A Bioarchaeological Approach to Everyday Life: Squatting Facets at Abu Fatima

Sarah Schrader

Everyday life in Nubia involves activities such as cooking, cleaning, planting seeds, harvesting crops, watching a football match, chatting with friends, monitoring children, eating delicious foods, and drinking tea. If we conjure up images of these quotidian actions from personal experiences, many of these activities are performed in a squatting position (Fig. 1). When a chair or mat is not available, modern Nubians will frequently assume a squatting position, with hips, knees, and ankles bent, to create temporary respite. As many of us that are not commonly in this position can attest to, it requires a degree of flexibility that no doubt comes with years of habituation and practice.

Using bioarchaeological methods, we are able to assess whether or not ancient populations also frequently assumed a squatting position. The lower leg bone (tibia) has been shown to possess accessory articulating facets when the ankle joint is regularly hyperdorsiflexed (i.e., when toes are drawn towards shins; Fig. 1). There have been a few bioarchaeological publications using this approach, however, they are mainly limited to case studies.[1] I argue that the squatting facets method has broader theoretical importance as it can be used as an indicator of everyday life in the *longue durée.* We have a window into how people spent their days, inside and outside of the home, and potentially a temporal line of continuity between ancient and modern populations.[2]

1 Ari, Oygucu, and Sendemir, "The Squatting Facets on the Tibia of Byzantine (13th) Skeletons"; Boulle, "Osteological Features Associatd with Ankle Hyperdorsiflexion"; Dlamini and Morris, "An Investigation of the Frequency of Suatting Facets in Later Stone Age Foragers from South Africa"; Molleson, "Seed Preparation in the Mesolithic"; Molleson, "Bones of Work at the Origins of Labour"; Robb, "Skeletal Signs of Activity in the Italian Metal Ages"; Trinkaus, "Squatting among the Neandertals."

2 Trinkaus, "Squatting among the Neandertals," p. 330.

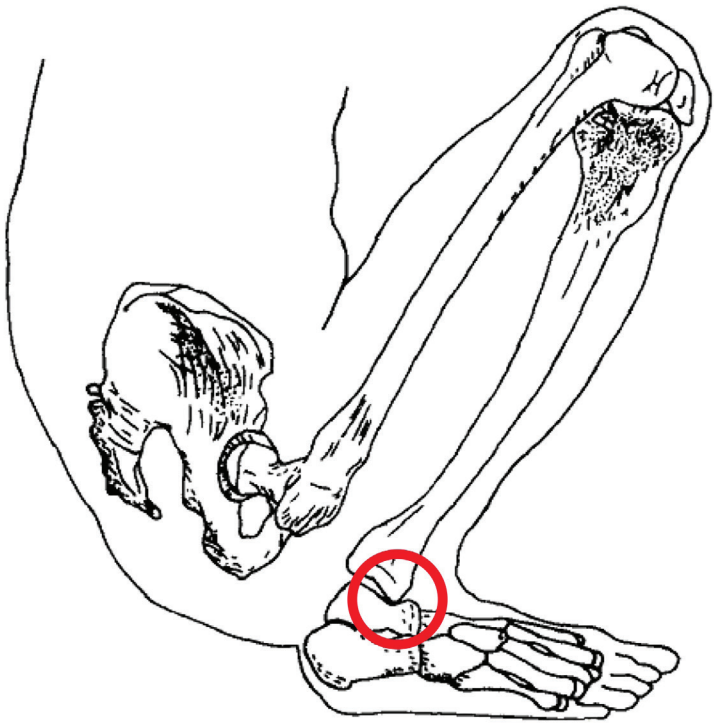

Figure 1. Squatting Position and Skeletal Consequences of Habitual Squatting (modified from Trinkaus 1975)

Bioarchaeology of the Everyday

Everyday life is vitally important to the development of individual and communal identities as well as to agentive action and social change. While certain major life events (e.g., wedding, funeral, war, etc.) may create a more marked memory, the majority of lived experiences are those that we might consider mundane. It is these minutiae that scholars of practice theory suggest are the most crucial — these everyday actions can be minor acts of resistance to an overarching social system that, with enough support and continuity, can go on to change entire social structures.[3] In this way, these everyday lives of everyday people are anything but mundane, but rather consist of a series of critical ways of operating.[4]

Archaeologists have long argued that understanding everyday life in the past is essential. Moving away from temples and tombs, archaeologists became interested in how everyday people lived in their day-to-day milieu. Additionally, archaeology is ideally situated

3 Bourdieu, *Outline of the Theory of Practice;* Giddens, *The Constitution of Society;* Schatzki, "Materiality and Social Life."

4 de Certeau, *The Practice of Everyday Life.*

to study this everyday past given the material record that everyday life creates. Interpretations of everyday practice have been achieved through studies of midden deposits, architecture, debitage, landscape modification, and ceramics. Footprints at the ancient Mayan site of Chan Nòohol were even used to recreate movements and personal interactions within this community.[5] The archaeology of everyday life in ancient Nubia has been examined through several lenses, including, but not limited to architecture and use of space, foodways, and identity expression.[6]

Skeletal data has the ability to provide unique insight into everyday life in the ancient world. Contrary to popular belief, bones are not as unmalleable as we might assume. Rather, the skeletal frame adapts throughout one's life, slowly remodeling on a cellular level. It is estimated that it takes approximately 10 years for the skeleton to completely remodel.[7] This process also facilitates a record of life events, embodied in the bones themselves. This is frequently referred to as embodiment theory in bioarchaeology and speaks to the biosocial nature of bioarchaeology.[8] The discipline goes beyond looking at broken bones or diseases to assessing lived experience in the ancient past, how it changed during periods of political, economic, and social upheaval, and how these data can be used to inform our understanding of our modern world.

In previous work I have used this embodiment framework to examine everyday life in ancient Nubia.[9] By examining skeletal indicators of activity (osteoarthritis and muscle attachment sites) as well as biomolecular approaches to diet (carbon and nitrogen isotope analysis), I was able to document how everyday life changed for Nubians living under colonial New Kingdom rule as well as in a post-colonial and Napatan landscape. By integrating a theoretical framework grounded in practice theory into bioarchaeological data, I was able to interpret relatively subtle diachronic changes in activity and diet as acts of agency and resistance. For example, bioarchaeological activity markers indicate that the post-colonial Third-Intermediate and Napatan period population may have indeed been engaging in more physically strenuous everyday movements than New Kingdom colonial Egypto-Nubian populations (at the site

5 Robin, *Everyday Life Matters: Maya Farmers at Chan.*

6 Agha, "Nubia Still Exists"; Budka and Doyen, "Life in New Kindom Towns in Upper Nubia"; Haaland, "Changing Food Ways as Indicators of Emerging Complexity in Sudanese Nubia"; Smith, "Pharoahs, Feasts, and Foreigners"; Smith, *Wretched Kush;* Smith, "A Potter's Wheelhead from Askut and the Organization of the Egyptian Ceramic Industry in Nubia"; Smith, "The Nubian Experience of Egyptian Domination during the New Kingdom"; van Peltt, "Revising Egypto-Nubian Relations in New Kingdom Lower Nubia"; Spencer, Stevens, and Binder, *Nubia in the New Kingdom.*

7 Hedges et al., "Collagen Turnover in the Adult Femoral Mid-Shaft."

8 Schrader and Torres-Rouff, "Embodying Bioarchaeology."

9 Schrader, *Activity, Diet and Social Practice.*

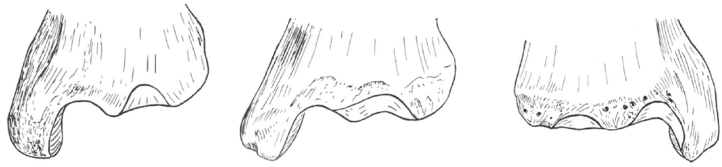

Figure 2. Images of Different Types of Squatting Facets on Distal Tibiae (modified from Singh 1959).

of Tombos, Third Cataract). However, this need not be interpreted as something negative, but rather can be framed as a newly independent community utilizing local raw materials (e.g., quarrying, mining) and building new communities and connections (e.g., construction efforts; new trading partners and political allies).[10]

Squatting Facets[11]

As discussed above, squatting facets are an articulation between the shin bone (distal tibia) and foot (talus) that are thought to be acquired in life. When an individual squats down for extended periods of time, the two bones begin to touch, where in a normal anatomical position, they would not. This creates a new joint, or articulation, and is an example of how the skeleton can adapt during life (Fig. 2). Note that changes can also be seen on the femur, patella, talus, and metatarsals, however, most commonly the distal tibia is affected and studied.[12]

Squatting facets have been studied for decades both from a clinical and bioarchaeological perspective. Clinicians have examined the prevalence of squatting facets in modern populations as well as associated the presence of squatting facets with the potential for subsequent injury.[13] Several papers have reported the presence of squatting facets both in adults as well as fetuses. The interest in fetal squatting facets stems from the question: are squatting facets the product of activity, acquired through one's life? In which case we would expect to find them only on adult remains. Or are squatting facets inherited? In which case we would find them on both adults and fetuses. Furthermore, does the frequency of squatting facets vary across genetically heterogeneous populations? Singh, for example, compares adult and fetal squatting facets prevalence in an Indian population and notes that, while adults do have higher frequencies, fetuses do indeed possess squatting facets.[14] Singh does state that the presence of squatting facets in fetuses is low

10 Schrader and Buzon, "Everyday Life after Collapse."
11 Singh, "Squatting Facets on the Talus and Tibia in Indians," p. 545.
12 Boulle, "Osteological Features Associatd with Ankle Hyperdorsiflexion"; Molleson, "Seed Preparation in the Mesolithic."
13 Massada, "Ankle Overuse Injuries in Soccer Players."
14 Singh, "Squatting Facets on the Talus and Tibia in Indian Foetuses."

in this sample, it is also variable between other samples published in previous works (22.6% Indian; 23% European; 3.1% Japanese). Barnett, however, provides an explanation for these findings. He argues that these traits can indeed be inherited, however, if the activities that maintain this articulation (i.e., squatting) are not maintained throughout the lifecourse, they will become obliterated as bone turnover occurs.[15] While this explanation does explain the presence of squatting facets on both fetal and adult remains, the matter is still a topic of debate today.

Bioarchaeological studies have contributed to this research by looking at changes in squatting facets frequency through time as well as sexual division of labor in the past. Squatting facets have been found in early hominin remains, including Neanderthals.[16] Broadly speaking, we see a decrease in squatting facets through time, and a notable decrease during the medieval period. Boule examined 543 tibiae from French and American archaeological sites (1st-20th centuries CE), and found that prior to the Middle Ages, squatting was quite common; however, with the dawn of the Middle Ages, there was a steady decrease in the frequency of squatting facets.[17] Similarly, Dlamini and Morris found that squatting facets were common in Late Stone Age (1st millennium BCE) South Africa, but almost nonexistent in comparative modern skeletal and cadaver samples.[18] Molleson reports high incidence of squatting facets at Abu Hureyra, Syria (Mesolithic/Neolithic) and Çatalhöyük, Turkey (Neolithic) and suggests that a saddle quern or mortar were used to process the grains that were being harvested.[19] Molleson also suggests the potential sexual division of labor, indicating that women and girls may have been responsible for preparing foodstuffs, whereas men and boys, who exhibited higher rates of squatting facets, were likely working with their hands while squatting, possibly making baskets and preparing cord.[20]

Squatting Facets in Nubia

To my knowledge squatting facets have not been systematically studied in Nubian remains. Here I present squatting facets data from the Kerma, or Kushite, period site of Abu Fatima (*ca.* 2500-1500 BCE). Abu Fatima is located near the Third Cataract of the Nile near Tombos and modern day Kerma (Fig. 3) and is currently

15 Barnett, "Squatting Facets on the European Talus."
16 Trinkaus, "Squatting among the Neandertals."
17 Boulle, "Evolution of Two Human Skeletal Markers of the Squatting Position."
18 Dlamini and Morris, "An Investigation of the Frequency of Squatting Facets in Later Stone Age Foragers from South Africa."
19 Molleson, "Seed Preparation in the Mesolithic."
20 Molleson, "Bones of Work at the Origins of Labour."

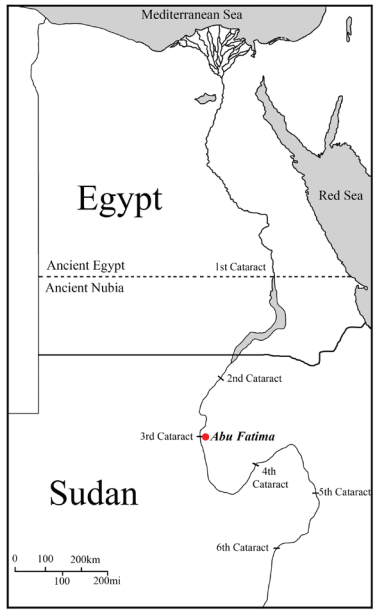

Figure 3. Map of Abu Fatima.

being excavated by Dr. Stuart Tyson Smith (University California, Santa Barbara) and myself. Given its location and size, it has been proposed that Abu Fatima was a suburban community, which would have been a long walk (approximately 10km) to the ancient capital city Kerma.[21] The community is thought to have participated in agricultural and animal husbandry practices, but also may have produced pottery, constructed homes, and manufactured other trade goods.

Analysis of squatting facets was conducted according to presence or absence of the trait.[22] All available adult skeletons from Abu Fatima were analyzed. In some cases, no tibiae were preserved, for which squatting facets could not be assessed. In other instances, only one tibia (left or right) was preserved and, thus, only one data point was collected for said individual(s). Analysis of sex and age-at-death were performed according to accepted bioarchaeological standards.[23]

The ethics of handling and studying human skeletal remains were taken into consideration at all stages of this research, including excavation, curation, and analysis.[24] The project worked closely with the National Corporation of Antiquities and Museums (NCAM)

21 Schrader and Smith, "Socializing Violence."
22 Mann, Hunt, and Lozanoff, *Photographic Regional Atlas of Non-Metric Traits and Anatomical Variants in the Human Skeleton.*
23 Buikstra and Ubelaker, *Standards for Data Collection from Human Skeletal Remains.*
24 Schrader et al., "Decolonizing Bioarchaeology in Sudan."

of Sudan as well as the local community of Abu Fatima, who were both supportive of this research. This analysis was non-destructive, so the remains were macroscopically analyzed and then returned to conservator boxes in a temperature- and humidity-controlled environment at the Faculty of Archaeology, Leiden University, The Netherlands.

Did Ancient Nubians Squat?

A total of 21 individuals from the Abu Fatima collection had at least one preserved distal tibia (Table 1). Of these, only one individual did not possess squatting facets (Burial 4E1). The vast majority of the Abu Fatima population (20/21, or 95%) did have the very clear presence of squatting facets. This is markedly higher than many previously published comparative studies (Table 2). Note that this list is limited to those studies that focus on tibial squatting facets, as opposed to femoral, patellar, tarsal, or metatarsal facets.

Table 1. Demographic Distribution of Squatting Facets at Abu Fatima.

ID #	Squatting Facet Presence		Sex	Age-at-Death	Locality
	Left	Right			
1A1	✓	✓	Male	35-49	Local
1B1	✓	✓	Female	50+	Local
1E1	✓	✓	Female	18-34	Local
1F1	✓	✓	Male	35-49	Local
1F2	✓	✓	Male	35-49	Local
2A1	✓	✓	Female	35-49	Non-local
2A2	✓	✓	Male	35-49	Local
2B1	✓	✓	Male	35-49	Local
2C1	✓	✓	Male	18-34	Non-local
2D1	✓	✓	Female	50+	Local
2F1	n/o	✓	Female	35-49	Local
3A1	n/o	✓	Male	35-49	Local
4A1	✓	✓	Male	18-34	Local
4B2	n/o	✓	Female	35-49	Unknown
4C1	✓	n/o	Female	50+	Local
4D1	n/o	✓	Female	35-49	Non-local
4E1	-	-	Probable Male	35-49	Local
5B1	✓	✓	Female	18-34	Local
8A2	✓	✓	Female	50+	Non-local
8B1	✓	✓	Female	35-49	Local
9A1	✓	✓	Male	35-49	Non-local

Table 2. Frequency of Squatting Facets in Other Populations

Population	Squatting Facet Presence	Sample Size	Citation
Abu Fatima	95%	21	Present study
Ancient Egypt	96%	300	Satinoff, "Study of the Squatting Facets of the Talus and Tibia in Ancient Egyptians
Ancient Egypt	33%	3	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Byzantine (13th century CE)	48%	100	Ari et al., "The Squatting Facets on the Tibia of Byzantine (13th) Skeletons"
Late Stone Age (1st millennium BCE), South Africa	50%	56	Dlamini and Morris, "An Investigation of the Frequency of Suatting Facets in Later Stone Age Foragers from South Africa"
Early farming (5th-19th centuries CE), South Africa	77%	17	Dlamini and Morris, "An Investigation of the Frequency of Suatting Facets in Later Stone Age Foragers from South Africa"
18th century Cape Town	5%	21	Dlamini and Morris, "An Investigation of the Frequency of Suatting Facets in Later Stone Age Foragers from South Africa"
20th century Cape Town cadavers	0%	29	Dlamini and Morris, "An Investigation of the Frequency of Suatting Facets in Later Stone Age Foragers from South Africa"

Table 2 contd.

South African (Oxford/Royal College of Surgeons' Museum)	27%	11	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Neanderthals (Europe, Near East)	91%	11	Trinkaus, "Squatting among the Neandertals: A Problem in the Behavioral Interpretation of Skeletal Morphology"
European (Oxford/ Royal College of Surgeons' Museum)	13%	40	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Scottish (Anatomical Department, University of Edinburgh)	17%	118	Wood, "The Tibia of the Australian Aborigine"
Asian (Oxford/Royal College of Surgeons' Museum)	48%	23	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Native American (Oxford/Royal College of Surgeons' Museum)	37%	19	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Polynesia (Oxford/ Royal College of Surgeons' Museum)	75%	4	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Melanesia (Oxford/ Royal College of Surgeons' Museum)	71%	38	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"

Table 2 contd.

Australian (Oxford/ Royal College of Surgeons' Museum)	79%	14	Thomson et al., "The Influence of Posture on the Form of the Articular Surfaces of the Tibia and Astragalus in the Different Races of Man and the Higher Apes"
Australian (Collection of Anatomical Museum of the University of Edinburgh)	81%	236	Wood, "The Tibia of the Australian Aborigine"
Indian (20th century) cadavers and "museum specimens"	77%	292	Singh, "Squatting Facets on the Talus and Tibia in Indians"
Panjabi, Indian	87%	52	"The Influence of Function, as Exemplified in the Morphology of the Lower Extremity of the Panjabi"

One interpretation of these data is that the people of ancient Kush, just like modern Nubians, spent much of their everyday life in a squatting position. This may have involved both occupational as well as leisure activities. It is also interesting that both males and females exhibit squatting facets, suggesting both sexes were usingthis position. All adult age categories, young, middle, and old adults, also possess evidence for squatting. This suggests that the activity was continued throughout life; if, for example, an individual was a squatter in childhood or young adulthood but then stopped, the facet would be obliterated by bone remodeling as they aged. In short, it would appear that a large portion of the Abu Fatima community, of both sexes and all age groups, were spending much of their everyday life in a squatting position.

It is also interesting to note that previous bioarchaeological research of the Abu Fatima collection indicates that approximately 25% of this population were of non-local origin, meaning they migrated from someplace else and eventually died and were buried at Abu Fatima.[25] This was assessed via strontium isotope analysis, which compares strontium values from dental enamel (produced during childhood) to local geology; if these values are similar, we can deduce that the individual was local to the region, however, if these values differ, it is possible that they migrated into this community. Interestingly, all non-local individuals also possessed squatting

25 Schrader et al., "Intraregional 87Sr/86Sr Variation in Nubia."

Figure 4. Statuette of Squatting Man (Old Kingdom, Dynasty 6; Image ©National Museums Scotland A.1954.10) https://www.nms.ac.uk/search-our-collections/collection-search-results?entry=300275 (last accessed November 27, 2024).

facets. This suggests that the patterns exhibited here at Abu Fatima, may not be limited to just this community, but rather may be a more pan-Nubian pattern. Using strontium isotope analysis, it is impossible to pinpoint the point of origin for an individual, so we cannot say where these non-locals came from. But it does appear that throughout their life they were habitually participating in a squatting behavior.

The one individual in the Abu Fatima collection that did not possess squatting facets (4E1) is a bit of an oddity. This was a probable male, dating to the Ancient Kerma period (2,500-2,050 BCE), who likely died between 35-50 years of age. The grave was looted in antiquity and was quite disturbed, with no skeletal elements remaining *in situ*. Despite this, there is evidence to suggest that this individual may have originally been buried with numerous and varied grave goods. Three lithic blades forming a Nubian-style arrowhead, rawhide sandals, faience beads, and intricate leatherwork and basketry were all found in this burial pit. Although it is difficult to say with any certainty given the looting, it is possible this grave could have belonged to an elite individual or an individual of a special class (e.g., occupation). For example, if individual 4E1 were elite, perhaps they didn't squat, but rather sat in chairs. If they were not participating in common tasks because of their status, they could have found other positions of relaxation. Another possible explanation is that this person had an occupation (e.g., warrior), or daily life, that did not require squatting. It could also be as simple as this individual

Figure 5. Statuette of Woman Grinding Grain (Old Kingdom, Dynasty 5 Image © Boston Museum of Fine Arts 21.2601) https://collections.mfa.org/objects/144023 (last accessed November 27, 2024).

did not enjoy squatting or perhaps an injury, unidentifiable in the skeletal remains, prevented them from assuming this position.

If we turn to archaeological evidence for squatting in the Nile Valley, there are a few examples. It is interesting to note that most of these samples are associated with the non-elite, working class. For example, there is an Old Kingdom (probably 6th Dynasty, *ca* 2,345-2,125 BCE) pottery statuette of a squatting man who appears to be naked and emaciated (Fig. 4). There is a similar figure, on display at the Egyptian Museum in Cairo, of an emaciated old squatting man grasping an ivory staff. There are also multiple examples of figures grinding grain, like a statuette from the 5th Dynasty (*ca.* 2,465-2,323 BCE; Giza; Fig. 5). Figures such as these exhibit scenes from everyday life and were thought to provide resources for deceased in the afterlife. They can also provide some insight into the types of activities Nile Valley inhabitants may have done while in a squatting position.

In other squatting facets studies, bioarchaeologists have concluded that individuals with squatting facets may have regularly participated in grinding, basketmaking, spinning, weaving, baking, milking animals, preparing dung, knitting rugs, sitting around

a fire, and working in the fields.[26] There is also some evidence within Egypt to suggest that scribes may have frequently taken a squatting position.[27] Archaeological evidence in Nubia indicates that percussion instruments were used in a squatting position.[28] Lastly, there are many iconographic examples from Ancient Egypt of women giving birth in a squatting position.[29] However, for the skeleton to modify it would need to be a highly repetitive behavior. It is certainly possible that childbirth contributed to the development of squatting facets, it was probably in combination with other activities.

Satinoff conducted a study of squatting facets in an Egyptian sample.[30] The origins of the skeletal material remain unclear as the only documentation provided is that they were housed at the Institute of Anthropology at the University of Turin; however, no chronological or spatial information was provided. Satinoff found that of the 300 male and female remains analyzed 96% did in fact have squatting facets. This is very much congruent with the findings presented here from Abu Fatima. It does beg the question about genetic predisposition to said facets, given the relatively genetic homogeneity between Egyptians and Nubians. Skeletal analysis of additional samples, with well-documented chronologies and cemetery locations, would be useful to better understand if the majority of Egyptians and Nubians had squatting facets, or if the similar values between Abu Fatima and the results presented by Satinoff are a coincidence. Additionally, skeletal analysis of non-adult remains, particularly neonates and infants, could be used to address the genetic predisposition theory.

Conclusions

These data provide a novel perspective on everyday life in ancient Nubia. Up until now, the Nubian quotidian had been examined via built space, everyday life objects, refuse, as well as skeletal indicators of physically strenuous activity and dietary practices. This study presents a unique line of embodied continuity between the ancient Kushites, inhabiting the Third Cataract region *ca.* 4,000 years ago and the Nubians that inhabit the region today. While it is impossible to specify what activities these individuals were engaging while

26 Baykara et al., "Squatting Facet"; Dlamini and Morris, "An Investigation of the Frequency of Squatting Facets in Later Stone Age Foragers from South Africa"; Molleson, "Bones of Work at the Origins of Labour."
27 Casson, *Everyday Life in Ancient Egypt.*
28 Kleinitz, "Soundscapes of the Nubian Nile Valley."
29 Haimov-Kochman, Sciaky-Tamir, and Hurwitz, "Reproduction Concepts and Practices in Ancient Egypt Mirrored by Modern Medicine."
30 Satinoff, "Study of the Squatting Facets of the Talus and Tibia in Ancient Egyptians."

assuming the squatting posture, these data suggest that both men and women were regularly squatting at Abu Fatima during the Kushite period. As Abu Fatima is considered a suburban space, these interpretations are further evidence for how the ordinary, non-elite population would have lived their daily lives, both inside and outside of the home. This may have involved squatting around a fire, preparing food (e.g., grinding, cooking), playing musical instruments, weaving, flint-knapping, or just chatting with friends.

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My thoughts are with the people of Sudan as the country, at the time of writing, is in the midst of a horrific war.

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