Conscious tokens?

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CONSCIOUS TOKENS?

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Small, geometric-shaped clay objects (spheres, discs cones, etc.) are a common feature of all occupational levels at Çatalhöyük. Crudely manufactured in the context of the site's material culture, clay objects are generally disposed of after little use, in middens. Clay objects appear at the start of the Neolithic across the wider Near East. They are the most prevalent artefact at neighbouring ninth to eight millennium BC Boncuklu Höyük, for example, and remain common across Anatolia and the Near East into the first millennium BC. It is largely assumed that from their inception, clay objects acted as "tokens", used as part of a formal, settlement wide and intersettlement mnemonic record-keeping system, consistent across the entire Near East for millennia. Their sudden appearance in the Neolithic was necessitated by the simultaneous shift in lifestyle from mobile hunter-gather to sedentary farming communities. It is further argued (Schmandt-Besserat 1992a, 1992b, 1996) that it is only after the cognitive shift into the modern, civilised mind that humans become capable of counting, recording and conceiving of abstract numbers. In this theoretical context, the presence of "tokens" at a settlement is clear evidence for the presence of a highly organised, intelligent, cognitively "advanced" population.

Systematic analysis of over 700 clay objects, considering object form, use-wear, immediate contextual deposition and broader spatial and temporal patterning, finds no support for the interpretation of these items as information storage tools at Çatalhöyük. Furthermore, the study of the distribution of clay objects across the wider Neolithic Near East, reveals little indication of correlations between site type, size, complexity and lifestyle, as would be expected (Bennison-Chapman 2013). At Çatalhöyük, there is no evidence for the use of small geometric clay objects as "tokens" – symbols used to represent goods or produce, and to retain information for retrieval at a later point in time. Clay objects held no intrinsic value, nor did they have a single, solid, universal role transcending households, occupational areas or levels of settlement at Çatalhöyük. They are just as likely to have been utilised as simple counting tools, as they were in gaming

or ritual activities. The presence of clay objects therefore provides little evidence for higher levels of consciousness at Neolithic Çatalhöyük.

INTRODUCTION

It is often claimed that higher levels of consciousness were essential for Neolithic village life. This is evidenced by an apparent increase in abstract thought, leading to metrication and objectification in the Neolithic (e.g. Donald 1991; Renfew 1998, 2007, 2012; Watkins 2010). Small, geometric clay objects, interpreted as "tokens" are presumed to be the material culture evidence for such cognitive abilities (Schmandt-Besserat 1992a, 1996). Aside from the many associated issues such as definitions of cognition, environmental factors, and the ability of material culture to influence and inform us on the mind (see Wheeler, this volume, Chapter 4), we must first look at the evidence for the existence of "tokens" at all in the archaeological record of the Neolithic Near East. Do we really have "tokens" at Çatalhöyük? If so, how, when and where were they used?

Small geometric clay objects appear in the archaeological record of the Near East at the start of the Neolithic, in the tenth millennium cal. BC (e.g. PPNA Jericho, Sheikh-e Abad and Çayönü) (Broman Morales 1990; Kenyon & Holland 1983: 815, fig. 367.6 p. 356; Matthews et al. 2013: 140, 141, table 11.5 p. 142). Commonly referred to as "tokens", they are found across the entire Near East region and are also the most prevalent artefact at neighbouring ninth to eight millennium BC Boncuklu Höyük. Clay objects remain common across Anatolia and the Near East into the first millennium BC. It is largely assumed that from their inception, clay objects functioned as "tokens": symbolic, mnemonic information storage tools (Schmandt-Besserat 1992a, 1996). Acting as a symbolic code, their function, it is argued, was consistent across the Near East, remaining unchanged into historic times (Schmandt-Besserat 1992a, 1996). Necessitated by the shift in lifestyle from mobile hunter-gather to sedentary farming communities, Schmandt-Besserat claims that it is only after a cognitive shift into the modern, civilised mind that humans become capable of counting, recording and conceiving of abstract numbers and using mnemonic devices.

Small geometric-shaped clay objects are a common feature of all occupational levels at Çatalhöyük. Present in a basic range of shapes (spheres, discs, cones, etc.), Çatalhöyük's clay objects are crudely manufactured in the context of the site's material culture and are generally disposed of, after little use, in middens (Figure 5.1). In the theoretical context of this volume (see especially Chapter 1, this volume), the presence of "tokens" at a Neolithic settlement is clear evidence of a highly organised, intelligent, cognitively "advanced" population, one exhibiting higher levels of consciousness with small geometric clay objects of basic shapes used to symbolise abstract notions of specific and varied commodities (specific animals, crops, processed food-stuffs and raw materials for craft production). However, this interpretation rests upon the assumption that these small geometric clay objects functioned as "tokens" at Çatalhöyük: abstract, symbolic, mnemonic, information storage devices.

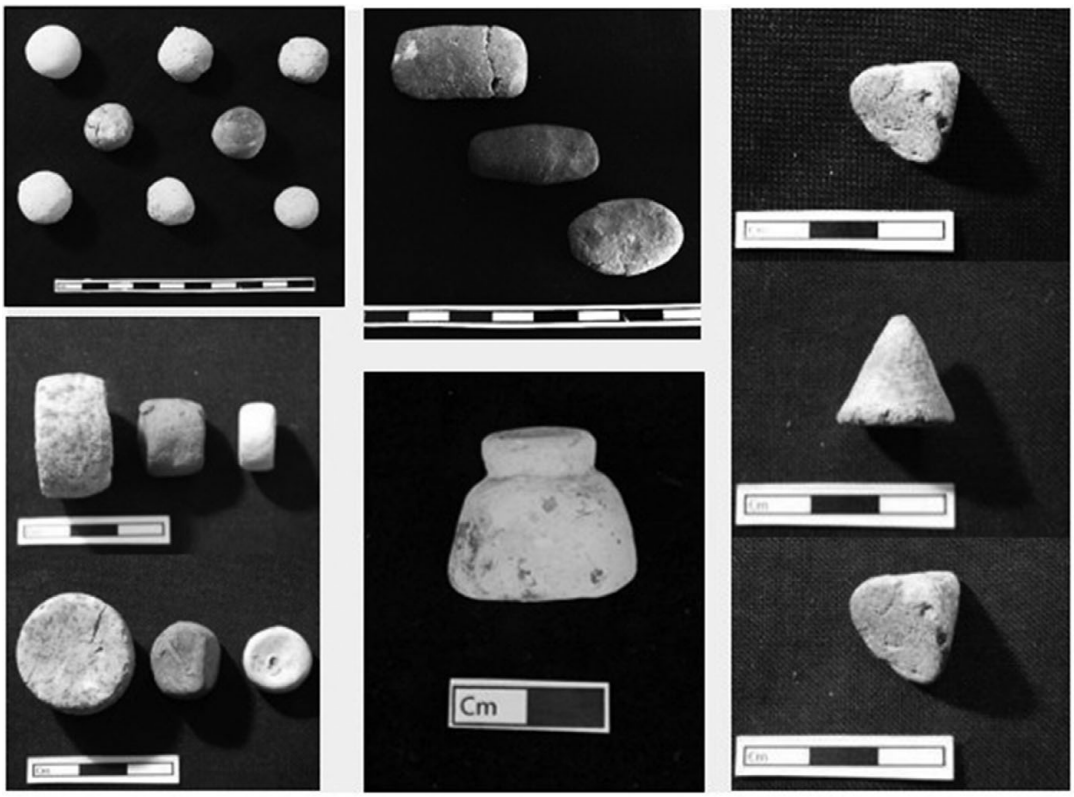

FIGURE 5.1 Examples of the types of small geometric clay objects recovered from Çatalhöyük East. (Photos: author's own)

Are small geometric clay objects at Neolithic Çatalhöyük "tokens" and thus evidence of abstraction, metrication and higher levels of consciousness? I define "tokens" as small tools acting as mnemonic aids, used to hold and transmit information. They are utilised within the sphere of administration, to store and communicate information. In this chapter I argue that systematic analysis of hundreds of clay objects from Çatalhöyük finds no support for the interpretation of these items as "tokens" in the traditional sense at Çatalhöyük. Evidence for other interpretive functions including simple counting aids, children's toys, gaming pieces and items of divination or lots will be discussed alongside evidence for their use in the symbolic, record keeping sphere.

RESEARCH CONTEXT

Early Research

Clay objects are small (generally <5 cm maximum dimension), portable objects, which are intentionally crafted into a geometric form (sphere, cone, disc, etc.) (Figure 5.1). The nonfunctional term "clay object" is used here, yet due to their uncertain function, identical and similar objects are referred to in archaeological literature as "tokens", "jetons", "counters", "gaming pieces" and the like (examples of diverse terminology from

Neolithic sites in the Near East include: "jeton": Costello 2000, 2002: "discs or jetons". "Gaming piece": Verhoeven & Akkermans 2000: fig. 4.7.3, pp. 117, 108; Kenyon & Holland 1983: p. 815, fig. 367.1-16 p. 560; Kenyon & Holland 1982: pp. 557–558, fig. 226.1-4 p. 557. "Abstract stalk": Broman Morales 1990: pp. 64–65, 71–72, 74, pl. 5.h & I p. 84. "Tally": Tekin 2007: fig.14 p. 51; Verhoeven & Akkermans 2000: fig. 4.7.4, pp. 117, 108. "Cone", "disc", cylinder" or other simple geometric-shape label: Duru & Umurtak 2005: various shape terms used including "rectangular prisms", "clay lumps", "cylindrical shaped objects" & "disc shaped objects" see pp. 109–110, 174, pl. 130–131, 172; Mahasneh & Gebel 1998: terms used include "cone", "cylinder", "disc", "sphere" 108, fig. 1 p. 108; Esin et al. 1991: "cones" 134; Broman Morales 1990: "cone" pp. 387–388 & fig. 168: 3–4, "abstract cone" pp. 66, 71–72, 74, pl. 5. j p. 84, "ball" p. 389; fig. 169: 1, 2, 3, 4, 10, "disc" pp. 66–67, 71–72, 75 & pl. 6.d p. 85, "ball" pp. 66, 71–72, 75, pl. 6.e p. 85; Voight 1983: "small cones" fig. 102.a–b p. 183 & pl. 27.i–q; Çambel & Braidwood 1979: "pawn-shaped" p. 149 lower illustration b. "Miscellaneous geometrics" [no further shape classification given]: Voight 1983: fig. 102.c–e p. 183 & pl. 27.g–h and "token": Iceland 2010; Özbal et al. 2004: fig. 13.15–22 p. 104 & fig. 15.8–10 p. 106; Nilhamn 2002; Akkermans 1996b: fig. 8.4 p. 465, fig. 8.5 p. 466). Clay objects can be plain or decorated with markings and incisions. For the purposes of this study, small ("miniature") vessels are excluded from this definition, as are any miniature version of a naturalistic form such as zoomorphic figurines.

An abundance of small geometric clay objects has long been acknowledged throughout the Near East. However, it was not until clay bullae, hollow spherical clay envelopes, marked with impressions on the outside and containing small clay objects, were first excavated at Near Eastern sites of the late fourth to second millennium BC that attention focused for the first time on the small clay objects themselves. The earliest publication of clay objects comes from archaeologist J. de Morgan (de Morgan et al. 1905), a catalogue of objects, including those classified as "tokens" and "counters" from numerous Near Eastern sites of the "Early Periods". The first study of *Neolithic* clay objects concerned Jarmo's late Neolithic (sixth millennium) artefacts, completed by Broman in 1958. Since this study, others have focused on clay objects and associated hollow envelopes (bullae), from the late fourth and third millennia BC (proto- and early historic) leaving Neolithic clay objects largely ignored.

The earliest interpretative study is by Leo Oppenheim (1959). His work was crucial in linking clay objects to counting and administration. This also cemented the link between clay objects, bullae and sealing practices in the early historic Near East (Leo Oppenheim 1959). The publication sparked a renewed research interest into early administrative technologies and their relationship to the appearance of writing, forming the basis for all subsequent interpretations of clay objects across all periods of Near Eastern archaeology. Leo Oppenheim's interpretation of nonliterate accounting systems in the Near East centres on the discussion of Text 449, a cuneiform administrative text published in the Harvard Semitic Series volume XVI

(Leo Oppenheim 1959). The "text" is in fact a clay envelope or "bulla", referred to as an "egg-shaped tablet", largely intact and with detailed markings on the outer surface (Leo Oppenheim 1959: 123). Recovered from second millennium BC Nuzi (ancient Yorghan Tepe) upon excavation, it contained 48 items recorded as "little stones" (Leo Oppenheim 1959: 122–123). The outer surface of the bulla records eight lines of cuneiform inscription (see following) and a seal impression (not published). The text, when translated, was found to be a count of 48 animals, along with details of their age, sex and reproductive maturity (Leo Oppenheim 1959: 124). With the number of animals in the inscription exactly matching the number of "stones" contained inside the "egg-shaped tablet", Leo Oppenheim is certain the artefact is administrative in function (Leo Oppenheim 1959: 123). Notably, the text opens with the line "Stones [referring] to sheep and goats. . ." The Akkadian word *abnu* being translated as "stone", therefore describing the containing items as mere pebbles acting as "counters, markers, or something of the sort" (Leo Oppenheim 1959: 123–124).

Leo Oppenheim's work was important in bringing attention to small, geometric clay objects. It led to subsequent research into early administrative systems in the Near East, clearly linking clay objects, bullae, the use of seals and writing. Leo Oppenheim's work suggests two crucial things. First, the small objects inside the bulla all served a single function, their appearance (shape, colour, size) unimportant. Second, they performed a role alongside and not instead of writing. Yet large urban centres of south Mesopotamia of the late fourth millennium BC onwards and small Neolithic agrarian communities are far removed in time and nature.

DENISE SCHMANDT-BESSERAT

Denise Schmandt-Besserat is the most prominent academic in the investigation of Near Eastern clay objects. Since the late 1970s she advanced detailed theories as to why geometric clay objects initially appeared in the Neolithic, the evolution of their use and form through time, and their supposed decline with the advent of writing in the third millennium BC (Schmandt-Besserat 1977, 1978a, 1978b, 1979, 1980, 1988, 1992a, 1992b, 1994, 1996, 1999). Schmandt-Besserat's theory stems from extensive study of 10,000 clay objects, mostly previously unpublished material (Schmandt-Besserat 1992a: 10, 1992b). The artefacts are dominated by small, geometric clay objects, but also include geometric-shaped stone objects, miniature vessels and anthropomorphic and zoomorphic figurines in clay (Schmandt-Besserat 1992a, 1992b, 1996). The material covers a long chronology, spanning mid-Neolithic (c. 8,000 BC) to Early Bronze Age (c. 3,000 BC). It hails from 116 sites across Southwest Asia, from modern Iran, Iraq, Syria, Turkey, Israel and Jordan (Schmandt-Besserat 1992a: 7, 1992b: vii–viii).

Inspired by the work of Leo Oppenheim, from the start of the Neolithic, "tokens", she claims, were invented by farmers, acting as mnemonic devices to meet administrative needs. Shape, size and elaboration symbolised a specific quantity of a set commodity. "Tokens" acted as a nonverbal, nonwritten "code". This code was understood and used consistently throughout the Near East,

directly evolving into cuneiform (the world's earliest known written script) around the mid-to-late fourth millennium BC (Schmandt-Besserat 1977, 1978a, 1980, 1992a, 1996). At all times, tokens were used in groups. Initially kept together in organic containers (wooden boxes, leather pouches, etc.), an increase in bureaucracy in the fourth millennium led to new methods of organisation, storage and archiving with bullae invented specifically to contain "tokens", acting as a permanent archive (Schmandt-Besserat 1992a: 108; 1996: 7).

Schmandt-Besserat's theory is complex, linking to the many social, economic and cognitive developments taking place from the Palaeolithic into the start of the early historic period of the late fourth millennium BC. "Tokens", she claims, appear simultaneously with animal and plant domestication and food production in the Neolithic. Their appearance becomes more elaborate with the "rise of social structures" and "rank leadership", peaking in use at the time of state formation c. 4,000 BC (Schmandt-Besserat 1992a: 99; 1996: 7). Schmandt-Besserat argues that that clay objects do not appear in the archaeological record until the Neolithic as mobile hunter-gather communities had neither need nor cognitive ability to count resources (Schmandt-Besserat 1992a: 157–159). Agriculture, the hallmark of sedentary Neolithic village life was what made accounting necessary (1992a: 161, 166–168, 170, 172, 1996: 102). At this point in time, a cognitive shift allowed the first framers to use abstract symbols, abstract number and thus utilise small clay objects as symbolic accounting tools (Schmandt-Besserat 1988, 1992a, 1996, 1999).

Upon the publication of her two-volume book (1992a, 1992b), Schmandt-Besserat's work became widely accepted. As such, her ideas have profoundly influenced the interpretation of small, geometric clay objects found at Neolithic, as well as later prehistoric and historic sites in the Near East. "Token" became the word used to identify such objects when found at Near Eastern sites. Neolithic archaeologists have been heavily influenced by Schmandt-Besserat's ideas in their interpretations of the role of clay objects (Akkermans & Duistermaat 1996; Costello 2000, 2002, 2011 in addition to archaeologists mentioned at the opening of the introduction). Researchers from secondary disciplines have been even more accepting of her theory (for example, Bottéro, Herrenschmidt & Vernant 2000; Coulmas 2003; Fischer 2001; Malafouris 2013; Netz 2002). The one exception is the early historic community, represented Peter Damerow, Robert Englund, Jöran Friberg and Hans Nissen. The group, comprised of linguistic scholars specialising in the origins of writing and counting, has been outspoken in its opposition to Schmandt-Besserat's "token" theory, citing many problems with her research (Brown 1996; Damerow 1993; Englund 1993, 1998; Friberg 1994; Michalowski 1993) and concluding that her 1992 work was an unsuccessful, "sprawling and highly speculative piece of research" (Brown 1996: 37, 42).

From the fourth millennium BC onwards, small clay objects are commonly recovered sealed inside hollow clay spheres or "bullae" acting as envelopes. These bullae often contained the impressions of the small items they contained along with cylinder seal impressions (see, for example, Leo

Oppenheim 1959: fig. 1 & 2 p. 122; Nissen et al. 1993: pp. 12–13; Pitman 1996: fig. 18a p. 231; Woods 2010: no. 32 & 33 p. 66, no. 35–36 p. 68). Soon writing also appeared on the surface of bullae and on flat clay tablets. Thus from the mid-fourth millennium BC onwards, small clay objects were almost certainly used alongside bullae, seals and writing as part of the administrative package. Though covering a vast geographic area and time period, Schmandt-Besserat's argument rests almost entirely on evidence from south Mesopotamia and Susa, likewise from urban sites of the fourth millennium BC onwards (1992b). One cannot assume a similar or identical function of material culture across such distant societies, distances and time periods (Bennison-Chapman 2014: ch. 2). To her credit, and in part due to the lack of an alternative theory, when recovered at Neolithic sites, clay objects were until very recently, attributed with the same administrative function as their fourth-millennium Sumerian counterparts. Geometric clay objects have been catalogued as "counters", "geometrics", "figurines", "gaming pieces", "tallies" and "misc. items" in addition to their interpretation as recording devices usually with no analysis of their form or regard to their find context.

AIMS, RESEARCH QUESTIONS AND HYPOTHESIS

Small geometric clay objects are assumed to have functioned as "tokens", symbolic tools used in the administration of agricultural produce within Neolithic communities. With different shapes and sizes seemingly representing exact units of specific commodities, in a standardised and universal symbolic system, Neolithic "tokens" were therefore mnemonic, information storage devices. If the dominant interpretation of clay objects within the Neolithic context is true, their presence at a site is unequivocal evidence of the existence of higher levels of consciousness. Their presence as "tokens" suggests villages at Çatalhöyük were capable of abstract thought, distant thought and metrication. Yet despite often being presented as fact, evidence for the use of clay objects as "tokens" within the Neolithic Near East is far from straightforward, as seen earlier.

This chapter scrutinises small geometric clay objects from Neolithic Çatalhöyük and independently assesses the evidence in support of their use as "tokens" as outlined earlier. If clay objects functioned as tokens in the way Schmandt-Besserat (1992a, 1992b, 1996) claims, it would be expected that they would be present in a range of standardised shapes and sizes, be recovered in groups, and show an increased diversity and distribution throughout Çatalhöyük's long occupation. Evidence fitting this interpretation is sought, alongside evidence for other common functional interpretations such as their use in administration but as simple counters, nonadministrative roles such as gaming pieces, children's toys, and the possibility that clay objects were indeed nonartefacts (waste products, accidently formed or "doodles" in clay). Specifically, if clay objects were used as "tokens", we would expect the following: (1) a range of objects definitely and intentionally crafted into a range of clear, geometric shapes; (2) little variation within specific three-dimensional shape categories; (3) a correlation between their presence at a site and specific features including sedentism,

agriculture, a range of crops and other materials in circulation; (4) a set repertoire of shapes, consistent with the range and type of goods and commodities in circulation at the site; and (5) regional and temporal correlation across the entire Neolithic of the Near East.

MATERIALS AND METHODS

Data for this chapter stems from extensive research into the classification, form, context and function of clay objects from sites across the Neolithic of the Near East. The methodology is a three-stage approach, (1) studying individual objects, (2) their contextual distribution at Çatalhöyük and (3) interpreting this data within the broader regional context of Neolithic Anatolia and the Near East. Due to the duration and scale of excavations, along with a thorough retrieval process and finds policy, thousands of artefacts crafted from clay have been recovered from Çatalhöyük over the many decades of excavations. Aside from generally identifiable artefacts including large "clay [cooking] balls", stamp seals and figurines, there are many crates of miscellaneous clay objects of unidentified function containing well over one thousand small, intentionally shaped clay objects in addition to nonartefactual pieces of clay such as remnants of structural material. A wide variety of clay materials and artefacts were viewed and assessed at Çatalhöyük in order to identify artefacts fitting the definition of clay object. Over 1,500 artefacts fitting the classification criteria were selected and studied in two phases, almost 700 in the initial phase and a further 800 in the second phase of analysis. Various features and characteristics of individual clay objects were assessed related to their appearance (e.g. colour, shape, dimensions), manufacture (e.g. clay type, finish, presence of fingerprints) and postdeposition processes (e.g. presence of burning, condition). This data was used to characterise and compare clay objects and establish the degree of similarity within and across specific three-dimensional shapes and thus identify groups of clay objects potentially capable of conveying the same symbolic meaning.

The contextual distribution of every single individual clay object was assessed, recording for each object the site area (North, South or TP), broad occupational phase (early, middle, late or final), exact stratigraphic level and the immediate find context and location (e.g. pit fill, pit within domestic structure). Analysis of the nature of the clay objects from different context types was undertaken, to track any changes in the nature or use of clay objects through time, across different areas of site, according to which features and/or artefacts and materials clay objects were found in association with and so on. One major downfall of past "token" studies is the lack of consideration of the contextual distribution of clay objects within a site as well as the use of these details to seek correlation between the range and nature of on-site activities and the presence and nature of clay objects. Consequently, data from Çatalhöyük's clay objects were considered in the wider context of Neolithic Anatolia and the Near East. Data from Çatalhöyük was compared to similarly detailed clay object studies of neighbouring Boncuklu Höyük (mid-ninth to mid-eight millennia BC) and Tell Sabi Abyad (north Syria, mid-eighth to early sixth millennia BC) in addition to data from the examination of 20 less complete assemblages along with a

broader level survey charting the presence, relative number or absence of clay objects at an additional 56 sites (Bennison-Chapman 2014; 2019a; 20019b). The aim was to evaluate the evidence for an intersite system of symbolic token accounting during the Neolithic.

RESULTS: OBJECT CHARACTERISTICS

Çatalhöyük's clay objects occur in a range of three-dimensional shapes. The objects are classified into seven *basic* three-dimensional shapes including a category for miscellaneous/other. Spheres (including semispheres) constitute over half of all studied objects (55%) with discs forming the second largest broad shape category, representing almost one-quarter of the total (23%). Cones are the next most numerous shaped clay object (8%). All other shapes (ovoid, cube/cuboid, cone, cylinder and miscellaneous) occur in far smaller proportions. Subdivisions occur within some of the basic shapes, leading to a total of 14 *detailed* three-dimensional shapes represented within the Çatalhöyük clay object assemblage. Spheres, for example, are split into true spheres and semi- or flattened spheres. The cones are divided into five subcategories dependent on the shape of the base and straightness of the sides, for example. Spheres still dominate the assemblage, with *true* spheres comprising 46 per cent of the assemblage. All other detailed three-dimensional shapes are represented in far smaller proportions with type 2 discs (flat base, 14%), flattened/semispheres (9%) and type 1 cones (round base, straight sides, 5%) the next most numerous (Figure 5.2).

The overwhelming majority of studied clay objects were complete and intact (64%), although methodology did not account for

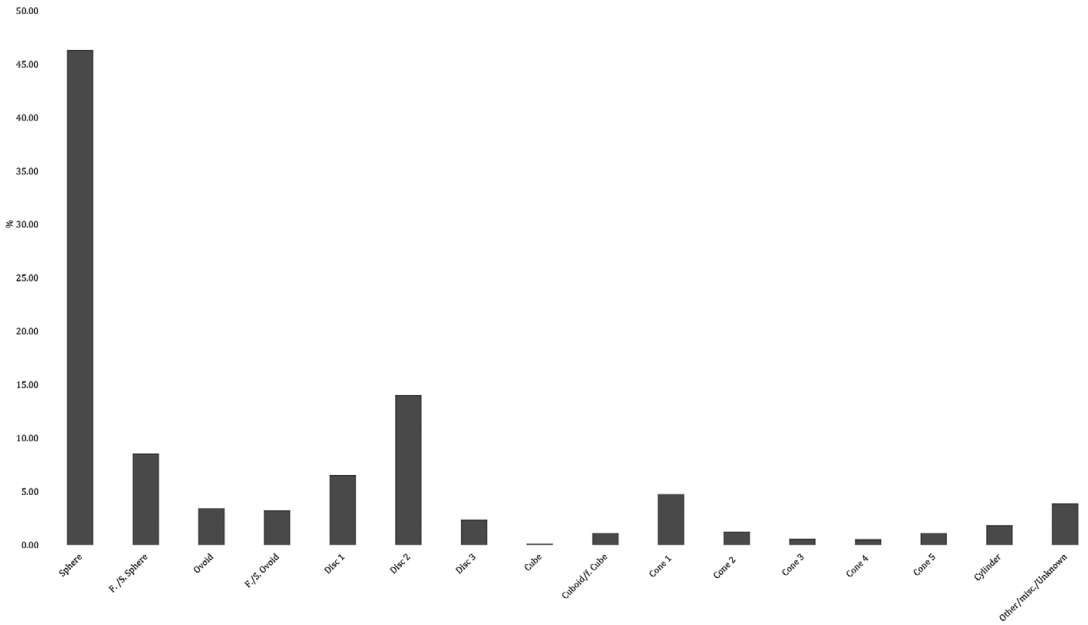

FIGURE 5.2 The relative number of clay objects assigned to each *detailed* three-dimensional shape category used in the study (n = 1,057).

heavily fragmented artefacts. Eighteen per cent of Çatalhöyük's clay objects assemblage are characterised as being damaged to the extent that the remaining artefact is less than 75 per cent complete. For the overwhelming majority of clay objects, weight and dimensions can be compared against one another, within and across three-dimensional shape categories. The selection strategy characterises clay objects as small and portable artefacts. The majority of objects weigh less than 3.00 g (50%), and 10 per cent of studied clay objects weigh over 10.00 g. Equally small in size, the maximum dimension of Çatalhöyük's clay objects as measured from three angles falls between 1.22 cm and 2.06 cm. Few objects stand out from the assemblage as a whole for being small or large variations of a common form. Yet size and weight data show there was no standardized weight or size overall or within any particular three-dimensional shape. The clay objects do not fall within any particular grouping, with a graduated increase and decrease in size, peaking within the average ranges listed earlier. In short, no correlation is evidenced in terms of object shape and size. This is not true of later, proto-historic (mid-late fourth millennium) clay objects. Recent research on the clay objects found within bullae Chogha Mish (Susiana plain), for example (Woods 2010), shows that when recovered in caches (as was the norm), clay objects tend to be grouped with others of the same shape, and furthermore, they are of identical proportions, size and therefore overall appearance (Delougaz & Kantor 1996: table 11 pp. 121–122 & table 12 p. 123; Woods 2010: pp. 7, 15–28, 3–85, fig. 21 p. 61). A contemporary example from Hacinebi Tepe (north Mesopotamia) demonstrates similar object shape and size standardization. Amongst other shapes were 10 spheres created in two distinct size groupings (Pitman 1996: p. 230, bulla HN1100 fig. 18a p. 231).

Like other small clay artefacts at Çatalhöyük (figurines and larger "clay balls"), the site's clay objects comprise a limited range of natural colours, most likely made from locally sourced, naturally occurring clays (Avis 2010; Doherty 2013, 2017: ch. 2). No evidence for tempering is attested. The use of pigment is documented on one or two examples only (faint traces of a red pigment), meaning the majority of clay objects exist in their natural colour. Practically all of Çatalhöyük's clay objects are intentionally hardened (85%), yet this was carefully undertaken, as the presence of blacked surfaces, the result of high temperature exposure is extremely low (<10%).

Fourteen different colour shades were defined and identified, ranging from jet black, through to grey and bright white, dark brown, lighter brown, orange and beige, with red and yellow less commonly found. These colours reflect the full range of naturally occurring, locally available clay sources in Çatalhöyük's immediate surrounds (Doherty 2017: 75, fig. 4.1 p. 68, fig. 4.3 p. 74). Differences in clay colour reflect distinctions in the landscape where the clays are formed. The Konya plain displays a wide variety of clay colours, each reflecting the immediate conditions under which it developed. Black and dark clays were formed under very moist conditions, where high levels of dark organic matter could persist. In contrast, the white and pale green marls found across the entire extent of the Konya plain were created in lakes and at lake margins; areas with little or no alluvial sediment, very

low iron and organic matter in combination with very high calcium carbonate content (Doherty 2017: 75–79). Thus in colour, Çatalhöyük's clay objects are present in a diverse range of colours, though the majority can be classified amongst the mid-tone ranges of the basic colours (mid-greys and browns). There is diversity in the type and range of clay objects colours according to three-dimensional shape categories. Spheres, for example, are present in a wide range of colour shades reflecting all 14 identified tones. Cones (all subtypes combined) are equally diverse in colour. Discs in contrast are presented in a far more limited range of colours, with just four to six shades represented according to exact colour-shade.

The assemblage is homogenous in finish with almost all objects described as having a "smooth" or "very smooth" outer surface finish (97%), along with a "fine" clay texture (99%). This shows a clear care and intentionally of craft and attentional to detail. This followed through in the relative lack of fingerprint impressions with just 9 per cent of clay objects displaying finger or palm prints on the clay surface (as viewed with a hand lens, 21 mm loupe, ×30 magnification). Likewise the presence of incidental impressions, most commonly basketry/matting, leather and plants are found on the surfaces of clay objects, yet in negligible proportions (5%; Bennison-Chapman 2013: fig. 15.6 p. 258). The generally faint nature, limited surface coverage (one or part of one surface only) along with their presence only on shapes that need to be manufactured using a flat surface (spheres, made by rolling the clay in the hands, for example, evidence such impressions, in contrast to their dominance on flat base discs).

A small, yet distinctive number of clay objects display intentional, decorative markings (7%), such as those far more common in the proto- and rarely historic period clay objects of the fourth millennium BC onwards (Schmandt-Besserat's "complex tokens"; see, for example, Delougaz & Kantor 1996: pl. 40. B, C, E, G & H; Jasim & Oates 1986: fig. 3 row 2 p. 356; Nisan et al. 1993: fig. 9 p. 13; Schmandt Besserat 1992a: 102, 107; Woods 2010: fig. 24-6 p. 62, fig. 27 p. 63 & fig. 30 p. 64). The markings most commonly appear on either the top or both the top and base of the objects; most are highly visible against the otherwise plain and smooth clay surface, with straight lines; either single or pairs of parallel lines prevail. Though clay objects of certain shapes are more likely to display decorative markings than others, there is no direct correlation between marking forms and objects of specific three-dimensional shape. Spheres do not come in a plain form along with the occasional occurrence of spheres with a single linear incision. Discs do not occur in both plain forms and those with a set of parallel lines incised on one surface. Therefore, though sometimes *marked*, evidence for the clear, consistent, symbolic meaning is lacking in the presence of the decorated clay objects from Çatalhöyük.

A small number of sets of clay objects are distinctive due to the level of homogeneity of three-dimensional shape along with additional characteristics of appearance and manufacture. One example is a group of three squat cylindrical-shaped objects (CO#s 396, 431 and 441, recorded as "other/miscellaneous" shape) (Bennison-Chapman 2013: fig. 15.15 p. 270). They share similarities in the degree of detail, finish, craft and

decoration, which hints at a defined, uniform function (summarised in Bennison-Chapman 2014: ch. 7 fig. 7.13). Near identical in dimensions and proportions, each has a concave base, perfectly rounded shape in plan view, tall straight sides and a pointed tip. Each is highly crafted from a fine clay.

SUMMARY

In comparison to the slightly earlier, neighbouring Neolithic village of Boncuklu Höyük (Bennison-Chapman 2014; 2019a), increased standardization is evidenced in all aspects of clay objects manufacture and appearance at Çatalhöyük. Yet overall, the clay object assemblage of Çatalhöyük is represented by a divergent range of simply manufactured artefacts. Though a varied selection of three-dimensional shapes is present, there is little evidence for the intentional, conscious standardisation of sets of artefacts, uniting them not only by shape category, but also according to other aspects such a size, colour, level of finish or the presence of markings, characteristics that when combined could have been used to represent specific, and distinctive commodities with the objects therefore acting as symbolic mnemonic tools. This is not the case at Late Neolithic Tell Sabi Abyad in Upper Mesopotamia, for example, where within certain limited occupational horizons and site areas, clay objects are far more standardized within their shape categories (Bennison-Chapman 2014, 2019b). At Çatalhöyük, there are, however, a very small number of distinctive sets of clay objects, yet as seen later, all come from disparate site areas and therefore could not have been utilised together as a set of tools.

RESULTS: OBJECT CONTEXT

The function of Çatalhöyük's clay objects cannot be understood if studied in isolation. The exact find-spot, activities carried out within it, the presence or absence of associated clay objects and/or other artefacts and activities all need to be taken into account when making any assessment of the presence of clay objects as indicators of potential Neolithic cognitive abilities. This is especially true when evaluating evidence for the possible presence, evolution and operation of clay objects as an aspect of material culture capable of symbolising, retaining and transmitting information.

BASIC CONTEXT

Occupation at Neolithic Çatalhöyük East can be divided in three main excavation areas, North, South and TP (Hodder, Chapter 1, this volume). North and South areas have similarly large clay object counts. Almost half (49%) of studied clay objects come from the North area, with a further 42 per cent excavated in the south. TP has yielded just 9 per cent of Çatalhöyük's clay objects, yet when the density of objects rather than count is considered, TP has a significantly higher clay object density compared to the other site areas at 0.0028 objects per litre (Figure 5.3). The temporal occupation of Çatalhöyük can broadly be divided into four phases (Hodder, Chapter 1, this volume). Overall, there is an increase in the density of clay objects at Çatalhöyük through time. This is true of both of the two main occupation areas, North and South, where there is a more than twofold increase in the density of clay objects in *Late*

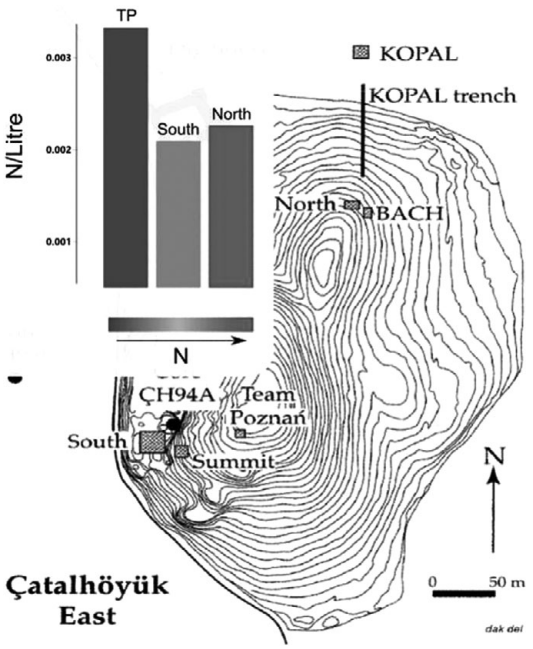

FIGURE 5.3 Plan of Çatalhöyük East Mound showing the three main excavation areas, North, South and TP. Insert: the number (reflected by colour) and the density (height of the columns) of clay objects at Çatalhöyük's main excavation areas. (Plan courtesy of the Çatalhöyük Research Project; thanks to Dr M. Milella)

and *Final Neolithic Occupation* phases compared to the *Early* and *Middle Occupation* phases. This patterning seems, at first, to support Renfrew's (1998, 2007, 2012) argument that an increasing quantity of material culture from the onset and throughout the Neolithic, along with greater engagement with material culture due to the needs of sedentary life resulted in and is evidence of cognitive change. However, when assessed in greater, occupational level by occupational level detail within North and South areas separately, it is clear that rather than a steady, gradual increase in the density of clay objects throughout the Çatalhöyük's occupation, the frequency of clay objects peaks and falls haphazardly (Figure 5.4). Although this is not evidence against the theory of cognitive change, it does not support the more common theory held by Renfrew (1998, 2007, 2012) and others (i.e. Donald 1991; Watkins 2010).

NATURE OF CONTEXT

If clay objects were utilised as commonly assumed, they may have been retained in order for the information they symbolically held to be checked and verified upon the conclusion of a transaction or at a longer interval – a stock take, end of season or annual audit-type activity. The large proportion of clay objects recovered from midden contexts does not directly indicate such meaning or activity. Forty-two per cent of Çatalhöyük's clay objects come from broad "midden" contexts (open-air disposal zones and activity areas), with a further 8 per cent from "construction/make-up/packing layer" context types representing the re-use of soil and other materials containing refuge including disposed of clay objects. This type of context indicates clay objects were readily disposed of and held no intrinsic value (not a surprise, considering their ease of craft and low value, abundant raw material). The vast majority of broad "midden" context clay objects (83%) come from common, open midden areas; however, a smaller proportion comes from more distinctive contexts *within* middens, including "fire spots", "room fill" and "pit fill". Aside from midden context objects, 21 per cent of Çatalhöyük's clay objects come from the broad category of "fill", which includes depositions such as pit fill, room fill, building fill and burial fill. However, in almost all instances, when examined closely,

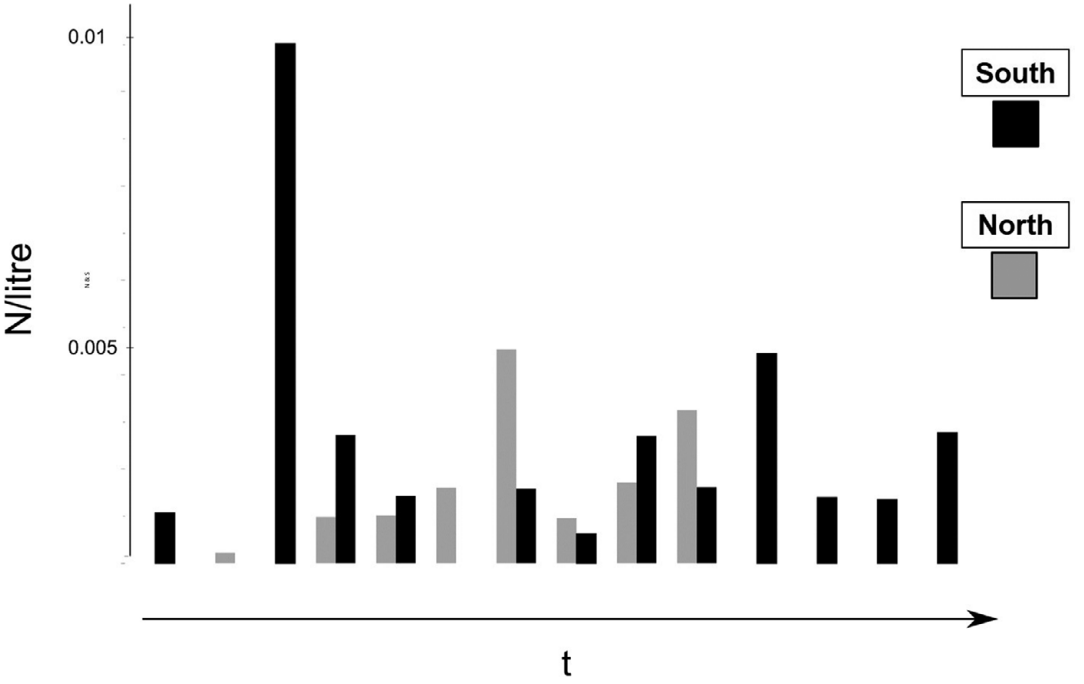

FIGURE 5.4 Density of clay objects in each discrete excavation level through time (across the *Early*, *Middle* and *Late Occupation* phases); North compared to South excavation areas.

the fill clay objects are included as part of the general soil makeup, and not included as intentional depositions (found in situ with other artefacts within a pit, on cache on a floor surface, nor in a specific, meaningful placement within a grave for example).

From the study of the broad contextual distribution of both the "midden" and "fill" context clay objects, no support for the notion that clay objects were used in groups, retained or cached for later information retrieval is attested. Nor is there evidence of a set symbolic system. The *nature* of clay objects within and across select detailed context types (pits within buildings, open-air middens, burials and room fill, for example) was assessed, and no correlation between the shape, size, colour, finish or any other aspect of an object's appearance according to context type was apparent. However, "cluster" objects, though rare, do indicate the presence of potentially interesting object associations along with nondisposal contexts.

CLUSTER OBJECTS

Cluster clay objects are defined as clay objects recovered in immediate and definite association with at least two other artefacts, either additional clay objects, artefacts of another classification or cultural objects. Differentiation is seen in the three-dimensional shape of cluster clay objects, the overwhelming majority of which are spheres, found alongside, and exclusively with large numbers (into the hundreds) of other spheres (Atalay 2013: 247, 248–252; 2001, 2005; Bennison-Chapman 2014: ch. 7, appx. D; 2013:

fig. 15.14 p. 270). Previously extensively studied under the term "mini-ball", spheres recovered in clusters are united by a number of other shared characteristics. (a) They are recovered alongside almost exclusively or only alongside other alike artefacts. (b) The spherical cluster clay objects are all are manufactured from unbaked clay of a white, pale beige to cream hue. (c) Clusters of "mini-balls" are most often recovered, intentionally placed inside buildings (57%), mostly within the main room. This differs from the contextual patterning of not only all clay objects combined, but all spherical-shaped clay objects overall (all colours and finishes) (Bennison-Chapman 2014: appx. D, tbl. A.D-1). Though occasionally recovered singly inside a building, the "mini-balls" recovered from inside buildings are mostly recovered in large caches running into the hundreds. Building 44, for example, has 29 "mini balls", Building 3 has 64, Building 63 has 63, and Building 75 has 485 "mini balls" (Bennison-Chapman 2014: fig. A.D-3, tbl. A.D-2). (d) Temporally, more than three-quarters (567) of "mini-balls" occur in Çatalhöyük's *Late* and *Final Occupation* phases (as opposed to just 99 from the *Early* and *Middle* phases) (Atalay 2013: 248–250; 2012: 14/4–14/7; 2000; Bennison-Chapman 2014: ch. 7, appx. D). There is no steady increase in their numbers through time, but "mini-ball" counts peak in certain occupational phases; South.P and North.I (Bennison-Chapman 2014: fig. A.D-2).

Aside from spheres, cluster clay objects are rare, with just nine other examples (1% all studied clay objects) documented within the present study at Çatalhöyük (Bennison-Chapman 2014: ch. 7). These differ in nature entirely, and nothing distinctive regarding the nature of the nine, nonspherical cluster clay objects can be discerned. These dense clusters of occupational deposits primarily consist of concentrated groupings of animal bones (i.e. unit 17070, CO#s 1066, 1067), stones, refuse (interpreted as "feasting deposits" alongside single, up to two or three geometric clay objects only; Bennison-Chapman 2014: ch. 7 tbl. 7.11). A unique example comes from Building 42, where three clay objects were recovered in direct association with a complete ceramic pot, which had in turn been set into the floor of the main room (CO#'s 1314, 1315 and 1317, associated with oven F. 828 and platform).

CONTEXT SUMMARY

In summary, the contextual evidence for Çatalhöyük's clay objects does not support the theory of their use as symbolic, mnemonic devoices, nor as tools used for long-term information storage and retrieval. In quantity they mostly occur in the site's largest two excavation areas, North and South yet are most *dense* within the smaller TP excavation zone. Clay objects are most commonly recovered alone, as single objects within disposal or secondary deposit contexts. Temporally, they do increase through time in number, yet this is not a gradual nor steady increase within any of the site's excavation areas. No patterning can be identified in terms of the nature and level of homogeneity/diversity of clay objects when comparing sets from specific temporal phases, site areas or context types. Spatially, clay objects are not, for example, deposited mostly in open-air middens within certain sectors of the village,

and within buildings in others. In the *Early* and *Middle Occupation* phases, the proportion of clay objects recovered in middens, as compared to fill, and the nature of the midden and fill contexts types differs little. Likewise, no increase in clay objects diversity in terms of three-dimensional shape is apparent, nor an increase in manufacture homogeneity, if the objects were used as symbols, increasingly so, with differences in basic appearance (shape, size, colour, elaboration) all important in terms of the information they held is seen. Almost half of Çatalhöyük's clay objects come from broad midden contexts, in which basic open-air middens dominate. The 21 per cent of clay objects recovered from fill contexts are dominated by the incidental inclusion of clay objects into the fill of daily activities such as the in-filling of pits, fire-spots and burials. As seen earlier, Çatalhöyük has a small number of distinctive sets of extremely homogenous clay objects, sharing many similarities in addition to basic three-dimensional shape. Many, yet far from all, of the spheres share similar contexts, recovered with identical objects in internal clusters within buildings. Aside from these, the sets of small numbers of homogenous cones and squat cylinders, for example, derive from divergent context types showing that despite a uniform appearance, they were neither manufactured nor used together.

DISCUSSION

The results presented allow us to return to the questions posed at the beginning of this chapter. How common were the geometric clay objects, how were they used, and what does this allow us to say about changing levels of consciousness at Neolithic Çatalhöyük?

NONADMINISTRATIVE POSSIBILITIES

Evaluating the potential nonadministrative explanations for the function of Neolithic clay objects, some seem more likely than others. Clay objects are intentionally manufactured artefacts that cannot be dismissed as "doodles", clay "blanks" or simply compacted dirt. Their use in gaming at some sites is a strong possibility. Gaming is generally a leisure activity. With more than one type of game common within any community, the overall diversity seen within Çatalhöyük's clay object assemblage is easily explained by this interpretation. Board-based games are just one of many types of games evidenced from at least the Neolithic of the Near East (Becker 2007; Freed 1982; Hoerth 2007; Kendall 2007; Lorenzi 2013; Simpson 2007; Vandier 1964: fig. 1-3 p. 494). Of approximately 13 Neolithic examples, the holes on the surfaces of the boards measure 3–4 cm – the correct size for the overwhelming majority of clay objects to fit within (Bartl, Ramadan & Al-Hafian 2011: fig. 28 p. 72; Simmons & Najjar 2006: fig. 7 p. 88; Simpson 2007: 6–7). The timing of the appearance of clay objects coincides with sedentism. Early village communities likely needed activities to enhance and maintain community bonds, and gaming could have promoted community cohesion. Limited evidence for caches of clay objects suggest otherwise – when disposed of in middens, they appear to have been disposed of singly. In gaming they would have been utilised in sets.

Children's Toys?

It is difficult to prove whether clay objects may or may not have been used as children's toys. Aside from gaming – a pastime open to

people of all ages – the idea of clay objects being specifically entertainment items for the very young is in itself problematic. The notion of "toys" implies a notion of "childhood" – a modern concept, not overtly attested at Çatalhöyük or other Neolithic sites in the Near East. Neonates receive special postmortuary treatment at Çatalhöyük, yet little else suggests children were considered "different" (Andrews et al. 2005; Boz & Hager 2013; Hodder 2006: 62, 117, 128, 159, 163, 175, 199). Therefore this possible interpretation is irrelevant in this context.

Ritual Objects?

Çatalhöyük and the Neolithic Near East in general has an abundantly rich record of evidence related to ritual and spiritual beliefs (see, for example, Hodder 2010). Neolithic beliefs were complex, and ritual varied. Though overall, evidence of Neolithic ritual is rich, the evidence we have relates to only certain elements of ritual practice. Confirmation of activities from many significant spheres of ritual activity: dance, singing, changing, processions, masks, costume, makeup and body paint is extremely sparse or absent in the Neolithic archaeological record. The category of "ritual" is often assigned to items where no other definitive function can be proved. Yet, Çatalhöyük has many lines of evidence and practices indicative of ritual activities. Therefore use of clay objects as part of normal ritual activity is not unrealistic, yet also, not likely to have been their main purpose.

Decision-Making Tools?

Small geometric clay objects may have been used in divination; for decision making and to foretell future events. Clay objects could have been used as "lots"; being thrown or drawn from a container to make a choice or decision. The outcome of decisions may have been dependent on how objects fell (for example, the distribution of the objects, or the angle or location of a specific objects within the group), as commonly evidenced ethnographically (Peek 1991). Evidence for this function at Neolithic Çatalhöyük is again inconclusive. The number, size and variety of appearance of the case-study assemblages certainly suggest the possibility of the use of their clay objects as lots. They are small enough for a few to be placed into a container or cupped in the hand, ready to be tossed or selected by an agent. Agriculturalists would certainly be in need of decision-making tools and lots may have been useful in making fair, undisputable and unbiased decisions. Many decisions would need to be made related to hunting and animal herding, plant and animal cultivation, the distribution of resources (including meat, cereals, land and animals) and the distribution of labour roles. "Lots" could have been a way to make difficult decisions, to ease tension and competition and to avoid confrontation between individuals and families within the new and growing village settlements of the Neolithic. Yet direct evidence of this function, like that of ritual in general is absent at Çatalhöyük.

ADMINISTRATIVE FUNCTIONS

The three basic ways in which small clay objects could have been used as administrative tools are (1) as aids in simple counting, (2) as nonsymbolic information storage devices and (3) as symbolic, mnemonic record keeping and information retention and transmission tools.

(1) Simple Counting Aids

One of the simplest functions for small, geometric clay objects proposed is their use in counting. A distinction must be made here between pure counting and recording or accounting: the latter distinguished by the use of the objects to retain and transmit information. As nonsymbolic, noninformation holding tools, clay objects certainly could have been useful counting tools. They may have been used in simple one-to-one correspondence to count a number of individual items or sets of items. A clay object would be moved from one place to another, counted side by side with each item. This could be advantageous if large numbers of items were being counted. The use of clay objects as counting aids could prevent people from losing count, which could easily happen, especially when performing large counts, undertaking counting in a busy or chaotic situation, and if there was a delay, however small, in the completion of a count. One-to-one counting with clay objects would also serve to increase the accuracy of counts, and such a system would also enable people with limited numeracy skills to perform simple counting tasks with ease. At the end, the new pile created would visually represent the number of items or units that had been counted (Herskovits 1932). Additionally, if, as the absence of abstract numbers in the earliest written records of south Mesopotamia for the first 1,000 years of writing (until the end of the third millennium cal. BC.) can be taken as evidence of the lack of a concept of abstract numbers (Brown 1996: 39; Englund 1993: 1671; Friberg 1994: 482, 483; Michalowski 1993: 998; Nissen et al. 1993: 130, 131–151), and correspondingly the absence of number vocabulary, abstract counting would be an impossibility. This is not to say that Neolithic communities lacked the cognitive ability of abstract counting and had no number words; however, the use of clay objects to aid counting in a one-to-one method makes the question of whether nor not these early village communities had the ability to conceive of abstract numbers irrelevant.

Assemblages of small, geometric clay and stone objects could have been used to aid simple counting. As a wide variety of people, animals and commodities might have been counted, the context of the clay objects within sites of the Neolithic would not be informative with regards to their exact counting function. They may be left scattered in fields or buildings or swept into midden areas as it would be likely they were disposed of after being used – or kept to be reused for a further count. Therefore, single clay objects, broad clay object scatters or caches of clay objects in a variety of find spots are all likely scenarios for the disposition of these objects if used in simple counting. The contextual evidence from Çatalhöyük largely supports the simple counting theory.

(2) Nonsymbolic Information Storage Devices

Adding to the complexity of counting involves using the position of "counters" on a board or abacus, for example, as indicators of values (as evidenced historically in other cultures; see, for example, Netz 2002). The position of clay objects (or other items) on a board or abacus could indicate further meaning, to change the value of a single "counter"

from a single to multiple unit (from 1 to 10 to 100, for example, in the metric system, or from 1 to 6 to 60 in the sexigesimal system of the earliest written records from south Mesopotamia) (Nissen et al. 1993: 131–151). In this scenario, clay objects may perform complex counts, their appearance being irrelevant as the information related to value is symbolised by their relative positions rather than in the objects themselves. Though possible, the use of Çatalhöyük's clay objects in the manner just described is not supported by the evidence, as their multiple, elaborate and varied shapes do not support the theory that appearance was unimportant. Likewise, contextual evidence does not support this scenario, as groups of clay objects would be simultaneously used, equally manipulated, thus equally ready to be disposed of at the same time. Why, therefore, are the overwhelming majority of clay objects disposed of singly? Neither option one nor two incorporate the *symbolic* element, crucial to most arguments that interpret the presence of "tokens" in the Neolithic as a sign of higher cognitive functioning. The operation of clay objects as advanced counters in the latter part of scenario two, however, could certainly be argued as evidence of significant intelligence.

(3) Symbolic Tools and Recording Devices

Dominant thought interprets "tokens" as evidence of increased cognitive abilities for two reasons: first, they are interpreted as evidence for humans to conceive of abstract ideas – a sphere standing for a sheep being evidence for abstraction. Yet why not just use a zoomorphic figurine to stand for the animal it represents (no evidence of such a system is seen at Çatalhöyük)? Clay objects at Çatalhöyük could potentially, as an extension to the counting system outlined earlier, be assigned a short-term, ad hoc symbolic value. Objects of a similar appearance could be used to count one specific item and counters of a different colour, size or shape, for example, used to count a second. This would prevent errors in the overlap of counts, or if the counters were accidently mixed. With objects given meaning at a single place in time, the meaning was lost once the count had been made, yet providing the ability to simultaneously count different things side by side. This concept cannot be proven or disproved, as the objects were not retained at all, nor the meaning held within their similarities permanent. This simple symbolic system is not supported by the contextual evidence, yet the diverse nature of the clay objects at Çatalhöyük means it could have potentially operated. Second, the "token" theory takes the "token" argument to a higher level, claiming the simple geometric shapes have consistent symbolic meaning, not only locally, but also regionally from the Neolithic to the fourth millennium BC (Schmandt-Besserat 1992a, 1996). In this system, clay objects were a method of communication, the shape representing a word relating to a specific, non-changing community in a singular form or set unit (a single animal or a sack of grain, for example). The "code" was understood and used by all, and therefore "tokens" were retained, carried on the body and once transactions completed, archives were created by the storage of sets of "tokens" (Schmandt-Besserat 1992a, 1996). This represents a

sophisticated method of information storage and communication distinct from both spoken and written word (Watkins 2010: 631). The value held within the shape of the "token" was universal, and therefore their function was also singular and universal.

SUMMARY

The evidence from Çatalhöyük does not support the notion of their use, either exclusively, or at times in conjunction with other functions, as symbolic, information storage and information transmission tools. Their infrequent recovery in caches is evidence against this. The singular shape of the clay objects most commonly cached together (the spherical "mini-balls") would suggest that in this system, the residents of Çatalhöyük were using the advanced administration system of scenario three only for the management of a single commodity represented by the sphere. In this case, all other clay objects must have functioned outside of the realm of administration. Furthermore, small spheres could not have acted as "tokens" alone. Though commonly cached together in large numbers, small clay spheres are equally as numerous in other contexts, recovered as lone artefacts in middens most commonly (identical to the dominant contextual deposition of all clay objects at Çatalhöyük). Therefore, even the spheres must have had a dual purpose. The interpretation of sphere caches as administrative archives brings to light other problems – why utilise an advanced, highly efficient and tightly managed system of control for one single commodity, and leave no evidence for the administration of any other commodity at the site? This suggests that clay sphere caches at Çatalhöyük, though distinct, do not represent archives.

The form of the other-shaped clay objects at Çatalhöyük and the overall degree of assemblage homogeneity again points away from the symbolic record keeping interpretation. Not all three-dimensional shape categories are overtly and immediately uniform, a necessity in the scenario in question. Many shapes are also only represented in very small proportions. Only a limited number of highly homogenous object sets have been identified in the Çatalhöyük assemblage, not enough for a site-wide, universal symbolic information storage and communication system to have been in operation. As seen in the contextual analysis earlier, not even within a discrete time period or smaller areas of the site is there evidence for the existence of a small number of highly distinct (across shape categories) and homogenous (within three-dimensional shape) clay objects, those homogenous sets identified as coming from diverse temporal and geographic parts of Çatalhöyük. If Çatalhöyük's clay objects were part of a set symbolic code, strong correlation across the Neolithic Near East would be expected. The same limited range of clearly defined and well-made shapes would be expected, evenly distributed across the geographic and temporal span of each settlement. With correlation of their presence, absence and range of shapes according to the nature of the site (e.g. temporary/seasonal, permanent, residential, ritual, agricultural, hunter gather, mixed subsistence), the evidence in this respect is lacking (Bennison-Chapman 2014: ch. 10, appx. J). Last, one must consider that a singular, consistent functional role for the use of

clay objects is not the only feasible interpretation at Çatalhöyük or elsewhere.

CONCLUSION

This research proves the common misconceptions about Neolithic "tokens" to be untrue. Clay objects are certainly intentionally made artefacts and not naturally formed clumps of clay or "doodles". There is no evidence for a singular and consistent function at Çatalhöyük nor across the wider Neolithic of the Near East. Nor does the evidence suggest clay objects were invented by the first farmers in the Near East, to keep track of agricultural produce. At Çatalhöyük along with neighbouring sites such as Boncuklu Höyük, and those further afield, clay objects are crafted into a clear range of geometric shapes, yet at Çatalhöyük, along with many other sites, the level of object standardization is limited. No correlation can be seen between the presence and relative number of clay objects and any specific site feature such as, most crucially, the appearance of farming. This is to be expected if clay objects acted as "tokens" and were introduced by farmers to administer their produce.

No variability is evidenced at Çatalhöyük in terms of the type and range of shapes or object standardization. Both temporally and according to context type little changes in the *nature* of Çatalhöyük's clay objects. They are more common in later phases of occupation; however, this is an overall pattern, and when examining the density of clay objects, level by level across all four phases, changes in density can be stark, yet do not correlate to any major events. With reference to object shape, no change in the range or homogeneity of form is seen at all. The dominant obsidian source slowly changes from one to another throughout Çatalhöyük's occupation, for instance, yet no difference in clay object form (the disappearance of one shape, replaced with a different shape, for example) is seen. Likewise, the *Later Occupation* phases demonstrate the transition to a heavy investment in sheep and cattle, yet no increase in the count or density of a "token" representing sheep or cattle, for example, occurs. From the middle of the occupational sequence (South N-O and North G) major developments occur across various spheres of life at Çatalhöyük, including the widespread use of pottery and the introduction of milk and domestic cattle. Yet no new "token" shapes occur, nor do increase in count or density during this or subsequent occupation phases.

No set "token" repertoire is suggested, as other sites studied in addition to Çatalhöyük display a similar lack of correlation between major events and the presence or absence of features (e.g. strong ritual evidence, the appearance of domestication) (Bennison-Chapman 2014: ch. 10, appx. J). Nor can any regional, or temporal correlation be seen according to the presence, relative number or type and range of shapes in circulation within a given site – suggestive of the invention and spread of an administrative technology and symbolic code. With no set repertoire of shapes, consistent with the range and/or types of goods and commodities in circulation at Çatalhöyük and other Neolithic sites, little variability is evidenced in all expected aspects of clay objects. This is evidence *against* the idea of as singular role and consistent function within Çatalhöyük and the wider Neolithic Near East. Variability is evidence not only in

the distribution of clay objects across the Neolithic Near East, but also in the nature of those sites and the immediate contexts in which clay objects are found.

Clay objects likely fulfilled multiple roles at Çatalhöyük, across different households, areas of site and phases of settlement. Their large numbers at Çatalhöyük and at other sites where present, the variability of deposition, the high proportion recovered from disposal contexts along with the simple range of shapes, their quick manufacture, crude appearance and the accessibility of clay proves that "tokens", at Çatalhöyük, were quickly and easily made and disposed of as readily. All evidence points to Çatalhöyük's clay objects having acted as multifunctional artefacts, their accessibility and ease of craft affording them fluidity of function and interpretation with imbued value and meaning. This is not to say clay objects were never used in administration. As discussed in the Discussion section, one of their likely roles at Çatalhöyük was as simple counters. Tell Sabi Abyad, a large, multitelled site in upper Mesopotamia, also has clear evidence for the use of clay objects in administration (Akkermans 1996a, 1996b; Akkermans et al. 2012, 2014; Akkermans & Duistermaat 1996; Verhoeven 1999; Verhoeven & Akkermans 2000). Again it seems likely that though found through its one-and-a-half millennia occupation history (c. 7,550–5,700 cal. B.C.), clay objects acted mainly or solely as counting tools retained for a limited time period, in two discrete site areas only, before being disposed of in groups, alongside other artefacts made of clay (Bennison-Chapman 2019b).

Despite much research, Çatalhöyük's small, geometric-shaped clay objects provide no definitive evidence for the existence of higher levels of consciousness of its inhabitants. The evidence for clay objects acting as "tokens" at Çatalhöyük is negligible. There is no evidence for what Renfrew (1998, 2007, 2012) or Donald (1991) or Watkins (2010) describe as the external storage of information with clay objects acting as material in Çatalhöyük's clay objects. Nor is there evidence of clay objects possessing a widely understood symbolic value thus acting as a form of communication, as a symbolic nonverbal communication system (Watkins 2010). Indeed, Çatalhöyük provides very little evidence to uphold the interpretation of its clay objects as tokens: symbolic, mnemonic information storage and transmission devices and thus indicative of increased cognitive abilities as Schmandt-Besserat (1977, 1978a, 1980, 1992a, 1992b, 1996) and others (including Mithen 2004; Renfrew 1998, 2007, 2012; Watkins 2010) so commonly suggest.

REFERENCES

Akkermans, P. M. M. G. ed. (1996a) *Tell Sabi Abyad, The Late Neolithic Settlement: Report on the Excavations of the University of Amsterdam 1988 and the National Museum of Antiquities Leiden 1991–1993 in Syria-Volume I*, Istanbul: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Akkermans, P. M. M. G. ed. (1996b) *Tell Sabi Abyad, the Late Neolithic Settlement: Report on the Excavations of the University of Amsterdam 1988 and the National Museum of Antiquities Leiden 1991–1993 in Syria-Volume II*, Istanbul: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Akkermans, P. M. M. G., Brüning, M., Hammers, N., Huigens, H., Kruijer, L., Meens, A., Nieuwenhuyse, O., Raat, A., Rogmans, E. F., Slappendel, C., Taipale, S., Tews, S. & Visser, E. (2012) "Burning Down the

House: The Burnt Building V6 at Late Neolithic Tell Sabi Abyad, Syria", *Analecta Praehistorica Leidensia*, vol. 43, no. 44, pp. 307–324.

Akkermans, P. M. M. G., Brüning, M., Huigens, H. & Nieuwenhuyse, O. eds. (2014) *Excavations at Late Neolithic Tell Sabi Abyad, Syria: The 1994–1999 Field Seasons*, Turnholt, Belgium: Brepolis.

Akkermans, P. M. M. G. & Duistermaat, K. (1996) "Of Storage and Nomads. The Sealings from Late Neolithic, Sabi Abyad, Syria [with comments and reply]", *Paléorient*, vol. 22, no. 2, pp. 17–44.

Andrews, P., Molleson, T. & Boz, B. (2005) "The Human Burials at Çatalhöyük" in *Inhabiting Çatalhöyük: reports from the 1995–99 seasons (Çatalhöyük Research Project Volume 4)*, ed. I. Hodder, Monograph No. 38, Cambridge, UK: McDonald Institute for Archaeological Research / British Institute of Archaeology at Ankara, pp. 261–278.

Atalay, S. (2000) "Clay Balls and Objects" in *Çatalhöyük Archive Report 2000*. Available at: www.catalhoyuk.com/archive_reports/2000/ar00_15.html.

Atalay, S. (2001) "BACH Area Clay Balls, Mini Balls and Geometric Objects" *in Çatalhöyük Archive Report 2001*. Available at: www.catalhoyuk.com/archive_reports/2001/index.html.

Atalay, S. (2005) "Domesticating Clay: The Role of Clay Balls, Mini Balls and Geometric Objects in Daily Life at Çatalhöyük" in *Changing Materialities at Çatalhöyük: Reports from the 1995–99 Seasons (Çatalhöyük Research Project Volume 5)*, ed. I. Hodder, Monograph No. 39, Cambridge, UK: McDonald Institute for Archaeological Research/British Institute at Ankara, pp. 139–168.

Atalay, S. (2012) "Analysis of Clay Balls from the BACH Area" in *Last House on the Hill: BACH Area Reports from Çatalhöyük, Turkey*, ed. R. Tringham & M. Stevanovic, Monumenta Archaeologica 27, Los Angeles: Cotsen Institute of Archaeology at UCLA, pp. 14/1–14/9.

Atalay, S. (2013) "Clay Balls, Mini Balls and Geometric Objects" in *Substantive Technologies at Çatalhöyük: Reports from the 2000–2008 seasons (Çatalhöyük Research Project Volume 9)*, ed. I. Hodder, London & Los Angeles: British Institute at Ankara & Cotsen Institute of Archaeology at UCLA, pp. 247–252.

Avis, J. (2010) "Figurines Clay Composition Report" in *Çatalhöyük Archive Report 2010*, pp. 94–103. Available at: www.catalhoyuk.com/downloads/Archive_Report_2010.pdf.

Bartl, K., Ramadan, J. & Al-Hafian, W. (2011) "Shir/West Syria Results of the Sixth and Seventh Seasons of Excavations in 2009" in *Chronique Archéologique en Syrie: Special Issue Documenting the Annual Excavation Reports Concerning the Archaeological Activities in Syria*, vol. V. Damascus, Syria: Press of the Ministry of Culture.

Becker, A. (2007) "The Royal Game of Ur" in *Ancient Board Games in Perspective: Papers from the 1990 British Museum Colloquium, with Additional Contributions*, ed. I. L. Finkel, London: The British Museum Press, pp. 11–15.

Bennison-Chapman, L. E. (2013) "Geometric Clay Objects" in *Substantive Technologies at Çatalhöyük: Reports from the 2000–2008 Seasons (Çatalhöyük Research Project Volume 9)*, ed. I. Hodder, Los Angeles, CA: British Institute at Ankara & Cotsen Institute of Archaeology at UCLA, pp. 253–276.

Bennison-Chapman, L. E. (2014) *The Role and Function of "Tokens" and Sealing Practices in the Neolithic of the Near East: The Question of Early Recording Systems, Symbolic Storage, Precursors to Writing, Gaming, or Monitoring Devices in the World's First Villages*, PhD, submitted to the Department of Archaeology, Classics and Egyptology; part of the School of Histories, Languages and Cultures, University of Liverpool, UK.

Bennison-Chapman, L. E. (2019a) "Reconsidering "tokens": Neolithic origins of accounting or multifunctional, utilitarian tools?" *Cambridge Archaeological Journal*, vol. 29.2, pp. 233–259. https://doi.org/10.1017/S0959774318000513.

Bennison-Chapman, L. E. (2019b) "Clay Objects as 'Tokens'? Evidence for early counting and administration at Late Neolithic Tell Sabi Abyad, Mesopotamia".

Bottéro, J., Herrenschmidt, C. & Vernant, J. P. (2000) *Ancestor of the West: Writing, Reasoning, and Religion in Mesopotamia, Elam, and Greece*, Chicago: University of Chicago Press.

Boz, B. & Hager, L. (2013) "Intramural Burial Practices at Çatalhöyük" in *Humans and Landscapes of*

Çatalhöyük: Reports from the 2000–2008 Seasons (Çatalhöyük Research Project Volume 8), ed. I. Hodder, Los Angeles, CA: British Institute at Ankara & Cotsen Institute of Archaeology at UCLA, pp. 413–440.

Broman Morales, V. (1990) *Figurines and Other Clay Objects from Sarab and Çayönü*, Chicago: The Oriental Institute of the University of Chicago.

Brown, S. (1996) "Review of Schmandt-Besserat, D. *Before* Writing, Volumes I & II, 1992", *Canadian Society for Mesopotamian Studies Bulletin*, 31, pp. 35–43.

Çambel, H. & Braidwood, R. J. (1979) "An Early Farming Village in Turkey (originally published in *Scientific American*, March 1970)" in *Readings from Scientific American. Hunters, Farmers, and Civilizations: Old World Archaeology with Introductions by C. C. Lamberg-Karlovsky*, San Francisco, CA: W. H. Freeman and Company, pp. 145–151.

Costello, S. K. (2000) "Memory Tools in Early Mesopotamia", *Antiquity*, vol. 74, no. 285, pp. 475–476.

Costello, S. K. (2002) *Tools of Memory: Investigation of the Context of Information Storage in the Halaf Period*, PhD, Binghamton University.

Costello, S. K. (2011) "Image, Memory and Ritual: Re-viewing the Antecedents of Writing", *Cambridge Archaeological Journal*, vol. 21, no. 2, pp. 247–262.

Coulmas, F. (2003) *Writing Systems: An Introduction to Their Linguistic Analysis*, Cambridge, UK: Cambridge University Press.

Damerow, P. (1993) "Bookkeepers Invented Scripture: Review of Schmandt-Besserat's *Before Writing* 1992", *Rechtshistorisches Journal*, vol. 12, no. VI, pp. 9–35.

Delougaz, P. & Kantor, H. (1996) *Chogha Mish, Volume 1: The First Five Seasons of Excavations, 1961–1971*. Abbas Alizadeh, ed. Oriental Institute Publications 101. Chicago: The Oriental Institute.

Doherty, C. (2013) "Sourcing Çatalhöyük's Clays" in *Substantive Technologies at Çatalhöyük: Reports from the 2000–2008 Seasons (Çatalhöyük Research Project Volume 9)*, ed. I. Hodder, Los Angeles, CA: British Institute at Ankara & Cotsen Institute of Archaeology at UCLA, pp. 51–66.

Doherty, C. (2017) *Living with Clay: Materials, Technology, Resources and Landscape at Çatalhöyük*, PhD, submitted to the School of Archaeology and Ancient History, University of Leicester, UK.

Donald, M. (1991) *Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition*, Cambridge, MA: Harvard University Press.

Duru, R. & Umurtak, G. (2005) *Höyücek. 1989–1992 Yılları Arasında Yapılan Kazıların Sonuçları 2005 (Höyücek. Results of the Excavations 1988–1992)*, Ankara, Turkey: Türk Tarih Kurumu Yayınları.

Englund, R. K. (1993) "The Origins of Script. Review of *Before Writing* by Denise Schmandt-Besserat", *Science*, 260(5114), pp. 1670–1671.

Englund, R. K. (1998) "Review of D. Schmandt-Besserat, 'How Writing Came About'", *Written Language and Literacy*, vol. 1, pp. 257–261.

Esin, U., Bıçakçı, E., Özbaşaran, M., Balkan-Atlı, N., Berker, D., Yağmur, İ. & Atlı, K. (1991) "Salvage Excavations at the Pre-Pottery Site of Aşıklı Höyük in Central Anatolia", *Anatolica*, vol. 17, pp. 123–174.

Fischer, S. R. (2001) *A History of Writing*, London: Reaktion Books.

Freed, R. E. (1982) "Games" in *Egypt's Golden Age: The Art of Living in the New Kingdom, 1558–1085 BC*, ed. R. E. Freed, Boston: Museum of Fine Arts-Boston, pp. 54–55.

Friberg, J. (1994) "Preliterate Counting and Accounting in the Middle East: A Constructively Critical Review of Schmandt-Besserat's *Before Writing*", *Orientalistische Literaturzeitung*, vol. 89, no. 5–6, pp. 477–502.

Herskovits, M. J. (1932) "Population Statistics in the Kingdom of Dahomey", *Human Biology*, vol. 4, no. 2, pp. 252–261.

Hodder, I. (2006) *Çatalhöyük: The Leopard's Tale: Revealing the Mysteries of Turkey's Ancient 'Town'*, London: Thames & Hudson.

Hodder, I. (2010) *Religion in the Emergence of Civilisation: Çatalhöyük as a Case Study*, Cambridge, UK: Cambridge University Press.

Hoerth, A. J. (2007) "The Game of Hounds and Jackals" in *Ancient Board Games in Perspective: Papers from the 1990 British Museum Colloquium, with Additional Contributions*, ed. I. L. Finkel, London: The British Museum Press, pp. 64–68.

Iceland, H. (2010) "Chapter 1: Token Finds at Pre-Pottery Neolithic 'Ain Ghazal, Jordan: A Formal and Technological Analysis" in *'Ain Ghazal Excavation Reports Volume 2: Symbols at 'Ain Ghazal*. Ed. D. Schmandt-Besserat. Published under the direction of Gary O. Rollefson and Zeidan Kafafi (visited on 14 April 2012). Available at: www.laits.utexas.edu/ghazal/Chap1/chapter1.html. [Last updated on 31 October 2010].

Jasim, S. A. & Oates, J. (1986) "Early Tokens and Tablets in Mesopotamia: New Information from Tell Abada and Tell Brak", *World Archaeology*, vol. 17, no. 3, pp. 348–362.

Kendall, T. (2007) "Mehen: The Ancient Egyptian Game of the Serpent" in *Ancient Board Games in Perspective: Papers from the 1990 British Museum Colloquium, with Additional Contributions*, ed. I. L. Finkel, London: The British Museum Press, pp. 33–45.

Kenyon, K. M., & Holland, T. A. (1982) *Excavations at Jericho Volume Four: The Pottery Type Series and Other Finds*, London: British School of Archaeology in Jerusalem.

Kenyon, K. M. & Holland, T. A. (1983) *Excavations at Jericho Volume 5: The Pottery Phases of the Tell and Other Finds*, London: British School of Archaeology in Jerusalem c/o The British Academy.

Leo Oppenheim, A. (1959) "On an Operational Device in Mesopotamian Bureaucracy", *Journal of Near Eastern Studies*, vol. 18, no. 2, pp. 121–128.

Lorenzi, R. (2013) "Oldest Gaming Tokens Found in Turkey" in *Discovery News* (last updated on 14 August 2013). Available at: http://news.discovery.com/history/archaeology/oldest-gaming-tokens-found-130814.htm. [Site visited on 14 August 2013].

Mahasneh, H. M. & Gebel, H. G. (1998) "Geometric Objects from LPPNB Es-Sifiya, Wadi Mujib, Jordan", *Paléorient*, vol. 24, no. 2, pp. 105–110.

Malafouris, L. (2013) *How Things Shape the Mind: A Theory of Material Engagement*, Cambridge, MA: MIT Press.

Matthews, R., Matthews, W. & Mohammadifar, Y. (eds.) (2013) *The Earliest Neolithic of Iran: 2008 Excavations at Sheikh-E Abad and Jani*, Oxford, UK: Oxbow Books.

Michalowski, P. (1993) "Review: Tokenism: *Before Writing*, Volume 1: From Counting to Cuneiform by Denise Schmandt-Besserat; *Before Writing*, Volume 2: A Catalog of Near Eastern Tokens by Denise Schmandt-Besserat", *American Anthropologist*, 95(4), pp. 996–999.

Mithen, S. (2004) *After the Ice: A Global Human History, 20,000–5000 BC*, London: Phoenix.

de Morgan, J., Jéquier, G., de Mecquenem, R., Haussoulier, B. & Graat van Roggen, D.-L. (1905) *Mémoires de la Délégation en Perse, vol. 7, Recherches archéologiques, zème série*, Paris: Editions Ernst Le Roux.

Netz, R. (2002) "Counter Culture: Towards a History of Greek Numeracy", *History of Science*, vol. 40, no. 3, pp. 321–352.

Nilhamn, B. (2002) *Tokens of Identity? Small Clay Objects in Near Eastern Archaeology*, Uppsala Universitet: Institutionen för Arkeologioch Antik Historia.

Nissen, H. J., Damerow, P. & Englund, R. K. (1993) *Archaic Bookkeeping: Early Writing and Techniques of Economic Administration in the Ancient Near East*, Chicago: University of Chicago Press.

Özbal, R., Gerritsen, F., Diebold, B., Healey, E., Aydin, N., Loyette, M., Nardulli, F., Reese, D., Ekstrom, H. & Sholts & S. (2004) "Tell Kurdu Excavations 2001", *Anatolica*, vol. 30, pp. 37–107.

Peek, M. (1991) *African Divination Systems: Ways of Knowing*, Bloomington: Indiana University Press.

Pitman, H. (1996) "Preliminary Report on the Glyptic Art: Hacinebi, 1993. In Gil Stein et al. Uruk Colonies and Mesopotamian Communities: An Interim Report on the 1992–3 Excavations at Hacinebi, Turkey", *American Journal of Archaeology*, vol. 100, no. 2, pp. 230–233.

Renfrew, C. (1998) "Mind and Matter: Cognitive Archaeology and External Symbolic Storage" in *Cognition and Material Culture: The Archaeology of Symbolic Storage*, ed. C. Renfrew & C. Scarre, Cambridge, UK: McDonald Institute for Archaeological Research, pp. 1–6.

Renfrew, C. (2007) *Prehistory – The Making of the Human Mind*, London: Phoenix.

Renfrew, C. (2012) "Towards a Cognitive Archaeology: Material Engagement and the Early

Development of Society" in *Archaeological Theory Today*, ed. I. Hodder, Malden, MA: Polity Press, pp. 124–145.

Schmandt-Besserat, D. (1977) *An Archaic Recording System and the Origin of Writing*, Malibu, CA: Undena.

Schmandt-Besserat, D. (1978a) "The Earliest Precursor of Writing", *Scientific American*, vol. 238, no. 6, pp. 50–59.

Schmandt-Besserat, D. (1978b) "Reckoning Before Writing", *Archaeology*, vol. 32, no. 3, pp. 22–31.

Schmandt-Besserat, D. (1979) "An Archaic Recording System in the Uruk-Jemdet Nasr Period", *American Journal of Archaeology*, vol. 83, no. 1, pp. 19–48.

Schmandt-Besserat, D. (1980) "The Envelopes That Bear the First Writing", *Technology and Culture*, vol. 21, no. 3, pp. 357–385.

Schmandt-Besserat, D. (1988) "From Accounting to Written Language: The Role of Abstract Counting in the Invention of Writing", *The Social Construction of Written Communication*, pp. 119–130.

Schmandt-Besserat, D. (1992a) *Before Writing, Volume I: From Counting to Cuneiform*, Austin: University of Texas Press.

Schmandt-Besserat, D. (1992b) *Before Writing, Volume II: A Catalogue of Near Eastern Tokens*, Austin: University of Texas Press.

Schmandt-Besserat, D. (1994) "Before Numerals", *Visible Language*, vol. 18, no. 1, pp. 48–60.

Schmandt-Besserat, D. (1996) *How Writing Came About*, Austin: University of Texas Press.

Schmandt-Besserat, D. (1999) "Tokens: The Cognitive Significance", *Documenta Praehistorica*, vol. 26, pp. 21–27.

Simmons, A. H. & Najjar, M. (2006) "Ghwair I: A Small, Complex Neolithic Community in Southern Jordan", *Journal of Field Archaeology*, vol. 31, no. 1, pp. 77–95.

Simpson, S. J. (2007) "Homo Ludens: The Earliest Board Games in the Near East" in *Ancient Board Games in Perspective: Papers from the 1990 British Museum Colloquium, with Additional Contributions*, ed. I. L. Finkel, London: The British Museum Press, pp. 5–10.

Tekin, H. (2007) "Hakemi Use: Güneydoğu Anadolu'da Son Neolitik Döneme Ait Yeni Bir Merkez" in *Anadolu'da Uygarligin Dogusu ve Avrupa'ya Yayilimi: Türkiye'de Neolitik Dönem: Yeni Kazılar, Yeni Bulgular. Vol. 2: Levhalar*, eds. M. Özdoğan & N. Başgelen, Istanbul: Arkeoloji ve sanat Yayınları, pp. 41–52.

Vandier, J. (1964) *Manuel d'Archéologie Égyptienne IV: Bas-Reliefs et Peintures*, Paris: Picard.

Verhoeven, M. (1999) *An Archaeological Ethnography of a Neolithic Community: Space, Place and Social Relationships in the Burnt Village at Tell Sabi Abyad, Syria*, Istanbul: Nederlands Historisch – Archaeologisch Instituut te Istanbul.

Verhoeven, M. & Akkermans, P. M. M. G. ed. (2000) *Tell Sabi Abyad II: The Pre-Pottery Neolithic B Settlement*, Istanbul: Nederlands Historisch-Archaeologisch Instituut te Istanbul.

Watkins, T. (2010) "New Light on Neolithic Revolution in South-West Asia", *Antiquity*, vol. 84, no. 325, pp. 621–634.

Woods, C. (ed.) (2010) *Visible Language: Inventions of Writing in the Ancient Middle East and Beyond*, Chicago: The Oriental Institute of the University of Chicago.