

# Innovative multi-scalar approaches to understanding complex urban settlement processes

## Danish Archaeological Expedition to Iraq (DAEI)

### EARLY URBANISM

Urbanisation entails dramatic transformations in societies' organisational dynamics and use of space. Industrial sprawl and urban-scale garbage dumping are a hallmark of this urban transformation and are visible at the inception of urbanism.

Recent investigations in northern Mesopotamia reveal that urban growth in the Late Chalcolithic (LC) period (5-4th millennium BC) transformed the surroundings of urban settlement from farmland into an 'urban edge zone' consisting of complex human activities including large areas devoted to quarry pitting, production and garbage dumping (1)(2).

Comparable developments are now being identified on the Rania Plain in northeastern Iraq (3)(4). DAEI presents here recent evidence for complex urban settlement processes from the Rania Plain based on a new multi-scalar approach. Ten seasons of investigations provide solid evidence of landscape exploitation and off-site activity areas associated with sites on the plain (3)(4). These include: industrial and settlement sprawl, quarries and urban-scale garbage dumping (Fig. 1-5).

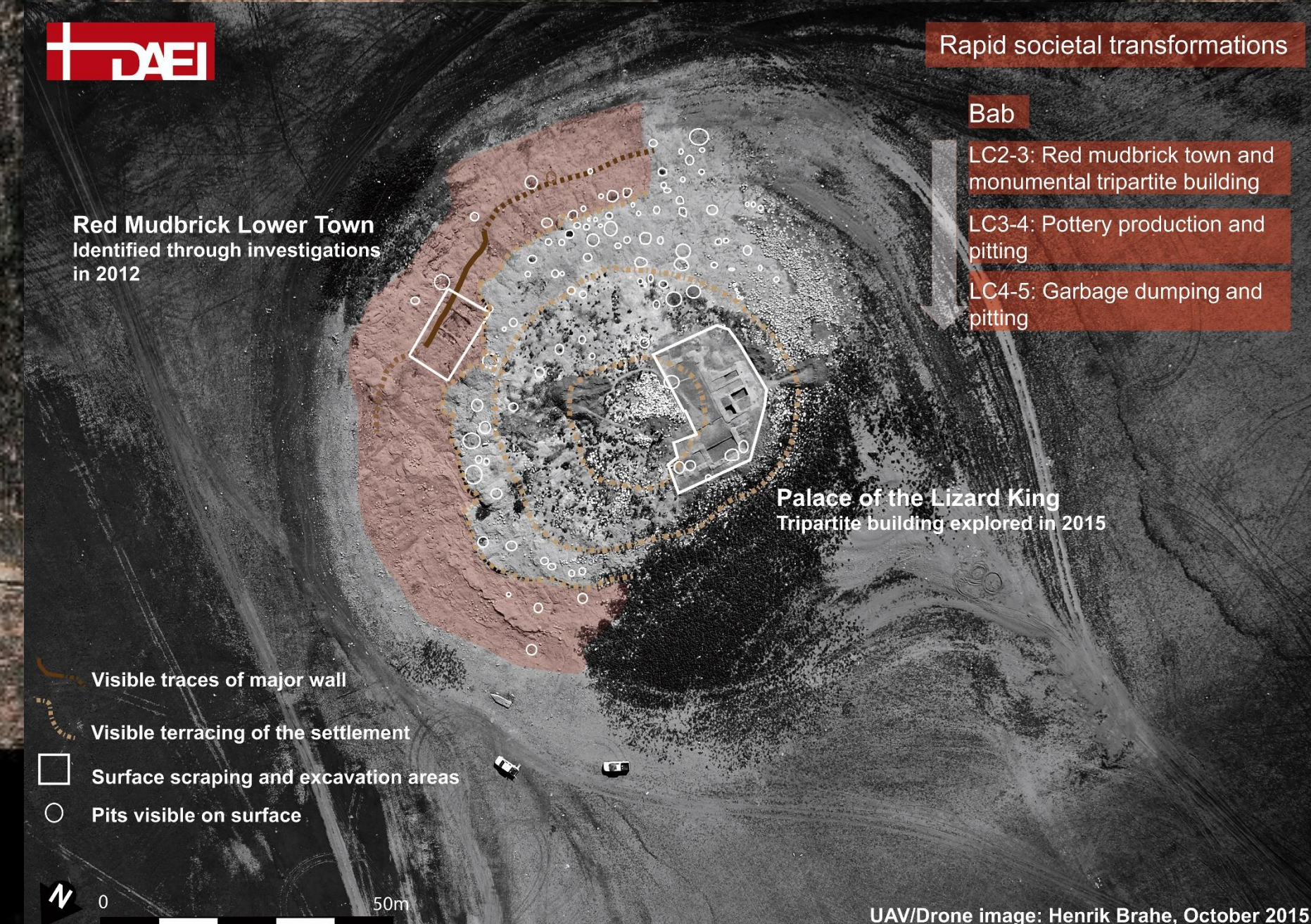


Fig. 1. UAV/drone image of Bab with systematic trash pitting, dating to the LC 3-5, visible cutting into the Tripartite Building (LC 2-3, outlined in white) on the top of the mound and the lower "Red Mudbrick Town" (LC 2-3).



Fig. 2. Soundings (2x2m) at Gird-i Gulak. DAEI has excavated numerous soundings at Gulak and Babukur. These provide invaluable insights into the nature and sequence of occupation at the sites. Evidence of trash dumping and potential quarry pits were found across the sites dating to the LC period.



Fig. 3. Coring and systematic soil sampling at Gulak and Babukur. When employed in tandem with soundings, coring identified settlement occupation through markers such as anthropomorphic soils. Soil samples are undergoing laboratory analyses. In conjunction with the recovered cultural material (ceramics, botanical and zoological) and evidence of trashing and quarrying from cultural material and soil profiles, these analyses will identify the nature, distribution and chronology of the transformative processes of early urbanism.

### MULTI-SCALAR APPROACH

Landscapes in which urban settlements are embedded are important reference points for the understanding of ancient urban societies and their socioeconomic organisation. Effectively investigating these, however, is challenging.

DAEI employs an innovative multi-scalar methodological approach to explore the anatomy and temporal development of early urbanism. This combination of interdisciplinary methods aims to probe, delimit and reconstruct urban settlements and their specialized landscapes.

Methods are diverse and includes remote sensing (satellite and UAV imagery), surface survey, subsurface inspections by coring and small soundings, surface scraping, and systematic sampling of soil and C-14 samples. These methods are complementary and effective means of corroborating new insights. They are well-suited to the challenges of investigating urban landscapes undergoing social and functional transformations, determining socioeconomic organisation and for establishing a fine-resolution chronology of the urbanisation process.

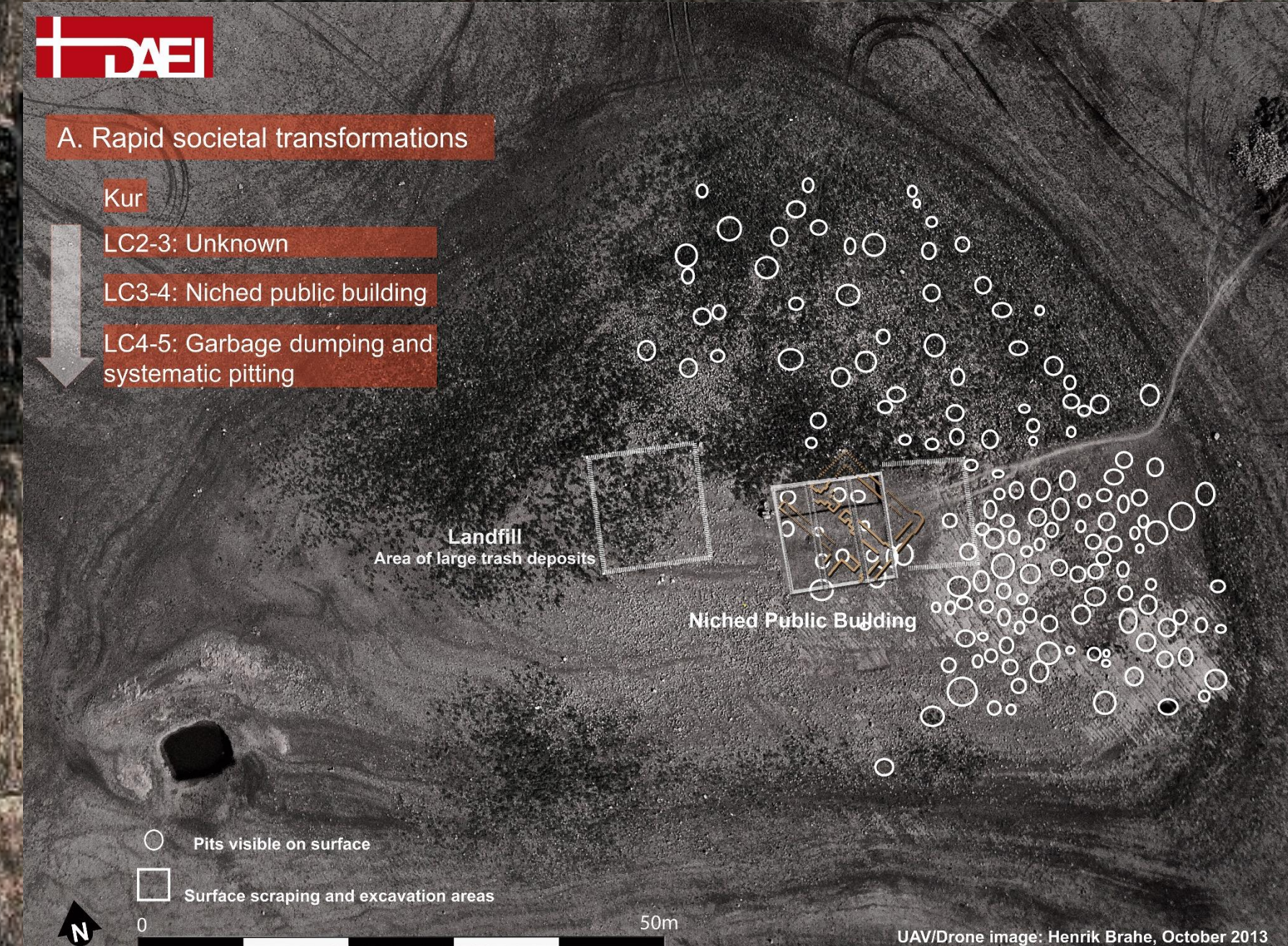


Fig. 4. Evidence of LC garbage management at the site of Kur (400m north of Bab). Visible are the Niche Building (LC 3-4) and systematic garbage pitting on the slopes of the mound and large area of trash deposits on the top (LC 4-5).



### ABOUT DAEI

The *Danish Archaeological Expedition to Iraq (DAEI)* is a collaboration between the *National Museum of Denmark* and *University of Copenhagen* and is directed by Tim Skuldbøl, Carlo Colantoni and Mette Marie Hald. Since 2012 the project has conducted archaeological research in the Zagros foothills of northeastern Iraq with excavations and survey on the Rania Plain. This collaborative project is investigating the anatomy and temporal development of early urban societies in northern Mesopotamia, as well as assisting in monitoring and protection of the archaeological heritage of northeastern Iraq.

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### FURTHER INFORMATION

Project webpage: [www.urbarch.tors.ku.dk](http://www.urbarch.tors.ku.dk)  
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### AUTHORS

**Tim Boaz Bruun Skuldbøl**, *University of Copenhagen*, Department of Cross-Cultural and Regional Studies, Karen Blixensvej 4, Building 10, DK-2300 Copenhagen S, Denmark.  
E-mail: [tbbs@hum.ku.dk](mailto:tbbs@hum.ku.dk)

**Carlo Colantoni**, *Independent scholar*, United Kingdom.  
E-mail: [carlo.colantoni@cantab.net](mailto:carlo.colantoni@cantab.net)

**Mette Marie Hald**, *National Museum of Denmark*, Environmental Archaeology and Materials Science, I.C. Modewegsvej, 2800 Kgs. Lyngby, Denmark.  
E-mail: [mette.marie.hald@natmus.dk](mailto:mette.marie.hald@natmus.dk)

**Photographer: Henrik Brahe**, [www.henrikbrahe.com](http://www.henrikbrahe.com)

Fig. 5. World View 2 image (Nov. 2010) with the location of soundings and corings at the site of Gird-i Gulak.

- Surface collection units indicating areas of settlement or past human activities
- 2x2 m sounding
- Coring

