

The second season of new, ongoing excavations at Jebel Moya (south-central Sudan)

AUTHORS

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Introduction

Jebel Moya is the largest habitation and mortuary site in Sub-Saharan Africa and is located ca. 250 km south-south-east of Khartoum in south-central Sudan (Figure 1). The site is 10.4 hectares. Around a fifth was excavated by the Henry Wellcome expedition in the early twentieth century (see Vella Gregory, this volume), but over half this area contains substantial unexcavated and viable archaeological deposits. The ongoing Jebel Moya project aims to investigate the area using targeted sampling, thorough excavations and recording. A second equally important aim is to undertake community engagement archaeology. Third, the project is in collaboration with the University of Khartoum, providing fieldwork opportunities for archaeologists and intensive training for students. Overall, the project is focused on understanding the rhythms of life on the Gezira plain, an archaeologically neglected area that has undergone various environmental changes. A focus on archaeobotany, modern zooarchaeology and osteoarchaeology, including the continued potential for ancient DNA, isotopes and AMS radiocarbon dating, alongside artefactual analysis, will enable an investigation into population health and movement and resilience in an environment previously considered marginal.

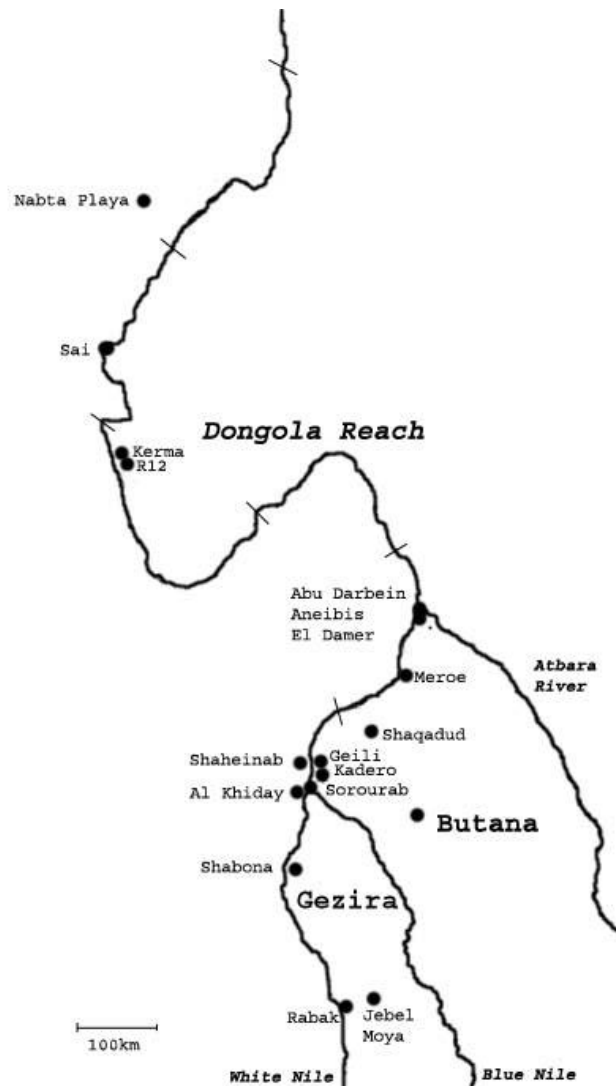


Figure 1. Jebel Moya (Gezira Plain, south-central Sudan) in relation to other major sites of the Sudan.

Background

The Jebel Moya project is directed by Michael Brass (University College London, UCL) and Ahmed Adam (University of Khartoum, UoK). The 2019 field team was comprised of the authors, many of whom formed the core of the first season of excavations in 2017. Kevin MacDonald is the faunal specialist and Dorian Fuller is conducting the archaeobotanical analysis.

The results to date from the 2017 season have substantially changed what is known about Jebel Moya and, in particular, has impacted upon the debate on the domestication of sorghum by the identification of the currently the second oldest known domesticated sorghum in the world dating to the mid-second millennium BC (Brass et al., 2018a, 2018b, 2018c, 2019). Apart from its impact on the picture for the spread of early African agricultural domesticates, the site more broadly serves as a unique reference point for all future work in the central and southern Gezira. A new dating framework has also been established (see Methodology and geology). Excavations continued in 2019, including a new walking survey of the valley. This enabled us to assess the conditions of preservation of previous trenches, identify areas at risk of erosion and clarify the overall picture of the site.

Methodology and geology

At first glance, the jebel gives the impression of a basalt dominance. Addison's (1949) report described the visible lack of micro-stratigraphy and instead focused on the four broad geologically-discernible strata, as determined by two of Wellcome's excavators Dixon and Wainwright (Addison 1949: 15). Their terminology of Stratum A-D has been retained for the sake of continuity and is described as follows:

- (A) Top soil: Dark Brown
- (B) Upper Layer: Grey
- (C) Black gravel: Black
- (D) Black gebel: Black

The 2017 season confirmed the description of strata A and B. The start of Stratum C is light brown when first exposed, quickly becoming brown-grey. Stratum D is a mid-dark brown-grey, becoming more grey. The survey reconfirmed the outcome of the first season's survey (Brass et al., 2018a): Stratum A survives only in the west and parts of the north-west sectors of the valley. Wellcome's camp extended over the north-west sector, meaning that the now thin Stratum A is potentially contaminated. The south, east and parts of the north-east sectors were excavated by Wellcome down to bedrock. The central sector was mostly unexcavated and a substantial portion of the north-east sector was also unexcavated due to it being used for his camp. The former has some Stratum B in places but it predominantly Stratum C overlying D. The latter begins at Stratum B.

Further confirmed at the start of the 2017 season was the lack of visible micro-stratigraphy. It necessitated the decision to excavate in spits. To minimise the possibility of conflating remains of occupational activities, a depth per spit of 10 cm was chosen. In 2017, five trenches were excavated (Brass et al., 2018b). Trenches 1 and 2 were placed in the west sector of the valley, which had not been excavated by Wellcome. Trench 2 was situated a few metres away from a gully, which has all the above geological strata (from the latest occupational phase down into the Late Mesolithic, late 6th millennium BC); the gully displayed a similar sequence of pottery sherds protruding from the gully wall to that reconstructed by Brass (Brass, 2016) during his Ph.D. Trench 3 was a retrieval excavation of a human skeleton in the centre of the valley. To gain a better understanding of the geological strata and occupational activities, Trench 4 was placed on the opposite side of the valley, just beyond the visible ending of Wellcome's excavations at the start of the hill slope on the north-east-east side, where there had been a great density of human burials. No burials were found in Trench 4 but a large quern and domesticated *Sorghum bicolor* husks dating to 2465 – 2211 BC (3870 ± 30 bp, Beta-501554) attested to habitation activities in this part of the valley contemporary with the burial in Trench 3 and dated botanical remains from Trench 2 (Brass et al., 2019: Table 4). Trench 5 was a stone circle immediately to the east of the Trench 1; it was partially excavated to determine if there were any materials which could indicate its age but it was archaeologically sterile.

To date, Stratum B is AMS and OSL-bracketed to between the mid-second and the end of the first millennium BC, and early-middle Stratum C currently to the early to late third millennium BC (Brass et al., 2019: Table 3). We expect the latter's date to be revised with new dates from the 2019 season. Stratum D was reached in the 2019 season and while comprehensive analysis of the pottery is underway, its sherds are currently assigned to the Late Mesolithic. The latter broadens the repertoire of the Late Mesolithic sherds excavated by Wellcome and curated in the National Museum in Khartoum (Brass et al., 2018c) and in the British Museum (Brass, 2016; Caneva, 1991). In the chronology of Central Sudan, this places Jebel Moya within the late Mesolithic, Neolithic, Napatan and Meroitic periods. However, the terms Neolithic and Mesolithic are used here for

expediency with misgivings towards the applicability of European and Near Eastern terminology to African contexts (cf. Linseele (2010) and Sadig (2013) for contrasting views). Finally, the cultural chronology of the central and southern Gezira has yet to be adequately deciphered and to uncritically overlay the chronology of sites 250 km and beyond to the north over it would be doing the archaeology of this area of the eastern Sahel a disservice.

The 2019 fieldwork

In the 2019 season, five new trenches were excavated (trenches 6 – 10) and one continued from 2017 (Trench 2) (Figure 2). The aims were to continue carrying out systematic sampling where substantial archaeological deposits remain, build upon last season's work and to investigate more human inhumations. Trench 2 was the richest area from the previous field season, penetrating down into viable, stratigraphically coherent Neolithic layers. These yielded abundant pottery stretching from 2000 years ago (contemporary with the northerly Meroitic state) down to the mid-third millennium BC, animal remains which offer valuable environmental data, and the second oldest domesticated sorghum yet found in the world (2575–2350 BC) (Brass et al., 2019). As the neighbouring gully shows a sequence down to and including Late Mesolithic pottery sherds at the base of the gully floor, the decision was made to resume excavating Trench 2 in an effort to reach bedrock and thereby have the first complete occupational sequence in the central and southern Gezira Plain.



Figure 2. The Jebel Moya valley, facing south from the House of Boulders, showing the location of the 2019 trenches. (Photograph: MB)

Trench 6 was opened to explore the stratigraphic integrity of the deposits north of where Wellcome stopped his excavations. The North-East sector of Wellcome's expedition is where the highest concentration of and the richest human burials were located. The boundary line where Wellcome stopped his excavations is marked by a low-slung rock wall, and the ground between it and the House of Boulders to the north was occupied by his expedition's camp. This trench is located about 30 m north of the boundary line.

Trench 7 was located north-west of Trench 2; here, numerous faunal remains were found exposed on the modern ground surface after the summer rains had stripped off the protective top soil. After the rescue excavation aimed at collecting the exposed remains, no further work was conducted in Trench 7.

Trench 8 was situated 10 m to the north of last season's Trench 3, the rescue excavation of an eroding human skeleton which has since yielded valuable information on age, diet and health (Brass et al., 2019). A pair of tibiae were seen eroding out of the base of the gully bank, but with the deposit immediately to the west not showing signs of an active slope towards the gully. During the course of the trench's excavation, the remains of three individuals were uncovered. The cranium of a sub-adult was in the north wall and therefore Trench 10 was opened immediately adjacent to the north. Shortly after Trench 8 had been opened, a cranium with mandible and maxilla was observed during a concentrated field survey immediately to the south-west of Trench 2. Trench 8 was temporarily closed and Trench 9 opened as a rescue excavation in case forecasted rains returned. For Trench 9, excavation did not continue subsequent to the extraction of the cranial and post-cranial remains, although the immediate vicinity shows enormous promise for both the retrieval of additional human skeletal remains and for a deep stratigraphic sequence similar to that of Trench 2.

Trenches 2 and 6 were standard units excavated in 10 cm spits and each was sampled for flotation for archaeobotanical remains. In Trench 8, four standard 10 cm spits were excavated until the first human skeleton was reached. Neither Trench 2 nor 6 reached natural bedrock or archaeologically sterile horizons, so stratigraphy was drawn. In Trench 2, plastic woven sacks were laid on the lowest level reached and the trench was backfilled, to help protect unexcavated deposits and to facilitate further investigation in future. Excavation of the lowest levels of Trench 2 will resume in Season 3.

Trench 2 (Supervisor JW)

Trench 2 is 2 x 2.5 m. It is situated on a highpoint in the preserved site sediment near an eroded gully section that indicated a considerable depth of stratigraphy, including Mesolithic material at the base of the gully exposure. In 2017, it was excavated to a depth of 1.5 m. In 2019, it was further excavated to a depth of 2.4 m (Figure 3).

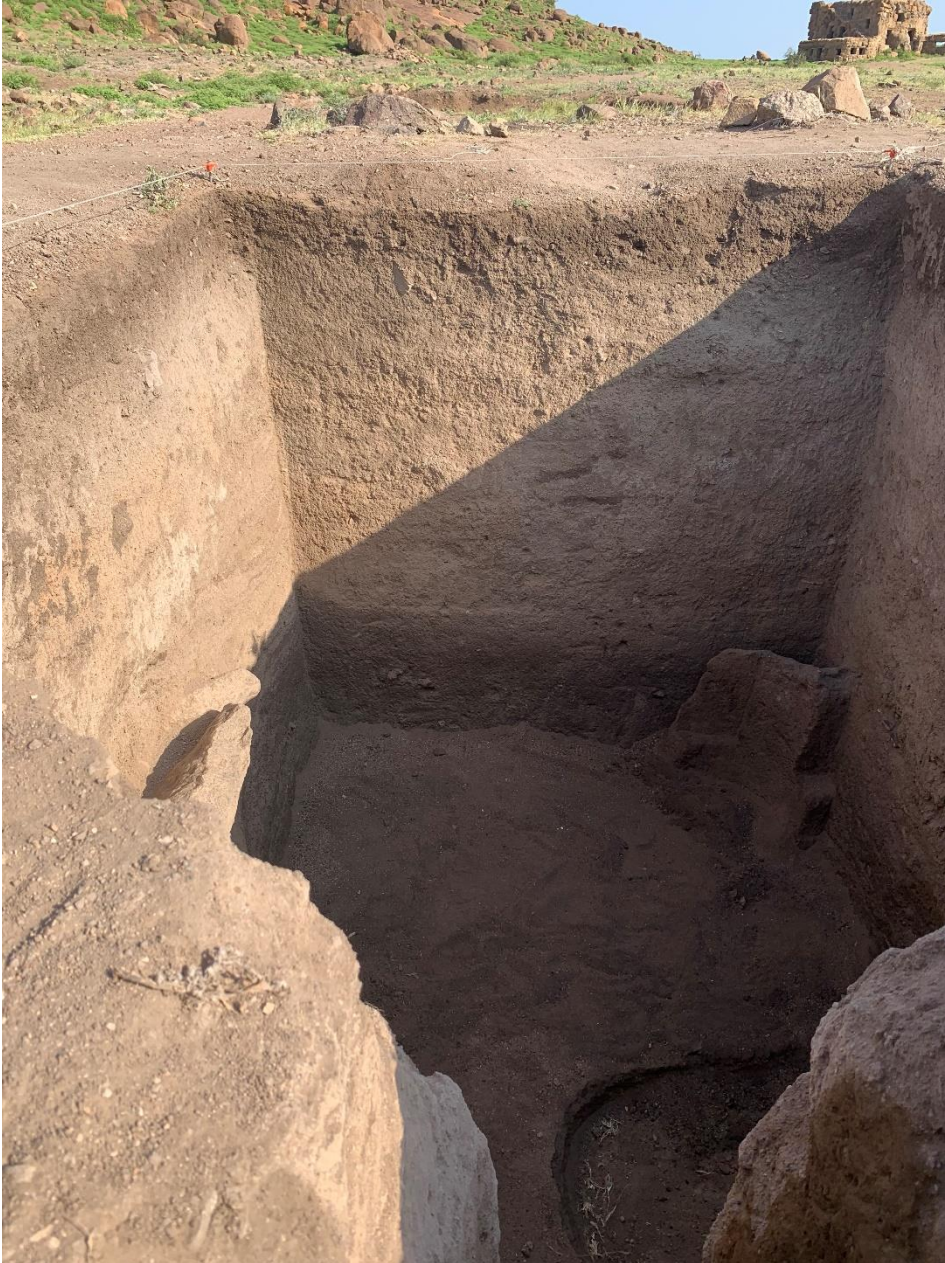


Figure 3. Trench 2 excavated to a depth of 2.4 m. The House of Boulders at the north of the valley is in the top foreground. There are two former ground surface stones on the left and a hardened mud feature on the right. (Photograph: MB)

Spit 16 was a 2 cm spit excavated once the trench backfill was removed. It was considered contaminated to avoid the risk of any inadvertent intermixing having occurred with the backfill. It overlay Spit 17 and is attributed to Stratum C. In the north-east corner of the latter spit, the top of a feature was found. The feature, whose base is in Spit 19, is the remains of a low-laying mud wall with small stone inclusions (Figure 4); similar features were seen on the outskirts of the modern village at the base of the jebel for demarcating an area outside of the mudbrick home. Also found in the spit were three natrolite beads, pottery sherds, assorted land snail shells, lithics, a grindstone and animal bone. The soil composition was a sandy brown-grey which quickly dried to grey.



Figure 4. The dried mud wall feature. (1) 170 cm, (2) 170 cm, (3) 155 cm, (4) 172 cm, (5) 153 cm, (6) 149 cm, (7) 151 cm, (8) 147 cm, (9) 152 cm, (10) 170 cm are the depth from the feature to the trench level at those points. The arrow points to cardinal north. (Photograph: MB)

Spit 18 overlaid Spit 17. The soil composition was similar although it was more sandy near the feature. Flecks of charcoal were found near the feature but no charcoal was present in or on it. Also excavated were animal teeth, animal bone, lithics and pottery sherds which varied in thickness.

Spit 19, whose soil was grey-brown in colour with charcoal inclusions in the north-west, was overlaid by Spit 18 and overlies spit 20. It is a fill layer around the feature whose base is at the bottom of the spit. The bottom of the spit around the feature appears to be an ancient living floor. The soil composition was similar to the previous spit; however, chalky white inclusions were found in the middle of the uppermost half of the trench in close proximity to the feature. The spit's finds include lithics, charcoal, animal bone and pottery sherds.

Spit 20 was a fill feature. It overlays Spit 22 and underlies spits 19 and 21. This is a new stratum, Stratum D, with the soil more compact, darker brown-grey and with more charcoal and chalky inclusions. The soil is more compact towards the north, where the charcoal inclusions predominate compared to elsewhere. The associated pottery sherds are Mesolithic. Other finds include lithics and animal dung, the latter in the north-west corner.

Spit 21's base is on the same level as the base of spit 19 and overlies Spit 20. This spit is a feature: the above-mentioned mud wall. It is in the north-east corner and protrudes south-westwards from the east section. Part of the top of the right of the small semi-circular wall is a small round depression (6 x 8 cm) in which a rib bone was found. An "arm" extends in a curvature for approximately 50 cm (measured straight).

Spit 22 underlies Spit 20. The soil composition is similar to Spit 20, with gravel inclusions. Finds include animal dung, a lip plug in the southern quarter, Mesolithic pottery sherds and lithics.

Spit 23 is unchanged in texture and composition. Finds were sparse in the southern one-eighth of the trench. The soil colour is mid-dark brown grey, as per spits 22 and 20. Finds include Mesolithic pottery sherds, a mud ball, animal bone, an unknown white substance which will be examined for plant remains and shell.

Spit 24. It is a light brown sandy fill which extends from lower Spit 20 in the south-east corner and contains pottery sherds. There is a cut into it which was recorded as Spit 25, which is black in colour. Both are provisionally interpreted as being the result of modern seepage where and how water is reacting to the carbonates present in the soil.

It is Spit 26 which is the spit directly beneath Spit 23. Spit 24 goes down in an arc into Spit 26. The soil composition is sandy and is dark grey in colour. Artefacts and other finds are sparse in the southern half of the trench in this spit.

Trench 6 (Supervisors IVG, RA)

The 2 x 2m trench was oriented directly cardinal north (Figures 5-7). Its co-ordinates are 13° 29' 8" N, 33° 19' 13" E at an elevation of 480 m absl. After stripping away the ground surface soil, it became apparent that there was no remaining Stratum A in this part of the valley. The colour of the Stratum B soil was a rich dark brown (similar to spits 6 and 7 from Season 1's Trench 1, where it was indicative of organic matter) grading to brown-grey (Stratum C) at a depth of 7 cm into Spit 1. There are no lithics. Fragments of pottery start from a depth of 9 cm, while there are small fragments of bone in Stratum C which may or may not be modern. Spit 2 was barren apart from 1 small lithic, one little animal bone and a few pottery fragments. It is highly likely that spits 1 and 2 were mixed, particularly considering that there was a small modern iron tent peg fragment embedded at 9 cm, a piece of modern glass at 17cm and an Assemblage 2 thick everted red rim with white inclusions.



Figure 5. Trench 6. Spits 1-8. Photo taken facing eastwards. The large stones visible are part of an ancient ground surface also seen in the north-west and south-west corners. (Photograph: MB)



Figure 6. Trench 6. Looking north to the House of Boulders. (Photograph: MB)



Figure 6. Trench 6. Looking south. Beyond the spoil heap from Trench 6 is the low-laying rock wall which formed the boundary between the northern-most extent of Wellcome's North-East sector excavations and his camp between the wall (blue line) and the House of Boulders. (Photograph: MB)

There were just three lithics in Spit 3, no shell but many animal bones with a concentration in the south-west corner. There was also a lip plug at a depth of 21 cm in the north-west corner and a quern partially embedded in the western section wall (62 cm south of the northern section) whose top was at a depth of 21 cm and bottom on the ground surface at 30 cm.

Spit 4 saw some animal bones and teeth, shell, as well as an increase in the number of pottery sherds. The pottery is what would be classified Neolithic to the north in Central Sudan; its diversity is beyond the variability displayed in the British Museum and Petrie Museum's collections, and what is currently recognised from the previous season's excavations. There was what looked like an avian bone concentration in the south-west. Half a large stone bead and a large lip plug were found to the north at a depth of 35 cm, associated with microliths in the same area. Finally, there was a large hammerstone (8 x 7 x 4.5 cm) located in the south-west. The bottom of the spit was an ancient ground surface, with numerous rocks and hardened soil. The soil was a dark rich brown, differing from the dark brown-grey of Stratum C, and the question was raised if we were seeing the remnants of a geological stratum in the north-east of the valley. However, it is more likely that it was due to organic matter as the subsequent Spit 4's soil composition returned to dark-brown-grey.

Spit 5 had the look and feel of being a former occupational layer: its grey-coloured soil composition was mixed with stone fragments across the square. There were numerous pottery sherds, small beads, two lip plugs and a Nilotic shell (northern area), in addition to animal bones. There was a grouping of animal bones and teeth in the south-east. There was also a fragment of an upper grinding stone and part of a ring stone. This spit also had the look and feel of being a former settlement layer.

Spit 6 has the same soil composition. The pottery remains Neolithic. Shell is found throughout the spit, with many concentrated in the south-east area. Other remains included a small bead, some animal bones and the end of a polished stone axe at a depth of 57 cm. There is also the first modern excavated example of a complete mace-head at Jebel Moya. Mace-heads are common at other Neolithic occupations in the Sudan, for example four and three mace-heads were deposited in the graves of males and children respectively, but not in habitation contexts, at R12 (Salvatori, 2008) and within and outside of graves at Kadero (Chlodnicki et al., 2011). Mace-heads have traditionally been assumed to be symbols of some level of authority, whether transient or permanent. From Wellcome's excavations, burial 1155 (Adult Male, Stratum C) was recorded with a pear-shaped, white granitic mace-head behind the left thigh. In total, 59 mace-heads were recognised from his excavations from both strata B and C, of which the remaining 58 were made from sandstone (available from the plain and not in the granitic valley) (Addison, 1949: 169).

The soil colour changed for Spit 7 to a light red-brown. Its composition was sandy and loose. It appears to have once been an exposed ground surface due to the mix of variable sizes of stone. There is a decrease in the number of pottery sherds (Neolithic) and faunal remains. However, shell remains dispersed throughout. Spit 8 was similar to 7 in composition.

Trench 7 (Supervisors AA, MB)

The trench was laid out facing cardinal north and was located in the western section of the valley. It measured 1.9 x 1.2 m around animal remains visible on the modern ground surface, either immediate or after the top soil was carefully brushed away. Included in the remains are what look to be two sets of teeth and a possible (shoulder?) joint.

Trenches 8 and 10 (Supervisors IVG, MB)

Tibiae were observed protruding 60 cm from the edge of the gully, an estimated 80 cm from the relatively flat modern ground surface. The GPS measurements were 520 m absl and co-ordinates of 13° 29' 4" N, 33° 19' 12" E. A trench measuring 1 x 1 m was laid out oriented westwards.

The ground surface layer was scrapped off to a depth of 1cm and the spit recording began immediately below. Spit 1 was immediately into Stratum B. No vestige of Stratum A remained. Stratum B consisted of fine mid-brown soil. Assemblage 3 pottery sherds were found in this stratum. Stratum C was detected from 9cm down, with soil tending from dark-brown to grey. Pottery sherds found from this depth downwards were Neolithic, with one thick seemingly "transitional" sherd found at 9 cm. Also found in this spit were microliths and ostrich eggshell pieces.

Spit 2 had micro-charcoal in the north-west corner from what looked like a small burnt plant. The lithics consist of, amongst others, scrapers, borers and burins. There is snail shell, ostrich eggshell, a few pottery sherds and small animal bones.

Spit 3 was highly interesting. There were disintegrated faunal bones at 55 cm from the north section and 35 cm from the west section, along with two pieces of non-disintegrated bone. They directly lay on top of a dark brown soil heavily impregnated with dark grey to black continuous discolouration, which was the start of Stratum C at a depth of 26 cm. There was no charcoal. However, the dark grey to black soil appears to have been plant matter and samples were taken for flotation for depths 27 – 30 cm. In the west section, at a depth of 26.5 cm and 57 cm from the north section, was a Mesolithic sherd. Other pottery sherds were found at 23 cm but were Neolithic. Also, at a depth of 25 – 27 cm, disintegrated animal bone was visible along the south section. There was also a small set of animal teeth at the bottom of the spit.

At the base of the spit, 28.5 cm from the north section and 20 cm from the west section, was a concentration of friable large pieces of human bone from the top of the cranium of the Trench 8 Skeleton 1. Ostrich eggshell fragments were found also at the base of the spit within a 30 cm radius of the top of the cranium.

In Spit 4, which had the same soil composition and colour, there was a bed of continuous rock beginning at a depth of 39cm as measured in the south-west corner; this rock stretched into the western section and continued northwards into what became an adjacent Trench 10. The aforementioned Skeleton 1 cranium and the upper part of its sternum were deliberately rested on this rock bed. There were a few lithics, faunal bones, shell and some pottery sherds.

Subsequently, we stopped excavating by spits and began slowly excavating down by tracing the human remains (Figure 7). At 78 cm from the west section along the north section, at a depth of 50 cm, was the first indication of a set of remains from a different individual. Trench 10 was opened immediately to the north of Trench 8. At the same time, excavation efforts also shifted to excavate the tibiae protruding from the gully. It was quickly found that we were dealing with a total of three individuals. The individual with the protruding tibiae was labelled Skeleton 2 and the individual whose remains stretched from Trench 10 into Trench 8 was Skeleton 3 (Figure 8).



Figure 7. Trench 8, Skeleton 1. It was laid prone with the head to the west facing south. (Photograph: IVG)



Figure 8. Trench 10, Skeleton 3. The arrow points north. (Photograph: MB)

Skeleton 1's teeth, mandible and maxillae were present, with the latter gracile. There was a stone lip plug by its forehead. The face was oriented due south and the body lay prone west to east with the cranium to the west. The post-cranial skeleton was incomplete and preserved only down to the femoral head. Other surviving elements were: both clavicles and scapulae, sternum, ribs, both humeri, vertebrae, both radii and ulnae, innominate, left half of the sacrum, patellae and some phalanges. The lower legs and feet were not present. Unfortunately, the remains were highly fragile and prone to post-excavation fragmentation.

Maxillary anterior teeth (incisors) showed wear on the lingual aspect, typically observed in dentition used as a tool. The left maxillary canine demonstrated a notch on the distal interproximal aspect, which could have been formed as a result of habitual activity. The individual showed prognathism. Dental wear observed on the occlusal surfaces of the molars was slight and suggestive of the individual's young age of approximately 25 – 35 years at the time of death.

The medial aspect of the clavicle was completely fused, which is attained by 30 years, corroborating the dental age estimation. The epiphyses of the long bones preserved were completely fused, as

expected in an individual of that age. Cranial features were inconclusive in the individual's sex estimation, which is not unusual in Sudanese skeletal remains. The supraorbital ridges and glabellar profile were smooth and not pronounced, and the vertical slope appeared vertical; the features typically associated with a female individual. However, the mandible was robust and the pubic bone showed typical masculine morphology (no subpubic concavity and ventral arch). Metric data was inconclusive in sex estimation: the femoral head diameter (R = 42.2 mm) and bicondylar width (L = 70.4 mm) would normally be indicative of a female individual; however, it is not unusual in the Sudanese populations to have slender male individuals. Overall, the individual was likely a young male: ?M –25-35 years.

There was a broken, large and worn projectile just inside the right elbow over the chest cavity. Two sherds from different pottery vessels were by the left elbow area and embedded, not displaced. As the body was excavated, other lithics, faunal remains, sherds, shell and ostrich eggshell were found. There were animal vertebrae found above and to the left of the burial.

The femurs and tibiae of Skeleton 2 were robust. They were crossed over each other at their join with the femur, angled right to left as seen when facing the trench from the gully, with these tibiae being the tibiae protruding from gully edge. The skeleton was incomplete (<10%), poorly preserved and fragmented, therefore the collection of metric data and macroscopic assessment of the remains were extremely limited. Overall, only a fragment of the occipital bone and mandible were present, and the post-cranial skeleton consisted of the fragmentarily preserved left scapula, humeral shafts, radial shaft, the left proximal femur, proximal tibiae and fragments of the fibular shafts.

Skeleton 2's femoral head diameter (L = 39.7mm) is suggestive of a female individual (<45mm = F). Its incomplete mandible showed permanent dentition. Mandibular molars showed moderate to severe occlusal wear; several teeth were lost ante-mortem, including RM2, RP1, RI2-1 and LM3. A single and extensive caries lesion was noted on the distal interproximal aspect of LM2, affecting the crown and extending below the cemento-enamel junction. No calculus deposits were noted. Dental wear observed on the occlusal surfaces of the left-side molars was advanced suggesting the individual was likely over 35 years of age at the time of death. The mandible showed features typical of a female individual, including smooth anterior aspect and obtuse mandibular angle. The individual was likely an adult female: ?F – 35+ years.

Skeleton 3 was present to the right of Skeleton 1. There were indications of post-depositional disturbance: the bones were light and some, apart from the cranium, had shifted leftwards to end up over the prone right side of Skeleton 1. The remains consist of the incomplete frontal bone, incomplete parietal bone, superior aspect of the occipital bone, medial part of the left clavicle, five rib fragments, a vertebral body, and a fragment of acetabulum, which could belong to another individual. The frontal sinuses were not formed yet, so the sub-adult was most likely around 6+ years at the time of death. Ostrich eggshell, lithics and pottery sherds were in association, and a microlithic arrowhead was nearby in direct association.

The pottery sherds found with all three individuals were the same, Neolithic, and bear similarities to the Neolithic pottery from Trench 6.

Trench 9 (Supervisor MB)

The GPS measures were 13° 29' 2" N, 33° 19' 9" E and 520 m absl. A potentially rich area of human skeletal remains was noted during a survey to the south-west of Trench 2. The summer rains had exposed part of the mandible above the ground within a slope. The square was an estimated 30 – 35 m south-west of Trench 2. The body was deposited in Stratum C.

The body was orientated north-west (334°) (Figure 9). The head was turned to the body's right, facing south-west. The teeth were in excellent condition. The cranium was present but fragmented, held together by the pressure of the surrounding and infilled soil. The mandible is robust but also fragile. The post-cranial skeleton included fragmentarily preserved right scapula and clavicle, shaft of the right humerus, fragmented cervical vertebrae and ribs, one cuneiform and proximal hand phalanx. The remainder of the vertebrae and the lower half of the body were eroded away as the slope formed and was eroded back.



Figure 9. Trench 9, Skeleton 1. Supine. Head oriented north-west. The arrow points to cardinal north. (Photograph: MB)

The individual's permanent teeth were well preserved allowing for dental age estimation to be made. Dental wear observed on the occlusal surfaces of the molars was advanced but likely a result of a habitual use of the teeth or very coarse diet consumed by the individual. The extensive enamel chipping observed on the molars would support that observation. Non-masticatory use of the teeth would advance dental wear creating a pattern observed in older individuals. The individual was likely over 30 years of age at the time of death. Cranial sutures were largely open or in very early stages of obliterations, suggesting a young-middle adult. Cranial features were robust and pronounced,

including the supraorbital and temporal ridges, pronounced glabella profile, and robust mandible with near-vertical ramus. The mastoid process was also very robust and large (L = 36mm; R = 34.2mm). Overall, the individual was a male: ?M – 30-45 years.

This individual has an interesting pathology. Two small size depressions were noted on the frontal bone and above the orbits. The depression observed on the left frontal bone could be a healed trauma from a projectile (round and well healed) (Figure 10). During excavation, a small microblade was found by the right eye socket and a second lithic on the sternum.

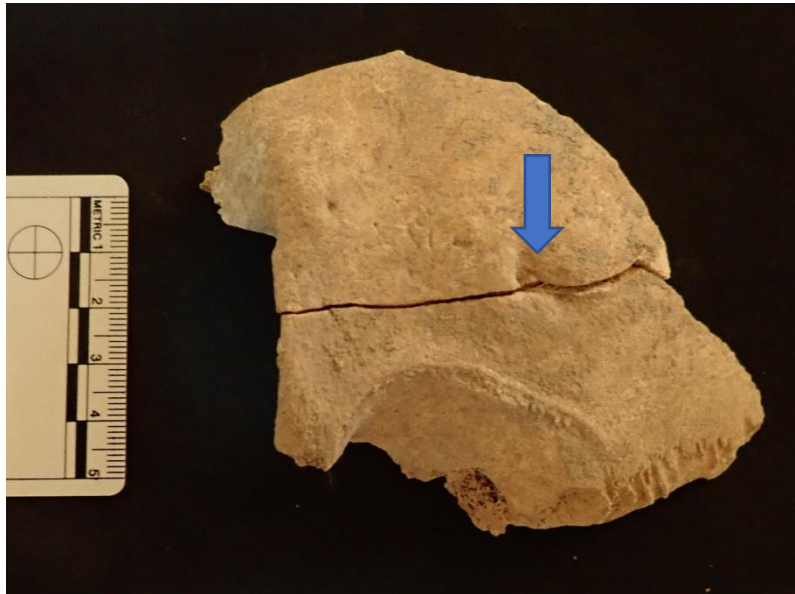


Figure 10. Trench 9. The left frontal bone with a marked temporal ridge and a circular depression (possible trauma). (Photograph: IKO)

Other finds include charcoal on the top of the sternum and a second charcoal patch where the left hand (not preserved) would have been. Ostrich eggshell was directly under and abutting the chin, as well as in situ 20 cm from the base of the mandible on top of the sternum. A faunal bone was found by the cranium.

Outreach programme

The extensive outreach programme is under the auspices of Isabelle Vella Gregory (IVG) and conducted in partnership with Rayan Mahjoub Jarelnabi Abdallah. We have adopted a broad approach to the outreach work. While the community at modern Jebel Moya remains at the heart of what we do, we are also committed to sharing our work to a very broad audience. To this end, Vella Gregory has established a blog (<https://thejebelmoypoproject.wordpress.com/>) and a Facebook page (<https://www.facebook.com/JebelMoya>). The blog is published in both Arabic and English, with contributions from team members. Posts in Arabic have attracted considerable attention, particularly among the residents of Jebel Moya. Throughout the excavation, Vella Gregory kept the Facebook page updated with latest developments, including news and photographs.

While the blog and Facebook page are an invaluable resource for archaeologists and broader interested audiences, the outreach programme is also for the benefit of the Jebel Moya community. This endeavour has presented many challenges. First, access to the Internet (and thus the blog) is limited. The majority of residents do not own computers or smart phones. However, posts are shared by those who do own this equipment. Second, the Jebel Moya community remembers the

Wellcome excavations in specific ways. They remember the tents, the relatives who worked there in some capacity and stories, often embellished, about Henry Wellcome. At no point was the village of Jebel Moya fully engaged with excavations other than to provide labour. It is worth noting that Wellcome's camp included Egyptian excavators and a large number of people from many areas of the Sudan, i.e. not part of the local community. As such, this project aims to redress the balance and place the community at the heart of our work.

Vella Gregory's first task was to establish good relations with the community. The response has been overwhelmingly positive. The people of Jebel Moya have shown great interest in our work. People of all ages constantly visited and asked questions about the materials we excavated, the site and its history. They were encouraged to handle material and offer their own observations. Furthermore, a number of men and younger boys frequently visited us on the Jebel, observed excavation and asked many questions. Special thanks go to Ammar Abdalla and Osman Karrar, who patiently translated for us and answered many questions. There was great interest in the past environment. In the process, IVG identified the need to improve her command of Arabic, particularly the dialect spoken in the area. In return, a large number of school girls aged 7-16 asked for help with English lessons. IVG observed that group activities, particularly ones in which information was transmitted, formed a core part of life in modern Jebel Moya. Consequently, English lessons were used as a medium to open a dialogue about our project, opportunities for further education and a broader exchange of information. IVG organized two drawing sessions for children, male and female. The response was overwhelmingly positive. Children drew pictures of the Jebel and pottery finds. The pictures are now part of the Jebel Moya archive.

Many women at Jebel Moya were kind enough to open their doors to Vella Gregory and invite her for coffee. With the excellent help of Abdallah, she went around various homes and showed objects and answered questions. Mahjoub also conducted interviews with some villagers and these are currently being analysed. Anfal Albadwi also provided valuable assistance, especially when interacting with women.

In the evenings after excavation, prayers and dinner, it is customary for men and older boys to congregate in one of the village's open piazzas. IVG was often invited to join. This was a time for general chat, but many villagers asked questions about the day's work, specific finds and the general purpose of our work. Some people expressed surprise at interest in what is often viewed as a marginal environment. The villagers responded best to a narrative technique, which talked about the history of the valley in the years before the birth of the Prophet. There was special interest in faunal remains, particularly the finding of waterbuck and gazelle, especially as "moya" is Arabic for "water" and a common refrain heard was, "Where is the water?". These stories were then shared with the wider community. IVG observed men and older boys repeating these stories to women, generally while women were busy with numerous household tasks. Women would then seek out IVG and ask more questions. On evenings when we were able to observe the Milky Way, the villagers recounted how the Milky Way is ancient and would have served as 'light' for the ancient people on the mountain.

During the middle of the excavation, Fath el Rahman, one of the community leaders and a keen supporter of the project since its inception, shared with us a teapot from Wellcome's expedition. He generously dedicated time to identify people and places from the Wellcome photographic archive. He explained that his great-grandfather worked in the camp kitchens. It is worth remembering that Wellcome had always intended to return to the Sudan after the First World War. This was not to be and he died in 1936. By 1938, the camp was shut down and Major Uribe (the camp commandant) left Sudan. We do not know what happened to the many things that formed part of the vast camp. Some were shipped back to England, but others appear to have found a new life in Sudan. Fath's

great grandfather kept the teapot as a memento. It has been stored safely for all these years, and it is not used to make tea. Rather it is a treasured memory of days gone by and an excellent conduit for reminiscing and telling stories.

The outreach programme is therefore a continuous and dynamic process. Future aims include strengthening relations with the community so as to better identify their needs and wants. In particular, we hope to have more involvement from women. It is acknowledged that their days are long and full of many complex tasks. However, as trust is built up and more invitations for coffee were received, it was possible to meet more women and broaden the audience. It is hoped that resources can be found to offer basic smartphones to key members of the community. This will enable the villagers to access information more quickly: currently, posts are shared by a Jebel Moya teacher who works in Sennar but visits the village regularly. Outside of Jebel Moya, the team continues to work with Sudanese colleagues and offer training to students. More broadly, there is a continued investment in the blog and the sharing of resources.

Flotation and wet-sieving program (CL)

A total of 19 bulk sediment samples were taken from trenches 2 and 8 for phytolith (microbotanical) analysis. A total of 20 sediment samples – 786 litres, with approximately 40 litres of sediment sampled per spit – were systematically processed from trenches 2, 6, 8 and 8 using a washover bucket method. A 250µm mesh was used for flotation bags and a 3mm mesh for heavy fraction. The latter returned charcoal and hopefully small seed/fruit remains. Analysis of the samples will be conducted by Professor Dorian Fuller at the archaeobotany laboratory of the Institute of Archaeology, University College London.

Preliminary results

The 2019 season focused on the Neolithic and Mesolithic occupations by virtue of the initially unexpectedly thin Stratum B in the North-East of the valley. Current geology data suggests that the southern Gezira environment became habitable during the second half of the sixth millennium BC as the 500 mm isohyet, which increased the northern range of the biting *Tabanidae* fly, retreated southwards (Adamson et al., 1982). Previously large swamps were much reduced in size (Wickens, 1982: 43). Whether domesticated animals were present during the first occupations is as yet unknown. Animal bones were observed in the gully adjacent to Trench 2 from Stratum D, and this is one of the unresolved questions which may be answered by the continued excavation of Trench 2. The Late Mesolithic pottery from Trench 2 currently being analyzed for publication reconfirms and extends the results of the 2017 examination of Wellcome's pottery at the National Museum (Khartoum) where new variability was seen and described (Brass et al., 2018c).

The next, and securely dated, occupation currently recognised spans the early to late third millennium BC (Brass et al., 2019). The first identified domestic animals and the domesticated sorghum remains are from this period. More information on the ecology and food remains will be available once the material retrieved this season from strata C and D is examined. The condition of the four human skeletons is suggestive of attribution to this period, contemporary with 2017's Trench 3's human skeleton (3880 ± 40 bp, 2470–2210 BC. GdA-5760). Samples from three of the skeletons have been sent off for radiocarbon dating, and aDNA, carbon and oxygen isotope analysis. The pottery sherds associated with the human skeletons and from the majority of the spits from Trench 6 were Neolithic. The sherds show variability seen neither in the British and Petrie Museum collections, nor from the 2017 season. Like the Mesolithic pottery, they are currently being studied

and one of the aims is to determine the validity of superficial resemblances to Neolithic sherd décor from central Sudan

Should the AMS results return expected middle-late third millennium BC dates, they will confirm an emerging hypothesis that burial activity started much earlier than the late first millennium BC model proposed by Brass in his 2016 Ph.D thesis. One major challenge will be to reconstruct the distribution and nature of these multi-phase burials.

In this light, a new site survey in light of two season's worth of information was conducted at the end of the season. Two locations in the west have been identified for their visual potential to yield both human and animal bones, and pottery amongst other material remains, in strata B and C. This would return the initial focus back to later occupation phase before mirroring Trench 2 in proceeding down into the Neolithic and Mesolithic strata over the next two field seasons. Additional fieldworkers have been identified to assist with the excavation work. At the same time, the mobile unit excavating human skeletal remains will continue and two promising localities with visual human remains (and associated grave goods) have been identified in the centre of the valley around 40 metres north of trenches 3, 8 and 10.

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