Assembling Çatalhöyük

Editors:
Ian Hodder and
Arkadiusz Marciniak

Themes in Contemporary Archaeology

Volume 1

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ROUTLEDGE

Assembling Çatalhöyük

Edited by Ian Hodder and Arkadiusz Marciniak

Themes in Contemporary Archaeology

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Cover image(s): *Left*: Ochre hand prints on the north wall of Building 77; *Middle*: Bucrania and horned bench associated with the northeast platform of Building 77 (both taken from Taylor pp. 127–50, this volume); *Right*: The incised panel above burial 327 in TP Area (taken from Marciniak et al., pp. 151–66, this volume).

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Introduction

Assembling the Archaeological Process at Çatalhöyük

Arkadiusz Marciniak

The archaeological process today is more complicated and heterogeneous than ever before. A wide range of new types of data are being introduced and these are responsible for the production of different types of knowledge. This knowledge no longer conforms to universal and abstracts epistemic standards. In particular, a claim by logical positivists and empiricists believing in the uniformity of empirical evidence and epistemic procedures free of nonepistemic influences is to be rejected. In these circumstances, a 'much richer, more dimensional and hybrid model of scientific practice and its product is needed' (Wylie, 2002a: 10).

Almost all contemporary archaeological projects mobilize a range of datasets and have some form of interdisciplinary endeavor. However, an in-depth understanding of the process of assembling different categories of material culture in the inference process has not yet been achieved. Theoretical underpinnings of these studies remain unexplored and links to dedicated case studies have been limited. This is particularly worrisome in a period of rapid incorporation of new data-to-become-evidence in archaeological practice. Many of these new forms of data have been generated by the dynamically developing archaeological sciences. As a result, an increasingly heterogeneous and idiosyncratic archaeological practice has emerged, which is part and parcel of contemporary archaeology. The heterogeneity applies to different aspects, such as assembling research teams, recording and documenting numerous datasets, and interpreting and interlinking diverse facets of the past.

Conceptualizing the very nature of the archaeological process as it assembles and consumes the results of analyses of ever increasing categories of data, produced by a wide of range of disciplines and undertaken within the realms of their own theoretical traditions, is an ongoing challenge for archaeology. The notion of 'assemblage' appears to be very useful in achieving these goals. Recent decades have witnessed a range of interesting proposals intended to conceptualize the complex nature of archaeological practice. The conjunctive approach of Walter Taylor, Wylie's 'cables and tacking', Latour's Actor Network Theory, Peirce's semiotics, Knappett's network theory or Hodder's entanglement theory provide examples that bear on the idea of assembling. When applied in archaeology, they facilitated a better understanding of large and complex datasets, operating at a micro- and supra-regional or diachronic scale.

These archaeological applications neither capture all diverse facets of the heterogeneous nature of archaeological practice nor are their applications comprehensive enough to take these different manifestations into consideration. While archaeological projects usually mobilize different datasets, they are often limited in scope and character. They rely upon a limited number of categories of potentially useful data, while others, mobilized to meet requirements of the genre of interdisciplinary studies, are only mentioned in passing, if at all, and treated superficially. In other instances, studies choose to focus only upon a restricted portion of their otherwise-rich heuristic potential, be it materiality, symbolism, monumentality or visuality, to pick up a few (see Marciniak, 2006).

The heuristic potential of different categories of data is not universal and straightforward. The meanings of objects are not only created in the conventional relation between the sign and its reference but through relations generated by the sign. Hence, its meaning is given in relation to other items constituting a cluster of objects that make an assemblage. Hence, the semiosis of any category of data in the ongoing process of contextualization and entextualization (transformation of objects into categories of objects and their types) (Preucel, 2006) is neither firm nor fixed. Furthermore, this meaning is subjected to change throughout the object's own 'life history'. Hence, any assemblage is made of objects at different phases in their life histories and hence ascribed different meanings. Accordingly, the assemblage is some kind topical entity where different syntactic, semiotic, and ideological transformations are taking place.

Scientific procedures applied in archaeology are often portrayed in the form of a hermeneutic circle. As pointed out by Wylie (2002b: 205) archaeologists should systematically exploit disunities 'that permit on many levels among scientific fields and theories' and their idiosyncrasy needs to be stressed in the context of the inference process. As this is not a viciously circular process, it is necessary to define the conditions of both justified and satisfactory interruption of this inferential-hermeneutic circle. In general, inference in archaeology needs to be defined both as the movement back and forth between theory and data and a series of inferential steps. These two modes should be viewed as complementary and not contradictory to each other.

Strategies of hypothesis formation involve exploitation of 'multiple strands and diverse types of evidence, data, hunches, and arguments' (Bernstein, 1983: 69). In playing back and forth between theories offered by sociology or anthropology, analogies, and constraints offered by archaeological data, archaeological inference should seek substantive coherence (Hodder, 1999: 43). Evidential claims provide both security (what is most plausible and what is not) and independence (a separate line of reasoning and justification). There are different dimensions of security depending upon the kind of evidence used and scale of phenomena studied. Wylie (2002b) defined three types of security in archaeological assessments of evidential claims: (i) a freedom from doubt regarding the linkages between archaeological data and the antecedents that produced them, (ii) security that arises because of the overall length and complexity of the linkages involved and (iii) the degree of determinism allocated to the linkages involved.

Archaeologists commonly refer to various scales and resolutions of studied phenomena. They usually require carefully selected types of material culture, variables, and methods of analysis. They also define the way in which these materials are sampled. This implies that there are no 'objective' results of various techniques and the use of science as such does not stand for objectivity. There is no single set of procedures universally applicable. Hence, it is necessary to recognize interdependencies between a wide range of scales at which prehistoric processes operate, and the variability and multidimensionality of material culture. It is then necessary to conceptualize convergences and divergences between various categories of data to avoid the situation in which some datasets are mobilized for supporting some theoretical stances but do not match up in relation to other categories of data (see Johnson, 2006). Furthermore, it is necessary to reflect on how empirical evidence constrains reconstructive claims about the past and what is the degree of epistemic independence in this process.

An inseparable element of the heterogeneous character of the archaeological process is the emergence of the dynamically growing archaeological sciences. They have often become a self-contained academic enterprise, largely disentangled from the main body of archaeology. Mutual understanding has rarely been deep, and both camps rather misrepresent and even caricaturize each other rather than elaborate the thoroughly grounded foundations for a mutual cooperation. Such foundations should include issues such as the sources and limits of knowledge, differences in ways of gathering and assessing evidence, problems of perceptual knowledge, or the role of experience and reasoning in knowledge acquiring.

The archaeological process operating at different levels can be described as 'heterogeneous assemblages of things – objects such as tools and furnaces, but also institutions, places, humans, social groups, rules, metaphors, rituals, and abstractions' (Hodder, 2012: 44). In particular, the assembling process refers to (a) different datasets used to address a wide range of issues pertaining to the past, (b) different modes of recording, documenting and managing datasets, and (c) assembling people and things in researching the past and communicating it to the general public.

The book aims to address these concerns by discussing the experience of the multiscalar and multifaceted research process at the Neolithic settlement in Çatalhöyük in Central Anatolia. The chapters show how to build a robust argument that expands the understanding of different aspects of Çatalhöyük and its people. They attempt to explore to what extent a proposed hypothesis is consistent with all the lines of evidence that are constructed using diverse sources. Disparate datasets are then seen as converging to allow for a highly contextualized analysis of different facets of these groups, which are weaved from multiple threads of biological and social data at the same time. The volume shows that it is possible to find greatest resolution in our understanding of these aspects when we consider multi-disciplinary evidence and approaches from the archaeological record. In more general context, it attempts to make the creation and presentation of archaeological knowledge explicit.

This volume thus has a number of purposes. At one level it reports on the exciting new discoveries and advances that are being made in the understanding of the 9000-year-old Neolithic site of Çatalhöyük. The site has long been central to debates about early village societies and the formation of 'mega-sites' in the Middle East. The current long-term project has made many advances in our understanding of the site that impact on our wider understanding of the Neolithic and its spread into Europe from the Middle East. These advances concern the use of the environment, climate change, subsistence practices, social and economic organization, the role of religion, ritual, and symbolism. The chapters assemble data from cultural,

social, biological and environmental realms in order to deal with key issues in the growth of the large agricultural village at Çatalhöyük and its transformation over time. At another level, the volume reports on methodological advances that have been made by team members, including the development of reflexive methods, paperless recording on site, the integrated use of 3D visualization, and interactive archives. The long-term nature of the project allows these various innovations to be evaluated and critiqued. In particular, the volume includes analyses of the social networks that underpin the assembling of data, and documents the complex ways in which arguments are built within quickly transforming alliances and allegiances within the team.

The Çatalhöyük Research Project is one of the most comprehensive and complex archaeological projects in contemporary archaeology. For more than 20 years the wide range of types of data have been collected and studied by a group of ca. 160 researchers representing 34 different specialisms. There have been attempts at inter-disciplinary collaboration and the assembling of strong arguments on the basis of multiple lines of evidence. Project members seek lines of connection between different datasets. When three to four different sets of data align, unexpectedly robust arguments can be built, but the different forms of data can also create dissonance that has to be resolved. The project epitomizes the current condition of archaeology, where research undertakings are no longer carried out within the realms of national traditions but assemble people from different traditions of training and practice.

The Çatalhöyük Research Project is directed by Ian Hodder of Stanford University. Since 1995, a number of excavation teams started excavating a number of areas of the mound and on the adjacent Early Chalcolithic mound, Çatalhöyük West. The core excavation team from University of Cambridge and Stanford University was later joined by independent groups from the University of California at Berkeley, the University of Thessaloniki, the Universities of Poznań and Gdańsk as well as three Turkish teams representing Istanbul University, Selçuk University and the University of Thrace at Edirne. On the Chalcolithic West Mound, the excavation works were carried out by a University of Cambridge and University of Buffalo team. In addition, different contract and professional archaeologists from different countries participated in the excavations.

In addition to the various excavation teams, an integral element of the project are the largely independent teams of specialists working at the site during the entire season and co-operating with the excavators on a daily basis. The organization of the different laboratories has varied considerably, from highly centralized structures, to more loosely organized entities. Over the years, the leaders of teams of specialists have changed, inevitably leading to modification of analytical procedures. Further modifications have been required as a result of the gradual accumulation of experience and changes of research questions.

An explicit methodology was defined prior to commencement of fieldwork not only to carry out the project's objectives, but also to confront 'the challenge of introducing multivocality and reflexivity in the laboratory and trench', as formulated by Hodder (2000). This new approach included: (a) priority tours aimed at discussions between the laboratory and field staff, (b) interpretive approaches to sampling strategies, (c) co-operation of specialists at the site, (d) quick feedback by the laboratory staff to the field staff, (e) interactive database available on and off the site, (f) the writing of a diary to enhance a fluid and flexible data, (g) video recording, (h) presence of social anthropologists studying the construction of knowledge at the site, and (i) hypertext solutions to challenge the linearity of archaeological narratives and allowing accounts with multiple pathways and multimedia.

The chapters in this volume cover two major dimensions of the assembling in the project: (i) recording and documentation, and (ii) interpretation of the Neolithic past. The former comprises the challenges of a continuous catching up with ever emerging technological innovations and exponentially increasing number of archaeological data. The latter covers three intertwined aspects of life at the settlement: (a) social practices and lifestyles, (b) house and household, and (c) long-term changes and landscape exploitation.

The book opens with the chapter by Ian Hodder presenting different theoretical underpinnings for the notion of assemblage. It underlines the nature and practice of the collaboration between different specialisms present in the Çatalhöyük project. Through the process of interlacing and braiding across and between domains within evanescent networks of various types, a solid and well-grounded knowledge about the Neolithic past is achieved.

Three chapters in the volume address the character of assembling in recording and documentation. Claudia Engel and Karl Grossner address the intrinsic difficulties in any large-scale project of integrating new digital methods into the long-term documentation of the archaeological process. They advocate geo-visualization and Linked Open Data as efficient means of facilitating long-term, collaborative, multivocal knowledge creation. In the chapter by Allison Mickel and Elijah Meeks the character of the social interactions, politics, and production of knowledge in the project, as a form of assemblage of researchers representing wide-ranging disciplinary traditions, is discussed. The authors explore the ways in which

team members are linked to each other by participating in diverse research groups and co-authoring excavation records and reports. These conditions enable the flow of data and the production of multidisciplinary knowledge about the past. The challenges of recording a wide range of data and their subsequent interpretation are addressed in the chapter by Maurizio Forte, Nicolo' Dell'Unto, Kristina Jonsson, and Nicola Lercari. The authors advocate the application of 3D models as a qualitatively new means of managing, visualizing, and querying a wide range of archaeological data that significantly enhances the archaeological process. They not only serve to advance inferential methods of interpretation but more importantly enhance their meta-interpretation.

Multi-disciplinary evidence and approaches to social practices and lifestyles at Çatalhöyük are addressed in three chapters. Joshua W. Sadvari, Christina Tsoraki, Lilian Dogiama, and Christopher J. Knüsel discuss the socioeconomic roles of the sexes at Çatalhöyük through the integration of data about people, objects, and practices in a single study. They investigate them by assembling data about human skeletal remains, ground stone, and projectile point assemblages, in addition to selected wall paintings and figurines. Bodily concerns and preoccupations are also addressed by Jessica Pearson, Lynn Meskell, Carolyn Nakamura, and Clark Spencer Larsen as they assemble evidence from stable isotope analysis and physical anthropology and bodily representation through figurines and in the burial assemblage. A wide range of datasets, including human remains, figurines, art and architecture, and burial assemblages, have made it possible to build up a more robust evidentiary basis for the identification of embodied practices at Çatalhöyük. Gender roles at the settlement are also addressed by Sabrina Agarwal, Patrick Beauchesne, Bonnie Glencross, Clark Spencer Larsen, Lynn Meskell, Carolyn Nakamura, Jessica Pearson, and Joshua W. Sadvari. By mobilizing different social and biological data, such as human remains and material culture in the form of figurines, the authors offer a more synergistic representation of sexual difference and division of labor for the individual and community in the Neolithic.

Another block of three chapters builds a robust argument that expands the understanding of different aspects of house and household at Çatalhöyük. The changing social standing of the house through time is addressed by Tristan Carter, Scott Haddow, Nerissa Russell, Amy Bogaard, and Christina Tsoraki. The authors address various activities associated with the foundation of a Çatalhöyük house, such as the deposition of the body parts of different animals, the deposition of fragmentary human remains, clay figurines, pieces of crystal, or pigment stained stone. The cycle of house construction, use and abandonment from the architectonical standpoint is addressed in the chapter by Marek Barański, Aroa García-Suárez, Arkadiusz Klimowicz, Serena Love, and Kamilla Pawłowska. The architectural perspective is advocated as a complex process in which experience and technical skills played a major role. These variables were recognized by studying the house architecture, microgeomorphology and clay procurement and use. A fine-grained analysis of a single house is provided in the chapter by James Taylor and co-authors. It aims at linking stratigraphic temporal data to spatial data, involving an innovative articulation of space and time within the structure of a Geographic Information System (GIS). The chapter offers a large number of visualizations exploring details of the lifecycle of one of the distinct dwelling structures.

Diverse datasets converged to allow for a highly-contextualized analysis of social changes and landscape exploitation at Çatalhöyük, as presented in three other chapters. Arkadiusz Marciniak, Eleni Asouti, Chris Doherty, and Elizabeth Henton in their chapter aim at explicitly testing a hypothesis regarding the emergence of the autonomous household in the Late Neolithic. Diverse datasets, such as settlement layout, clay, wood charcoal, and animal bones, were investigated to address different dimensions of the functioning of the community at the end of Çatalhöyük's occupation. Another dimension of landscape exploitation is discussed by Joshua W. Sadvari, Michael Charles, Christopher Ruff, Tristan Carter, Milena Vasić, Clark Spencer Larsen, Daniella Bar-Yosef Mayer, and Chris Doherty. The authors investigate the complex web of factors influencing mobility patterns as evidenced by the human skeletal remains, pottery, chipped stone, shell bead, and stone bead datasets. The final chapter by Serap Özdöl-Kutlu, Tristan Carter, Lech Czerniak, Arkadiusz Marciniak aims at understanding developments in the final centuries of the settlement occupation of the East Mound in the context of the Anatolian plateau as well as western and northwestern Anatolia. They use multiple datasets from Çatalhöyük and other Anatolian settlements concerning spatial organization, patterns of architecture, burial practices, chipped stone, and pottery manufacture to reveal the character of the Çatalhöyük community shortly before it was abandoned.

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CHAPTER 1

Assembling Science at Çatalhöyük
Interdisciplinarity in Theory and Practice

Ian Hodder

Introduction

Within archaeology, the term 'assemblage' has a long and central history, though it has perhaps not been theorized as much as other terms. The notion that artefacts are associated together in assemblages within contexts has always been the key that separates archaeology from antiquarianism. If the associations of traits in assemblages are recurring, archaeologists are able to identify cultures, time horizons, elite and non-elite graves, functional tool kits, and so on. The underlying idea is that an artefact found with other artefacts within an assemblage can be interpreted in terms of these other artefacts, and vice versa. Assemblage is thus a building block of archaeological method and theory that allows us to gauge the date, function, type, meaning of objects. But this building block is relational and contextual; relational because one find is interpreted in terms of others, and contextual because the specific set of associations can be related to stratigraphic and spatial information beyond the assemblage itself.

Without assemblages archaeologists would not be able to work out the environment of a site, its economy, or social organization, they would not be able to date many contexts or understand the relationships between sites. Without context and assemblage, there is little to archaeology beyond collecting objects. But there are problems in the definition and interpretation of assemblages (Binford, 1982; LaMotta & Schiffer, 1999; Bailey, 2007; Lucas, 2008). When does a cluster of artefacts become an assemblage? What is the relationship between palimpsest and assemblage? Do we find assemblages or do we actively construct or assemble them? And are clusters of artefacts intentional associations or unintentional relations produced by depositional or post-depositional processes? And if intentional, what types of intention (conscious or non-discursive etc.) are involved? And who made the association; for example, are the associated artefacts in a grave the assemblage of the deceased or of the living? So, in archaeology, the notion of assemblage raises questions about the processes of assembling. An assemblage is not self-evident.

It is perhaps unfortunate then that the term has been so little theorized in archaeology (see, however, the online Sheffield graduate journal of archaeology called 'Assemblage'). In contemporary social theory, on the other hand, there is an active and important discussion of assemblage. This theoretical debate deals less with the associations of past artefacts in contexts and more with the production of knowledge—that is with the ways that statements are based on assembling bits of information from divergent sources. It is primarily in this sense that the term is used here, though clearly there is a connection between how archaeologists assemble arguments and how past social actors constructed assemblages. Taylor (1948) argued for a conjunctive approach and I have argued for a contextual approach (1986); in both cases interpretations are based on associations of objects in past assemblages and contexts. But how exactly are theoretical arguments based on these contextual associations? I have argued that archaeologists follow a hermeneutic approach (Hodder, 1999) while Wylie (1989) has argued for a tacking to and fro between different types of data in order to build arguments.

The twenty years of research conducted by the current project at Çatalhöyük allow investigations into how archaeologists assemble arguments by moving between different types of data. Can current social theories about assemblage contribute to an understanding of the archaeological process? Whether it is the work of Latour (2005) on 'Re-assembling the Social' or the ideas of Deleuze and Guattari (Deleuze, 2004) and their influence on DeLanda (2006) and Bennett (2009), does the social theoretical discussion of assemblage throw light on the Çatalhöyük research experience?

What are the inflections of meaning that are given to 'assemblage' in this social theoretical debate? According to DeLanda (2006), assemblages refer to heterogeneous entities that are not holistic. Assemblages come about historically and have both stabilizing and destabilizing components (that he calls territorialization and deterritorialization). The focus in DeLanda's assemblage theory is not on essential

categories like city or government or person, but on their emergence in specific historical circumstances and on their maintenance. For Marcus & Saka (2006: 101), 'assemblage … permits the researcher to speak of emergence, heterogeneity, the decentred and the ephemeral in nonetheless ordered social life'. The components of assemblage described by Bennett (2005) are as follows. Assemblage is (1) an ad hoc grouping that comes about historically. (2) Its coherence co-exists with internal counter energies. (3) Assemblage is a web that is uneven and power is differentially distributed. (4) It is not governed by a central power. (5) Assemblage is heterogeneous, made up of different types of actants, human and non-human.

Assembling Çatalhöyük

To explore whether these notions of assemblage apply to the research conducted at Çatalhöyük, the project's working practices need to be explained (Hodder, 2000). As in any large archaeological project, there are a lot of different specialisms. There are one hundred and sixty people currently working on the team—dividable into excavation teams and pods, and there are laboratories in which thirty-six specialisms work (listed in Figure 1). The team members in these different specialisms are brought into conjunction through working together on site, through the 'priority tours' where lab members choose priority units together with the excavation pods every second day, through use of a common data base, through writing together in themed volumes, through social events and venues on site, and in some cases through reading each other's online diaries etc. Within these interactions there are lots of tensions. For example, a major tension has been described elsewhere (Hamilton, 2000) between excavators and lab teams. And there are also fault lines between those specialists more based in the natural sciences and those more engaged in cultural data—I have described elsewhere the ways these different specialisms work (Hodder, 1999).

Laboratory specialists	
GIS	Architecture
Geochemistry	Bricks
Micromorphology	Fire forensics
Coprolites	Ceramics
Malacology	Lipids
Archaeobotany	Figurines
Charcoal	Stamp seals
Phytolith	Clay balls
Starch	Geometrics
Fauna	Worked bone
Microfauna	Metallurgy
Isotopes	Wall paintings
Dental microwear	Ornaments
Fish	Groundstone
Bioarchaeology – human remains	Chipped stone
Burial associations	Conservation
Heavy residue	3D reconstruction
Clay sourcing	Database

Figure 1. *The main groupings of scientific specialists working on the material excavated from Çatalhöyük.*

While I as Director make decisions about team membership, and have made major changes to the team on two occasions over the twenty years of the project, and while some will argue that I am a tyrannical and despotic director, the overall research structure is in my view quite flat. There are overall research questions—such as the overarching statement that the project aims to place the art and symbolism within its full environmental, economic, and social context. There has been an overall shift through time from the study of individual houses and depositional processes to the study of the settlement's social geography. But I as Director play a small or remote part in many research groupings, and a wide range of specific questions have also been asked by different team members, often related to the different profiles and interests of funding bodies. Figure 2 shows the main research interests of different funding bodies that have supported the project over recent years. The research goals do not coincide. By working with these different funding bodies, team members have been pulled in different directions. So, for example, the Templeton Foundation that focuses on religion has drawn in Lynn Meskell and myself on symbolism, Carrie Nakamura on placed deposits, and Lori Hager on the interpretation of a particular burial. Funding from the Thiel Foundation and Imitatio focuses on the relationships between real and symbolic violence and has drawn in bioarchaeologist Chris Knusel regarding evidence of violence on human bodies, groundstone specialist Christina Tsoraki to explore the role of mace heads, and the chipped stone team regarding the function of bifacially flaked points and daggers. National Science Foundation funding was obtained by Kathy Twiss and Amy Bogaard for faunal and botanical studies relating to the question of economic integration and cultural survival at Çatalhöyük. Another group has written about the issue of burning in B52 and whether the fire was caused intentionally or was an accident—this issue has brought in Kathy Twiss and Nerissa Russell from faunal the laboratory, Amy Bogaard and Mike Charles from the botanical laboratory, members of the excavation team including Shahina Farid, Tristan Carter from the chipped stone lab, Nurcan Yalman from pottery and Mira Stevanović from architecture. There are many other examples documented in our themed volumes and in this new volume, sometimes related to funding opportunities, but often just resulting from shared fascination with sets of data that people come to notice fit together or that create interpretive puzzles or problems. The

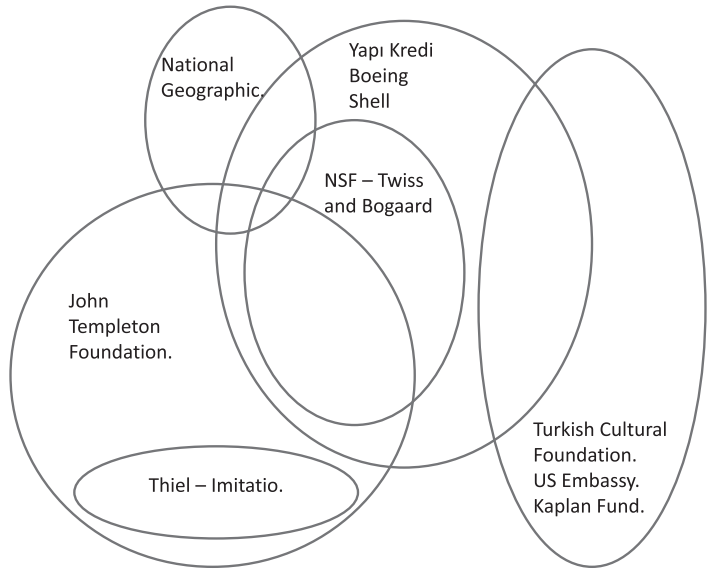

Figure 2. *Overlaps between the research interests of the different funders at Çatalhöyük.*

network that put together the 'house foundation' paper for this volume (chapter 8) is shown in Figure 3. A fuller account of these networks and a more adequate description of their working are provided by Mickel and Meeks in chapter 3.

It sometimes seems that if up to four to six types of data can be assembled by these groups in such a way that they align and give the same answer, the interpretation appears robust and persuasive. These groups with more fits are more likely to persuade other groups in the team and beyond. A good example is the evidence for increased mobility in the upper levels of the East Mound, as discussed in this volume by Sadvari et al. (chapter 12). The evidence for increased mobility is based on at least seven strands of evidence—the cross-sectional geometry of human femurs, *Phragmites* encroachment near the site (indicating people had to travel farther from the site), pottery production that increasingly used non-local clays, sheep isotope data suggesting wider use of the environment including C4 plants, obsidian data indicating the use of sources in eastern Anatolia, beads and groundstone items produced from a wider range of distant sources. It seems that strong arguments can be made by boot-strapping different types of data so as to assemble a coherent and persuasive argument. But it should be noted that each one of these types of data could be interpreted differently. For example, the use of more distant pottery, groundstone, and obsidian sources may have nothing to do with increased travel across the landscape but could result from exchange. Each individual strand of evidence is interpreted in relation to the other strands, even if they are quite weak, such as the only marginally statistically significant results on the cross-sectional

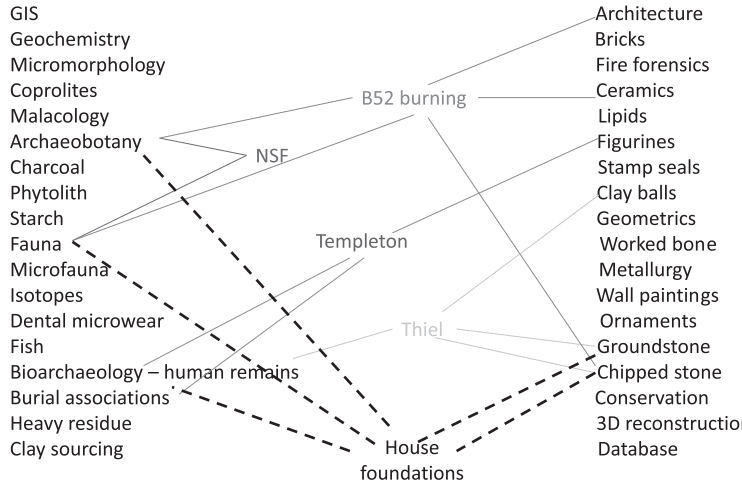

Figure 3. *Specialist groups and their research networks.*