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Preliminary Findings at a Late Old Kingdom Fort in South Sinai, Including the Pottery, From the 2008 Season[1]

Gregory Mumford
The University of Alabama at Birmingham

Rexine Hummel
The University of Toronto

Abstract

The 2008 excavations at Ras Budran continued exposing the late Old Kingdom fort's courtyard, finding baking installations, deep hollows filled by ash and sand, and parts of an underlying occupation layer that may reflect earlier activity at the fort (which needs further clarification). The exploration of a suggestive "chamber" in the eastern enclosure wall revealed it to be a modern disturbance. The project also concentrated on the western "bastion," tracing it for 20 meters and finding evidence for salt encrustations and potential storm activity along the fort's western side; one preliminary conclusion is that the sealing of the fort's original entryway, and the subsequent abandonment and dismantling of the fort, may have been encouraged by a poor placement of the fort too close to the Red Sea and/or possibly increasingly harsher (winter) weather ca. 2300–2200 B.C. The study also contains Rexine Hummel's analysis of the fort's pottery fabrics, forms, and functions.

Introduction

Tell Ras Budran is located in Southwest Sinai, 210 meters from the modern Red Sea coastline, at the northern end of El-Markha Plain, about halfway between Abu Rodeis and Abu Zeinima. The site contains a small, circular fort, built of rough limestone slabs, and measures 44 meters in diameter (**Figure 1**); it has been dated by pottery and other artifacts to the late Old Kingdom, probably somewhere in the late 5th to 6th dynasty.[2] The structure provided a secured anchorage for Old Kingdom expeditions heading to the turquoise and copper mines in South Sinai: These expeditions departed from Wadi al-Jarf and Ayn Soukhna and crossed the Red Sea to Ras Budran,[3] which served as a base from which most expedition members headed inland to the mines at Wadi Maghara, Wadi Kharig,[4] and perhaps site 702B near Serabit el-Khadim.[5] Although the structure was first noted in Beno Rothenberg's 1967 survey,[6] the earliest known excavations took place in 2002, and continued in 2004 and 2008, with a study season in 2010, through the joint efforts of the Supreme Council of Antiquities (SCA; now renamed the Ministry of Antiquities [MoA]) and a University of Toronto project directed by Gregory Mumford (this project transferred to the University of Alabama at Birmingham [UAB] in 2007).[7] This preliminary report focuses mainly upon the 2008 season's findings, but also incorporates earlier materials as well as subsequent research findings, and concludes with R. Hummel's assessment of the 2008 season's pottery.

In the summer of 2008 investigations resumed at Tell Ras Budran by the UAB project, in conjunction with the Supreme Council of Antiquities (SCA/MoA). The team included several core staff members: Gregory Mumford (director; architect; excavation supervisor), Sarah Parcak (co-director; excavation supervisor), Mohammed Bedir (SCA chief inspector), Rexine Hummel (ceramicist), Frances Cahill (registrar), Patrick Carstens (photographer), Shakira Christodoulou (artist; excavation supervisor), and Reis Omer Farouk el-Sayed (foreman); the neighboring Bedouin village of Kilo Tisa supplied a workforce of mostly returning, trained workmen, who were supervised by Reis Farouk and worked alongside three unit excavators and recorders (G. Mumford; S. Parcak; S. Christodoulou).

Refined Excavation Methodology for 2008

After removing the windblown sand that had accumulated between the 2004 and 2008 seasons (Figure 2), the project members began excavating the ancient, overlying wind-blown sand from the eastern half of the fort's courtyard, proceeding eastward in a series of north-south trenches (numbered IV–VI)

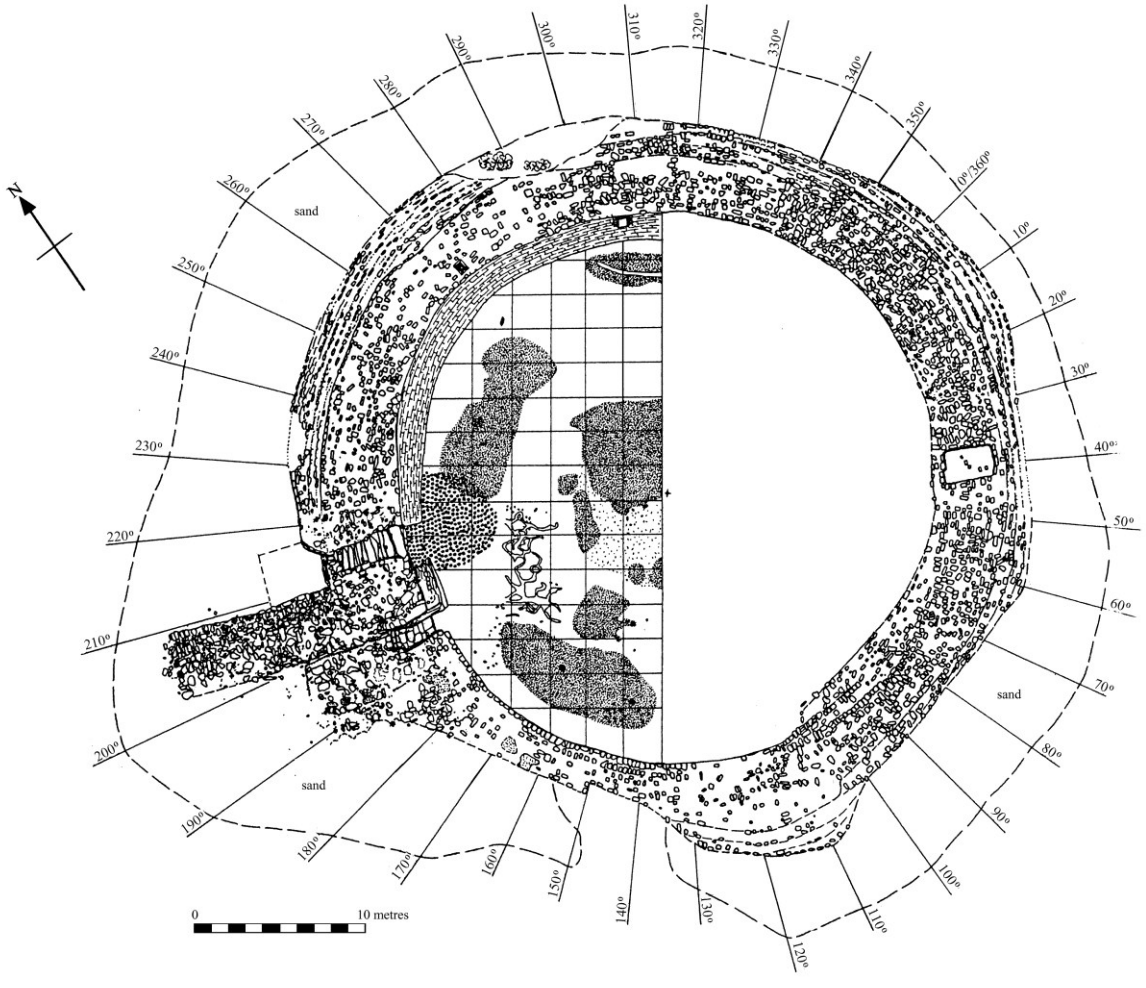

Figure 1: Top plan of the fort at Ras Budran from the 2004 season (Drawing: G. Mumford)

that spanned two excavation units (labelled Units 6 and 7, which lie in the courtyard's southeast and northeast quadrants, respectively).[8] The project also placed a new trench outside the fort, in the area along the north side of the western bastion (extending Unit 1 from 2002, and delineating the bastion's wall top). In addition, the 2004 season's materials were re-photographed digitally (improving views and labelling) and recorded in greater detail: The registrar, F. Cahill, weighed and measured the volume of all the previously collected copper and turquoise nodules, and quantified and assigned preliminary identifications to the various Red Sea shell types (in conjunction with other project members),[9] while the ceramicist, R. Hummel, re-assessed the fabrics and types of pottery from 2004.[10] They applied this refined approach to all the materials and artifacts collected during the current, 2008 season, and to any artifacts and materials available for study from the 2002 season. F. Cahill also assigned every small find and the other materials and samples from 2002, 2004, and 2008 with a unique material culture number.[11] Of note, during the 2010 study season, all project members collaborated in completing a full database of the pottery, non-pottery artifacts, and materials from the 2002, 2004, and 2008 excavations.[12]

Refined Excavation Methodology for 2008

The ancient sand layers filling the unexcavated, eastern portion of the fort produced evidence for at least four distinct and successive phases of late Old Kingdom campsites on the windblown sand that progressively accumulated within the courtyard (Figure 3). A closer examination revealed that the earliest campsite lay on an irregular wind-blown surface and sloping dunes, ranging from 3 cm to 180 cm above the underlying surface associated with the fort's main occupation phase. The initial, returning Egyptian expedition had apparently begun to dismantle the southern wall of the fort (Figure 4), leaving traces of their presence via a hearth (elsewhere than the hearths shown in the illustrated section), a few discarded basalt hammer stones, a scattering of broken pottery, some dislodged limestone blocks (*i.e.*, mostly small chunks from the southern retaining wall), and numerous tiny stone chips and dust across the interior sand dune's surface. The next accumulation of windblown sand and overlying campsite lay over the surface of a sand dune that ranged from 70 cm to 250 cm above the fort's floor and also contained further evidence for a continued dismantling of the southern side of the fort. This second campsite contained a hearth ("B") that lay near

Figure 2: 2008 clean-up of inter-seasonal sand accumulation (Photograph: P. Carstens)

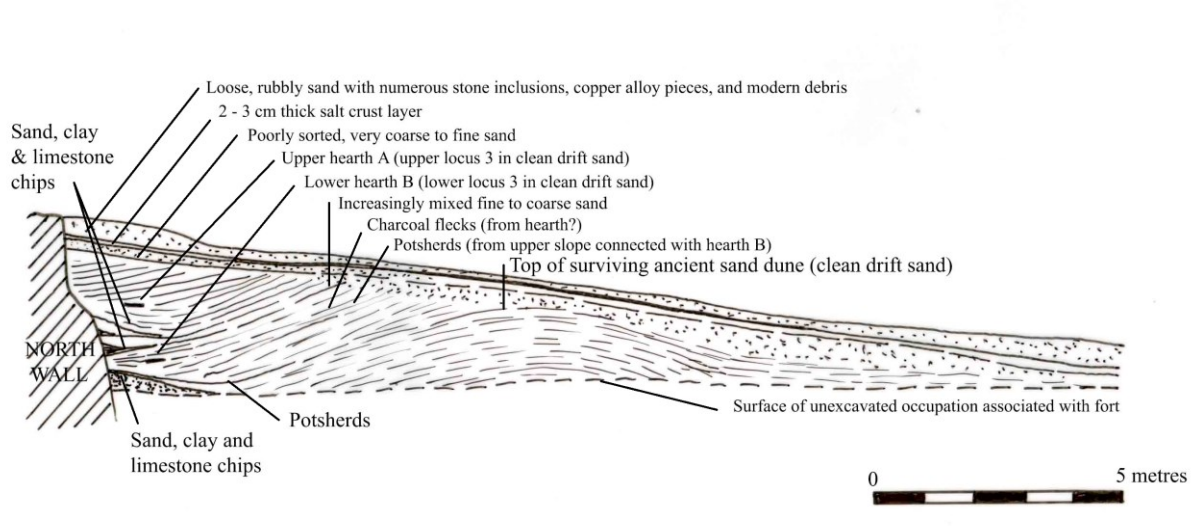

Figure 3: Unit 7 (northeast quadrant of courtyard), vertical section of sand fill for Trench IV/V in 2008 season (Photograph: P. Carstens)

to and was protected from the strong northern coastal winds by the adjacent northern wall, a hearth elsewhere (*e.g.*, Unit 2, near the blocked-up entry), more hammer stones, some potsherds, and a greater concentration of shifted stone blocks and stone chip debris (especially along the southern side of the fort). The third campsite lay on a further accumulation of drift sand that varied from 110 to 320 cm above the fort floor and yielded charcoal flecks and some potsherds. The fourth and last identified late Old

Kingdom campsite lay on a higher dune slope that fluctuated from 190 cm to 350 cm, and had a hearth ("A"), some potsherds, and other cultural debris. Of note, the lower two initial campsites contained traces of copper smelting near the interior face of the fort's northern wall, being sheltered from the fairly continuous, northern (summer) winds. Although it is hard to provide a precise estimate of the passage of time between the few campsites, it would seem that each campsite marks a period of at least a few years for a sum total of 10 to 20 years or more.[13] In addition, during the cleaning and delineation of the partly exposed wall tops of the fort (Figure 5), we encountered various small clusters and isolated finds of copper nodules, especially along the northern and western wall top areas, suggesting that the Egyptian expeditions camping here carried out some industrial activity in these areas.

Upon reaching the fort's interior surface, the team refined the 2004 season's application of the 2 by 2 meter grid system introduced in the western half of the courtyard's occupation surface. The courtyard's interior had been already subdivided into excavation unit quadrants (mainly units 3 and 5), three internal, north-south trenches (I–III), and the 2002 season's interior sondage units (2 and 4).[14] In 2008, the project added two new excavation quadrants and trench subdivisions to the east (Units 6–7, Trenches IV–VI), which were maintained particularly in the overlying ancient, windblown sand. The original 2 by 2 meter grid system was extended across the eastern half of the courtyard's occupation surface, being retained in order to minimize confusion and maintain the same grid coordinates (*e.g.*, A-O north-south; 1–14 east-west). However, the 2008 season devised a refined system, subdividing each 2 by 2 meter grid square (*e.g.*, B8) into four 1 by 1 meter grid square quadrants, namely northwest (*e.g.*, B8, NW), northeast (*e.g.*, B8, NE), southeast (*e.g.*, B8, SE), and southwest (*e.g.*, B8, SW). Each grid square quadrant was further subdivided into one or more locus to distinguish the main sandy floor matrix (*e.g.*, B8, NE, locus 3) from discrete ash patches (*e.g.*, B8, NE, locus 4), or other features (*e.g.,* post holes). Each excavation team planned, excavated, sieved (fully), and collected virtually all flooring materials and artifacts from these 1 by 1 meter quadrants, and any smaller locus subdivisions that appeared within them (Figure 6). This refined system thereby enabled a much more accurate spatial plotting of many different types of artifacts, materials, and the volumes and weights of specific, meaningful materials (*e.g.,* shells; charcoal; copper; turquoise) in order to generate reconstructions of the activity patterns across the fort's occupation surface.[15]

The 2008 excavations in Trench IV of the western part of Units 6–7 revealed suggestive evidence for at least two phases of seasonal activity associated with the initial construction and habitation of the fort: Project members observed two layers of organic and cultural debris (*e.g.,* ash, charcoal flecks, sand, and other materials) separated by a layer and lenses of hard-packed, windblown sand. However, a stratigraphic section will be needed in future to join the small interior area containing traces of a lower layer with an interior wall face in the fort in order to determine whether the lower layer is part of a series of early occupation surfaces within the fort's wall, or if it predates (*i.e.,* is cut by) the foundation trench affiliated with the fort's main core wall.[16] An examination of the fort's exposed core wall along its denuded, southern side showed a distinct foundation trench that was otherwise covered by the addition and survival of a steeply battered retaining wall along the interior face of much of the courtyard's northern side (Figure 7). The fort's upper, main occupation surface yielded further evidence for storage areas (*e.g.,* a concentrations of jar rims), cooking (*e.g.,* a stone-lined hearth), baking (*e.g.,* clusters of discarded bread molds), deep hollows filled with ash and sand (Figure 8), and several areas with copper working (*e.g.,* copper slag, lumps, and ore). In general, the material

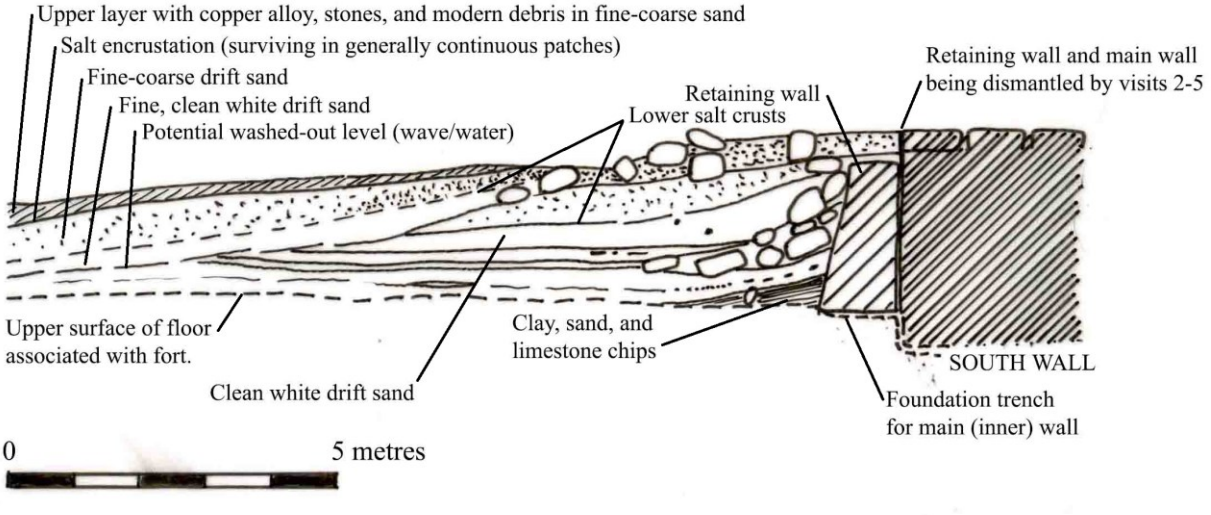

Figure 4: Unit 6 (southeast quadrant of courtyard), vertical section of sand fill for Trench V/VI in 2008 season (Photograph: P. Carstens)

Figure 5: 2004 season delineation of the fort's northern wall top, looking northwest across the coastal plain and bay towards the fort's proposed limestone source (Photograph: G. Mumford)

Figure 6: View looking north at Trench IV in Units 6–7, sieving grid squares in loci 4–5 of fort surface (Photograph: P. Carstens)

Figure 7: End of 2008 season: covering the remaining exposed and unexcavated courtyard floor with sheeting and loose sand (Photograph: P. Carstens)

Figure 8: View of Unit 6, Grid-square G7, locus 4 pit/hollow filled with ash and sand debris with an overlying filling-capping of windblown sand (Photograph: P. Carstens)

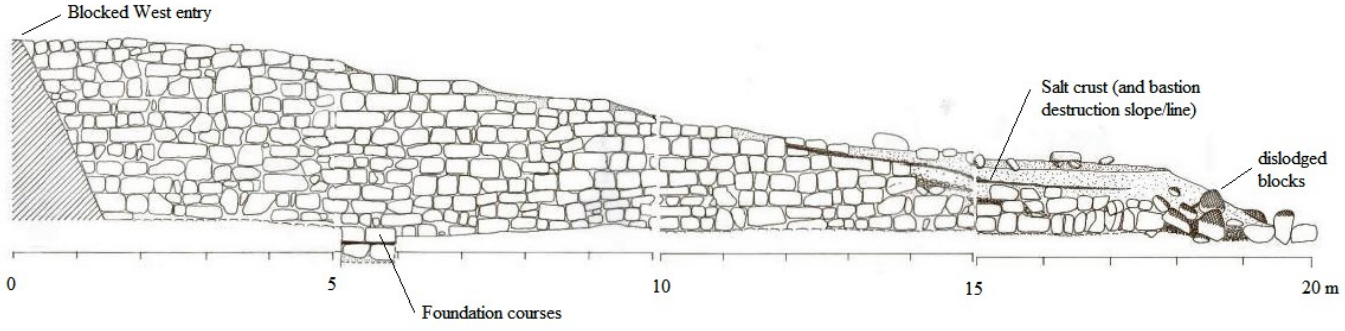

Figure 9: Profile view of the northern face of the 20 m long, western "bastion"/projecting wall (Drawing: G. Mumford)

Figure 10: Detail view of the rough limestone masonry in the western "bastion" with a test trench exposing the two foundation courses (Photograph: P. Carstens)

remains included potsherds (mostly from basins, bowls, bread molds, and store jars), many copper lumps, reddish mineral debris, some pieces of turquoise, many charcoal pieces (from twigs and branches), natural and worked flint pieces,[17] stone tools, marine shells (catering to both secondary subsistence and exotica for export to Egypt),[18] sea urchin bodies and spines, and other materials and debris. Regarding the fort's occupation surface, the eastern 2 meters of Trench V, and the entirety of Trench VI remain to be excavated in Units 6-7.

The Fort's Walling System

The potential "chamber" detected in the fort's eastern wall during the 2004 season (Figure 1) was excavated in 2008. Upon reaching the base of this irregularly shaped "chamber" some modern debris emerged, including a broken light bulb, whilst the irregularities in its stone sides and bottom demonstrated that this "chamber" probably represents an exploratory "robber's pit," perhaps a soldier's "fox hole," or another such installation for a gun position (*e.g.*, the remains of sporadic, modern military debris and other items at and near the fort suggest that soldiers and other persons had camped here several decades ago and more recently).[19] Hence, aside from the blocked-up western entry passage, the circular walling system surrounding the courtyard appears to contain a solid construction. This observation has been confirmed further by tracing the closely laid masonry across multiple stone course levels along the variously exposed and surviving wall core's top, which ranges from 25 cm in height along the south to 350 cm in height along the fort's northern side.

The Fort's Exterior

In 2002, an examination of the mostly exposed wall top uncovered a westward, downward-sloping "bastion," which was traced for 10 meters until reaching the modern ground level surrounding the fortress. The initial excavation of Unit 1, beside the exterior blocked-up entryway, had been halted in 2002 owing to a shift in focus to the structure's interior in 2004. In 2008, however, the excavation and expansion of Unit 1 extended well below the modern ground level, and traced the western bastion for at least 20 meters to the west, at which point it had been destroyed in antiquity to its original ground and foundation levels (Figure 9). Future plans include tracing any potential surviving extension of

Figure 11: Detail of test trench revealing two foundation courses of western "bastion" in a narrow trench, with a mud and stone chip pile (from wind erosion) at the wall base (Photograph: P. Carstens)

Figure 12: View of the 1+ m wide stone blocking sealing the western end of the fort's original entry passage (Photograph: P. Carstens)

this "bastion" further to the west, and to determine where the late Old Kingdom coastline lay in relation to the fort.

This westward extension of Unit 1 along the northern face of the "bastion" confirmed that the wall had been laid in a shallow foundation trench, to a depth of two courses, using rough limestone slabs (Figures 10, 11). Although the interior wall core had been built using dry laid rough slabs and a sand filling, parts of the outer wall faces displayed traces of a desert marl clay packing that had aimed to consolidate the wall face. This clay packing appears to have survived mainly in areas sheltered from the almost continuous northern winds, and in some cases had become encrusted with salt (perhaps from sea spray and/or salts already within the packing's matrix). Aside from providing a smoother wall face that would be hard to scale, another reason for this packing may have been the almost continuous wind erosion of the weaker stone work, especially along the northern wall faces. The poor quality rough limestone slabs along the western bastion had begun to be eroded almost immediately after the fort's completion: a composite, mixed layer of eroded stone dust, chips, and marl clay had created a sloping debris layer along the bastion's northern base, capping the exterior surface associated with the bastion and its foundation trench (Figure 11). This exterior floor surface yielded only a few flat-lying potsherds, which had been trodden into the ground near the blocked-up entryway. The western entry passage had been sealed up at some point after construction had been completed (Figure 12), and received additional protection from the wind by being inset one meter

Figure 13: Detail view of the blocked-up western entry to the fort (Photograph: P. Carstens)

Figure 14: Detail of the salt encrustation on the stone and mud blocking sealing the exterior face of the fort's original western entryway (Photograph: G. Mumford)

within the main exterior enclosure wall (Figure 13). The marl clay packing had stayed intact in this area, and had been further strengthened by the accumulation of a salt crust over it – presumably through salt water spray from the adjacent, and originally much closer Red Sea coastline. In fact, the dense salt encrustations on the surface of the exterior entryway's blocking (Figure 14), and the later hard salt crust layers covering both the termination of the fort's dismantlement and accumulation of clean windblown sand, suggest that the sea storms and spray were sufficiently strong to encourage the garrison to seal the exterior of the western entry passage.[20]

The accumulation of several meters of clean, white drift sand above the fort's exterior surface parallels the abandonment of the courtyard floor and deposition of identical windblown sand and four successive, periodic late Old Kingdom campsites inside the fort (see above). The clean windblown sand and western bastion display a parallel, sloping cut-line across the stratified layers of sand deposition and horizontal courses of stone, coinciding with the point at which a large wave or heavy sea storm probably hit the western side of the sand-engulfed fort. This presumed storm surge, or "tidal wave," struck the western end of the fort's bastion, deeply scouring out some clay plaster and sand filling from the wall face and its interior, dislodging, shifting, and removing many wall blocks, and introducing numerous tiny marine shells, coarse sand, and beach cobbles into the destruction's interface zone (Figure 15). This wave/storm(s) also cut into the side of the hard packed, clean white drift sand, and introduced an overlying thick layer of coarse beach sand, shells, shell fragments, and numerous "beach cobbles."[21] The white drift sand inside the fort's courtyard met a

Figure 15: Reis Omer (center right) and the Bedouin crew delineating the dislodged and salt crust capped blocks at the western end of the "bastion" (Photograph: P. Carstens)

Figure 16: 2002 season's exposure of the blocking sealing the interior doorway in the western entry passage (Photograph: P. Carstens)

similar fate, namely some apparent dynamic event scouring and cutting into the stratified, hard-packed, clean dune layers. After this event, or series of storms, the overlying layers exhibit a radically different appearance, containing a churned/mixed, coarse through fine, yellow-brown sand, with a series of several parallel layers of thick salt encrustations. The period following this event also introduced heavy salt encrustations to the pottery containers and potsherds lying near the surviving top level of the late Old Kingdom fort and white sand dunes, and immediately underlay the area of disturbance associated with this apparent sea storm.[22]

Summation of New Ideas Regarding the Fort

The discoveries made during the 2008 season, and subsequent analysis, have generated both modified and new ideas regarding this coastal fortress. The 2002 and 2004 excavations had revealed only a single layer of occupation debris associated with the fort wall, in the western half of the courtyard. In contrast, the 2008 season yielded evidence for at least one lower occupation layer under a thick, hard-packed sand layer, near the center of the eastern half of the courtyard. It seems probable that this virtually unexcavated, underlying layer either reflects a construction campsite that predates the fort's main occupation, or the earlier of two (or more?) phases of seasonal occupation during the fort's brief lifetime. Future investigation in this area should resolve this question. Regardless of the answer, however, the proximity and relatively similar level of the fort's foundation trench to the two

Figure 17: 2002 season's exposure of a cobblestone pile sealing the entry passage's interior doorway in Unit 2 (Photograph: P. Carstens)

Figure 18: 2008 view of the fort's western interior with the stairway, retaining wall, and the unblocked/open eastern end of the entry passage (Photograph: P. Carstens)

Figure 19: Horizontal and fractured bedding layers of stone 6 km to the north of Ras Budran, in the vicinity of the nearest potential source for the fort's masonry (Photograph: P. Carstens)

Figure 20: Pottery jar top RB.662 made from "Sinai" A fabric (Photograph: P. Carstens)

occupation layers suggest that the fort was occupied only once or twice seasonally, before the Egyptian expeditions decided to abandon it. It seems highly improbable that the expeditions intended this remote fort to hold a permanent garrison, while any returning expedition and transitory garrison that wished to re-occupy the fort could easily have cleared any inter-seasonal debris within a few days, or less, depending upon the numbers of laborers employed in sand clearance.[23] To-date, our investigations favor the theory of a brief seasonal occupation at this fort during the late Old Kingdom.

At the beginning of our investigations at Ras Budran, it was postulated that the late Old Kingdom fort may have been abandoned owing to a possible Bedouin attack, the diminishment of a local Bedouin threat, or the inability or disinterest of the late Old Kingdom state in maintaining a fort 8–10 days distance from Egypt. In contrast, the emerging evidence from the 2008 season points towards a late Old Kingdom Egyptian realization regarding the intense nature of the Red Sea winter storms (*i.e.*, indirectly suggested by the thick sea spray/salt encrustations that formed on the exterior entryway's blocking during the fort's initial occupation). In addition, the subsequent abandonment and dismantling of the fort augment the notion that it may have been placed too close to the Red Sea, or that Red Sea storms had become much rougher over a short period in the late Old Kingdom. Hence, the initial blocking of the single entry passage may not necessarily reflect simply an Egyptian fear of a Bedouin attack, but perhaps an early measure to prevent sea spray or waves from

impacting the seaward facing portion of this coastal structure. The apparent relatively short period between the fort's construction and a decision to abandon and dismantle it may thus reflect an acknowledgement of the failure of such measures (*i.e.,* sealing the entry), an acceptance that the fort had been inadequately situated, and perhaps an attempt to re-locate the fort further inland, or at a less vulnerable and more secure location elsewhere along the coast. Indeed, the bulk of the missing stonework begs the question: Where did the late Old Kingdom Egyptian expeditions take the stone? Although there is no firm evidence (yet) for an alternate destination of any such relocated stone blocks, the local Bedouin report seeing a similar structure closer to Abu Rodeis to the south in El-Markha Plain. While S. Parcak's examination of satellite imagery suggests some options (perhaps 3.3 km to the south; see her report in this issue of *JAEI*), the existence of any such structure remains to be confirmed, and may be beyond immediate access in one of the various off-bounds commercial or military compounds to the south of Ras Budran.[24]

Some new ideas regarding the fort include other postulated functions for the western "bastion" and the interior eastern blocking of the entryway passage. As mentioned above, the western bastion had earlier been suggested to be mainly a military feature, namely to defend the western entry before it was blocked-up.[25] However, the combination of a substantially longer "bastion" (20+ meters), a probable much closer Red Sea coastline, and an apparently fairly quick sealing of the only entry to the fort (*i.e.*, soon after the fort's completion), suggest that the western projection may actually have served more as a protective breakwater and quay for ships anchored or beached to its immediate south –perhaps not too dissimilar to the massive Old Kingdom docking facility found at Wadi al-Jarf.[26] Although future excavations are required to the south and west of the bastion to assess this idea, the evidence for stormy seas at Ras Budran suggests that any anchorage would have required some shelter from the strong northern winds and waves, which is implied by the necessity of investing much labor, time, and materials in building the huge, 190 by 120 meter, L-shaped, protected anchorage at Wadi al-Jarf.[27]

The initial theory for the blocking of the interior eastern end of the entry passageway (in the fort's western wall) also postulated that it may have introduced, in part, an additional security measure against a potential Bedouin attack and breaching of the outer blocked-up entry. However, a re-thinking of this idea and consideration of features elsewhere suggests a different function: the light eastern blocking (Figure 16), albeit sealed by a substantial ramp/pile of wadi cobblestones (Figure 17), probably functioned as an inter-seasonal storage cupboard for Old Kingdom expeditions leaving the fort (Figure 18). This idea is supported by the evidence for two distinct occupation levels associated with the completed fort, and by the parallels at Wadi Maghara for Middle Kingdom expeditions burying pottery vessels within the miners' huts between mining seasons for reuse in subsequent visits.[28] Additional and more compelling parallels occur at Ayn Soukhna, Wadi al-Jarf,[29] and Wadi Gawasis, where seasonal Old through New Kingdom expeditions to Sinai and Punt placed various materials in caves for storage in-between Red Sea voyages.[30]

Potential Source(s) for the Fort's Materials

Aside from the roofing slabs from the entry passage of the fort at Ras Budran, the overwhelming bulk of the visible stone pieces from the fort represent rough "blocks" and chunks of uncut limestone of varying lengths and widths, and display generally rectilinear shapes and a limited range of heights to create a mixture of horizontal courses and stepped courses in the enclosure wall, the western entry passage, and the 20+ meter long "bastion" (see figure 12).[31] However, most of the fort's limestone is quite poor in quality: the rough blocks often contain weak flint veins and exhibit differing rates of erosion –both in antiquity and after their recent re-exposure.

The Ras Budran project spent part of one afternoon surveying a portion of the most promising and nearest potential limestone source, namely a 2 kilometer stretch along the foot of the coastal hills of Gebel Markha and Matulla, which lay only 4–6 km north of Ras Budran, and reportedly contained a large band of similar Cretaceous limestone and Upper Cretaceous flinty limestone.[32] We started our reconnaissance near a projecting stone outcrop that sported a series of fractured, horizontal bands of rock. This outcrop resembled one photographed by Henry Field in 1948 (see Figure 19)–a few kilometers north of Albright's pharaonic sea port (Rothenberg's site 346) in El-Markha Plain.[33] This outcrop yielded mostly different stone types than those found at Ras Budran, but a few areas near this outcrop and the coast did produce some similar limestone bands that would repay further investigation. The few similar stone bedding layers we noted had apparently been mostly removed from the underlying and different rock layers, by natural and/or human means at some point in the past. We found no obvious traces of pharaonic pottery or hammer stones, but it is quite probable that any such remains would have been covered by sand drifts, much like the fort at Ras Budran. Regarding the few attested quarried roofing blocks at Ras Budran, our brief survey did not find any evidence for an obvious quarry in the small area of our investigation along the coastal stretch on either side of the modern road. Of note: the Old Kingdom builders of the fort may have transported the few quarried roofing blocks at Ras Budran directly by ship for the 50 km distance across the Red Sea between Wadi al-Jarf and Ras Budran. At this stage, it cannot be ruled out that the bulk of the uncut limestone for Ras Budran could have been obtained from the nearest available source, namely along the coastal area 4–6 km north of Ras Budran, while the more distant Old Kingdom port at Wadi al-Jarf offers a viable, alternate option with other considerations and benefits.[34]

Figure 21: Pottery bread mold fragment RB.659 made from "Sinai" B fabric (Photograph: P. Carstens)

Figure 22: Pottery jar top RB.515 made from Nile Silt 1 fabric (Photograph: P. Carstens)

The Pottery from Ras Budran (Mainly the 2008 Season) [35]

The pottery from the 2008 season came from loci in the eastern half of the circular, stone structure at Ras Budran. The structure, a fortified anchorage and mining camp, was dated to the Late Old Kingdom based on the pottery excavated from the floor of the structure's courtyard in the 2004 season.[36]

Methodology

The focus of this season's ceramic analysis was to clarify the classification of fabrics that began in the 2004 season. All pottery fragments were collected and put into bags labeled with their appropriate grid, grid quadrant, and locus number. Each bag was then sorted into groups of diagnostic and non-diagnostic sherds. The non-diagnostic sherds (*i.e.*, usually undecorated body sherds) were classified by fabric and counted. Every diagnostic sherd (*i.e.*, rims, bases, and decorated body sherds) was also classified by fabric, described in detail, drawn and entered into a database under its grid coordinates and locus number. The subdivided grid system and subdivisions across the fort's floor surface allowed for a precise fine-tuning of the occupation layer's pottery scatters. Combined with the one hundred percent sampling of the potsherds (and other materials and artifacts), a complete view could be obtained of the activity patterns in the eastern half of this unusual fortified anchorage.

Preservation of the Potsherds

The sherds retrieved from the overlying windblown sand layers and series of intervening campsites above the fort's floor displayed heavy encrustations of salt and calcium accretions. In contrast, most of the sherds from the fort's occupation surface (floor) contained signs of abrasion and wear (*i.e.*, worn breaks), while those potsherds collected from the fort's hearth areas often showed signs of burning (*e.g.*, black soot coatings). The potsherds from some particular hearths actually retained a "greasy feel," as well as a remarkably strong "meat" smell. In future, it is hoped that residue analysis can be carried out on selected samples to determine the types of foods stored in the pottery jars.

Fabrics

The pottery vessel fabrics fall into two groups: (a) local fabrics from the "Sinai" and/or this region of the Red Sea in general,[37] and (b) fabrics imported from the Egyptian Nile Valley. Of note, one of the arguments in favor of the local collection and production of pottery comes from the discovery of several pieces of pottery, such as a probable bread mold, that remained unbaked and came from the fort's occupation surface.[38] On the other hand, it cannot be denied that some to most pottery may easily have been produced by the Old Kingdom pottery workshops associated with the Red Sea port at Wadi al-Jarf, immediately opposite Ras Budran. A kiln has yet to be discovered at Ras Budran, but the excavations have only focused mostly on the fort's interior and on part of the exterior blocked-up entry area, along the northern face of the projecting western "bastion" (be it a wharf, water breaker, or some other feature).

Local Sinaitic and/or Regional "Red Sea" Fabrics (Ras Budran 2008)

As outlined above, the following "local" pottery fabrics from Ras Budran have been designated as "Sinaitic" for the moment, relying upon the discovery of both petrographic matches with the materials from El-Markha plain and the presence of unbaked pieces of pottery containers from the occupation surface in the fort itself. However, it is quite likely that the "Sinaitic" pottery from the overlying campsites (on the windblown sand that accumulated within the fort's abandoned shell) represents pottery made elsewhere in the adjacent Red Sea region, perhaps at Ain Soukhna or Wadi al-Jarf.

Sinai A Fabric (Figure 20)

Sinai A is a locally-made clay that is characterized by its abundant large, flat slate inclusions. The matrix of the fabric is relatively well-levigated and dense, and ranges in color from pinky-orange (Munsell 5YR 6/4) to buff (Munsell 2.5YR 7/6). The core, when visible, is buff-colored. The shale inclusions are often seen popping through the pottery containers' surface, giving a decorative effect, somewhat like a terrazzo floor. This may have been intentional, or just a byproduct of the local materials, but nonetheless it appears attractive to the modern, and presumably, ancient eye. The pottery surfaces sometimes appear to have a white coating and it is unclear whether this is a result of the firing process, or the potter smearing water mixed with clay over the surface when he is finished producing each jar. The fired clay is soft and very light in weight, and is used exclusively to make large, neckless jars with wide shoulders and a rounded base. The porous fabric is perfect for keeping liquids cool.

Sinai B Fabric (Figure 21)

Sinai B is also a locally-made clay that is characterized by the presence of abundant angular sand. The fabric is very poorly fired and tends to crumble easily. This ware is used exclusively for manufacturing bread moulds or basins, and represented 3.87 % of the total pottery from the 2008 assemblage. This fabric is divided into four sub-groups that are recognizable by their inclusions.

(1). Sinai B1 Fabric

Sinai B1 is the most common of the four sub-group wares and is characterized by the presence of abundant, angular quartz sand and occasional long chaff. The matrix can be yellow, or pale brown, with no core. The fabric is tempered with abundant quartz sand, and occasionally contains some long chaff.

Figure 23: Pottery jar base RB.598 made from Nile Silt 2 fabric (Photograph: P. Carstens)

(2). Sinai B2 Fabric

Sinai B2 is distinguished by the presence of abundant black and clear sand grains, which distinguish it from the other sub-groups in conjunction with their other specific characteristics.

(3). Sinai B3 Fabric

Sinai B3 is characterized by the predominance of angular black rock pieces, in addition to the presence of regular quartz sand.

(4). Sinai B4 Fabric

Sinai B4 is characterized by the presence of some large slate particles along with abundant angular sand.

Egyptian Nile Valley Fabrics

Nile Silt vessels were exported to Ras Budran from the Nile Valley mostly in the form of jars and large open vessels that had received a thick, red slip coat. Some of these vessels display large black patches on their otherwise red surfaces that I suspect are the product of an uneven presence of oxygen during the firing process. The entire surface appears to be burnished, including the black areas. The Nile Silt fabrics represent 7.72 % of the ceramic assemblage (from 2008). These Nile Silts can be subdivided further into multiple sub-groupings from different parts of the Nile Valley, or combining different fabrics in Egypt.

Nile Silt 1 Fabric (Figure 22)

Nile Silt 1 (NS 1) is a fairly dense and medium, hard fabric. The pottery's fracture is usually red-brown, or dark brown in color, with no core, or may exhibit a dark brown with a wide rust core and few visible inclusions other than some fine grits, voids, and pieces of mica (it is equivalent to the Vienna System B1 fabric). This fabric appears to have a variant, Nile Silt 1a (NS 1a) that has obvious, short chaff inclusions.

Nile Silt 2 Fabric (Figure 23)

Nile Silt 2 (NS 2) is also a fairly dense fabric, but not so much as NS 1. This fabric is characterized by the relatively greater

Figure 24: Pottery jar body sherd and pot mark RB.549 made from Fabric C (Photograph: P. Carstens)

number and size of the inclusions. There is much variety, but fine to medium chaff and fine to medium sand are present in varying quantities in this fabric (it parallels the Vienna System B2 fabric).

Nile Silt (NS 3) Fabric

Nile Silt 3 (NS 3) is more coarse and porous than the above fabrics (NS 1–2), but contains a conspicuous chaff temper. It is usually coarse and soft (it matches the Vienna System Nile C fabric).

Fabric C (Nile C) (Figure 24)

Fabric C (ware C) is a dark brown or red-brown fabric that is characterized by its speckled appearance, which is caused by the presence of abundant, fine, decomposed limestone pieces. It resembles Marl C in the 'Vienna System'. At Ras Budran this ware is used to make jars that are often coated with a red slip. Only 12 fragments of this fabric were found in 2008 at Ras Budran.

Fabric D (Nile D) (Figure 25)

Fabric D (ware D) consists of a dark brown fabric (Munsell 10YR 5/3 and 5YR 5/3); it usually contains a wide black core that is very dense, noticeably hard, and feels heavy. Its lack of visible inclusions, other than some mica, fine grits, or very fine, short chaff, also makes it quite easy to recognize. It has appeared so far only in jars, usually with a thick, light brown slip and it forms only 5.76 % of the total potsherd assemblage. A similar very hard, totally black, or dark gray, fabric appears to be related to this fabric (D), but is fired in a reducing atmosphere. The surface is coated with a cream slip. This fabric appears to be imported from the Nile Valley and most closely resembles the later 19th dynasty "mixed clay" described by Bourriau.[39] Rzeuska describes short-necked jars

Figure 25: Pottery jar rim RB.705 of Fabric D (Photograph: Patrick Carstens)

Figure 26: Pottery jar rim RB.522 made from Fabric E2 (Photograph: P. Carstens)

at Saqqara that have wide shoulders, rounded bases, and are made of a very hard fabric called "P60."[40] However, she mentions the presence of large inclusions in the Saqqara (P60) fabric that are otherwise absent from the Ras Budran examples. From the evidence at Saqqara it appears that very hard fabrics are not unusual in the Late Old Kingdom.

Fabric E (Nile E) (Figure 25)

Fabric E (ware E) is a very fine dense paste that ranges in color from pale brown to light red. It is used to manufacture thin-walled, small jars and carinated bowls. These vessels are given a red slip and burnished to a fine finish. Three variants of Fabric E occur at Ras Budran.

(1). Fabric E1 (Nile E1)

Fabric E1 (ware E1) is a very fine, dense paste that is light brown with a yellow core (Munsell 5YR 5/6). It has no visible inclusions.

(2). Fabric E2 (Nile E2)

Fabric E2 (ware E2) is a red variant (Munsell 5YR 5/6) of Fabric E and is distinguished by an abundance of very fine white flecks of limestone that are evenly distributed along with

occasional grains of quartz. It resembles Marl A that is common at Thebes. It is represented by four diagnostic pieces (*i.e.*, one bowl and three incised body sherds). The surface of some of these sherds exhibits burnished, black patches on red slip decoration.

(3). Fabric E3 (Nile E3)

Fabric E3 (ware E3) is a pale brown variant (Munsell 5YR 6/6) of Fabric E. It has a buff core (Munsell 7.5YR 6/3) and is tempered with conspicuous fine to medium black rock particles, as well as some sand grains or white particles. It contains a buff core (Munsell 7.5YR 6/3).

The Frequency of the Various Fabrics at Ras Budran

The 2008 season at Ras Budran produced 5,295 potsherds in total (100%), including body pieces and diagnostic sherds of various fabric types. These potsherds can be subdivided into a majority of "local" and/or regional "Sinai"/Red Sea fabrics A-B, numbering 4,529 sherds (85.5%), which can be further subdivided into 4,324 "Sinai" Fabric A sherds (81.7%) and 205 "Sinai" Fabric B sherds (3.9%). The remaining 766 sherds (14.5%) consist of various types of fabrics from the Nile Valley (Table 1 and Chart 1).

Ras Budran potsherds (2008 season)		
SINAI FABRICS	**4,529 sherds**	**85.53%**
Local/"Sinai" Fabric A (jars)	4,324	81.66%
Local/"Sinai" Fabric B (bread molds; trays)	205	3.87%
NILE FABRICS (jars; bowls)	**766 sherds**	**14.47%**
Nile Silt (NS 1–3 = Vienna: Nile B1, B2, C)	409	7.72%
Fabric D (= closest to Saqqara P60)	305	5.76%
Fabric C (= Vienna System: Marl C)	40	0.76%
Fabric E (E1–3 = some Theban similarities)	12	0.23%
TOTALS	5,295 sherds	100%

Table 1: Numbers and relative frequency of different fabrics at Ras Budran (see chart 1).

Corpus of Pottery Forms (Ras Budran 2008)

The number of different ceramic forms at Ras Budran is very small, although this is not unexpected in a remote and seasonal encampment where virtually everything must be imported. One of the most interesting aspects is noting what types of Old Kingdom vessels are absent from the fort's material culture assemblage. For instance, Ras Budran did not yield any beer jars or other kinds of narrow jars that are otherwise so prevalent at late Old Kingdom sites in the Nile Valley and elsewhere in Egypt. In addition, while some Nile silt bowls did appear in the fort during the 2004 season, which excavated the western half of the courtyard, the 2008 season only found two rim sherds from bowls in part of the eastern half of the courtyard. This lower quantity, however, is undoubtedly connected to the much smaller exposure of the occupation surface in the 2008 season. The 2008 season's ceramic assemblage from Ras Budran consists predominantly of jars and bread molds. To-date, it would seem that the diet must have been restricted to bread, alongside some form of gruel or soups that could be boiled, and perhaps any fish or other animal product that could be grilled over an open fire. The site's close proximity to the Red Sea coast would allow for fishing daily, as may be the case via the presence of two fish bones (so far unidentified as to species: presumably local Red Sea and/or imported Nile fresh water fish).[41]

In addition to the potsherds from the fort's occupation surface, the several late Old Kingdom campsites on the successive sand dune surfaces overlaying the floor (*e.g.*, loci 2 and 3) yielded identical potsherds in fabric and form to those found on the floor (*i.e.*, loci 4 and 5). In cases where the diagnostic fragments from the overlying campsites and sand dune surfaces are larger and better preserved than those from the floor, these larger pieces have been selected for illustration in the accompanying plates.

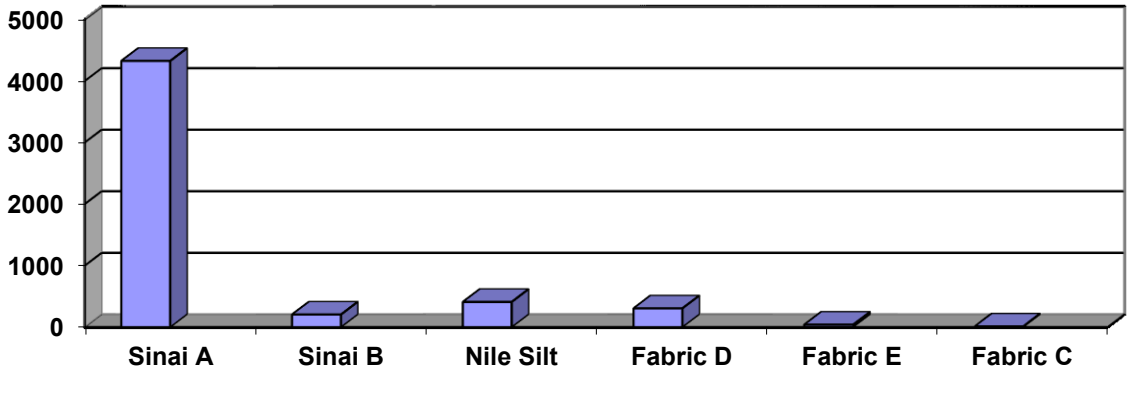

Chart 1: Numbers and relative frequency of different fabrics at Ras Budran (R. Hummel)

Figure 27: An unbaked clay fragment of a bread mold(?) found in locus 7-L (*i.e.*, an ash patch) in the northeast area of Unit 3 (Photograph: P. Carstens)

Local "Sinai" and/or Regional "Red Sea" Forms (Fabrics A-B)

The combination of the large numbers of local jars and bread molds and some unbaked pottery pieces from the surface of the late Old Kingdom fort at Ras Budran suggest that at least some, and perhaps most of the pottery was manufactured nearby. For instance, several lumps of raw clay bearing signs of working have been found, including what appears to be the portion from a bread mold base. However, there are no signs of a kiln inside the stone structure, while the exterior of the fort (where a kiln would most likely exist) remains virtually unexcavated. It is presumed that any pottery production area may have been close to the clay source, and thus outside the walls, while the Old Kingdom pottery production area at Wadi al-Jarf, which lay directly west across the Red Sea, also represents another highly plausible source for Ras Budran's pottery –especially once the fort is abandoned and several late Old Kingdom expeditions begin dismantling the fort and using its surviving shell as a temporary campsite.

Jars ("Sinai" A Fabric): Table 2 and Figure 28: 1–5

The jars made of "Sinai" Fabric A are ubiquitous at the site, the fragments of which form 81.7% of the total number of sherds found in 2008. The forms of these locally-made jars show remarkable uniformity with each other as well as a great similarity to the particular jars that occur in late Old Kingdom sites in Egypt. This similarity could be explained by the royal workshops sending potters to Wadi al-Jarf and/or Ras Budran in Southwest Sinai to meet the expedition and fort's ceramic needs. Needless to say this would be much easier than transporting a full supply of already prepared pottery. The large, neckless jars with wide shoulders are all handmade, a fact that is reflected in their rims that can vary in thickness and form on the same vessel. The rims do, however, appear to exhibit a standard aperture of nine centimeters. The fabric of the jars is very light weight, is sufficiently porous to keep liquids cool, but would break readily if handled roughly. On the other hand, the shape of this jar type does not lend itself to pouring easily and so far no dippers have been found. However, the jars' size and shape would make them excellent for storing water (so far no well or nearby spring has been found at the site, but a well could easily have been dug beside the fort, in the adjacent wadi bed that is apparently underlain by ground water, albeit a little brackish).[42] In addition, some of these jars bear obscure signs incised into their exterior surfaces after they were fired. Unfortunately, these pot marks appear only on fragmentary potsherds and are usually incomplete.

Bread Molds ("Sinai" B Fabric): Table 3 and Figure 28: 6–9

Between the 4th and 6th dynasties two main types of bread molds predominated at Old Kingdom sites, such as Giza,[43] Abusir,[44] and Saqqara.[45] Bakers used these molds to bake two different kinds of loaves, which are often depicted in tomb scenes[46] and are described as *bḏ3* pots and *ʿprt* trays. The *bḏ3* pot displays an open, thick-walled bowl with a beveled rim, an exterior ridge, and a thick, crude, bulbous base. Potters probably shaped this mold over a lump of wood or stone form to ensure a smooth interior, while the exterior was left rough, retaining the potter's finger marks. In tomb scenes the pots appear to be stacked over an open fire to be preheated. Two of these molds pressed rim to rim created a small furnace. Hundreds of fragments of these *bḏ3* molds have been found discarded at Giza, near bakeries that baked bread for the pyramid work crews residing beside the Giza plateau. The *ʿprt* tray represents a shallow, flat-based basin with low vertical walls.

Both of these bread mold types are found in abundance on most Old Kingdom sites. These two forms remained unchanged into the First Intermediate Period and throughout Egypt as far away as the Dakhleh Oasis (*e.g.*, Balat) and in the Sinai (*e.g.*, Ras Budran), reflecting a strong central authority. The *bḏ3* bread moulds, which predominate at Ras Budran, reflect type A1 in the typology compiled by Helen Jacquet-Gordon,[47] and date to the 6th dynasty. A great deal of evidence exists indicating that the Ancient Egyptians recycled these bread molds often, using them as small containers, crucibles, or small furnaces for copper working.[48] At Ras Budran, Grid squares A-7 and A-8 contained an

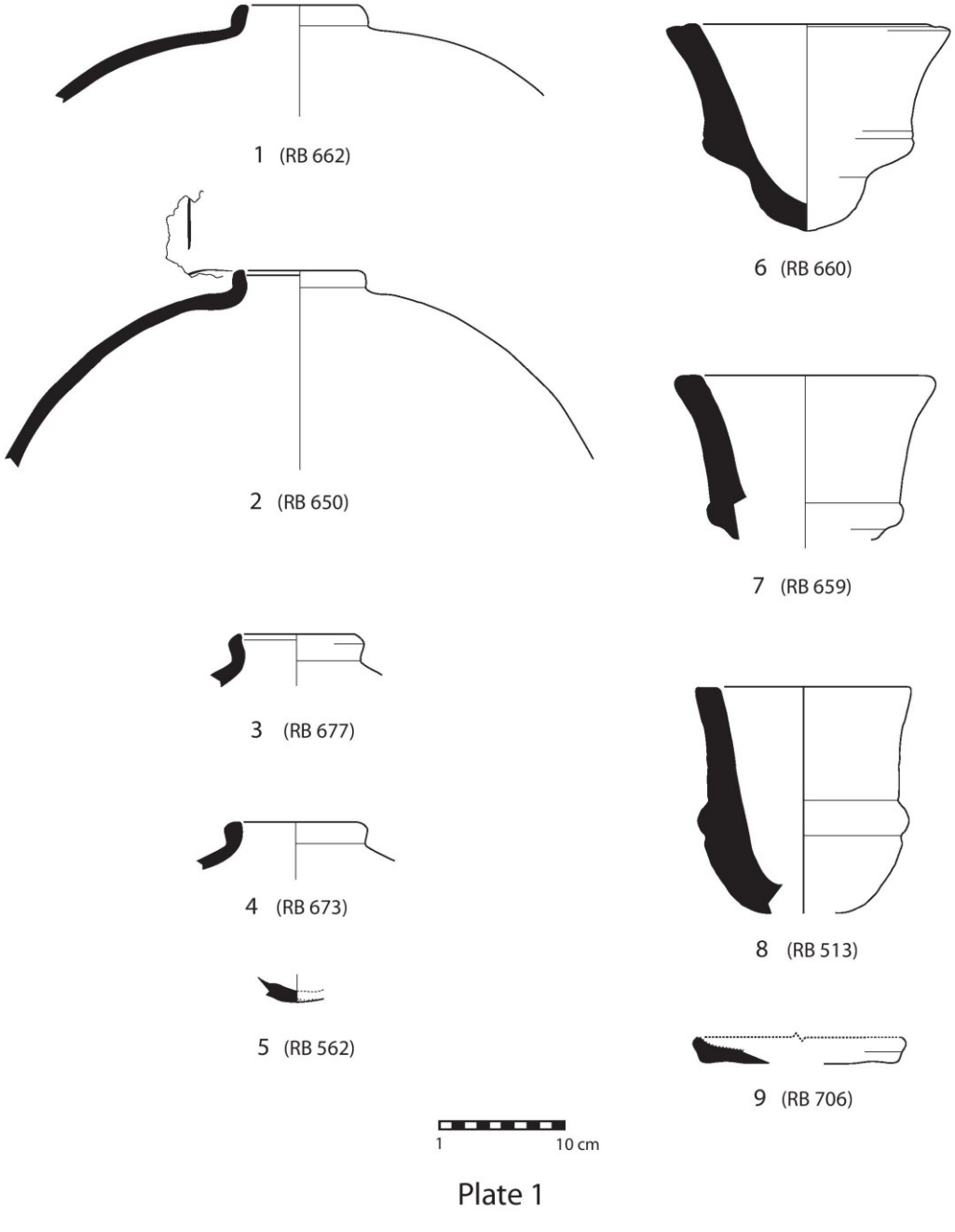

Figure 28, Nos. 1–9: Pottery jars, bread molds, and a platter/tray from Ras Budran (Drawings: R. Hummel)

exceptionally large number of fragments of *bḏ3* bread molds, suggesting one possible activity area for bread-making, or perhaps some secondary use of these vessels connected to the copper industry (the fort displays copper working in both the main occupation level and in the several campsites overlying the main floor). The best preserved examples of bread molds appear on a sand layer just above the earlier floor, but reflect "exact duplicates" in form of the bread mold fragments found on the floor (and have thereby been selected as illustrative, better preserved types of the forms from the main floor). Of note, one intact basin, or *ʿprt* bread mold, came from the western half of the structure's courtyard[49] during the 2004 season.

Figure 28	Type & Number	Provinence	Diameter	Observations and parallels
28:1	Jar rim RB 662	Unit 6 Locus 3	9 cm	**Fabric:** "Sinai" A; **Surface:** Fires to cream color with red and black rock particles appearing on the exterior. The sherd is heavily encrusted with accretions; **Parallels:** Kanawati and Abder-Raziq 2000, pl. 70:2, Saqqara, 6th Dynasty; Rzeuska, 2005, fig. 3, Saqqara, late Old Kingdom.
28:2	Jar rim RB 650	Unit 6, Trench 5 Locus 3	9 cm	**Fabric:** "Sinai" A; **Surface:** The cream-colored surface is flaking badly, but a vertical incised line is visible on the shoulder.
28:3	Jar rim RB 677	Unit 7, Grid N9 SE quad	9 cm	**Fabric:** "Sinai" A; **Surface:** Fires to cream color with red and black rock particles appearing on exterior; **Parallel:** Rzeuska 2005, fig. 8, Saqqara, late Old Kingdom. The shape of the rim as well as the wide-shouldered body resembles the Ras Budran example.
28:4	Jar rim RB 673	Unit 7, Grid N9 SW quad Locus 5	9 cm	**Fabric:** "Sinai" A; **Surface:** Fires to cream color with red and black rock particles appearing on exterior; **Parallel:** Kanawati and Abder-Raziq 2000, pl. 70:2, Saqqara, 6th Dynasty.
28:5	Jar base RB 562	Unit 7, Grid N8 SW quad Locus 5	9 cm	**Fabric:** "Sinai" A; **Surface:** Uncoated, extra clay blobs are visible on the inside where the clay was pinched; note: This is a typical late Old Kingdom base for large store jars.
28:6	Bread mold RB 660	Unit 7, Trench V Locus 3	18 cm inside	**Fabric:** "Sinai" B; **Surface:** Interior smoothed, with a rough exterior; **Parallel:** Wodzińska 2007, fig. 11.38, Giza, 4th to 6th dynasties.
28:7	Bread mold RB 659	Unit 7, Trench V Locus 3	17 cm	**Fabric:** "Sinai" B; **Surface:** Interior smoothed, with a rough exterior.
28:8	Bread mold RB 513	Unit 7, Locus 2	15 cm	**Fabric:** "Sinai" B; **Surface:** Interior smoothed, with a rough exterior.
28:9	Bread tray RB 706	Unit 7, Trench V Locus 3	-	**Fabric:** "Sinai" B; **Surface:** An uncoated surface, with a rough exterior; **Note:** This tray fragment lay above Grid square M9, SW quadrant.

Table 2: "Sinai" A jars from Ras Budran, illustrated on Figure 28 (R. Hummel)

Nile Silt Forms (Various Fabrics, Nile Silts 1–3)

It appears likely that the Nile Silt vessels found at Ras Budran had been manufactured and sent from the Nile Valley, presumably accompanying the turquoise mining expedition, the main portion of which would have headed east for one day's journey to the region of Wadis Maghara and Kharig. These Nile valley containers could have carried commodities such as wine, beer, and various oils that would not otherwise be readily obtained at Ras Budran.

Jars (Nile Silt Fabrics): Table 4 and Figure 29: 1–7

The Nile Silts jars form a minority of the jar forms found at Ras Budran, indicating that most jars were either made locally at Ras Budran, or perhaps regionally at the Old Kingdom port and associated workshops at Wadi al-Jarf, immediately to the west across the Red Sea.

Bread Molds (Nile Silt Fabrics): Table 5 and figure 29: 8–10

The Nile Silt corpus of vessels at Ras Budran include a small group of rims resembling the shapes of bread molds. Owing to the fragmentary nature of these sherds it is difficult to ascertain whether they reflect flat-based "flower pots" (i.e., a type of bread mold), the rims of deep *ʾprt* trays, or rims from the typical *bḏ3* molds. In general, however, these imported "bread molds" have wider rims and slightly thinner walls than their locally made counterparts, but are otherwise the same. Large bread moulds have parallels at Giza, where *bḏ3* rims occur with 35 cm diameters.

Jars of Fabric C (Nile Valley)

At Ras Budran, the only pottery types manufactured from Fabric C (i.e., a Nile Valley type ware) appear to be limited to jars. The jars made of this fabric are also mainly limited to the remains from the bodies of jars, and are discussed and illustrated further below in the section dealing with incised body sherds.

Jars of Fabric D (Nile Valley): Table 6, Figure 25 and Figure 30: 1–2

The occurrence of Fabric D at Ras Budran also seems to be very specialized; it was probably used for jars that carried a particular substance from Egypt. Most of the fragments of these jars concentrated in a cluster in a single area within and around Grid square M9.

Jars and Bowls of Fabric E (Nile Valley): Table 7 and Figure 30: 3

Ras Budran has yielded forty sherds composed of Fabric E, of which only four examples were diagnostic, namely a rim, a base,

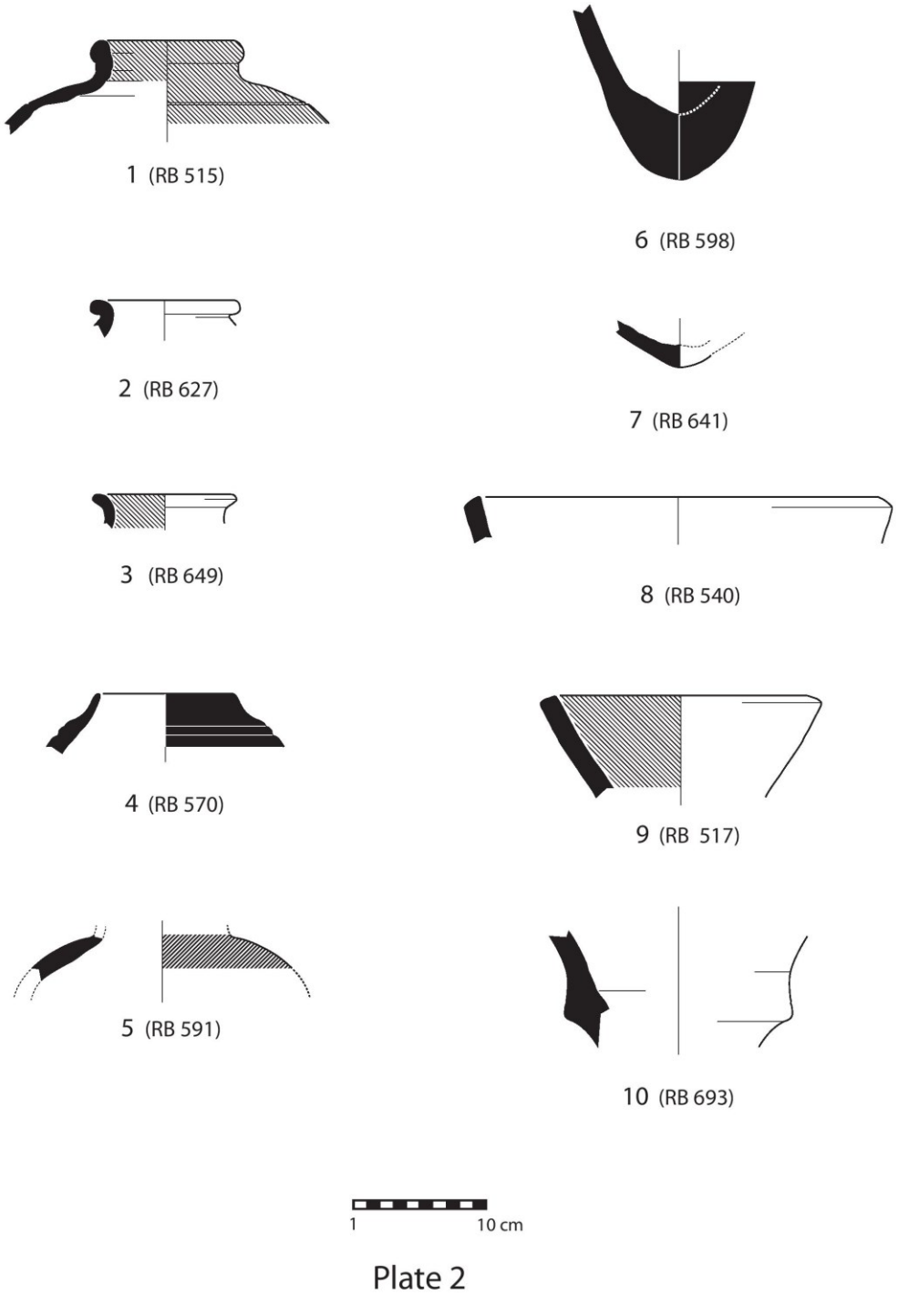

Figure 29, Nos. 1–10: Pottery jars and bread molds from Ras Budran (Drawings: R. Hummel)

Figure 29	Type & Number	Provinence	Diameter	Observations and parallels
29:1	Jar rim RB 515	Unit 7, Trench IV Locus 3	9 cm	**Fabric:** Nile Silt 1; **Surface:** Red slip on exterior and extending over rim for about 6 cm. of interior; a groove is incised horizontally on the exterior at the shoulder; **Parallels:** Bárta 1996, pl. I, Type CE-VI, Abusir 5th Dynasty; Hope and McFarlane 2006, fig. 11: BbIII.2bxii, Akhmim Old Kingdom.
29:2	Jar rim RB 627	Unit 6, Grid D8 SE-quad Locus 5	10 cm	**Fabric:** Nile Silt 2; **Surface:** Uncoated.
29:3	Jar rim RB 649	Unit 6, Grid D8 SE-quad SE-quad	10 cm	**Fabric:** Nile Silt 1; **Surface:** The sherd is abraded and burned, but red slip is visible on the exterior; **Parallel:** Kanawati and Abder-Raziq 2000, Saqqara, 6th dynasty.
29:4	Jar rim RB 570	Unit 7, Grid N8 NE-quad Locus 4	10 cm	**Fabric:** Nile Silt 1; This rim is the only one of its type at Ras Budran; it resembles in some ways the form of an Old Kingdom type of beer jar; handmade with finger marks visible on the interior; **Surface:** Black slip burnished horizontally; **Parallels:** Reisner 1955, fig. 85:27–3–787, Giza, Old Kingdom; Kanawati and Abder-Raziq 2000, pl. 70:5, Saqqara, 6th dynasty; Hope and McFarlane 2006, fig. 7: AIVa.2ai, Akhmim, Old Kingdom.
29:5	Jar shoulder RB 591	Unit 6, Grid B7 NE-quad Locus 5	9 cm (at the neck)	**Fabric:** Nile Silt 1a, black as the result of being fired in a reducing atmosphere; **Surface:** Traces of pale brown slip.
29:6	Jar base RB 598	Unit 6, Grid A7 / Grid B-7 SE-quad Locus 4	-	**Fabric**: Nile Silt 2; Handmade; **Surface:** Abraded surface, but with traces of black slip.
29:7	Jar base RB 641	Unit 6, Grid B8 SW-quad Locus 5	-	**Fabric:** Nile Silt 2; **Surface:** Very abraded surface.
29:8	Pot rim RB 540	Unit 7, Grid I8, Locus 5	30 cm	**Fabric:** Nile Silt 2; **Surface:** Smooth interior.
29:9	Pot rim RB 517	Unit 6, Locus 2	19 cm	**Fabric:** Nile Silt 2; **Surface:** Traces of red slip on the vessel's interior.
29:10	Bread mold RB 693	Unit 7, Grid L9 SE-quad Locus 5	-	**Fabric:** Nile Silt 3; **Surface:** Smooth interior, with a rough exterior; **Note:** The rim is missing.

Table 3: Nile Silt jars from Ras Budran, illustrated on Figure 29 (R. Hummel)

and two body sherds with incised marks. The body sherds consisted of thin-walled vessels with red- slipped and burnished surfaces. Some of the exterior surfaces also displayed black patches. Fabric E2 contained a diagnostic, bowl rim (Table 7, Figures 26 and 30: 3).

Incised Pot Marks: Table 8 and Figure 30: 4–13

In addition to the various jar rims of different fabrics, Ras Budran produced many body sherds from both local and imported fabrics (Sinai A; Nile Silts; Fabrics C, D and E) that bore obscure, irregular markings incised in the outer surface. The great majority of these "pot marks" appear on jars. Although a preliminary observation in 2004 interpreted them as having been incised prior to their original firing, it now seems, upon more recent and much closer examination, that most of these "pot marks" were incised post-firing. It is planned to restudy these marks more thoroughly in future excavation seasons.

Incised pot marks are extremely common in the Predynastic and Early Dynastic periods, when they are believed to have indicated the owner or origin of the commodity contained in the vessels. Incised pot marks continued throughout the Old Kingdom, and the Giza Plateau Mapping Project has collected 400 vessels that bear incised marks, most of which occur on jars, and secondly on bread moulds. Likewise, at Ras Budran the great majority of pot marks appear on jars; only one vessel, a bread mold from the 2004 season, bears a legible hieroglyphic inscription: a coarsely incised *Neb-Tawy* ("Lord of the Two Lands"). The incised potsherds consist of various fabrics, including twenty-two of Sinai A fabric (see Figure 30: 4–5), two of Nile Silt 1–2 fabrics (Figure 30: 6–7), two of Fabric C (Figure 30: 8–9), four of Fabric D (Figure 30: 10–11), and two of Fabric E (Figure 30: 12–13).

Dating the Ras Budran Pottery Corpus

The Ras Budran ceramic assemblage includes many typical late Old Kingdom markers. The most important amongst these forms consist of the bell-shaped, *bḏ3* bread molds. The wide-shouldered jars also find parallels during the Old Kingdom, especially in the Memphite area. The single spouted vessel appeared in the 2004 season alongside a few fine, red slipped and carinated bowls that fit well in this time period. None of the other pottery shapes from either the floor surface or in the overlying campsites contradict the late Old Kingdom (to First Intermediate Period) date.

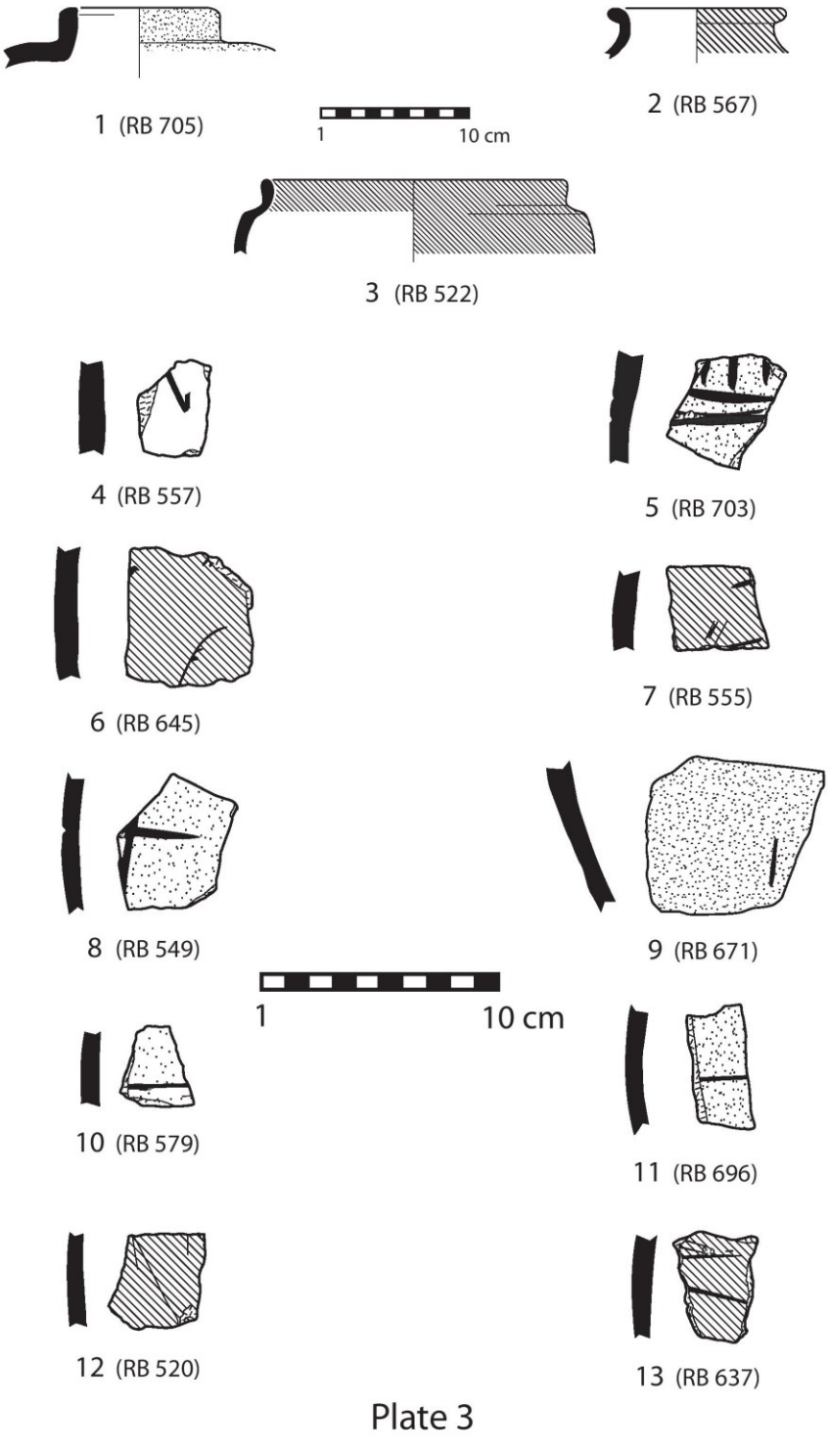

Figure 30, Nos. 1–13: Pottery jar tops, a bowl, and pot marks on body sherds from Ras Budran (Drawings: R. Hummel)

Figure 30	Type & Number	Provinence	Diameter	Observations and parallels
30:1	Jar rim RB 705	Unit 7, Trench V Locus 3	10 cm	**Fabric**: Fabric D; **Surface:** A thick cream slip; two parallel marks were deeply incised on the shoulder of the jar, pre-firing; **Parallel:** Rzeuska 2005, fig: 8, Saqqara, late Old Kingdom: The fabric of the Saqqara example is described as very hard and is called mixed clay (P.60 fabric); Note: This jar rim (RB 705) lay immediately above Grid square M9, SW-quadrant.
30:2	Jar rim RB 567	Unit 6, Grid G7 SE quad	10 cm	**Fabric:** Fabric D; **Surface:** Traces of a reddish-brown slip (Munsell 10R 4/4); **Parallel:** Rzeuska 2005, fig: 2, Saqqara, late Old Kingdom: The fabric of this large jar from Saqqara is also very hard and is called mixed clay (P.60 fabric).
30:3	Bowl rim RB 522	Unit 7, Grid M7 NW quad Locus 5	20 cm	**Fabric**: E2; **Surface:** Red slip and burnished, with the interior having been blackened (soot?); **Parallel:** Rzeuska 2005, fig. 9, Saqqara, late Old Kingdom.
30:4	Jar body sherd RB 557	Unit 7, Grid J8 NE quad Locus 4		**Fabric:** "Sinai" A (one of 22); **Surface:** A pot mark incised into the exterior surface.
30:5	Jar body sherd RB 703	Unit 7, Grid I9 NW quad Locus 4		**Fabric:** "Sinai" A (one of 22); **Surface:** A deeply incised pot mark, applied on the exterior surface before firing.
30:6	Jar body sherd RB 645	Unit 6, Grid B8 SE quad Locus 4		**Fabric:** Nile Silt NS 2 (one of two); **Surface:** Red slip with black patches, and polished. The pot mark was incised on the vessel's exterior surface.
30:7	Jar body sherd RB 555	Unit 7, RB 555 Grid O8 SW quad Locus 5		**Fabric:** Nile Silt NS 1 (one of two); **Surface:** Red slip with black patches, and polished. The pot mark was incised post-firing into the exterior surface.
30:8	Jar body sherd RB 549	Unit 7, Grid N7 NE quad Locus 5		**Fabric:** Fabric C (one of two); **Surface:** Pale green slip. A "cross"-shaped sign was incised into the vessel's exterior surface.
30:9	Jar body sherd RB 671	Unit 7, Grid N9 NE quad Locus 5		**Fabric:** Fabric C (one of two); **Surface:** Cream slip; a line was incised into the vessel's exterior surface.
30:10	Jar body sherd RB 579	Unit 7, Grid M8 NW quad Locus 5		**Fabric:** Fabric D (one of four); **Surface:** White slip; a line was incised into the vessel's exterior surface.
30:11	Jar body sherd RB 696	Unit 7, Grid M9 SE quad Locus 4		**Fabric:** Fabric D (one of four); **Surface:** Thick cream slip; a line was incised into the vessel's exterior; **Note:** See also RB 705 (Figure 30: 1), which displayed deeply incised, pre-firing marks on its shoulder.
30:12	Jar body sherd RB 520	Unit 7, Grid J7 NE quad Locus 5		**Fabric:** Fabric E (one of two); **Surface:** Red slip with frequent black patches, and burnished; some lines incised post-firing on the vessel's exterior.
30:13	Jar body sherd RB 637	Unit 6, Grid C8 NE quad Locus 4		**Fabri+A1:E14c: Fabric E3 (one of two); Surface: Red slip with black patches; lines incised on the vessel's exterior surface.**

Table 4: Nile Valley jars and pot marks from Ras Budran, illustrated in figure 26 and Figure 30 (R. Hummel)

Summary of Pottery Findings

All of the pottery vessels found at Ras Budran in 2008 (and earlier seasons), including pottery made of imported Nile fabrics and local/regional "Sinai" clays, resemble the typical forms from the Nile Valley. The great similarity of forms reflects a ceramic tradition that was probably developed in the Memphite area and came to dominate pottery production within Egypt until the end of the Old Kingdom.[50] Egyptian potters are attested at the Old Kingdom port site and associated installations at Wadi al-Jarf on the west shore of the Red Sea (directly opposite Ras Budran in Southwest Sinai), while some potters may have accompanied the turquoise mining expeditions to Ras Budran to take care of the ceramic needs of the fortified anchorage and used local clays (as is suggested by the presence of a few unbaked, clay vessel pieces at Ras Budran; **Figure 27**). A similar situation exists at Balat in Dakhleh Oasis, where Colin Hope has suggested that the Memphite administrative capital dispatched potters with the early settlers.[51]

Conclusions and Future Goals

Some future plans for the late Old Kingdom fort at Ras Budran include (a) excavating the remaining portions of the eastern half of the courtyard, (b) exploring the suggestive underlying layer within the courtyard, (c) expanding Unit 1 to the west to trace the end of the bastion's foundations, (d) locating the late Old Kingdom coastline, and (e) expanding survey work and excavations around the fort to explore the exterior wall face and any potential outlying architecture and features. It is estimated that at least three to five further seasons will be required before excavations are complete, while the resumption of investigations at Ras Budran awaits future developments. In the meantime, the project continues to analyze and publish its preliminary findings from Ras Budran and other sites in El-Markha Plain.

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Notes

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[2] For previous reports on the excavations at Ras Budran, see Mumford 2003; *idem* 2005; *idem* 2006; *idem* 2012a; *idem* 2012b.

[3] The Old Kingdom activity from Wadi al-Jarf seem to date mainly to the early portion of the Old Kingdom (especially the 4th dynasty: *e.g.,* Khufu papyri fragments), but presumably continues later (Marouard and Tallet 2012, 40–43), while Old Kingdom activity at Ayn Soukhna spans the 4th to 5th dynasties, and probably into the 6th dynasty; Ayn Soukhna has also yielded the names of Khafre, Niuserre, Djedkare, and Unas (Abd el-Raziq, Castel, Tallet and Marouard 2012, 6, 10).

[4] Mumford 1999, 875–8.

[5] Gayer and Rothenberg 1995, 147–52 site 702B.

[6] Rothenberg 1970, 25–7.

[7] Mumford and Parcak 2003, 83–116; Mumford 2005, 24–26; *idem* 2006: 13–67.

[8] To maximize the season's effectiveness regarding time and labor expenditures in conjunction with the minimal material culture being found in the overlying, ancient windblown sand layers, the excavation team first concentrated on removing the overlying sand layers from trench IV (*i.e.*, beside season 2004's excavation units 3 [*i.e.*, northwest quadrant] and 5 [*i.e.*, southwest quadrant] in the west half of the courtyard). Upon reaching the fort's main occupation surface in Trench IV, the refined grid system was laid out in this trench and the three supervisors (Mumford; Parcak; Christodoulou) began planning, excavating, sieving, data recording, and collecting diverse materials and artifacts with their teams of two to three Bedouin assistants each; Reis Omer mainly supervised the excavation of Trench V with additional, periodic assistance from G. Mumford (as required), who was stationed close by in Trench IV. Trench V was separated

from Trench IV by leaving a temporary, 1 meter wide balk along the western side of Trench V (between the fully excavated ancient windblown sand in Trench IV and the unexcavated windblown sand in Trench V), and we concentrated on excavating the eastern remaining strip within Trench V. This balk ensured that materials and sand did not fall into the cleaned, lower excavation areas in Trench IV, while the Trench V workforce removed their sand via the southern, lower wall of the fort. Sporadic potsherds, copper nodules, and other materials appeared in Trench V and recorded as they appeared.

[9] See the preliminary report by G. Mumford 2012b, 107–45. For important corrections to the preliminary Red Sea shell identifications, see a review of Mumford (2012b) by L. J. van Gemert (2013), who provides much useful data in a section entitled, "Discussion of the malacological taxa in 'Ras Budran and the Old Kingdom trade in Red Sea shells and other exotica by Mumford (2012);" David Reese has also provided further corrections (in a personal communication), which will be published later, and will hopefully be participating in a future study season to aid in the precise identifications of the project's Red Sea materials.

[10] The time-consuming removal of the ancient windblown sand in Trench IV in conjunction with its very low yield of artifacts and materials provided sufficient time for the technical staff (*e.g.*, registrar; ceramicist; photographer; artist) to re-assess the 2004 materials (which were still fully accessible to the project).

[11] Rexine Hummel maintained a separate database and catalogue of all the diagnostic pottery from the 2002, 2004, and 2008 seasons, which were given a sequential number starting with RB.001 (she also has recorded all the potsherds from each locus, grid square, trench, and excavation unit, according to their find spots in relation to the diagnostic pottery (*i.e.*, rims, bases, decorated/marked body sherds, and other potsherds with special features).

[12] The 2010 study season, which was based in Egypt (*i.e.*, while awaiting the approval of a delayed permit to begin excavations at Ras Budran in South Sinai), but did not have direct access to Ras Budran: The team members included Gregory Mumford, Sarah Parcak, Rexine Hummel, Frances Cahill, Patrick Carstens, Shakira Christodoulou, David Gathings, Joshua Harden, Molly Haight, William Crowe, Catherine Crowe, and Reis Omer. The Ras Budran project's initial 2002 and 2004 methodology is outlined in more detail in a preliminary report (see Mumford 2006), while several online power point presentations on the recent 2008 and intended 2010 excavations at Ras Budran provide more details on the revised methodology (see Gregory Mumford's presentation/talk's section via his profile on www.academia.edu).

[13] Based upon the current coastal plain's configuration (*i.e.*, lying 210 meters further west of the fort today, but being much closer *ca.* 2300–2200 B.C.), and the estimated rate of accumulation of windblown sand inside the fort during the four years between the 2004 and 2008 seasons, I would estimate that given a similar rate of accumulation in the late Old Kingdom, each campsite would represent the passage of at least two to four years, with a greater time span between them if it took a bit longer for windblown sand to gather from a presumably narrower coastal plain (of note: the north-south coastal stretch [from where much of the windblown sand was drawn] might not be quite as dissimilar both in the Old Kingdom and today in contrast to the more dynamic, expanding western coastline).

[14] The 2002 season's series of four sondage units actually included an aborted "Unit/Trench 3," which was barely excavated, was soon halted, and later became expanded into the larger Unit 3 in the northwest quadrant of the courtyard.

[15] The 2008 season only managed to excavate most of grid squares A-O/7–9 in a north-south strip along the initial (western) portion of the eastern half of the courtyard. Most efforts went into excavating the overlying sand and campsites, plus an exterior portion (Unit 1) of the fortress. However, much of the eastern courtyard now awaits immediate excavation (after the more rapid removal of any new windblown sand above a series of protective, and perforated covering sheets).

[16] An examination of the southern, mostly dismantled wall of the fort revealed that the sloping, interior retaining wall had been added later, on top of the fort's floor surface. The builders had dug a shallow foundation trench for the main enclosure wall, placed one to two courses of stone in it, leaving a minimal area of foundation trench to backfill (*i.e.*, a few centimeters), built an almost vertical wall within and above the foundation trench, and subsequently added a sloping interior retaining wall –presumably to help bolster the weak, and probably already eroding limestone blocks in the face of the core wall. This interior core wall is exposed at various locations along its top and beside the interior western entrance and entry passage.

[17] The rough limestone used in the construction of the fort's walling system contained veins of identical grey flint, many of which eroded, and continue to erode, out of the weak limestone slabs/bocks, and may thereby represent the source of much of the "flint" (*i.e.*, ecofacts) within the courtyard. Actually, only a few definite worked flint tools appear in the fort to-date, while the hammer stones and anvils are much more easily identified as tools. See Mumford 2012a-b for a summary and photographs of the artifacts and materials found in the 2002, 2004, and 2008 seasons.

[18] See Mumford 2012b.

[19] The local Bedouin have used the fort enclosure for temporary shelter and other transitory activities whilst tending small flocks of goats in this area. The site is fairly isolated, however, and until its recent excavations did not stand out amongst the numerous other vegetation covered sand dunes and mounds that cover the El-Markha coastal plain.

[20] See Mumford 2006, 15 fig. 15, 18–20.

[21] Another scenario that might have played a role would be for excessively strong flash flooding hitting the fort from its eastern, landward side, washing over the interior and taking out part of the bastion and eastern dune top in an east-west moving destruction, or series of destructions. This action does not seem quite as likely, but may have occurred periodically in addition to heavy sea storms. However, these circumstances and features require far more specialist, geological examination before any firm conclusions are made.

[22] In an informal, preliminary discussion with a few geologists about the nature of the white salt crust layers inside the fort (see Mumford 2006), and especially one thin salt crust "flow" that penetrated a gap in the roofing blocks (which still mostly cap the entry passage), and spread over part of the sand filling, the main suggestion that has emerged was that such quantities of salt could not be introduced by a single wave, or even several waves and storms, but probably represents salt already present within the sand, which would only need frequent or multiple water flows over and through this area to create the distinct "salt flow" feature. Hence, one idea includes periodic, but long-term, flash floods that traversed El-Markha Plain from the mountains, perhaps being of sufficient strength to flow into and over the raised portions of the fort. Another option might be that the fort at Ras Budran lay sufficiently close to the Red Sea coast in the past that it experienced constant sea spray and periodic heavy waves that introduced sea water to the already present salts in the sand layers overlying the fort. In any case, some combined form of the presence of water, salt, and dynamic activity created the entry passage's "salt flow," the successive salt crusts within and outside the fort, and the salt crusts capping exposed pottery in the campsites and the block tops along the western, seaward side of the fort.

[23] In 2008, our initial crew of approximately a dozen Bedouin took several days to clear the fort of the four years of inter-seasonal windblown sand (*i.e.*, 2004–2008), admittedly using wheelbarrows. In contrast, the ancient Egyptian expeditions to Sinai, attested as numbering 1400 persons in one Old Kingdom account (Mumford and Parcak 2003; Mumford 2006), could easily have applied far larger numbers of laborers and removed any such windblown sand as quickly, if not more rapidly, if desired.

[24] Sarah Parcak has examined various satellite images to see if any other such circular or other suggestive features occur across El-Markha Plain, and has found a few promising sites, which she discusses in a brief report in this issue of *JAEI*.

[25] See Mumford 2006.

[26] Wadi al-Jarf has yielded a substantial, 160 by 120 meter, L-shaped stone wall and docking facility to protect the Old Kingdom anchorage opposite Ras Budran (Tallet and Marouard 2012, 43). Hence, the feature at Ras Budran may have served a similar function, albeit on a smaller scale.

[27] Tallet and Marouard 2012, 40.

[28] Petrie 1906, 52, figs. 61–62.

[29] Abd el-Raziq, Castel, Tallet, and Fluzin 2011; Marouard and Tallet 2012, 40–43; Tallet 2012, 147–68; Abd el-Raziq, Castel, Tallet and Marouard 2012, 6, 8–9, 10.

[30] Bard and Fattovich 2007; *idem* 2011; Abd el-Raziq, Castel, Tallet and Marouard 2012, 5–6.

[31] See Mumford 2006, 6 fig. 4, 7 figs. 5–6, 8 fig. 7, and 14 figs. 13–14.

[32] See Barron 1907, 117, 146–47; Mumford 2006, 35.

[33] Field 1948, 800.

[34] A more extensive survey is required in this region before ruling it out as an optimum source. The ancient Egyptian expedition's stone masons would most likely have surveyed the immediate terrain for available stone before considering more distant options. On the other hand, Wadi al-Jarf has yielded multiple rough stone structures and did offer a clear benefit of being an already secure port site that could ship rough stone directly to the building site at Ras Budran. In addition, if South Sinai had become sufficiently more dangerous to pharaonic expeditions to warrant the construction of a fortified anchorage (see Mumford 2006), perhaps the longer shipping time across a 50 km stretch of Red Sea would be offset by its relatively greater security and safety for the workforce versus in Sinai.

[35] This section was initially compiled and written by Rexine Hummel (the project ceramicist) in 2008–2009, but has been since re-formatted, edited, and augmented by Gregory Mumford regarding the placement of narrative data into the current tables, footnote, and the addition of various details on the excavation findings, more recent research and related matters at Ras Budran.

[36] Mumford 2006, 1–55.

[37] This writer (G. Mumford) notes that Tallet and Marouard (2012: 40, 43) are certainly mostly, and perhaps entirely correct in noting that the pottery from Ras Budran has been "... mislabelled as 'Sinaitic Ware' ..." It should be added, however, that the 2002, 2004, and 2008 excavations at Ras Budran and the initial assessment of its pottery fabrics took place prior to the 2011 discovery of the Old Kingdom installation at Wadi al-Jarf (including its large potter's kiln), while Ras Budran has yielded some unbaked pieces of pottery (see Figure 27), which suggests the possibility of a small-scale kiln at Ras Budran (naturally this remains unconfirmed and conjecture at this stage). In addition, some (unpublished) petrographic analysis of selected pottery fabrics from this area (sites 345 and 346) still allow for a "Sinaitic" source for these fabrics, while the clays on both sides of the Red Sea are presumably also fairly similar, if not identical (future research may resolve or clarify this). Hence, it may be a bit premature to rule out some local pottery production at Ras Budran, but the recent evidence from Wadi al-Jarf and the excavators' reasoning are certainly compelling and will most likely prove to be the case for at least most of Ras Budran's pottery.

[38] This writer (G. Mumford) realizes that some of our non-diagnostic, unbaked clay pieces may also reflect various other things, including sealings for storage jar tops,

which would be a logical find amidst our many storage jars. However, at least one of the large, unbaked clay pieces seems to suggest a bread mold base (illustrated here: figure 27). Of note, in my prior participation in excavations in diverse periods and contexts in the Nile Valley and East Delta, I have encountered clay jar sealings from the late Old Kingdom through First Intermediate Period (*e.g.*, at Mendes and Karnak), and other periods, none of which resembles our unbaked clay findings. On the other hand, many of our storage jars may have been both manufactured and sealed in a different fashion at Wadi al-Jarf, with a few of our less distinct unbaked clay pieces perhaps representing portions from jar top seals (more comparisons are needed between the findings from both sites).

39 Bourriau et. al., 2000, 19.

40 Rzeuska 2005, 173.

41 See Van Neer, Lernau, Friedman, Mumford, Poblome, and Waelkens 2004.

42 The (late) project geoarchaeologist, Larry Pavlish, communicated this information to the project director (Gregory Mumford).

43 Lehner 2007, 280.

44 Bárta 1996, 153.

45 Rzeuska 2004, 19.

46 Bárta (1995, fig. 3) illustrates a wall scene of bread baking using *bꜣ* moulds stacked over a fire from the Tomb of Ti at Saqqara; fig. 2 shows a scene of bread baking in *ʾprt* moulds from the Tomb of Khentika at Saqqara.

47 Jaquet-Gordon 1981, fig. 2:6 and 7.

48 Lehner 2007, 280.

49 See Mumford 2006, fig. 19:24 and 25.

50 Hope 1999, 224.

51 Hope, 1999, 224.