ANCIENT EGYPT RESEARCH ASSOCIATES' OBJECT TYPOLOGY, v. 1.2022

by Emmy Malak, Claire Malleson, and Ali Witsell

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Introduction and Acknowledgments

The AERA Object Typology is the result of work on material culture at Giza by a large team of specialists over more than 30 years. This is not a catalog and therefore does not contain all objects founds by AERA. Instead, it is a living typology document, providing examples of the different kinds of artifacts found during AERA's excavations. It is intended to be used for reference by archaeologists working in other Egyptian (Old Kingdom) settlement sites, to facilitate comparisons between their assemblages and ours. We hope it acts as a useful tool for students of Egyptian Archaeology around the world, enabling us all to develop more sophisticated lines of inquiry and investigation into the "everyday" material culture of ancient Egypt. Our ultimate goal is to publish an online catalog of the (more than) 4,800 objects recovered during AERA's excavations at Giza, but due to various considerations we chose to start by publishing a freely downloadable pdf object typology, which we will update as and when appropriate. At present the typology contains only Old Kingdom items, examples of the Late Period burial items will be added in the future. At the beginning of each section a total number of object types is mentioned. In some cases, the number is an estimate, since the studying and processing of the material is still an ongoing process. Additionally, we will add a dedicated section of copper object types in the future following metallurgical analysis, a section on statue fragments, and distribution maps of the objects by category and type.

This publication project was made possible due to a generous American Center of Research in Egypt (ARCE) Antiquities Endowment Fund (AEF) data conservation grant, awarded to AERA in 2019. Unfortunately, the COVID-19 pandemic hit part-way through the spring season in 2020, and we were forced to close down our illustration and photography work earlier than planned. Some work (digitization of drawings) was conducted remotely, but for many obvious reasons we had to extend our deadlines quite considerably; we are grateful to ARCE for their understanding on this matter.

The project was led by AERA Lab Director Claire Malleson, but the bulk of the work was in the hands of Emmy Malak, who has worked with AERA as an Object Specialist since 2005. Ali Witsell, AERA's Managing Editor, completed the layouts and edited the final product. Primary support was provided by AERA Director Mark Lehner; Rebekah Miracle, AERA GIS Director, who produced all the maps and assisted in database work; and Dan Jones, Senior Archaeologist, who worked closely with Emmy in the Cairo archives. One of our aims was to continue AERA's long history of in-house training, and so in the spring of 2020 a team of Ministry of Tourism and Antiquities (MoTA) inspectors joined us to teach, and train, in objects illustration and photography: Yaser Mahmoud (Illustration) with Alaa Talaat and Rasha Mohamed Abd Elsalam, and Amel Aweida (Photography) with Mohamed Mohsen M. Hamed and Nourhan Hassan.

The curation and analyses of the objects at Giza was first directed by Ana Tavares and is now directed by Emmy Malak. The objects' database was created by Tobias Tonner and later Malak developed and oversaw the database. We would like to thank the object team members for their work on the artifacts throughout the years. The artifact recording and cataloging has been assisted by Marie-Astrid Calmettes, Ahmed Ezz, Hanan Mahmoud Mohammed, Amanda Watts, Nagwan Bahaa Fayez, Reham Mahmoud, Rasha Saafan, and Sarah Hitchens. Data entry was done by the authors and Luke Lehner, Meredith Brand, Nicole Hansen, and Reinert Skumsnes. The drawing of the objects was done by Will Schenk, Caroline Hebron, Johnny Karlsson, Marcia Gaylord, Pieter Collet, Sherif Abdel Moneam, Yaser Mahmoud, Alaa Talaat Shams El-Dein, Rasha Mohamed, and L. Darcy Hackley. The photographers include Francis Dzikowski, Yukinori Kawae, Jason Quinlan, Hilary McDonald, Dan Jones, Claire Malleson, M. Gamal Tolba Alwya, Amel Nasr Mohamed Eweida, Mohamed Mohsen M. Hamed, and Nourhan Hassan. Our workroom assistant Mr. Mohammed Hassan has shown unfailing dedication to AERA for over 26 years and is undeniably a crucial (and much-loved) team member.

Since 1988 our work has been supported by numerous inspectors from the Giza Ministry of Tourism and Antiquities Inspectorate, Ahmed Ezz deserves special mention for his assistance over the past 16 years. Our work on this specific project (2019–2021) was made possible due to the support of the Ministry of Tourism and Antiquities, especially its Director, his excellency Dr. Khaled El-Enany, and the Giza Inspectorate, directed by Mr. Ashraf Mohie.

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History of Excavation

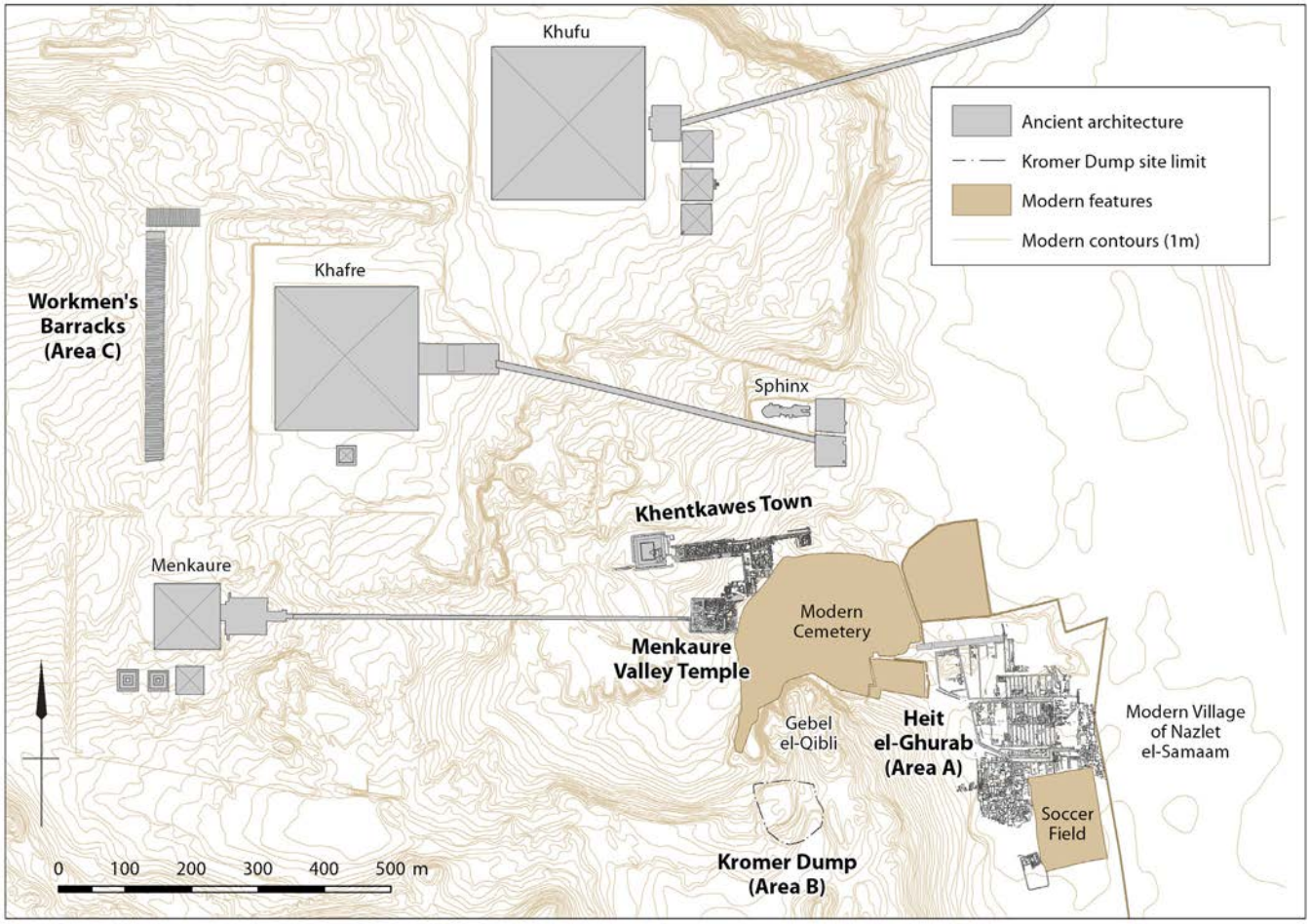
In 1988, three years after founding Ancient Egypt Research Associates (AERA), Dr. Mark Lehner opened the first season of excavations by the Giza Plateau Mapping Project (GPMP, founded 1984) with the explicit purpose of locating the settlement that had been home to the pyramid builders. Three locations had been identified for investigations (see Map 1): Area A was situated south of the Wall of the Crow, Area B was situated in a "bowl" to the north of the site of Karl Kromer's excavations (the "Kromer Dump"), and Area C was situated in the already well-known "workmen's barracks" to the west of the Khafre pyramid (Conard and Lehner 2001).

This season in 1988–89 led to the discovery of what rapidly became known as the "Lost City of the Pyramids," otherwise known as Heit el-Ghurab (HeG, see Map 2). The first excavation squares opened in Area A revealed the so-called "pedestal building" (later designated Area AA)—confirming the existence of non-funerary architecture and hinting at the presence of a settlement. The team returned in 1990, and while investigating a hole gouged out by a backhoe they came upon the remains of the now-famous bakeries (designated Area A7; Lehner 1992: 1–9), and the southeastern corner of what later became known to the team as the "Hypostyle Hall." Following a hiatus of a few years, in 1995 the team extended trenches around this backhoe hole, uncovering more of that building: crucially identifying the presence of fish fins embedded in the surfaces of the low benches that characterize the building.

Over the next few years, the AERA team expanded the excavations, but it was in the spring of 1998 that "The Big Leap Forward" season revealed what could be considered the heart of the site. The gallery complex that started to emerge at this point provided absolute confirmation, after 10 years of steady work, that this site was undoubtedly the location of a major settlement, unequivocally linked to the royal construction projects of Giza. This led to the inauguration of the "Millennium Project," which enabled us to open a large area and uncover the footprint of the HeG town. Work has continued almost annually at HeG since then, gradually revealing more and more of the town. In 2002, ahead of construction of a wall between the site and the modern village of Nazlet el-Samaam, a less-formal strip of housing to the east of the gallery complex was discovered, and tentatively identified as a village of support staff (Eastern Town). In 2004 a southern extension outside the main enclosure walls to the south of Area AA that is filled with larger "mansions" of the scribal and official classes (Western Town/SFW) was uncovered. In 2011 the previously flooded "Standing Wall Island" was identified as being a large corral complex, thought to have been the primary herding yard for the butcheries of the town (SWI). Additionally, large areas in which craft/industry workshops may have been identified (EOG, "East of Galleries"), and a massive, walled storage complex ("Royal Administrative Building," RAB). The "blank spot on the map," occupied by the soccer field of the Abu Hol (Sphinx) team is the only area that has not been investigated. At the time of writing (Fall 2021), this land has just been turned over to the MoTA, and AERA has initiated work with the aim of perhaps finding the royal palace that Mark Lehner anticipated finding over 33 years ago.

In 2005 AERA started work in the area of the Khentkawes Town (KKT) and Menkaure Valley Temple (MVT) as part of the overall goal to understand the settlements of the Giza Plateau (see Map 3). KKT was discovered by Selim Hassan in 1931 by accident—as he was testing locations in which to locate spoil heaps from his excavations of the Old Kingdom mastabas to the west of the Sphinx (Hassan 1943). He cleared the town, only later mapping the site based on aerial photographs. He left the site exposed, which unfortunately led to almost complete degradation of what had been a beautifully well-preserved planned town of the Old Kingdom. The goal of AERA's work in KKT has been to recover as much information from the site as possible, via detailed mapping and careful excavation. In 2007 the team very unexpectedly discovered a building to the east of the well-known town area (KKT-E). Over the next three years, excavations revealed a massive basin, and in 2011 at the eastern side of that basin, a building was discovered that had clearly operated as a storage and production facility. The work within the main area of KKT revealed a great deal of information about the life of the settlement, despite the almost complete denudation of the structures.

Between 1908 and 1910 George Reisner excavated (cleared) the valley temple of the Menkaure pyramid (MVT), finding the remains of habitation—a so-called "squatters' settlement"—within the temple's central court (crucially, Reisner dumped his spoil into the empty spaces of the temple that he had already cleared). These excavations yielded the famous Men-

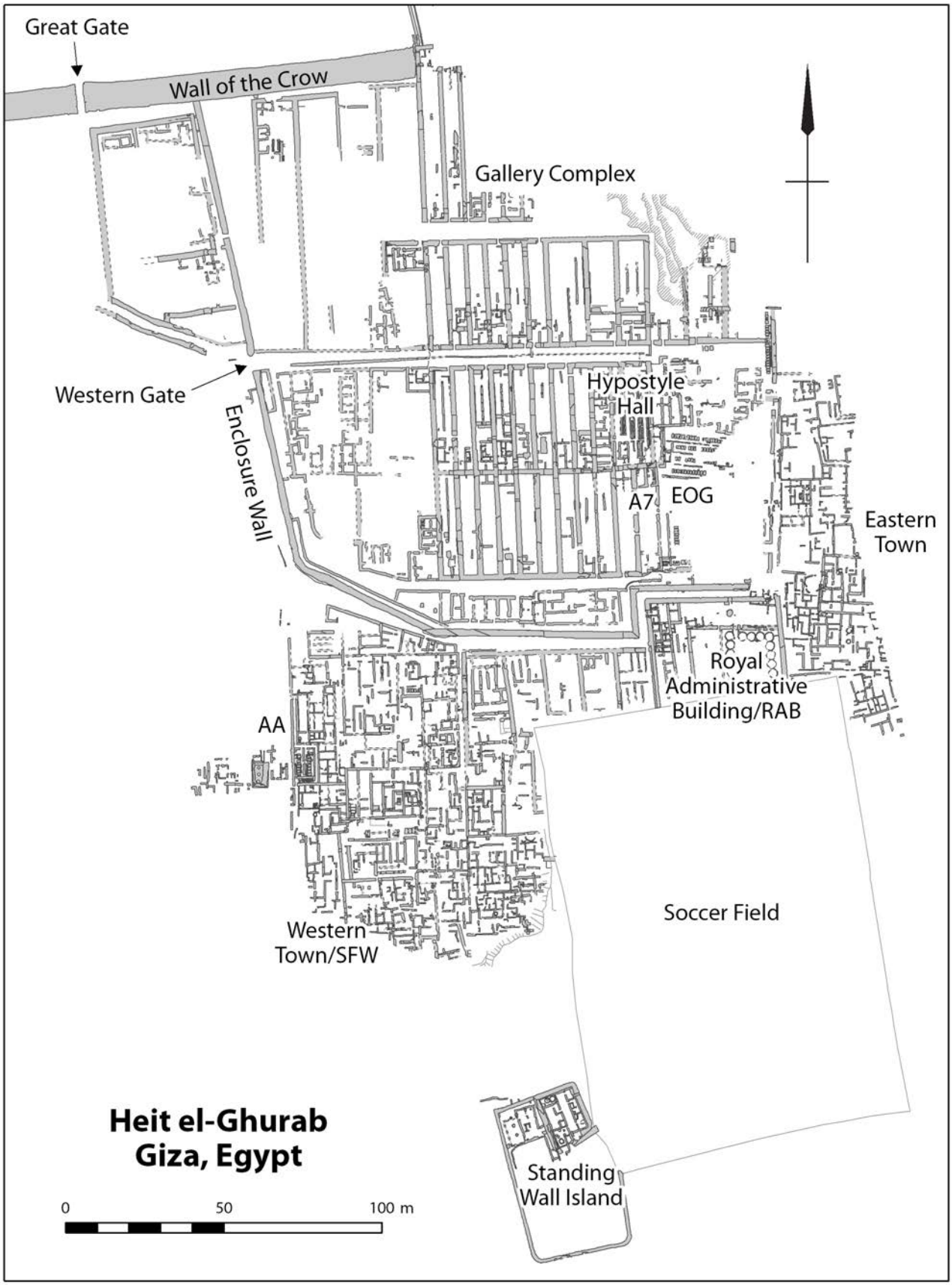


Map 1. Giza Plateau map identifying main areas of AERA excavation since 1988. Map by Rebekah Miracle, AERA GIS.

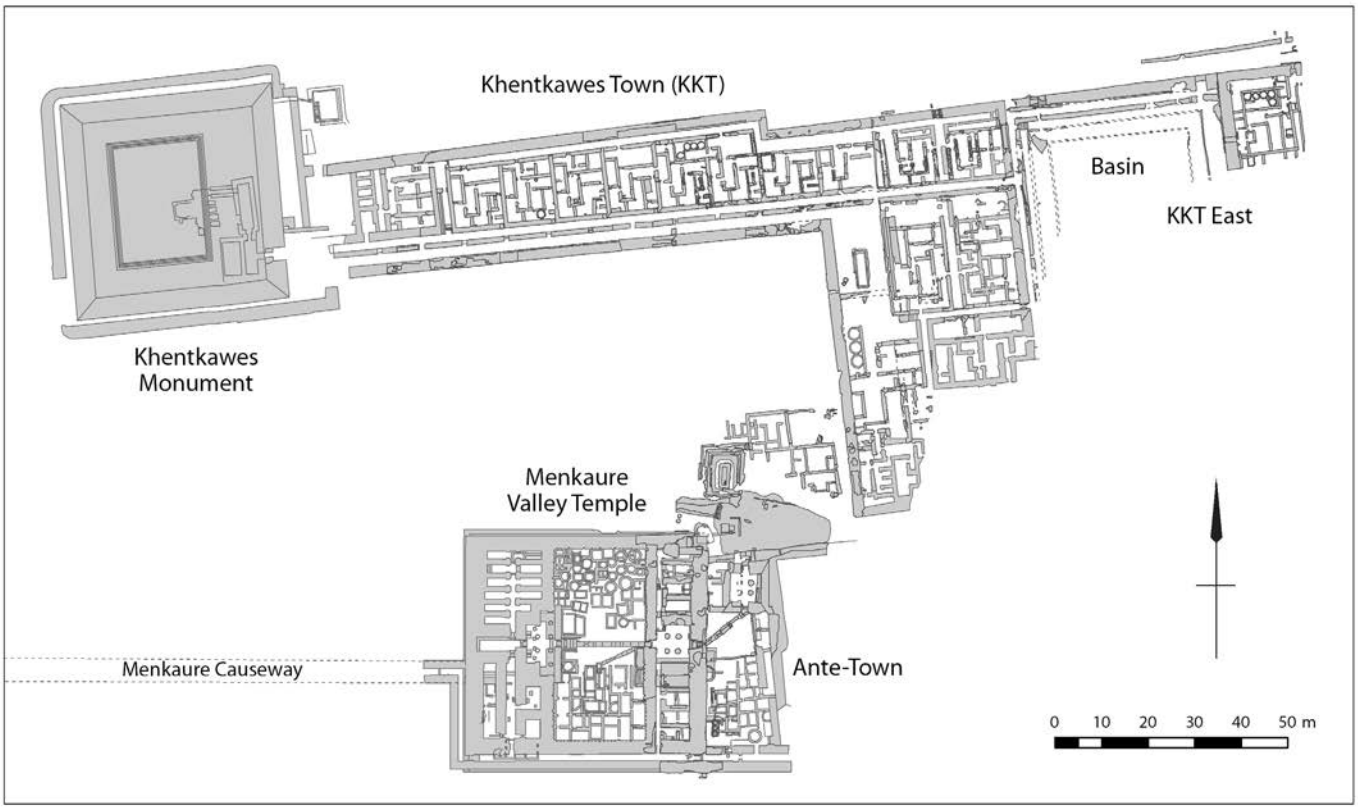
kaure triad and dyad statues, now on display in the Boston Museum of Fine Arts and the Egyptian Museum Cairo (Tahrir). In 1932, Selim Hassan expanded Reisner's excavations to the east, revealing a later extension to the valley temple (the "Ante-town"). The connections between MVT, KKT, and the Ante-town were investigated by AERA in 2008, 2011 and 2012, then in 2019 the team began work clearing Reisner's spoil from the western side of the main temple in order to better understand the architectural history of the structure. These excavations (to date) have yielded large quantities of material culture that were "missed" by Reisner, due to the techniques used in the early 20th century. The progress of his work tells us that the spoil we have been sifting through almost certainly derived from the inner court—the settlement area that was established during the 5th Dynasty, therefore this material is highly relevant to AERA's investigations of the settlement archaeology of the Giza Plateau.

Between 1971 and 1975 Karl Kromer excavated a huge mound of debris located south of the Gebel el-Qibli formation, above the HeG, to the south of the MVT complex. This mound of debris very clearly derived from the demolition of a high-status building. AERA began work at "Kromer's Dump" (KRO) in 2018, revisiting his excavation with the goal of better defining the nature of this massive ancient municipal dump. Because this site contains no architecture, it is not settlement archaeology in the "normal" sense. However, the material culture of the dump derives from a settlement, or at least, from a building, and is therefore of great value to our appreciation of the lives of people inhabiting the Giza Plateau during the Old Kingdom.

From the outset of work, the GPMP/AERA excavations followed strict protocols. Excavations were (and have always been) conducted using careful stratigraphic detailed recording, and painstaking recovery of as much material culture as possible via the implementation of sieving and flotation techniques. As a result, the archaeological record of the work by AERA is almost unparalleled in Egypt. The team now utilizes recording methods advocated by the Museum of London —developed for urban rescue excavations, ensuring recov-



Map 2. The flagship site of AERA's excavations, the Heit el-Ghurab (HeG). Map by Rebekah Miracle, AERA GIS.



Map 3. Map of the Menkaure Valley Temple (MVT) and Khentkawes Town (KKT) and Monument. Areas newly discovered by AERA to the east include a basin and the so-called Silo Building Complex (SBC). Map by Rebekah Miracle, AERA GIS.

ery of information at a very high resolution. All context drawings are digitized and entered into a Geographic Information System (GIS) of all records that AERA has been building since 2005. Because we meticulously record the precise archaeological context (deposit, layer, pit, wall, floor, etc.) in which every item is found, we are able to undertake detailed spatial analyses of any type of material class.

The study and analysis of all classes of material, from ceramics to plant remains and objects, requires immense skill and dedication, and a huge capacity to patiently classify, record, and quantify countless thousands of mundane and broken scraps of items. However, it is via the synthesis of information from these thousands of scraps of information that we are able provide the "color" for all our descriptions of the daily lives of people living thousands of years ago, working at the epicenter of one of the most important human achievements—the construction of the Great Pyramids of Giza.

Terminologies and Definitions

Throughout the definition of the typologies that follow, a few terms will be used to classify, define, and describe objects. These are: class, category, type, strategically designed, and expediently designed. The term "class" used here refers to the broad overall division of objects, such as the different types of crafts and tools (construction tools, drilling tools, grinding tools, among others), personal adornments, and household items, among others. The term "category" is the subdivision of the class, for example, tool classes have different categories, for example, axes, hammers, drill bits, and others. "Type" refers to the different form of objects within each category. The category querns in grinding tools, for example, has different types that are defined by their different shapes, such as flat/concave querns, boat-shaped querns, and saddle-shaped querns. As for the terms strategically and expediently designed, we follow Jenny Adams' definitions and description for the use of these terms in defining the design of objects. Strategically designed tools are "modifications that make the item easier to hold or to achieve a specific shape" (2002: 21), meaning, the shaping of a stone on purpose to make it easier to use for a specific task or craft. Expediently designed tools are when "the natural shape of the rock was altered only through use" (Adams 2002: 21). As for the materials, the term travertine

is used rather than the terms calcite or Egyptian alabaster, following Ian Shaw's note in *Hatnub* (2010: xv) and in the "Stones" chapter in *Ancient Egyptian Materials and Technologies* (Aston, Harrel, and Shaw 2000: 59). Some of the terms we use to refer to a certain category or type of object is different than the ones used by other scholars or in different sites. When there is a difference in the use of the terms, these will be noted under each definition.

Methodology

All material culture recovered by the archaeologists is sorted into various categories for study by different members of specialists:

- Ceramics
- Lithics (chipped stone tools, waste products)
- Faunal remains (unworked animal bones)
- Charcoal
- Clay Sealings
- Shell
- Plaster/Roofing
- Pigments
- Textiles
- Archaeobotanical samples (from flotation)
- Objects

The objects category includes all artifacts that do not fall into any of the other categories. For AERA's work, flint (lithic) knives and knapped tools are not classed as objects, because they need to be studied by a lithic specialist. Some items will be studied by more than one specialist. For example, worked ceramic sherds will be studied by both the ceramicist and the objects specialist, as will seals and worked bone items. Metals are a special category that are included in objects, but not all examples are included in this typology, since many need further study by a metallurgist.

Every "object" discovered during excavation is placed into a bag (or a box when needed) and each bag is given a unique ID number; this is critical, as it allows us to keep track of every single object recovered, minimizing confusion due to cross-numbering. Objects are then brought from the excavation sites to be stored and recorded in the magazine. After the basic recording of the bags in the magazine's registers, the bags are distributed to the different specialists. The objects are assigned an object number and recorded first on the object register lists.* There are two main methods for recording the objects: on a paper recording form and on a form in a Microsoft Access database. The basic site information—like season, area code, feature number, bag number, and square—is recorded on the objects' register, paper recording forms, and the database recording form. The database has more complete artifact-related variables, such as object register, object drawing numbers, and object photo numbers, in addition to site-related variables, such as feature log, site season, and area codes, among others, which are represented by different tabs. All the different kinds of tables in the database are linked together, which makes all the data easily accessible and searchable through tables or queries.

This dataset is difficult to describe and analyze because of the diversity of materials, forms, and functions. Trying to identify and categorize these objects is a daunting task. The objects range in size from an item as small as a bead to one as large as a hammer stone or quern base. The materials of the artifacts vary, including stones, faience, bone, and ceramic. The classification and categorization of the artifacts presented here is divided into different tool classes; faience and personal adornment; household items; stone vessel; incised and inscribed objects; and multipurpose and miscellaneous objects. Some objects might overlap between our different classifications or could have been used as multipurpose tools. Such objects are discussed in our last section, "Multipurpose and Miscellaneous Objects."

Recording and Analysis

In classifying objects, we depend on parallels from other archaeological sites and also on the artistic representations and tomb depictions of the usage of various object types. In the definition of all the different object types below, we will either refer to tomb depictions of the object and/or parallels from other archaeological sites.

* Up until 2003, object numbers were assigned as a year prefix followed by a number, starting at number 1 each year. In 2003, it was decided to change the numbering system into consecutive numbers, starting at number 1000, regardless of the year or season the object was excavated or registered in the lab. Hence, in the text that follows, some object numbers still have the old system of numbering while others follow the new system. We are gradually trying to renumber all the objects following this new system, while keeping track of the old numbers, but such a task takes a long time.

When describing an object, we follow a certain pattern: type, shape, technology, and use wear. We start by identifying the artifact and its material. Then we describe its shape as viewed from different angles, for example, when the artifact is viewed from top, side, and its profile shapes. When possible, a description of how the object was made and fashioned is provided. Then we describe its use wear, traces of use and manufacturing shown on its surface, visible marks, and how the object was handled (mostly when the object is a tool that had been used). In the recording form, we record the basic measurements and weight of an artifact. The main difference between the paper form and the digital Microsoft Access Database form is the sketch. All objects are sketched on the paper, with basic description of where the working surface is or how the object was handled. The sketches are mostly for basic records, since not all objects are drawn by professional illustrators.

As mentioned earlier, we have a wide range of object sizes and materials. This makes it difficult to organize in the lab. We thought about organizing the objects by year, by area, by size, or by category, but ultimately decided that the best solution was to place objects on shelves by object type, and if possible, by object class. We also thought that it would be best to place objects of lighter weight on top shelves and heavier objects on lower shelves, for greater convenience and safety. Each unit and shelf in the lab has a number. The location of each of the artifacts (placed in a box on a shelf of a shelving unit) is then entered in the objects' database in order to make it easier to track object locations and be able to locate them when needed. When grouping the objects by category, it is easier to study one category of artifacts together at the same time and compare to examples of the similar type from different areas.

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A boat-building scene from the tomb of Ti at Saqqara showing workers building using two big hammers (Wild 1953: pl. CXXIX).

CONSTRUCTION TOOLS

Settlement sites on the Giza Plateau housed people involved in construction activities related to the building of the pyramids, as well as houses and tombs of the area. The majority of the construction tools were recovered in the different areas of HeG, in comparison to MVT, KKT, and KRO, which all had fewer examples. The construction tool kit we have consists of axes, hammers, pounders, and plumb weights. Sometimes it is difficult to make a clear distinction between the different kinds of tools, as a tool could have been used for more than one purpose. For example, a blunt axe was later used as a hammer and a hammer might have also been used as a pounder. The axes, hammers, and pounders are made of hard stone, like granodiorite, dolerite, diorite, and a few examples of basalt, granite, and limestone.

In the definition of the typologies below, the terms bit edge, poll end, and hafting groove are used. The bit edge is the working edge of the tool. The poll end is the opposite end side of the working surface (Adams 2002: 162, fig. 7.2). The hafting groove is a depression on the surface where the tool would have been held between two sticks and tied by rope or leather (Arnold 1991: 262).

AXES

An axe is a percussion tool with sharp bit edge. Complete axes are oval in outline when viewed from the top and from the side along the length (**Fig. I.1.a–b**). They have narrow bit edges and flat thicker poll ends, see Object 1044 (**Fig. I.1.c**). Most of the examples recovered by AERA have hafting grooves. The grooves are sometimes three-fourths grooves, meaning it goes around three-fourths of the tool's circumference, although they are sometimes full grooves (for attaching handles to the grooves, see Adams 2002: 160). Some examples have no groove. Axes are strategically designed tools, manufactured by "combinations of flaking, pecking, and abrasion" (Wright 1992: 634).

As mentioned previously, percussion tools are sometimes multi-purpose tools that could have been used for more than one function or perhaps first used as one tool, then reused as another. In the case of axes, the tool is first manufactured as a complete axe with sharp bit edges. As the tool gets used, the bit edge is flattened, then resharpened again and reused (see Adams 2002: 165–66, fig. 7.4 for the different phases of use and reuse). As the bit edge flattens again, the tool could then be used as a hammer or in some cases a pounder.
The axes recovered by AERA number more than 100, over 90 of which are from HeG, with 3 from MVT, and 1 from KKT. The examples we have are made of hard, fine-grained stone, like granodiorite, dolerite, diorite, and a few examples of basalt and granite. The complete examples recovered range from 10–17 cm in length and are as heavy as 2.5 kg. Examples of axes in our corpus of construction tools are Objects 1587 (**Fig. I.1.d**), 2279 (**Fig. I.1.e**), 2299 (**Fig. I.1.f**), 2659 (**Fig. I.1.g**), and 2697 (**Fig. I.1.h**).

Axes and hammers might have been used in quarry sites and in rough work (Arnold 1991: 262; Petrie 1917: 46; Petrie refers to the axes in his publication as "mauls," shown on pl. KII), as well as in other crafts, like statue making, as depicted in the reliefs in the tomb to Ti, Saqqara (Wild 1966: 3, pl. CLXXIII).

Figs. I.1.a–b. A collection of the different axes in our collection with different stages of the bit edges; a hafting groove pronounced in some examples while others have no traces of hafting grooves. Objects 1086, 1095, 1853, 1951, 1952, 2145, 2198, 2279, 2351, 4650; bottom photo has one additional axe, Object 4653, photos 116686 and 116689 by A. Eweida.

Fig. I.1.c. A complete granodiorite axe from HeG, with a visible hafting groove and a slightly blunt bit edge. Object 1044, drawing 1000-307 by C. Hebron, photos 114531, 114533, 114537 by D. Jones; ***Fig. I.1.d.*** A complete dolerite axe from HeG, with small parts of the outer surface chipped off. The tool has a blunt bit edge and a pronounced hafting groove cut very close to the poll end of the tool. Object 1587, drawing 1000-477 by J. Karlsson, photos 302336, 302340, 302342 by Y. Kawae; ***Fig. I.1.e.*** An almost complete granodiorite axe from HeG with small parts chipped off along the length and close to the poll end. The tool has a slightly sharp bit edge but has no defined hafting groove. Object 2279, drawing 1000-671 by W. Schenk, photos 914380, 914381, 914388 by J. Quinlan.

Fig. I.1.f. A fragment of a granodiorite axe, only a sharp bit edge remains of the tool. Object 2299, drawing 1000-943 by P. Collet, photos 805550–51 by Y. Kawae; ***Fig. I.1.g.*** A complete granodiorite axe from HeG, with a narrow profile, a narrow bit edge, and a pronounced hafting groove close to the poll end. Object 2659, drawing 1000-668a by M. Othman, photos 914528, 914530, 914534 by J. Quinlan; ***Fig. I.1.h.*** A complete granodiorite axe from HeG with a blunt/rounded bit edge, a flat poll end, and no hafting groove. Object 2697, drawing 1000-663 by W. Schenk, photos 114555, 114558, 114561, 114563 by D. Jones.

HAMMERS

Like axes, the majority of hammers excavated by AERA team members were from the different areas of HeG, with a few examples recovered from KKT and MVT. Hammer is a category that lies somewhere between axes and pounders. Some examples are similar in shape to axes, but the main difference is that hammers have flat bit edges. Hammers are oval in outline when viewed from above along the length of the tool. The poll end and bit edge are more rounded, convex in profile across the width of the tool. A number of complete examples have hafting grooves that were attached to sticks. Other examples, the ones that are closer in shape to pounders, have no traces of hafting groove remaining. These examples were probably handheld, as depicted in a boat building scene in the tomb of Ti in Saqqara (Wild 1953: 2, pl. CXXIX). Such examples show more signs of use, with flatter and more rounded surfaces.

An unusual example is a large limestone hammer found in HeG, Object 1006 (**Fig. I.2.a**). It is similar in shape to the hammer depicted in the same boat-building scene on p. 14 (Wild 1953: pl. CXXIX). It is a cylindrical-shaped hammer, with the base surface slightly larger than the top surface, weighing over 17 kgs. It has a roughly rectangular outline when viewed from the side and along its height, and has ovoid cross-sections. Two handles were shaped on both sides of the tool, along its height, where it was held. In the tomb depiction, the builder is holding a similar kind of hammer, yet the one depicted has two negative spaces in the handles where one could hold the tool.

The hammers found on the different sites of Giza by the AERA team members number approximately 80, mostly from HeG. This includes examples of hammers that were used as multi-purpose tools, for example, tools that were used as hammers and/or axes, and ones that were used as hammers and/or pounders. Some of the fragments of tools we have are worn out or broken in a way that makes them hard to classify. Many of the examples we have are made of granodiorite, with a few examples of diorite, dolerite, basalt, and one of limestone, discussed above separately (**Fig. I.2.b**). The complete examples found range from about 10–15 cm in length. Examples of hammers are Objects 1998-67 (**Fig. I.2.c**), 1089 (**Fig. I.2.d**), 1589 (**Fig. I.2.e**), 2657 (**Fig. I.2.f**), and 4666 (**Fig. I.2.g**).

Fig. I.2.a. An unusually large limestone hammer from HeG, cylindrical-in-shape, flat base, and handles on both sides along the height of the tool. Object 1006, drawing 1000-456 by J. Karlsson, photo 230412 by C. Malleson.

(b)

Fig. I.2.b. A group photo of the collection of hammer tools excavated thus far by AERA. The hammers vary in size greatly, as the example shown on the top right corner of the photo, Object 2777. This is a big dolerite hammer from HeG, with only the poll end remaining, with a hafting groove. Unlike axes, hammers have flatter bit edges. Objects 1118, 1088, 1589, 2190, 2777, and 4666, photo 116692 by A. Eweida; ***Fig. I.2.c.*** A complete granodiorite hammer from HeG with a shallow hafting groove that runs into the poll end of the tool. Object 1998-67, drawing 1000-303 by C. Hebron, photos 114595, 114598, 114660 by D. Jones.

Fig. I.2.d. A granodiorite hammer from HeG with a shallow hafting groove that goes around three-fourths of the tool. Object 1089, drawing 1000-423 by J. Karlsson, photos 114483, 114486, 114491 by D. Jones; ***Fig. I.2.e.*** An incomplete small dolerite hammer from HeG, with a well-pronounced hafting groove. Both ends of the tool were probably used as part of the percussion tool. Object 1589, drawing 1000-461 by J. Karlsson, photos 116714–15 by A. Eweida.

Fig. I.2.f. A complete dolerite hammer from HeG with small parts chipped off. The tool has a blunt bit, a well-defined hafting groove, and a short poll end. Object 2657, photos 914549, 914551, 914554 by J. Quinlan; ***Fig. I.2.g.*** A complete granodiorite hammer from HeG with no hafting groove. Object 4666, drawing 1000-874 by Y. Mahmoud, photo 302329 by Y. Kawae.

POUNDERS

Among the different tools of the construction tool kits we have; pounders are the most numerous kind of objects found. This is most likely due to the fact that pounders were a multi-purpose tool. In addition, pounders are expediently designed tools (Adams 2002: 151). This means that pounders may have been the final "form" of many other tool types, re-fashioned or re-purposed as tools broke from use. Pounders were located in different areas of the site in different contexts, ranging from domestic to craft areas. In addition to construction activities, pounders were used for a number of other purposes, such as preparation of foodstuffs, with mortars for non-food items (like ochre), and semi-industrial activities (manufacture of household, funerary, or temple items). (For a New Kingdom example in a workshop scene see the tomb of Rekhmire; Davies 1943: vol. II, XI, pl. LV.)

Pounders are handheld stones, with only some examples being large enough to be held in both hands. Pounders often have pecked surfaces due to use. Like pestles, the motion of use for pounders is vertical, against other surfaces. There are four main shapes of pounders found in Giza: sphere, ovoid, disc (fragment), and dome, with the main dominant shape being spherical. A pounding stone originally started as an irregular or square-shaped stone, then due to use, it would round out, thus creating a spherical shape. Once they lost their percussion edge they would have been discarded or used as rollers (Lehner 1997: 211). Disc-shaped pounders are mostly fragments of large pounders fractured due to their forceful use against another surface. As for the large stone pounders, they were probably "used for initial quarrying and initial shaping" (Adams 2002: 152; Clarke and Engelbach 1990: 27). There is a wide range of pounder sizes, varying in weight from 100 g (fragments or fractures of pounders) to 6 kgs. (**Figs. I.3.a–b**, at right).

Pounders and handheld grinding stones can be similar, in that they are both handheld tools, and that they could both be used for processing food, cereals, and pigment. The main difference is the technique by which each was used. As previously mentioned, pounders were used vertically and forcefully onto another surface or substance. Grinders were used horizontally on a base, like a quern, which results in a flatter surface rather than a convex one, see "Grinding Tools." In addition to the shape and use-wear, one of the main factors we use to differentiate between these two tool types is the material. Most grinding stones are made of coarser grained stones, while pounders are made of fine-grained stone, for example granodiorite, dolerite, diorite, granite, and a few examples of granite and flint. Examples of pounders are Objects 1052 (**Fig. I.3.c**), 1053 (**Fig. I.3.d**), 1583 (**Fig. I.3.e**), 1882 (**Fig. I.3.f**), and 1948 (**Fig. I.3.g**).

Figs. I.3.a–b. A collection of pounders showing the range of sizes, weights, and materials of the pounders we have in our collection. All pounders in the photos are from HeG and are made of granodiorite, granite, dolerite, and flint. Objects 1998-18, 1051, 1056, 1484, 1546b, 1579, 2152, and 3043, photos 116683–84 by A. Eweida.

Fig. I.3.c. A spherical-shaped dolerite pounder from HeG with a pecked surface around the complete circumference of the tool from use. Hachure marks indicate traces of red pigment. Object 1052, drawing 1000-281 by C. Hebron, photos 115417–18 by A. Eweida; ***Fig. I.3.d.*** An incomplete dolerite spherical-shaped pounder from HeG, with pecking marks on its surface from use. Object 1053, drawing 1000-280 by C. Hebron; ***Fig. I.3.e.*** An almost complete granodiorite spherical-shaped pounder from HeG. Object 1583, photos 302601–02 by Y. Kawae.

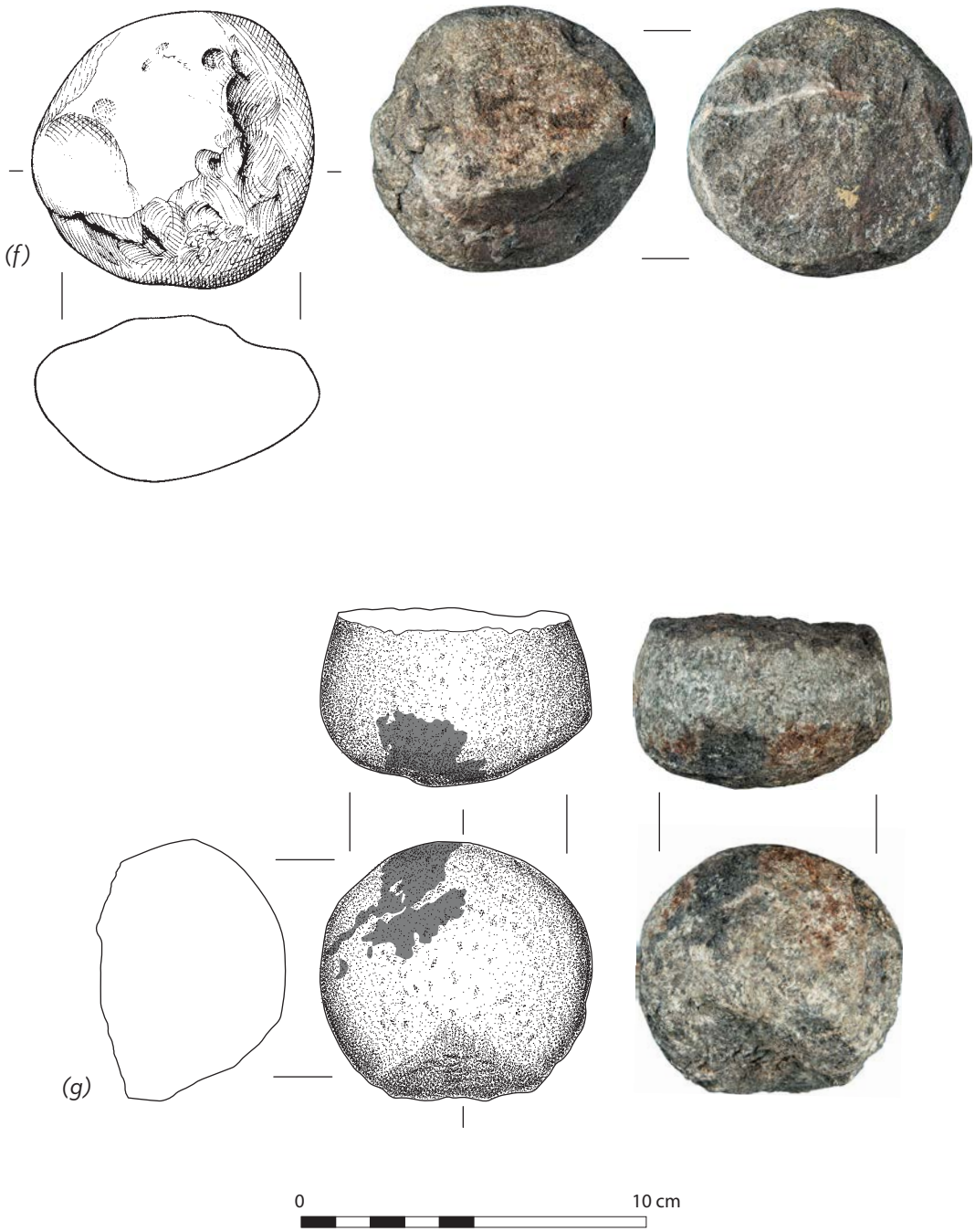


Fig. I.3.f. An incomplete granodiorite pounder example from HeG, as a semi-spherical-shaped tool. The top dome part has pecking marks from use. Other surfaces are uneven. Object 1882, drawing 1000-523 by W. Schenk, photos 115500–01 by A. Eweida; ***Fig. I.3.g.*** A granodiorite dome-shaped pounder from HeG with pecked surfaces from pounding around the circumference. The top domed surface has pecking marks from use, indicated in gray. Object 1948, drawing 1000-907 drawn by Y. Mahmoud, digitally inked by P. Collet, photos 115579, 115581 by A. Eweida.

PLUMB WEIGHTS

There are 7 examples of plumb weights recovered by AERA team members, 5 of which are from HeG, with 1 from MVT and 1 from KKT. The examples we have are mostly of limestone, with a single example of clay. Most examples have a roughly triangular outline when viewed across their height with a perforation at the top part where the tool would be tied and hung, like Objects 2101 (**Fig. I.4.a**), 2811 (**Fig. I.4.b**), and 2934 (**Fig. I.4.c**). One unusual example has a rhombic outline across its height with a perforation at the top, Object 3701 (**Fig. I.4.d**). Plumb weights of similar shapes are recorded by Petrie and were referred to as plumb bobs (1917: 42, pl. XLVIII, nos. B64, B69).

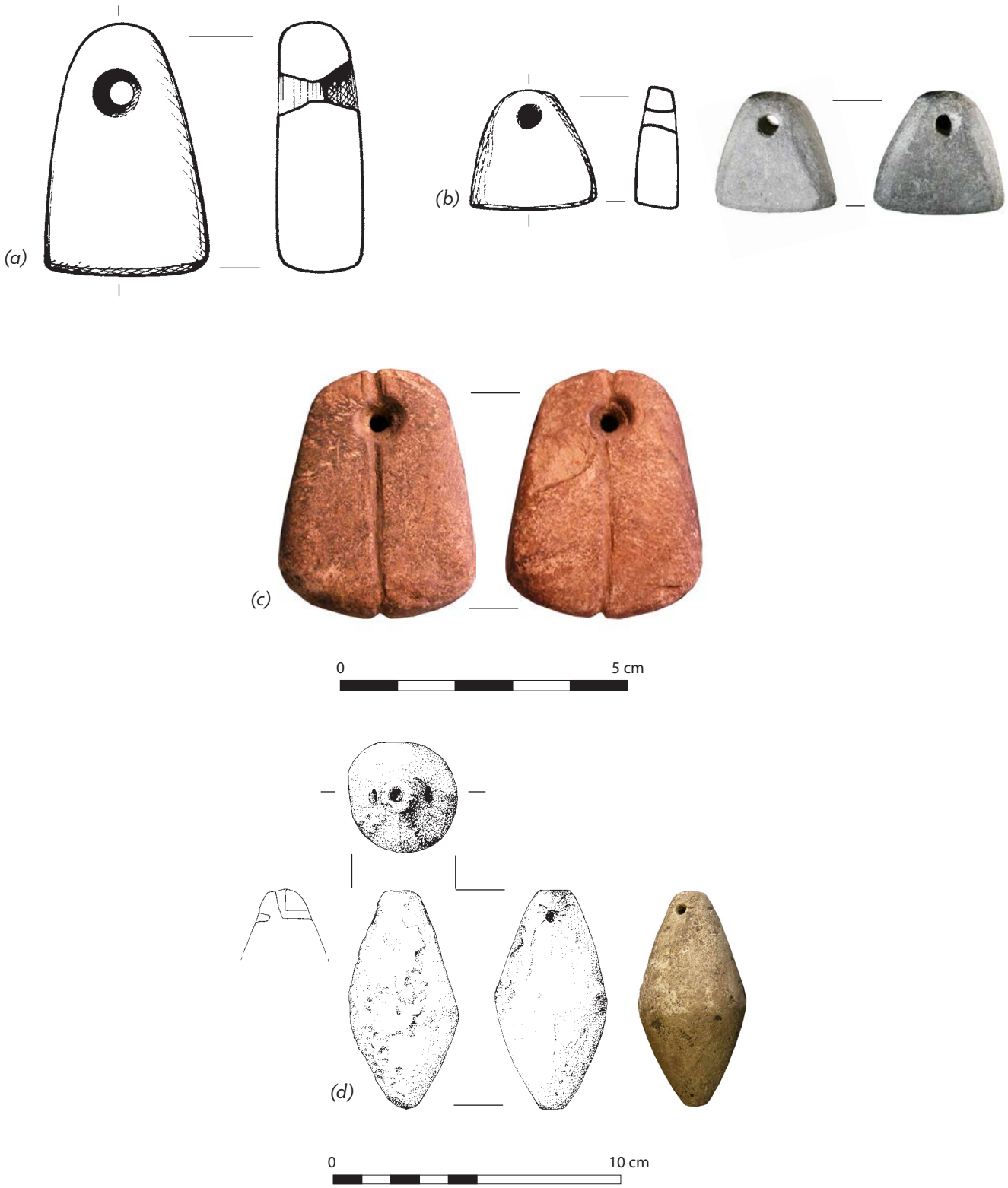
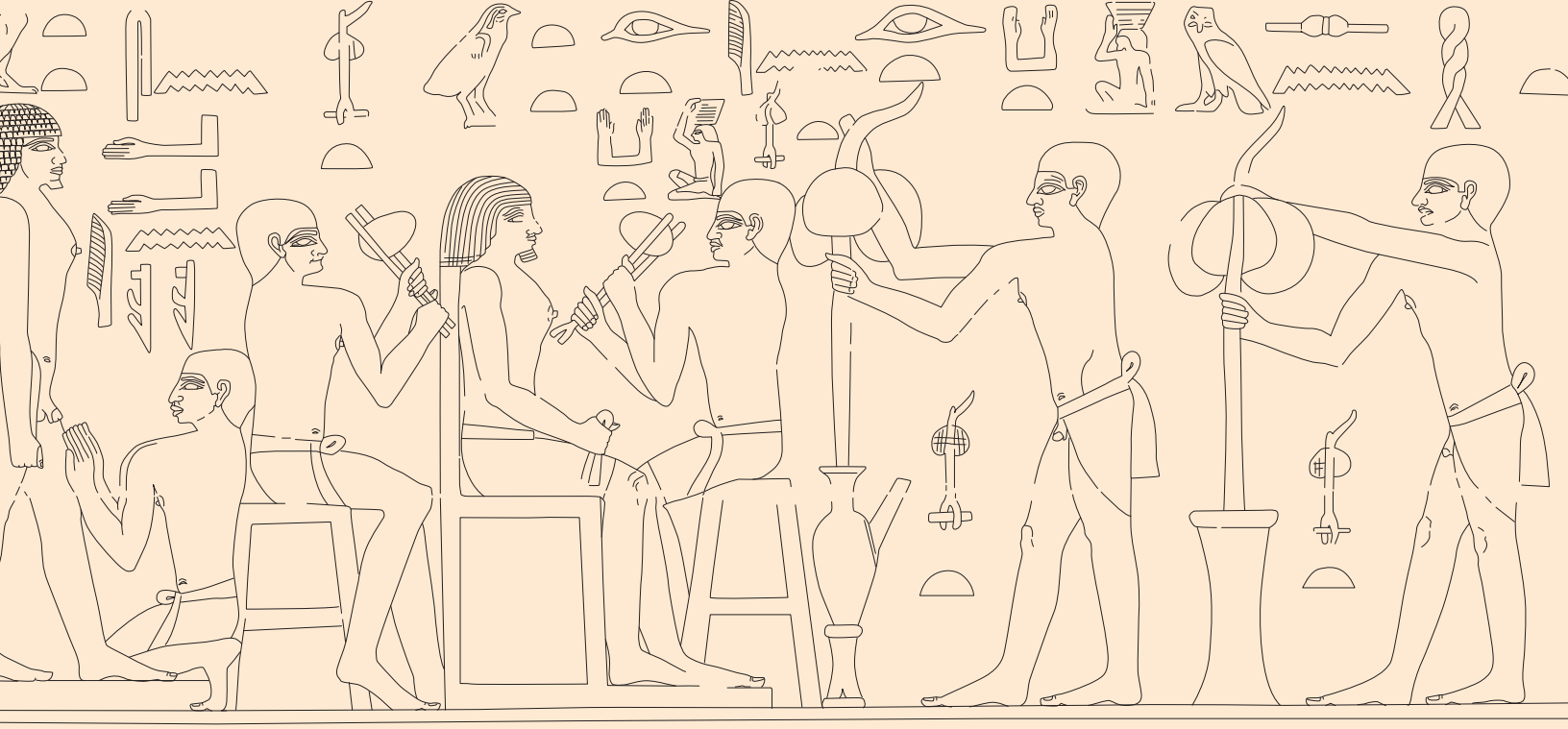


Fig. I.4.a. A small, complete limestone plumb weight from HeG with a smooth outer surface. Object 2101, drawing 1000-605 by W. Schenk; ***Fig. I.4.b.*** A small limestone plumb weight from HeG; a complete example with smooth surfaces and a perforation hole that goes across the thickness of the tool. Object 2811, drawing 1000-622 by W. Schenk, photos 919525–26 by H. McDonald; ***Fig. I.4.c.*** An anchor-shaped limestone plumb weight from HeG, with a groove line in the center under the perforation, across the height of the tool on both surfaces. Object 2934, photos 601707–08 by an unknown photographer; ***Fig. I.4.d.*** A limestone plumb weight from MVT, rhombus-shaped with a perforation hole at the top of the tool that goes through the thickness of the tip. Object 3701, drawing 1000-747 by L. D. Hackley, photo 410635 by M. G. T. Alwya.



A workshop scene depicting the drilling of stone vessels on the righthand side and statue making on the left. (Wild 1966: pl. CLXXIII)

DRILLING TOOLS

Drilling is an activity that results in the perforation of objects. The ancient Egyptians used drilling techniques for a number of purposes, including drilling beads (see Davies 1943: pl. LIV from Rekhmire's tomb in Luxor), drilling wood to make furniture (from the tomb of Ti at Saqqara, Wild 1966: pl. CLXXIV; from Rekhmire, Davies 1943: pls. LII and LIII), and manufacturing stone vessels. Scenes of manufacturing stone vessels appear in several Old Kingdom tombs, including the tomb of Nebemakhet at Giza (Reisner 1955: 351; Hassan 1943: 140, fig. 81), the tomb of Ti at Saqqara (Wild 1966: pl. CLXXIII), and the tomb of Mereruka Meri at Saqqara (Duell 1938a: pls. 29–30), among others. (A more complete list of Old Kingdom scenes of stone vessels manufacturing is in Malak 2014: 29–30, table 2.1). Based on the archaeological evidence, experiments conducted by Denys A. Stocks (1986; 1993: 596–603; 2003: 139–68), and tomb depictions, we can say that the tools recovered by AERA members were used for the manufacture of stone vessels: drill bits, drill cores, and drill capstones. In comparison to tools for the other crafts discussed here, the drilling tools excavated are relatively small in number. The majority of them were recovered from HeG, with a couple of tools from KRO and MVT.

The tool kit used for drilling stone vessels was made of a drill bit of varied shapes, discussed below, attached to one end of a wooden shaft. The opposite end of the wooden shaft had a crank-like, inclined portion at the top used as a handle for rotating the apparatus. The crank-like top was where the capstones or weights[1] would be fitted to apply pressure downward during the hollowing-out process (Stocks 1986: 16). The same apparatus used for drilling depicted in tomb scenes is the determinative for the word *ḥmt*, "craft" (Gardiner 2001: 518,  sign U24). Dry sand was used as an abrasive material (Stocks 1993: 600). The stone vessels' outer surfaces were first shaped and modeled, before hollowing out the interior, as seen in the Tomb of Ti (above). The vessel was first bored by a tubular-shaped copper drill bit[2] fitted onto a wooden shaft (Reisner 1931: 180; Stocks 1993: 596; Stocks 2003: 142). Another fork-shaped wooden shaft fitted with drill bits of different shapes was then used to widen the mouth, the shoulders, and the body of the vessel.

1. Weights are discussed as a separate category in Section X: "Multipurpose and Miscellaneous Tools and Objects." The reason for this is there are a number of weights among the AERA objects collection of different shapes and sizes that could have been used for a variety of crafts and/or functions, like drilling, fishing, and weighing. Plumb weights and well-defined fishnet weights are discussed in the construction activity section and fishing tools section, respectively, since weights of these kinds have distinct shapes.

2. We do not have copper drill bits as part of the AERA objects corpus, but we have remains of the tubular cores of the drill, discussed below.

DRILL BITS

As mentioned earlier, the drill bit is the part of the apparatus that is attached to one end of the wooden shaft. The term "drill bit" is sometimes referred to as a borer (Petrie 1917: 45; Jórdeczka 2004: 449–52) or grinder (Bevan 2007: 40–60; Quibell and Green 1902: 46). We have a total of 17 drill bits, all of which are made of quartzite. We also have drill bits of chert, but as mentioned in the introduction, the typologies presented here do not include chert or lithic tools. (For more information on the chert drill bits found in HeG, see Malak 2014: 31–32). The drill bits excavated are identified as three different types: 8 conical, 5 figure-eight (or "figure-of-eight," see Stocks 2003: 161), 1 "flower," and 3 fragmented examples of unidentified shape. The majority of the drill bits are from different areas of HeG (total of 15) and 2 were recovered from KRO.

We have a total of 8 conical-shaped drill bits, 6 from HeG and 2 from KRO. The tool is conical in shape when viewed from the side, with the bottom portion rounded and narrower in width that the top portion. The bottom is circular/oval in section, and is the boring bit of the tool. The opposite, broader side has a figure-eight outline in section, with two notches on each side where the forked shaft would be fitted and tied. The vertical sides around the tool have fine parallel concentric striations from the drilling. Object 2291 (**Fig. II.1.a**) is a unique example of a conical drill bit from HeG. It was strategically designed as a cone drill, yet it has no indentations on the vertical sides for the wooden shaft to be tied. Other complete conical drill bits are Objects 1352 (**Fig. II.1.b**), 2936 (**Fig. II.1.c**), and 4161 (**Fig. II.1.d**). Both examples are made of quartzite and were excavated at HeG. Similar examples of conical-shaped bits were found in the Early Dynastic workshop at Tell el-Farkha (Jórdeczka 2004: 290, fig. 18), and in the Old Kingdom sites of Hierakonpolis (Quibell and Green 1902: pl. LXII; Adams 1974: 39, pl. 28, nos. 194–96) and Elephantine (Dreyer 1986: 135, fig. 46, no. 348; pl. 44, 348).

We have a total of 5 figure-eight drill bits (**Figs. II.1.e–g**), sometimes referred to as the "hour-glass" form in other publications (Petrie 1917: 45). Drill bits of this shape have a figure-eight outline when viewed from above, with a pointed oval-to-hemispherical outline in section along the length. The pointed ends form a defined ridge line on both sides where the top and bottom surfaces meet. The two indentations on the top surface are where the fork-shaped wooden shaft would fit on the tool. The tool is strategically designed. These drills were used on both sides, thus creating the convex worked surface in profile, that comes to a point around the circumference of the object. The top and bottom surfaces have fine parallel concentric from use. Similar figure-eight drill bits were found in Hierakonpolis (Quibell and Green 1902: pl. LXII; Hikade 2004: 186, fig. 1:7–9), in Tell el-Farkha (Jórdeczka 2004: 290, fig. 17), and in an Old Kingdom stone vessel workshop in Elephantine (Dreyer 1986: 135, fig. 46, nos. 349; pl. 44, 349).

The flower-shaped drill bit is a variant of the figure-eight drill bit, but with four grooves and a circular outline when viewed from above. One example was recovered from HeG, object 2700 (**Fig. II.1.i**). Like the figure-eight drill bit, the upper and lower surfaces are convex in profile with pointy edges and fine concentric lines from reeling. A similar example was found in Elephantine (Dreyer 1986: 135, fig. 46, no. 349; pl. 44, 349).

Three quartzite drill bits of unidentified shape have been excavated over the years in different areas of HeG. Two fragments have traces of drilling concentric lines on the surfaces, but their fragmented state makes it difficult to identify the original intended shape. One tool, Object 3548 (**Fig. II.1.j**), referred to in our database as a rounded-bottom drill bit, is a variant of the conical and figure-eight drill bits. It has a hemispherical shape when viewed from the side and an hour-glass shape when viewed from the top, with two hafting grooves on each side along its length. Since the drilling bits are strategically designed, this tool might be an unfinished example of either the conical shaped tool or a figure-eight one, since it shows no traces of use or reeling lines on its surfaces.

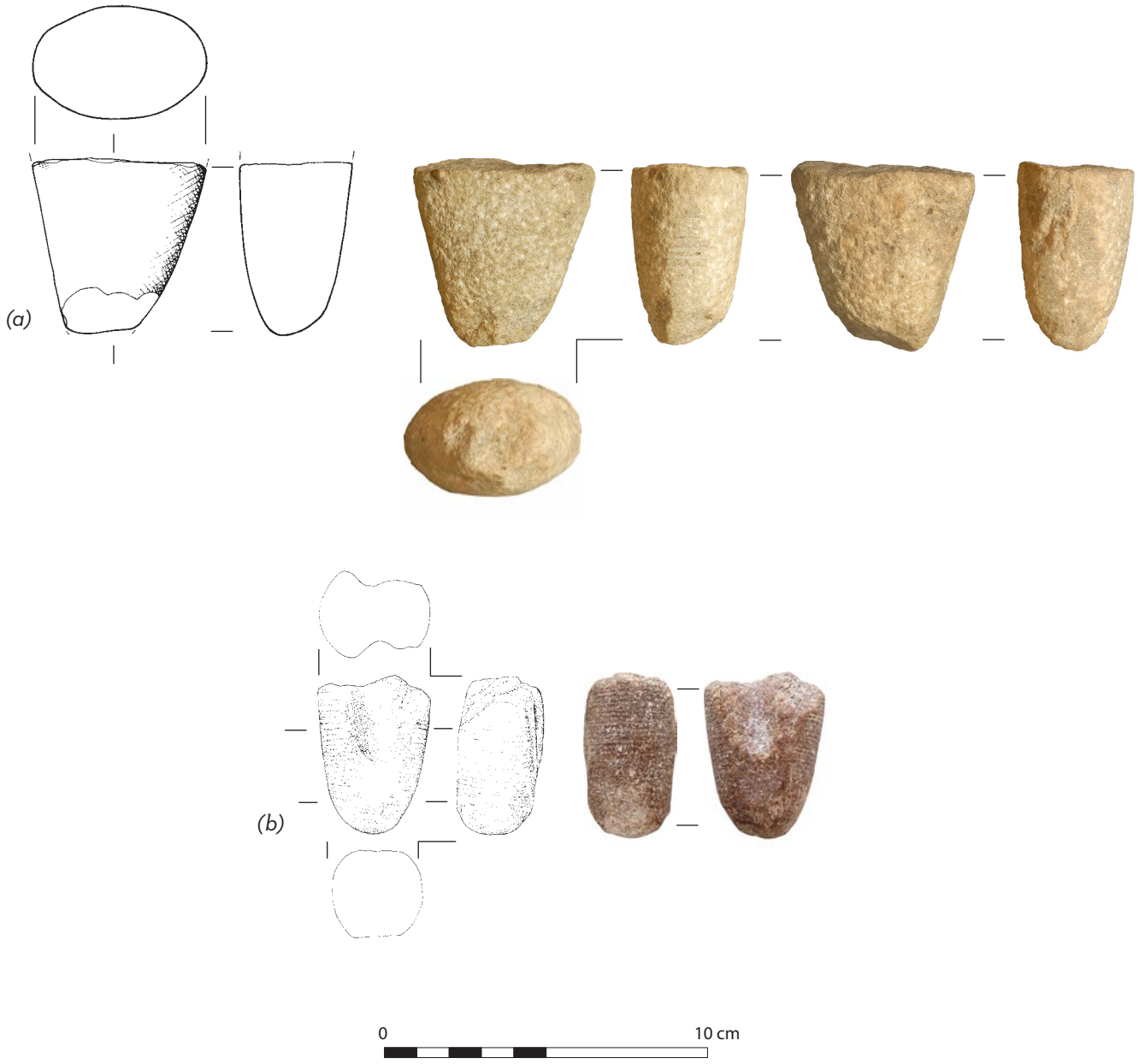


Fig. II.1.a. Conical shaped quartzite drill bit from HeG with pitted surface. The bit edge has a small part chipped off. Object 2291, drawing 1000-652 by W. Schenk, photos 805577–81 by Y. Kawae; ***Fig. II.1.b.*** Conical shaped quartzite drill bit from HeG with visible parallel striations on the sides from use. Tool has a well-shaped hafting grooves along the height. Object 1352, drawing 1000-457 by J. Karlsson, photos 201583, 201585 by Y. Kawae.

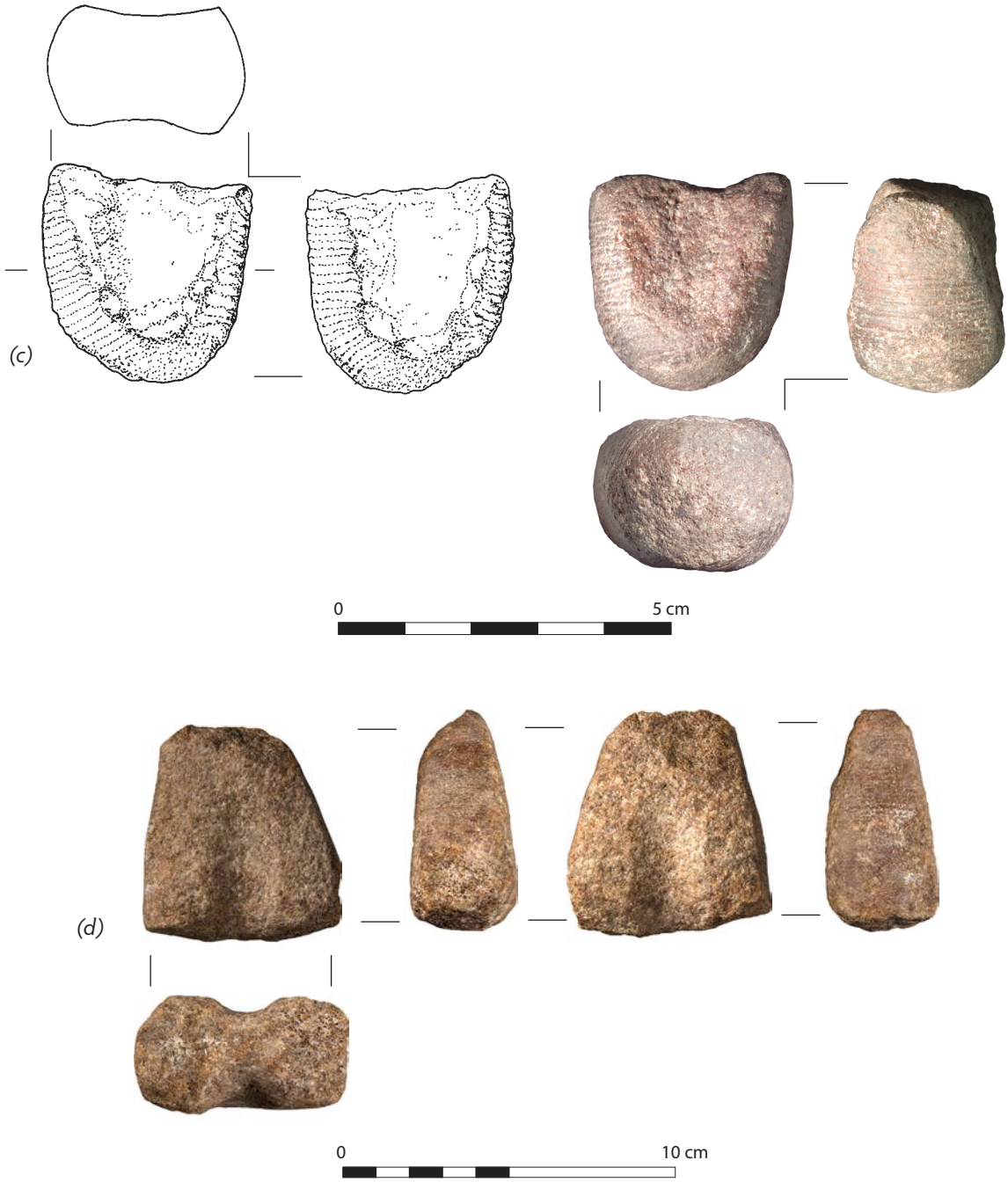


Fig. II.1.c. A quartzite, conical-shaped drill bit from HeG. Tool has fine parallel lines on the rounded sides from drilling. Object 2936, drawing 1000-168 by C. Hebron, photos 302871, 302876–77 by Y. Kawae; ***Fig. II.1.d.*** A conical-shaped quartzite drill bit from KRO. Tool has well-defined hafting groove along its height and fine horizontal concentric lines across the curved sides. Object number 4161, photo 116222–26 by A. Eweida.

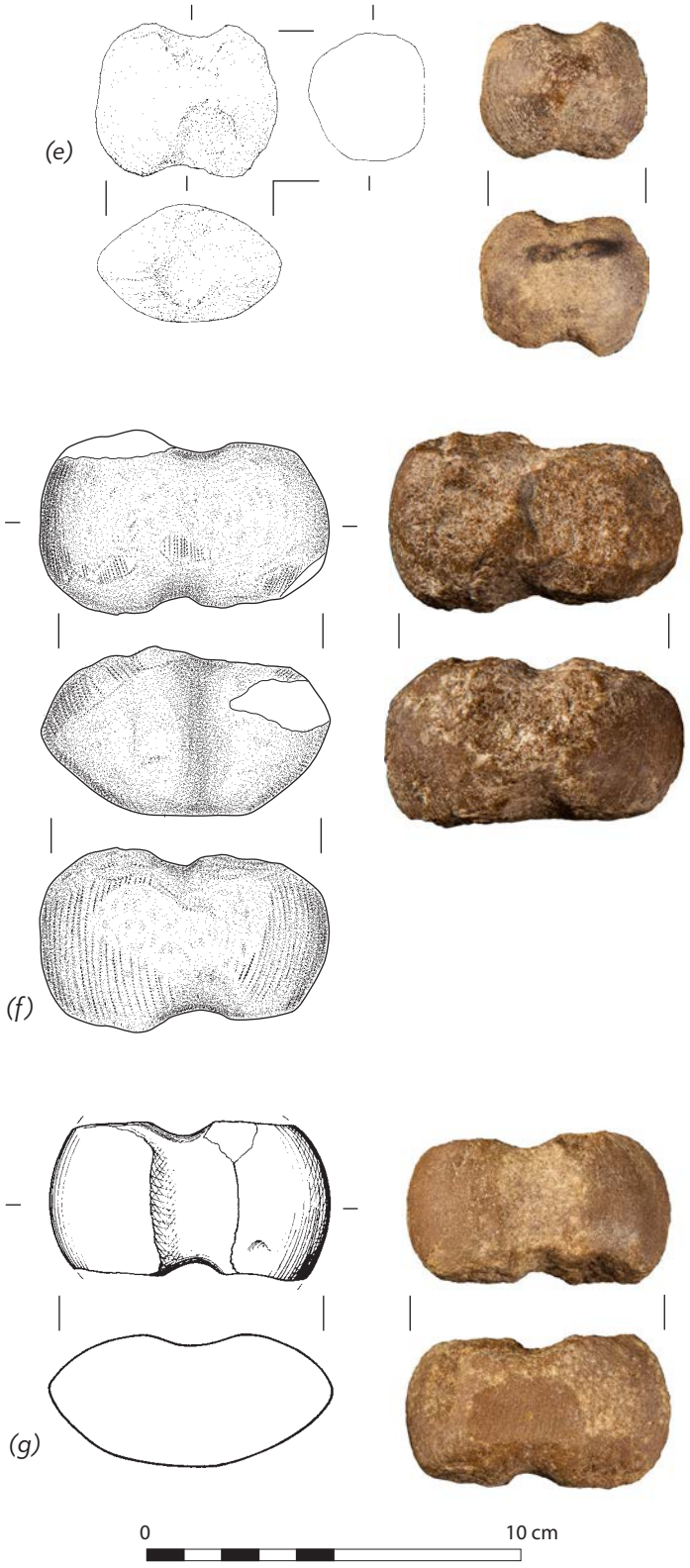


Fig. II.1.e. A quartzite figure-eight drill bit from HeG. Tool is almost oval in shape in longitudinal section, with one side almost flat in profile and opposite side convex/dome in profile. Convex/dome surface has fine concentric lines from use. Object 1510, drawing 1000-421 by J. Karlsson, photos 116240–41 by A. Eweida; ***Fig. II.1.f.*** A quartzite figure-eight drill bit from HeG, oval outline in section along length. Traces of concentric lines from use, visible on one surface. Object 2699, drawing 1000-863 drawn by R. M. Abd El-Salam, digitally inked by P. Collet, photos 116240–41 by A. Eweida; ***Fig. II.1.g.*** A quartzite figure-eight drill bit from HeG, with two notches on each side of the tool where the shaft would have been. Object 2865, drawing 1000-653 by W. Schenk, photos 116240–41 by A. Eweida.

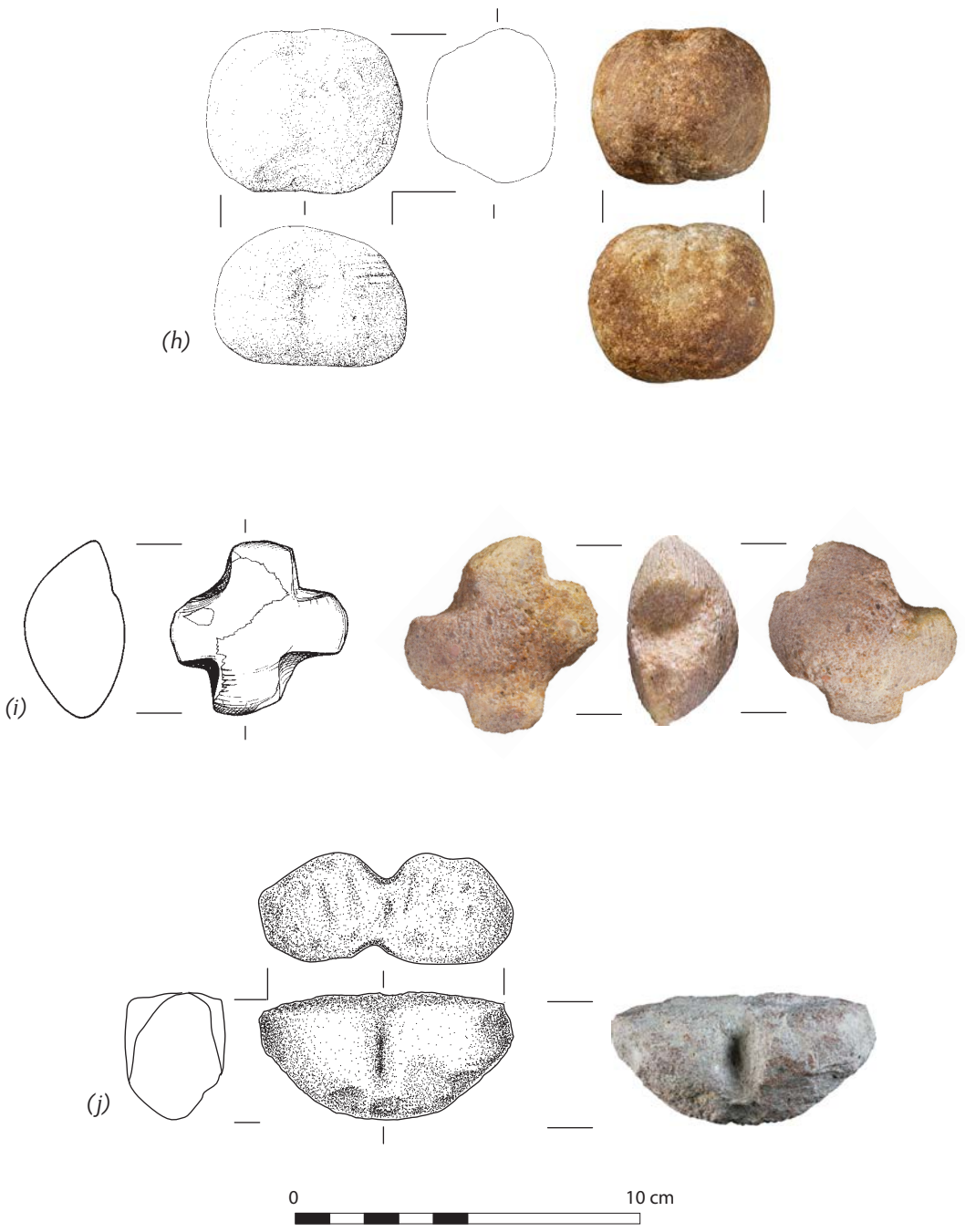
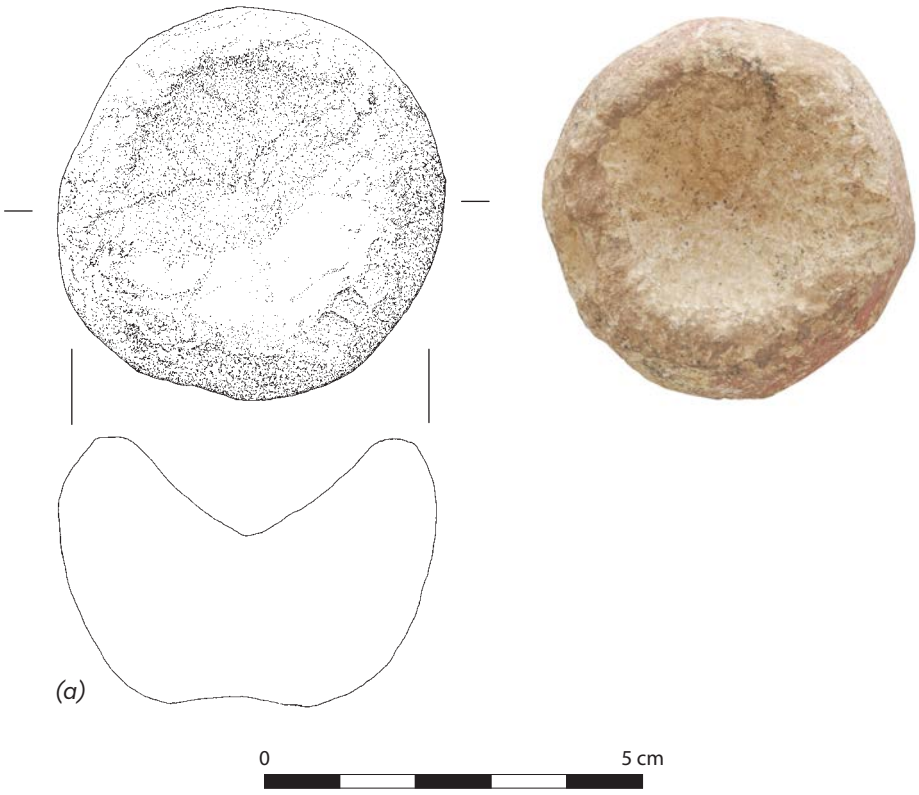


Fig. II.1.h. A quartzite figure-eight drill bit from HeG. Tool has an oval in outline. One side along the length is slightly flat-in-profile and the opposite side has a dome-shaped profile. Top dome-shaped surface has traces of concentric lines from use. Object 2937, drawing 1000-417 by J. Karlsson, photos 116240–41 by A. Eweida; ***Fig. II.1.i.*** Flower-shaped quartzite drill bit from HeG. Tool has four notches, creating the flower shape. Top surface is dome-shaped with traces of fine concentric lines. Object 2700, drawing 1000-650 by W. Schenk, photos 914316, 914318, 914322 by J. Quinlan; ***Fig. II.1.j.*** A unique quartzite drilling tool from HeG, which is a variant of the conical and figure-eight drill bits. Object 3548, drawing 1000-865 by Y. Mahmoud, photos 919586–87 by H. McDonald.

DRILL CAPSTONES

A total of 13 capstones have been excavated thus far, 11 from the different areas of HeG, 1 from KKT, and 1 from MVT, mostly of limestone but with a single example in travertine. Drill capstones were used to apply pressure on the drill bit, as mentioned earlier. Capstones are circular-to-oval in outline when viewed from above, with a crescent-shaped cross-section. The inner/bottom surface of the tool is concave in profile with a small depression that has concentric lines from use. The top surface is convex in profile. Examples of drill capstones are Object 1282 (**Fig. II.2.a**) and 2289 (**Fig. II.2.b**).



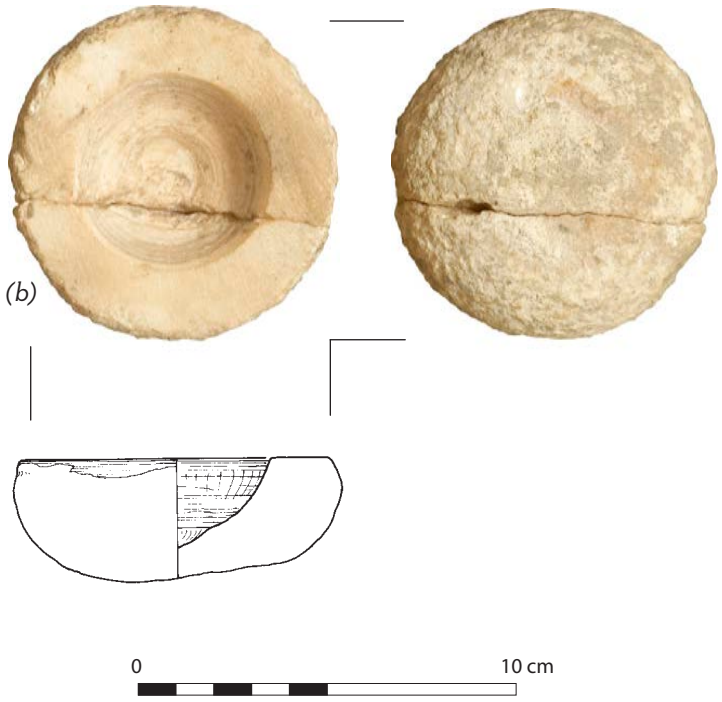


Fig. II.2.a. A circular-shaped limestone capstone from HeG, with a depression on one side where the tool was used. Object 1282, drawing 1000-458 by J. Karlsson, photo 201586 by Y. Kawae; ***Fig. II.2.b.*** A travertine capstone from HeG, broken across its diameter, with visible reeling lines on its inner concave surface. Object 2289, drawing 1000-642 by W. Schenk, photos 805582–83 by Y. Kawae.

DRILL CORES

The initial step of drilling a stone vessel was done by using a tubular copper drill bit fitted into a wooden shaft, as mentioned earlier. We have not yet found copper drill bits, as copper was an expensive material and not often left behind. In addition, drilling with copper tubes in abrasive material results in the loss of parts of the tube. What remains of this process are drill cores: the central cylinder "waste" portion of the vessel. We have 3 travertine drill cores from HeG, ranging from 2–2.4 cm in diameter, indicating the original size of the tubular copper drill bit. The cores are tubular in shape with fine concentric lines around the circumference of the object. Examples of drill cores are Objects 1001 (**Fig. II.3.a**) and 2822 (**Fig. II.3.b**). Similar examples are published by Petrie (1917: pl. LII, nos. 67–71).

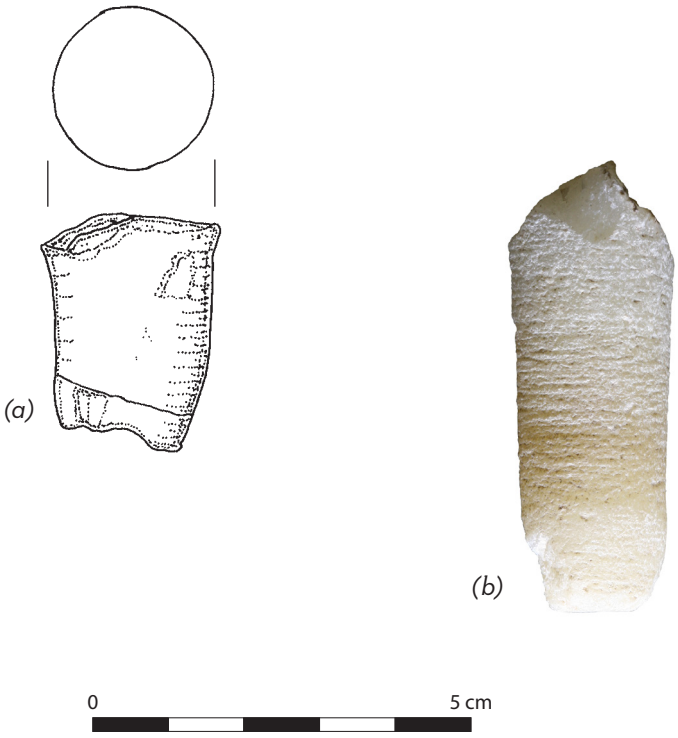
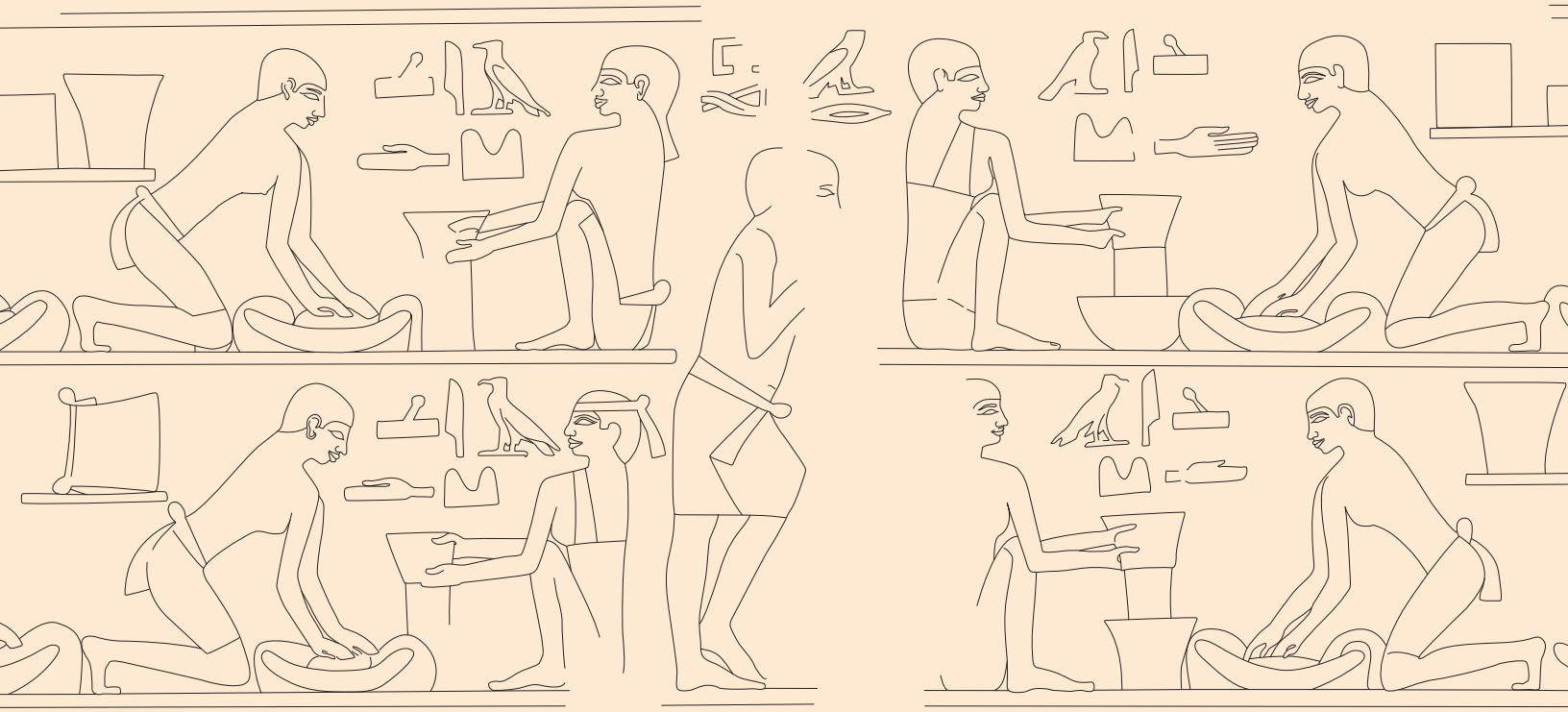


Fig. II.3.a. A fragment of a cylindrical-shaped limestone drill core from HeG, with visible reeling lines on its surface. Object 1001, drawing 1000-222 by C. Hebron; ***Fig. II.3.b.*** An incomplete cylindrical-shaped travertine drill core, broken across its height with fine irregular striations on its surface. Object 2822, photo 919534 by H. McDonald.



A scene depicting workers grinding grains on querns using handstone grinders, from the tomb of Ti at Saqqara (Épron, Daumas, and Goyon 1939, pl LXVI).

GRINDING TOOLS

Grinding tools consist of *manos* (such as grinders), *metates* (such as quern bases), and palettes (Adams 2002: 99). Metates are the netherstones while manos are the handheld stones used on the metates. Both manos and metates work together, one cannot function without the other. Therefore, "the use wear on the surface of one tool reflects that on the surface of the other" (Adams 2002: 100). Manos and metates can either be strategically or expediently designed tools (Adams 2002: 99). Grinding tools were used for processing cereal for food preparation and sometimes for pigment production. We have few examples of grinding tools with ochre residues visible on the surfaces. The majority of the grinding tools were found in the different areas of HeG (over 300 grinding tools). Some grinding tools were recovered from MVT (about 20 objects), KKT (about 13 objects), and a few from KRO (5 objects).

GRINDER STONES (MANO)

What we refer to as grinder stones, or manos, are the handheld tools used on top of the quern bases. Grinder manos are mostly made from dense-grained stone like quartzite and granite, with a few examples of travertine, sandstone, and limestone. The grinders vary in size; some examples could be used with one hand while other examples are big enough to be used with both hands. Grinding on a quern was usually "a simple back and forth motion" (Giddy 1999: 205), as seen in tomb depictions, like in the tomb of Ti at Saqqara (see p. 40; Épron, Daumas, and Goyon 1939: pls. LXVI, LXVII), and in models, like the Middle Kingdom model of Meketre (Winlock 1955: figs. 22, 23). Due to the movement of its use, the tools have at least one or more flat or slightly convex working surfaces. According to Jenny Adams, "manos function properly when they are compatible in size and configuration with the metates against which they are used" (2002: 99).

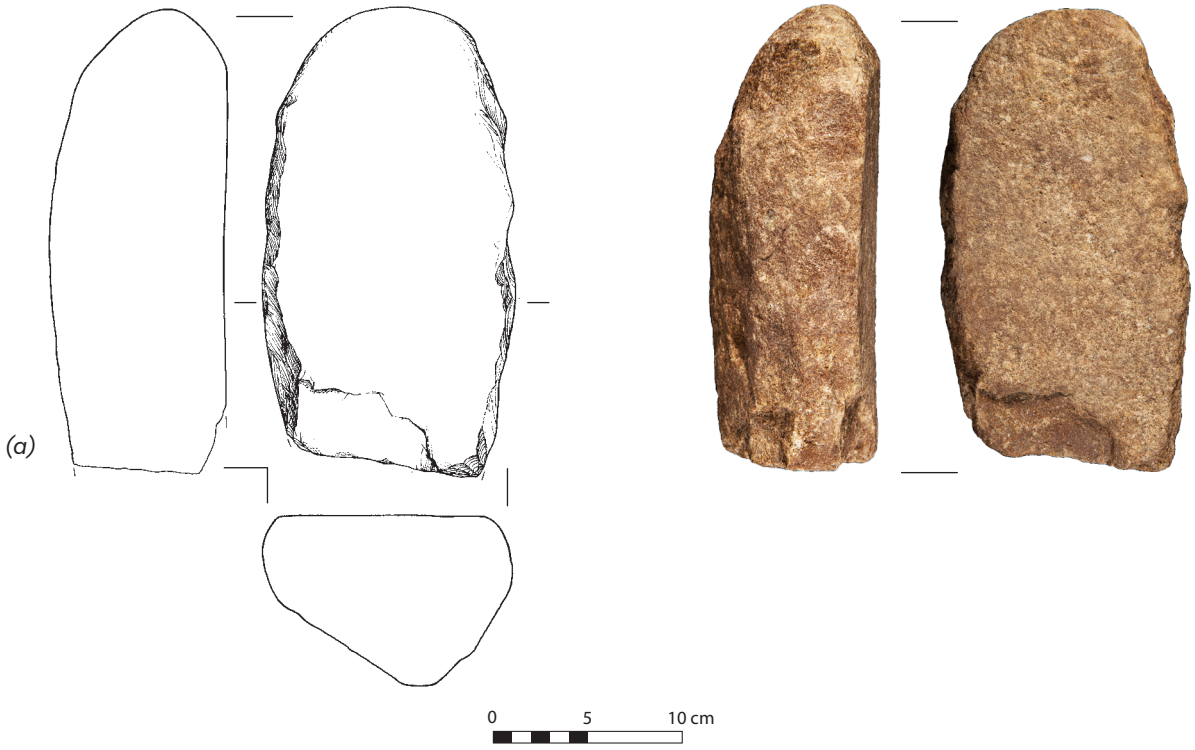
AERA team members have excavated four different shapes of grinder manos: loaf, dome, brick/rectangle, and cube, described in detail below. Sometimes the distinction between grinders and polishers is not a simple one, due to the fact that both tools could be of similar sizes and materials, often quartzite and sandstone.

A loaf-shaped grinder mano has a rectangular outline when viewed from above, rectangular outline in longitudinal section, and hemispherical outline in cross-section, and a flat/slightly convex working surface. A loaf-shaped grinder is found as an example in one of Meketre's models (Winlock 1955: figs. 64, 65; Kemp 2018: 174, fig. 4.4, no. 2). Some examples of this type of grinder are two-hand tools. Among the best examples of the loaf-shaped grinders is Object 1064 (**Fig. III.1.a**).

A dome-shaped grinder mano has a circular or oval outline when viewed from top and is hemispherical-shaped across its thickness, with a flat, slightly convex bottom for the working surface. This type of grinder is a single-hand tool. Examples of dome-shaped grinders are Objects 1633, 1555, and 3796 (**Fig. III.1.b**).

A brick/rectangular-shaped grinder mano has a rectangular outline when viewed from the top, a rectangular outline in its section along the length, and a square shaped cross-section. At least one flat side along the length was used for grinding. In a few examples, one short side across the width of the tool is flat and might have been used also, creating a surface that is slightly convex in profile. Some examples of this type of grinder are two-hand tools. Examples of this shape of grinder are Objects 2000-33 (**Fig. III.1.c**), 1572 (**Fig. III.1.d**), and 3954.

A couple of the grinder examples are cubed in shape. They are almost square in outline and in cross-section. Some of the cube surfaces have traces of use wear. This shape might have originally been a sphere (Giddy 1999: 206) that gradually transformed into a cube due to use. This type of grinder is a single-hand tool.



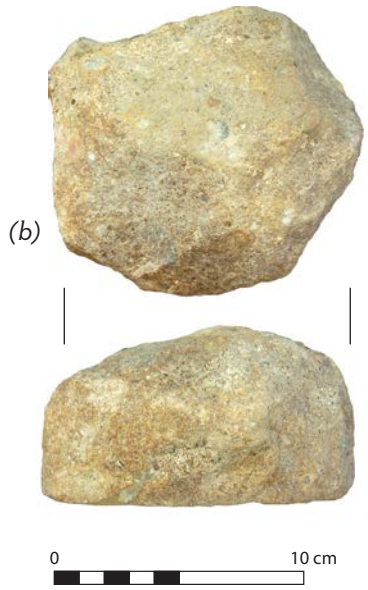


Fig. III.1.a. A loaf-shaped quartzite grinder from HeG, with an oval outline and a dome-shaped longitudinal section. The opposite longitudinal surface was used for grinding. Object 1064, drawing 1000-660 by W. Schenk, photos 116831, 116833 by A. Eweida; ***Fig. III.1.b.*** A dome-shaped quartzite grinder from HeG. Tool has remains of yellow pigment on both top convex surface and bottom surface. Object 3796, photos 617061–62 by N. B. Fayez.

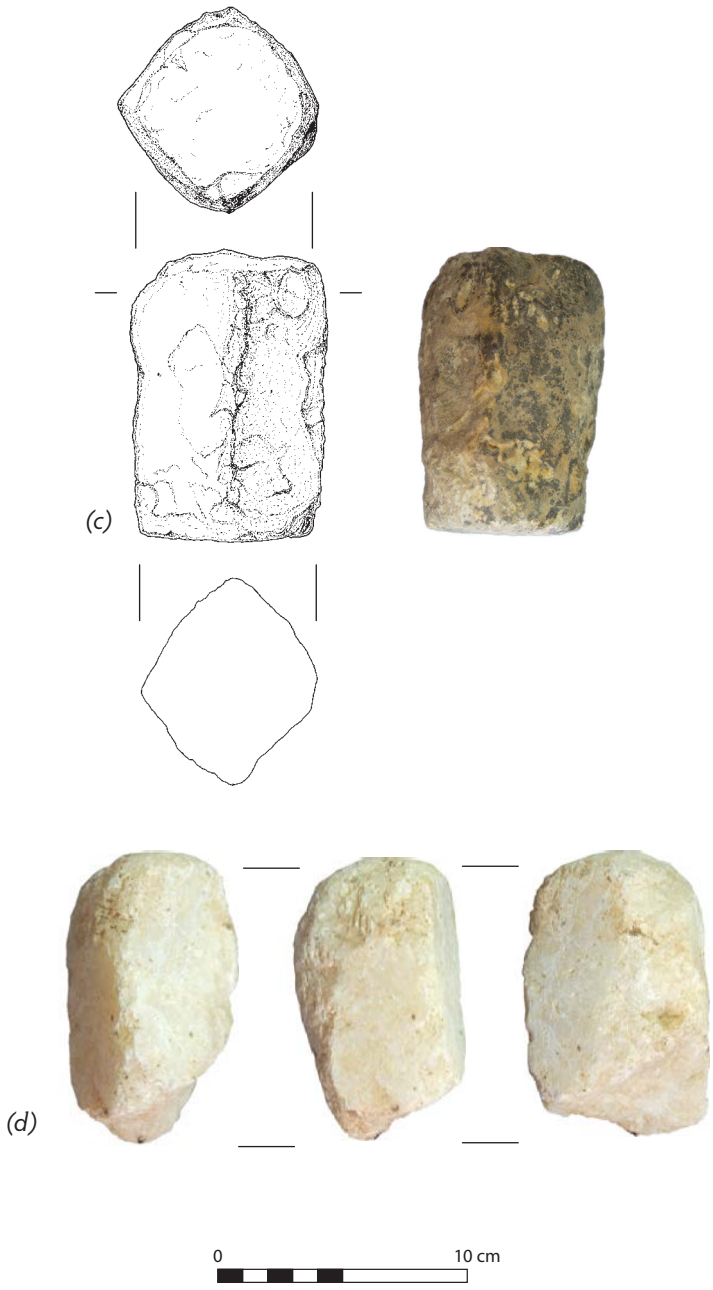


Fig. III.1.c. A brick- or rectangular-shaped limestone grinder from HeG. One side along the length of the tool show traces of use. Object 2000-33, drawing 1000-243 by C. Hebron, photos 617336–37 by N. B. Fayez; ***Fig. III.1.d.*** A brick- or rectangular-shaped travertine grinder from HeG, with pecked surfaces from use. Object 1572, photos 617171–73 by N. B. Fayez.

QUERN STONES (METATES)

Quern stones are metate grinding stones that could be placed on the ground, on a quern emplacement or on the knees, with the working surface facing upwards. The main differences between quern stones and grinder manos are the size and the work surfaces. The querns have a concave upper working surface while grinders have a flat to convex lower working surface (Giddy 1999: 201). The majority of the quern stones excavated were found in HeG, with a few examples from MVT and KKT. Only one quern was recovered from KRO. Quern stones are mostly made out of quartzite, with some examples of granite, grano-diorite, basalt, diorite, and a couple of limestone examples.

Quern stones can be either expediently or strategically designed. The main shapes of quern and quern fragments recovered are: flat/concave (over 30 examples), boat (19), and saddle (12). A flat/concave-shape has a roughly rectangular outline when viewed from above with a flat base/undersurface. It has a rectangular outline in its cross-section, with the ends sometimes turning upwards. Querns of similar shapes were found in Ayn Asil (Jeuthe 2012: 234–35, 239, fig. 96). Top and bottom surfaces are almost parallel. Its working surface is flat, but sometimes becomes slightly concave in profile due to extensive use. Examples of flat/concave-shaped querns are Objects 1811 (**Fig. III.2.a**) and 2188 (**Fig. III.2.b**).

A boat-shaped quern is slightly similar to the saddle-shaped ones; hence it is difficult at times to differentiate between both querns. An example is Object 1521 (**Fig. III.2.c**). It is an incomplete example that could have either been a boat-shaped quern or a saddle-shaped one. It has a concave to flat upper working surface and a thick body with an uneven narrow underside, creating a "keel" bottom. It has an almost oval to elongated dome-shaped outline when viewed from above. This is evident in the complete and nearly complete examples we have, and is due to the fact that one end is wider than the opposite end. The narrower end of the working surface is slightly convex in profile, sloping downwards towards the undersurface at its extremities, creating a ridge line. Among the best examples of this shape is Object 1062 (**Fig. III.2.d**).

Saddle-shaped querns have a roughly rectangular/oval outline when viewed from above. The upper working surface has a deep depression/concave in profile. The lower surface/base is curved, creating an almost parallel surface to the upper surface. Some examples have a flat middle section on the undersurface, making the object stable; see Object 3900 (**Fig. III.2.e**). The ends of the working top surface are narrower in width than the body of the tool, but not as narrow as the boat shaped querns. Most of the querns we have of this shape are not complete but are mostly either fragmented or broken across the width. Parallels of the saddle quern are found in Ayn Asil (Jeuthe 2012: 234, 237–38, figs. 94b, 95).

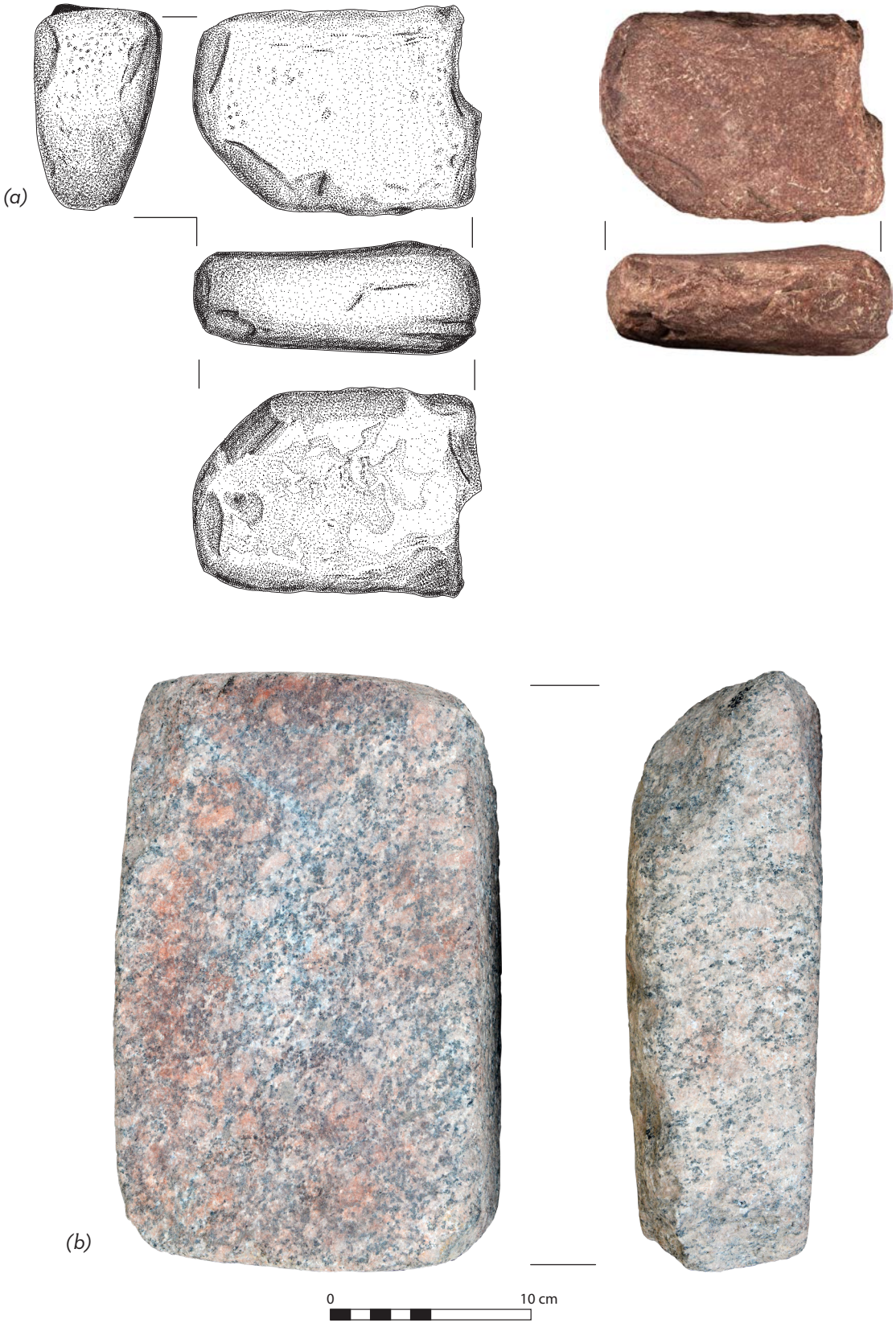


Fig. III.2.a. Flat/concave-shaped quartzite quern from HeG. Quern has a rectangular-shaped outline when viewed from above. Upper surface is slightly concave in profile, while the undersurface is slightly convex in profile. Object 1811, drawing 1000-989 by P. Collet, photos 116854, 116858 by A. Eweida; ***Fig. III.2.b.*** Flat/concave-shaped granite quern from HeG, rectangular in shape and in both longitudinal and lateral sections. Surfaces have traces of red ochre. Object 2188, photos 113734,113737 by D. Jones.

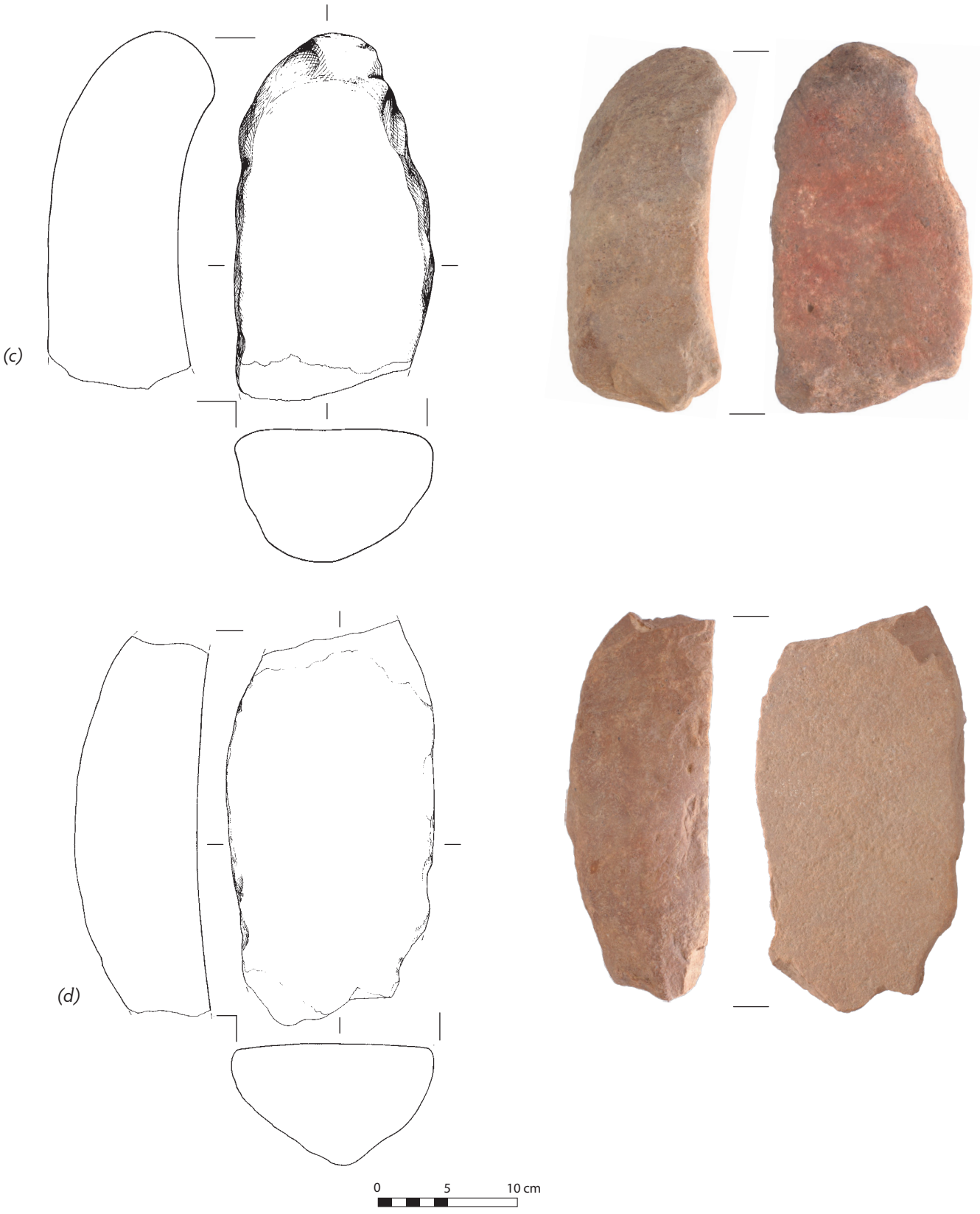


Fig. III.2.c. Boat-shaped quartzite quern from HeG, with a concave upper surface from use. Undersurface is narrower in width, creating a "keel" bottom. Object 1521, drawing 1000-661 by W. Schenk, photos 302417, 302419 by Y. Kawae; ***Fig. III.2.d.*** An almost complete boat-shaped quartzite quern from HeG with both extremities broken off. Tool has a concave upper surface and a narrow undersurface. Object 1062, drawing 1000-662 by W. Schenk, photos 302421, 302424 by Y. Kawae.

Fig. III.2.e. A large, unusual saddle-shaped granite quern from KKT. Tool is complete, well shaped, and finished with a concave upper surface and rounded ends. Object 3900, photo 113728 by D. Jones.

PALETTES

Palettes are a kind of grinder base. Unlike quern stones, palettes were used for grinding pigment only. They were a single-hand tool, unlike querns, which are much heavier in weight. Palettes excavated by AERA team members are mostly of limestone, sandstone, and travertine. It is difficult at times to differentiate and identify the sandstone palettes from the abraders, since the latter typology is mostly made of sandstone, and they are very similar in form. (Abrasion and whetting tools are discussed in a following section.) Some examples of palettes have slightly concave working surfaces, confirming their use as a palette and/or whetstones. Like most tools, the majority of the palettes were excavated from HeG (over 80), with only 3 examples from KRO, 1 example from MVT, and 1 from KKT.

There are two different shapes of palettes: slab/rectangular-shaped and a few examples of a lunate shape. Slab/rectangular-shaped palettes have a relatively rectangular outline when viewed from above. They have a thin body with top and bottom surfaces almost parallel and a rectangular cross-section. The top working surface is smooth and slightly concave. Examples of slab palettes are Objects 4025 (**Fig. III.3.a**), 1817 (**Fig. III.3.b**), and 1685 (**Fig. III.3.c**). Palettes are usually handheld tools, with the exception of one example from HeG. Object 3288 (**Fig. III.3.d**) is a large slab/rectangular palette made of hematite-rich sandstone, which was used for its red color content.

Lunate-shaped palettes have a semicircular outline when viewed from above; a thin, roughly rectangular cross-section; and a slightly convex upper working surface (Giddy 1999: 224). Both examples of the lunate shape are of limestone and were found in HeG, see Object 1449 (**Fig. III.3.e**).

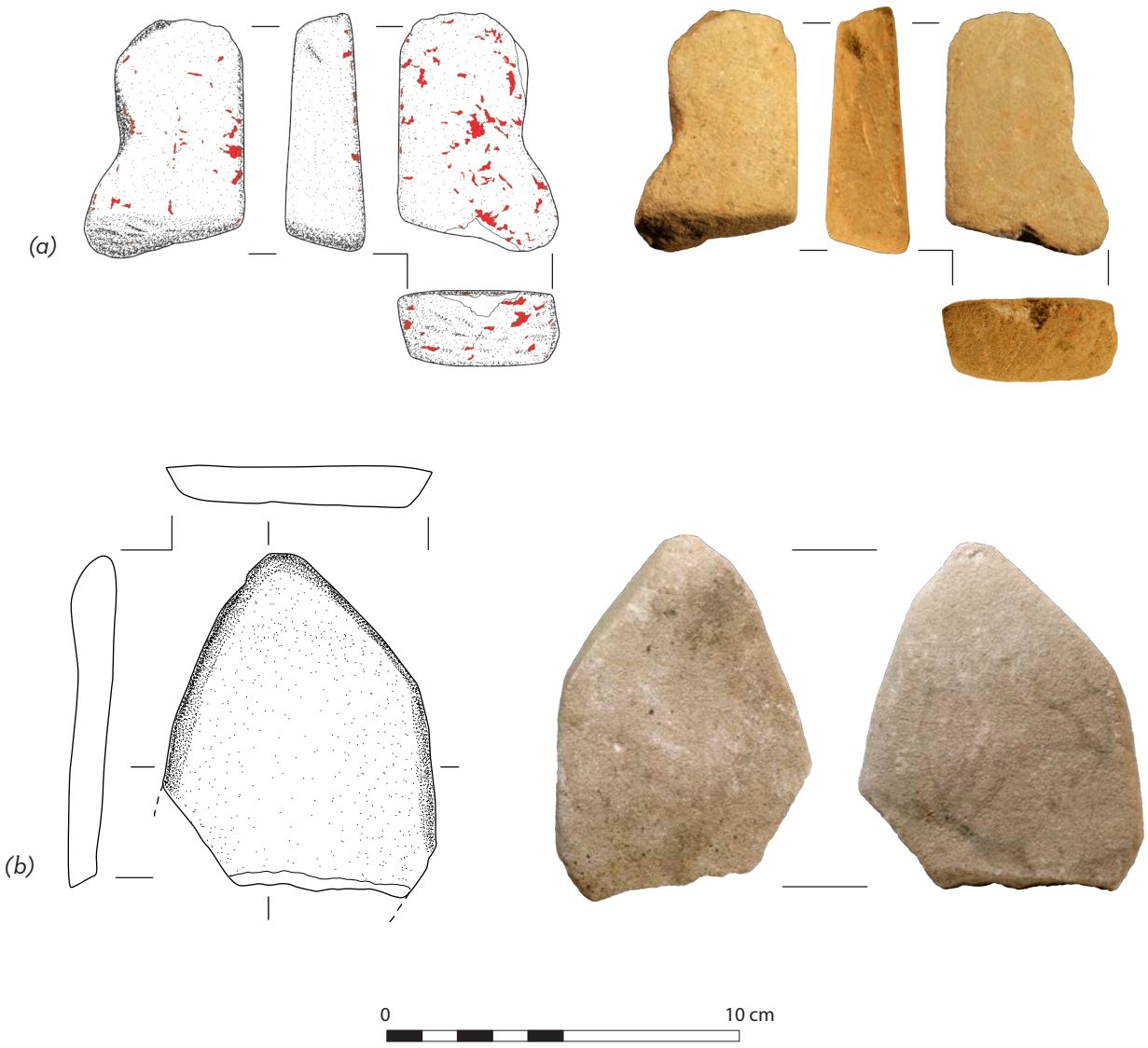


Fig. III.3.a. Slab-shaped sandstone palette from HeG, top surface is slightly concave in profile. Tool has traces of red ochre on its surfaces. Object 4025, drawing 1000-981 drawn by R. M. Abd El-Salam, digitally reconstructed and inked by P. Collet, photos 414117–414120 by C. Malleson; ***Fig. III.3.b.*** Slab-shaped sandstone palette from HeG, upper and undersurfaces are almost parallel and slightly concave in profile from use. Object 1817, drawing 1000-971 drawn by Y. Mahmoud, digitally inked by P. Collet, photos 909406, 909408 by J. Quinlan.

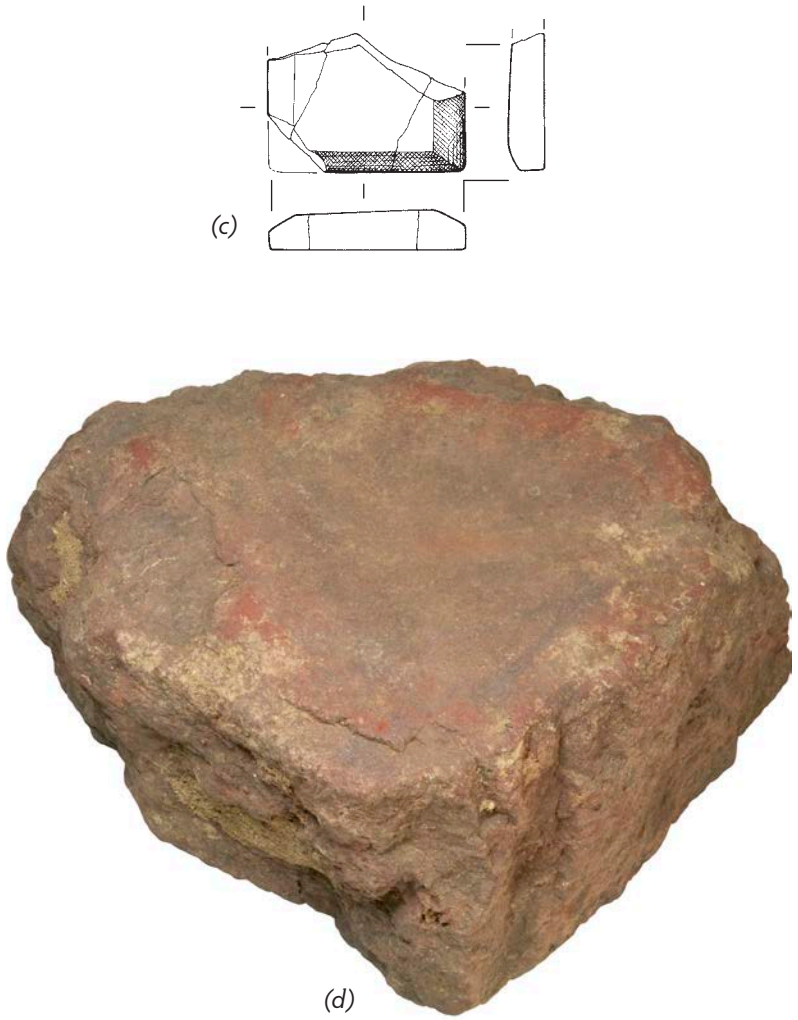
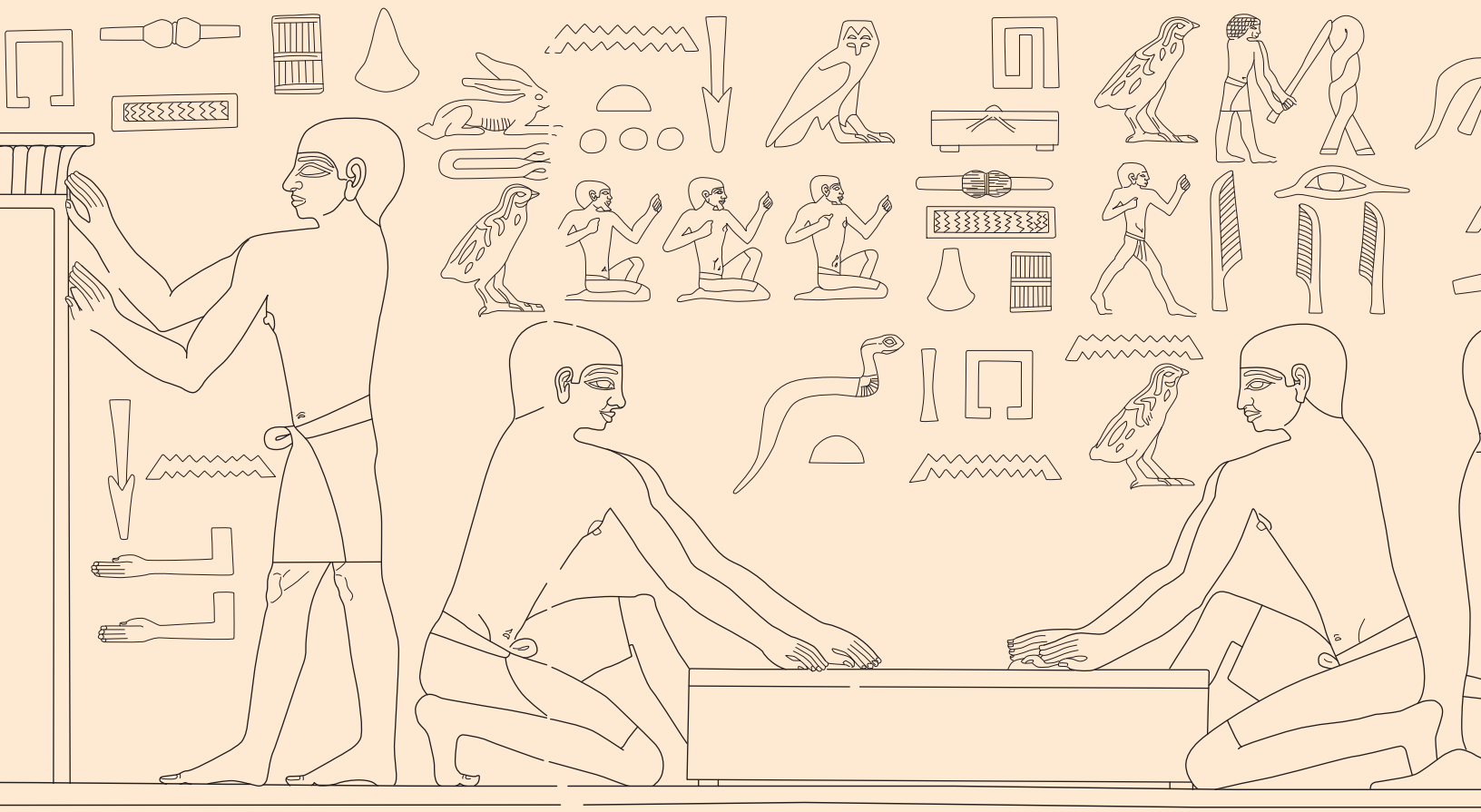


Fig. III.3.c. An incomplete slab-shaped sandstone palette from HeG, broken into three pieces. Top and bottom surfaces are parallel. Object 1685, drawing 1000-521 by W. Schenk; ***Fig. III.3.d.*** A large slab-shaped palette from HeG, made of hematite-rich sandstone. The tool was used as the source for the red color used. Object 3288, photo 909552 by J. Quinlan.

Fig. III.3.e. Lunate-shaped limestone palette from HeG, with a slightly concave upper surface. Object 1449, drawing 1000-460 by J. Karlsson, photos 201632–33 by Y. Kawae.



Workers making furniture using a small abrasion/polishing tool cupped in their hands, from the tomb of Ti at Saqqara (Wild 1966, pl. CLXXIV).

ABRASION AND WHETTING TOOLS

The abrasion/whetting category includes abraders, polishers, burnishers, whetstones, and scrapers. Tools of this category are expediently designed tools, with no defined shape, but are shaped due to use wear. In some cases, abrasion/whetting tools were fashioned due to the secondary use of other broken tools or objects.[1] Hence, abrasion/whetting tools were found in abundance in HeG, with over 800 examples, as well as examples found in KRO, KKT, and MVT.

Tools of the abrasion/whetting category can overlap. One tool might have been used for one than one purpose, such as abraders and whetstones. In theory, abraders, burnishers, and polishers are three tools used for different stages and activities of finishing an object and are made of different materials. Yet, the three tools are very similar to one another and at times, differentiating between the three types can be difficult. All three tools were probably used on vessels (stones and ceramic; see Quibell 1915), as mentioned later in the stone vessels typology, statues in the statue-making process (Davies 1943, vol. 2, xi, pl. LX), furniture (see scene above, Wild 1966, pl. CLXXIV; Davies 1943, vol. 2, xi, pl. LIII), among others.

1. See the "Multipurpose and Miscellaneous Tools and Objects" section.

ABRADERS

Abraders are handheld stone tools used for smoothing the outer surface of an object, by reducing the surface it is working on and removing extra parts of the original material "through adhesive and abrasive mechanisms" (Adams 2002: 77). It is the first stage of the smoothing processes. As mentioned earlier, abraders are expediently designed tools, with shapes determined by their use wear. This means that abraders have no one defined shape but are mostly irregular in shape, differing from one example to another. An abrader usually has one or more flat surface, usually with an edge line between surfaces. The working surfaces of the tool are reduced due to its use wear. Due to the use of an abrader, the stone material is usually of fine-grained and coarse-grained, dense material, such as sandstone or quartzite. Abraders examples are objects number 1040 (**Fig. IV.1.a**), 2029 (**Fig. IV.1.b**), 2148 (**Fig. IV.1.c**), and 3051 (**Fig. IV.1.d**). Another Giza example of a sandstone abrader was excavated by Kromer (1972: 40, Taf. 13, no. 1). Some examples of abraders have traces of color from use, such as red ochre or black pigment, such as Objects 3051 (**Fig. IV.1.d**), 1971 (**Fig. IV.1.e**), 2135 (**Fig. IV.1.f**), 2966 (**Fig. IV.1.g**), 3220 (**Fig. IV.1.h**), and 4090 (**Fig. IV.1.i**).

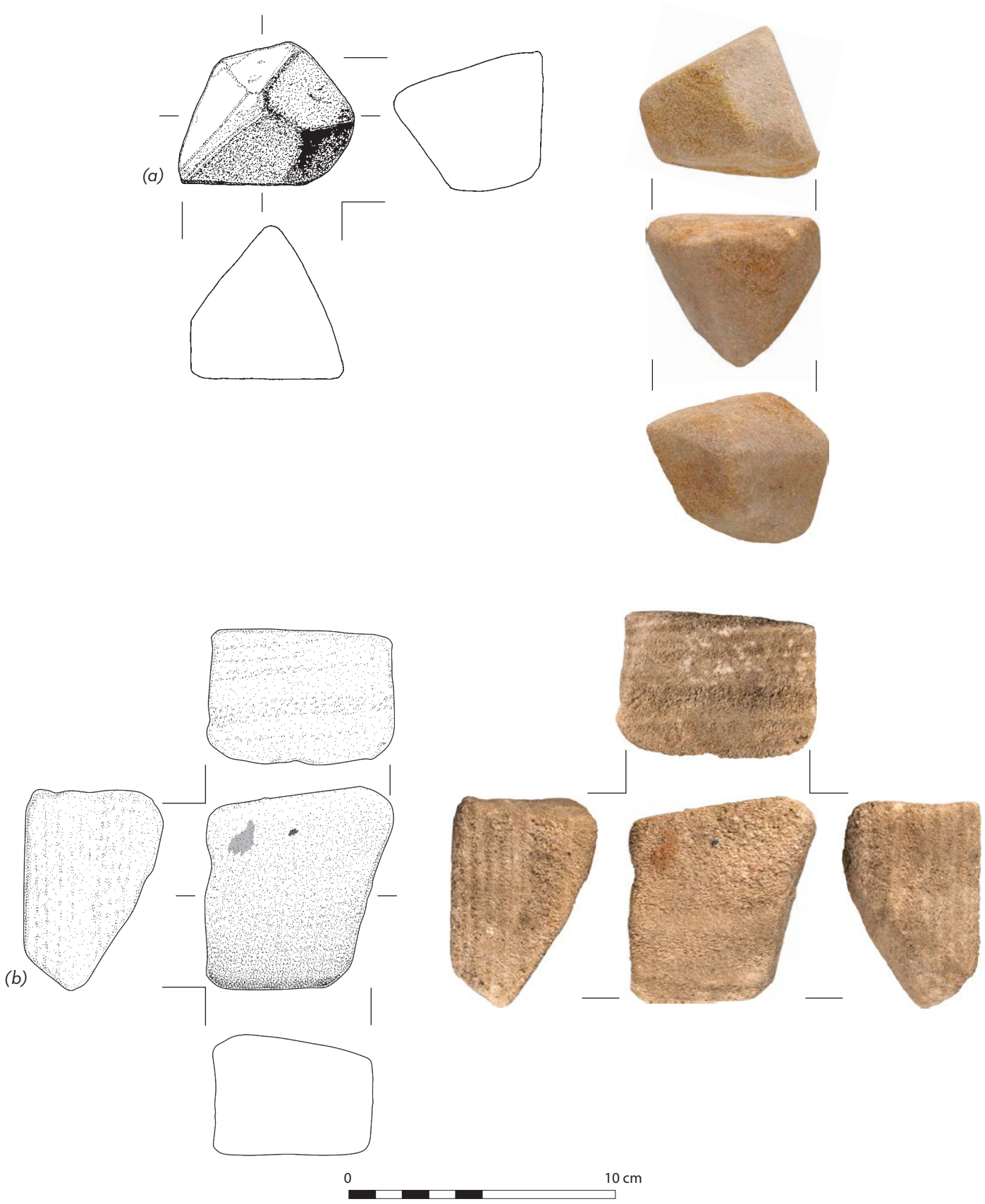


Fig. IV.1.a. A sandstone irregular cube-shaped abrader from HeG, with flat, faceted working surfaces. Object 1040, drawing 1000-293 by C. Hebron; photos 201649–50, 201655 by Y. Kawae; ***Fig. IV.1.b.*** An almost cube-shaped abrader made of coarse-grained sandstone from HeG, with surfaces flattened from use. Object 2029, drawing 1000-880 drawn by A. Talaat, digitally reconstructed and inked by P. Collet, photos 116777–80 by A. Eweida.

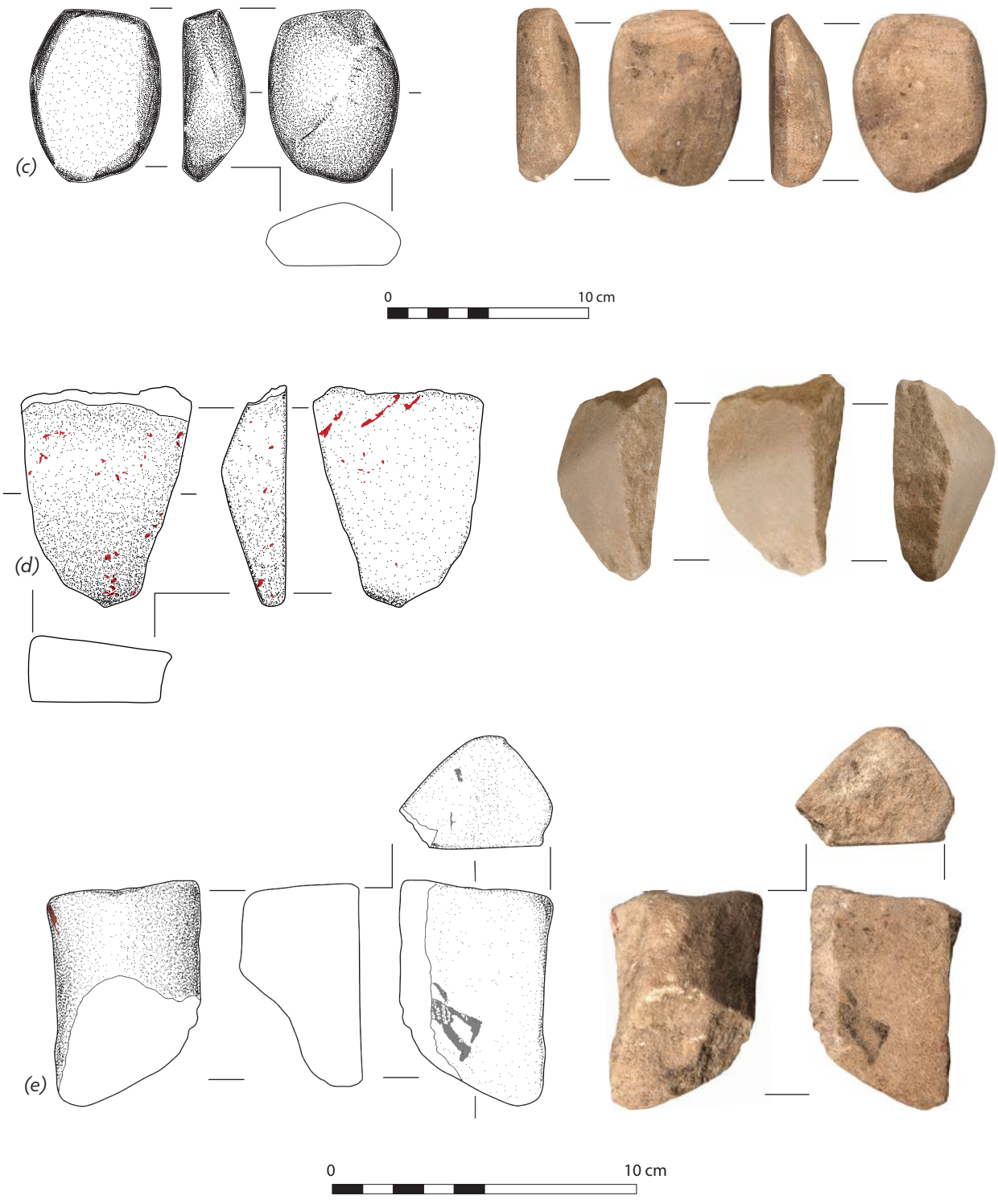


Fig. IV.1.c. A loaf-shaped sandstone abrader from HeG. Tool has one flat surface and faceted top surface and vertical sides – all surfaces used. Object 2148, drawing 1000-873 by P. Collet, photos 116356–59 by A. Eweida; ***Fig. IV.1.d.*** An irregular-shaped sandstone abrader from HeG with a flat bottom surface and a dome-shaped upper surface, with traces of red ochre on its surfaces. Object 3051, drawing 1000-886 drawn by A. Talaat, digitally reconstructed and inked by P. Collet, photos 909420–21, 909423 by J. Quinlan; ***Fig. IV.1.e.*** An irregular-shaped sandstone abrader from HeG, with a rectangular outline and a dome-shaped cross-section. One flat surface has traces of black pigment and red ochre, forming the shape of walking legs. Stone might have been painted and reused as an abrader after break. Object 1971, drawing 1000-875 drawn by A. Talaat, digitally reconstructed and inked by P. Collet, photos 116352–54 by A. Eweida.

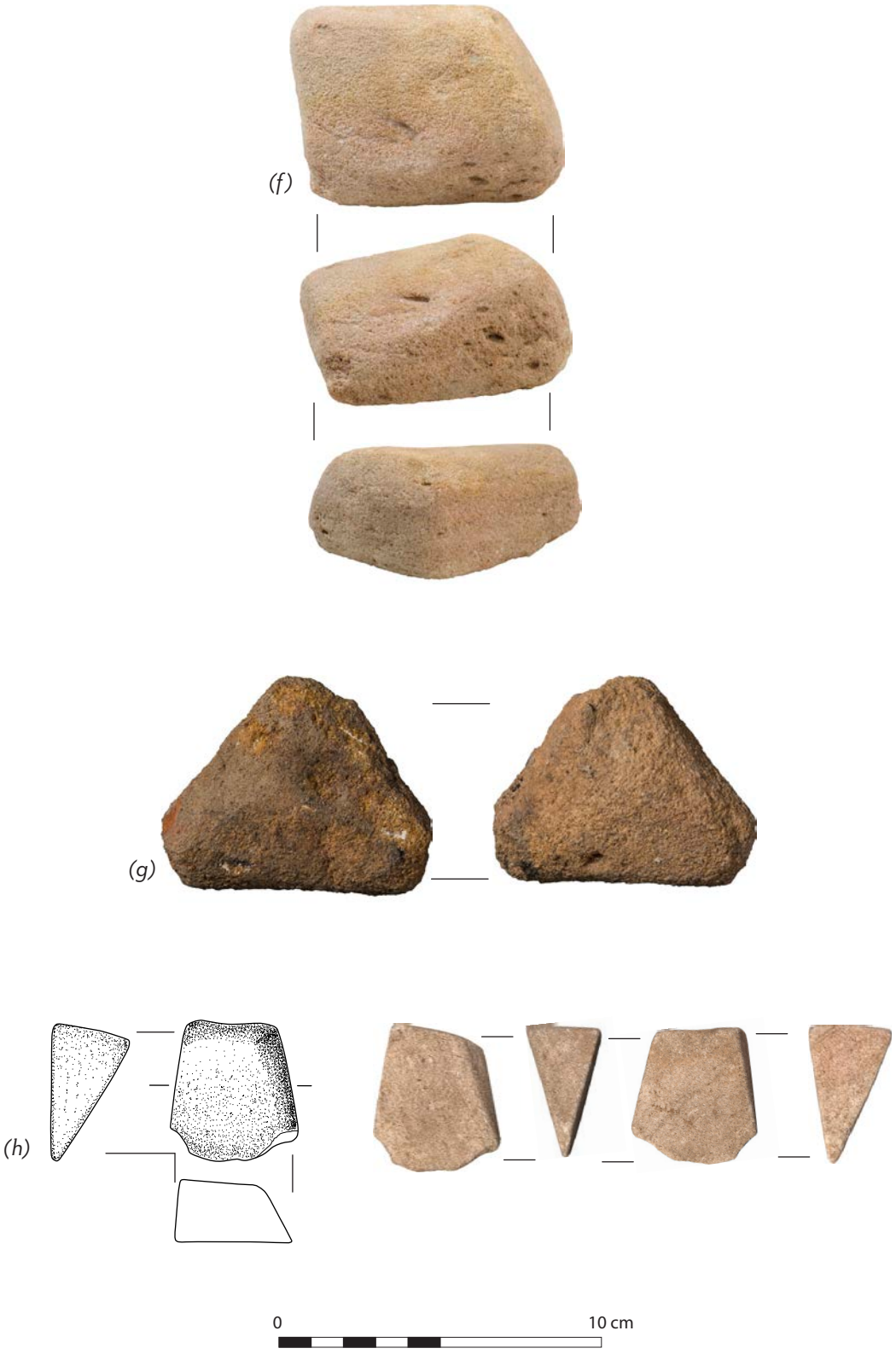


Fig. IV.1.f. A cube-shaped quartzite abrader object from HeG, with worked faceted surfaces. Object 3228, photos 909370–72 by J. Quinlan; ***Fig. IV.1.g.*** A coarse-grained sandstone abrader from HeG with traces of red ochre. Object 2135, photos 116972–73 by A. Eweida; ***Fig. IV.1.h.*** A sandstone abrader from HeG, with a rectangular outline and a triangular-shaped cross section. All surfaces were used for abrasion. One surface has traces of red ochre. Object 2966, drawing 1000-889 drawn by A. Talaat, digitally inked by P. Collet, photos 116766–69 by A. Eweida.

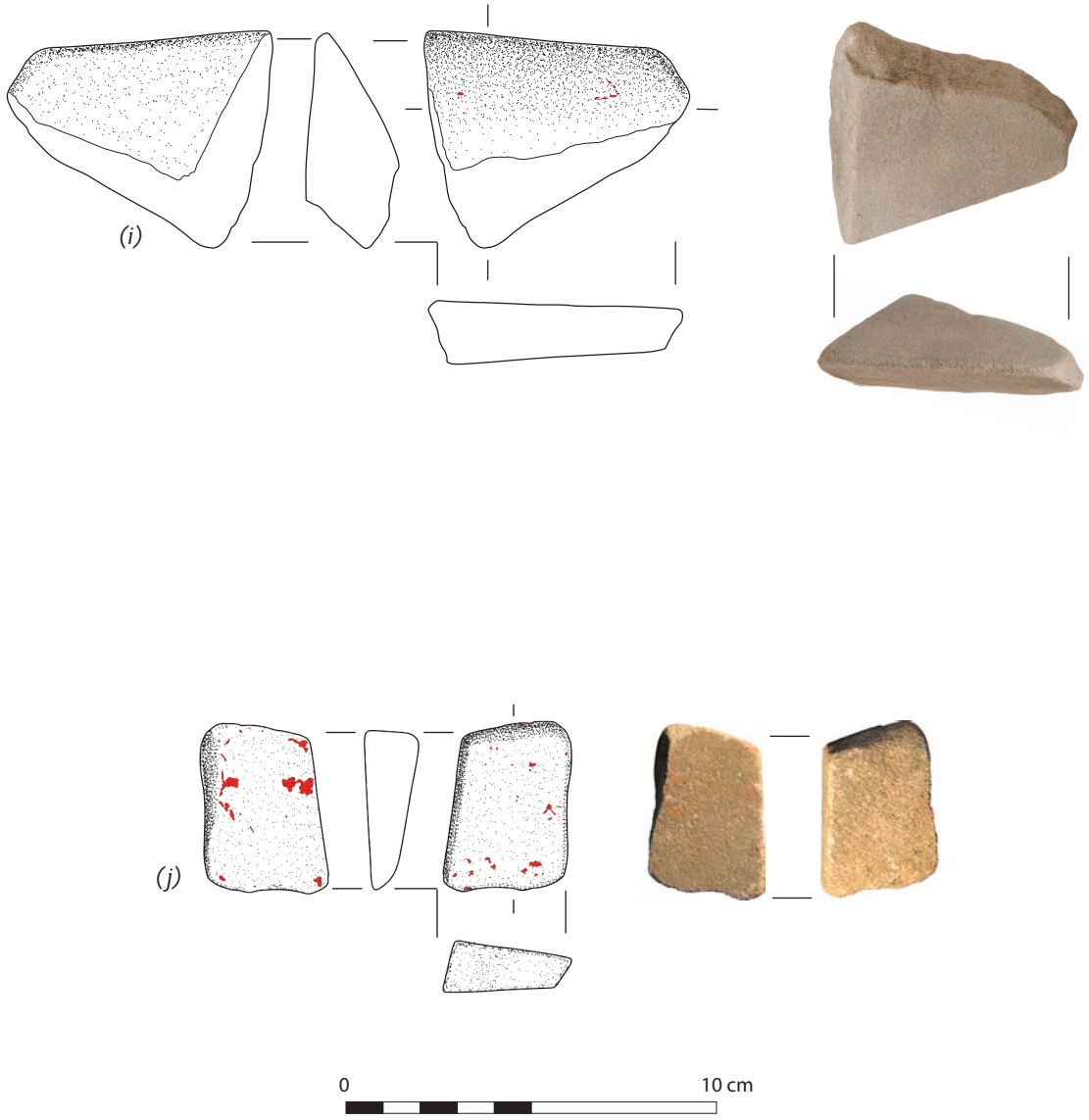


Fig. IV.1.i. A triangular-shaped sandstone abrader from HeG with traces of red ochre on its working surface. Object 3220, drawing 1000-887 drawn by R. M. Abd El-Salam, digitally reconstructed and inked by P. Collet, photos 909410–15 by J. Quinlan; ***Fig. IV.1.j.*** A sandstone abrader from HeG with smooth surfaces and traces of red ochre. Object 4090, drawing 1000-891 drawn by A. Talaat, digitally reconstructed and inked by P. Collet, photos 414967–68 by C. Malleson.

POLISHERS

Polishers are small handheld tools. They were used to create an outer sheen on an object, such as a stone vessel or statue, after the use of an abrader. Like abraders, polishers are expediently shaped tools. Examples are made of fine-grained, dense material like sandstone, quartzite, and a few limestone examples. Examples representing different shapes of polishers are Objects 1048 (**Fig. IV.2.a**), 2701 (**Fig. IV.2.b**), and 3999 (**Fig. IV.2.c**).

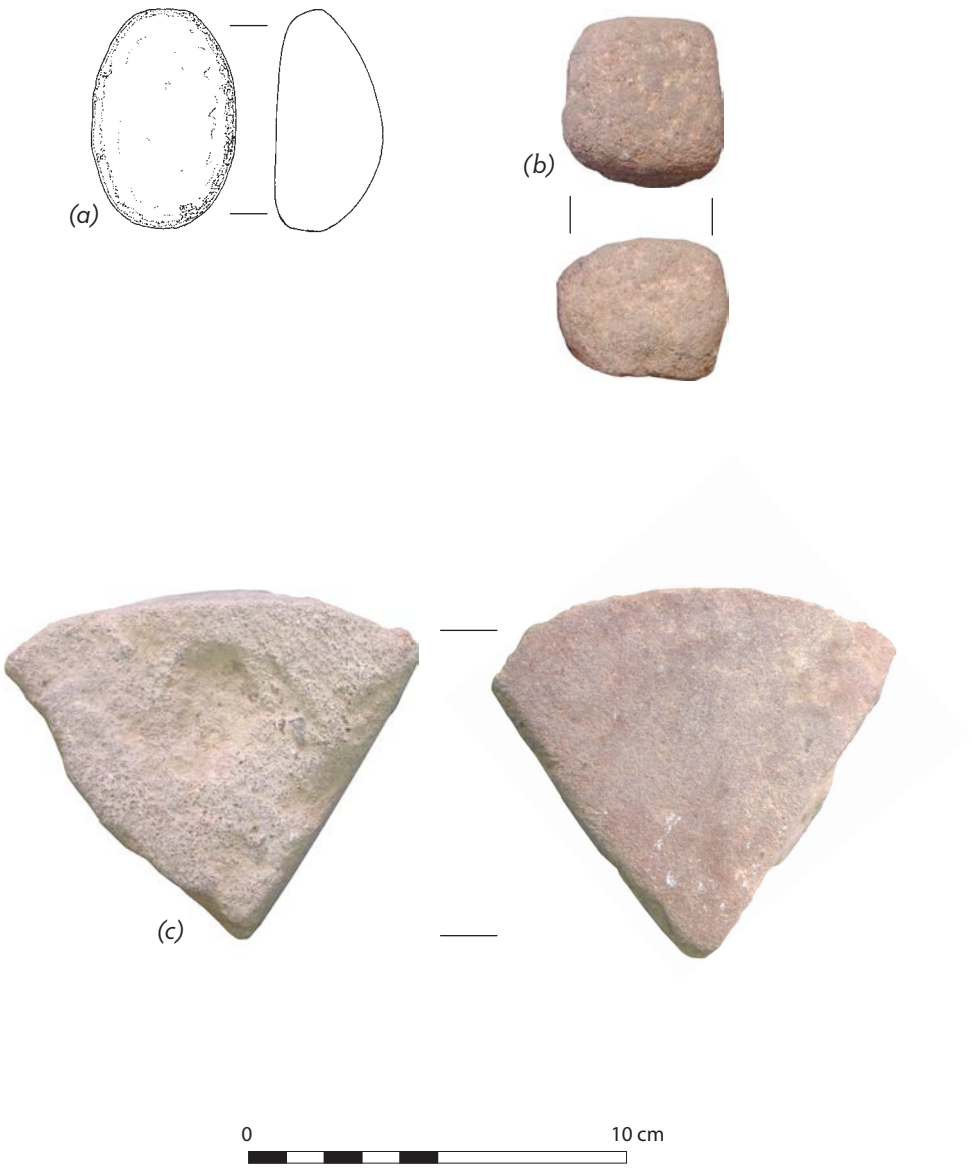


Fig. IV.2.a. A fine-grained quartzite loaf-shaped polisher from HeG, with oval outline, convex upper surface, and a flat undersurface. Object 1048, drawing 1000-264 by C. Hebron; ***Fig. IV.2.b.*** A cube-shaped quartzite polisher from HeG, with a square outline and convex upper surface. Object 2701, photos 511467–68 by A. Tavares; ***Fig. IV.2.c.*** A fine-grained quartzite polisher from HeG, has one flat surface along the length and worked vertical surfaces, smoothed from use. Object 3999, photos 222960, 222963 by S. Hitchens.

WHETSTONES

Whetstones are small handheld sharpening tools. Most whetstones are irregular in shape. Some examples are slab- or block-shaped whetstones. A whetsone is defined by having either deep grooves or concave surfaces on at least one of its surfaces, due to use wear. They are usually made of hard, fine-grained stones like quartzite and sandstone, such as Objects 1553 (**Fig. IV.3.a**) and 1614 (**Fig. IV.3.b**). They could have been used for sharpening tools of copper tools, wood, bone, or lithic. Adams (2002: 82–87) classifies whetstones as a variant of abraders. Examples of whetstones have also been found at Ayn Asil (Jeuthe 2012: 252, fig. 98; 258, fig. 105). At Giza, some examples have remnants of copper on the grooves or on at least one surface, such as Objects 4924 (**Fig. IV.3.c**), 1605 (**Fig. IV.3.d**), and 1904 (**Fig. IV.3.e**).

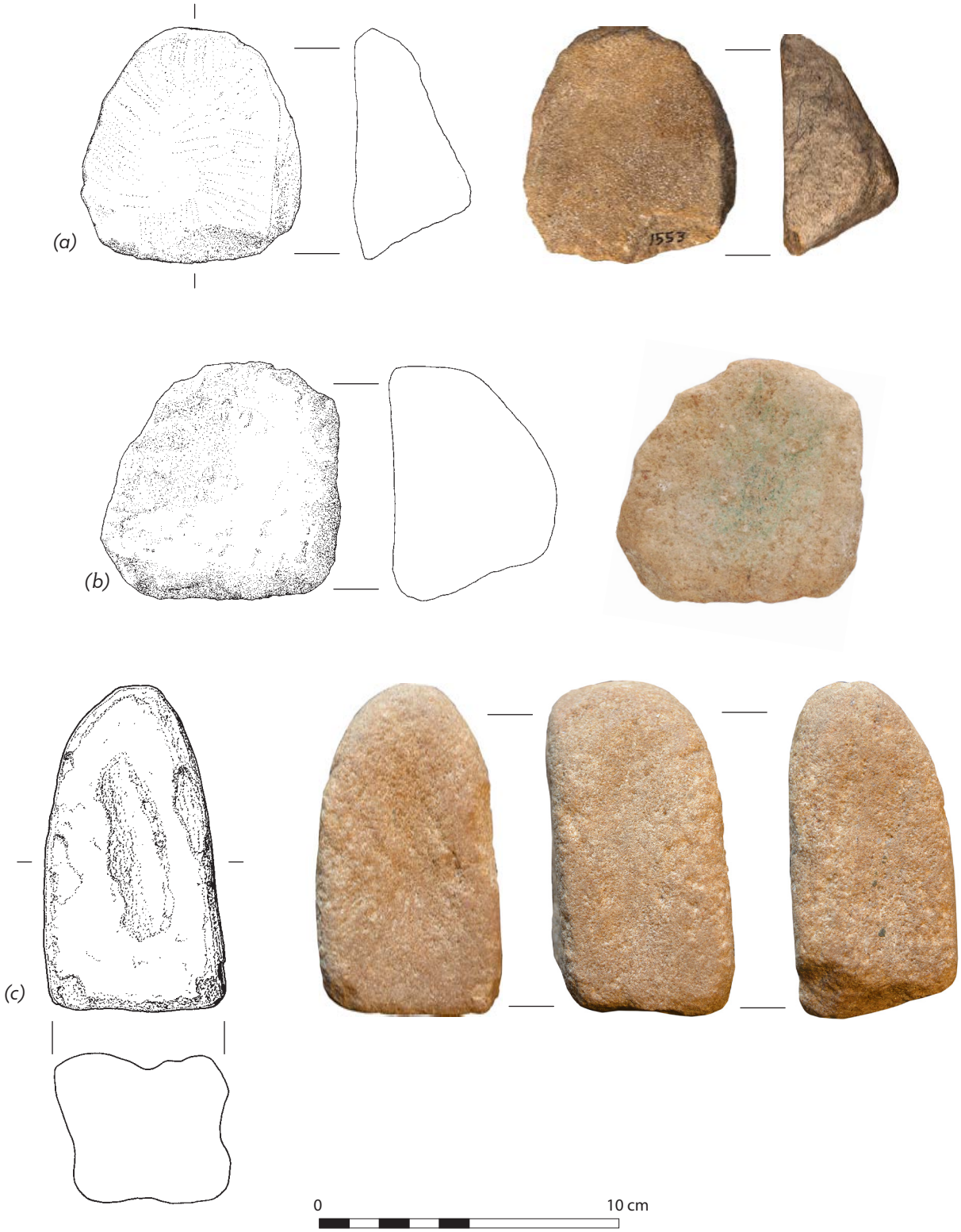


Fig. IV.3.a. A sandstone whetstone with an irregular shape and a relatively flat top surface, used for whetting activities. Tool can be single hand-held. Might have been a quern base, reused as a whetstone (see multipurpose tools and objects section). Object 1553, drawing 1000-463 by C. Hebron, photos 116841–42 by A. Eweida; ***Fig. IV.3.b.*** A quartzite whetstone from HeG with copper residue on the top working surface. Object 1614, drawing 1000-448 by C. Hebron, photo 201679 by Y. Kawae; ***Fig. IV.3.c.*** A quartzite whetstone from HeG, roughly rectangular outline when viewed from above. All four surfaces along the length of the tool have a deep groove, used for whetting. Traces of copper are visible on three surfaces. Object 4924, drawing 1000-287 by C. Hebron, photos 230484, 230487, 230489 by E. Malak.

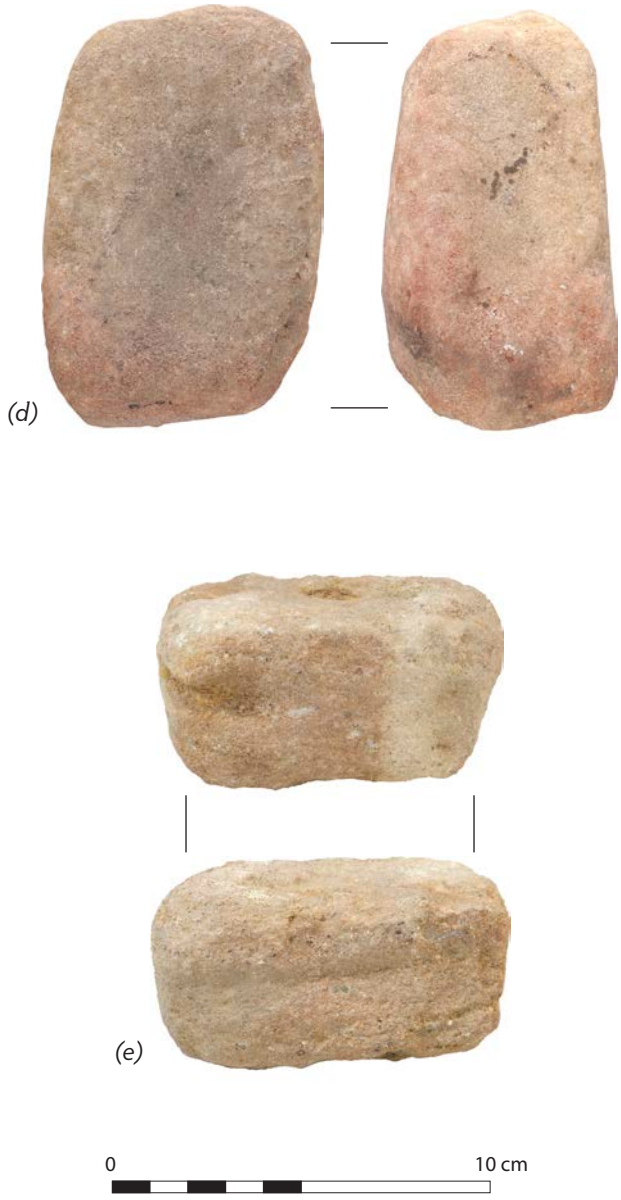
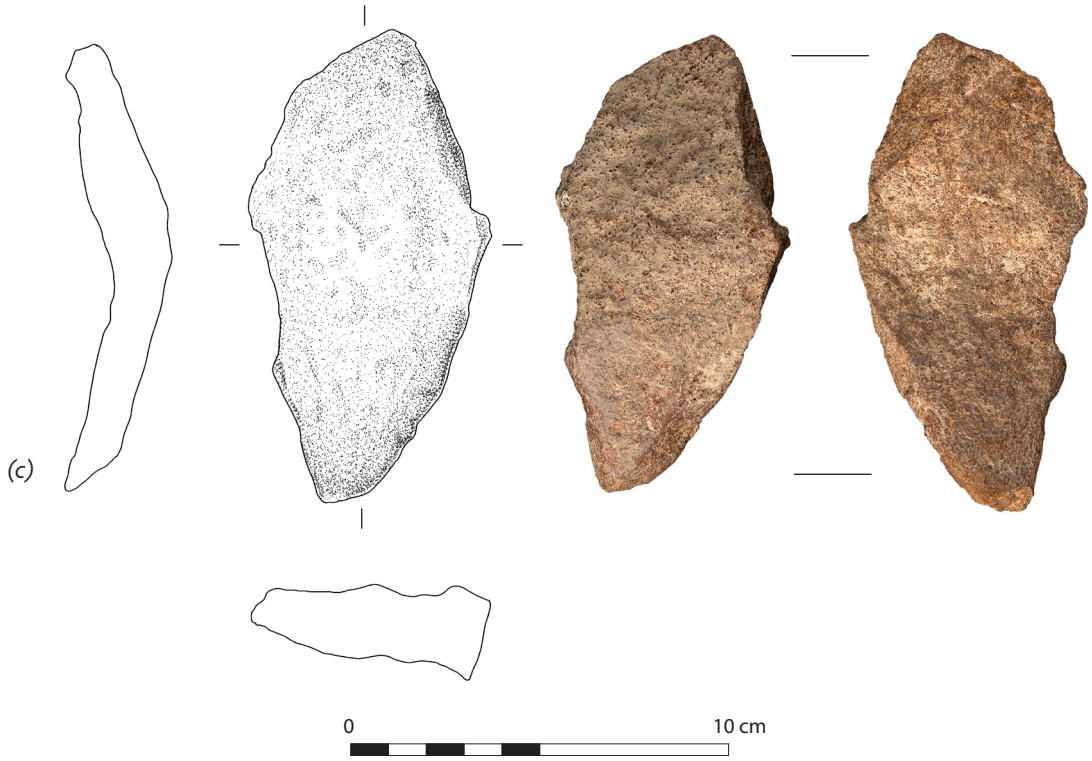


Fig. IV.3.d. A fine-grained quartzite whetstone from HeG; a cuboid-shaped tool with concave surfaces from use and traces of copper. Object 1605, photos 201686, 201688 by Y. Kawae; ***Fig. IV.3.e.*** A blocked-shaped quartzite whetstone from HeG with a deep groove on one edge that carries on one longitudinal surface and one short vertical side. Tool has copper residues on its surfaces. Object 1904, photos 909330, 909332–33 by J. Quinlan.

ABRADERS AND WHETSTONES

As mentioned earlier, the abrader and whetstone typologies overlap in certain examples because both tools were often made of the same material, mainly sandstone and quartzite. Abrader/whetstone tools have at least one surface used for whetting activities, with either a defined groove or a concave surface, and at least one flat surface that was probably used for abrasion. Like other abraders and whetstone examples, an abrader/whetstone tool does not have a defined shape and outline. It is an expediently designed tool. Examples of abrader/whetstone tools are Objects 1476 (**Fig. IV.4.a**), 1880 (**Fig. IV.4.b**), 2084 (**Fig. IV.4.c**), 3020 (**Fig. IV.4.d**), 3228 (**Fig. IV.4.e**).

Fig. IV.4.a. An irregular-shaped abrader/whetstone tool from HeG with a rectangular-shaped outline and a triangular-shaped section. Tool has vertical flat surfaces along the length and one concave surface used for whetting activities. Object 1476, photos 116753–56 by A. Eweida; ***Fig. IV.4.b.*** A quartzite abrader/whetstone from HeG, with a rectangular outline when viewed from above and a trapezoidal outline in longitudinal section. Tool's surfaces are worked, some surfaces are slightly concave in profile from whetting activities. Abrasion activities are visible on rounded corners and faceted surfaces around the object. Object 1880, drawing 1000-522 by W. Schenk, photos 909336, 909339, 909340, 909345 by J. Quinlan.



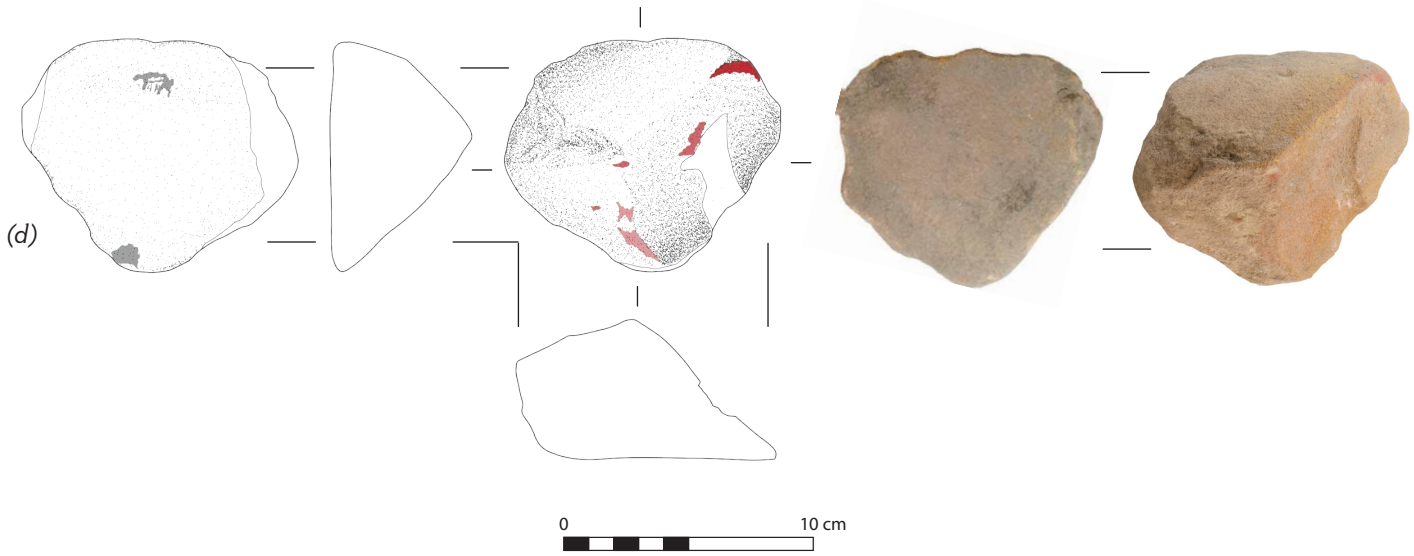


Fig. IV.4.c. A quartzite abrader/whetstone tool from HeG with an irregular shape. Tool has one concave surface, used for whetting activities, and smooth rounded surfaces on the side, which could have been used for abrasion/polishing activities. Tool fits comfortably in one hand. Object 2084, drawing 1000-884 by A. Talaat, digitally inked by P. Collet, photos 116763–64 by A. Eweida; ***Fig. IV.4.d.*** A sandstone abrader/whetstone from HeG, irregular in shape. Tool has smooth surfaces from use and one surface with a depression, used for whetting activities. Tool has traces of red ochre. Object 3020, drawing 1000-899 drawn by R. M. Abd el-Salam, digitally inked by P. Collet, photos 909390–94 by J. Quinlan.

RECUT POTSHERD TOOLS

In addition to the previously mentioned stone polishing tools, a few examples of recut ceramic potsherd abraders, burnishers, and scrapers have been excavated, mainly in HeG (almost 70), and a few examples from KRO (13), KKT (5), and MVT (1).

Ceramic abraders are thick cube-shaped tools. They are made of a coarse texture to quickly reduce the size of the surface of the object on which they are being used. Their use wear surfaces are the vertical sides around the tool, rather than the inner or outer surfaces. Like stone abraders, recut potsherd abraders were probably used at an early stage of processing, before burnishers were used. Examples of ceramic abraders are Objects 2253, 2254, 2260, and 2270 (**Fig. IV.5.a**).

Ceramic recut burnishers have mostly curved-shaped outlines. Burnishers have a slightly concave inner surface and slightly convex outer surface in longitudinal sections, due to the original shape of the pot. They are made from fine marl. Like other polishing tools, burnishers were probably shaped due to use, expediently designed. Traces of use are visible on vertical sides around the curved sides of the tool, rather than upper or under surfaces. Burnishers were used for smoothing/rubbing surfaces. Examples of ceramic burnishers are objects number 1784 (**Fig. IV.5.b**), 1938 (**Fig. IV.5.c**), 3728 (**Fig. IV.5.d**), and 4202 (**Fig. IV.5.e**).

Recut potsherd scrapers have no particular outline. They have slightly concave inner surface and slightly convex outer surface in longitudinal sections, due to the original shape of the pot. The inner side slopes upwards towards outer surface creating a beveled edge. There are scraper examples of both fine marl fabrics and some of more coarse textures. Examples of ceramic scrapers are Objects 2247 (**Fig. IV.5.f**), 2626 (**Fig. IV.5.g**), 2636 (**Fig. IV.5.h**), and 4734 (**Fig. IV.5.i**). Ceramic scraper examples were found at Ayn Asil (Jeuthe 2012: 309, figs. 121–22).

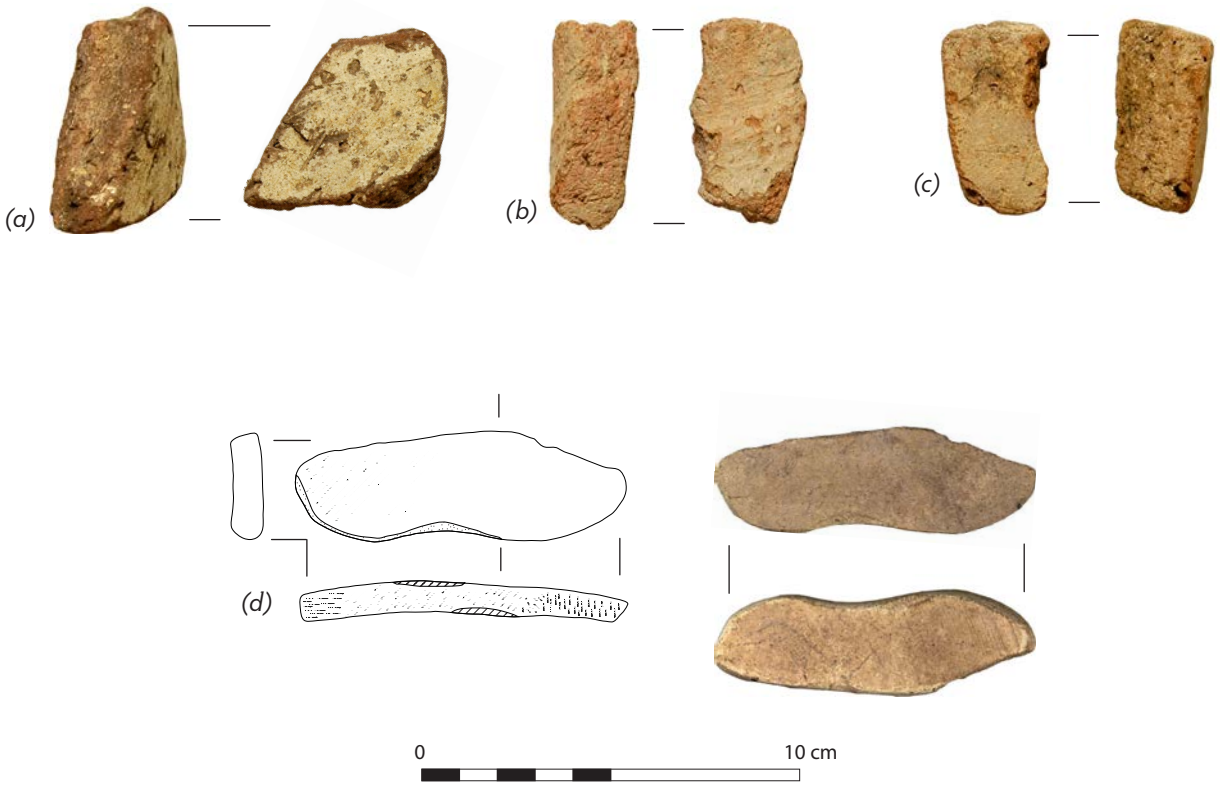


Fig. IV.5.a. A coarse recut potsherd abrader from HeG, with an irregular shape. Tool has a vertical worked surface along the length. Object 2253, photos 805605, 805607 by Y. Kawae; ***Fig. IV.5.b.*** A coarse recut potsherd abrader from HeG, with a rectangular outline, a slightly concave inner surface, and a worked surface along the length. Object 2260, photos 805605, 805607 by Y. Kawae; ***Fig. IV.5.c.*** A coarse recut potsherd abrader from HeG, rectangular outline when viewed from above and a worked vertical side along the length. Object 2270, photos 805605, 805607 by Y. Kawae; ***Fig. IV.5.d.*** A ceramic burnisher from HeG, elongated outline when viewed from above, with curved sides. Vertical sides along the length of the tool are worked and smoothed from use. Object 1784, drawing 1000-959 by A. Talaat, photos 117276–77 by A. Eweida; ***Fig. IV.5.e.*** A recut potsherd burnisher from HeG, irregular in shape, with worked vertical sides along all sides of the object. Object 1938, drawing 1000-494 by W. Schenk, photos 511237–38 by A. Tavares.

Fig. IV.5.f. A recut potsherd burnisher from HeG with worked vertical sides around the sides of the tool and a few fine striations on one surface. Object 3728, drawing 1000-954 drawn by A. Talaat, digitally reconstructed and inked by P. Collet, photos 117286–87 by A. Eweida; ***Fig. IV.5.g.*** A "bow"-shaped ceramic recut burnisher from KRO. All vertical sides around the tool are smoothed and worked from burnishing. Object 4202, drawing 1000-958 drawn by A. Talaat, digitally inked by P. Collet, photos 108119–20 by A. Eweida; ***Fig. IV.5.h.*** A ceramic rectangular-shaped scraper with a coarse texture. One flat surface—the inner surface has a beveled side, sloping towards the top surface and was used for scraping. Object 2247, drawing 1000-664 by W. Schenk, photos 914439, 914441–42 by J. Quinlan.

Fig. IV.5.i. A ceramic scraper with an irregular shape from HeG, with one beveled side on the bottom surface. Object 2626, photos 117267–68 by A. Eweida; ***Fig. IV.5.j.*** A recut potsherd scraper from HeG with a rectangular outline when viewed from above with a convex upper surface and a concave bottom surface. One short side across the width of the tool is beveled on the bottom surface. Object 2636, photos 117180–82 by A. Eweida; ***Fig. IV.5.k.*** A trapezoidal-shaped ceramic scraper from KKT with a coarse texture. Object 4734, photos 117261–62 by A. Eweida.

A spinning scene showing workers pulling yarn and spinning it using a spindle whorl and a rod (Wild 1953, pl. CXXI).

WEAVING TOOLS

Weaving was one of the many different crafts taking place on the Giza Plateau. As discussed below, weaving tools found by AERA team members indicate that different activities might have taken place at Giza, like yarn production, weaving using looms, and the possibility of basketry, rope production, leather working, or thread production. A number of artifacts indicate evidence for such activities, including weaving points (a total of 25), spindle whorls (20), weaving rods (7), and points/rods (4). There are a total of 56 weaving tools found at HeG (47), KRO (5), KKT (3), and MVT (1). Weaving rods and points are mostly made of bone, with very few examples made of either clay or wood. Spindle whorls are mostly made of ceramic (11). Other examples are made of limestone (5), travertine (1), ivory (1), chert (1), and quartzite (1). We do have a few copper weaving tools and points, but these are not discussed here as they are pending study by metal specialists.

WEAVING POINTS

Weaving points have a triangular outline when viewed from above, a pointed tip/bit end, and a roughly square/circular cross-section. The bit ends are sharpened and worked. On most weaving points, fine parallel striations are visible along the length of the tool and at its point. In some cases, there are a few fine striations across the width of the tool. Striations along the length and across the width of the tool are caused by the manufacturing of the tool and made due to use-wear. Some examples have finished surfaces with sheen visible, like Objects 1679 (**Fig. V.1.a**) and 4046 (**Fig. V.1.b**). Other examples have unfinished outer surfaces, like Object 4199 (**Fig. V.1.c**).

Weaving points are mostly made of bone, with a few examples of clay or wood. Most of the examples are not complete and are broken across the width. Weaving points have a triangular outline when viewed from above; a pointed, yet blunt tip/bit end; and a cross-section that can be roughly rectangular, square, or circular. The bit end is shaped and worked to by slightly pointed. Weaving points are thought to have been used for basketry, rope production, thread-twisting, woodworking, leather-working, or weaving (Becker 2001: 130). Other examples of weaving points are Objects 2392 (**Fig. V.1.d**), 3257 (**Fig. V.1.e**), and 4177 (**Fig. V.1.f**). Kromer excavated similar examples of bone points at Giza (1972: 40, Taf. 12, no. 3). An unusual example from our Giza weaving point selection is a fragment of the end of one bone point from HeG, Object 4070 (**Fig. V.1.g**). The tool has a rectangular outline when viewed from above and in both sections, along length and across the width. What is unusual about it is that the remaining end is perforated through the width of the tool. In comparing the small fragment with other similar examples (Petrie 1917: Pl. LXV, nos. 118–21; Kromer 1972: 45, Taf. 24, no. 4), it is thought that the original tool was actually a weaving point and not a rod.

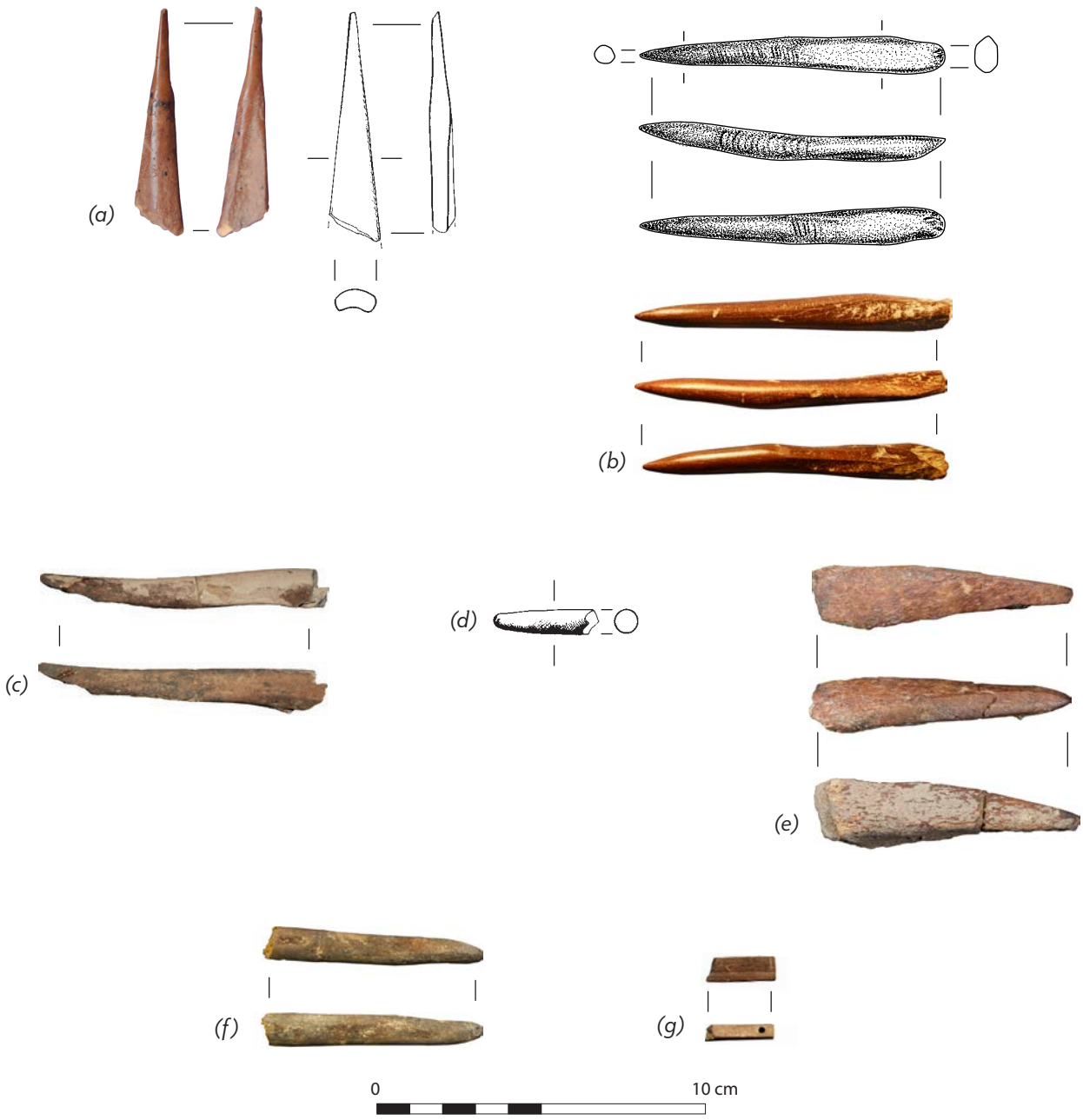


Fig. V.1.a. A pointed triangular-shaped bone point. Tool has fine parallel lateral striations from use that go around its width. Object 1679, drawing 1000-482 by W. Schenk, photos 511348–49 by A. Tavares; ***Fig. V.1.b.*** A pointed bone point from HeG, almost complete, with fine striations along the length and across the width of the tool. Object 4046, drawing 1000-829 drawn by Y. Mahmoud, digitally reconstructed and inked by P. Collet, photos 414096, 414099–100 by C. Malleson; ***Fig. V.1.c.*** An incomplete bone weaving point from KRO, with a reserved bit edge. Tool's surface is not polished. Object 4199, photos 107702, 107703 by E. Malak; ***Fig. V.1.d.*** An incomplete clay weaving point from HeG with the pointed bit remaining. Object 2392, drawing 1000-629 by W. Schenk; ***Fig. V.1.e.*** An almost complete bone point from HeG with one side finished and slightly smooth, with the opposite side eroded. Tool has a pointed bit. Object 3257, drawing 1000-655 by W. Schenk, photos 914447–49 by J. Quinlan; ***Fig. V.1.f.*** A wood weaving point from KRO with a blunt bit point, oval-shaped cross section, and a smooth outer surface. Object 4177, photos 417152–53 by S. Hitchens; ***Fig. V.1.g.*** A fragment of a bone point with drilled hole at one end. Tool's surface is polished, with traces of fine parallel incisions. Object 4070, photos 414033–34 by C. Malleson.

WEAVING RODS

It is difficult at times to differentiate between the fragments of weaving points and weaving rods. The main difference between these types is the bit end. Both types of tools could have a square/rectangular cross-section at times, meaning that when the pointed end is missing, identification can be tricky. These types of tools are grouped here as points/rods; we have 5 fragments, all from HeG, made of bone. Object 2002-492 is an example of a point/rod (**Fig. V.2.a**). The weaving rods excavated are all made of bone. Six examples are from HeG and 1 is from MVT. Weaving rods have a rectangular outline when viewed from the top and a thin, flat cross-section. Some examples have finished and polished surfaces. Weaving rods have more rounded ends while weaving points have a pointier bit. Weaving rods were used in weaving on horizontal looms by pushing down the thread (for more, see Tavares 2004: 11). Examples are Objects 1611 (**Fig. V.2.b**) and 2000-197 (**Fig. V.2.c**).

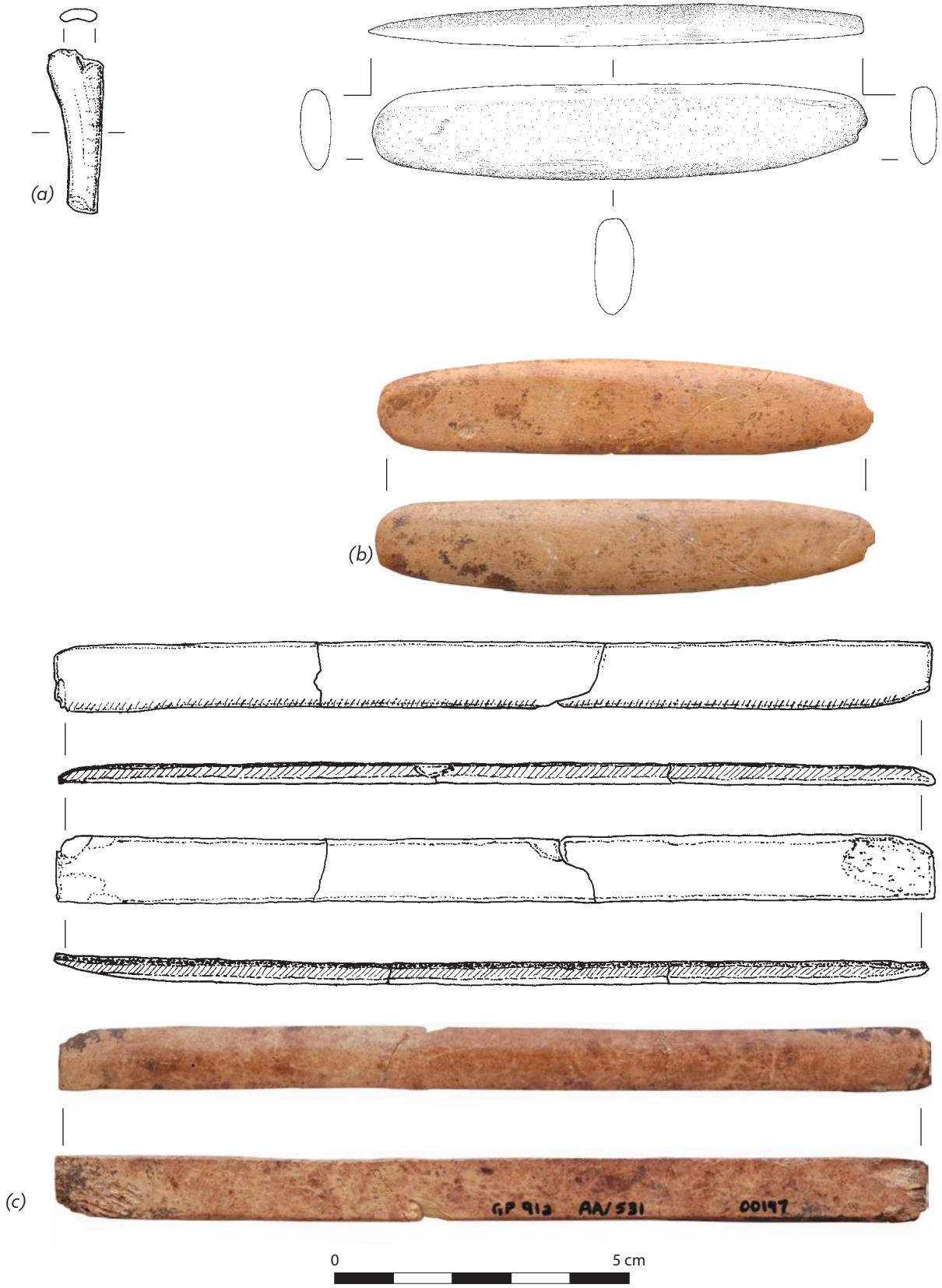


Fig. V.2.a. An incomplete bone weaving point/rod. Surface is well polished with fine longitudinal striations. Object 2002-492, drawing 1000-232 by C. Hebron; ***Fig. V.2.b.*** A complete bone weaving rod from HeG, with an elongated oval outline and highly polished surfaces. Object 1611, drawing 1000-431 by J. Karlsson, photos 302913 and 302916 by Y. Kawae; ***Fig. V.2.c.*** A bone weaving rod from HeG, with rectangular outline when viewed from above and highly polished upper surface. Tool is broken into three pieces, but restored. Object 2000-197, drawing 1000-242 by C. Hebron, photos 302979–81 by Y. Kawae.

SPINDLE WHORLS

Spindle whorls have a circular outline when viewed from the top and are perforated through the middle. To date, we have found both disc- and dome-shaped whorls. Spindle whorls were used as weights on spindle shafts, possibly of wood, for spinning thread. The spindle is the hieroglyphic sign for the word *ḫsf* which means "spin" (Gardiner 2001: 520, sign U34). The use of a dome-shaped spindle whorl is depicted in the tomb of Ti (see scene on p. 70, Wild 1953 2: pl. CXXI.) To date, there is no evidence of spindle shafts recovered from any sites where AERA team members have excavated. This could be due to the fact that wood can decompose, hence it is not easily found.

Spindle whorls were found in HeG (16), KKT (2), and KRO (2). Spindle whorl examples are object numbers 1998-15 (**Fig. V.3.a**), 1571 (**Fig. V.3.b**), 2558 (**Fig. V.3.c**), 2994 (**Fig. V.3.d**), and 2998 (**Fig. V.3.e**). Similar whorls of disc- and dome-shapes are published by Petrie, although his examples are later in date, dating to the Middle and New Kingdoms, with a few examples dating earlier found in Naqada (1917: 53, pl. LXV, Nos. 138, 144–46). See also Hitchens 2018 for more on the whorls discovered by the AERA team.

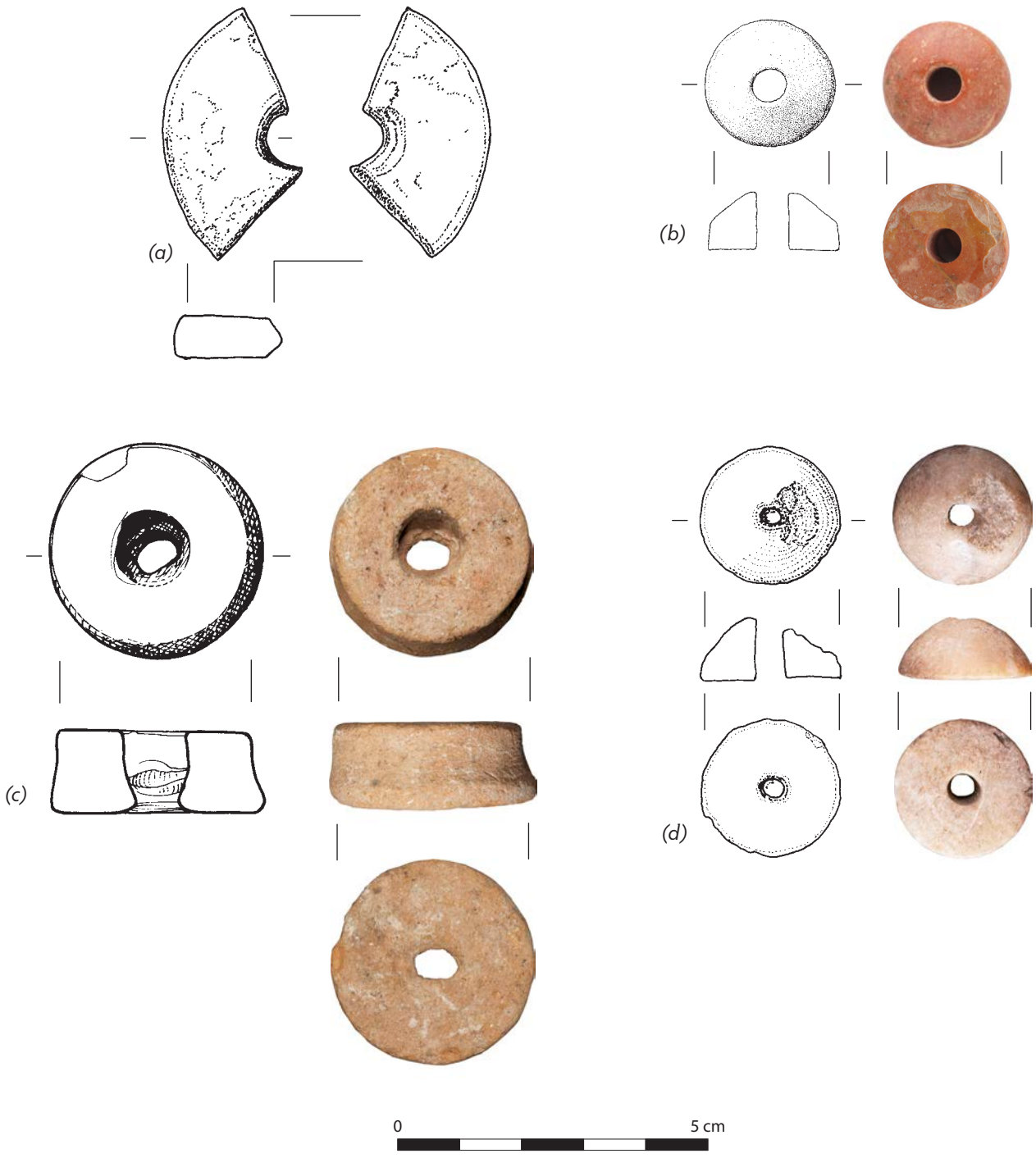


Fig. V.3.a. An incomplete ceramic whorl from HeG, about one-third preserved. Object 1998-15, drawing 1000-306 by C. Hebron; ***Fig. V.3.b.*** A complete chert small whorl from HeG, with a dome-shaped upper surface and a flat lower surface. The lower surface shows a few fine concentric lines near the hole. Object 1571, drawing 1000-428 by J. Karlsson, photos 302919, 302923 by Y. Kawae; ***Fig. V.3.c.*** A complete ceramic whorl from HeG. One surface has a smaller diameter than the opposite side. Object 2558, drawing 1000-628 by W. Schenk, photos 914243–45 by J. Quinlan; ***Fig. V.3.d.*** Like the chert example of object number 1571, this travertine spindle whorl from HeG has a dome-shaped section across its height, with a small part chipped off. Object 2994, drawing 1000-205 by C. Hebron, photos 914329, 914331, 914334 by J. Quinlan.

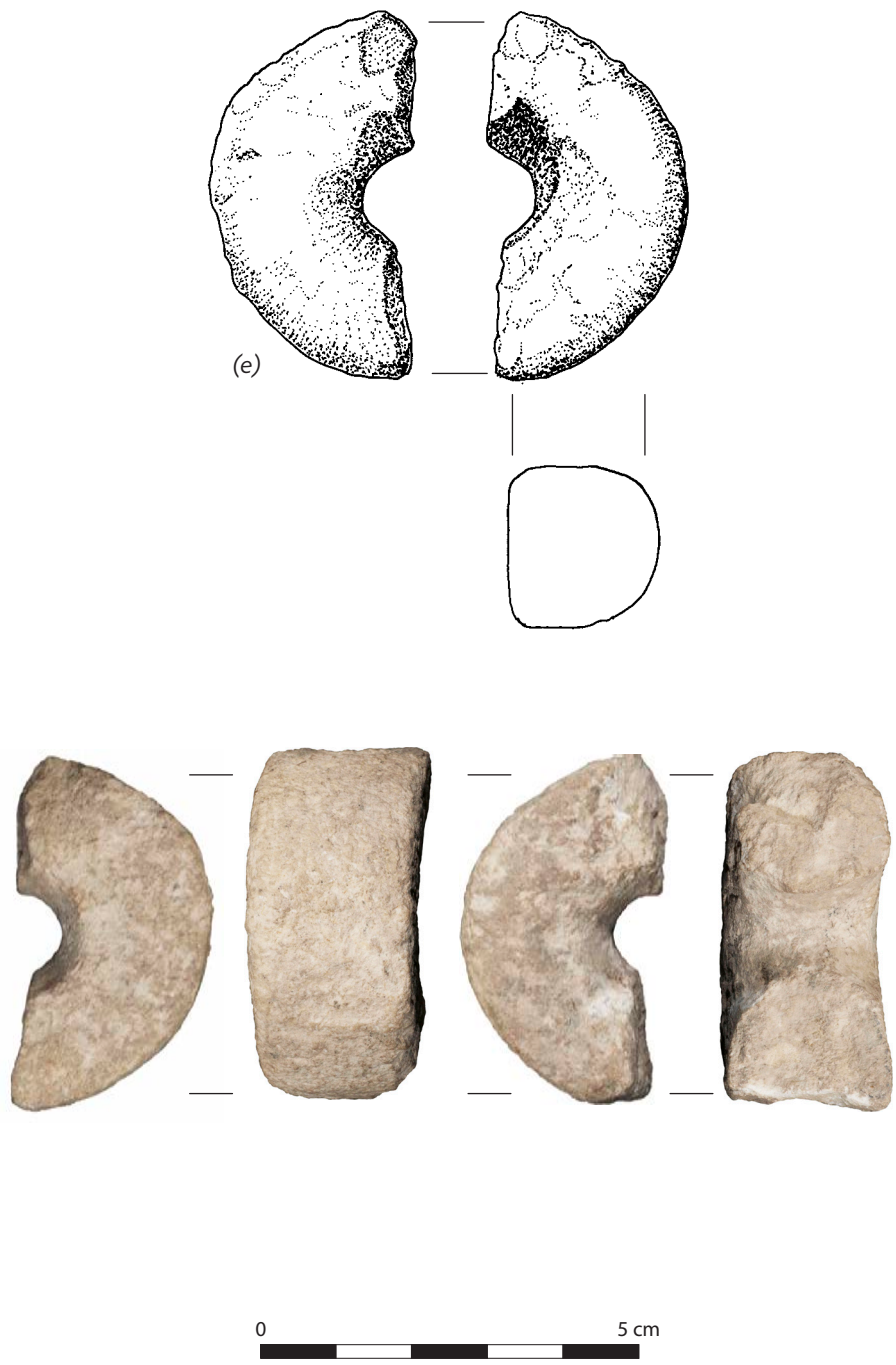
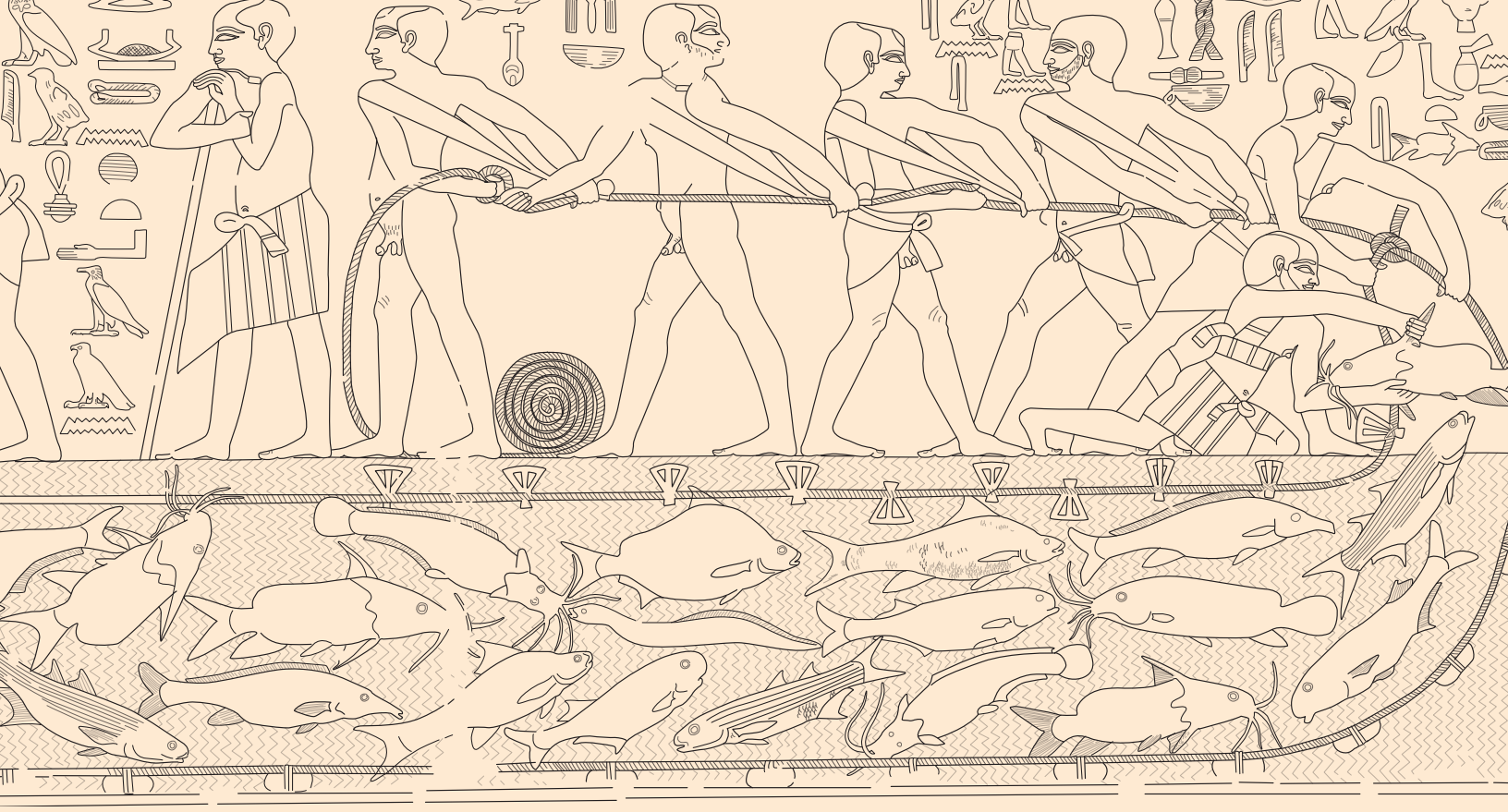


Fig. V.3.e. An incomplete limestone whorl from HeG with a beveled perforation in the middle and a slightly rough surface. Object 2998, drawing 1000-61 by C. Hebron, photos 914428–31 by J. Quinlan.



A fishing scene depicting workers using a big fishing net weighed down but a number of small net weights, from the tomb of Ti at Saqqara (Wild 1953, pl. CXXIII).

FISHING TOOLS

The collection of tools excavated from the Giza Plateau inform us about a variety of crafts and activities that took place. Among the interesting and unusual tools excavated are fishing tools. The majority of the tools were found in HeG with only few excavated at MVT and KKT. The fishing toolkit consists of fish hooks (14) and net weights (9). Fish hook examples are made of copper and net weights are of limestone.

NET WEIGHTS

A total of 9 possible limestone net weights were excavated from HeG (7), MVT (1), and KKT (1). Fishing net weights are biconical in shape, with an oval outline when viewed from above with straight to rounded vertical ends, and with a central deep groove cut around the circumference of the object. In some examples, traces of use wear are visible on the surfaces, like parallel striations along the length, across the width, or on the deep groove, from the use of the rope. Examples of fishing weights are Objects 2000b-21 (**Fig. VI.1.a**), 2000b-30 (**Fig. VI.1.b**), 2002-515 (**Fig. VI.1.c**), and 1523 (**Fig. VI.1.d**). Similar fishing weights are depicted on a fishnet in the tomb of Ti at Saqqara (Wild 1953: pl. CXI). A smaller example of a net weight is Object 2147 (**Fig. VI.1.e**), a complete limestone example, oval in outline, with a circular cross-section and a groove in the center that goes around its circumference. The outer surface is not smoothed. This kind of small weight is also depicted in a fishing scene in the tomb of Ti at Saqqara, as seen in the drawing on the previous page (Wild 1953: pl. CXXIII). Another example of a possible net weight is Object 3899, a limestone weight from KKT. The object has a rectangular outline and a groove in the center. The outer surfaces of the tool were shaped but not smoothed (**Fig. VI.1.f**).

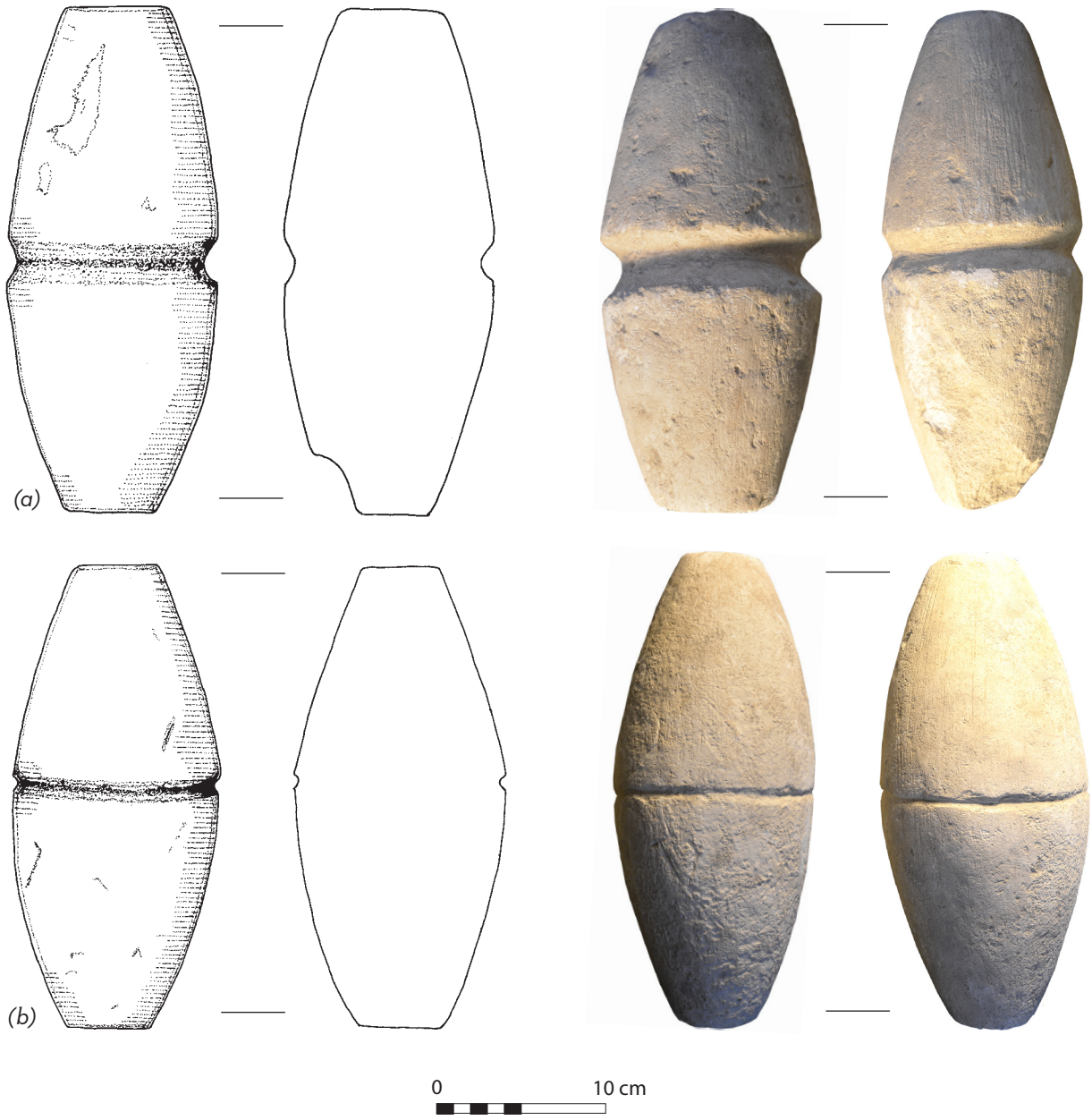


Fig. VI.1.a. A complete limestone fishing weight from HeG, with one part chipped off near the end of the tool. Traces of fine striations visible on the object. Object 2000b-21, drawing 1000-246 by C. Hebron, photos 416821, 416826 by R. M. El-Sayed; ***Fig. VI.1.b.*** A complete oval-shaped limestone fishing weight from HeG, with a thin groove in the middle of the object. Object 2000b-30, drawing 1000-244 by C. Hebron, photos 416806-07 by C. Malleson.

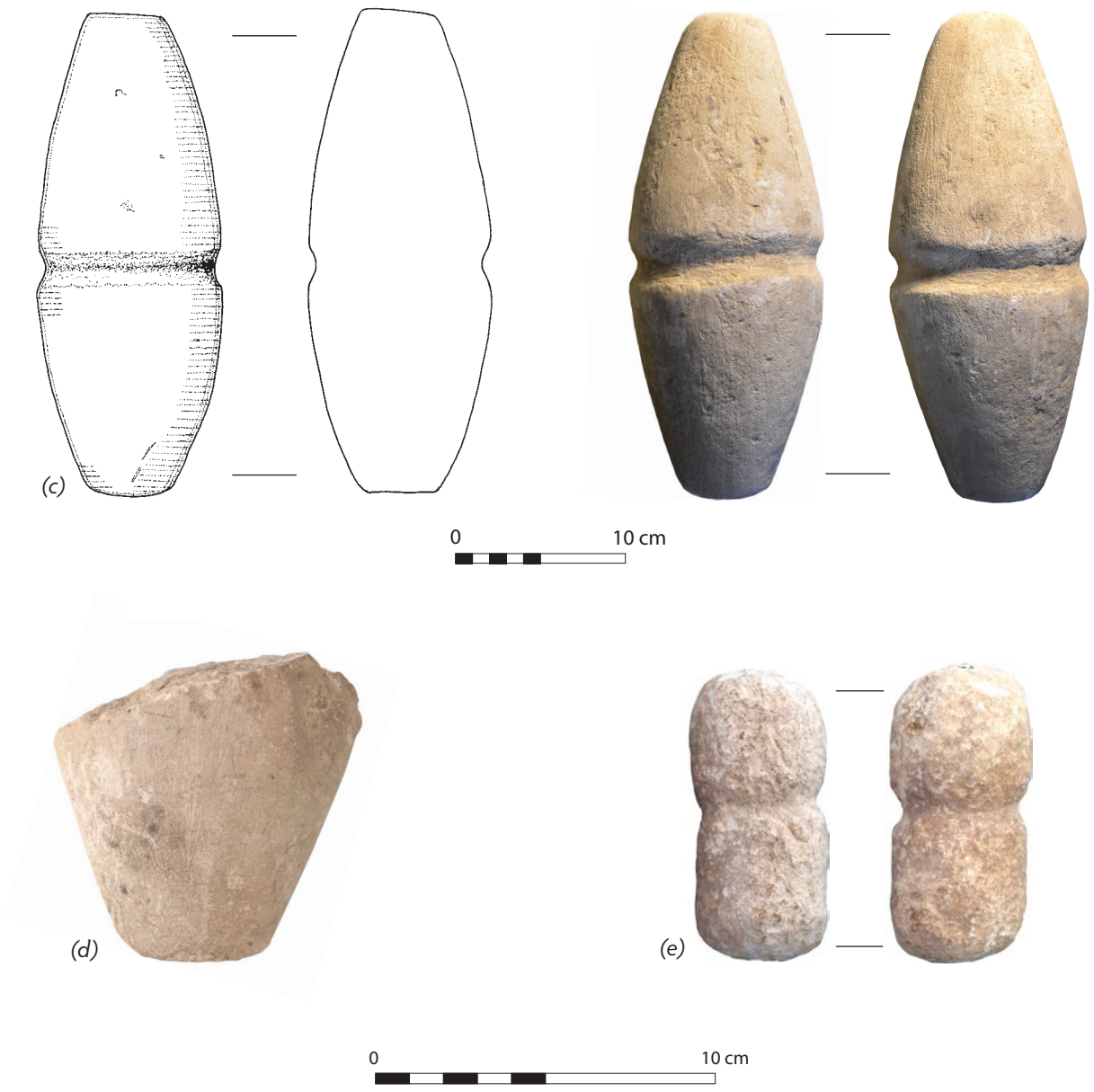


Fig. VI.1.c. A complete biconical limestone fishing weight from HeG, with a deep groove in the center of the object and longitudinal fine striations. Object 2002-515, drawing 1000-252 by C. Hebron, photos 416810–11 by R. M. El-Sayed; ***Fig. VI.1.d.*** A fragment of a limestone biconical fishing weight from HeG with well-finished outer surfaces. Object 1523, photo 201693 by Y. Kawae; ***Fig. VI.1.e.*** A limestone weight from HeG, oval outline when viewed from above with a well-defined groove line in the middle of the tool's length where the rope was tied. Surface is well-shaped but uneven. Object 2147, photos 114653, 114657 by D. Jones.

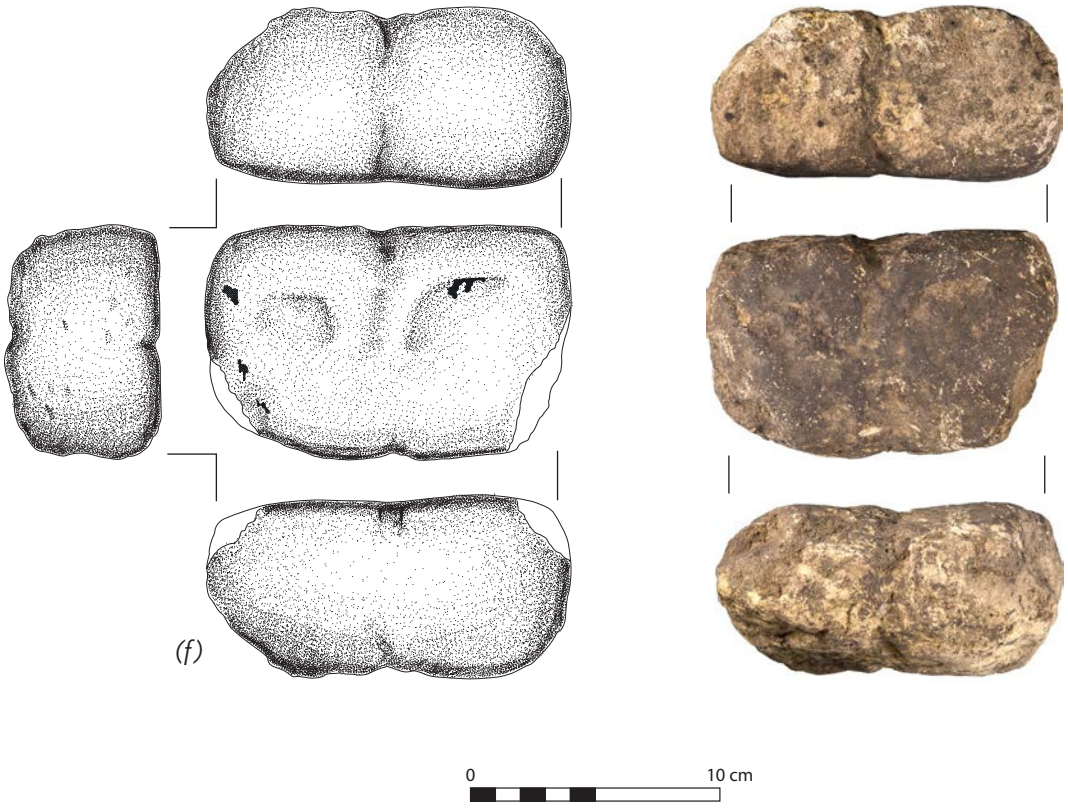


Fig. VI.1.f. A limestone weight from KKT. Object 3899, drawing 1000-897 drawn by Y. Mahmoud, digitally reconstructed and inked by P. Collet, photos 116785, 116787-88 by A. Eweida.

FISH HOOKS

Over 14 fishhooks have been recovered, 12 from HeG and 2 from MVT, all of which were made of copper. The examples have mostly corroded surfaces. Fishhooks have a curved, "J"-shaped outline when viewed from above and circular cross-sections. Some examples have a rounded bit while others are more angular in shape. Examples of fishhooks are Objects 5068 (**Fig. VI.2.a**), 2000-153 (**Fig. VI.2.b**), 2866 (**Fig. VI.2.c**), and 4745 (**Fig. VI.2.d**). For similar examples, see Petrie 1917: 37, pl. XLIV.

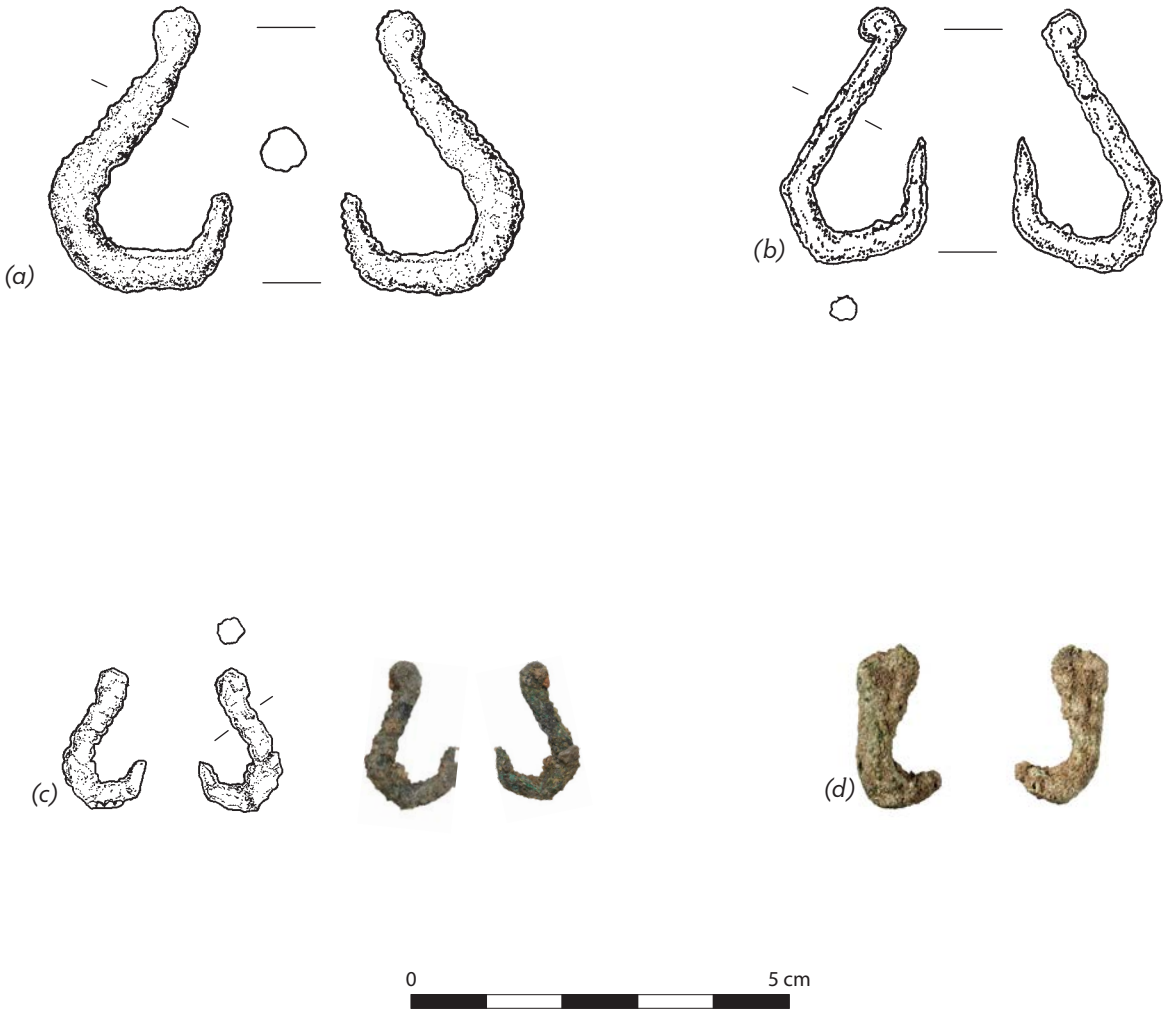


Fig. VI.2.a. A large complete corroded fishhook from HeG with a circular cross section. Object 5068, drawing 1000-210 by C. Hebron; ***Fig. VI.2.b.*** A complete corroded fishhook from HeG. Object 2000-153, drawing 1000-29 by C. Hebron; ***Fig. VI.2.c.*** A small corroded complete copper fishhook from HeG. Object 2866, drawing 1000-173 by C. Hebron, photos 909525–26 by J. Quinlan; ***Fig. VI.2.d.*** A small, badly corroded copper fishhook from HeG. Object 4745, photos 117334–35 by A. Eweida.

A jewelry-making scene showing a large bead collar from the tomb of Mereruka (Duell 1938, v.1, pl. 30).

PERSONAL ADORNMENT AND FINE OBJECTS

The personal adornment and fine objects class includes jewelry artifacts and worked faience objects. Jewelry includes beads and bracelets. The most abundant class of object from all the different sites excavated by AERA team members are jewelry artifacts, primarily beads, with a few fragments of bracelets. While there is a large number of beads excavated from all different sites (over 1,500 beads of different shapes), there are fewer than 50 bracelet fragments recovered. Worked faience objects include tiles, inlays, and faience vessels.[1] Grouped together, there are over 100 faience objects excavated.

1. Faience vessels are discussed and grouped separately from stone vessels, discussed later, since the manufacturing process of each is different.

BEADS

Beads are the most frequently found object type in all areas and in almost all phases at Giza. However, some beads are badly fragmented and/or are broken, making it difficult to know the exact number of beads recovered of each shape and material. Most beads recovered are of faience, in addition to examples of Egyptian blue, shell, clay, bone, and carnelian. Some faience beads have remains of the outer glaze remaining on their surface, with a blue-green glaze; others have powdery outer surfaces with very little to no traces of the outer glaze.

Bead typologies have been defined by Horace C. Beck (1928) and Lisa Giddy (1999: 112–16). The different shapes found at Giza are disc, drum, "eight"-shaped, "flower"-shaped, lozenge/barley-shaped, ring-shaped, spherical, and tubular-shaped. The most common shape is the tubular-shape—over 1000 beads—followed by the disc-shaped beads, at almost 300 examples. Tubular-shaped beads are long and narrow in diameter, pierced longitudinally, and with a circular cross-section. Examples of tubular-shaped beads are Objects 1205 (**Fig. VII.1.a**), 1358 a–b (**Fig. VII.1.b**), 1956 (**Fig. VII.1.c**), and 1960 (**Fig. VII.1.d**).

Three shapes of beads are very similar: disc, drum, and ring. The main difference between disc and drum is the thickness of the bead, with the disc-shaped bead having a thinner thickness than the drum-shaped ones. Object 1458 is a faience disc-shaped bead from HeG with a finished outer surface but no sheen remaining (**Fig. VII.1.e**). Another example of a faience disc-shaped bead is Object 1939 (**Fig. VII.1.f**), which is different than Object 1494 (**Fig. VII.1.g**), six faience ring-shaped beads from HeG, white in color. For a drum-shaped faience bead from HeG, see Object 1289b (**Fig. VII.1.h**). Both shapes of beads are circular in section and pierced through the thickest part. The main difference between the disc and ring shapes is the diameter of hole, which is bigger in the ring-shaped than it is in the disc-shaped beads. Ring- and disc-shaped beads have almost the same thicknesses and are both pierced through the thickness of the bead.

Eight-shaped beads take the shape of a figure eight when viewed from top, with two holes across the thickness, like two-disc shaped beads put together. Object 1627 is an example of an eight-shaped bead (**Fig. VII.1.i**). Flower-shaped beads have a flower outline when viewed from above and are pierced in the middle; an example in faience is Object 1626 (**Fig. VII.1.j**). Lozenge or barley-shaped beads are more of an elongated lentoid shape, with slightly convex sides along their length, a circular shape in cross-section, and they are pieced longitudinally (**Fig. VII.1.k**). Spherical beads are circular in cross-section, almost circular along the length, and are pierced through their height, see Object 1319b (**Fig. VII.1.l**).

Fig. VII.1.a. Faience tubular bead from HeG. Object 1205, drawing 1000-706 by M. Gaylor, photo 302804 by Y. Kawae; ***Fig. VII.1.b.*** Two faience tubular-shaped beads from HeG with powdery outer surfaces. Objects 1358a–b, drawing 1000-438 by J. Karlsson, photo 302803 by Y. Kawae; ***Fig. VII.1.c.*** Two faience tubular-shaped beads from HeG. Object 1956, drawing 1000-537 by W. Schenk**;** ***Fig. VII.1.d.*** An incomplete faience tubular-shaped bead from HeG. Object 1960, drawing 1000-536 by W. Schenk; ***Fig. VII.1.e.*** A faience disc-shaped bead from HeG with powdery outer surface. Object 1458, drawing 1000-425 by J. Karlsson, photo 302783–84 by Y. Kawae; ***Fig. VII.1.f.*** A disc-shaped faience bead from HeG. Object 1939, drawing 1000-541 by W. Schenk; ***Fig. VII.1.g.*** Six faience ring-shaped beads from HeG with remains of outer glaze. Object 1949, photo 302794; ***Fig. VII.1.h.*** A drum-shaped faience bead from HeG. Object 1289b, drawing 1000-762 by M. Gaylor; ***Fig. VII.1.i.*** An eight-shaped faience bead from HeG. Object 1627, drawing 1000-539 by W. Schenk; ***Fig. VII.1.j.*** A flower-shaped faience bead from HeG. Object 1626, drawing 1000-540 by W. Schenk; ***Fig. VII.1.k.*** A barley-shaped clay bead from HeG. Object 1230, photo 919549 by H. McDonald; ***Fig. VII.1.l.*** A spherical faience bead from HeG, pale blue-green in color with no outer sheen remaining. Object 1319b, drawing 1000-454 by J. Karlsson, photo 302827 by Y. Kawae.

BRACELETS

In modern times, there are two terms used for bracelets: bracelets and bangles. Bracelets are made of either chains or of beads; while bangles are a ridged single element. The archaeological term we use for bangles is bracelets. All the bracelet examples we have are from the HeG site. The majority of the examples are of bone (26), and chert (12), with a few examples of faience, shell, slate, and ivory. Bracelets have domed-shaped cross-sections with fine striations on the inner surfaces from manufacturing. Outer surfaces are mostly polished with remains of sheen. The bracelet examples we have are mostly fragmented; no complete bracelets have been found. The maximum diameter of the fragments is 8 cm and minimum diameter is almost 4 cm. The reason for the small bracelet diameter is unclear, but one bone bracelet fragment found in HeG had an end finished and polished. This suggests the possibility that the bracelets were not complete circles but open-ended (**Fig. VII.2.a**). Other examples of bracelet fragments are Objects 1489 (**Fig. VII.2.b**), 2395 (**Fig. VII.2.c**), 3451 (**Fig. VII.2.d**), and 3460 (**Fig. VII.2.e**).

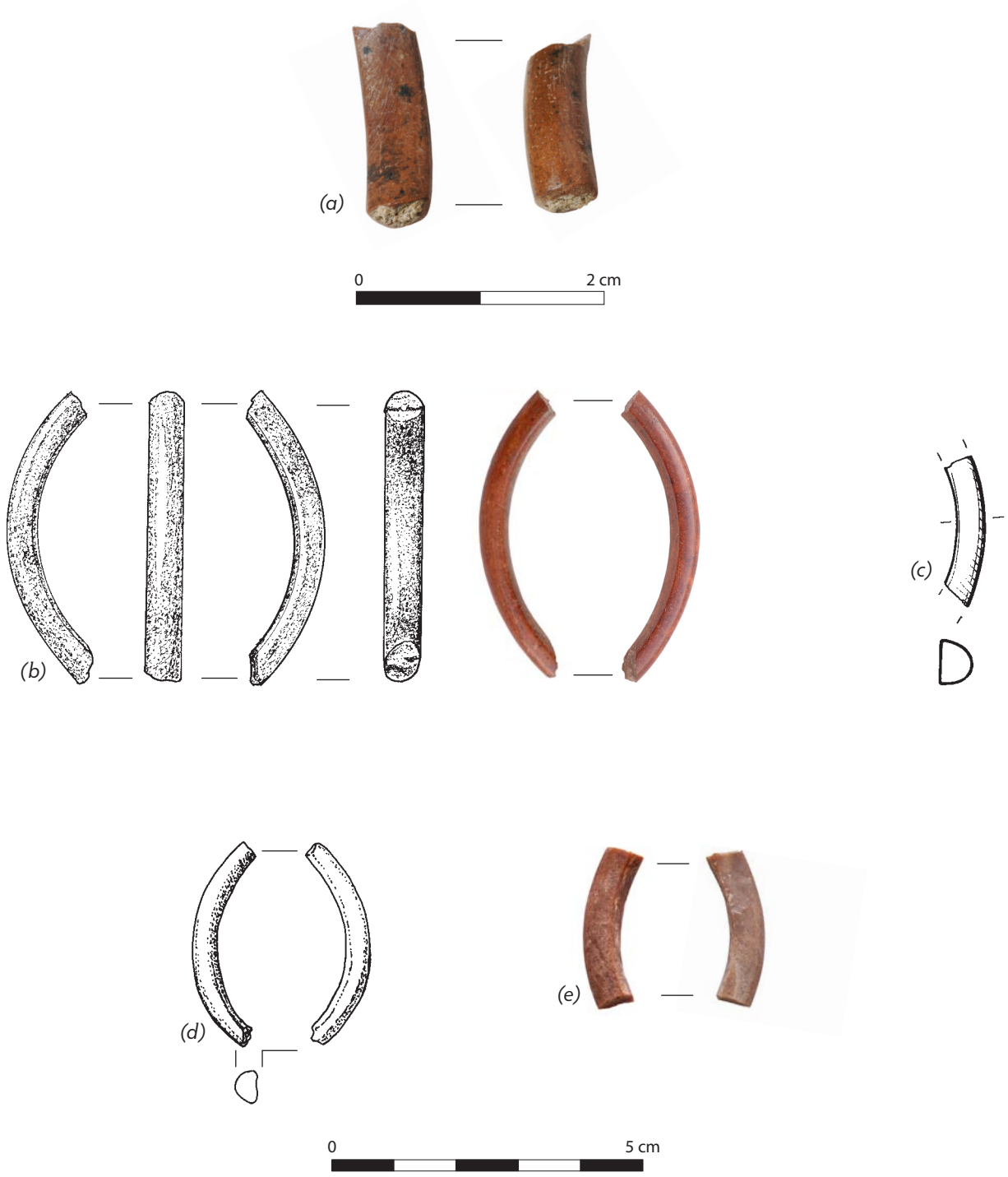


Fig. VII.2.a. Bone bracelet fragment from HeG, with fine polished surface and remains of outer sheen. One end of the bracelet is rounded and finished, suggesting that the bracelet was not a complete circle. Object 3254, photos 909511–12 by J. Quinlan; ***Fig. VII.2.b.*** Chert bracelet fragment from HeG with polished outer surface and visible outer sheen. Object 1489, drawing 1000-761 by M. Gaylor, photos 302931, 302937 by Y. Kawae; ***Fig. VII.2.c.*** A burnt faience bracelet fragment from HeG with a black powdery outer surface. Object 2395, drawing 1000-621 by W. Schenk; ***Fig. VII.2.d.*** A fragment of a bone bracelet from HeG with polished surfaces and striations from manufacturing. Object 3451, drawing 1000-143 by C. Hebron; ***Fig. VII.2.e.*** A chert bracelet fragment from HeG, brown in color with polished inner and outer surfaces and a few manufacturing striations on the outer surface. Object 3460, photos 302924, 302929 by Y. Kawae.

FAIENCE OBJECTS

In addition to the above-mentioned faience beads, faience objects of different kinds, like tiles, inlays, and vessels, were excavated by AERA team members. About 100 faience objects were recovered from HeG (80), MVT (12), KRO (5), and KKT (1). Faience objects include tiles (62), inlays (24), vessels (12), in addition to a number of unidentifiable worked faience fragments. With the exception of beads, the majority of faience objects excavated are tiles and/or inlays. The use of faience was of importance to the ancient Egyptians, as it was to "imitate semiprecious stones such as turquoise and green feldspar, as well as lapis lazuli" (Nicholson 2009: 1). Faience was assigned the term *ṯḥnt* in hieroglyphs (Faulkner 1962: 306).

Faience tiles and inlays are closely similar to one another. The majority of the faience tiles and inlays recovered are either not complete or fragmented, with the exceptions of some examples. This makes it difficult at times to identify a fragment as one type for certain, hence tiles and inlays are discussed together in this section. Tiles and inlays were found in all sites: HeG, MVT, KRO, and KKT. The majority of the examples were from HeG as there is evidence of faience production in certain areas of the site (Lehner, Kamel, and Tavares 2009: 49–59). Tiles and inlays fragments have different thicknesses of the top powdery surface in relation to the bottom layer. It is visible in some examples on the vertical surfaces or breaks of the object. Some tiles and inlays have thicker top powdery surface and a more heavily glazed surface than others, while in other examples, the bottom layer is thicker. Faience tiles and inlays were previously excavated in Giza, Abusir and Saqqara. In Giza, inlays were fitted in the furniture of Queen Khentkawes II, found by Reisner in her funerary complex (Reisner and Smith 1955; Smith and Simpson 1998: 48). Faience tiles decorated the walls of some rooms of King Djoser's subterranean palace in Saqqara (Lehner 1997: 88; Málek 2003: 45) and were also located in the funerary temple of King Raneferef in Abusir (Landgráfova 2006: 230).

Tiles have a square or rectangular outline when viewed from above, with the top and bottom surfaces parallel in most cases. Some tiles have traces of glaze and color remaining on the top surface, while other examples have more worn out or powdery surfaces. A few examples of faience tiles have fluted surfaces with pronounced parallel grooves running across the width,[1] like Objects 3080 (**Fig. VII.3.a**) and 3082 (**Fig. VII.3.b**).

Inlays are made in a variety of shapes, depending on where it would have been placed, like rectangular and semi-circular shapes. Inlays similar to the ones fitted in Queen Khentkawes' furniture were found in HeG (Landgráfova 2006: 231), for example Object 3470 (**Fig. VII.3.c**). A fragment of a rectangular-shaped tile with remains of green color on the surface was found in HeG, similar to the furniture inlays of Queen Khentkawes II. Two semicircular inlays were recovered from HeG and could have been the ancient *t* sign (Gardiner 2001: 531, sign X1) or *nb* sign (Gardiner 2001: 525, sign V30). Both inlays are similar in shape; Objects 2021 (**Fig. VII.3.d**) and 5106 (**Fig. VII.3.e**). Unique and unusual examples of faience inlays are Objects 1307 and 2320. Object 1307 (**Fig. VII.3.f**) is the oval-shaped part of an *ankh* sign. Object 2320 (**Fig. VII.3.g**) is a *wadjet*/Horus eye-shaped inlay. Both examples have raised contours and sunk hollow interiors. A unique faience tile/inlay is Object 1876 (**Fig. VII.3.h**). It has an unusual cross pattern on its top surface, creating a rhombus shaped with extended lines.

There are a few faience vessel fragments (total 12), mostly from HeG and one fragment from KRO. The vessels are small in size and are of different types. The recovered vessel fragments are mostly parts of the body, for example Objects 5103 (**Fig. VII.3.i**) and 5123 (**Fig. VII.3.j**). Three miniature jar vessels with pointed base were found in HeG (Aston 1994: 96, no. 17), for example Objects 3301 (**Fig. VII.3.k**) and 5102 (**Fig. VII.3.l**).

1. Similar examples was excavated by Kromer 1978: 77; Taf. 77, fig. 3.

Fig. VII.3.a. An incomplete square-shaped faience tile from HeG, broken into three pieces with parallel grooves on the top surface. Object 3080, photos 926406, 926410 by E. Malak, drawing 1000-1036 by L. D. Hackley; ***Fig. VII.3.b.*** A faience tile from HeG broken into two pieces with one corner missing. Object 3082, photos 926570, 926573 by E. Malak, drawing 1000- 1035 by L. D. Hackley; ***Fig. VII.3.c.*** An incomplete rectangular-shaped inlay from HeG with light green top surface and remains of the outer sheen. Object 3470, drawing 1000-65 by C. Hebron, photos 926623–24 by E. Malak.

Fig. VII.3.d. Semi-circular shaped inlay from HeG. Object 2021, drawing 1000-600 by W. Schenk, photos 925517–18 by E. Malak; ***Fig. VII.3.e.*** A faience inlay from HeG, similar to Fig. VII.3.d, yet slightly bigger in size. Object 5106, photos 926667, 926670 by E. Malak; ***Fig. VII.3.f.*** The top oval part of an ankh sign inlay from HeG with a high bored line and a hollow interior. Object 1307, photos 302767–68 by Y. Kawae; ***Fig. VII.3.g.*** An incomplete *wadjet* eye-shaped inlay from HeG. The inlay has raised border lines. Object 2320, photos 926972, 926976 by E. Malak, drawing 1000-632 by L. D. Hackley; ***Fig. VII.3.h.*** A faience tile from HeG with unique decoration on the top surface, a rhombus-shaped design. Object 1876, drawing 1000-497 by W. Schenk, photos 926651–52 by E. Malak.

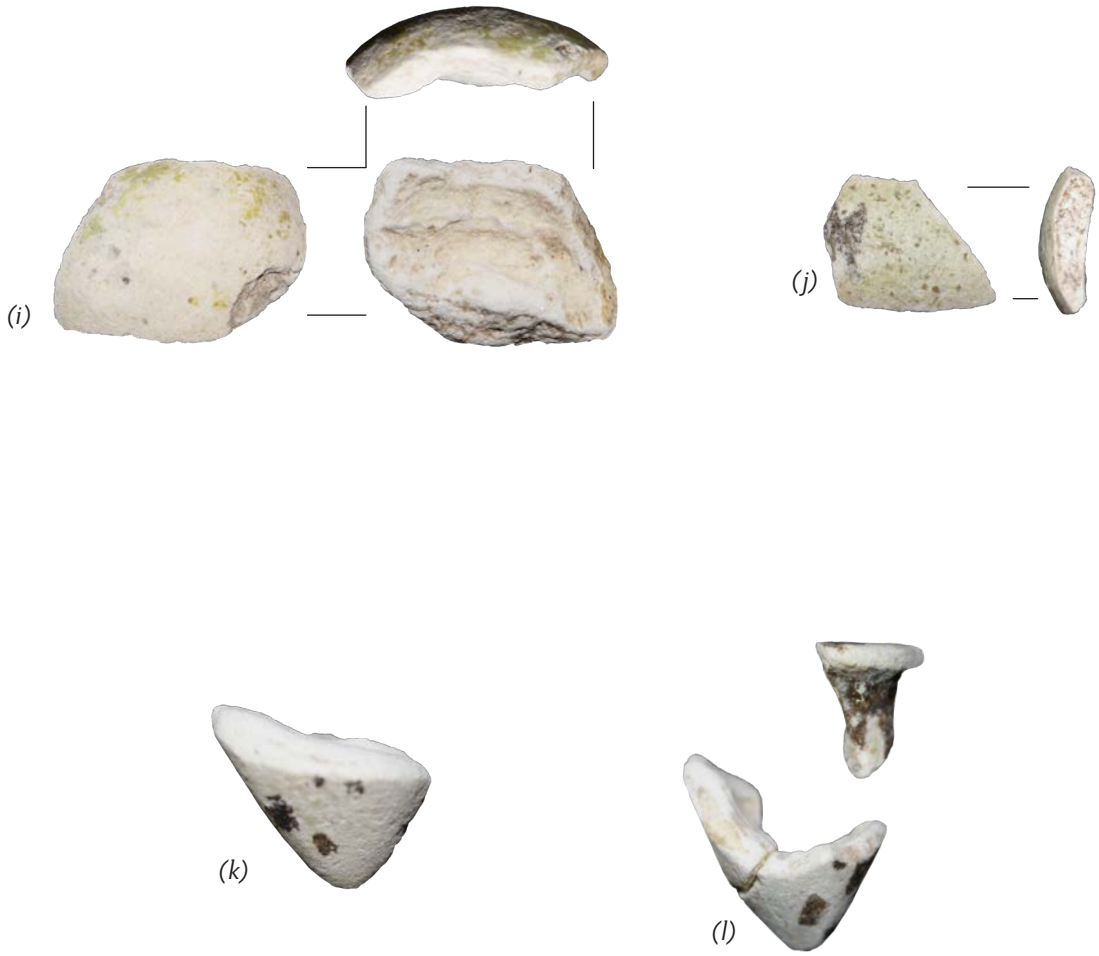
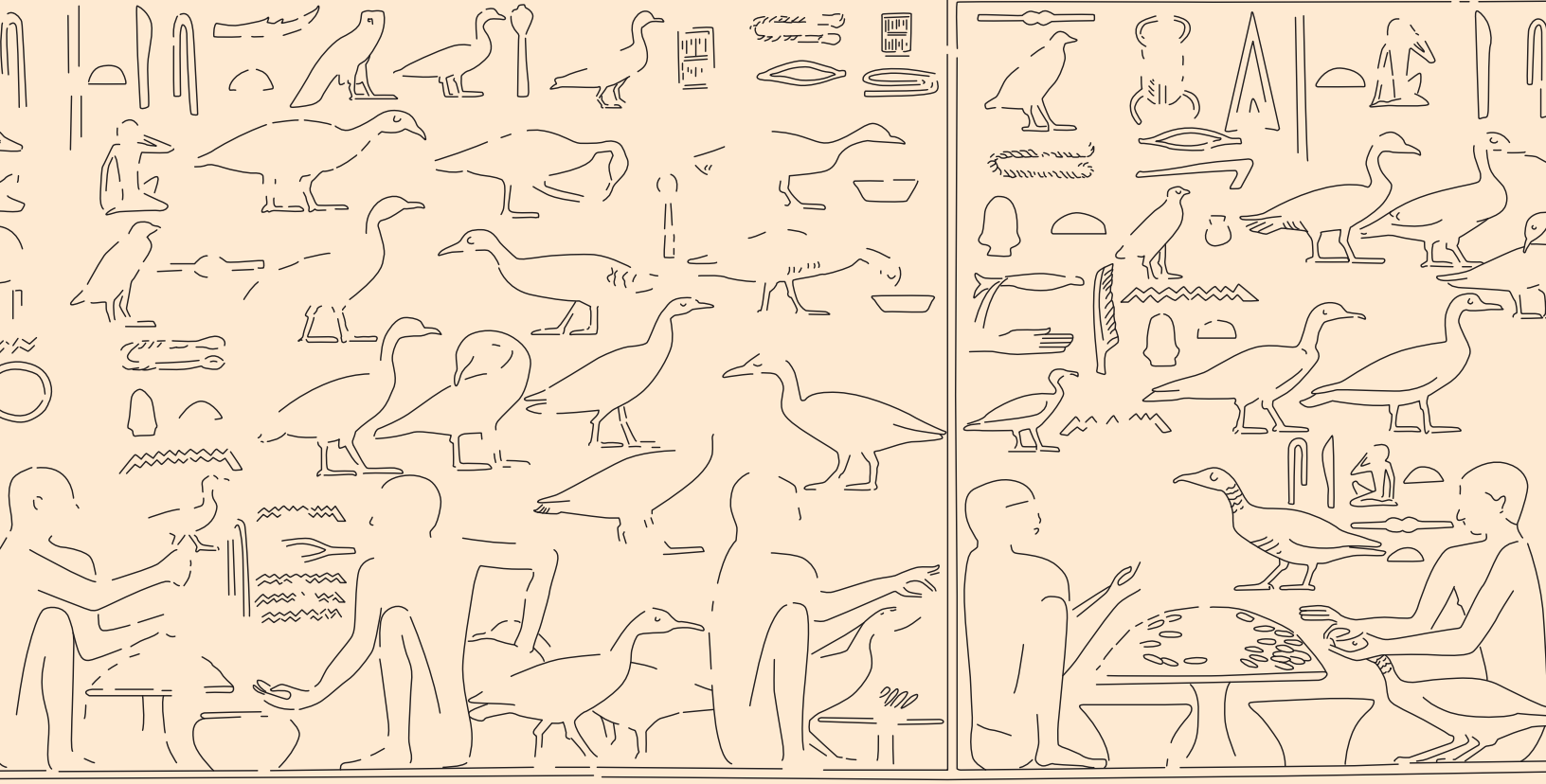


Fig. VII.3.i. Small body fragment of a faience vessel from HeG. Object 5103, photos 926833, 926834, and 926837 by E. Malak; ***Fig. VII.3.j.*** Fragment of the body of a miniature faience vessel from HeG. Object 5123, photos 926956, 926959 by E. Malak; ***Fig. VII.3.k.*** A pointed base of a faience miniature jar. Object 3301, photo 926840 by E. Malak; ***Fig. VII.3.l.*** Remains of the rim and a pointed base of a miniature faience jar from HeG. Object 5102, photo 926986 by E. Malak.



A scene of men force-feeding fowl. The grain is placed on short tables similar to examples AERA has recovered. (Épron, Daumas, and Goyon 1939: pl. VII)

HOUSEHOLD ITEMS

There are a total of 30 household items excavated from the different sites of the Giza plateau, 28 from HeG, 1 from MVT, and 1 from KRO. The household items category includes tables (14), headrests (10), and furniture supports/fittings (6). All household items recovered are made of limestone, except for two tables made of travertine, both from HeG.

TABLES

We have found a total of 14 tables, 13 from HeG and 1 from KRO. As mentioned earlier, almost all tables are made of limestone (12), just two tables from HeG are of travertine. Like most of the artifact categories recovered from the different sites of Giza, only a few complete examples of tables remain. Tables are short in height and with a flat top and a short base. The maximum height of the tables we have is 16.5 cm. The tops of the tables excavated by the AERA team members differ in shape. The majority of the tables have a circular top, like Object 4042 (**Fig. VIII.1.a**), while one complete table has a rectangular-shaped top, Object 4075 (**Fig. VIII.1.b**). A circular table is seen in the tomb of Ti in Saqqara, albeit the one in the tomb depiction is taller than Object 4042 (see scene on p. 94; Épron, Daumas, and Goyon 1939: pl. VII). The rectangular-shaped table has a very short, small knob-like base that is also rectangular in shape. Other table examples are Objects 2000b-31 (**Fig. VIII.1.c**), 4048 (**Fig. VIII.1.d**), and 4673 (**Fig. VIII.1.e**).

Fig. VIII.1.a. A complete limestone table from HeG, with a circular-shaped top and a complete short leg. Object 4042, photos 114428, 114436, 114438 by D. Jones; ***Fig. VIII.1.b.*** A complete limestone table from HeG with a rectangular top and a very short rectangular-shaped base. Object 4075, photos 114441, 114453, 114454 by D. Jones.

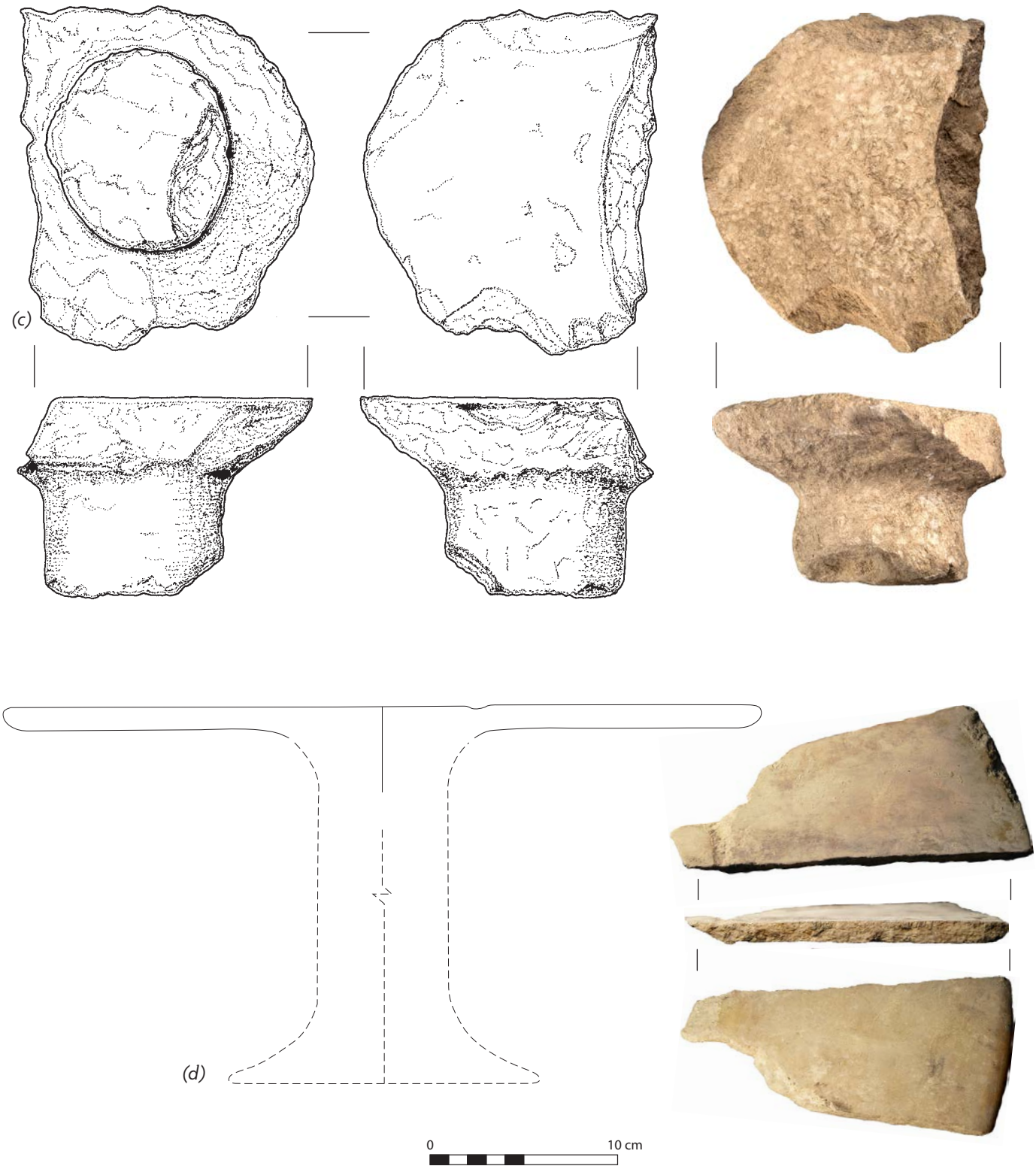


Fig. VIII.1.c. An incomplete limestone table with a circular top and an almost complete circular base from HeG. Object 2000b-31, drawing 1000-257 by C. Hebron, photos 116204-05 by A. Eweida; ***Fig. VIII.1.d.*** A travertine fragment of what would have been a circular tabletop from HeG. Object 4048, drawing 1000-832a by A. Talaat, photos 413841, 413843, 413844 by C. Malleson.

Fig. VIII.1.e. An incomplete short limestone table from HeG with a slightly oval top and a short circular leg. Object 4673, photos 116204-05 by A. Eweida.

HEADRESTS

We have recovered a total of 10 headrests, 9 from HeG and 1 from MVT. All of these are made of limestone. Headrests have a rectangular outline when viewed from above. Some examples have a rectangular outline when viewed from the side, like object 1919 (**Fig. VIII.2.a**). Other examples have a "T"-like shape when viewed from the side with a relatively thinner base, like Object 2393 (**Fig. VIII.2.b**). It has a flat base, and, in some examples, the top surface is concave in profile, as this is where the head would lie. It is also unique in shape as the object has a groove line around the top part of the headrest, suggesting that it might have been tied with a rope and reused as a weight at a later stage, after the headrest broke. Other examples of headrests are Objects1516 (**Fig. VIII.2.c**), 3562 (**Fig. VIII.2.d;** a similar example was excavated in the tomb of Qar at Abusir, Bárta 2009: 207, fig. 6.3.50.), and 4083 (**Fig. VIII.2.e;** a similar example and material is found in Abusir in the tomb of Qar, Bárta 2009: 127, fig. 5.4.26.).

Fig. VIII.2.a. A complete example of a limestone headrest from HeG, well shaped with a smooth but slightly pitted surface. Object 1919, drawing 1000-525 by W. Schenk, photos 113807, 113808, 113811 by D. Jones;
Fig. VIII.2.b. A "T"-shaped, almost complete limestone headrest, reused as a weight, from HeG, with fragile surfaces. Object 2393, drawing 1000-611 by W. Schenk, photos 116188–90 by A. Eweida.

Fig. VIII.2.c. An unusual headrest with a rectangular-shaped base that is has a depression along its height, creating an "eight"-shape in profile across the width of its base. Object 1516, drawing 1000-447 by J. Karlsson, photos 116178–81 by A. Eweida; ***Fig. VIII.2.d.*** A block-shaped incomplete limestone headrest from HeG. Top vertical surface across the width is slightly concave in profile. Object 3562, photos 116165–67 by A. Eweida.

Fig. VIII.2.e. A complete rectangular shaped limestone headrest from HeG, with a concave top vertical surface and a roughly smoothed surface. Object 4083, photos 414222–23 by C. Malleson.

FURNITURE SUPPORTS

A total of 6 limestone furniture supports have been found in HeG. Furniture supports, or furniture fittings, have a truncated pyramidion shape (or a trapezoidal prism shape), square outline when viewed from above (with a bigger square for the base and a smaller square at the top of the object). They have a square outline when viewed from the side, sloping inwards towards the top part of the artifact. The furniture supports range in size, with the tallest height being 13.5 cm, and the shortest is 9.5 cm, longest length is 17 cm and shortest length is 14.5 cm, as for the width, the largest width is 16.5 cm and shortest width is 14 cm. The heaviest of all 6 furniture supports weighs 4,735 grams and the smallest is 2,712 grams, showing that although all have being found in close proximity to each other, they vary considerably. The top surfaces of the supports have a small depression in the middle. Some depressions have a circular shape, like objects 4056 (**Fig. 3a**), 4057 (**Fig. 3b**), and 3932 (**Fig. 3c**), while others have more rectangular shapes, like objects 3930 (**Fig. 3d**), 3931 (**Fig. 3e**), and 4055 (**Fig. 3f**). The depressions are where the legs of the furniture would fit into the furniture support. Furniture supports are depicted in several tomb scenes of the Old Kingdom under seats (Épron, Daumas, and Goyon 1939: pl. XLIV; Duell 1938a: 117), and in some cases, under beds (Duell 1938b:pl. 93).

Fig. VIII.3.a. Furniture support from HeG with a slightly circular depression in the middle of the object; the object might not be finished, but still in the manufacturing phase. Object 4056, photos 114397 and 114398 by D. Jones; ***Fig. VIII.3.b.*** Furniture support from HeG with a circular depression in the middle of the object. Object 4057, photos 114375 and 114377 by D. Jones; ***Fig. VIII.3.c.*** Furniture support from HeG with an oval/rectangular depression in the middle of the object. The depression is relatively larger in size than the ones found in other examples from HeG. Object 3932, drawing 1000-733 drawn by Y. Mahmoud, digitally inked by P. Collet, photos 114421, 114423, 114426 by D. Jones.

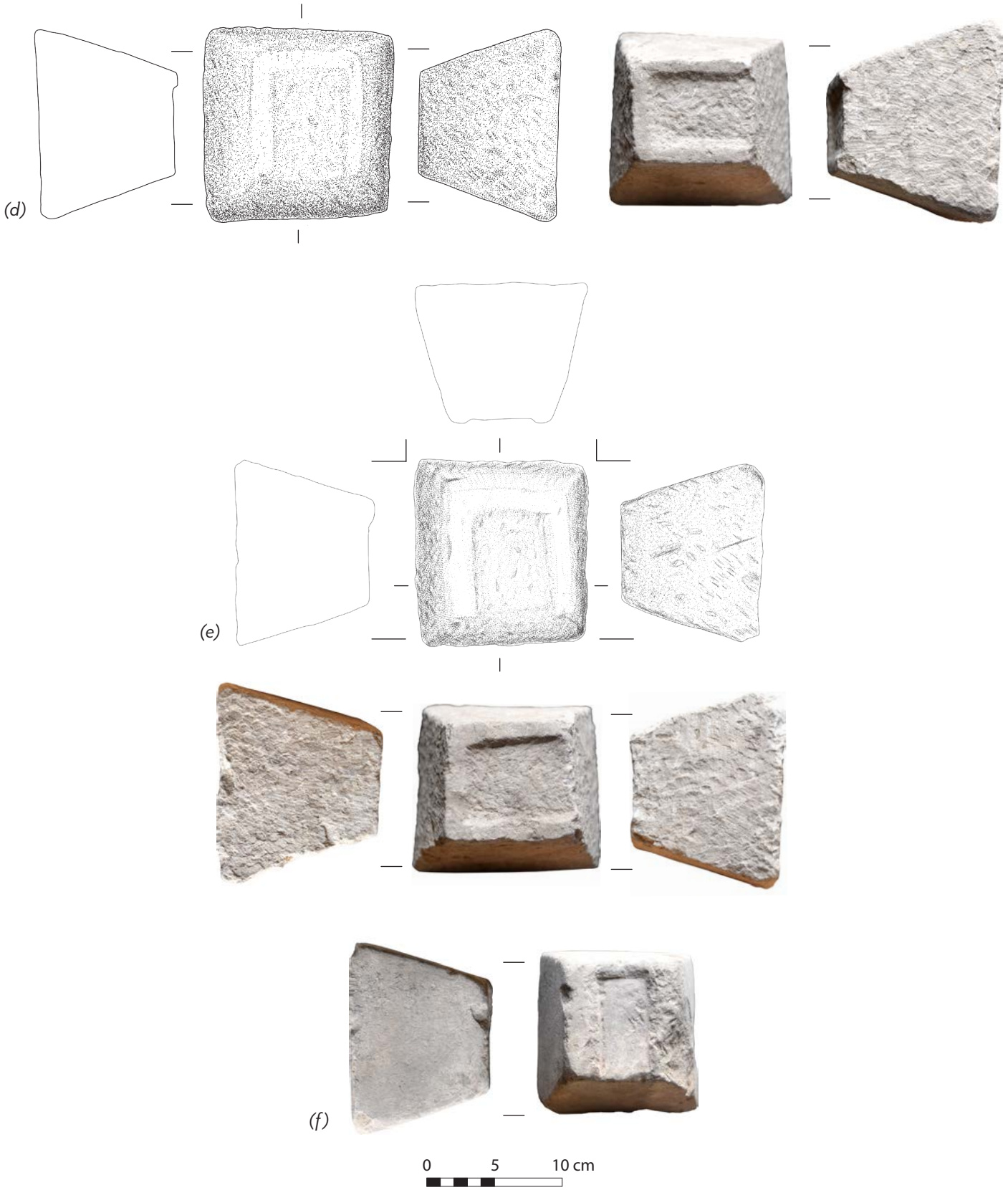
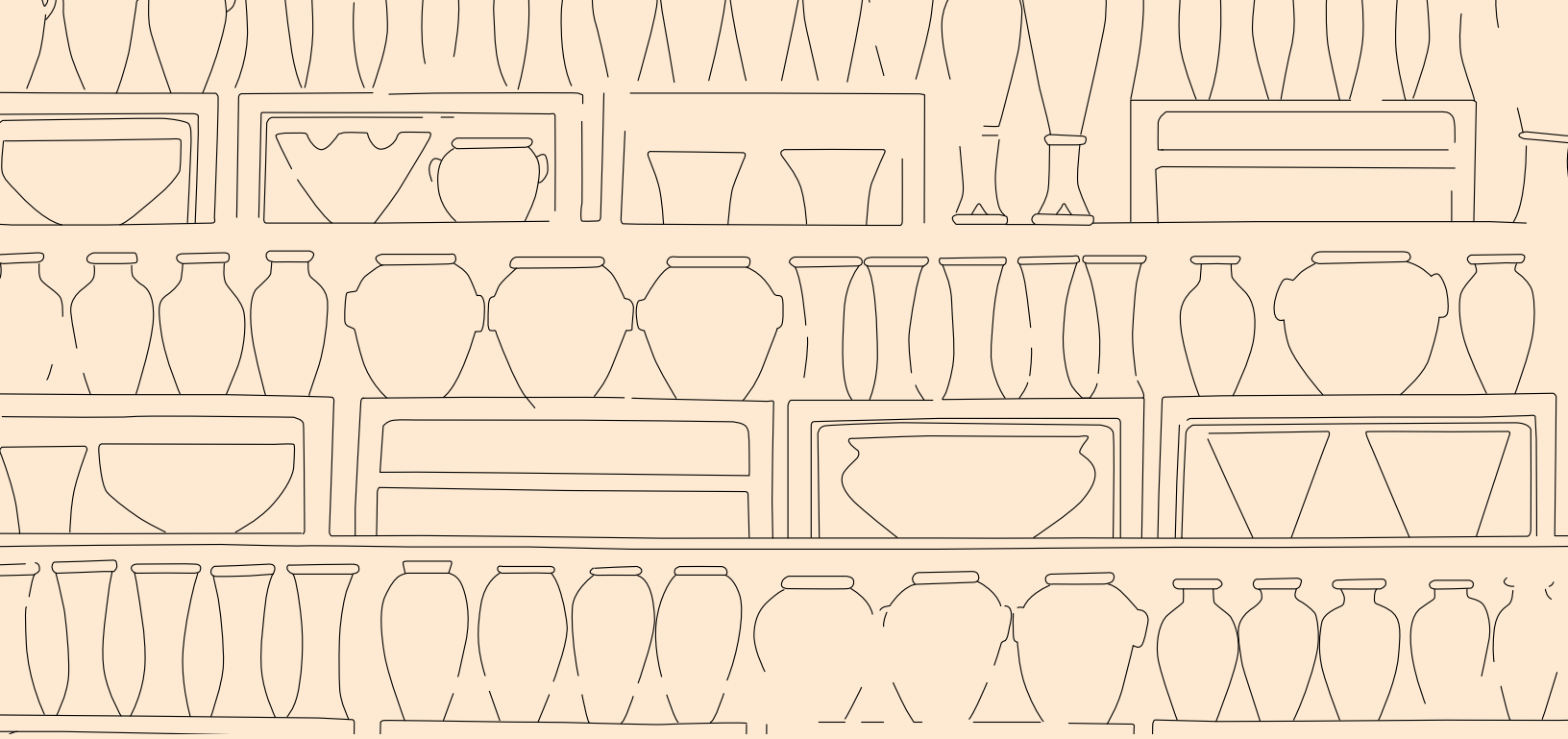


Fig. VIII.3.d. Furniture support from HeG with a rectangular depression in the middle of the object. Object 3930, drawing 1000-732 drawn by Y. Mahmoud, digitally inked by P. Collet, photos 114412 and114414 by D. Jones;
Fig. VIII.3.e. Furniture support from HeG with a rectangular depression in the middle of the object. Object 3931, drawing 1000-734 drawn by Y. Mahmoud, digitally inked by P. Collet, photos 114403, 114406, and 114408 by D. Jones;
Fig. VIII.3.f. Furniture support from HeG with a rectangular depression in the middle of the object. Object 4055, photos 114385 and 114389 by D. Jones.



A tomb depiction of different kinds of vessels from the tomb of Ti at Saqqara (Épron, Daumas, and Goyon 1939: pl. LIX).

STONE VESSELS

Stone vessel fragments have been found in all the different areas and sites excavated by AERA. Most are fragmented, incomplete, and/or broken. After studying the drilling tools, abraders, polishers, and scrapers excavated at HeG, discussed earlier, we know that stone vessels were manufactured on site.[1] There are more than 100 stone vessel fragments excavated from HeG. Most examples are from HeG, but a high number of fragments were excavated from MVT (40 fragments), 8 from KKT, and 5 from KRO. The stone vessel typology discussed below includes bowls (of different shapes and types), jars, miniature/model vessels,[2] as well as basins, jar stoppers, and lids. Due to the fragmentary state of the excavated stone vessels, it is difficult at times to identify with certainty the original type of vessel, or the type of bowl it belonged to, discussed below.[3] There are a total of 50 bowls, 17 cylindrical jars, and 10 miniature/model vessels.[4] A scene in the tomb of Ti at Saqqara has a depiction of various kinds of bowls and cylindrical jars discussed below (see scene above, Épron, Daumas, and Goyon 1939: pl. LIX).

1. The same assumption was made in Tell el-Farkha, due to finding drilling tools, polishing, and abrading tools (Jórdeczka 2004: 451). Scenes of the manufacturing of stone vessels are mentioned under the drilling tools typology, discussed earlier.

2. The following sources were used to identify the stone vessel typologies: Reisner 1931: 130–201; Reisner and Smith 1955: 90–102; and Aston 1994.

3. The diagnostic fragments include rims, bases, and handles.

4. As mentioned earlier and since the majority of the vessels recovered are fragmented, the typologies discussed below include only fragments with diagnostic features, rims, bases, or spouts. Some fragments are of the middle parts of the body of a vessel, and hence it is difficult to identify to which type of vessel the fragment belonged.

BOWLS

The bowls category has different types, determined by shape. These include convex-sided, vertical-sided, bent-sided, open-spouted, straight-sided, carinated, and restricted. Distinctions between bowl types are based on the profiles and distinct features like rims, spouts, and bases. Each bowl type, as indicated by Reisner (1931: 137) and Aston (1994: 106–40), can either be "round-bottomed" or "flat-bottomed."

The majority of stone bowls recovered by AERA team members throughout the years are classified as convex-sided bowls (32 total; see also Aston 1994: 108, 111; Reisner 1931: 158–62). Convex-sided bowls have been found in different areas of HeG. Convex-sided bowls have variations in the rim and base shape. There are no complete vessels: we have only rims (29) or bases (12; 9 round-bottom, 3 flat-bottom) remaining, while a few examples include a partial rim and base. Rims vary from plain (18),[5] incurved and square-shaped (5),[6] (plain) square-shaped (3), to (plain) incurved (3 total; Malak 2014: 51). Convex-sided vessels of HeG are made of limestone, gneiss, and a few examples of travertine, phyllite, and granite. Examples of convex-sided bowls are Objects 1077, 1740 (**Fig. IX.1.a**), 2047 (**Fig. IX.1.b**), 2783, 2841, 2844, 3563, and 3837 (**Fig. IX.1.c**).

Vertical-sided bowls are the second greatest type of bowl we have. Seven vertical-sided bowls have been found, made of limestone (5), gneiss (1), and travertine (1). Vertical-sided bowls are mostly rounded-bottoms, with a few exceptions of examples with flat-bottoms. Examples of vertical-sided bowls are Objects 1754 (**Fig. IX.1.d**), 2790 (**Fig. IX.1.e**), and 3006 (**Fig. IX.1.f**). Similar bowl examples were excavated by Reisner in Menkaure's valley temple (Reisner 1931: 186, fig. 56:4, 5).

Five bent-sided bowls were excavated from HeG, 4 of limestone and 1 of travertine. Bent-sided bowls are bent under the rim on the outer surface of the bowl, creating a ridge line, convex in profile. Bent-sided bowls are bent under the rim on the outer surface of the bowl, creating a ridge line, convex in profile and with a faceted body surface. Examples are Objects 1569 (**Fig. IX.1.g**), 1689 (**Fig. IX.1.h**), and 3857 (**Fig. IX.1.i**). Similar examples showing a bent surface were found in the Giza necropolis (Reisner 1942: 1:439, fig. 297b, nos. 14-1-51, 14-1-56).

Two unusual open-spouted bowls—1 of travertine and 1 of limestone—were found at HeG. Both examples are round-bottomed and have polished exteriors. Examples of this class of bowls are Object 2796 (**Fig. IX.1.j**) and 3826 (**Fig. IX.1.k**). Similar examples were found in Menkaure's Valley Temple at Giza (a basalt flat-bottomed bowl, Reisner 1931: 187, fig. 59:8) and Sahure's mortuary temple at Abusir (Borchardt 1910: I:1:118, fig. 162).

Straight-sided bowls (Aston 1994: 110) have wider tops than bases, with the rims flaring outwards. Two examples of this type of bowl were recovered at HeG; 1 of travertine and 1 of limestone. Both examples are just rim fragments, with no bases remaining. Examples of straight-sided bowls are Objects 2795 (**Fig. IX.1.l**) and 3787 (**Fig. IX.1.m**). Straight-sided bowls were found by Reisner in Queen Hetepheres I's tomb at Giza (Reisner and Smith 1955: 657, fig. 146).

Only 1 example of a carinated bowl (Aston 1994: 132) was recovered from HeG, Object 2785 (**Fig. IX.1.n**); it is made of gneiss. The fragmentary rim, shoulder, and a portion of the body are thin in profile, with a smoothed and polished outer surface. Carinated bowls are sometimes referred to as a "Meidum bowl." Bowls of the same type were found by Reisner in Menkaure's valley temple at Giza, made of travertine (1931: 183, fig. 49:30), as well as in Abusir in Raneferef's mortuary temple, made of gneiss (Vlčková 2006: 140, pl. 24:525/l/82-b).

An unusual example of a diorite restricted bowl (Aston1994: 130) was excavated at HeG, Object 2786 (**Fig. IX.1.o**). The rim and the shoulder of the bowl remains with a smoothed and well-polished outer surface. The rim of the bowl curves inward, unlike the straight-sided bowls. Diorite bowls of similar shaped were found by Reisner in Menkaure's Valley Temple (1931: 186, fig. 56:18–19).

5. Similar types of gneiss bowls were found in Abusir, in the mortuary temple of Raneferef, (Vlčková 2006: 138, pl. 22: 98/l/85-y; 532/l/82-b).

6. Incurved bowls of diorite were found in Menkaure's Valley Temple; Reisner 1931: 186, fig. 57:21.

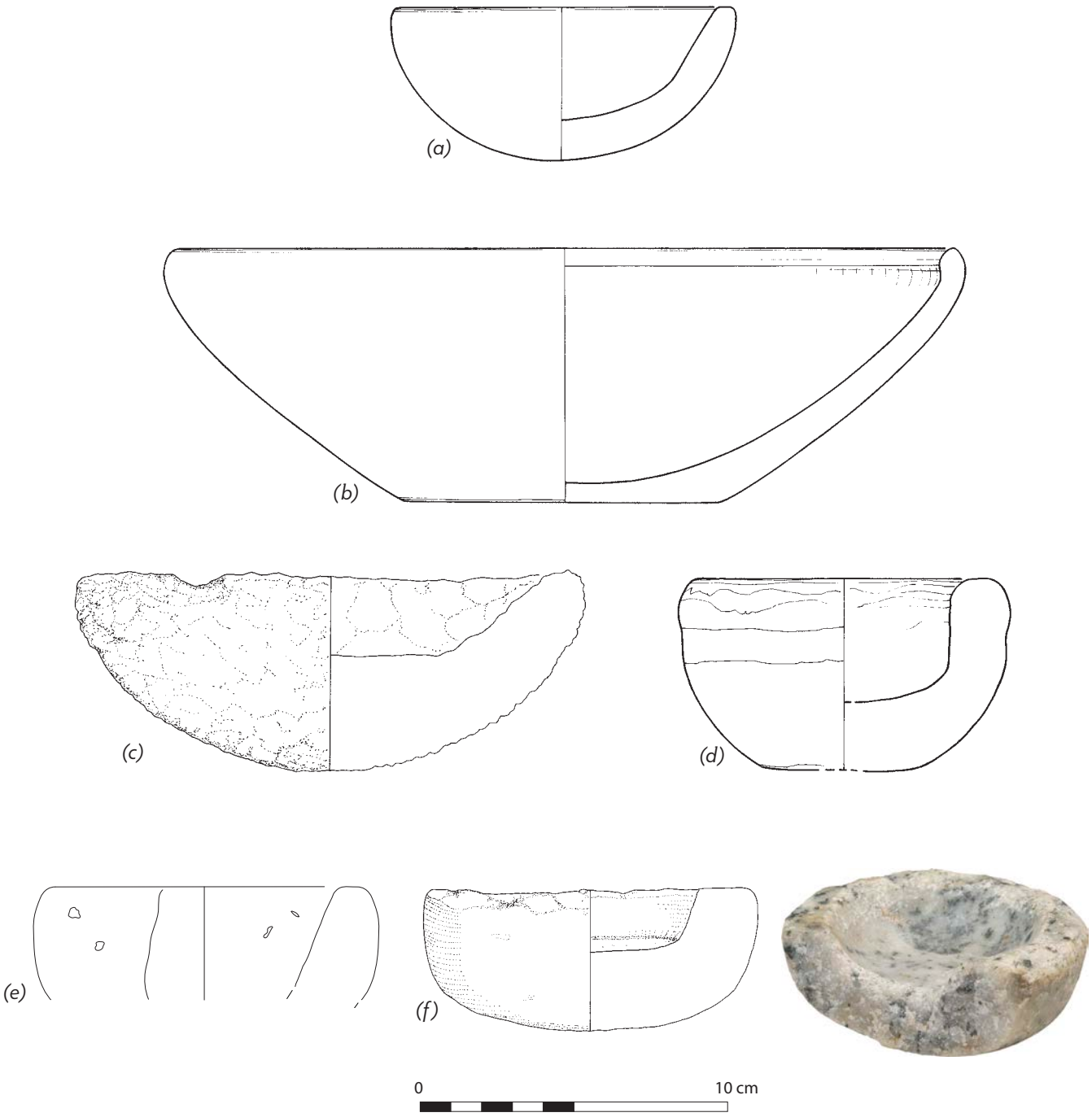


Fig. IX.1.a. A round-bottomed, convex-sided limestone bowl from HeG. Interior and exterior surfaces are smoothed but slightly worn out. Object 1740, drawing 1000-529 by W. Schenk; ***Fig. IX.1.b.*** A flat-bottomed, convex-sided limestone bowl with an incurved rim from HeG, with a complete and well-polished outer surface. Object 2047, drawing 1000-534 by W. Schenk; ***Fig. IX.1.c.*** A shallow, round-bottomed, convex-sided limestone bowl from HeG with thick walls and rough outer surface. Object 3837, drawing 1000-109 by C. Hebron; ***Fig. IX.1.d.*** A flat-bottomed limestone bowl from HeG. Exterior surface is more rounded-in-shape than the interior of the bowl. Object 1754, drawing 1000-528 by W. Schenk; ***Fig. IX.1.e.*** A limestone rim of a bowl from HeG, with thick sides and unpolished surfaces. Object 2790, drawing 1000-700 drawn by E. Malak, digitally inked by A. Talaat; **Fig. IX.1.f.** A shallow, round-bottomed gneiss bowl from HeG, with thick sides and base, and a pitted rim. Object 3006, drawing 1000-167 by C. Hebron, photo 909535 by J. Quinlan.

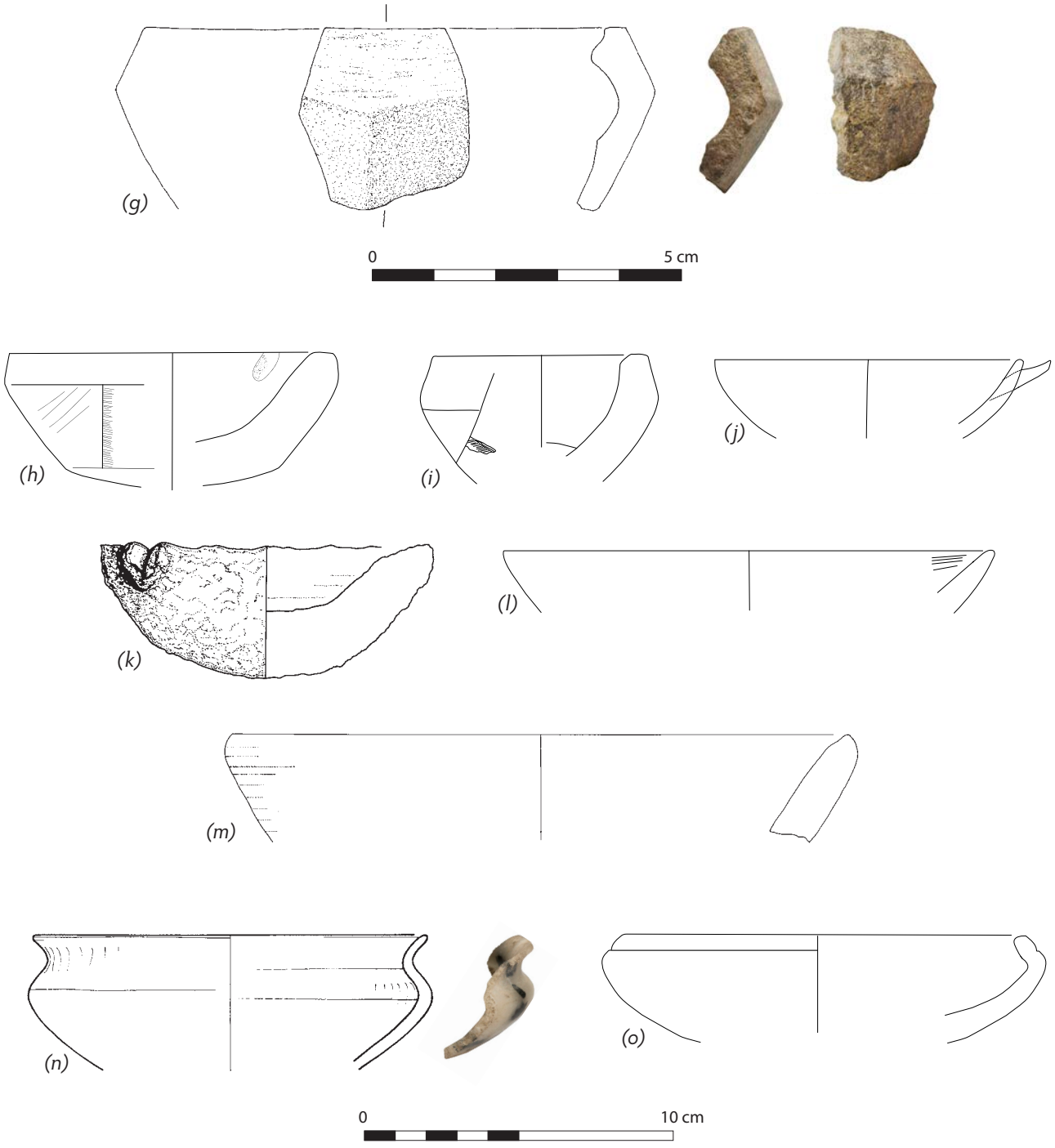


Fig. IX.1.g. A limestone bowl from HeG, with faceted outer surface. Object 1569, drawing 1000-441 by J. Karlsson, photos 909488 and 909496 by J. Quinlan; ***Fig. IX.1.h.*** A round-bottomed, limestone bent-sided bowl from HeG. Object 1689, drawing 1000-713 drawn by E. Malak, digitally inked by R. M. Abd El-Salam; ***Fig. IX.1.i.*** A limestone bent-sided bowl from HeG and thick sides. Object 3857, drawing 1000-719 drawn by E. Malak, digitally inked by A. Witsell; ***Fig. IX.1.j.*** Travertine rim with an open spout from HeG. Spout is complete and preserved. Inner and outer surfaces are smoothed and polished. Object 2796, drawing 1000-715 drawn by E. Malak, digitally inked by R. M. Abd El-Salam; ***Fig. IX.1.k.*** Limestone open-spouted bowl from HeG, with pitted inner and outer surfaces. Object 3826, drawing 1000-56 by C. Hebron; ***Fig. IX.1.l.*** A travertine rim of a straight-sided vessel from HeG, with well-polished interior and exterior surfaces. Object 2795, drawing 1000-690 drawn by E. Malak, digitally inked by M. Abd El-Salam; ***Fig. IX.1.m.*** A limestone rim of a straight-sided vessel from HeG. Surfaces are smoothed but not polished. Object 3787, drawing 1000-148 by C. Hebron; ***Fig. IX.1.n.*** A gneiss rim of a carinated bowl from HeG. Bowl has thin walls and well-polished surfaces. Object 2785, drawing 1000-649 by W. Schenk; ***Fig. IX.1.o.*** A diorite bowl fragment from HeG. Inner and outer surfaces and smoothed, well-polished, with remains of outer sheen. Object 2786, drawing 1000-693 drawn by E. Malak, digitally inked by R. M. Abd El-Salam.

CYLINDRICAL JARS

Some scholars refer to what we call "cylindrical jars" as "beakers." A total of 17 cylindrical jar fragments have thus far been excavated, 10 fragments from MVT and 9 from HeG. Jar fragments are of travertine (14), limestone (2), and gneiss (1). Travertine jar fragments were found both in MVT and HeG, the 2 examples of limestone jars were recovered at HeG and the gneiss example was found in MVT.

Most of the cylindrical jar fragments recovered are either rims, bodies, or bases. There is a great deal of variation in the details of their forms. For example, rims vary between squared, rounded, and un-modeled; the body variations are either concave-sided, straight-sided, or sloping inwards towards the base; and the bases found are either plain, flaring/concave, or footed. Only one cylindrical jar found in HeG is nearly complete, but it was found cracked and is fragile, Object 2799 (**Fig. IX.2.a**). The jar has a rounded rim, a concave side that slopes inwards towards the base and a flaring/concave base. A unique find among the jar fragments excavated by AERA team members at MVT is a complete travertine rim of a jar that would have been fitted separately on the jar. It was manufactured separately from the jar, object 4708 (**Fig. IX.2.b**). Other examples of cylindrical jars are Objects 2787/2788 (**Fig. IX.2.c**), 2798 (**Fig. IX.2.d**), 3265 (**Fig. IX.2.e**), 3776 (**Fig. IX.2.f**), 3864 (**Fig. IX.2.g**), 4258 (**Fig. IX.2.h**), 4622 (**Fig. IX.2.i**), 4697 (**Fig. IX.2.j**), and 4701 (**Fig. IX.2.k**).

Fig. IX.2.a. A travertine cylindrical jar from HeG with a rounded rim. Inner and outer surfaces are well-polished. Object 2799, drawing 1000-780 drawn by A. Talaat, digitally inked by A. Witsell, photos 116213, 116229 by A. Eweida; ***Fig. IX.2.b.*** An unusual travertine cylindrical jar rim from MVT that looks like a complete detachable rim of a jar. Object 4708, drawing 1000-941 drawn by A. Talaat, digitally inked by A. Witsell, photos 116642, 116644, 116645 by A. Eweida; ***Fig. IX.2.c.*** A limestone squared rim of a cylindrical jar from HeG, broken into three pieces and put together. Object 2787/2788, drawing 1000-698 drawn by A. Talaat, digitally inked by A. Witsell.

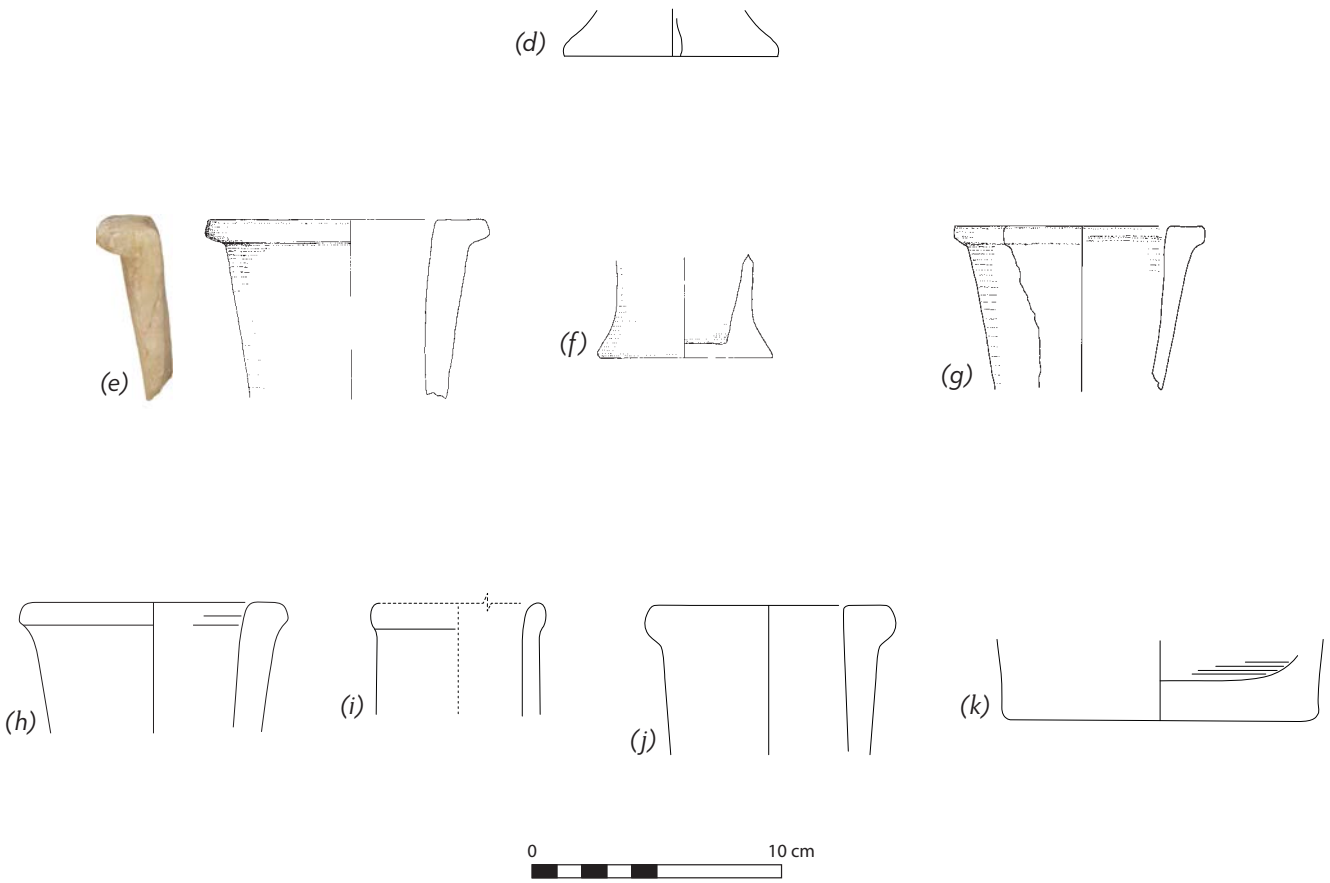


Fig. IX.2.d. A limestone base of a footed-jar found in HeG. Only small fragment of the jar remains. Object 2798, drawing 1000-695 drawn by E. Malak, digitally inked by R. M. Abd El-Salam; ***Fig. IX.2.e.*** A travertine cylindrical jar with a square rim and a concave body from HeG. Object 3265, drawing 1000-80 by C. Hebron, photo 909428 by J. Quinlan; ***Fig. IX.2.f.*** A travertine base of a cylindrical jar with a footed base from HeG with a thin body wall. Object 3776, drawing 1000-194 by C. Hebron; ***Fig. IX.2.g.*** A travertine square rim of a cylindrical jar with a concave body from HeG. Object 3864, drawing 1000-172 by C. Hebron; ***Fig. IX.2.h.*** A gneiss round rim of a cylindrical jar from MVT that has possibly a straight to concave-side. Object 4258, drawing 1000-778 by R. M. Abd El-Salam; ***Fig. IX.2.i.*** A travertine unmodeled rim of a cylindrical jar with straight sides from MVT. Object 4622, drawing 1000-805 drawn by Y. Mahmoud, digitally inked by A. Witsell; ***Fig. IX.2.j.*** A travertine rounded rim of jar with the body sloping inwards from MVT. Object 4697, drawing 1000-936 drawn by Y. Mahmoud, digitally inked by A. Witsell; ***Fig. IX.2.k.*** A plain base of a travertine cylindrical base from MVT with possibly straight sides. Object 4701, drawing 1000-937 drawn by Y. Mahmoud, digitally inked by A. Witsell.

MINIATURE/MODEL VESSELS

The miniature and model vessels found by AERA thus far are made of limestone (7), travertine (1), gneiss (1), and granite (1). Model and miniature vessels include examples from the different types of vessels previously mentioned, like bowls of different kinds and jars, yet model and miniature vessels are smaller in size and have finished exteriors, but not all interiors are worked or hollowed-out. For example, there is an almost complete model travertine cylindrical jar in the shape of a *hś* vase, from KKT, Object 3279 (**Fig. IX.3.a**). A small part of its rim is chipped off. The jar has a depression below the rim, creating a wider shoulder for the vessel, with concave sides for its bow and a footed base. The vessel is not hollow from the inside, only the top part of the rim is partially hollow. The outer surfaces are smoothed, and show remnants of the original outer sheen. (Similar examples of *hś*-shaped model jars were found in the tomb of Kairsu at Abusir, see Bárta et al. 2020: pl. VI:2.) One gneiss bowl found by AERA is classified as a restricted bowl, Object 3281 (**Fig. IX.3.b**). A unique miniature restricted bowl made of gray granite was excavated at HeG, Object 3945 (**Fig. IX.3.c**). It has a flat base and is finely worked with a well-defined rim and shoulder. The outer surface is well-polished, and the inner surface has visible reeling lines. Another interesting model vessel excavated at HeG is one shaped as a beer jar, made of limestone, Object 3777 (**Fig. IX.3.d**). The vessel has pitted outer surface, a smooth rim, and traces of reeling lines visible on the interior of the jar. Miniature and model vessels of other shapes are Objects 2792 (**Fig. IX.3.e**) and 3267 (**Fig. IX.3.f**).

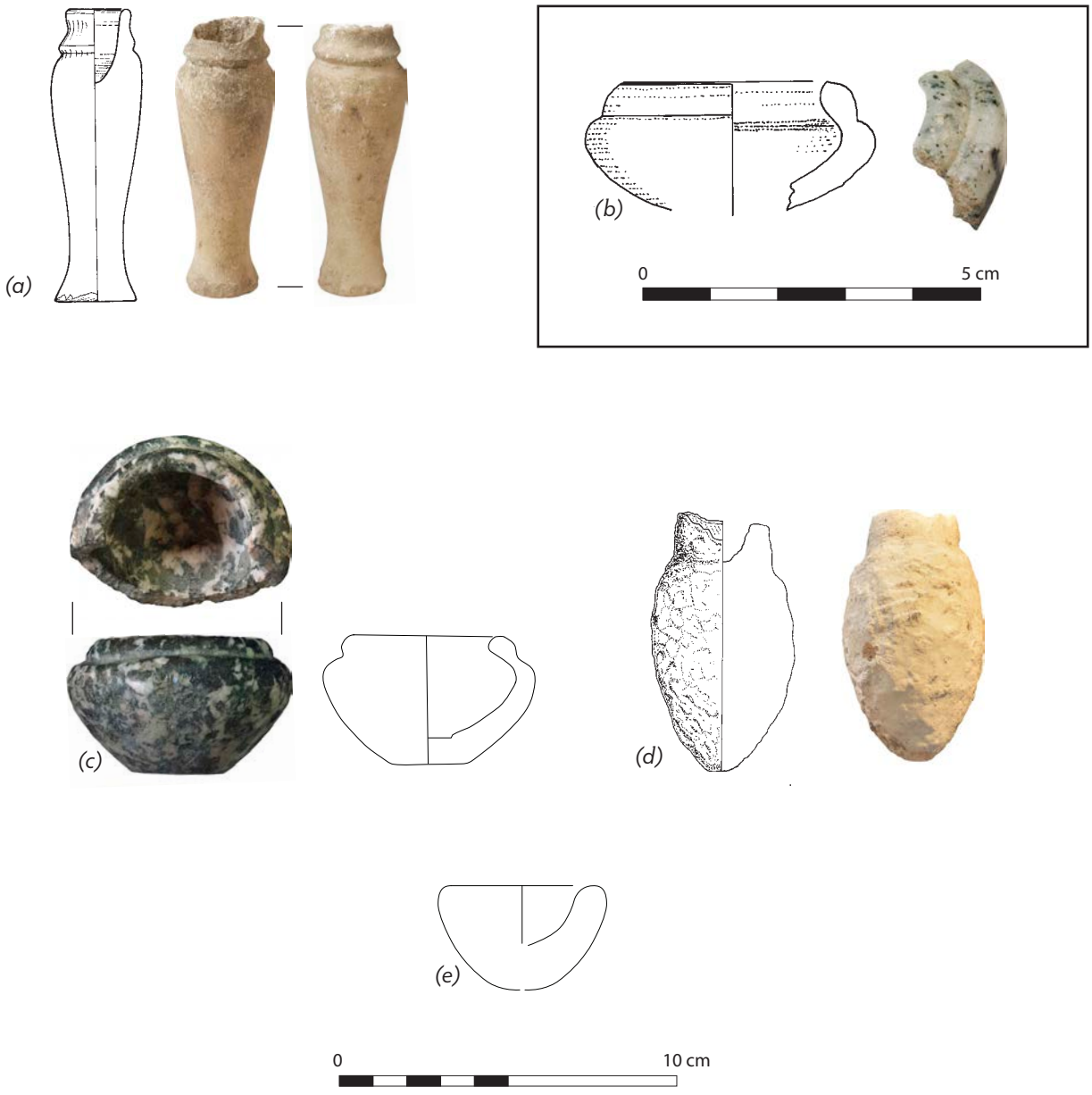


Fig. IX.3.a. A travertine model vase from KKT, shaped as a *hś*-vase. Object is well shaped with polished outer surfaces where remains of the outer sheen are visible. Object 3279, drawing 1000-651 by W. Schenk, photos 909453, 909456 by J. Quinlan; ***Fig. IX.3.b.*** A restricted miniature bowl of gneiss from HeG. A small part of the rim remains and it has a well-polished outer surface. Object 3281, drawing 1000-191 by C. Hebron, photo 909539 by J. Quinlan; ***Fig. IX.3.c.*** A restricted miniature bowl of gray granite from HeG. About two-thirds of the bowl remains, it has a well-polished exterior and a clear outer sheen. Object 3495, drawing 1000-731a by Y. Mahmoud, photos 713863, 713869 by Y. Mahmoud; ***Fig. IX.3.d.*** A limestone beer jar model vessel from HeG with a rough exterior. Jar's interior is not hollowed out. Object 3777, drawing 1000-219 by C. Hebron, photo 416921 by R. M. el-Sayed; ***Fig. IX.3.e.*** A small limestone convex-sided model vessel with a rounded rim from HeG. Object 2792, drawing 1000-702a by E. Malak, digitally inked by A. Talaat.

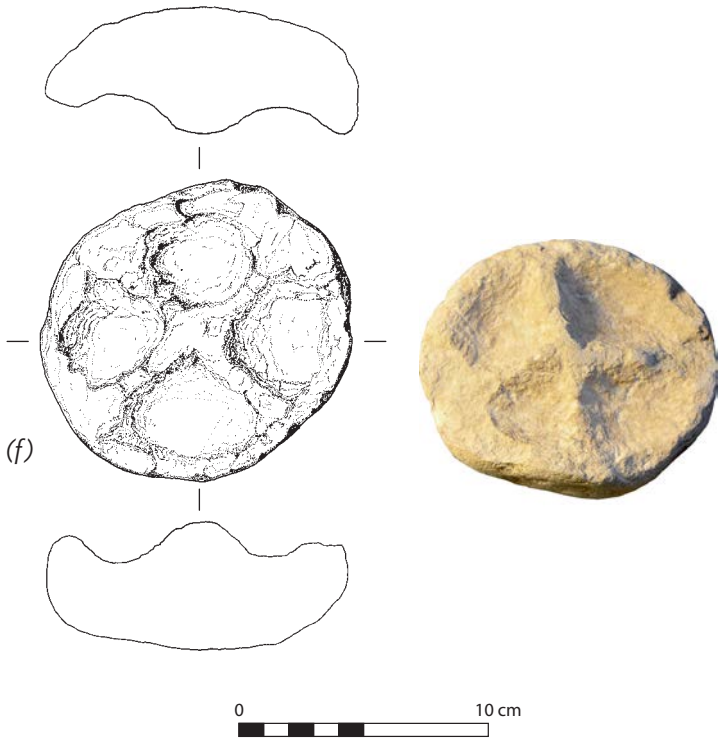


Fig. IX.3.f. A limestone miniature bowl with convex sides from HeG. The bowl's interor is divided into four sections that are hollowed out. Outer surface is smoothed but not polished. Object 3267, drawing 1000-166 by C. Hebron, photo 416838 by R. M. el-Sayed.

JAR STOPPERS*

A total of 26 jar stoppers have been excavated from HeG (25) and KKT (1), made of travertine, limestone, clay, and quartzite. Jar stoppers have a circular or oval outline when viewed from above, and a conical shape in section across their height. Examples of jar stoppers are Objects 1261 (**Fig. IX.4.a**), 2097 (**Fig. IX.4.b**), 2295 (**Fig. IX.4.c**), 2846 (**Fig. IX.4.d**), 3912 (**Fig. IX.4.e**).

**It is not easy at times to make a clear distinction between jar stoppers and drill cores, as mentioned earlier. The main difference used in differentiating between both types is the diameter size. Jar stoppers are bigger in size and more conical in shape. Another overlapping type of object is gaming pieces, since some types are conical in shape. These types of objects that overlap between gaming pieces and jar stoppers are discussed later in the "Multipurpose and Miscellaneous Tools and Objects" section.*

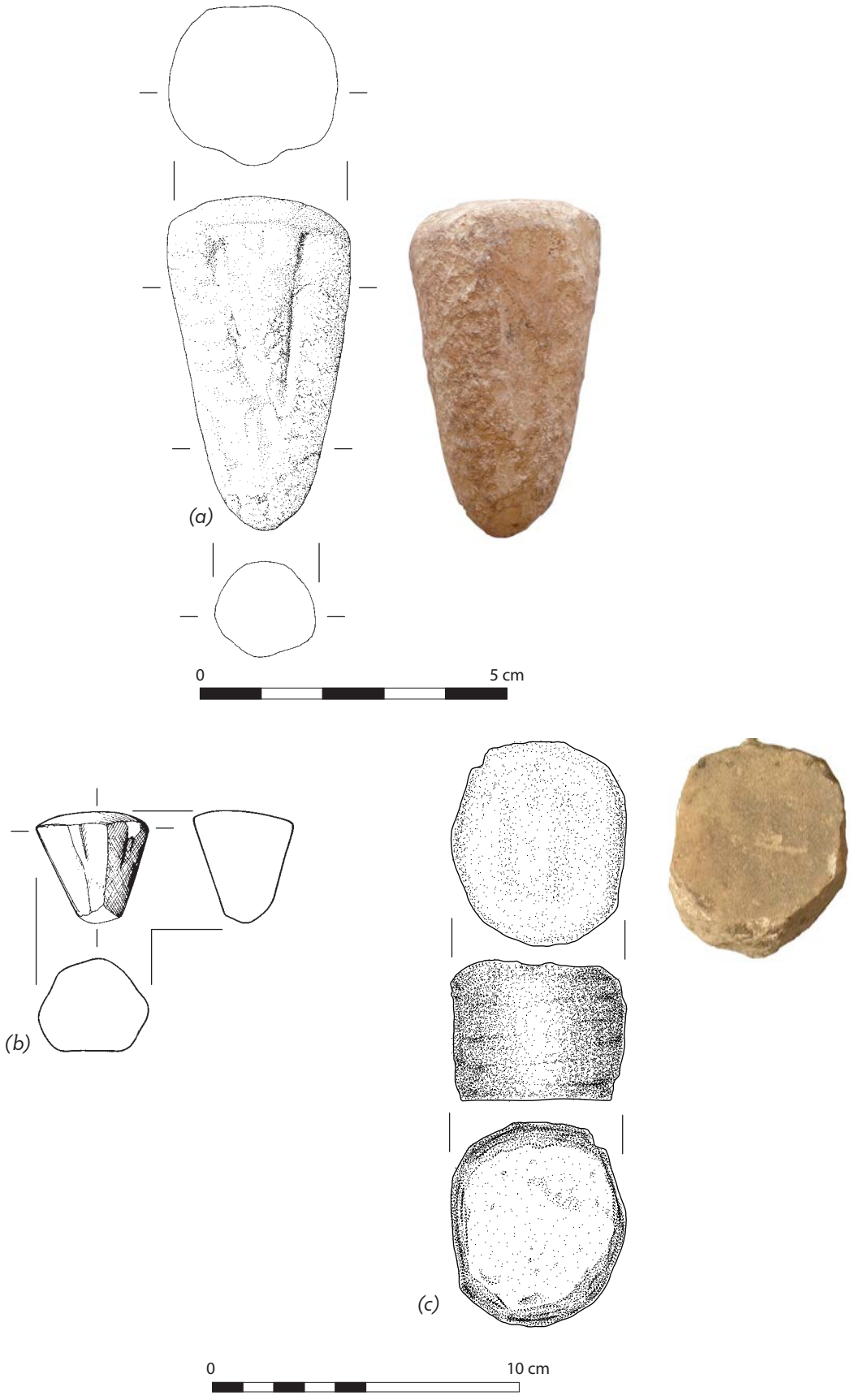


Fig. IX.4.a. A complete travertine conical-shaped jar stopper from HeG with pitted uneven surface and a rounded end. Object 1261, drawing 1000-429 by J. Karlsson, photo 201575 by Y. Kawae; ***Fig. IX.4.b.*** A small, complete travertine conical-shaped jar stopper from HeG, with an oval-shaped cross section. Object 2097, drawing 1000-606 by W. Schenk; ***Fig. IX.4.c.*** An oval-shaped travertine jar stopper from HeG with one polished surface. Object 2295, drawing 1000-743 drawn by Y. Mahmoud, digitally reconstructed and inked by P. Collet, photo 805611 by Y. Kawae.

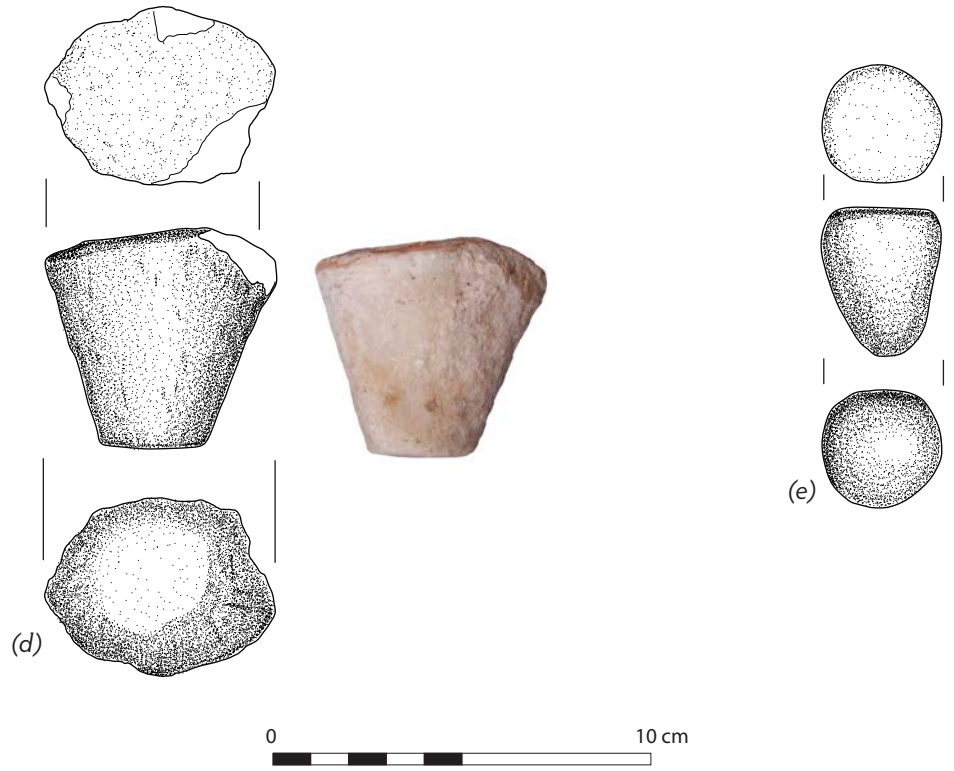


Fig. IX.4.d. A travertine conical jar stopper from HeG. Both top and bottom surfaces are roughly flat. Object has an oval-shaped cross section. Object 2846, drawing 1000-738 drawn by Y. Mahmoud, digitally reconstructed and inked by P. Collet, photo 511482 by A. Tavares; ***Fig. IX.4.e.*** A small limestone jar stopper from KKT. Object 3912, drawing 1000-742 drawn by Y. Mahmoud, digitally reconstructed and inked by P. Collet.

LIDS

Lids are circular in outline when viewed from above and disc-shaped in cross-section. A total of 40 lids have been excavated by AERA, 36 from HeG, 2 from KRO, 1 from MVT, and 1 from KKT; they are made of limestone (20), recut pottery sherds (10), travertine (9), clay (2), red granite (1) and gneiss (1). Among the lid examples recovered are Objects 1293 (**Fig. IX.5.a**), 1379 (**Fig. IX.5.b**), and 3842 (**Fig. IX.5.c**). A clay disc that perhaps serve as a lid was also excavated by Kromer at Giza (1972: 40; Taf. 13:8).

A few objects (8) overlap between the lid and jar stopper typologies, 7 from HeG and 1 from MVT. This is because the object has a circular outline when viewed from above and has a thicker height than other lids, but is smaller than a jar stopper. These examples also include artifacts that have a lid-shape on top and a small protruding section on its bottom surface that would fit into a vessel. Lid/stoppers were made of limestone (4), travertine (1), sandstone (1), and clay (1). Examples of this type of artifact are Objects 1351 (**Fig. IX.5.d**), 2042 (**Fig. IX.5.e**), 2059, and 3845 (**Fig. IX.5.f**).

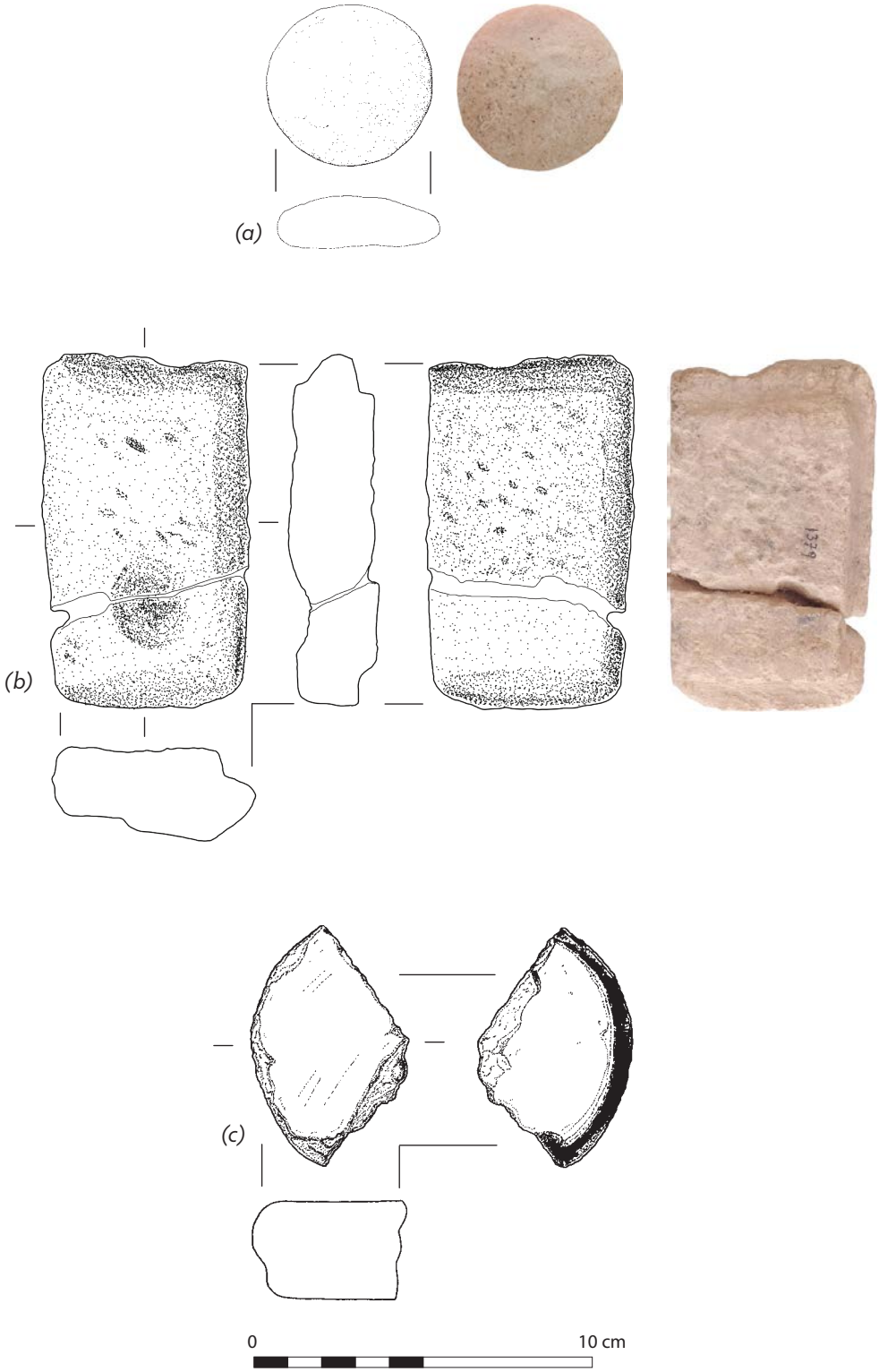


Fig. IX.5.a. A ceramic circular/disc shaped lid from HeG with a slightly convex upper surface and a flat undersurface. Object 1293, drawing 1000-440 by J. Karlsson, photo 201620 by Y. Kawae; ***Fig. IX.5.b.*** A limestone rectangular lid, broken across its width, and well carved. Object 1379, drawing 1000-739 drawn by Y. Mahmoud, digitally inked by P. Collet, photo 201665 by Y. Kawae; ***Fig. IX.5.c.*** An incomplete travertine lid, originally circular in shape. Object 3842, drawing 1000-283 by C. Hebron.

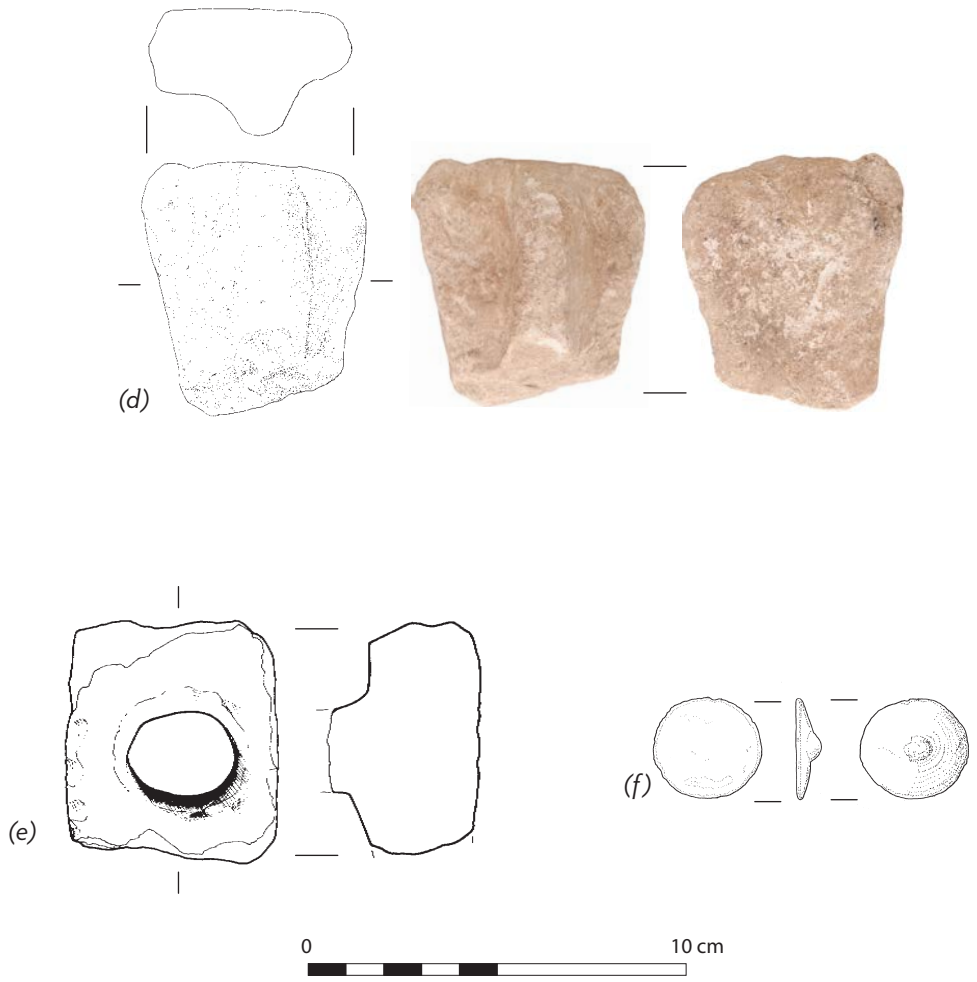
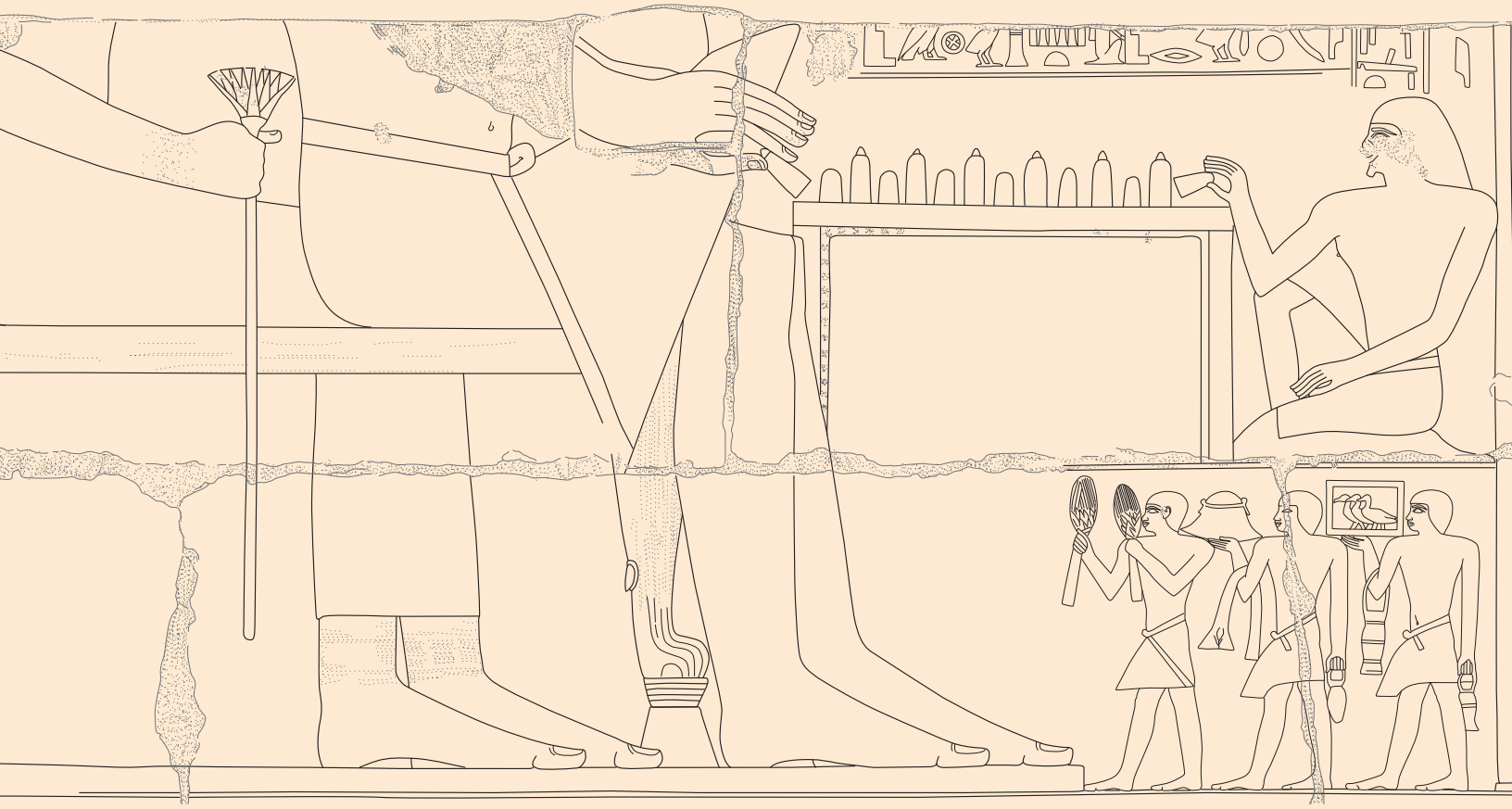


Fig. IX.5.d. A limestone lid/stopper from HeG, with a rectangular outline when viewed from above and a rectangular protruding knob on its bottom surface. Object 1351, drawing 1000-444 by J. Karlsson, photos 201611 and 201615 by Y. Kawae; ***Fig. IX.5.e.*** A limestone lid/stopper from HeG, with a rectangular outline when viewed from above and an oval-shaped knob on its bottom surface. Object 2042, drawing 1000-604 by W. Schenk; ***Fig. IX.5.f.*** A limestone circular/disc-shaped lid/stopper from HeG, with a knob on its bottom surface. Object 3845, drawing number 1000-214 by C. Hebron.

BASINS

We have recovered a total of 6 basins: 4 from HeG, 1 from KKT, and 1 from MVT. All are made of limestone, but not all are complete. Some examples have only one or two corners of the artifact remaining. Basins have a rectangular outline when viewed from above with a rectangular depression in the middle section. Complete basin examples are Objects 2197 (**Fig. IX.6.a**) and 4614 (**Fig. IX.6.b**).

Fig. IX.6.a. A limestone basin, rectangular in shape from HeG with thick body walls and base. Surfaces are shaped bit unpolished. Object 2197, drawing 1000-466 by J. Karlsson, photo 905851 by J. Quinlan; **Fig. IX.6.b.** A limestone basin with a rectangular outline from HeG. Surfaces are pitted and unpolished. Object 4614, drawing 1000-658 by W. Schenk, photos 114458–59 by D. Jones.



A scene from the tomb of Mereruka at Saqqara depicting the tomb owner holding and playing with conical-shaped gaming pieces on a gaming table (Duell 1938b: pl. 172).

MULTIPURPOSE AND MISCELLANEOUS TOOLS AND OBJECTS

Some artifacts are easily identified and classified into specific categories, like the ones mentioned in the previous sections. Other artifacts could have been used for one or more purposes or for purposes that might not be entirely clear to us today. The latter types of objects are discussed in the following section. These include lentoid-shaped objects, anvils, gamers and/or accounting objects, weights, incised and inscribed objects,[1] and multipurpose tools.

1. The definition of the incised and inscribed objects was written by Emmy Malak and Ali Witsell, the editor of this volume and clay sealings specialist at AERA.

LENTOID OBJECTS

The tools referred to here as "lentoid objects" are ceramic recut sherds, reshaped and used as tools. Over 100 lentoid-shaped objects have been recovered from the different areas of HeG (88), KKT (18), MVT (3), and KRO (2). Complete examples vary in size, with a length between 10 and 13 cm, width between 5 to 6.5 cm, and a body thickness between 0.6 to 1 cm. Lentoid-shaped objects have an ellipsoid/ovoid outline when viewed from above, and a convex upper surface and concave bottom surface, due to the original shape of the ceramic vessel.

The bit edges on both sides of the tool vary from rounded and shaped (**Fig. X.1.a**) to pointed (**Fig. X.1.b**). Some examples have both, like Object 1254 (**Fig. X.1.c**). Other examples have pronounced pointed bits, like Objects 2893 (**Fig. X.1.d**) and 3770 (**Fig. X.1.e**), while Objects 1733 (**Fig. X.1.f**), 2033 (**Fig. X.1.g**), and 2344 (**Fig. X.1.h**) have rounded bit edges on both ends. In some examples, like Object 2344, the bit edges are slightly worn on the under surface and are beveled at an angle towards the upper surface. This could be from use as a scraper, as a study of similarly shaped ceramic tools found in Qantir suggests. Although the tools presented in the study are in many ways similar to the lentoid-shaped tools, there are some minor differences in shape (Raedler 2007). Lentoid-shaped objects usually have fine striations on the upper and lower surfaces and when the vertical sides of the tool are preserved, it is common to have fine parallel striations around the sides of the tool. The reeling lines are visible on the under surface of a number of examples, usually found at a diagonal angle on the concave surface.

The lentoid-shaped tools are grouped with the miscellaneous/multipurpose tools and objects since the exact use is not apparent. As mentioned previously, and as suggested by the finds in tombs of Abusir (Arias Kytnarová 2015: 8; Arias Kytnarová 2011: 79, fig. 6.9, no. 40-12.AS59.2010; Arias Kytnarová et al. 2014: 254, fig. 4.103, nos. 89.AC26.09, 359.AC26.09; 255, 4.104, no. 89.AC26.09) this type of tool could have been used as a scraper. Yet, according to Kromer (1972: 66–67, Taf. 26, nos. 4–5; 1978: Taf. 2, no. 6, Taf. 14, nos. 5–6) and by comparing it to Old Kingdom scenes, lentoid-shaped tools might have been used as palettes. In the Old Kingdom tomb of Mereruka at Saqqara, Mereruka is depicted seated with the scribal palette on his shoulder, a reed in one hand, and what looks like a lentoid-shaped tool in the other hand (Duell 1938a: pl. 7). Another scene in the tomb of Mersyankh in Giza shows an artisan painting a statue, holding a small ovoid-shaped object in one hand that looks like a lentoid-shaped tool (Dunham and Simpson 1974: 1, fig. 8, bottom register, right side).

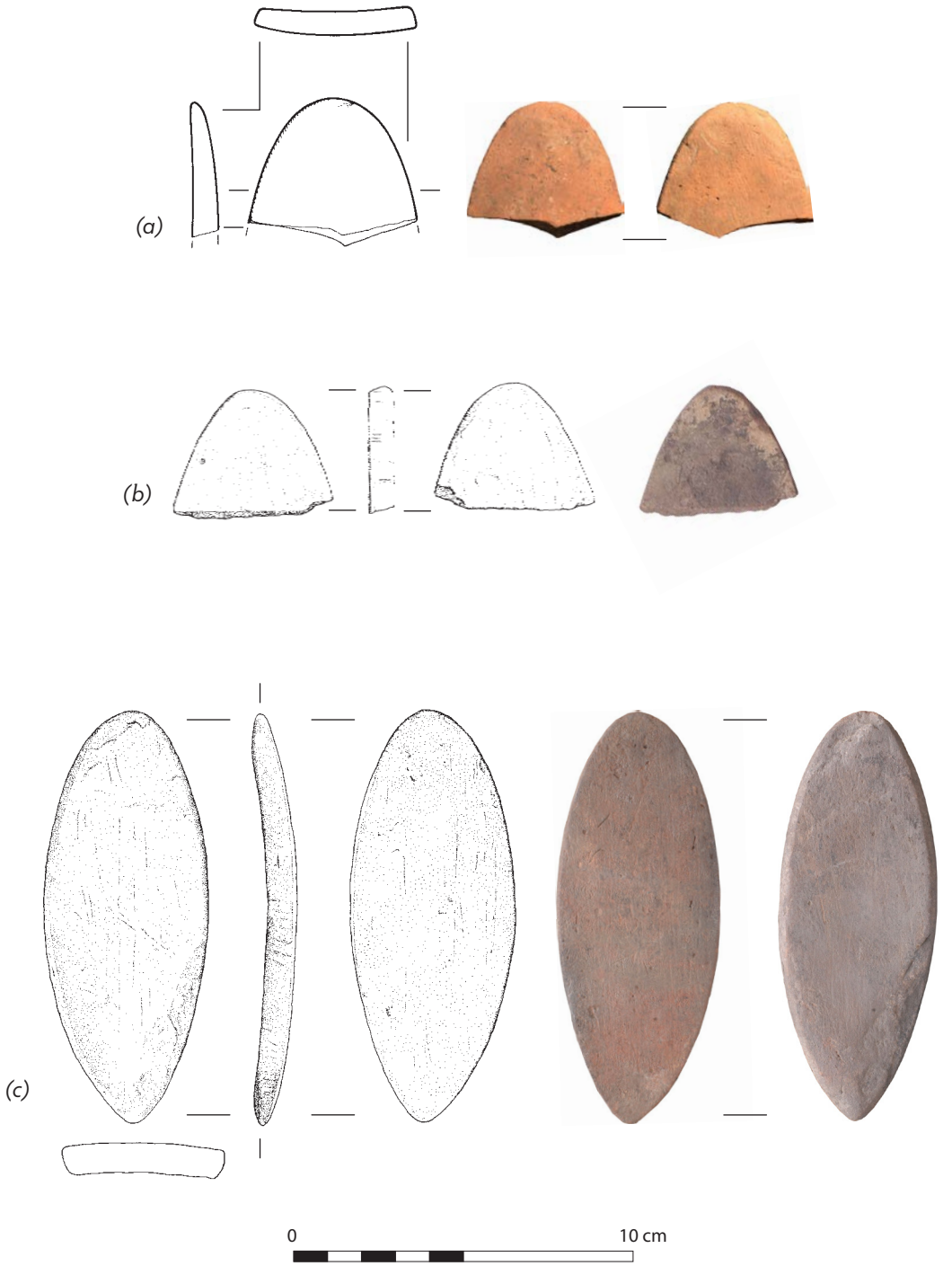


Fig. X.1.a. A fragment of a lentoid object with an oval-shaped bit from HeG; only the bit part of the tool remains. Object 1642, drawing 1000-500 by W. Schenk, photos 415003–04 by E. Malak; ***Fig. X.1.b.*** A pointed bit of an incomplete lentoid-shaped object from HeG. Tool has fine parallel striations on upper and lower surfaces. Object 1537, drawing 1000-432 by J. Karlsson, photo 201660 by Y. Kawae; ***Fig. X.1.c.*** A complete ceramic lentoid-shaped object from HeG. One bit end is more rounded in shape than the opposite, and the top and bottom surfaces have fine incision lines along the length of the tool from use. Parts of the bit edges on the concave bottom surface are chipped off. Object 1254, drawing 1000-468 by J. Karlsson, photos 302895–96 by Y. Kawae.

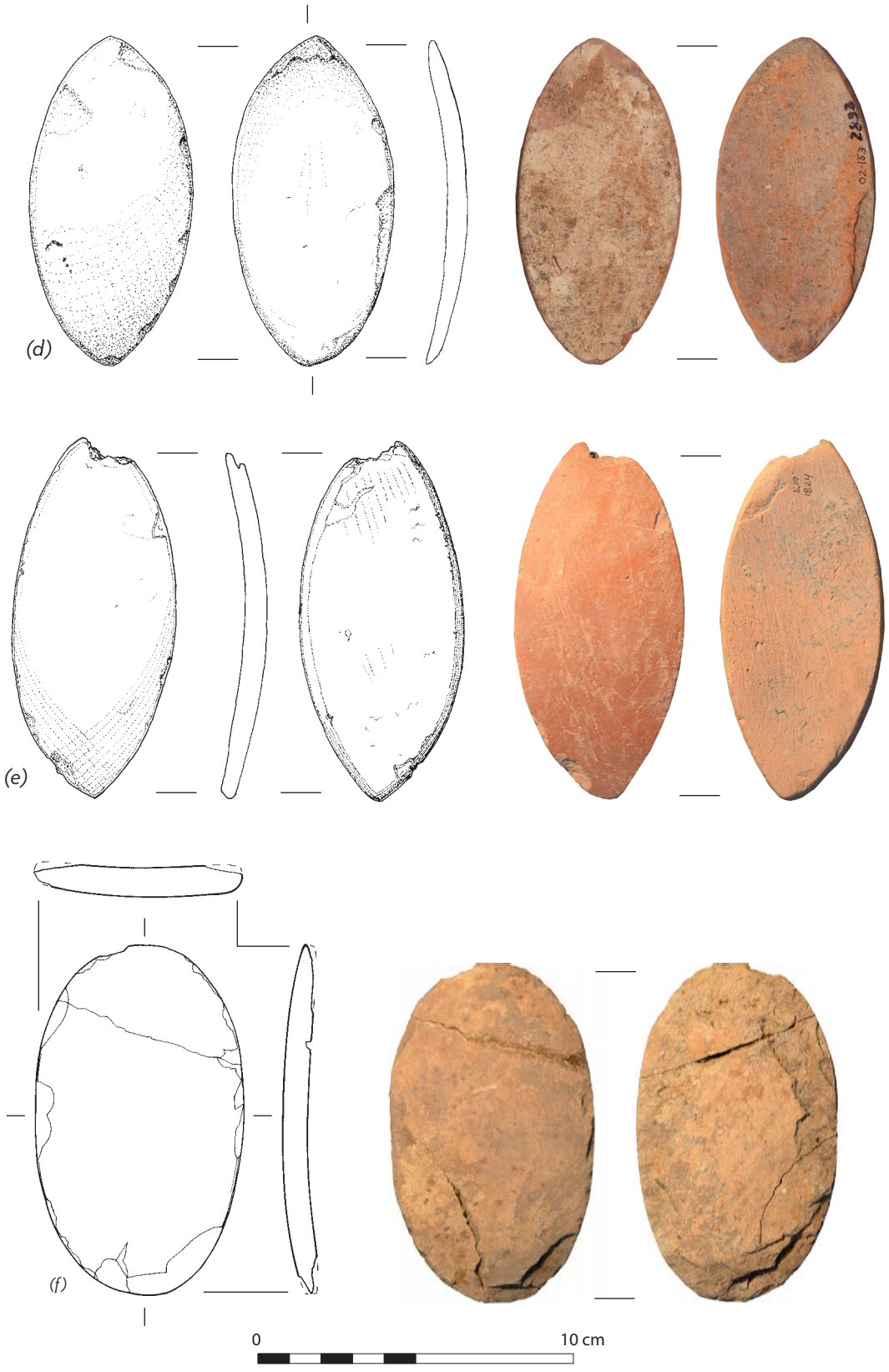


Fig. X.1.d. A complete lentoid-shaped object from HeG with a few striations on upper and lower surfaces of the tool and fine parallel striations on the vertical sides around the circumference of the tool. Object 2893, drawing 1000-59 by C. Hebron, photos 511213–15 by A. Tavares; ***Fig. X.1.e.*** An almost complete ceramic lentoid-shaped object from HeG, with a portion of one bit edge broken off. Upper convex surface and lower concave surface have fine parallel striations from use. Object 3770, drawing 1000-54 by C. Hebron, photos 415006–07 by E. Malak; ***Fig. X.1.f.*** A complete fragile lentoid-shaped object with worn-out undersurface from HeG. Reeling lines are visible at an angle on the undersurface. Undersurface has broken edges all around the tool, and a part of the bit edge chipped off on the top surface. Object 1733, drawing 1000-520 by W. Schenk, photos 415010–11 by E. Malak.

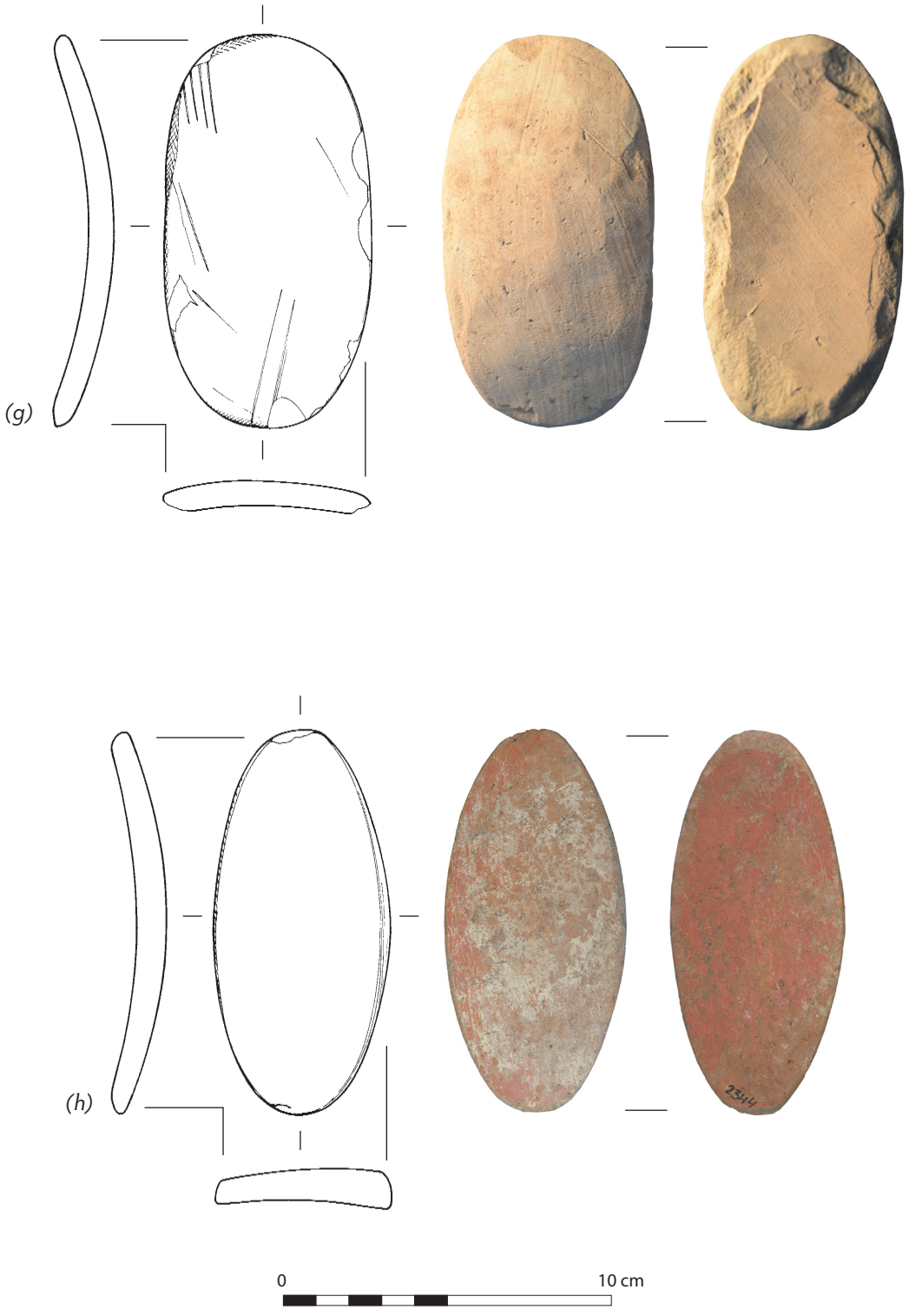


Fig. X.1.g. A complete lentoid-shaped tool with oval bits from HeG. Reeling lines are visible on the undersurface. Object 2033, drawing 1000-607 by W. Schenk, photos 415014–16 by E. Malak; ***Fig. X.1.h.*** A complete lentoid-shaped object with rounded/oval bits from HeG. Upper surface is worn out. Tool has fine striations along its length, on both upper and bottom surfaces. Bit points on the bottom surface are sloping at an angle towards the top surface from use. Object 2344, drawing 1000-613 by W. Schenk, photos 113895–96 by D. Jones.

ANVILS

AERA has found a total of 67 anvils, 60 of which were found in HeG, 6 in MVT, and 1 in KKT. The majority of the anvil examples are made of limestone (over 40), in some cases burnt limestone, others are made of travertine (13), a few examples of granite, granodiorite, and 1 of garnet-rich hornfels. All the travertine anvils were found in the different areas of HeG, none from KKT or MVT.

Anvils are the nether stone for working/manufacturing, used for different crafts and activities. They are brick-shaped, with a rectangular outline when viewed from above, rectangular-shaped in longitudinal section, and square-shaped in lateral cross-section. Examples are Objects 1804 (**Fig. X.2.a**), 2304 (**Fig. X.2.b**), 2308 (**Fig. X.2.c**), 2309 (**Fig. X.2.d**), 3298 (**Fig. X.2.e**), and 3971 (**Fig. X.2.f**). The surfaces have traces of use, like incision lines and fine striations. In some cases, like Object 4098 (**Fig. X.2.g**), the middle section of the anvil is smaller in width than both ends. Other examples have small circular/oval depressions on the longitudinal surfaces from use, such as Objects 1031 (**Fig. X.2.h**), 1526 (**Fig. X.2.i**), and 1534 (**Fig. X.2.j**), 1854 (**Fig. X.2.k**). An anvil made of unusual material and shape is Object 3047 (**Fig. X.2.l**), found in HeG. It is of a slightly different shape than our other examples. It had a broad, rectangular-shaped working surface, short vertical sides, and rectangular sections, both along the length and across the width of the tool. Upper and lower flat working surfaces are uneven with small depressions and fine striation lines from use. The use of anvils is depicted in use in Old Kingdom tombs, like in the tomb of Mereruka at Saqqara (Duell 1983a: pl. 30, in the second register from the bottom).

Fig. X.2.a. An incomplete limestone anvil from HeG, broken along its length and across the width. Use-wear marks are visible on the remaining top surface along the length and the short vertical side. Object 1804, drawing 1000-532 by W. Schenk; ***Fig. X.2.b.*** A limestone anvil from HeG with a smooth outer surface. Object 2304, drawing 1000-253 by C. Hebron, photos 113786–89 by D. Jones.

Fig. X.2.c. A limestone anvil from HeG with a smoothed but unpolished surface. Object 2308, drawing 1000-277 by C. Hebron, photos 113770–72 by D. Jones; ***Fig. X.2.d.*** A complete limestone anvil from HeG, with both smooth and pecked outer surfaces. Object 2309, drawing 1000-251 by C. Hebron, photos 114497–500 by D. Jones.

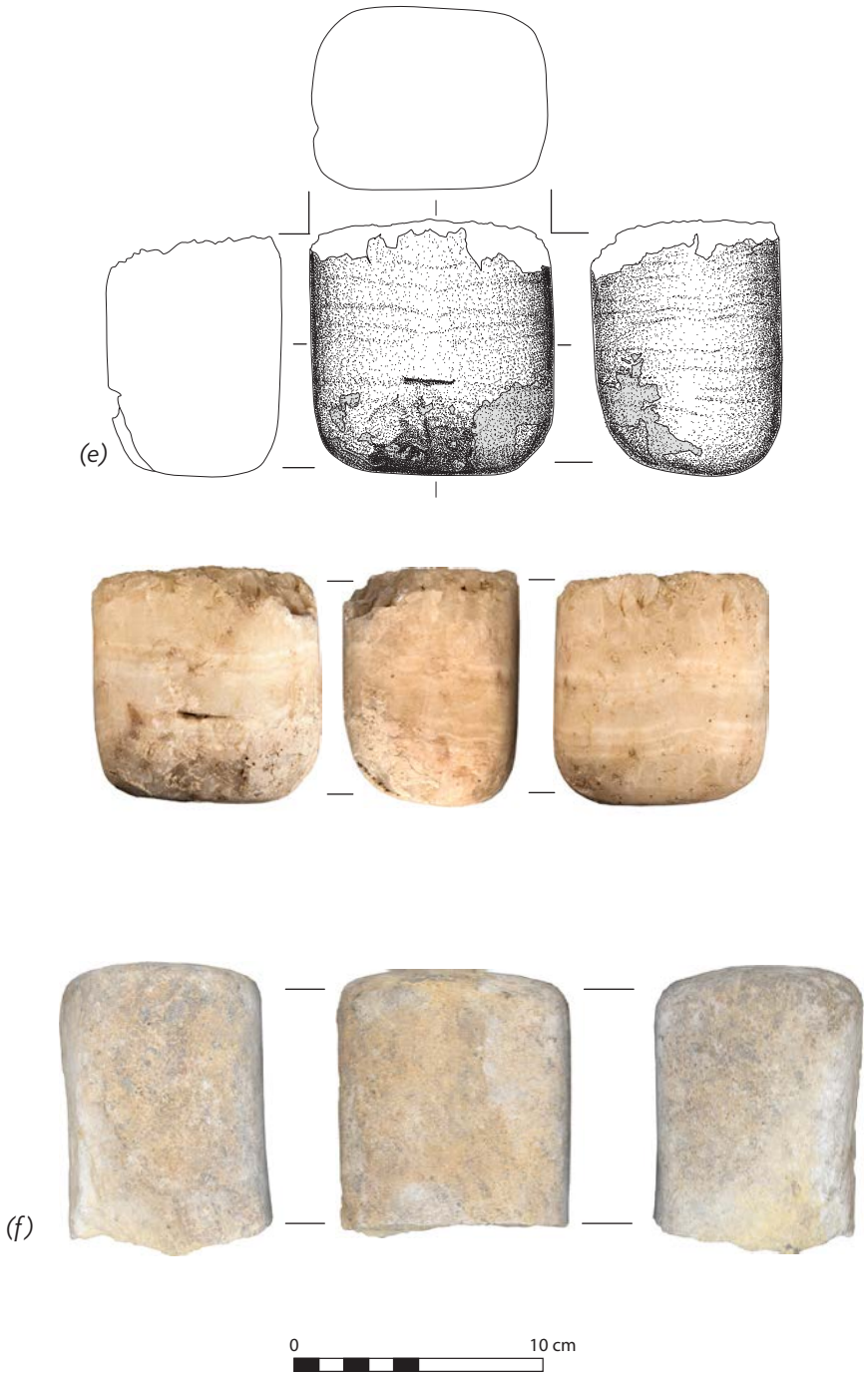


Fig. X.2.e. A travertine anvil from HeG, broken across the width, shows fine striations on its surfaces and pecking marks on the short vertical side across the width. Object 3298, drawing 1000-990 drawn by Y. Mahmoud, digitally reconstructed and inked by P. Collet, photos 117101–103 by A. Eweida; ***Fig. X.2.f.*** An incomplete limestone anvil from HeG, broken across the width, with a smooth outer surface and a narrow middle section. Object 4098, photos 113823–85 by D. Jones.

Fig. X.2.g. A limestone brick-shaped anvil from HeG that shows both the narrow middle section of an anvil and a depression on the longitudinal surface from use. Object 1031, photos 113743–46 by D. Jones; ***Fig. X.2.h.*** A limestone anvil from HeG with a depression on the top surface from use and one corner chipped. Object 1526, photos 113793–95 by D. Jones.

Fig. X.2.i. Limestone anvil from HeG with a small depression on the top surface. Object 1534, photos 113778–79, 113781 by D. Jones; ***Fig. X.2.j.*** A limestone anvil with well finished outer surfaces and a small depression on one of the working surfaces along the length of the tool. Object 1854, photos 113801–03 by D. Jones.

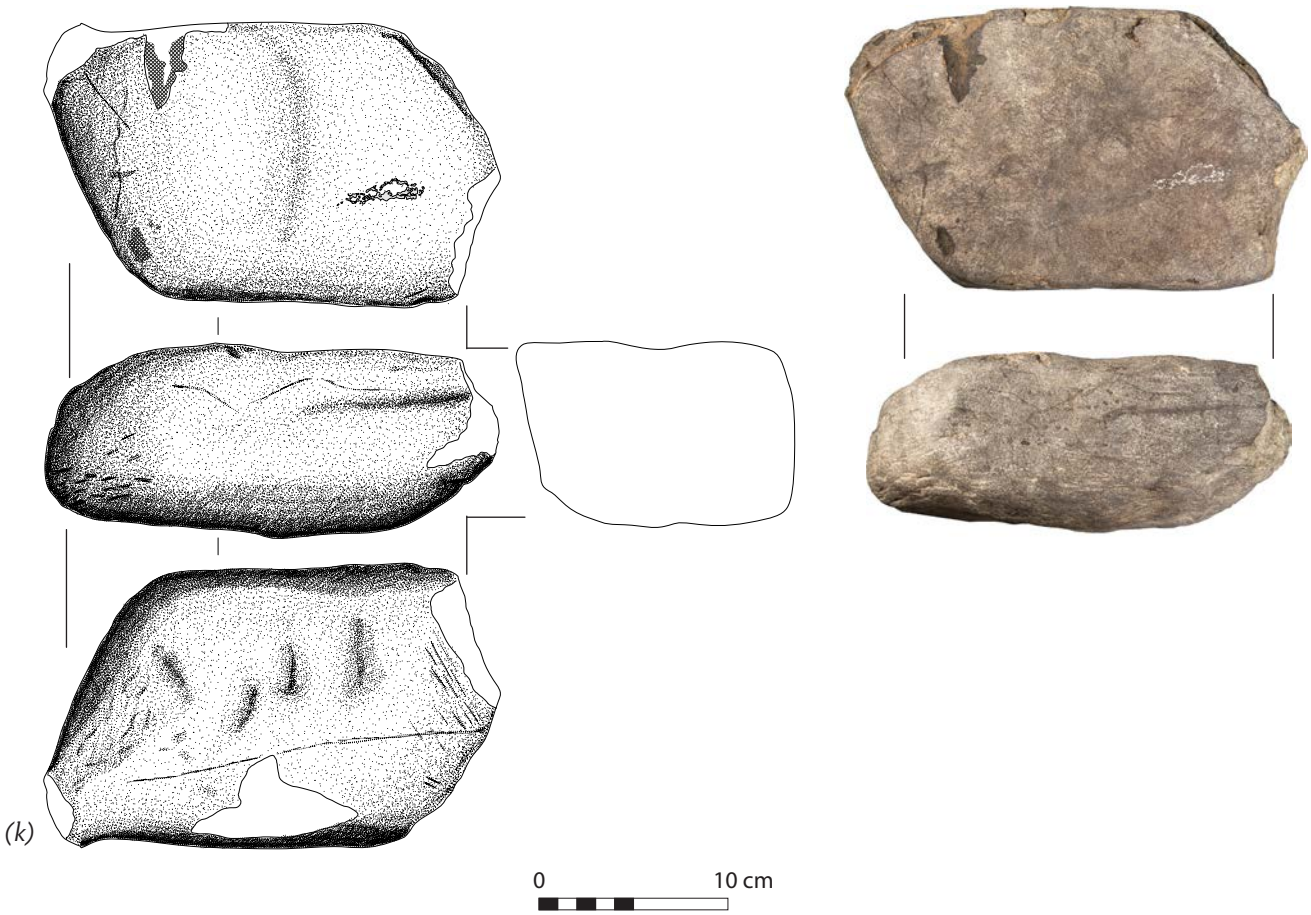


Fig. X.2.k. A hornfels anvil from HeG with uneven surfaces. Object 3047, drawing 1000-986 drawn by A. Talaat, digitally reconstructed and inked by P. Collet, photos 117116–17 by A. Eweida.

GAMERS/ACCOUNTING OBJECTS

A number of objects have been found that could have either been used as gaming pieces or tokens for accounting purposes. Since the artifacts excavated are mostly not recovered in situ, it is not easy to determine their exact use. The gamers/accounting category consists of small balls (over 100 examples), disc-shaped objects (about 60), conical-shaped objects (15), as well as small, worked gaming pieces/artifacts of different shapes.

Small spherical balls were made of limestone, clay, and a few of chert. Ball gaming pieces were located in HeG, KKT, and MVT. These vary in size, ranging in diameter from 2 to 5.5 cm. Examples of balls are Objects 1348 and 1350 (**Fig. X.3.a**), 1495b (**Fig. X.3.b**), 1673 (**Fig. X.3.c**), and 2949 (**Fig. X.3.d**). Similar gaming balls were excavated by Petrie (1927: pl. XLVIII). Conical-shaped gaming pieces were made of limestone, clay, travertine, and sandstone. These range from a height 1.2 to 3.8 cm with a maximum diameter of 1.5 to 3.5 cm. Examples are Objects 1832 (**Fig. X.3.e**), 1953 (**Fig. X.3.f**), and 2324 (**Fig. X.3.g**; a similar example was found by Kromer in Giza [1978: Taf. 32, no. 17]). Similar examples were found in a tomb in Abusir (Bárta 2009: 137, fig. 5.4.48, no. 151c). A unique complete limestone conical/pyramidal-shaped gaming piece was found in HeG (**Fig. X.3.h**). It has a pyramidal outline when viewed from the side and a rectangular base. The bottom part of the piece (about two-thirds of the object) and the base are deeply incised with a hatched net pattern. The apex of the object is at a slight angle to the orientation of the object. In the tomb of Mereruka at Saqqara, Mereruka is depicted playing with his son with conical-shaped gaming pieces, similar to some of the conical examples excavated by AERA team members (see scene on p. 124, Duell 1938b: pl. 172).

Disc-shaped gamers/tokens were made of clay, limestone, sandstone, and ceramic. Disc-shaped tokens/gamers have a circular/oval outline when viewed from above and are in most cases rectangular in cross-sections. Examples of disc-shaped gamers/tokens are Objects 2000-44 (**Fig. X.3.i**), 1398 (**Fig. X.3.j**), 2816 (**Fig. X.3.k**), 2828 (**Fig. X.3.l**), 4088 (**Fig. X.3.m**), and 4168 (**Fig. X.3.n**). Some disc-shaped gamer/token examples are taller in height than clay discs, like Objects 2812 (**Fig. X.3.o**), 2959 (**Fig. X.3.p**), and 3272 (**Fig. X.3.q**).

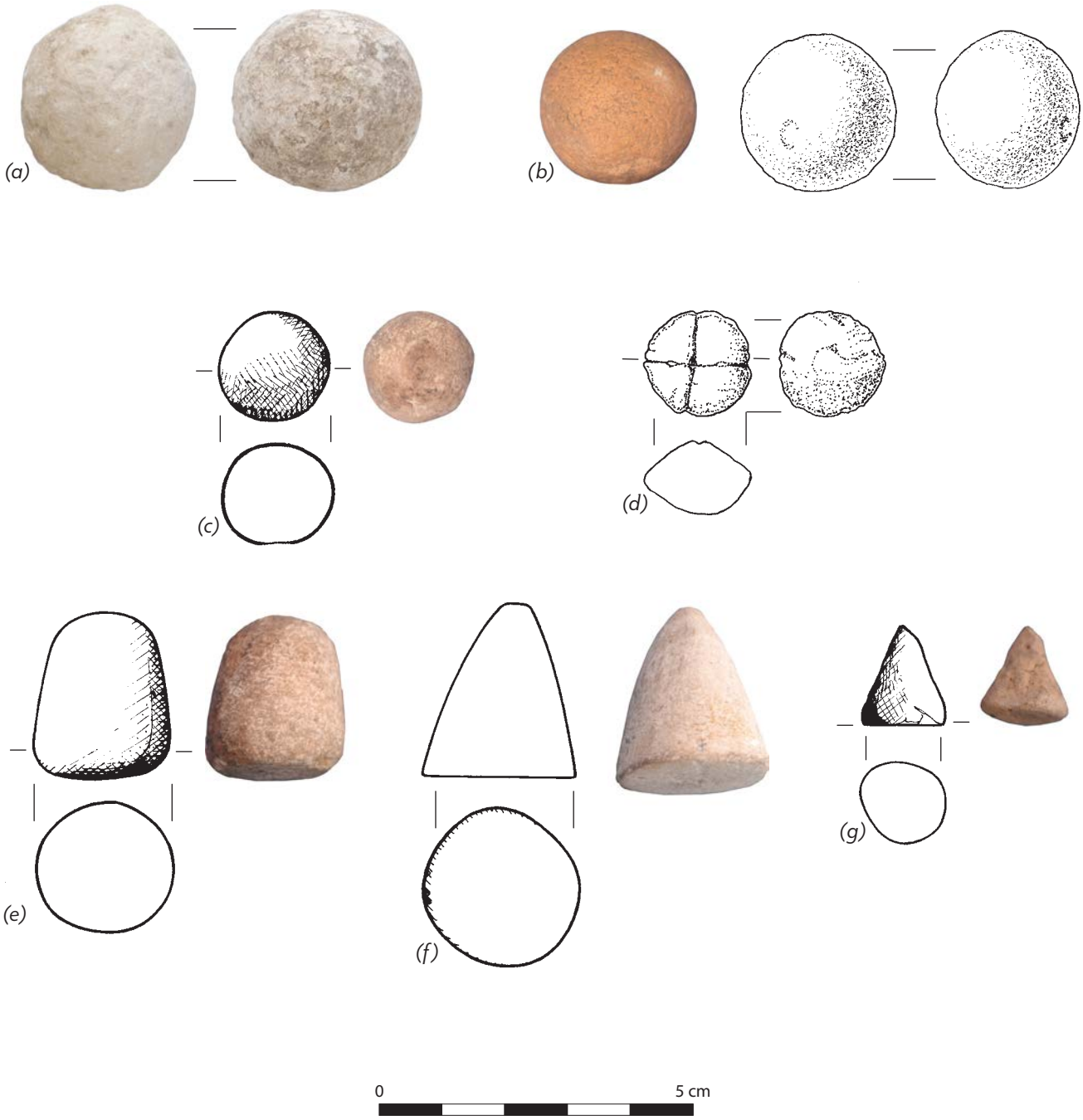


Fig. X.3.a. Two complete limestone balls from HeG. Objects 1348 and 1350, photo 201601 by Y. Kawae; ***Fig. X.3.b.*** A chert ball from HeG. Object 1495b, drawing number 1000-759 by M. Gaylor, photo 113928 by D. Jones; ***Fig. X.3.c.*** A small limestone ball from HeG with smoothed outer surface. Object 1673, drawing 1000-507 by W. Schenk, photo 113917 by D. Jones; ***Fig. X.3.d.*** A clay gaming piece from HeG, ovoid in shape, with a ridge line in the center that goes around the circumference of the oval. Top surface has a cross-shape incision, probably for a string. Object 2949, drawing 1000-152 by C. Hebron; ***Fig. X.3.e.*** A complete limestone conical/cylindrical-shaped gaming piece from HeG with a rounded top. Object 1832, drawing 1000-499 by W. Schenk, photo 114728 by D. Jones; ***Fig. X.3.f.*** A complete limestone conical-shaped gamer from HeG with a slightly rounded bit end of the cone shape. A part of the object is smooth, other part is weathered. Object 1953, drawing 1000-544 by W. Schenk, photo 114728 by D. Jones; ***Fig. X.3.g.*** A clay conical gaming piece from HeG, with an oval base. Object 2324, drawing 1000-624 by W. Schenk, photo 114714 by D. Jones.

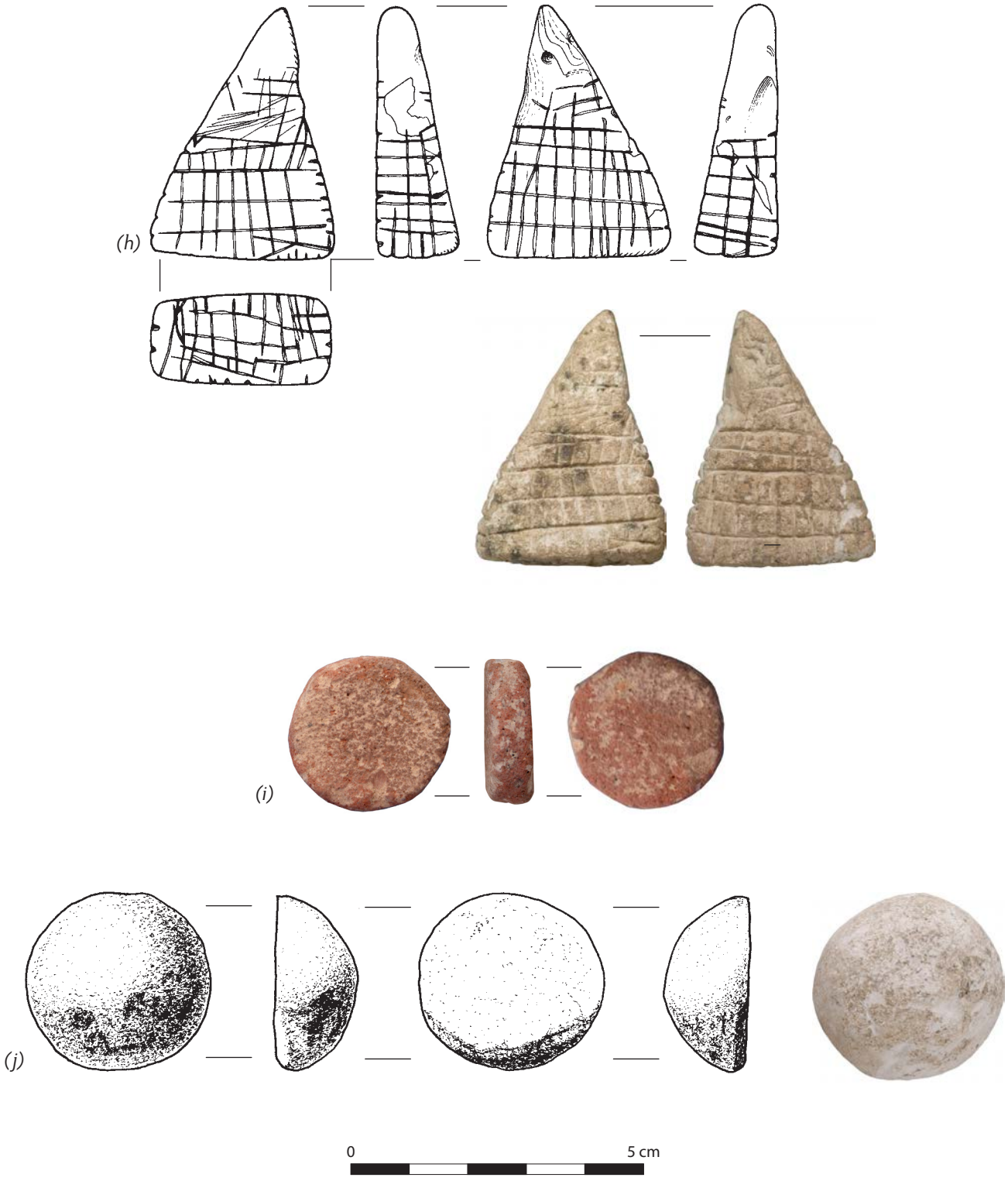


Fig. X.3.h. A unique limestone gaming piece from HeG, pyramid shaped. The top part of the gaming piece has few curvy lines and fine incisions. The remaining surfaces of the gaming piece are incised with a grid pattern design. Object might have been initially designed to be a possible stamp or seal. Object 1665, drawing 1000-491 by W. Schenk, photos 909440, 909443, 909447 by J. Quinlan; ***Fig. X.3.i.*** A ceramic token/gamer, disc-shaped, from HeG. Object is well-shaped, with worked vertical sides around its circumference. Object 2000-44, photos 114705, 114706, 114708, 114711 by D. Jones; ***Fig. X.3.j.*** A dome-shaped limestone token/gaming piece from HeG, circular outline when viewed from above and a flat base. Object 1398, drawing 1000-757 by M. Gaylor, photo 201606 by Y. Kawae.

Fig. X.3.k. A complete sandstone disc-shaped token/gamer from HeG with a black band on the sides around its circumference and traces of red pigment. Object 2816, photo 909479 by J. Quinlan; ***Fig. X.3.l.*** A clay disc-shaped token/gamer from HeG. Object roughly shaped with fine stripes on both upper and lower surfaces. Object 2828, photos 114705, 114708, 114711 by D. Jones; ***Fig. X.3.m.*** A recut, ceramic potsherd disc token/gamer from HeG, ridged circular outline when viewed from above and a concave/convex profile from the original shape of the pot. Top surface has three deep incision marks, two along the length and one across the width, crossing over the two lines. Object 4088, photos 414256–57 by C. Malleson; ***Fig. X.3.n.*** A clay dome-shaped token/gamer from KRO with smoothed outer surfaces. Object 4168, photos 114705, 114708, 114711 by D. Jones.

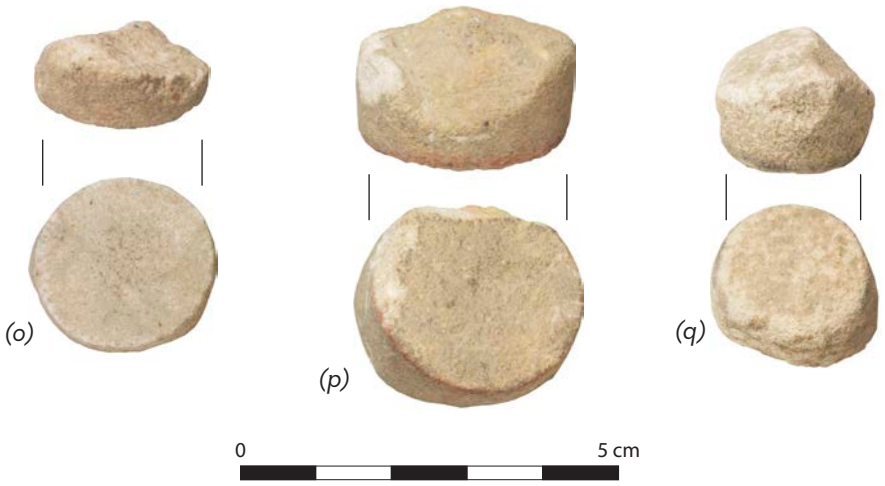


Fig. X.3.o. A sandstone gamer/disc-shaped token from HeG, with a flat base and incomplete/broken top surface. Object 2812, photos 909476–79 by J. Quinlan; ***Fig. X.3.p.*** Sandstone gamer/token from HeG with a flat base and a smoothed, finished sides around the circumference. Like Object 2812, the top part of the object is broken off. A thin red band runs around the circumference of the base of the object. Object 2959, photos 909479 by J. Quinlan; ***Fig. X.3.q.*** A sandstone gamer/disc-shaped token from HeG, with a flat base. The top part of the object is broken, creating a triangular shape. The object is thicker than other disc-shaped objects, perhaps it was a cylindrical-shaped gaming piece when complete. A fine black line runs around the circumference of its base. Object 3272, photos 909479 by J. Quinlan.

WEIGHTS

Weights were made of different shapes, materials, and were used for different crafts and activities. Weights were used for a number of crafts, like drilling, construction, and fishing, among others. Some examples have well-defined shapes making it is easier to identify their use, like in the case of plumb weights (see "Construction Tools") and fish net weights (see "Fishing Tools"). In other cases, it is difficult to identify specific uses for certain weights, as not all examples recovered are complete and because some examples could have been used for more than one purpose (see "Multipurpose Tools").[1]

Seventeen weight examples have been recovered from both HeG (16) and KKT (1). The examples recovered are mostly made of limestone, with a few of travertine and unfired mud. Two unusual weights were recovered from the same area in HeG, both are made of unfired mud, and hence are fragile: Objects 3203 (**Fig. X.4.a**) and 3285 (**Fig. X.4.b**). Object 3203 has a rectangular outline and 3285 has a dome-shaped outline. Both weights are perforated in the middle. Three unusual possibly counterweights were found in HeG, all three of the same shape but different sizes, Objects 2300 (**Fig. X.4.c**), 2301 (**Fig. X.4.d**), and 2302 (**Fig. X.4.e**). The three examples were found in the same area in HeG, made of limestone, with oval-shaped outlines and dome-shaped cross-sections. The bottom surfaces are flat and worked.

1. Examples of weights used as multipurpose tools are ones that have been used either as counterweights and/or pounder as well as counterweights and/or gaming piece.

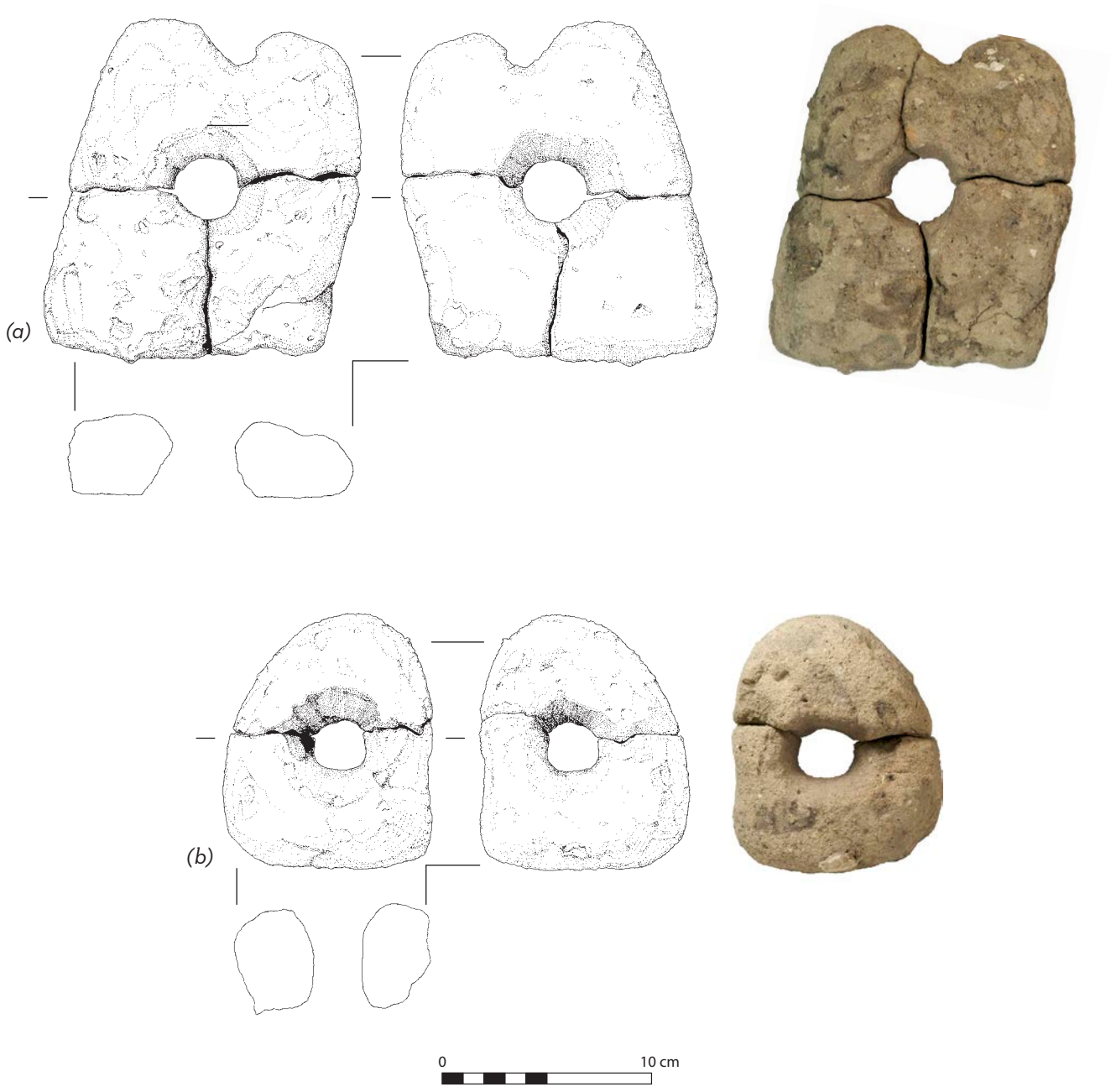


Fig. X.4.a. Unfired mud weight from HeG, has an almost rectangular outline and rectangular cross-sections. Tool was so very fragile that it broke after drawing and before photographing it. Object 3203, drawing 1000-178 by C. Hebron, photo to 909545 by J. Quinlan; ***Fig. X.4.b.*** Unfired mud weight from HeG, very fragile, with an oval outline and a perforation in the middle of the tool. The weight is broken into two pieces. Object 3285, drawing 1000-179 by C. Hebron, photo 909543 by J. Quinlan.

Fig. X.4.c. Limestone counterweight from HeG, oval outline, and dome-shaped cross-section. Object 2300; ***Fig. X.4.d.*** Limestone counterweight from HeG, oval outline, and dome-shaped cross-section. Object 2301; ***Fig. X.4.e.*** Limestone counterweight from HeG, oval outline, and dome-shaped cross-section. Object 2302. Photos 805608-805610 by Y. Kawae.

INCISED AND INSCRIBED OBJECTS

A number of objects recovered by AERA team members are inscribed, incised, and/or painted, and were used for different purposes and functions, such as stamps, seals, incised or inscribed stone fragments, and others. These objects were recovered from HeG, KKT, and KRO, and are made mostly of limestone, with one example of dolerite, and one of quartzite. An unusual example is a dolerite block or slab, painted with red ochre what looks like an *ankh* sign (**Fig. X.5.a**). Another, made of limestone, is a limestone plaque from KKT, carved in low relief and may be read as *smyt* "desert" or "necropolis" (**Fig. X.5.b**).

Seals and seal fragments from AERA's excavations at HeG, KKT, and MVT number approximately two dozen. Following patterns in the sealing impressions from these sites (in addition to KRO), these fall into two main categories: cylinders and stamps. (At the time of writing, AERA's corpus of sealings and sealing-related objects—seals, ancient discarded/aborted sealings, cores, byproducts, stoppers/toppers/lids, test strips, and the like—numbers over 6200. The typology of both of the sealings and the seals that made the impressions as it stood in 2010 was published in John Nolan's dissertation [Nolan 2010]; an updated version is currently being prepared by the author.)

As the majority of AERA's work thus far has focused on 4th Dynasty levels at HeG, it is no surprise that sealing impressions skew overwhelmingly to those made by cylinders, but not exclusively so. Stamp seals and stamp-sealed clay sealings have been found at both HeG (4th Dynasty) and MVT (5th–6th Dynasty). Two objects that were possibly intended to function as stamp seals feature incised lines in cross-hatched patterns: Objects 1412 (**Fig. X.5.c**) and Object 2718 (**Fig. X.5d**). Neither item has a suspension hole to indicate they were finished or actually served as stamps, but we have recovered a sealing featuring a cross-hatch pattern of the same scale (ca. 1-cm grid) as Object 2718. Two examples do have suspension holes and more clearly functioned as stamps. Object 1457 (**Fig. X.5.e**) has incisions forming a geometric pattern, with lines radiating from a central design; its back has small indentations for holding the seal. Object 1944 (**Fig. X.5.f**) features a small hieroglyphic inscription, perhaps related to the title *wṯz rˁ nb* or "everyday porter" (J. Nolan, unpublished registration form).

Recent excavations in the MVT have uncovered two button stamp seals (Object 4935, **Figs. X.5.g**; Object 5020, **Fig. X.5.h**). Object 4935 (**Fig. X.5.g**) is of the *Kreuz* or quartered-circle type. Object 5020 has a frog motif, carved in a style familiar from other late Old Kingdom–Early First Intermediate comparables.

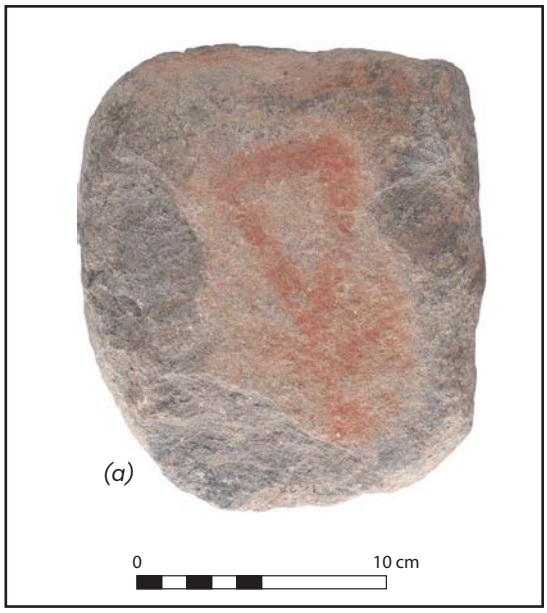
Cylinder seals and seal fragments make up the majority of AERA's seal examples. In the sealings corpus, the majority of pieces are from "Official" or *Amtssiegel* cylinders (based on the typology of P. Kaplony). In an interesting twist, none of the recovered seals (or fragments) are from Official cylinders, rather they are what might be termed personal or administrative. Objects 3929, 1666, 1985, and 5026 (**Figs. X.5.i–l**) are limestone examples, somewhat crudely carved. Object 1666/Sealing 4957 (**Fig. X.5.j**) is a limestone cylinder with the possible inscription *k3p wśḫ nbw wr (?) i.nb*, "Censer of the great golden broad collar, Ineb" (J. Nolan, unpublished AERA report). Object 5026/Sealing 5237 (**Fig. X.5.l)** is a partial cylinder preserving a portion of a well-known formula reading *ʳRNˀ nṯr.wj [mry]*, "(royal name) [beloved of] the Two Gods" (D. Jerabek, unpublished AERA report).

Object 1766 (**Fig. X.5.m**) is a fragment of a bone seal with two inscribed quail chicks. Object 5027 (**Fig. X.5.n**) is a small fragment of a limestone seal from HeG. The top edge with cross-hatching border is preserved, as well as a partial recumbant lion with tail curled up over its back. Interior shows striations from boring the perforation hole.

The fishnet or cross-hatch geometric pattern illustrated in Objects 1540, 1539, 2000-31, and 1258 (**Figs. X.5.o–r)** is well represented among the sealings from HeG. Fragments of stone and bone seals have been recovered.

Lastly, AERA has found a handful of clay seals and fragments—be they "model" seals or just doodles by idle hands passing the time—as seen in Object 3256, 3620, and 1538 (**Figs. X.5.s–u)**. These can be either incised (as **Fig. X.5.s**, geometric pattern, or **Fig. X.5.u**, a partial cylinder with a crude hieratic inscription and two boundary lines at the ends; D. Jerabek suggests a tentative reading of *jmj-ḫt pr-hd (n) ḫnw* "under-supervisor of the Treasury of the Residence," based on the remnants) or formed and then impressed by a cylinder seal (as in **Fig. X.5.t**, impressed by a informal cylinder with a fishnet panel and a row of elongated, nested ovals). Similarly, HeG produced one so-called "test strip" or "test plaque," Sealing number 786, **Fig. X.5.v**. Sealing 786 bears one roll from an informal cylinder; its composition features perhaps one large horizontal panel with traces of one recumbent animal (tail up, perhaps canine) and one scorpion, ending/beginning with a small vertical panel featuring long-eared tête-bêche hares. The clay bearing the impression was well-formed, smoothed and shaped on the front prior to impression; the back is smoothed and flattened. It is currently unknown whether this plaque served as insurance against forgery for incoming transactions, was a "quality check" by the seal carver, or perhaps a sample intended as inspiration for a commissioned piece.

- A. Witsell



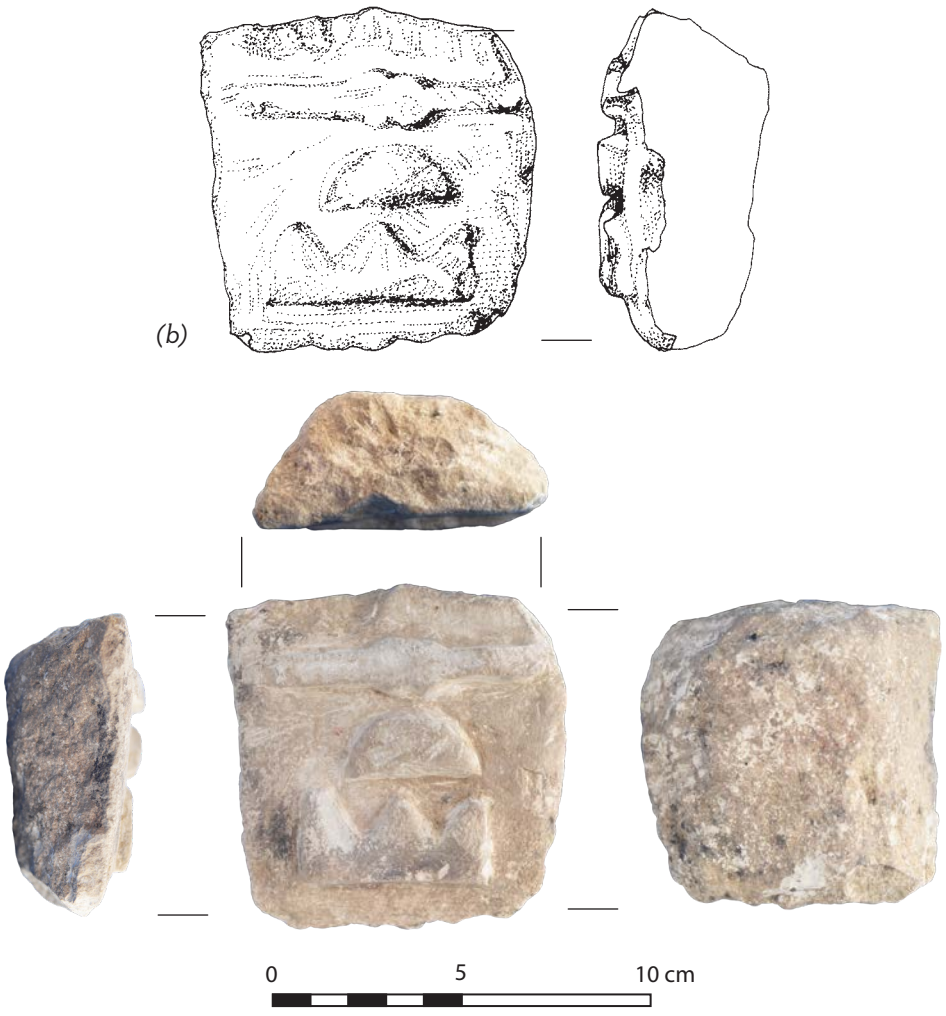


Fig. X.5.a. Dolerite block from HeG, inscribed with an ankh sign painted in red ochre. Object 2196, photo 302622 by Y. Kawae; ***Fig. X.5.b.*** Carved limestone plaque featuring three hierolyphs. Object 3875, drawing 1000-1049 by D. L. Hackley, photos 114831, 114835, 114837, 114839 by D. Jones.

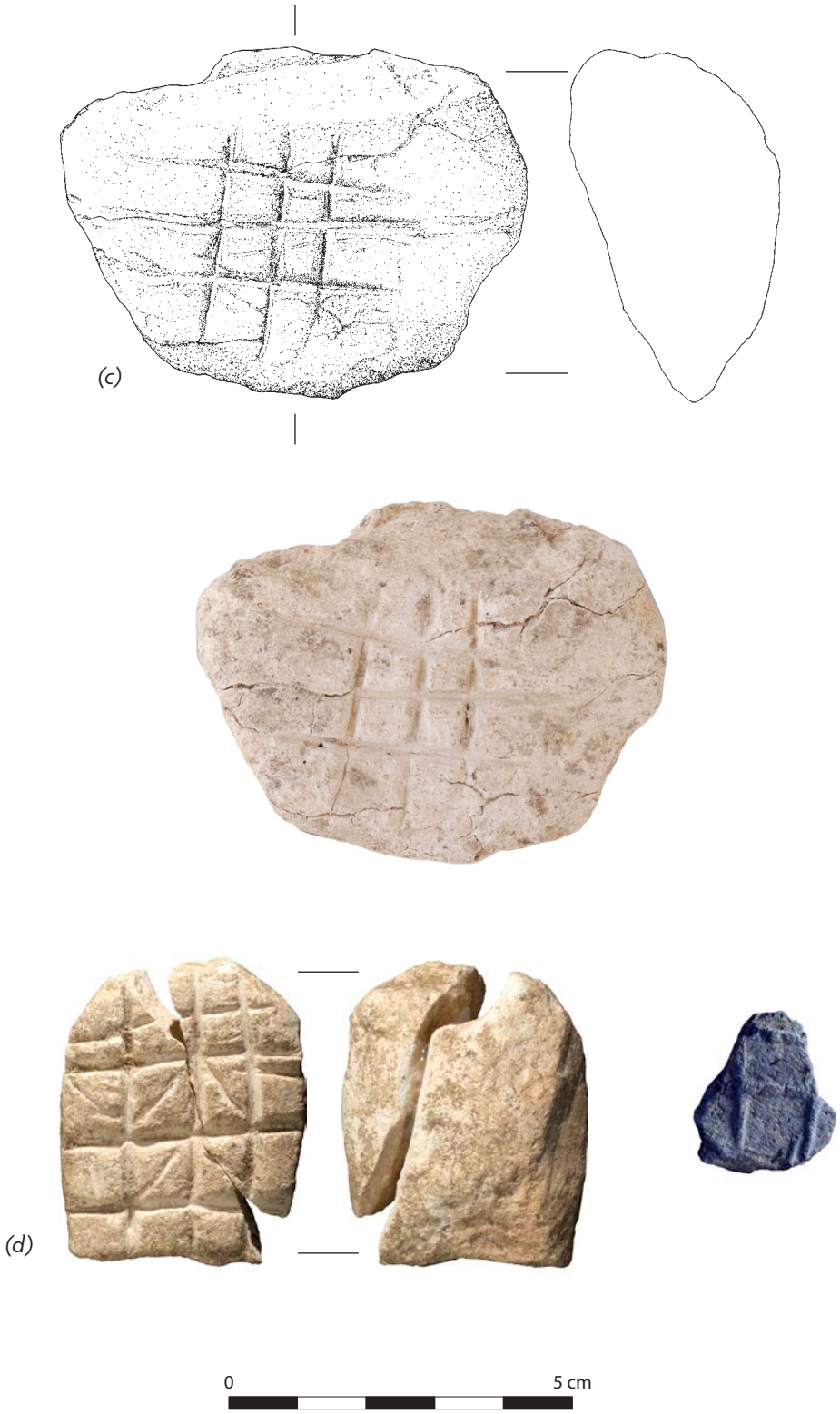


Fig. X.5.c. Possible limestone stamp from HeG, with a grid pattern on its flat surface. Object 1412, drawing 1000-459 by J. Karlsson, photo 201690 by Y. Kawae; ***Fig. X.5.d.*** Possible limestone stamp from HeG, broken into two pieces. The flat surface has incised lines along the length and across the width, creating a grid pattern; Object 2718/Sealing number 4394, photos 118002, 118003 by J. Quinlan; Sealing 796, perhaps from a seal similar to Object 2718, photo 118004 by J. Nolan.

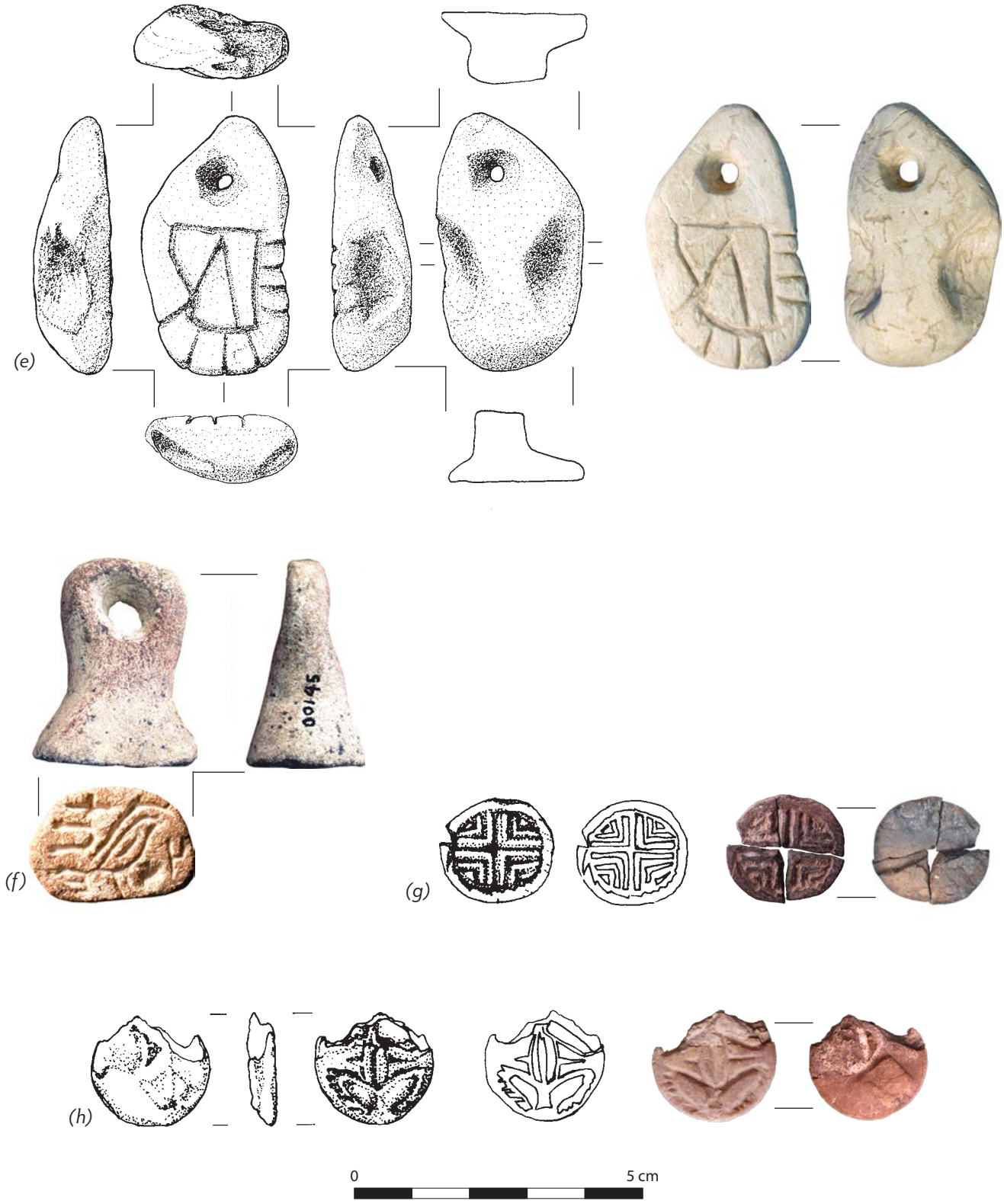


Fig. X.5.e. Complete limestone stamp from HeG with a perforation on the top, to be worn as a pendant/amulet, with irregular incisions on the flat surface. Object 1457/Sealing 2530, drawing 1000-765 by M. Gaylor, photos 118005, 18006 by J. Nolan; ***Fig. X.5.f.*** Complete limestone stamp seal from HeG with a perforation on the top, to be worn as a pendant/amulet. Object 2000-145/Sealing 1944, photos 118007–118009 by J. Nolan; ***Fig. X.5.g.*** Small button stamp from MVT in *Kreuz* or quartered-circle motif, burnt ivory. Object 4935/Sealing 6282, drawing 1000-1004 by L. D. Hackley (after reconstruction), photos 118010 and 118011 by D. Jerabek and C. Malleson; ***Fig. X.5.h.*** Small button stamp from MVT with a frog motif, stone. Object 5020/Sealing 6283, drawing 1000-1003 by L. D. Hackley, photos 118012, 118013 by D. Jerabek.

Fig. X.5.i. An incomplete limestone seal from HeG, with inscriptions and a lattice design. Object 3929, drawing 1000-730 drawn by Y. Mahmoud, digitally inked by P. Collet, photos 223033, 223037 by S. Hitchens; ***Fig. X.5.j.*** A complete limestone seal from HeG, pierced through its height. Seal has three columns of hieroglyphs, separated by a vertical line. On the top and bottom of the seal, two horizontal lines run around the circumference of the object. Object 1666/Sealing 4957, drawing 1000-487 by W. Schenk, photos 915876, 915880, 915886 by J. Quinlan; ***Fig. X.5.k.*** An incomplete limestone seal from HeG, with geometric striations on the outer surface. Object 1985/Sealing 3035, drawing 1000-506 by W. Schenk, photos 118014–118017 by J. Nolan.

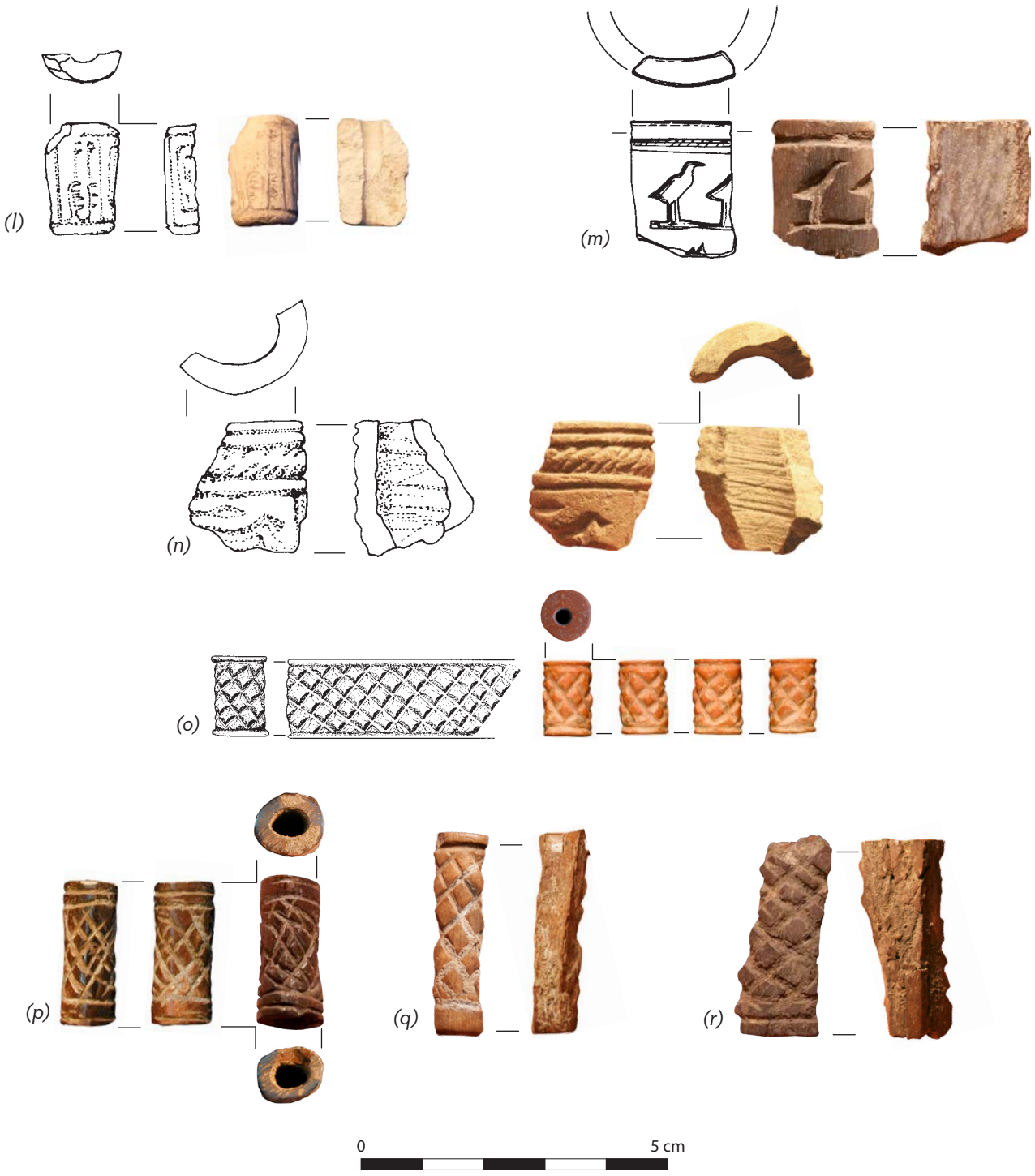


Fig. X.5.l. Small incomplete personal seal from KKT, broken vertically, with striations from boring on interior surface. Object 5026/Sealing 5327, drawing 1000-1023 by L. D. Hackley, photos 118018, 118019 by A. Witsell; ***Fig. X.5.m.*** A fragment of a bone seal from HeG with two inscribed quail chicks. Object 1766/Sealing 3038, drawing 1000-492 by W. Schenk, photos 118020, 118021 by A. Witsell; ***Fig. X.5.n.*** Small fragment of a personal seal from HeG. Top edge with cross-hatching border preserved, as well as a partial recumbant lion with tail curled up over back. Interior shows striataions from boring the perforation hole. Object 5027/Sealing 5338, drawing 1000-1024 by L. D. Hackley, photos 118022–118024 by A. Witsell; ***Fig. X.5.o.*** A complete chert seal from HeG. Seal has a lattice design all over the height of the object and around its circumference. Object 1540/Sealing 2532, drawing 1000-753 by M. Gaylor, photos 118025–118029 by J. Nolan and A. Witsell; ***Fig. X.5.p.*** A partial cylinder seal from HeG, with cross-hatch/fishnet pattern, made of bone. Object 1539/Sealing 2531, photos118030–118034 by J. Nolan; ***Fig. X.5.q.*** A partial cylinder seal from HeG, with cross-hatch/fishnet pattern, made of bone (sheep/goat). Object 2000-31/Sealing 6285, photos 118035, 118036 by A. Witsell; ***Fig. X.5.r.*** A partial cross-hatch/fishnet pattern cylinder seal from HeG, of unknown material. Object 1258/Sealing 6286, photos 118037, 118038 by A. Witsell.

Fig. X.5.s. A complete clay seal from HeG, pierced vertically. Possibly a "model" seal. Seal has a fine incised line at the top and bottom sections that goes around the circumference. Across its height, two-thirds of the body has a chevron pattern incised, and on the remaining third, fine striations are incised, creating a grid pattern. Object 3256/Sealing 5658, drawing 1000-1025 by L. D. Hackley, photos by J. Nolan or 909482-83 by J. Quinlan, 118039 by A. Witsell; ***Fig. X.5.t.*** A complete clay seal from HeG, possibly a "model" seal. Not fully perforated. Seal was impressed on all sides by a personal cylinder seal with fishnet and elongated oval geometric motif. Object 3620/Sealing 4302, photos 17728, 11730–17733 by Y. Kawae; ***Fig. X.5.u.*** An incomplete clay seal from HeG, attempted vertical perforation. Possibly a "model" seal, with a hieratic inscription, crudely made. Sheared along one side. Object 1538/Sealing 2519, field sketch by J. Nolan, photos 915891–915804 by J. Quinlan, 118040, 118041 by A. Witsell.

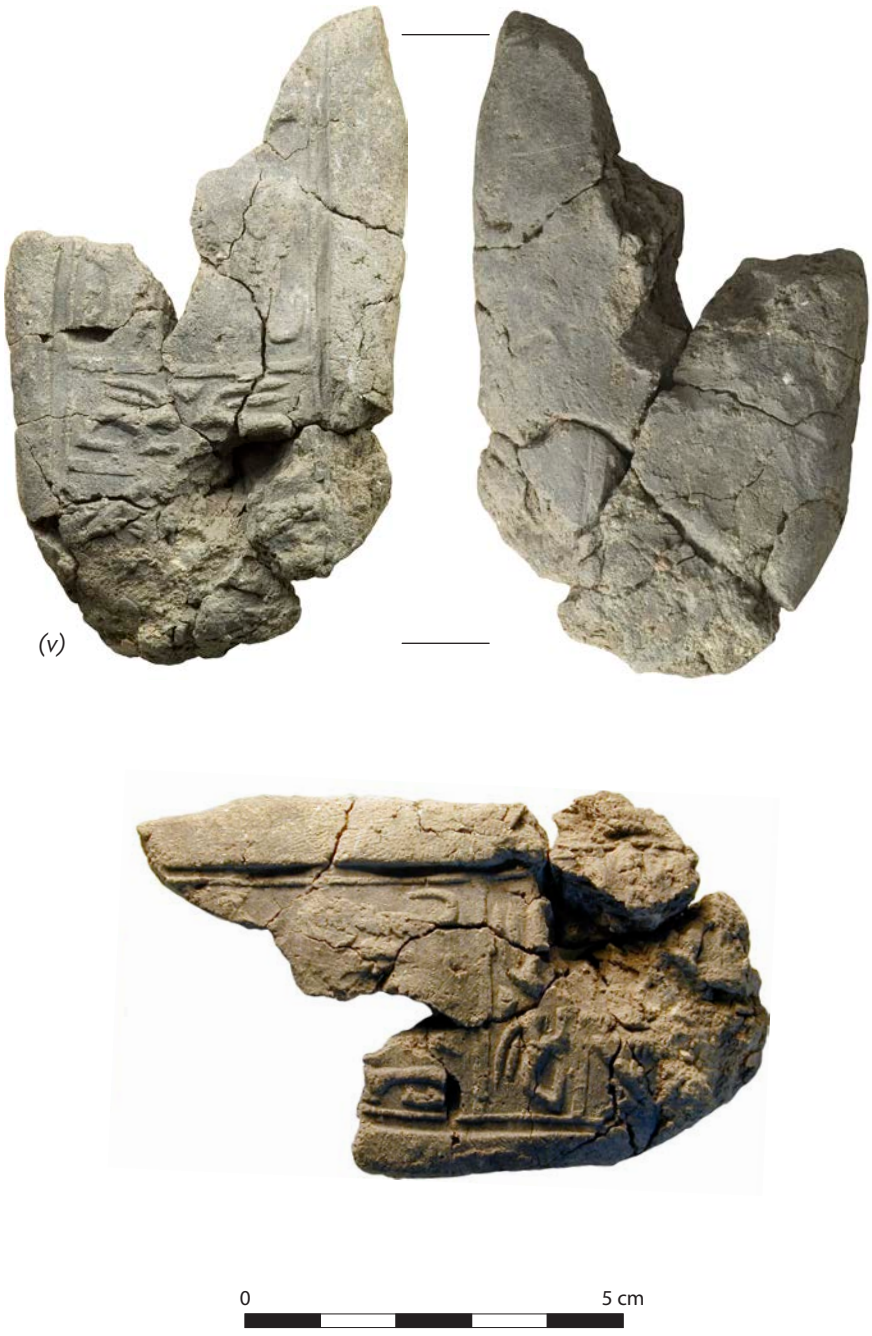


Fig. X.5.v. Partial clay "tester plaque" from HeG, bearing an impression from a cylinder seal with tete-beche long-eared hares, a scorpion, and another recumbant animal. Object 5030/Sealing 786, photos 17786, 17787 by Y. Kawae and 118042 by A. Witsell.

MULTIPURPOSE TOOLS

Towards the end of the 4th Dynasty, the HeG site was abandoned and most complete and useful objects and tools were taken away or removed (see Lehner 2002: 30; Malak 2014: 13). Hence the majority of the objects recovered during AERA's excavations are either incomplete, fragmented, or worn out and at the end of their life-cycle. Additionally, a number of objects found were used for more than one purpose, most probably made for one purpose then reused for a different function after the object is broken or worn out. Due to the fragmentary state in which objects are recovered, it is at times difficult to assign the use or function of one artifact to just one category or function, such as Object 1574 (**Fig. X.6.a**). This quartzite tool might have been used as a handheld grinder, mano, or as a polisher.

Some tools overlap in the same category, such as construction tools, including pounders/hammers or axes/hammers, abraders/whetstones, and gamers/tokens, among others. Yet, other artifacts overlap across categories even more diverse, such as diorite Object 2854 (**Fig. X.6.b**). This may have been a statue fragment reused as a polisher on one surface and as a pounder on another.

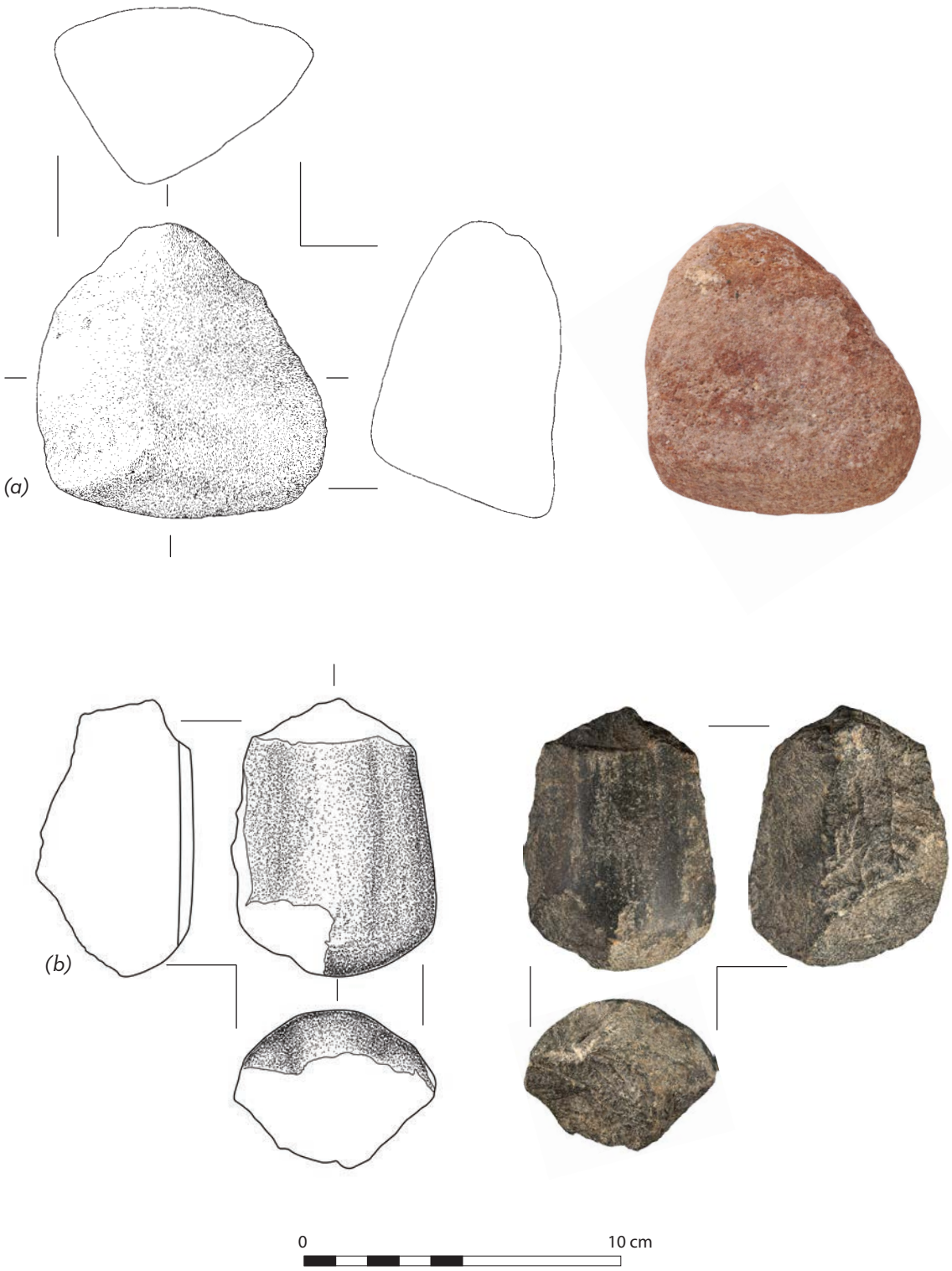


Fig. X.6.a. Quartzite grinder mano/polisher from HeG. Tool is faceted and might have been used for more than one purpose. Object 1574, drawing 1000-449 by J. Karlsson, photo 201683 by Y. Kawae; ***Fig. X.6.b.*** Multipurpose diorite tool from HeG, used as a polisher and a pounder. Object 2854, drawing 1000-888 by A. Talaat, digitally inked by P. Collet, photos 116799–801 by A. Eweida.