Mehrgarh. Tell-e Atashi shares similar aspects with Tepe Yahya, such as construction materials (thumb-impressed mudbricks) and categories of artefacts (among them ornaments, counting/recording devices, or game pieces), as well as burial practices. However, there is also considerable divergence in the fact that Tell-e Atashi has yielded no pottery. This is quite an important difference, with the potential implication that the communities at these two sites were perhaps following different practices in terms of how they cooked, ate, and stored their provisions. On the other hand, an aceramic profile is also observed at Mehrgarh (Period I), possibly contemporaneously (?), while the clay figurines described above (as well as the thumb-impressed mudbricks) point to an additional connection between Tell-e Atashi and this site. The function of these figurines is not known, although Catherine Jarrige (2008: 160–61) suggests that they are 'linked with religious rituals and sympathetic magic'. Finally, the pottery that did eventually appear at Mehrgarh (Period II) is comparable to that of the Daulatabad Plain and Tepe Yahya, and the applied decorations observed on some fragments are also a feature identified on finds recorded at Tal-i Iblis.

Two general observations can be made about this preliminary picture. If the site of Tepe Gav Koshi, which is apparently older, is omitted from this comparison, the first such observation is that, based on the differences outlined above, there was evidently a diversity of practices between the mid-sixth and mid-fifth millennia cal. bce in south-eastern Iran and Pakistan. These can be divided into: farming groups with painted pottery identified in Fars; farming groups with plain pottery in Kerman; farming groups with no pottery in Kerman; farming groups with no pottery at Mehrgarh, followed by farming groups with Mehrgarh (depending on how one considers its radiocarbon dates); communities who collected shellfish in south-eastern Pakistan; hunter-gatherers further east; and probably many other communities that we do not know of. The second observation is that, despite these differences, similarities can be observed between south-eastern Iran and Pakistan, although it is unclear whether, and in which cases, they should be deemed to reflect convergences, or specific migrations, transfer or exchange. We agree with Carl Lamberg-Karlovsky and Thomas Beale (1986: 266) that, at a minimum, 'some degree of communication and diffusion' must have existed. In addition to the examples of similarities mentioned above, this is also illustrated by the presence of minerals found far away from their natural sources, such as obsidian, found from sites as early as the Early Neolithic in the Zagros Mountains, and also further to the south-east, at Tepe Gav Koshi and Tepe Yahya (e.g., Hole 1969; Hole et al. 1977; Beale 1986d: 183, 193, fig. 7.19 f.; Alizadeh 2003; Soleimani & Fazeli Nashli 2018: 72, fig. 15), as well as lapis lazuli and turquoise in the Neolithic levels at Mehrgarh (Jarrige 2008) and in Darestan (Mutin et al. in preparation). It is perhaps also worth remembering here that early farmers tended to settle on alluvial fans, both in south-eastern Iran and Pakistan. This, at least, was the case in the Daulatabad Plain and at Mehrgarh (Petrie & Thomas 2012). Thus while a significant diversity between sites is clearly observable in the archaeological record, it is also apparent that there was a degree of communication and diffusion between the mid-sixth-to-mid-fifth millennia cal. bce Neolithic groups in south-eastern Iran, and it emerges from this overview that this may have been the case between these groups and Mehrgarh. At a minimum, although many

differences can be identified between the assemblage from this site and those from south-eastern Iran, data from Darestan have highlighted additional parallels with Mehrgarh Periods I–II that do not point to distant Early Neolithic sites, but rather to south-eastern Iran between the mid-sixth and mid-fifth millennia bce, and these parallels are consistent with a series of radiocarbon dates from this site.

A reevaluation of the topic of the Neolithization of eastern Middle Asia and South Asia would undoubtedly require more research, including a thorough comparative assessment of all aspects of the archaeological assemblage from Mehrgarh, consideration of other sites and regions, including north-eastern Iran and southern Central Asia in particular, and inclusion of data on ancient climate. We hope, nonetheless, that, in highlighting here some of the mid-sixth-to-mid-fifth millennia cal. bce differences and relationships we have observed in the archaeological record between the Daulatabad and Kachi Plains, and their potential implications, we have at least contributed to a reopening of this topic with the right questions.

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Fig. 1: Map of south-eastern Iran and Pakistan with location of the main sites mentioned in the text. Map by B. Mutin using ArcMap.

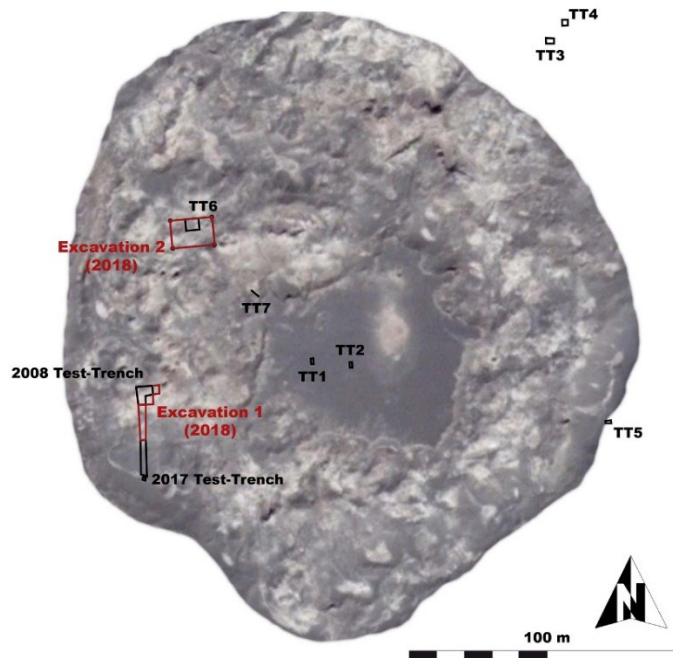


Fig. 2: View of the main part of the mounded area at Tell-e Atashi with locations of the archaeological trenches and excavations. Image by B. Mutin, basemap © Google Earth.



Fig. 3: Views of Excavation 1 (up) and Excavation 2 (down). © BAM.



Fig. 4: Mudbrick from Tell-e Atashi, Excavation 2. © BAM.



Fig. 5: Unbaked clay miniature dish from Tell-e Atashi, Excavation 2. © BAM.

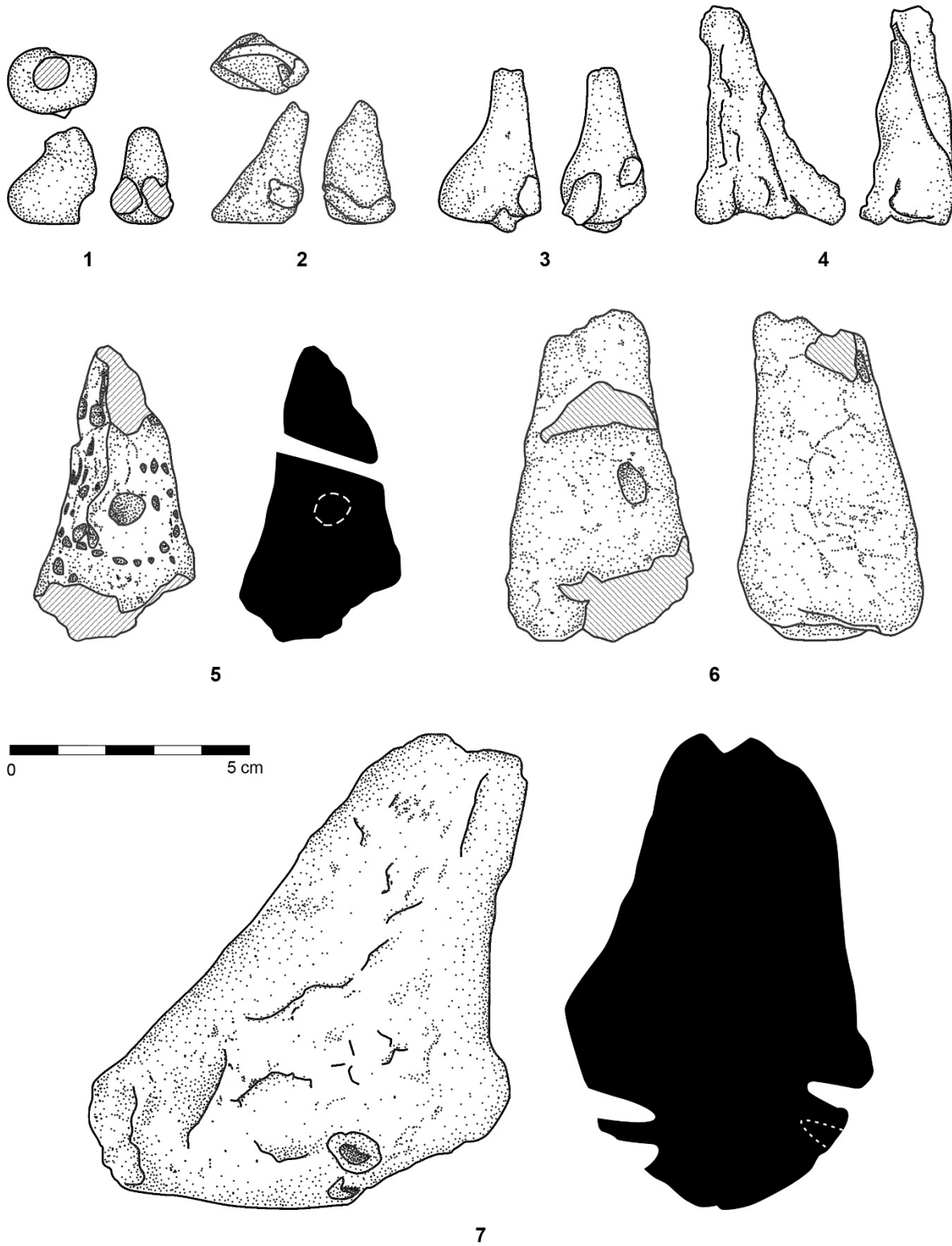


Fig. 6: Unbaked clay figurines from Tell-e Atashi, Excavation 1 (nos 1–2, 4, 6) and Excavation 2 (nos 3, 5, 7). © BAM; drawings by H. Fakhre-Ghaemi.



Fig. 7: Burial from Excavation 2 (TT6). © BAM.