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Front cover. Block 1000.0049 from Naga (photograph courtesy Karla Kroper).

Above. Pottery jar with decoration of sorghum heads from BMC 60, Berber (photograph courtesy Mahmoud Suliman Bashir).

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A desert Middle Nubian amethyst mining camp at Wadi el-Hudi

Meredith Brand and Kate Liszka

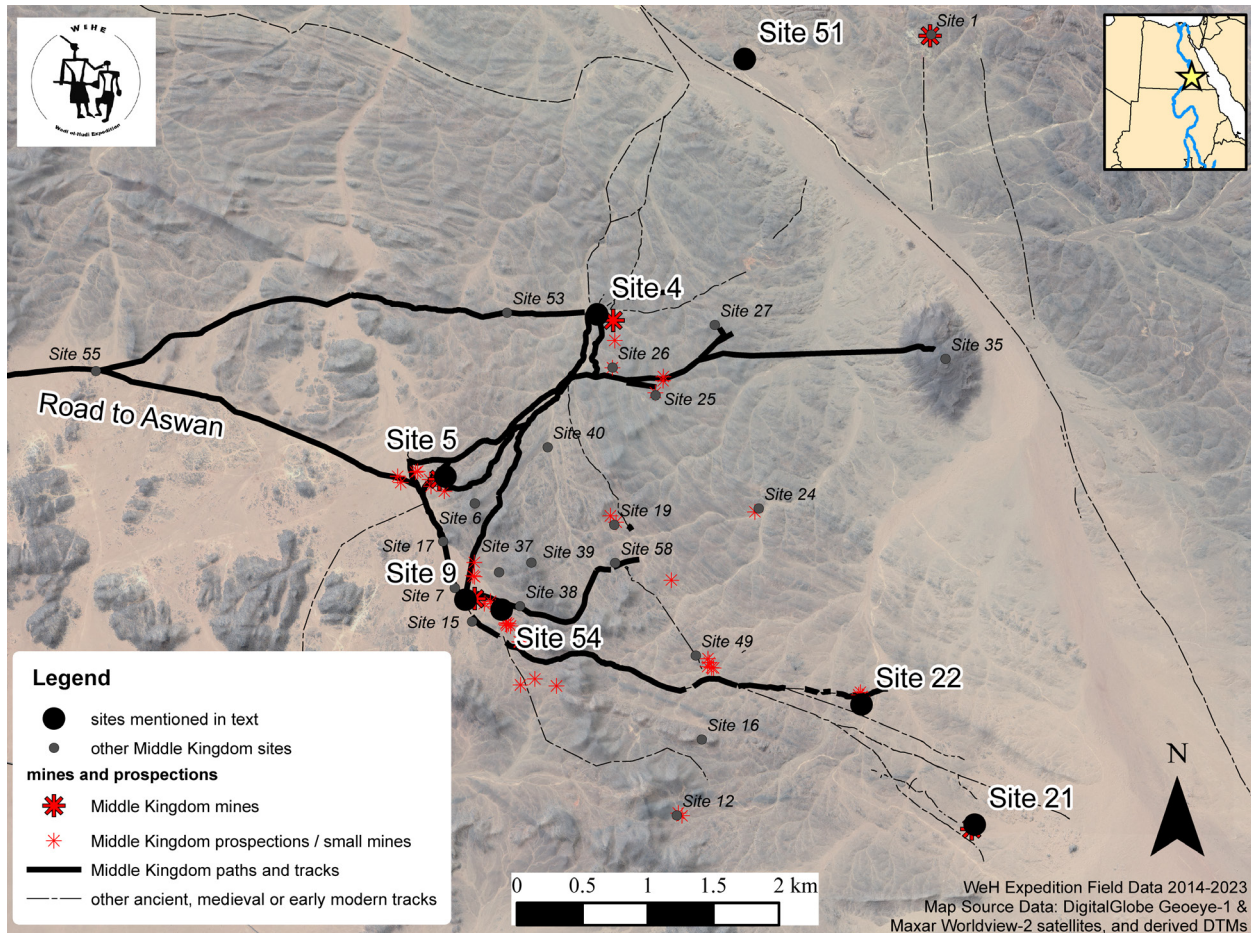


Figure 1. Map of Wadi el-Hudi made by Bryan Kraemer.

Wadi el-Hudi¹ is mainly known as a location where the Egyptian kings of the Middle Kingdom (c. 2000-1700BC) sent large expeditions to mine amethyst to increase the wealth of the royal treasury. Craftsmen turned these deep purple stones into jewellery that the king gifted as objects of prestige to members of the court and the royal family. Temporary, but frequent, expeditions of up to 1500 people sent from the Nile Valley lived and worked at a networked series of settlements and mines that were all supplied by the state. Wadi el-Hudi Sites 4, 5, and 9 were the heart of this Middle Kingdom activity - with significant standing architecture, deep mines often over 80m wide, dense archaeological deposition, and about 200 carved inscriptions, some explaining the workings of the expeditions (Figure 1). Our initial understanding of the work at Wadi el-Hudi was of large, well-equipped mining expeditions backed by a state apparatus controlling vast swathes of the desert. Textual evidence mentioning Nubians and artefacts associated with Middle Nubian groups at Wadi el-Hudi also seemed to indicate that some Nubians were included among the larger Egyptian state-controlled workforce. Our recent discovery of an amethyst mine at Site 21 with

¹ wadielhudi.com.

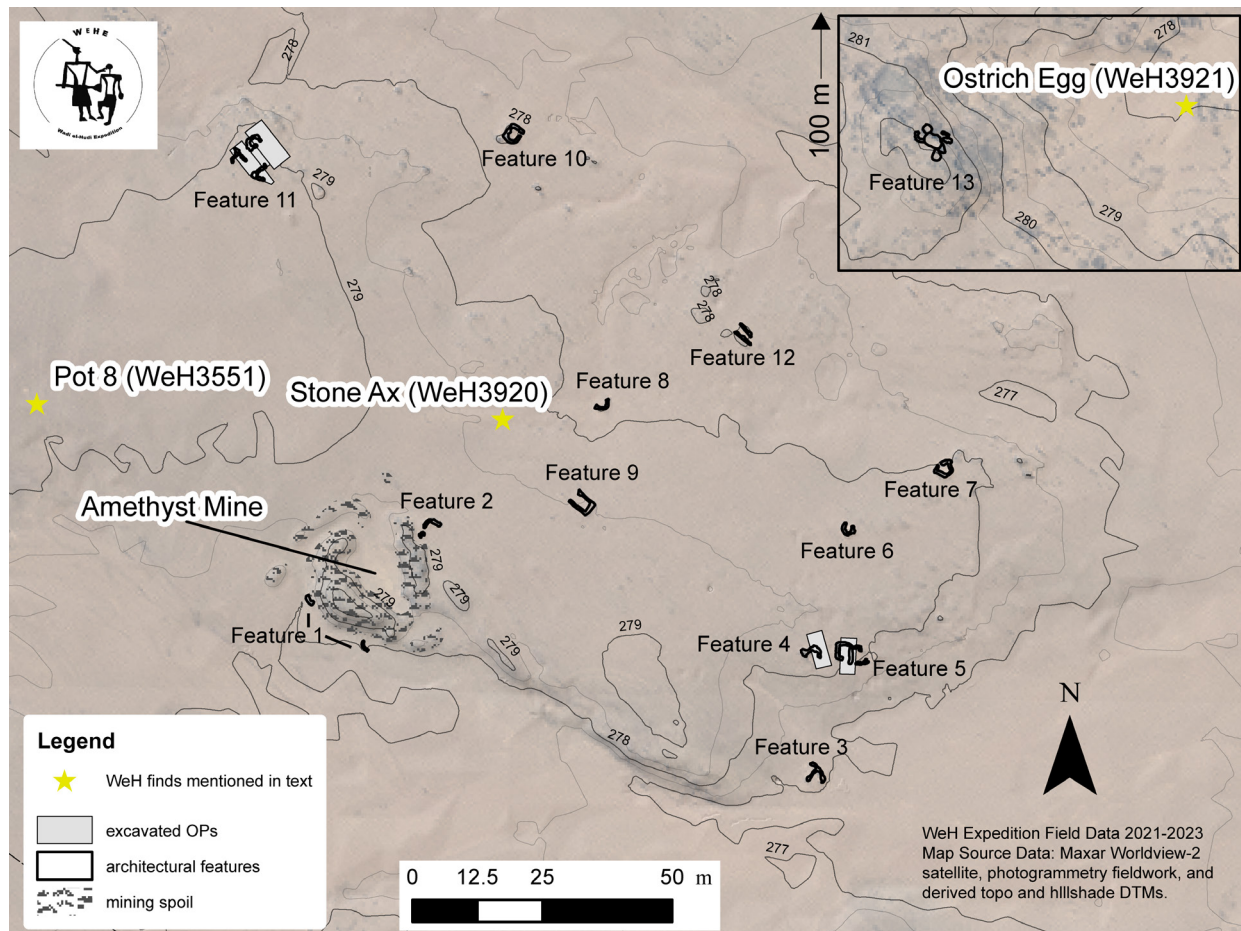


Figure 2. Map of Site 21 made by Bryan Kraemer.

mostly Middle Nubian pottery and material culture has shown that the picture is more complicated, involving other agents in the desert than just the Egyptian state (Figure 2). Site 21 points to non-standard Middle Nubian group(s) contemporary with the Egyptian Middle Kingdom living and mining amethyst in Wadi el-Hudi without the Egyptian government's oversight.

The discovery, survey, and partial excavation of Site 21 during the Wadi el-Hudi Expedition's 2021 and 2023 seasons is creating a larger, more nuanced picture of activities in the Eastern Desert.² Amethyst mining was not limited to the areas of the large Egyptian mines (Harrell forthcoming). In an over 100km² area of Wadi el-Hudi, abundant amethyst-bearing and other mineral-bearing outcrops were exploited away from the major Middle Kingdom settlements. Nor was mining limited to expeditions supplied and organised by the Egyptian state. We discovered significant evidence for three other groups of people in the desert: pastoral nomads with their herds, small groups of Egyptian miners, and Nubian miners conducting small-scale mining distinct and probably separate from the large mines run by the Egyptian state. The presence of Nubian people in the desert at Wadi el-Hudi raises important questions about Nubian

² Sincere thanks goes to our entire Site 21 archaeology and survey team: first and foremost, our chief field archaeologist, Magdalena Włodarska, whose astute observations made this whole article possible. We would also like to thank Maia Matheu, Rabab Ali Hamdy, Omer Farouk, Cristina Alù, Bryan Kraemer, Michael Kraemer, and Joana Pinto. Many thanks to Maria Vecchiotti and many others for supporting our work in Egypt. We are grateful to everyone at the Ministry of Antiquities and Tourism and the Aswan Inspectorate, without whose support, none of this work is possible: Minister Ahmed Issa, Mostafa Waziri, Mohamed el-Badie, Nashwa Gaber, the Permanent Committee, Abdelmonem Said Hany Saleh, Shazley Ali Abd Elaziem, Zeinab Gharib, Sayed el-Rawy, Ayman el-Baghdady, and Moatez Sayed. We would also like to thank everyone at the American Research Center in Egypt, especially Mary Sadek and Mariam Foum.

communities directly mining precious stones in Middle Kingdom Egypt, informal mining operations led by non-Egyptian groups, multicultural interactions in the desert, and the limits of the Egyptian state's control over a frontier border zone in the Eastern Desert.

Nubians and pastoral nomads at Wadi el-Hudi in the Middle Kingdom

Before addressing these broader issues, we need to examine the chronology of Middle Nubian groups to understand where the inhabitants of Site 21 fit within the broader context of Middle Nubian populations. In the last few years, there have been some significant breakthroughs when it comes to understanding the chronology and cultural complexity of Middle Nubian groups in Egypt. Marie-Kristin Schröder recently demonstrated that the C-Group chronology of standard corpora is significantly shorter than originally thought; it begins in the late Old Kingdom and is not attested after the reign of Senwosret III (Schröder 2021, 311-325). Similarly, Aaron de Souza showed that the chronology of the traditional Pan-Grave starts earlier than originally thought. Although a few select examples may start as early as the reign of Amenemhet III, Pan-Grave pottery primarily dates to the 13th dynasty and the Second Intermediate Period (de Souza 2019, 143-150).

The question of who the Nubians at Site 21 were directly relates to the date(s) of their activities. Unfortunately, the dating is primarily based on Egyptian pottery because we cannot conduct more advanced archaeometric tests on artefacts and have no textual evidence from the site. Elsewhere at Wadi el-Hudi, Middle Kingdom mining by the Pharaonic state had started by at least by the 11th dynasty reign of Montuhotep IV at Site 5 and expanded to Site 9 and possibly to Site 4 in the early 12th dynasty, under Senwosret I. The inscriptions and pottery attest to a high rate of mining through the reign of Amenemhet III and then a decreased level of mining into the reign of Sobekhotep IV (Liszka and Kraemer forthcoming 2024; Sadek 1980). The material culture from Site 21 differs from what we find in the Egyptian mining settlements. The activity there coincides with both the C-Group and the early Pan-Grave activities elsewhere, and we have found C-Group style pottery made of Nile silt within the main mining settlements (Brand 2018; Brand *et al.* 2022). We have yet, however, to identify any clearly Pan-Grave style pottery at Wadi el-Hudi.

So where does that leave the evidence for Nubians in the Eastern Desert? Some Nubians participated in the large expeditions organised by the Egyptian government. Evidence found at Sites 4, 5, and 9 includes consistent low levels of standard C-Group pottery, inscriptions that mention Nubians as team members, and architectural designs in the settlements utilising standard Nubian construction techniques (Liszka 2017; Brand 2018). Inscription WH4 discusses how sub-groups of Nubians went to Wadi el-Hudi with their own possessions to work in the expeditions (Brand 2018, 30-31). It would seem that the Nubians who worked with the Egyptians likely came from the Nile Valley and worked in the same capacities as the groups that the Egyptian government brought from Egyptian towns to make up their mining crews.

The mining operation and material culture at Site 21, however, does not preserve similar evidence of a Middle Nubian workforce in the Egyptian controlled mines. It is possible though that the people at Site 21 could have been pastoral nomads. Evidence for pastoral nomads and possibly Nubian groups living in this part of the desert exists in the Egyptian textual record, which identifies several other groups such as the Medjay, Nehesy, and *Iwntyw* as nomadic peoples of the Eastern Desert (Cooper 2020, 71-73). Archaeologically, there is evidence for pastoral nomads at Wadi el-Hudi as well, some of whom may have been parts of the Middle Nubian cultural horizon. Our recently discovered Site 51 seems to be a long inhabited pastoral nomadic shelter. Although most of the pottery is from the Late Roman and Islamic periods, the site probably has deep stratigraphy (Liszka forthcoming). We have also found small mines where one or two people could have gathered minerals. At Site 54, we found a few isolated Middle Nubian,

hand-made pottery sherds. Yet like the Site 21 pottery (discussed below), they do not fall firmly into C-Group or Pan-Grave pottery categories. Overall, our survey work shows that there is a larger pattern of small sites in the desert with pottery that cannot fully be associated with the C-Group or Pan-Grave cultures.

Small Egyptian Middle Kingdom mining sites in Wadi el-Hudi

Site 21 is one of many smaller mines in Wadi el-Hudi. In addition to the large mines at Sites 4, 5, and 9, many small mines ranging from 1m to 15m wide also dot the landscape (Figure 1). Some of these were abandoned unsuccessful prospects, while others were small mines yielding minerals that were worked by small groups of people. We have found paths connecting some of these mines to the larger mines and seem to have been extensions of the work done by the large expeditions, while others seem to have been isolated projects worked by individual, small groups of miners. Most of these mines have very few remains of material culture.

Site 22 is typical of a standard Egyptian Middle Kingdom small mining camp, made up of a mine, hut(s), and other small dry-stone features (Figure 3). In the north, the mine covers about 15 x 10m to the ends of its spoil heaps. Occupants lived in three small huts spaced about 45-60m apart from one another and built onto boulders. Dry-stone walls were built by stacking local stones from the ground onto the boulders to create living spaces. Typically, the walls were about 2-5m long and only 0.5-0.8m high. A few Egyptian Nile C body sherds and a Nile B2 bowl rim were found around these features, thus confirming a general Middle Kingdom date and the use of Egyptian pottery. Site 22 is probably connected to the Egyptian expeditions stationed at Site 9 because a small path connects the two locations. It was probably a short-lived mining operation where Egyptians looked for, but did not find new large veins.

Landscape, geology, mine, and architecture at Site 21

At first glance, Site 21 seems similar to Site 22. Site 21 is relatively isolated on a flat, open, and rocky terrain 0.85km west of the Wadi el-Hudi proper and 2km east of a granitic mountain range (Figure 2). A few boulders are spread out on the landscape far apart from one another. Local rocks were used to construct dry-stone building structures. People camping in these locations could be seen from far away and could not easily escape to shelter. No natural water source, catchment basin, natural shade from hills or overhangs existed, and even the desert plants would have been located a kilometre away in the wadi (Figure 4). Like Site 22, Site 21 was a poor place to camp. The miners must have chosen it despite the bad environment because of the mineral resources they wanted to mine. Unlike Site 22, Site 21 was not connected to Site 9 or other Egyptian mining locations with a trodden path. It seems to have been an independent operation.

The mine at Site 21 is 22x24m, which is about double the size of Site 22, making it a medium-sized mine. Site 21's mine yielded amethyst; we found purple samples both in the spoil heaps of the mine and in the excavations of the habitation area at Feature 11. Workers at Site 21 built 13 stone features³ widely spaced over the landscape, often being 50m away from any other structure. They consist of huts, small windbreaks, emplacements for water jars, and other yet unexplained shapes. Features 4/5, 6, 10, and 11 are the better built 'huts' with walls up to a metre tall that may have been areas of habitation. Unlike Site 22, the majority of Site 21's features are free-standing dry-stone structures that do not incorporate local boulders.

After having surveyed, partially excavated, and mapped this area, we hypothesise that the different locations within Site 21 may represent temporary habitations active at different times. Yet even if

³ Here a 'feature' is any structure built or used by humans.



Figure 3. Two dry-stone huts built onto boulders at Site 22.



Figure 4. Site 21 landscape with Feature 7 in the foreground and the mine in the right corner.

chronological phasing explains the conundrums, the fact that every feature is at least 50m from its nearest neighbour is unlike most Egyptian huts at small mines elsewhere in Wadi el-Hudi. This begs the question: Why did each group choose to rebuild in a nearby location, rather than reuse a previous group's structure(s)?

Pottery was found scattered throughout the site. Individual pottery sherds will often join with others from the same bowl even though they were found over 150m away from each other. Similarly, individual sherds found on the surface have joined with sherds found in the lowest stratigraphic levels of excavation (up to 0.4m down).

Excavated features at Site 21

In January 2023, we excavated two of these 'huts' and their associated courtyards and windbreaks at Feature 11 and at Feature 4/5 because they are the most substantial structures at the site and they had large concentrations of pottery.

Feature 4/5 has three associated spaces that formed a short-lived habitation space (Figure 5). The main hut is a rectangular structure 3.65x2.70x1m, opening southward. On its east side abuts a L-shaped extension, about 1.5x0.5x0.5m. Around 4m to the west is another collapsed L-shaped windbreak, about 3.3x2.3m that may have been up to half a metre tall.

Inside the hut, there were a few small sherds and the bottom half of a Nile C water jar that seems to have been reused as a large bowl (Figure 6). There was also a small hearth in the centre at floor level, that does not seem to have been used for cooking and, therefore, may have been built for warmth.⁴ Thus, a few people may have used the hut for only a short time. Perhaps they kept the area clean for living. Broken pottery, however, was found in the extension to the east and behind the windbreak to the west. The extension with shorter walls may have been used to store or stand goods, such as water jars. The only small stone tool in this area was found behind the extension on the north side. It could fit in one's hand and had a curved top and pointed edge (Figure 11). It was probably used to reduce quartz chunks to finer chips. This activity would have occurred in front of the Feature 4/5 hut and windbreak, where small amounts of chipped quartz were found. Considering the quantity and complexity of artefacts, this area seems to have been used for a much shorter time than Feature 11.

Feature 11 (Figure 7) is located 150m north of Feature 4/5 on the opposite end of Site 21. It is located on a natural outcrop of stone, and some of the boulders were incorporated into the feature's design. Here the occupants built a hut with a path leading up to it and two windbreaks on the south side and the west side over a 10x10m area. The large hut has the same rectangular shape as Feature 4/5, with its entrance to the south, and a small wall built to enclose part of the front. It is 3.55x2.50x1m. Two L-shaped windbreaks with low walls (0.3m) open towards the southeast and southwest sides; they were 3.5x3m and 2.2x2m respectively. Surprisingly, the natural rocks that pop up directly south of the entrance to the hut were incorporated into Feature 11, often delimitating the space's use and organisation.

Excavations revealed that the activities and their organisation remained consistent throughout the area's use. Yet the number of times the area was occupied is in question. Although we can see different phasing levels based on stratigraphy from hearths and other elements, pottery sherds found on the surface corresponded with those in the lowest levels of excavations. We hypothesise that Feature 11 was used by the same people possibly multiple times over a number of years and thus maintained a consistent organisation of activities.

⁴ The placement of small fires either in the centre or on the side of the structure is often found in C-Group dry-stone settlements like Wadi es-Sebua, Aniba, and others (Sauneron and Jacquet 2005, 333; Steindorff 1935, 209-212). This pattern is not a cultural marker because it is also found in other 'Egyptian' dry-stone huts in the desert.



Figure 5. Feature 4/5 after excavation, image derived from a 3D model made by Bryan Kraemer.



Figure 6. Feature 4/5 bottom half of Nile C water jar *in situ*.

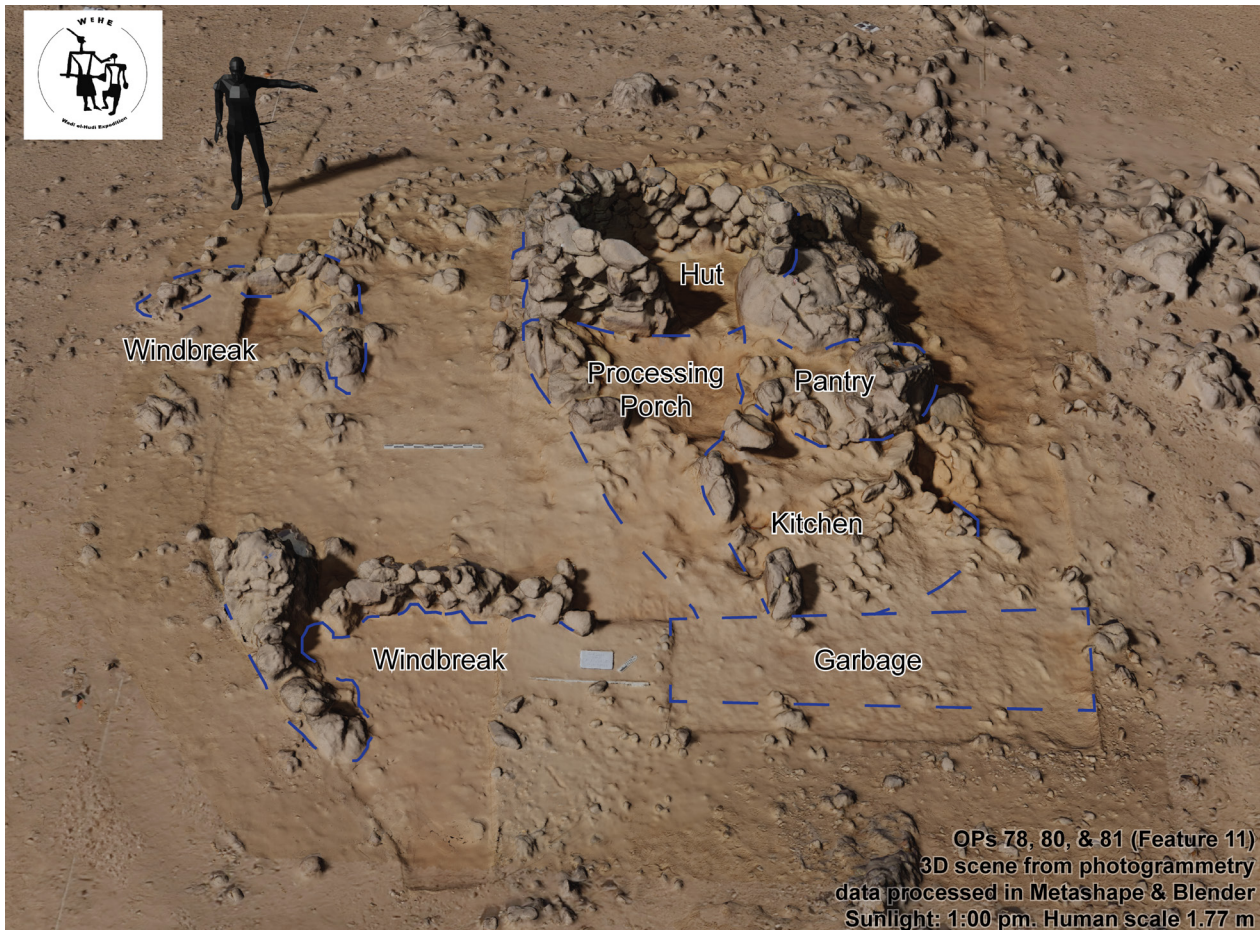


Figure 7. Feature 11 after excavation, with activity areas labelled, image derived from a 3D model made by Bryan Kraemer.

The occupation area of Feature 11 can be divided into six activity areas.

Hut. Very few artefacts were in the main hut. Although some sherds and even tools were found, the inhabitants kept the interior relatively clean. Inside the front doorframe, the occupant(s) created a niche within the stones and built small fires there (Figure 8). It is possible that the hut was used for living, sleeping, and/or even further processing of amethyst.

Processing porch and path leading to the hut. Amethyst was processed directly in front of the hut's entrance on the west side of the natural boulders. Although chipped quartz was found in every archaeological level, dense amounts of chipped quartz congregated here, including pieces of amethyst. Several hearths and small burning spots were also found here. A pottery tool and a stone axe also were left where they had been used.

Kitchen. In front of the hut, downslope, and to the east of the natural boulders was probably where they cooked food. A mixed layer of multiple burn activities about 0.1 to 0.2m deep and 0.5m wide was discovered. Stones that were likely used for balancing a cooking pot show traces of burning at the bottom. A layer of ash and other charcoal sealed the area. Sherds broken from cooking pots (Figure 13 and below) and a stone tool covered the ashy deposit.

Pantry. In the spaces within the rocks to the east, dense amounts of sherds were found. These spaces seem to have been natural areas to stand and store jars.

Garbage Deposits. About three metres to the south and downslope of the hut, the archaeological deposition decreases. Yet a mix of broken ceramics was found strewn on the surface over a four-metre area running east-west. Additionally, discarded pottery sherds were also found east and downslope of the pantry.



Figure 8. Feature 11, 'fireplace' just inside of the hut's entrance, on left side.

Someone cooking or working apparently wanted to get rid of them by tossing them out or letting them drift downslope. These sherds join with pottery found in the excavation.

Windbreaks. On the south and west, the two windbreaks surprisingly yielded small amounts of archaeological debris. There were sherds, chipped quartz, and even a tool or two, but not in high densities. These areas seemed ephemeral to the other utilised spaces at Feature 11.

Food at Site 21

The quantity and types of animal bones found in the excavations at Site 21 show distinct food patterns. There are very few animal bones found at Site 21, particularly compared to those found at the large Egyptian state-run mining settlements at Sites 4, 5, and 9. At the larger Egyptian sites, a variety of animal bones were recovered including locally hunted meat (e.g., gazelle and birds), meats brought from the Nile valley (e.g., fish and cattle), as well as sheep and goat.

At Site 21, in contrast, the few animal bones found seem to be those of small rodents, birds, or snakes, i.e., local animals. Only three bones were found at Feature 4/5. With such a small number of animal bones, it is challenging to comment further. Feature 11, however, had about five times as many animal bones and their deposition shows a pattern. The bones appear on the processing porch and in the hut, both on the floor and in the windblown sand above. Almost no bones occur in the kitchen area and none in the ceramic dump. Their deposition pattern tentatively suggests that the inhabitants of Feature 11 may have caught and eaten these desert animals. Then the bones were disposed of directly where the occupants ate, rather than where they cooked.

This relative lack of animal bones may be explained in two ways. Either the miners brought deboned,

cured or salted meat, or they did not eat meat regularly. Regardless, this low amount or lack of bones demonstrates that the Site 21 miners were probably not connected to the regularly supplied expeditions of the Egyptian-state, whose workers commonly ate large quantities of sheep/goat, cow, fish, and gazelle.⁵

Possible Nubian cultural markers

The material culture at Site 21 reflects the multiculturalism of the ‘borderscape’ between Egypt and Nubia. In order to understand the behaviours of the people and recognise how their entanglements are reflected in the surviving artefacts, the first step is to identify artefacts that reflect the technology, materials, and style commonly associated with Middle Kingdom Egypt and Middle Nubian cultures. The next step is to place the artefacts within predetermined groups to look for patterns (Bader 2021). At present the working terms ‘Egyptian’, ‘C-Group’, ‘Pan-Grave’, and ‘Kerma’ are used (the last three being Middle Nubian groups), although there is a burgeoning movement to replace or redefine them (de Souza 2021). Ultimately, Site 21’s material culture (particularly pottery) can help us to deconstruct ‘Nubian’ culture because it highlights the complexities among these entangled groups.

Some artefacts may indicate that Nubians lived and worked at Site 21. About 225m northeast east of Feature 11, on a path connecting Site 21 to the main wadi, we discovered dozens of pieces of broken ostrich eggshell that probably came from the same egg (Figure 9). Theoretically, it was dropped by a person going from Site 21 to the wadi, rather than towards Aswan. Two or three fragments of ostrich eggshell were also found on the processing porch in excavations at Feature 11. Ostrich eggshells are rare at the Egyptian Middle Kingdom sites in Wadi el-Hudi. They are, however, more regularly found in Middle Nubian habitations where they were used as drinking vessels, and they occur in Middle Nubian tombs, especially carved into amulets and beads (Sauneron and Jacquet 2005, 344; Säve-Söderbergh 1989, 110ff., 140-141, 268-270). The ostrich eggshells may reflect Nubian cultural practices.



Figure 9. Fragments of ostrich eggshells on the path between Site 21 and the wadi.

⁵Thanks to Kathryn Grossmann for her preliminary insights into animal bones at Sites 4, 5, and 9. Grossmann’s analysis is forthcoming. Site 21’s faunal remains still need to be analysed as part of a larger study.

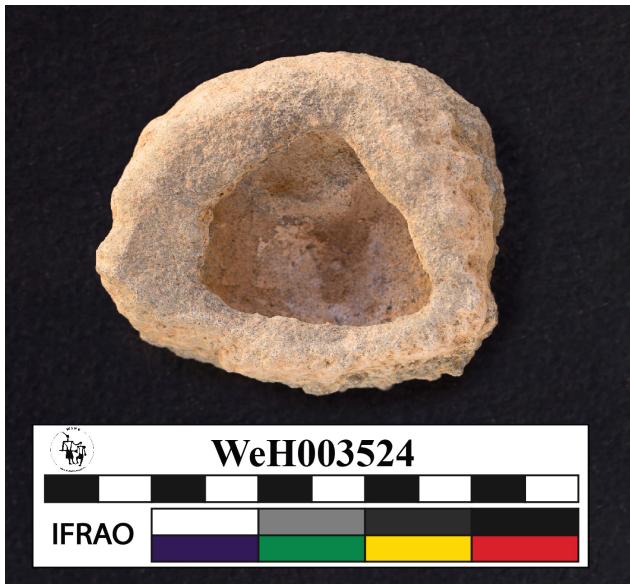


Figure 10. Geode from Feature 11 southern windbreak.

Next to the southern windbreak of Feature 11, we discovered a geode whose use is uncertain from the archaeological context (Figure 10). Similarly, archaeologists at contemporary Wadi es-Sebua also discovered about 20 geodes (Sauneron and Jacquet 2005, 343), whose use or symbolic value is unknown. We have not found anything similar in the other Middle Kingdom sites at Wadi el-Hudi.

The stone tools used at Site 21 are of a different variety from those used elsewhere in Wadi el-Hudi. At the large Egyptian mining sites, we typically see handstone pounders, drill bits, abraders, grinding stones, smoothers, and whetstones, as well as netherstone anvils and querns. At Site 21, we found three handstone pounders and one hammerstone/anvil. However, we have also found 3-4 stone axes - two were found at Feature

11 and one near the mine (Figure 11). Each is of a slightly different shape ranging from teardrop to irregular wedge. They have flat sides that angle inward towards a wide edge for cutting. They may have been handheld or used with an anvil.⁶ These axes/wedges seem to have been used elsewhere as often as the handstone pounders. At the large Egyptian mining sites, we found about three stone axes across the entirety of all Sites 4, 5, and 9; they seem to have been rarely used by the Egyptian workers. Smith's discussion distinguishes between Egyptian and Nubian styles of groundstone axes, especially those from Askut and Kerma (Smith 2003, 106; see references within). Various forms of stone hand tools and wedges are also found in Upper and Lower Nubian fortresses and settlements, such as Amara West,⁷ Askut, and others (Wegner 1995, 156-157; Emery and Kirwan 1935, 45-46; Säve-Söderbergh 1989, 123 n20). Site 21's stone tools deviate in shape from the standard corpora. It seems that the people at Site 21 used stone axes/wedges in the mining process more readily than the Egyptian workers elsewhere. Perhaps their choice reflects a Nubian cultural preference or a non-state, independent approach to mining amethyst.

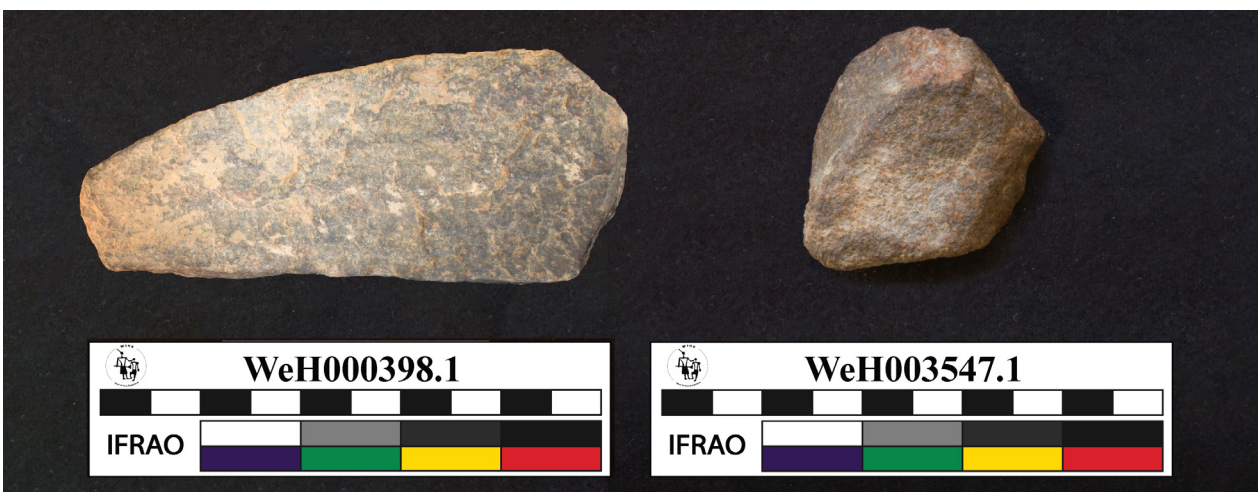


Figure 11. A wedge axe and a small hand pounder found at Site 21.

⁶Thanks to Emmy Malak for her preliminary insights into these tools as part of a larger, future study.

⁷ <https://amara-west.researchspace.org/> See objects FEA 86082, FEA86083, F5603, F5655, and F975.

Pottery at Site 21

Pottery was the most commonly found artefact in both the 2021 survey and the 2023 targeted excavations at Feature 11 and Feature 4/5. From the survey, we estimate that there were around 450 pottery sherds on the surface of the site, with roughly 55% being Nubian and 45% Egyptian. When we look at the different zones of the site, clear patterns emerge. Feature 11 has the most pottery with around 230 sherds, and most are Nubian in character (roughly 80% Nubian and 20% Egyptian). In comparison, the Middle Kingdom Egyptian Sites 5 and 9 had well under 10% Nubian pottery (Brand *et al.* 2022). This very high percentage of Nubian pottery suggests that the people in Feature 11 overwhelmingly preferred Nubian to Egyptian style pottery. Feature 4/5, however, has less pottery overall with approximately 90 sherds and most are Egyptian (around 76% Egyptian and 24% Nubian). The pottery distribution suggests different communities may have been at the site at different periods.⁸

Egyptian pottery types and chronological phasing

Egyptian pottery provides both the dating of Site 21 (above) and an insight into the activities at the site. Figures 13 and 14 present the Egyptian diagnostic sherds from the 2021 survey and their dates. There are three main Egyptian pottery types from Site 21 that are distributed differently across the site. First, body sherds of Nile C water jars (often called ‘beer bottles’, Schiestl and Seiler 2012, 640-643) are most commonly found in small quantities all over the surface, including around Features 11 and 4/5. While no diagnostic Nile C water jar sherds were found on the surface, excavations of Feature 4/5 found a Nile C water jar base (Figure 6) and small fragments of rim sherds. Second, Nile B1 bowls were found on the surface around Feature 11, and our excavations found more sherds that correlated with the same bowls underground. Unfortunately, these bowls are either too fragmentary or not chronologically distinctive enough to provide a specific date within the Middle Kingdom. Third, two Marl C rim sherds of large jars can be dated more accurately. The round-rim Marl C *zir* (Type 1 *zir* in Schiestl and Seiler 2012, 584) are found in the north part of the site and connect Feature 2, the mine, and Feature 11 with the late 11th to mid 12th dynasties. A corrugated Marl C rim fragment found in the southern part of the site at Feature 4/5 dates from the mid-12th dynasty to the 13th dynasty (Schiestl and Seiler 2012, 610-617). The excavations of Feature 4/5 uncovered connecting fragments of the Marl C corrugated rim jar, which link the activities inside the hut with the later Middle Kingdom date established by the surface fragment. The dates of the Marl C jars suggest two different phases of occupation; the northern part of Site 21 and Feature 11 probably date to the early Middle Kingdom and the southern part of Site 21 including Feature 4/5 date later from the mid to late Middle Kingdom.

Nubian pottery: decoration, form, and fabric

Traditionally, Egyptologists have divided Middle Nubian groups into three archaeological ‘cultures’: C-Group, Kerma, and Pan-Grave. Over the last two decades, researchers have pointed out that these three categories are in fact much more complex culturally and chronologically than originally defined, and need to be re-evaluated. The pottery at Site 21 reflects the entanglement of Middle Nubian culture; it has similar motifs to C-Group pottery and to a lesser extent Pan-Grave pottery, and yet the specific decoration motifs on Site 21 pottery are unusual.

From the surface survey and the excavation, we were able to reconstruct 8 pots with a rim or base (Figure 13 and Figures 15-20). There are possibly an additional 3 to 5 pots based on body sherds, which will be explored in a future publication.

⁸ We have identified individual Nubian and Egyptian pots within the assemblage. The drawings in this preliminary analysis show individual fragments that still need to be reconstructed. A full analysis with complete drawings will appear in later publications.

Pottery number	Location	Fabric (based on Vienna System)	Shape and Diameter	Use	Date
WeH003205.1	Feature 4/5	Marl C 1	Rim diameter 130mm. Bag-shaped corrugated rim jar	Storage	Second half of 12 th dynasty and possibly 13 th dynasty (Schiestl and Seiler 2012, 610 – 617)
WeH003208.1	Between Feature 2 and the mine	Marl C compact	Rim diameter 310mm. Bag shaped jar with round rim	Storage <i>zir</i>	Late 11 th dynasty to reign of Senwosret II, and possibly Senwosret III Schiestl and Seiler Type 1 <i>zir</i> rim (2012, 584)
WeH002843.8 / WeH003202.2	Feature 11	Nile B1	Rim diameter 170mm Bowl	Food or liquid consumption	Middle Kingdom
WeH002844.1	Feature 11	Nile B1	Rim diameter 160mm Bowl	Food or liquid consumption	Middle Kingdom
WeH003201.1 / WeH003204.1	Feature 11	Nile B1	Rim diameter 140mm Bowl	Food or liquid consumption	Middle Kingdom
WeH003206.1	Between Feature 10 and Feature 11	Nile C	Base diameter 20mm Small jar or small bowl	Food or liquid consumption (if a bowl) or short term small volume liquid storage (if a jar)	Middle Kingdom

Figure 12. Diagnostic Egyptian sherds related to the chronology and phasing of Site 21. See images in Figure 14.

Nubian pottery fabric from Site 21 is made from both Nile silt and clay sources most probably from the low desert, near the Nile valley.⁹ Standard C-Group and Pan-Grave pottery from the Nile Valley was made from Nile silt and the fabrics are generally fine, with varying amounts of dung, chaff, and/or rounded sand grains, as well as occasional fine mineral inclusions (de Souza and Ownby 2022; Schröder 2021, 59; Nordström 1972; D’Ercole *et al.* 2015). Pan-Grave pottery fabrics have more variability than C-Group fabrics and can be coarser with larger and more copious rounded sand grains and angular rock fragments (de

⁹ Site 21 pottery samples have been transferred to the IFAO for petrography, which will provide more information on the geological origins of the clay.

Pot no.	Location	Figure no.	Site 21 fabric	rim diameter	Forming Technology and Surface Treatment	Colour firing and technology	Use
Pot 1	Feature 11	16,20	Fabric 3	190mm	Handmade, Burnished interior and exterior Incised line decoration on exterior	Red/brown interior and exterior Oxidised firing conditions	Food or liquid consumption
Pot 2	Feature 4/5	17,19	Fabric 2	240mm	Handmade Highly burnished exterior and lightly burnished interior Red slip exterior and interior Incised line decoration on exterior	Dark red/brown Oxidised firing conditions	Food or liquid consumption. No sooting or fire clouding
Pot 3	Feature 11	18	Fabric 1	350mm	Handmade, Burnished exterior and interior Incised line decoration on exterior	Red brown interior and exterior Oxidised firing conditions	Cooking pot. Firing clouding and traces of sooting on exterior bottom
Pot 4	Feature 11	16	Fabric 2	290mm	Handmade Lightly burnished on exterior Faintly incised lines on exterior	Dark brown and brown-red Oxidised firing conditions	Possible cooking(?), but no firing residue
Pot 5	North west of mine	16	Fabric 2	35mmmm (base diameter)	Handmade, Burnished exterior and interior, Red slip exterior and interior, Deep incised line decoration on exterior	Brown-Grey Oxygen reduced slightly in firing	Food or liquid consumption? There is no trace of burning or sooting on the base

Figure 13. Groups of Nubian pottery divided by individual pots.

Pot no.	Location	Figure no.	Site fabric	rim diameter	Forming Technology and Surface Treatment	Colour firing and technology	Use
Pot 6	Feature 11	16	Fabric 2	Rim sherds too small to determine	Handmade. Lightly burnished on exterior. Faintly incised lines on exterior.	Dark brown and brown-red Oxidised firing conditions	Possible cooking(?), but no firing residue
Pot 7	Feature 11	16	Fabric 2	190mm	Handmade. Burnished on interior and unclear on exterior.	Oxidising	Food or liquid consumption
Pot 8	Feature 4/5 And North west of mine	17	Fabric 2	300mm	Handmade, Burnished exterior and interior, Red slip exterior and interior, Incised line decoration on exterior	Red/brown interior and exterior Oxidised firing conditions	Unclear

Figure 13 (cont.). Groups of Nubian pottery divided by individual pots.

Souza 2019, 29-32; de Souza and Ownby 2022). Nile silt C-Group and Pan-Grave pottery generally fires to a dark grey or black when oxygen is reduced in the firing process and red-brown when oxygen is present.

The use of clays outside the Nile Valley is significant because it suggests the potters were at some point based in the desert. Potters tended to use locally available clays (Arnold 1985, 39-49), and the use of desert-clays means these potters must have been well acquainted with utilising desert sources of clay. Thus, the Site 21 potters must have been at least part time inhabitants of the desert. Site 21's desert clays fit within a growing body of research showing that the Eastern Desert had localised pottery production. For example, archaeologists at Wadi Khashab in the Eastern Desert discovered a C-Group style pot made from wadi clay (Osypiński *et al.* 2021, 23, fig. 16). While petrographic analysis of the clay will help identify the geological origin of the clay, from studying the pottery with a x10 hand lens it is clear that the Site 21 Middle Nubian fabrics are markedly different from standard C-Group pottery.

There are three Nubian pottery fabrics from Site 21 (Figure 15).

Fabric 1 has a gritty clay matrix and could be a desert clay. This fabric fires to light brown, orange brown, or light red brown. It has medium (0.2-0.5mm) and coarse (>0.5mm) angular fragments of white, pinkish, and grey rocks, as well as sand-size rounded rock grains, and occasional organic inclusions. This fabric is similar to those used to make the non-typical C-Group style of pottery found at small mines elsewhere in Wadi el-Hudi.

Fabric 2 is a fine grain clay with common fine (<0.2mm) dung inclusions and infrequent to common, fine to medium white rock and other mineral inclusions. It fires to red, brown orange with a light beige/grey core, and the carbon in the organic material in the clay creates black splotches against the light grey clay matrix. The majority of Nubian pots at Site 21 are made from Fabric 2 (Figure 13). This clay is probably a mixture of Nile silt and calcareous material, which give the clay a lighter colour.

Fabric 3 is a moderately gritty clay with common fine to coarse white and grey rock inclusions, and infrequent dung and chaff inclusions. It fires to a uniformly brown colour. This is potentially a Nile silt and desert clay mix.

The decoration of Site 21's Nubian pots shows affinities with the C-Group, but it also has distinctive differences from the Nile Valley corpus. Some pots have shapes and decorative motifs similar to those on C-Group pottery, but at Site 21, the decorative motifs are combined in new ways without parallels elsewhere. Other pots like Pots 2 and 8, however, do not have clear parallels among the C-Group or Pan-Grave corpora. This brief discussion of Site 21 Nubian pottery will be expanded on in a later publication after petrographic analysis is complete.

Five of the pots from Feature 11 and near the mine (Pots 1, 4, 5, 6, and 7; Figure 16) have shapes and decorations similar to those in C-Group pottery. Yet their fabrics and oxidised firing techniques differ from typical C-Group assemblages. Pot 1's alternating bands of hatching are common among C-Group, Middle Kerma, and Pan-Grave pottery, with the closest parallels being from the C-Group, particularly from Elephantine (Schröder 2021, 76-77, Tafel 4, 44501Q1/n-1-3/Z5109). Pots 4 and 6 are coarse-ware with lightly incised decorations in simple patterns that have parallels among C-Group cooking pots (Schröder 2021, Tafeln 10-13). Pot 5 is known only from the base of a bowl, which has an elaborate incised crosshatched pattern on the bottom and a body with deep incised horizontal hatching, common in C-Group pottery (below, similar horizontal patterns appear on Pot 3). Pot 7 is a thin-walled bowl with oblong impressed rim band decoration, closely incised horizontal hatching, and contrasting hatching on its lower part. These are all features common in C-Group pottery (at Elephantine, for example Schröder 2021, Tafeln 26-27; Raue 2018, Abb. 75, 87, 88).

Pot 3 (Figure 18) is similar to C-Group cooking pottery in form and decoration. It is a deep bowl with

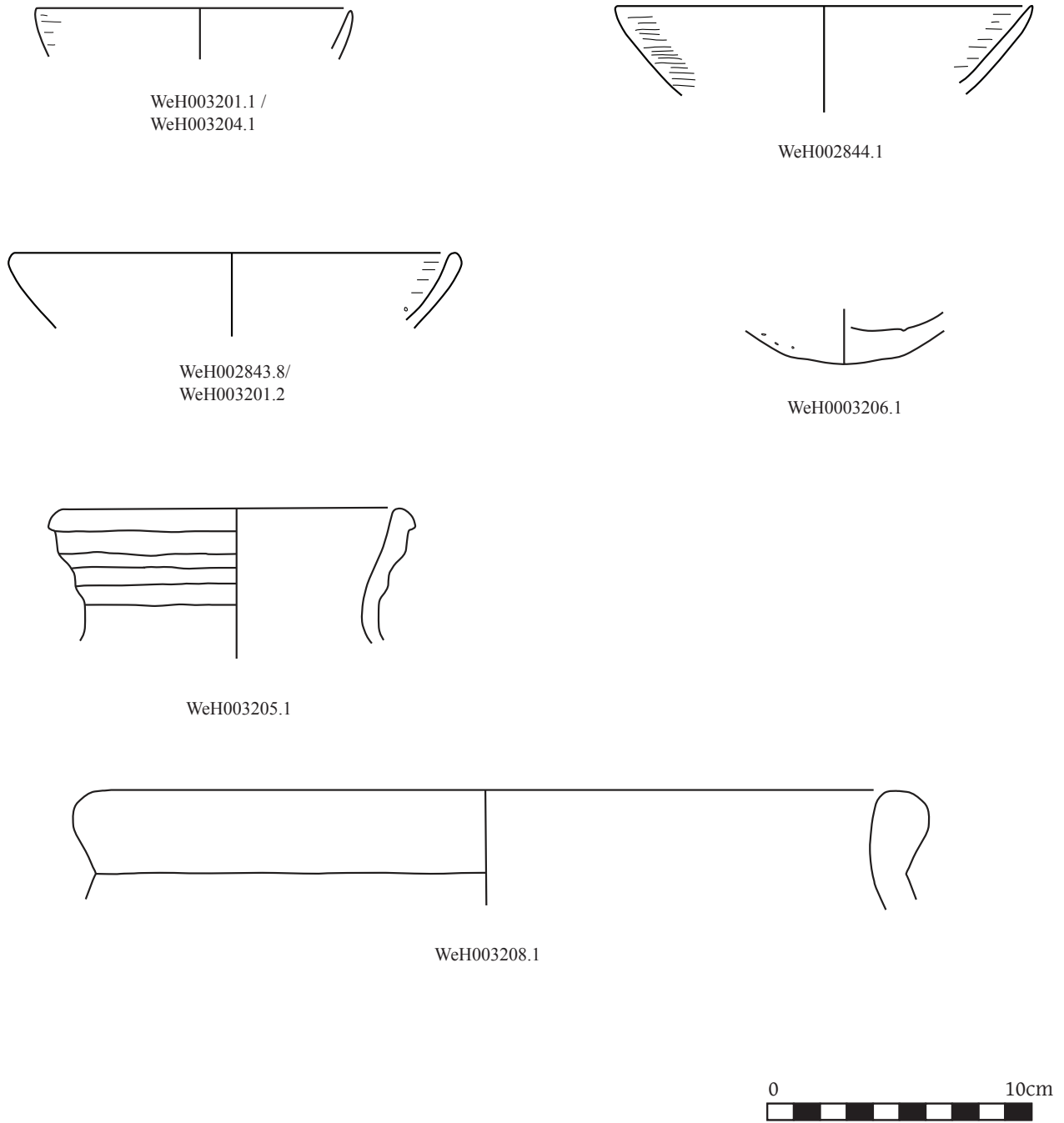


Figure 14. Middle Kingdom Egyptian pottery.

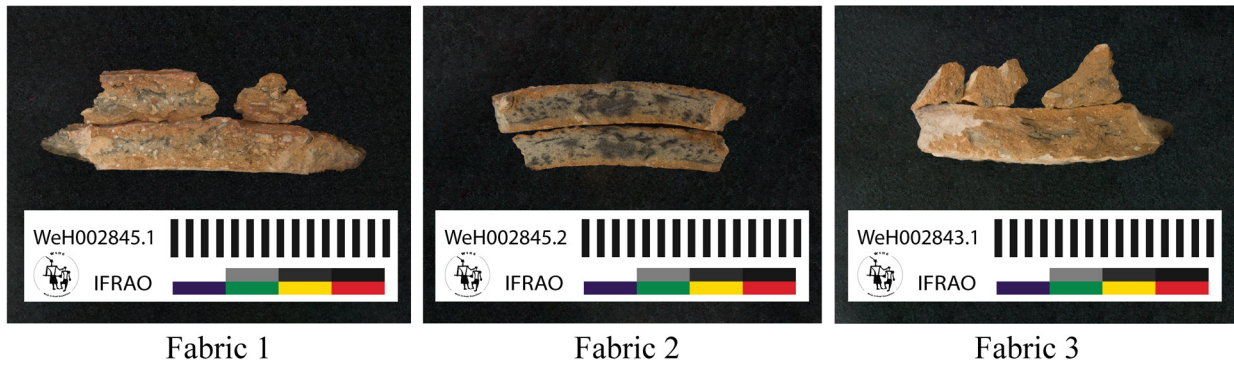


Figure 15. Middle Nubian pottery fabrics.

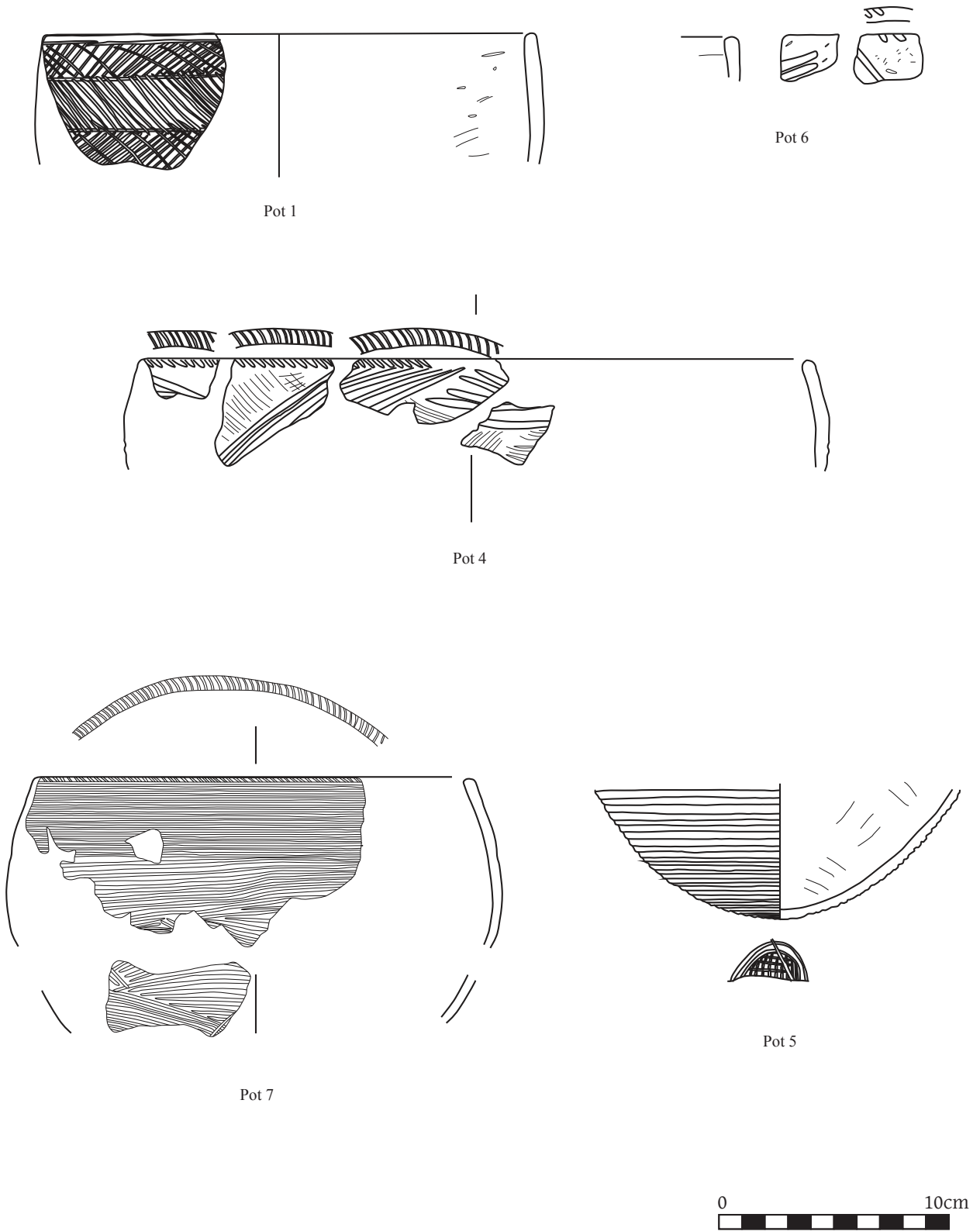


Figure 16. Middle Nubian Pottery.

straight walls and an inwardly curved rim that constricts the mouth, which is a common shape among C-Group pottery. The rim band decoration is also typical of C-Group, having a band of triangles on the rim and fine incised lines filling the triangles (Gratien 2000, 16). Horizontal hatching also frequently decorates C-Group pottery (Gratien 2000) and is found on cooking pottery at Wadi es-Sebua (Gratien 1985, fig. 12, no. 177) and Elephantine (Schröder 2021, Tafel 36). The wadi clay pot from Wadi Khashab also has horizontal incised lines (Osypiński *et al.* 2021, 23, Fig. 16). Nevertheless, the combination of triangle rim decoration with incised horizontal lines on the body of the bowl is an unusual design for Middle Nubian pottery (Schröder, pers. comm.).

Pots 2 and 8 (Figures 17 and 19) do not fully align with C-Group or Pan-Grave decoration styles. The sherds from Pots 2 and 8 were originally found on the surface of the site around Feature 4/5, and additional sherds belonging to Pot 8 were found about 150m west of Feature 4/5, on the other side of the mine. The former area probably dates to the later use of the site (above). Yet these pots were not found underground in the excavation of Feature 4/5, so the relationship between them and the activities at Feature 4/5 remains tentative. Pot 2 has a mixture of Pan-Grave and C-Group decorative features. Its impressed rim decoration is closer to C-Group styles, but the oblique hatching under the rim is similar to Pan-Grave motifs. The contrasting hatched panels are similar to Pan-Grave and to a lesser extent C-Group pottery (de Souza 2019, 45-46, 49). Its decoration seems to be neither entirely Pan-Grave nor C-Group. Pot 8's wide spaced horizontal hatching and impressed hatched rim decoration is common among C-Group pottery (above), but unusually, it includes a wavy band of hatching on the body. Overall, Pots 2 and 8 do not seem to have close parallels with C-Group, Pan-Grave, Kerma, or pottery from the Atbai (Gatto, Schröder, de Souza, and Manzo, pers. comm.).

As can be seen, the decoration of Nubian pottery at Site 21 does not fall neatly into any standard group of Middle Nubian pottery. The overall impression from the pots around Feature 11 is that the potters followed the C-Group stylistic tradition, yet with a different clay recipe and different combinations of decorative motifs, creating something new. The Middle Nubian pottery from the southern and later section of Site 21 is connected to Middle Nubian pottery, but the influences are not clear. This material demonstrates the complexity and problems in the cultural-history sequences that are being reevaluated (de Souza 2021).

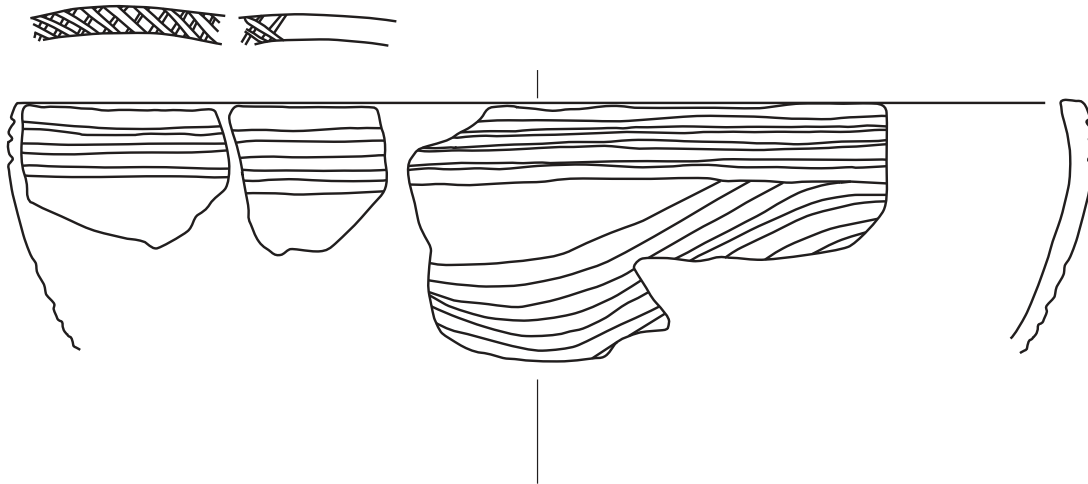
Use and distribution of pottery

The Egyptian and Nubian pottery at Site 21 yield interesting clues to the behaviour and identity of the workers. Feature 11 has more Nubian pottery than Egyptian pottery (above). Here people ate and drank from both Egyptian (three Nile B1 bowls, Figure 12) and Nubian small bowls (Pots 1 and 7, Figure 13). Cooking, however, was done in Nubian cooking pots. Pot 3 is a large cooking pot. It has decorative motifs similar to C-Group cooking pottery; it was made from a fabric with coarse mineral inclusions, making it ideal for resisting heat while cooking; and it has fire-clouding or residual staining on the exterior bottom of the pot from use in fire. Pots 4 and 6 could also be used for cooking, as they are large coarse-ware bowls, with lightly incised designs that are fairly similar to C-Group cooking pots from Elephantine. Unfortunately, the bottoms of these pots have not been found so we cannot comment on sooting or fire-clouding.

Feature 4/5 has a different pottery assemblage that consists mostly of Egyptian pottery, with limited amounts of Nubian sherds on the surface. The surface Nubian pottery (Pots 2 and 8, Figure 13) was probably used for food consumption. The Egyptian pottery was mostly used for liquid and dry storage. There were substantial amounts of Nile C body sherds on the surface, and the excavation of Feature 4/5 found Nile C water jar rim sherds, as well as the bottom half of a Nile C water jar (Figure 6). Large



Pot 2



Pot 8



Figure 17. Middle Nubian Pottery.

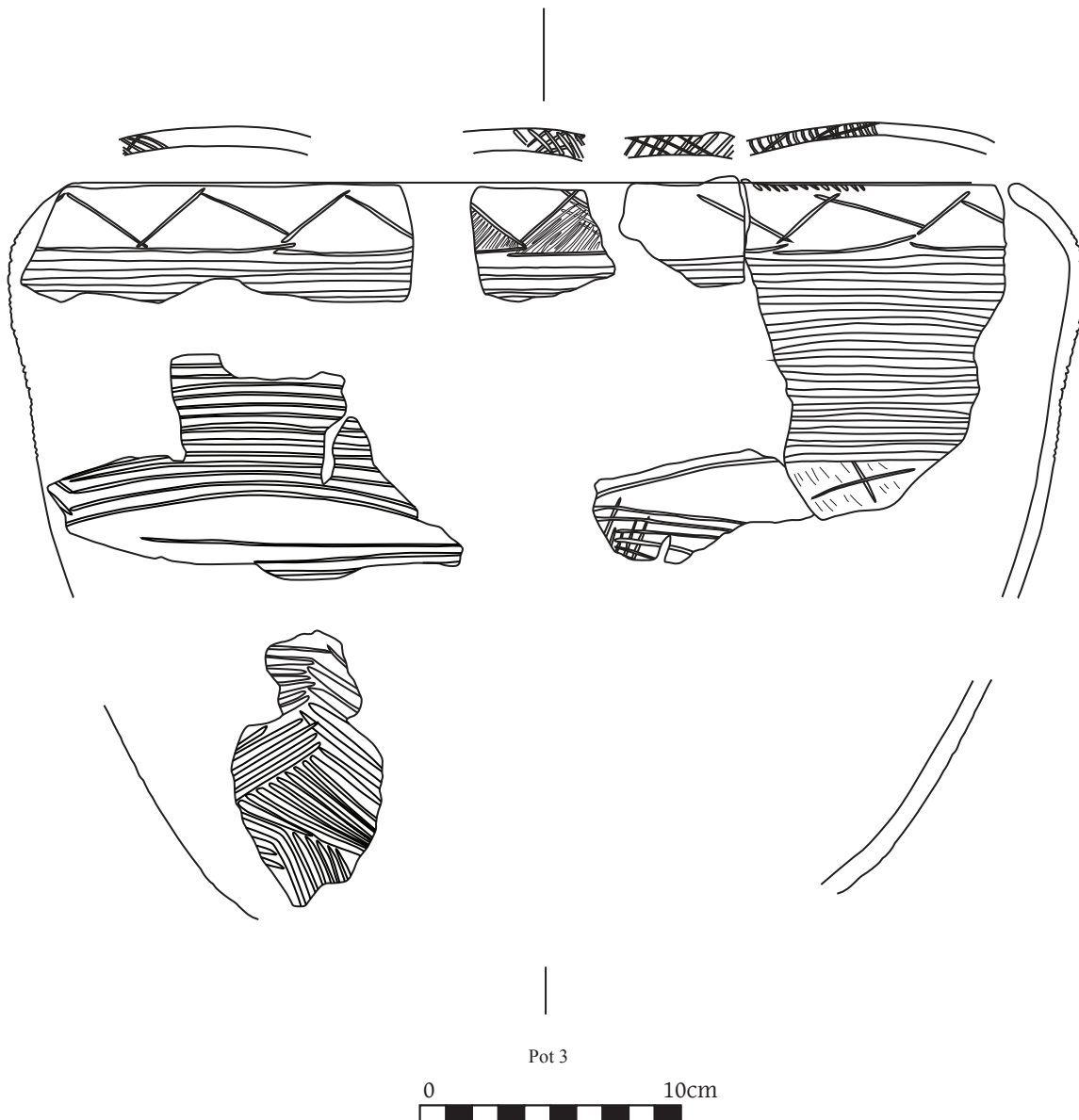


Figure 18. Middle Nubian Pottery.

Marl C bag-shaped jar sherds (Figure 12) were also used for storage at Feature 4/5 and were found both on the surface and during excavation.

In brief, the Site 21 occupants around Feature 11 prepared food in Nubian pottery, and ate food in Nubian and Egyptian pottery. Interestingly, there is little evidence for Nubian storage pottery at Feature 11. In general, storage jars are rare in Middle Nubian pottery, and it seems that people mostly relied on animal skins or large Egyptian vessels for storage. Marl C *zir* sherds were found near the mine and Nile C water jar body sherds were found all over the site, indicating that water and similar supplies were stored in Egyptian pottery. Feature 4/5 occupants seemed to mostly leave behind Egyptian storage jars with a few Nubian bowls for food and liquid consumption.

The types of pottery at Feature 11 and Feature 4/5 show a distinction between these two areas. Given the largely Nubian pottery corpus at Feature 11, the Egyptian pottery seems to supplement the Nubian pottery. Feature 4/5, however, seems to be different. The greater Egyptian pottery assemblage could reflect a later stage of habitation with a population different from those at Feature 11. Further analysis of the pottery from excavations will hopefully clarify this.

It is challenging to interpret the presence of a non-standard style of Nubian pottery mixed with



Figure 19. Pot 2.

non-standard Nubian and Egyptian pottery are different from Nile Valley settlements. In this rare case, these differences in pottery may suggest that the peoples mining at Site 21 differ from standard urban Nile Valley populations.

Conclusion

Site 21's archaeological remains and artefacts demonstrate complex cultural and economic behaviours and should help scholars in their continuing efforts to reinterpret reified Nubian cultural categories with better analysed material evidence.

A preliminary study of Site 21 leads to several key observations. First, the individuals at Feature 11 and Feature 4/5 were there to mine amethyst; these features were temporary structures built to support the miners. Both groups probably lived an austere lifestyle while at Site 21. The people at Feature 11 mined on a much larger scale than those at Feature 4/5. Both of these operations seem to have been physically and organisationally separated from those of the Egyptian state, perhaps even actively avoiding contemporary Egyptian state-run operations in the large sites at Wadi el-Hudi. Their mining resulted in



Figure 20. A selection of unreconstructed sherds from Pot 1.

Egyptian pottery. In Egyptian Nile Valley sites, small quantities (i.e., less than 5%) of standard Nubian pottery are often present (e.g., Forster-Müller and Rose 2013). Likewise, at Egyptian colonial sites in Nubia, varying quantities of Nubian pottery exist at Middle Kingdom sites (e.g., Smith 2003) and New Kingdom sites (e.g., Budka 2017). In Middle Nubian C-Group settlements, Egyptian pottery exists in small quantities. For example, at Wadi es-Sebua, 7% of the assemblage was Egyptian pottery imported from Egypt (Gratien 1985, 42). However, the pottery of Site 21 does not fit any of these patterns found in the Nile Valley. Why is it different? First, the pottery is non-standard in terms of decoration and fabric. Second, the relative proportion of

independent economic activities to acquire their own luxury gems. The size of Site 21's mine suggests that it yielded a significant amount of raw amethyst for the miners to bring home, to use personally, or exchange.

Within Site 21, varied archaeological evidence between Feature 11 and Feature 4/5 reflect both chronological and cultural differences. Chronologically, Feature 11 dates to the early Middle Kingdom, while Feature 4/5 dates to later in the Middle Kingdom (mid-12th dynasty and later). These dates are important because Feature 11 aligns chronologically with the contemporary C-Group in Lower

Nubia and Upper Egypt and Feature 4/5 dates to a time when the C-Group starts to disappear and the Pan-Grave slowly appears.

Culturally, the small group of people mining amethyst at Feature 11 used Nubian style pots for cooking and eating, as well as Egyptian pots for eating and potentially for storage. Ostrich eggshells and the stone tools used may affiliate them with other Nubian cultures. Pottery at Feature 11 tangentially relates these people with the C-Group. However, the unusual decoration and - more importantly - the possible use of desert clays suggests that the pottery is atypical for the C-Group as it is currently defined. This localisation is odd because of the noted homogeneity of the standard, Nile silt C-Group corpus at excavated settlement sites in the Nile Valley including both Wadi es-Sebua and Elephantine (Schröder 2021, 323-325; Gratien 1985).

Where did the people living and working at Feature 11 come from? Answers must await further studies of C-Group fabric and manufacture, as well as studies of other Middle Nubian pottery found in the Eastern Desert. But for now, we know that they lived and worked in small stone huts, with a fairly substantial pottery assemblage, apparently in a semi-sedentary lifestyle. However, some of their pottery is made from desert clays, which connects potters and their economic activities with the desert, while other pottery is made from Nile silt, which hints at a more nomadic or pastoral nomadic lifestyle between the desert and the valley. Our working hypothesis is that these people belonged to the larger C-Group cultural sphere in terms of material culture, but their economy and at least part time habitation was linked to the desert. Tentatively, these people could have been a desert C-Group who lived semi-nomadically, but interacted with those in the Nile Valley. As stated above, many textual references in contemporary Egyptian sources identify peoples in the Eastern Desert. Yet it would be risky to align the archaeology at Site 21 with any of these textual references, given the small quantity of evidence and its preliminary analysis.

The identity of the people at Feature 4/5 is not clear, but they are probably not related to the people at Feature 11, and came later. The majority of the pottery on the surface and below ground at Feature 4/5 is Egyptian. Only two Nubian pots were found on the surface of Feature 4/5 (Pots 2 and 8), but because adjoining sherds were not found below ground, it is unclear if they were used by the same people who lived at Feature 4/5 or if they were dropped there at another time. Culturally, these pots are atypical in that their designs do not align with any other known Middle Nubian decoration.

While there are many unresolved questions regarding Site 21, the site demonstrates that a community following Nubian cultural traditions mined parts of the Eastern Desert at the same time as the large Egyptian expeditions dominating the region. However, their raw amethyst extraction became part of an informal economy of luxury products. The desert was a multicultural border zone that the Egyptian state tried to control, but from which it could not effectively exclude other people. Moreover, at this juncture, evidence of these people only appears through eight pots, two excavated huts, and a mine; more work needs to be done to link them to larger traditions. For now, they must simply remain Middle Nubians of the Desert.

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