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UMM AL-JIMĀL CEMETERIES Z, AA, BB AND CC: 1996 AND 1998 FIELD REPORTS

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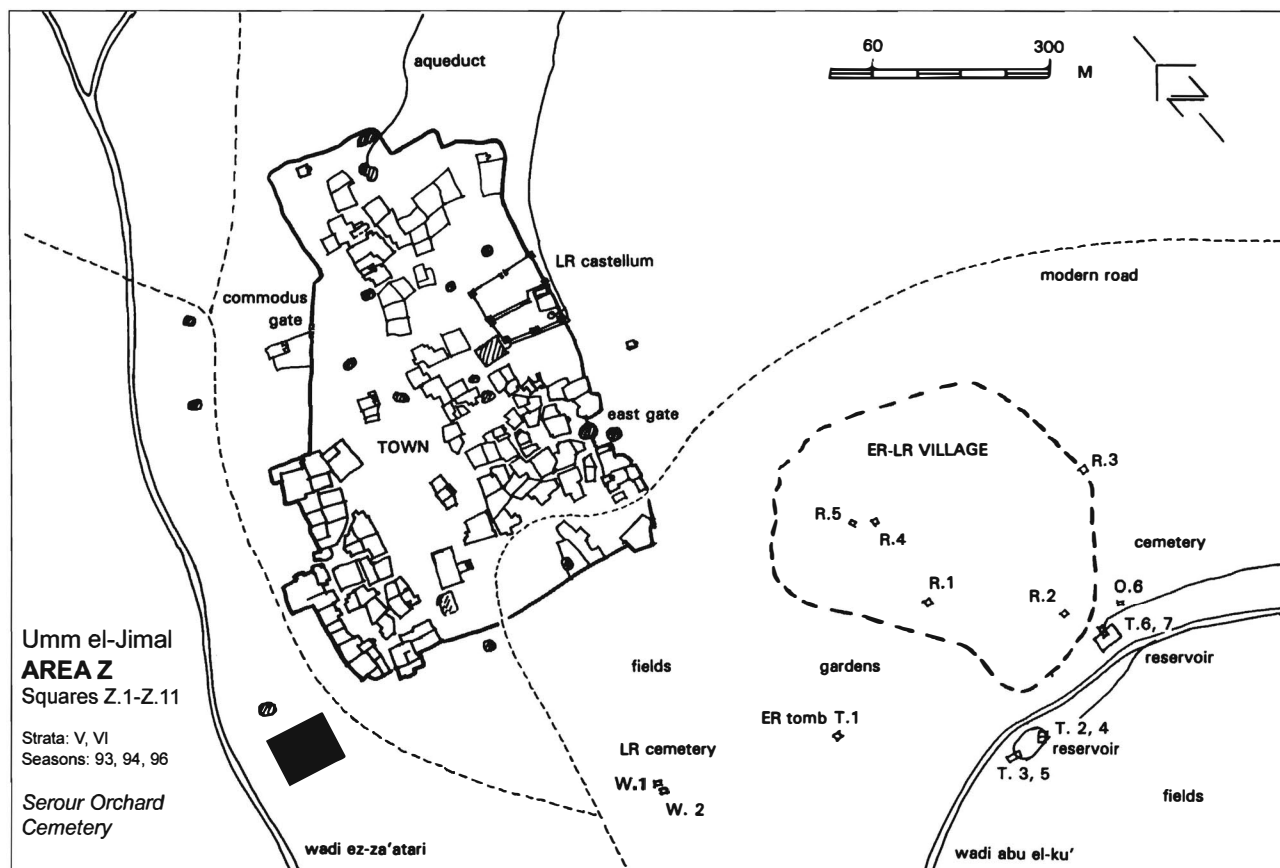
UMM AL-JIMĀL 1996: AREA Z CEMETERY (M. Cheyney)

Introduction

Area Z is located approximately 75 meters west of the southern limit of the Byzantine town ruins, in the olive garden of Shaykh Hail es-Serour (**Fig. 1**). Excavations began here in 1993 when a disturbed cist tomb, Z.1, was accidentally discovered by the owner of the property (Cheyney 1995). More systematic excavations continued in 1994 resulting in the discovery of

two additional burials, Z.2 and Z.3 (Brashler 1995). In 1996 excavation was resumed in an effort to reach three specific research goals.

The first goal was to increase the sample size of human remains from undisturbed burial contexts. This involved the excavation and recording of tomb structure, burial type and orientation, and cultural remains present. Osteological profiles for each interment including age, sex, pathology and Minimum Number of Individuals (MNI) distributions were also estimated where human remains were sufficiently preserved. The

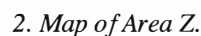


1. Map locating Area Z relative to the Byzantine town ruins.

In order to achieve the above goals, excavation was concentrated in two regions of Area Z. The first two and a half weeks were spent opening three squares in the vicinity of Z.1. Squares Z.4, Z.5 and Z.6 were located north of Z.1 and southeast of Z.2 and Z.3 (**Fig. 2**). During the last two and a half weeks excavations were moved to a second region of Area Z located north of all previously opened units. Squares Z.7, Z.8, Z.9, Z.10, and Z.11 were all concentrated in this region.

Units were located where above ground probing indicated the presence of stones occurring in a somewhat regular pattern below the surface. Probing involved the unsophisticated, yet highly effective, use of a metal bar driven into the soil in areas where, given the distribution of known burials, tomb lid architecture was expected. Once the unit was located above ground, a square was laid out, excavated and expanded to reveal the extent of tomb cover slabs. Grave lid architecture was mapped, photographed and lifted. The underlying stone-lined cist or simple dirt pit was then defined, drawn to scale, photographed and gradually excavated through a layer of nearly sterile fill, located within the pit or cist. Soil was removed down to a locus containing remains of either a disturbed or an intact human interment.

Excavation of human remains involved the complete articulation and recording of skeletal elements *in situ*. Small brushes and bamboo bone picks were used to remove the surrounding soil matrix. Photographs were taken and exposed remains mapped in full before the bones



were lifted. This allowed for the differentiation of individuals prior to removal. Remains were exhumed and packaged by individual to avoid commingling. All skeletal remains were taken to a field laboratory where they were inventoried and evaluated for morphological and metric traits including age, sex, pathology, anomalies and stature. Bones were then packaged for shipment to Western Michigan University, and later moved to Oregon State University where they await a more comprehensive examination.

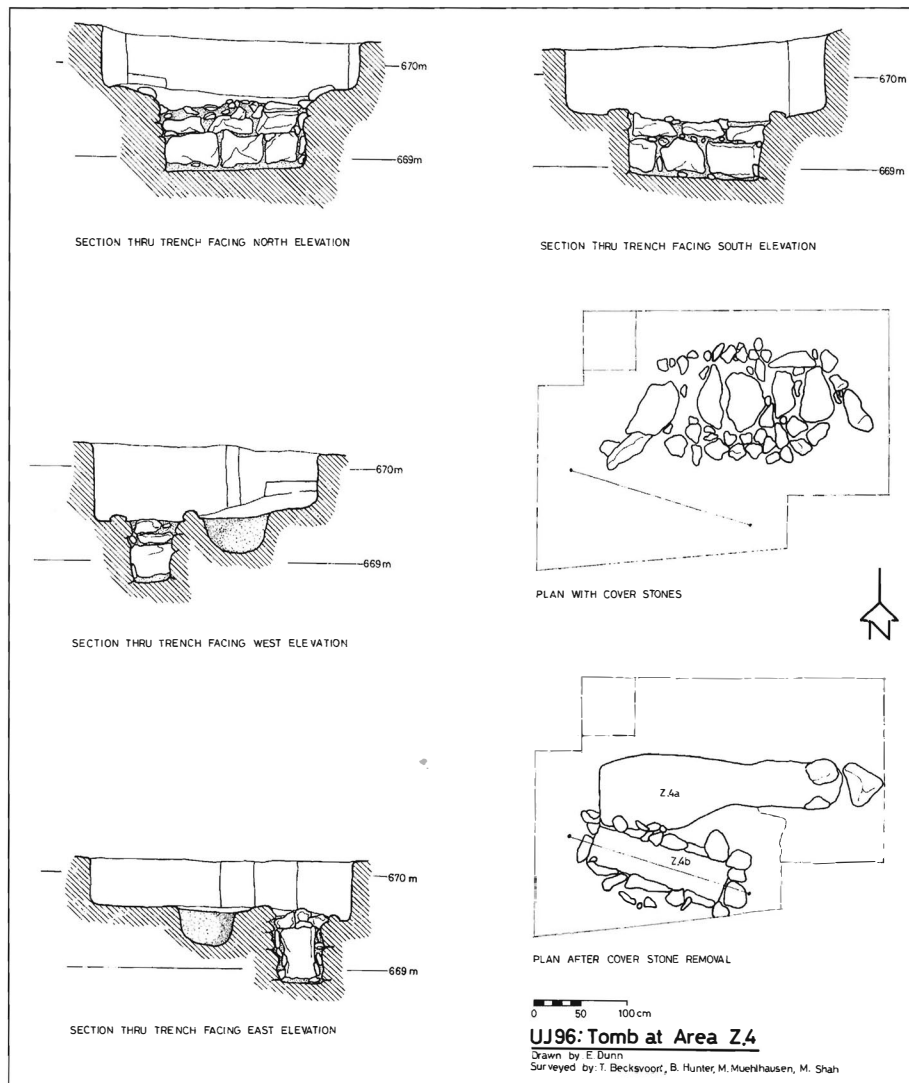
Summary of Results

Tombs Z.4a and Z.4b

The lid architecture of Z.4a, composed of five large basalt slabs, was discovered under 0.55m of naturally deposited sandy brown silt. Small to medium-sized chinking stones were used to line the outside of the lid and were also

placed in between each of the slabs. Beneath the cover stones, a pit of slightly softer soil was uncovered. The pit contained a few human skeletal fragments and small pottery sherds tentatively identified as Late Roman / Early Byzantine. A total of ten identifiable bone pieces resulted in an MNI calculation of two individuals based on the presence of an immature humerus fragment and several adult bone segments.

A second tomb, Z.4b, was uncovered running parallel with and to the south of Z.4a (**Fig. 3**). The lid architecture was of similar construction, although on a smaller scale, and built for a child. The contents of the cist contained the remains of one subadult individual aged at 7 years \pm 24 months on the basis of dental development (Ubelaker 1978; White 2000) and incomplete fusion of epiphyses. Vertebrae were completely fused suggesting that the age at death was probably



3. Plan and elevations for tombs Z.4a and Z.4b.

closest to the middle of the given range (Bass 1995). The disturbed nature of the upper body, due to a night-time looting part way through excavation, made it impossible to reconstruct the position of the arms, head and torso. The preservation of the legs and feet *in situ*, however, suggested that this individual was buried in an extended supine position with the head at the eastern end of the tomb facing west. No pottery was uncovered. Small metal fragments associated with the feet indicate burial with foot adornments, likely sandals. It is impossible to determine whether the relative lack of grave goods is attributable to the recent disturbance or to culturally dictate burial practices, perhaps related to the individual's status in antiquity.

The side wall architecture of the Z.4b tomb comprised two courses of basalt blocks and small chinking stones. Small fragments of plaster were found associated with the cist construction and bagged for analysis.

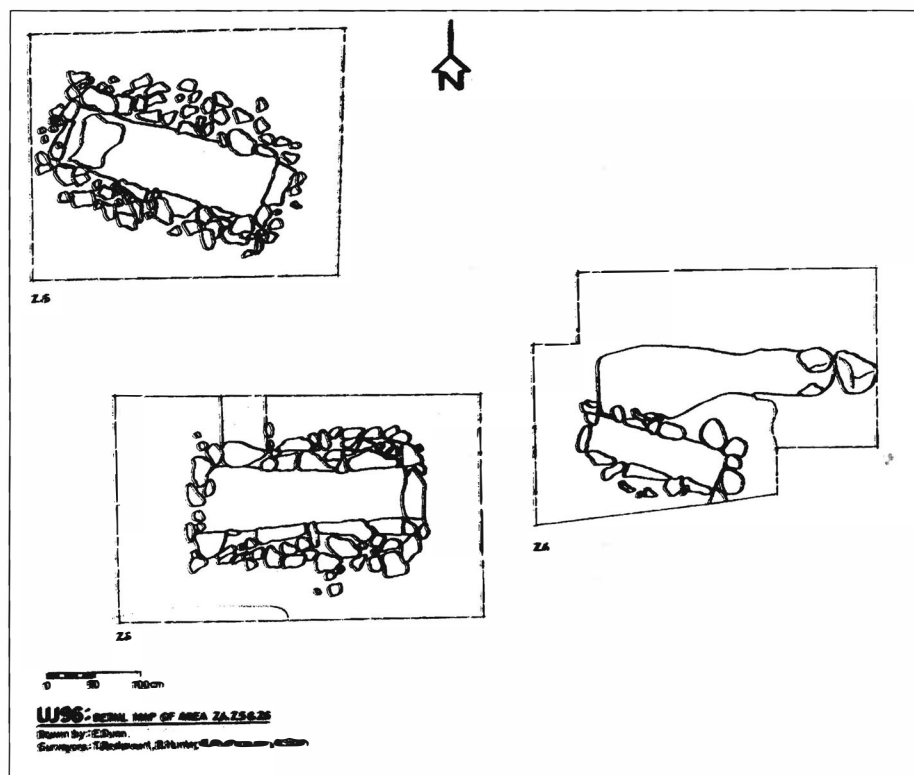
Tomb Z.5

Z.5 (Fig. 4) is of the same construction as Z.4b, with side wall architecture consisting of two courses of basalt blocks, chinking stones of the same material and some plaster fragments, but no other associated cultural material. Within

the walls of the tomb, a layer of soil was uncovered which contained evidence of a disturbed burial. A nail, one copper bead, two glass fragments, and undifferentiated segments of human bone were found in association with dark, irregular stains occurring in a roughly rectangular pattern. A few pottery sherds were also uncovered in this locus and identified as Early Roman / Late Roman. Beneath this soil layer and within the side wall architecture, a dark brown soil stain indicated the remains of a coffin bottom.

Tomb Z.6

Z.6 lid architecture consisted of five large basalt slabs *in situ* and a sixth, disturbed cover stone standing on end at the western end of the tomb. Basalt chinking stones lined the edge of the grave with the smallest ones wedged between the slabs. Beneath the cover slabs, side wall architecture was uncovered that consisted of two courses of finely hewn basalt blocks with intermittent smaller stones. Small plaster fragments and a large Late Roman jar handle fragment were the only cultural materials located in the top layer of burial cist fill. A large 'pocket' of botanical remains was found associated with the handle fragment and collected for flotation sampling. Some human bone fragments, a large



4. Detail map of Z.4a, Z.4b, Z.5 and Z.6.

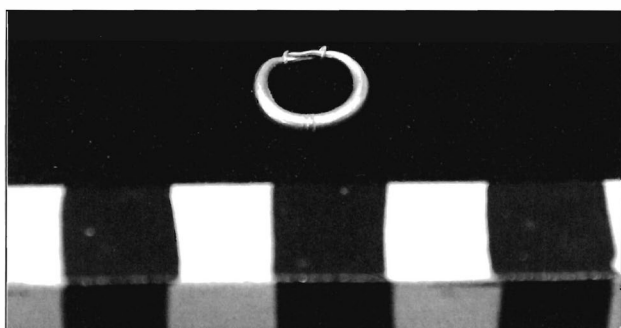
array of copper and glass beads, one small gold earring (**Fig. 5**) and the badly decayed remains of a wood coffin were uncovered just above sterile soil.

The human remains from this soil layer were inventoried and analyzed in the field laboratory which resulted in the identification of 46 fragments. From these remains a minimum number of one subadult individual, age 15 years \pm 36 months, was calculated.

Tomb Z.7

Z.7's tomb capping consisted of seven large slabs, one a reused lintel, and smaller basalt chinking and liner stones. Beneath the tomb lid architecture, a pit of soft, flaky soil was defined. Excavation yielded wood fragments, dark soil stains in a distinct, rectangular pattern and articulated human remains. A copper ring was uncovered on the right hand of the uppermost individual. Pottery found in this locus was dated to the Roman period. In addition, four nails were found approximately 0.10m in from each corner along the long axis of the wood, likely coffin, soil stain.

The articulation of human remains *in situ* revealed the presence of two individuals oriented east to west from head to foot. In addition, three diagnostic bone fragments belonging to a third immature individual were found beneath the fully articulated skeletons. Both complete individuals were uncovered in the extended supine position. Individual number one, the uppermost burial, was interred with legs extended, the left hand placed across the pelvis and the right arm completely flexed at the elbow joint, with the right hand resting on the right shoulder. Individual number one's skull was uncovered facing north and separated from the mandible, which was located with the mandibular symphysis



5. Gold earring from Z.6 (Photo by Open Hand Studios).

facing west – a configuration best explained by postmortem settling. Individual number two's right arm was flexed at a 90 degree angle across the inferior thoracic vertebrae. The left arm was fully extended and lying adjacent to the left innominate. The skull of the second individual was turned to the side and facing south.

Laboratory analysis revealed that individual one was a female of approximately 14-16 years of age at the time of death based on degree of fusion in long bones. Living stature was estimated at 1.46-1.54m from the right tibia using Trotter and Gleser's formula for white females (1952; White 2000). No evidence of pathology was noted in the field.

Individual number two is an adult male who was between the ages of 27 and 35 at the time of death. Age was calculated from pubic symphyseal morphology (Brooks and Suchey 1990), dental attrition patterns (Bass 1995; Brothwell 1965), sternal rib extremity development (Iskan *et al.* 1984) and medial clavicle fusion. A living stature of 1.65-1.74m was estimated from the right femur using Trotter and Gleser's formula for white males (1952; White 2000). Primary osteoarthritis was noted in the thoracic vertebrae in the form of minor osteophytic lipping of the centrams. The phalanges and metatarsals of the right foot evidenced the early stages of rheumatoid arthritis. The presence of these degenerative pathologies may indicate that individual number two was closer to the upper range of the age estimate given. Finally, extensive enamel hypoplasia was noted in all of the mandibular and maxillary dentition, indicating a period of severe disease and or dietary stress during the years of tooth formation (White 2000).

Tomb Z.8

Beneath the topsoil layer, eight intact cover slabs and chinking stones were uncovered – the largest of the lids excavated this season. Below this locus, pottery sherds dated in the field as Late Roman, coffin remains, metal brackets, nails and human remains were exposed and excavated. Like Z.4a and Z.7, Z.8 was a simple pit inhumation with no sidewall architecture.

One adult individual was uncovered in the supine extended position facing west. The left arm was flexed at a 90-degree angle with the hand lying across the thoracic vertebrae. The right

arm was flexed 110 degrees with the hand lying across the pelvis. The skull, located at the east end of the tomb, was turned and facing north with the mandible tucked towards the sternum.

Morphological analysis of skeletal remains indicates that this individual was a male between the ages of 30 and 40 years at the time of death. Age estimation was based primarily on sternal rib extremity phase, metamorphic changes in pubic symphyses and dental attrition patterns. Stature estimation based on the length of the right femur suggests a range in height between 1.65-1.73m (Trotter and Gleser 1952; White 2000). Dental analysis revealed several carious lesions. Two large occlusal caries were found in the left first molars of the mandible and maxilla. One smaller interstitial caries was located in the right third mandibular molar. No other forms of pathology or skeletal anomaly were observed in this individual.

Tomb Z.9

The excavation of Square Z.9 uncovered the southernmost edge of a badly disturbed tomb running into the north balk and underneath the backfill pile. The decision was made not to excavate further and the unit was closed and back-filled.

Tomb Z.10

The removal of topsoil above tomb Z.10 revealed the presence of cover slab architecture that varied to some degree from the typical plan for Area Z tombs as described above. A large ring of cobble stones was found above the cover slabs, encircling a pit of soft, dark soil (**Fig. 6**). Pottery in this locus was identified in the field as Late Roman. The removal of the rock circle and the soil within revealed what appeared to be intact, horizontal cover slabs without the chinking stones between cover slabs noted in other Area Z mortuary structures. A burial pit was visible around and contiguous with the outer edge of the cover slabs, suggesting that the tomb lid structure was placed within and level with the top of the pit. This is unlike the plan for the rest of the lid architecture in Area Z where cover slabs are placed over the top of a narrower pit. Cover slabs typically occur above the pit stratigraphically and not within and contiguous with the pit as in Z.10. In general, these differences



6. Tomb Z.10, showing stone-encircled pit above cover slab architecture.

combine to suggest a somewhat unique method of burial for this unit, though the significance of this architectural difference is not determinable at present. Beneath the cover slab and cobble ring structure, the pit continued down to a soil layer containing the skeletal remains of one individual and no associated objects or pottery sherds.

Laboratory analysis of skeletal morphology indicates an adult female between the ages of 35 and 45 at the time of death. Age estimation was based on sternal rib extremity phase (Iskan *et al.* 1985) and dental wear patterns. Pubic symphyses were too poorly preserved to provide evidence for aging. Alveolar resorption resulting from antemortem tooth loss was observed in both the mandible and maxilla. The only other pathology noted in the field was an arthritic phalanx of the right hand. Robust muscle attachments on both humeri were also noted.

Tomb Z.11

Z.11, located next to and to the north of Z.10, was of nearly identical plan and construction to Z.10, differing only in that the former was built to a smaller scale with only four basalt cover slabs. Pottery identified from within the circle of cobbles was Late Roman. The pit that was contiguous with and beneath the tomb lid architecture contained the remains of wood, presumably a coffin, and a single subadult individual. No pottery or other cultural materials were found in this locus.

Skeletal analysis of the immature remains indicated an individual between the ages of 4 and 6 years. This estimation was based primarily on the degree of occipital and vertebral epiphyseal union and dental development and eruption. Skeletal data collected from the 1996 Area Z tombs are summarized below (**Table 1**).

Discussion and Preliminary Interpretations*Dating*

The question of dating the loci associated with the pit and cist burials has relied on small pottery sherds and several pieces of jewelry as the only forms of chronological evidence. All of the pottery found within the burial pits and cists this season was dated to the Early Roman / Late Roman period (**Table 2**). Similarly, all of the ceramic material found in the soil associated with the tomb lids was given dates of Early Roman / Late Roman, with one Early Byzantine exception in Z.6. Soil above the tomb (Locus 001) was dated to the Late Roman / Early Byzantine period. The only exception to this pattern was in Z.2 and Z.3 (Brashler 1995). Z.2 had a few Early Byzantine sherds, though most of the pottery found within the burial pit was Late Roman. Z.3, on the other hand, yielded tentative

Table 1: Summary of Area Z skeletal data from the 1996 season.

TOMB	ARTIC. REMAINS	MNI	SEX	AGE	PATH/ ANOMALY	STATURE	BURIAL TYPE	COFFIN	OBJECTS	POTTERY CALLS ASSOC. WITH PIT OR CIST	BURIAL ORIENTATION
Z.4a	N	2	ID	1 adult 1 sub-adult	ID	ID	pit	N	none	LR	E-W
Z.4b	Y	1	ID	7y ±24 mos.	ID	ID	cist	Y	metal foot adornment	—	E-W
Z.5	N	ID	ID	ID	ID	ID	cist	Y	glass, nail, 1 copper bead	LR	ID
Z.6	N	1	ID	15y ± 36 mos.	ID	ID	cist	Y	beads, floral sample, carring metal frag.	LR	E-W
Z.7	Y	2	F M	14-16y 27-35y	possible cranial pathology arthritis, enamel hypoplasia in male	1.46m-1.54m 1.65m-1.74m	pit	Y	nails, ring	R	E-W
Z.8	Y	1	M	30-40y	3 dental caries	1.65m-1.73m	pit	Y	metal brackets, nails	LR	E-W
Z.10	Y	1	F	35-45y	alveolar resorption, robust muscle attachment	ID	pit	N	none	LR	E-W
Z.11	Y	1	ID	4-6y	ID	ID	pit	Y	none	LR	E-W

Late Roman / Early Byzantine dates for pottery associated with human remains. The presence of a Byzantine cookpot, plastered over to create a chalice, pushes the date into the Early Byzantine time period. Collectively, pottery evidence suggests that both pits and cists are early fourth century burial structures.

Table 2: Pottery dates from the Area Z tombs for the 1996 season.

Topsoil	LR / EByz
Tomb lid architecture	ER / LR / EByz
Cist or pit	ER / LR
Sterile Soil	

Dating by grave goods is consistent with Late Roman / Early Byzantine attributions but is not helpful for refining the dates. Preliminary analysis suggests a relatively long and somewhat non-specific chronology, on the basis of beads, nails and gold earrings from Early Roman to Late Byzantine times (Ibrahim and Gordon 1986; Waterhouse 1973; Stirling 1976, 1978; McNicoll *et al* 1992; Winnett and Reed 1964; Tushingham 1972).

In terms of dating by tomb structure, reports from Dhibān suggest that pit and cist burials are roughly contemporaneous and Byzantine (Tushingham 1972; Winnett and Reed 1964). At Umm al-Jimāl, the pottery from Area Z supports a theory of concurrence. However, there seems to be more evidence, at least for the tombs excavated this season that use began in the Early Roman period and continued into Early Byzantine times. This is further substantiated by the similarity of burial type reported for the pre-Byzantine graves at the Queen Alia Airport cemetery (Ibrahim and Gordon 1986) and the Roman tombs at Jericho (Kenyon 1965). The differences in tomb structure in Area Z are most likely more attributable to disturbance and the ability of individuals to acquire resources rather than changes in burial construction over time.

Diversity of Burial Type

Area Z can be characterized as variable in burial style, a matter further complicated by the

disturbed condition of many of the graves. For example, although all of the human remains uncovered this season were facing west with skulls positioned in the east, 1994 excavations discovered individuals facing east and west, with small infants oriented north-south (Brashler 1995). Grave goods vary from complete absence, to several beads and gold and copper jewelry remaining in robbed or otherwise disturbed tombs. In addition, burials range from single interments in simple pits to 13+ individuals in a large block lined cists. Multiple interments of four or more individuals buried in tombs with side wall architecture seemed to be the norm prior to this year's excavation. This season's finds now, however, suggest that a higher degree of variability in number of individuals, orientation and burial type is characteristic of Area Z.

In addition, tombs with distinct architectures are interspersed throughout the cemetery, rather than being concentrated in specific sectors. Square Z.4 is the best example of this with a disturbed pit burial abutting a single, subadult cist interment with finely-constructed side wall architecture.

Disturbances in Antiquity

The second unusual aspect of the Area Z excavation this season was the extensive robbing and / or disturbance evidenced in the region of Z.1. Tomb Z.4a and Z.6 were uncovered with completely intact cover slabs and chinking stones, but contained only fragments of human remains, coffin stains and small grave goods. All but one of Z.5's cover slabs were discovered intact, despite the fact that the grave was extensively disturbed. It is likely that Z.4a, Z.5 and Z.6 were disturbed relatively soon after they were buried because the coffins appear to have been removed intact.

The question with these disturbances is whether the human remains and associated objects were removed as an aspect of culturally defined mortuary practice, involving secondary burial (perhaps in the larger, monumental tomb structures of Area BB, see Brashler, this volume), or in the process of extensive robbing during antiquity. The possibility of robbery seems likely at first glance, given the modern problem of grave looting and object hunting. However, it must also be noted that the disturbance noted

in Z.4a, Z.5 and Z.6 differs markedly from the robbing noted in Z.1 in 1993 (Cheyney 1995). In Z.1, the majority of bones were left behind and piled in one corner of the tomb as though they had been systematically sorted through in an effort to recover grave goods. Only the (presumed) objects were removed. The cover slabs were also left disturbed, with no attempt to replace them. In contrast, the robbers / modifiers of Z.4a, Z.5 and Z.6 made a real effort to restore the cover stones. Even the small chinking stones were replaced between the slabs.

One possible interpretation is that the ancient inhabitants of Umm al-Jimāl systematically reused burial cists over a period of time. Several reports from tomb excavations in Jordan describe the removal of primary burials to make room for new interments (McNicoll *et al.* 1992; Waterhouse 1973; Stirling 1978; Ibrahim and Gordon 1986). This behavior has also been suggested for other tombs at Umm al-Jimāl (Brashler 1995 and this volume).

In Area Z itself, strong evidence for the reuse of graves comes from Z.7. A detailed inventory of human remains from this burial revealed two complete individuals – a subadult female and an adult male. In addition, three diagnostic fragments were found during screening that could not have belonged to the first two individuals. A fragment of an iliac crest that was in an earlier stage of union than those found for the subadult female and two fully unfused distal epiphyses of an ulna were uncovered. Based on duplication and developmental stage, these fragments must belong to a third individual. They were uncovered beneath the deepest burial, and therefore, must predate the two complete individuals. The remains left behind in the disturbed tombs Z.4a, Z.5 and Z.6 were similar to these, in that they were small fragments that conceivably could have been left behind when remains were removed in an attempt to clear a tomb for reuse.

Reports from Ḥisbān describe nearly empty burial shafts with intact covering structures (Stirling 1978; Waterhouse 1973). The authors attribute this arrangement to looting, but also note evidence for reuse in other contemporaneous tombs. Further investigation, including C¹⁴ dating of skeletal material and coffin remains, is necessary to clarify these questions of burial practice and post-depositional disturbance.

However, at present, it seems likely that both robbery and reuse combined to play a role in the complexity and diversity of burial types evidenced in Area Z.

UMM EL-JIMĀL 1998: AREA AA CEMETERY (M. Cheyney)

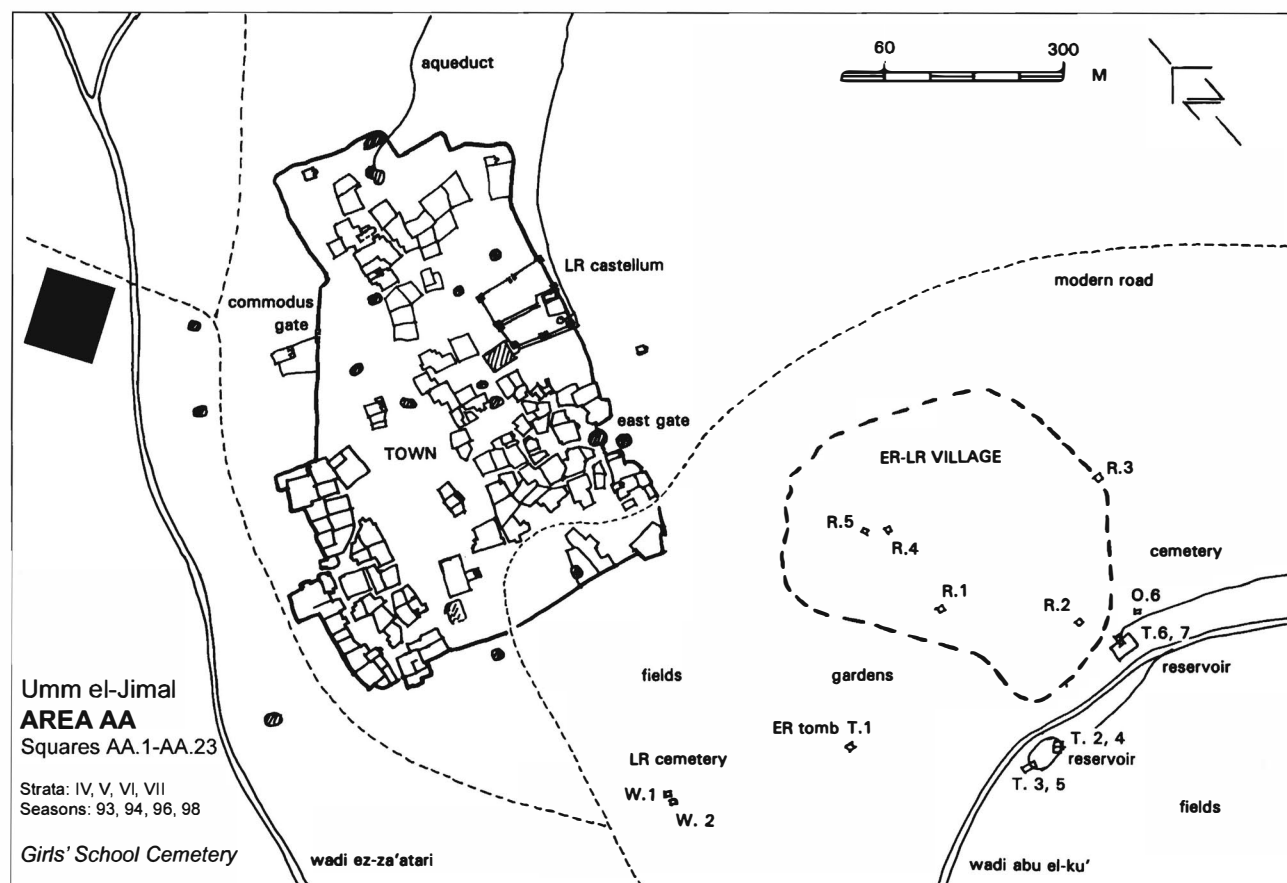
Introduction

The primary goal of excavation in Area AA in the 1998 season was to continue to increase the sample of human remains from undisturbed burial contexts, so that existing paleodemographic statistics calculated for the 1993, 1994 and 1996 collections could be incorporated into a more representative examination of Umm al-Jimāl's burial population. In addition, more extensive data on stratigraphy and ceramic chronology was needed to help refine dating estimates for the Area AA burials. In order to achieve these goals, excavation and recording of tomb structure, burial type and orientation, cultural remains present and basic age, sex, pathology and Minimum Number of Individuals (MNI) distributions were completed for four new mortuary units. In this report, I present preliminary stratigraphic and osteological results from Area AA's 1998 excavation and discuss how these findings add to previous research at Umm al-Jimāl and relevant comparative sites.

Strategy and Progress of Excavation

Area AA is located adjacent to the Umm al-Jimāl girls' school, approximately 200m west of the main standing ruins at the site (**Fig. 7**). Excavations were concentrated along the northern edge of previous units from the 1994 season (Brashler 1995: 458, 460). The patterning of known installations was projected to the north and used, with some degree of accuracy, to estimate the location of new structures. Above-ground probing allowed for relatively precise estimation of subterranean mortuary architecture. The placement of excavation units was further determined by modern building activity and estimates of likely disturbance in a given sector.

Excavations in Area AA demonstrated a consistent stratigraphic sequence of naturally deposited, red-brown aeolian soils, interrupted by tombs excavated in antiquity down to eroded bedrock. Initial excavation involved the removal of one to three loci (0.4 to 1m) of overlying soil



7. Map showing Area AA in relation to the Byzantine town ruins.

deposits until tomb architecture (cover slabs) or simple burial pits were identified. As tomb architecture became evident in the original unit, a series of extensions were opened to expose the full plan of structures running along an east-west axis. Tomb lid architecture was mapped, photographed, and removed revealing outlines of pits beneath the cover slabs. Pits were mapped and photographed before excavation of the burial space began. Human and cultural remains from the graves were systematically exposed/articulated, photographed, and mapped. Bones and associated materials were removed sequentially and, where possible, by individual until sterile soil was identified. All of the tombs excavated in Area AA this season followed a similar progress of excavation, with minor modifications related to the number of burial units uncovered per square.

With the exceptions of AA.17, AA.18 and AA.22, where no skeletal or significant cultural remains were found, all tombs in this area revealed multiple interments. As such, significant care was taken in the field to determine MNI,

sex, age and pathologies, as well as position relative to the tomb and any associated grave objects. As bones were removed, they were wrapped in newspaper and labeled. All skeletal and associated cultural material were inventoried, analyzed in the field laboratory and packed for shipment to more permanent curation facilities in the United States. At the time of writing, the skeletal material is being stored and analyzed at Oregon State University.

Summary of Results

AA.19 Stratigraphy and History of Use

The stratigraphy of AA.19 reveals a complex history of use and reuse. The remains of disturbed tomb lid architecture were discovered in the eastern end of the unit 0.8m below datum, while a reused, inscribed grave marker and six undisturbed cover slabs were found at the western end. Immediately below the slabs were wood fragments, iron nails and hinges, all remnants of an ancient coffin, along with Roman/Byzantine sherds. Glass and alabaster fragments were also present. At the base of the coffin re-

mains, an articulated skeleton (AA.19:010) was recovered (osteological analysis summarized below). Glass fragments were found in the soil surrounding the skeleton along with an *in situ* earring and a copper ring on the right middle finger. While it appears to have been common practice in the AA cemetery to deposit remains into coffins or pits that were too small (requiring disarticulation or forcing of the body into the confines of the burial structure), AA.19:010 was unusual in that the skeleton fitted easily within the coffin.

Beneath the disturbed slabs at the eastern end of the grave, another burial pit (AA.19:015) was discovered. This pit, extending down to a depth of 1.5m, contained the remains of a single individual (AA.19:020) that was complete with the exception of a missing right femur. A copper ring was found near the left hand of this individual. At the bottom of the pit, beneath the skeleton, the remains of a wooden coffin, with three iron nail fragments, and an additional set of cover slabs were uncovered. Upon removal of these slabs, a pit containing another human skeleton (AA.19:018) was revealed (**Fig. 8**). At the eastern edge of this pit, a small ossuary (AA.19:017) held the disarticulated remains of three adult individuals (**Fig. 9**).

It is likely that these three individuals were the original occupants of the pit in AA.19:015. At some point in the history of the grave's use, fully decomposed skeletons were removed from the pit grave and placed in the adjacent ossuary in what appears to be one reburial event, as little or no soil was found between the individual bones. The skeletal remains were apparently moved with great care into the ossuary space,



8. Photo of AA.19 burial pit showing skeleton AA.19:018, with cover slabs AA.19:016 still in place over the legs and feet (photo by Nathan Contant).



9. Photo of AA.19 burial pit showing ossuary with skeletal remains of three individuals on the right; articulated skeleton AA.018 is in the main pit on the left (photo by Nathan Contant).

as no postmortem fractures were inflicted until excavation this season. There also seems to have been some measure of organization to the removal and placement of ossuary remains as a distinct layer of long bones with skulls piled on top was noted during excavation.

A single individual (AA.19:020) was then interred in burial pit AA.19:015 and sealed with stone cover slabs, as was the custom in the vast majority of Umm al-Jimāl's pit and cist burials. Coffin AA.19:021 could have been associated originally with either the primary burials later moved to the ossuary, or with the fourth person who was deposited after the creation of the separate bone repository. At some point later in the history of cemetery use, another burial pit, AA.19:018, was dug through a portion of AA.19:015 and its associated cover slab architecture. This later excavation disturbed the cover slabs and the right femur of the 020 skeleton. A fifth individual (AA.19:018) was then deposited in the 018 pit and covered with stone slabs.

AA.19 Human Remains Analysis

AA.19:010: The single burial in the western half of the square, AA.19:010, was uncovered in the extended supine position, the left arm flexed across the chest cavity, and the right arm bent, hand resting on the pelvis. The skull was turned to the right, facing north with the chin tucked slightly toward the sternum.

AA.19:010 was determined to be a female on the basis of morphological characteristics including the flatness of the sacrum, the presence of ventral arcs, extremely narrow and gracile

medial aspects of the ischiopubic rami, a wide subpubic angle, and a pointed mandible (Bass 1995). Age was estimated at 35-45+ years, or late adulthood, on the basis of molar attrition patterns, anterior dental wear, antemortem tooth loss and the well-preserved faces of both pubic symphyses (White 2000). Pathological conditions in this individual included severe osteophytic lipping on the fourth lumbar vertebra, sacralization of the fifth lumbar, severe osteophytic development of the right first distal phalanx and two occlusal surface pit caries in RM₂ and RM₃. A total of nine teeth were also lost antemortem and full alveolar resorption had occurred in all locations. Attrition of the anterior dentition was so severe that secondary dentin formation was evident and crowns were frequently fully obliterated. As a result, the dental roots apparently functioned as chewing surfaces. Stature for this individual was calculated using Trotter and Glesser's (1952, 1977; White 2000) formula for the combined maximum lengths of the femur and tibia. Both complete right leg bones were used, and an estimated living stature range of 145.56-152.66cm (4'9"-5') resulted.

AA.19:017: The individuals recovered from the Locus 017 ossuary within pit AA.19:018 were fully disarticulated and commingled. However, excellent preservation and relative completeness made it possible to establish a MNI of three, and to reconstruct age, sex and pathology profiles for these individuals.

Individual #1: Individual #1 was sexed as female on the basis of cranial, sacral and pubic symphyseal morphology. Age was estimated at 17-23 years based on the non-union of the medial clavicles and the anterior iliac crests, full eruption of the third molars, and the remaining presence of visible lines of fusion in the long bones. Pathology included one occlusal surface caries in the mandibular first molar and eight additional small, pit caries in the mandibular and maxillary first and second molars on both sides. In addition, Linear Enamel Hypoplasia (LEH) of the canines, and a partially healed fracture of the clavicle with periostitis were noted. The pattern of pathologies in this individual, i.e. high caries incidence, LEH, and problematic healing of a clavicular fracture, are consistent with poor nutritional status and / or chronic disease stress.

Individual #2: Individual #2 was sexed as male based on robust and squared mandibular morphology, a pelvic fragment with an extremely narrow, classically male sciatic notch, and a complete left pubic symphysis with a narrow subpubic angle and a wide medial aspect of the ischiopubic ramus. Pubic symphyseal face morphology was estimated at early Phase IV, giving an age range of 35-45 years old at the time of death (Brooks and Suchey 1990). Extreme anterior dental attrition and uneven molar wear, especially of the left, mandibular first molar were consistent with the age estimate from the pubic symphysis. Large occlusal surface dental caries were noted in RM₃ and LM₂, along with antemortem loss and alveolar resorption of RM₁. Living stature for individual #2 was estimated at between 162.28-170.16cm (5'4"-5'7") from the maximum length of the right femur.

Owing to commingling and the similarity in size and stage of development of individuals #2 and #3 (latter described below), it was not possible to distinguish which of the following conditions afflicted which of these two adults. A survey of postcranial remains revealed that one of the two late adults suffered from a healed fracture of the left fibula (large bone callus is still present which suggests the break occurred late in life), severe hyper-ossification of the costal cartilage at rib and sternal attachment sites, a lytic lesion of the posterior manubrium, *spondylosis deformans*, osteoarthritis of the first metatarsal and the adjacent distal phalanx, and vertebral lipping.

Individual #3: Individual #3 was sexed female on the basis of mandibular morphology. Dental wear patterns indicated an estimated age range of 35-45 years. The maxillary molars and premolars in particular showed extreme attrition and uneven wear of occlusal surfaces. No intact pubic symphyses were available for corroborating age calculations. Calculus buildup was observed in five teeth and LEH could be detected on the three present canines and in one incisor. Additional dental pathologies included one caries in a mandibular molar, antemortem tooth loss and associated alveolar resorption of both mandibular third molars. Living stature was calculated at 152.14-159.6cm (5'-5'3") from one of the complete femurs (L) from the ossuary. The maximum femoral head diameter measurement

suggested that this long bone belonged to one of the two females in the ossuary. The absence of lines of fusion, which were noted as still visible in long bones belonging to individual #1, suggest that this stature calculation is most reliably associated with the late adult female, individual #3.

AA.19:020: This individual was uncovered fully articulated with the exception of the right femur which was apparently removed when the intrusive pit burial AA.19:018 was excavated in antiquity. AA.19:020 was interred extended supine, with the right arm flexed across the thoracic region, left arm extended, skull turned to the right, or south, and the chin tucked against the sternum. Either through settling or intentional placement, this individual was angled towards their left side so they appeared in a nearly side-lying position.

Individual AA.19:020 was determined to be female on the basis of pelvic and cranial morphological traits. The maximum femoral head diameter also measured 36mm, or within the range expected for females. Age was evaluated from the sternal rib extremities and dental wear patterns, as the pubic symphyses were too poorly preserved and fragmentary to allow for interpretation. Dental wear patterns suggested an age range of 25-35 years with relatively low attrition for two to three molar sequences in the upper and lower jaws. Sternal rib extremity morphology, however, suggested a somewhat older age range of Phase IV/V, or between 30 and 45 years of age. Taking all available data into account, the age of individual AA.19:020 was estimated at 30-40 years.

A dental inventory of both upper and lower arcades for the AA.19:020 individual revealed the antemortem loss and subsequent resorption of LP₃, LM₁ and LM₂. In addition, both maxillary third molars were congenitally absent and an enormous occlusal surface caries (30% of the biting surface consumed) in RM₂ was identified. This configuration of diseased or absent teeth would have caused this individual to rely more heavily on anterior dentition for food processing. Indeed, this adult's anterior teeth are extremely worn. A second caries in a maxillary lateral incisor, calculus buildup of the anterior teeth, and LEH of the right mandibular canine

were also observed, along with osteophytic lip-ping of the vertebral bodies and articular facets. This pattern of pathology helps to reconcile the apparent disjunction in dental and skeletal age, and supports an older age estimate than that indicated by molar wear patterns alone. Stature for the AA.19:020 individual was estimated at 141.7-148.8cm (4'8"-4'11") from the combined maximum lengths of the left femur and tibia.

AA.19:018: A single individual was uncovered fully articulated in intrusive pit AA.19:018 in an extended supine position, arms flexed and hands resting on the left innominate. In addition to the complete remains of this individual, two extra incisors were also recovered. Based on duplication and differences in wear patterns these elements could not have belonged to the AA.19:018 individual. However, the degree of wear is consistent with the young adult female buried in the AA.19:017 ossuary, who had sustained postmortem loss of five incisors. Given the intrusive nature of the 018 pit, the most likely conclusion is that these teeth are simply commingled from the early burials. The overall MNI for the AA.19 unit, therefore, stands at six.

Sex estimation was problematic in this individual because pelvic remains were not well preserved. Cranial features were somewhat ambiguous, although most suggested a male sex determination. A curved sacrum, pronounced brow ridges, rounded supraorbital margins and intermediate mastoid processes were observed. In addition, the mandible, though somewhat fragmentary, appeared squared or typically masculine in morphology. The AA.19:018 individual was aged at between 30 and 40 years at the time of death on the basis of molar wear patterning and sternal rib extremity morphology. The later criteria suggested an age of 25.7-34.3, or Phase IV sternal rib development (Iskan *et al.* 1984, 1985). Molar sequences indicated an age estimation towards the upper end of Brothwell's (1963; White 2000) 25-35 year range. Extreme anterior dental wear was noted in the AA.19:018 individual with all premolars and incisors worn to only a few mm above the cemento-enamel junction. Additional dental pathologies included five caries (one extremely large consuming over 25 % of the crown), antemortem tooth loss, and the subsequent alveolar resorption of the three

left mandibular molars and one right lower molar. Osteophytic lipping of the thoracic and cervical vertebrae and the distal phalanges of the feet was observed, along with a partially healed fracture of the interosseous crest in the right radius. Long bones were too fragmented to allow for stature assessment.

AA.20 Stratigraphy and History of Use

In the western half of grave AA.20, five large basalt cover slabs and associated chinking stones were uncovered at an average depth of 0.6m below datum. Beneath these cover slabs, a large burial pit (AA.20:008) with commingled, disarticulated human remains (AA.20:009; **Fig. 10**) concentrated in the south-west end of the pit was uncovered, associated with Late Roman/Early Byzantine pottery sherds. This skeletal material was likely the primary burial that was later moved to the western end of the pit in order to make room for additional burials added over an extended period of time. Adjacent to the 009 remains, at the eastern end of the pit, an articulated skeleton (AA.20:011) was uncovered interred within a poorly preserved wooden coffin facing west (AA.20:020). Within the boundaries of the coffin and beneath the 011 individual, a soil layer (Locus 012) approximately 0.1m deep and completely devoid of any skeletal or cultural material suggests that a substantial period of time separated the deposition of the AA.20:011 individual and the remains found beneath the Locus 012 soil layer - AA.20:013.

The AA.20:013 individual was fully articulated, though the upper thoracic vertebrae, associated ribs and cervical spine had settled substantially to a deeper level during decomposition or as a result of coffin base decay. Be-



10. Commingled disarticulated human skeletal remains, AA.20:009 (photo by Nathan Contant).

neath individual AA.20:013, the remains of the bottom of the coffin (AA.20:014) were found, along with small bone fragments and coffin nails. AA.20:015, located underneath what appeared to be the bottom of the coffin (014), contained the incomplete and commingled remains of three individuals. Although some articulation of these individuals was distinguishable, the remains were largely disarticulated and commingled prior to the burial of the two articulated individuals within the coffin. An analysis of the skeletal material from the commingled bone Locus 009 revealed that the AA.20:009 and AA.20:015 remains were from the same three people who comprised the primary interments of the AA.20 grave.

The history of use of the AA.20 grave likely began with the burial of the three individuals found in loci 009 and 015 during a single burial event. The remains were commingled due to settling and reburial disturbance but very little, if any, soil separated the individuals. At some point later in time, after complete skeletonization had occurred, the primary burials were partially removed and placed in the western end of the pit to make room for a coffin containing the AA.20:013 individual. Still later in time, the AA.20 grave was re-entered (after 0.1m of soil had either accumulated or, perhaps, been intentionally deposited) and a fifth individual (AA.20:011) was interred.

Following the excavation of the large burial pit described above, a 0.5m extension was made in order to expose four small stones (Locus 018) protruding from the northern balk. Beneath the cover slab structure, a small pit (AA.20:19) was uncovered. The pit contained loose reddish soil, tiny bone fragments, one tooth bud, a copper bracelet with a small round pendant, and a bead. These remains indicated the burial of a very young infant or neonate whose bones would have been too fragile to survive over the hundreds of years leading up to our excavation.

AA.20 Human Remains Analysis

AA.20:009 and AA.20:015: A minimum of three individuals were recovered from loci 009 and 015. This determination was based on the duplication of skeletal elements including long bones, pelvic remains and mandibles. In addition, developmental stage indicated the pres-

ence of at least two adults and one late subadult.

Individual #1: Individual #1 was determined to be a male on the basis of mastoid process, subpubic angle and mandibular morphology. Although this individual was largely disarticulated, it was possible to associate cranial and pelvic remains because age estimates from pubic symphyses and dental wear patterning overlapped. In addition, the diagnostic elements from the other individuals indicated the presence of two females. The pelvis, skull and mandibular fragments attributed to individual #1 were the only elements that demonstrated typically male morphology. Age was estimated at between 20 and 27 years on the basis of molar wear patterns and pubic symphyseal face morphology (early Phase II, 20-27 years). LM_3 was congenitally absent, and a living stature range of between 159.03 and 166.9cm (5'3"-5'6") was calculated from the left femur.

Individual #2: Individual #2 is a late subadult female aged 14-18 years on the basis of pubic symphyseal morphology (early Phase I, 15-24 years), epiphyseal union, and dental eruption patterning. Third molars were unerupted, and the anterior iliac crests and femoral heads were not fused at the time of death. Pelvic morphology suggests female for sex estimation, and no skeletal or dental pathologies were observed in any of the remains that could be associated specifically with the late subadult female.

Individual #3: The third individual recovered from the commingled remains of AA.20:009 and 015 was determined to be an adult female between the ages of 25 and 35+ years. Small mastoid processes, a high frontal elevation and pointed mandibular morphology all support a sex estimation of female. Dental attrition patterns of three molar sequences suggest an age range between Brothwell's early (17-25 years) and middle adult (25-35 years) ranges, for an overall age estimation of 20-30 at the time of death. None of the pathologies observed in bones and teeth could be attributed directly to this person. However, of the loose teeth excavated from Loci 009 and 015, Linear Enamel Hypoplasia (LEH) was observed in nine of the eleven canines recovered during excavation. This indicates that all three commingled individuals experienced some degree of LEH, although the poor state of preservation and the lack of articulation makes it im-

possible to associate the prevalence or severity of the condition with individuals of known sex or age. In addition, six dental caries were noted in commingled teeth, for an uncorrected average (ante-and postmortem loss not accounted for) of two caries per individual.

AA.20:011: The single individual recovered from Locus 011 was found in the extended supine position, arms at the sides, hands resting on the ilia. The cranium was uncovered in the western end of the pit facing west.

The sex of the AA.20:011 individual was determined to be male based on a number of morphological and metric traits including robust mastoid processes, sacral curvature, a narrow sciatic notch, and a maximum diameter of the femoral head within the range expected for males (45mm). An age range of 30-40 years was estimated for the AA.20:011 individual on the sole basis of dental attrition patterning (the late end of Brothwell's 25-35 years age range), as pubic symphyses were too poorly preserved to allow for evaluation. Osteophytosis of the fourth lumbar vertebra was observed along with a relatively high rate of antemortem tooth loss and alveolar resorption in this individual. Seven teeth (RM^2 , RM^3 , LM^1 , LM^3 , RM_1 , RM_3 , LM_3) had been lost prior to death, and at least partial resorption of the alveolus had occurred in all cases. Living stature for the AA.20:011 individual was calculated from the maximum length of the right femur (44.2cm) and estimated at between 164.13 and 172.0cm (5'5"-5'7", Trotter and Glesser 1952, 1977; White 2000).

AA.20:013: The AA.20:013 remains were deposited in an extended supine position with the feet partially overlapped, the right arm flexed at the elbow, hand resting on the sternum, and left arms flexed with the hand resting on the lumbar spine just above the pelvis.

The AA.20:013 individual was sexed male on the basis of the sacral curvature, a narrow subpubic angle, a wide medial aspect of the ischiopubic ramus, and the absence of a ventral arc. Pubic symphyseal face morphology was consistent with an estimation of 35-50 years of age at the time of death (early Phase IV development). Dental wear patterns of three molar sequences indicated an age range of 25-35 years.

The combination of criteria suggests an overall estimated range of 30-40 years, or middle to late adulthood. Skeletal pathology included osteophytic development of the cervical vertebrae, and of the sacrum and coccyx. Minor vertebral lipping was observed in the superior thoracic region (T1 - T4), and the manubrium and sternal body were also fully fused. Dental pathologies included calculus deposition on LP³, LM¹, LM², the mandibular incisors, and both lower canines. Finally, occlusal surface dental caries were observed in RM₂ and in a loose premolar that was too badly preserved for further identification. Stature was estimated from the maximum length of the right femur (42.4cm), and a living height range of 160.0-167.8cm (or 5'3"-5'6") resulted.

AA.20:019: The AA.20:019 burial contained the badly preserved remains of a small infant. One small phalanx and a single tooth bud were the only skeletal elements that survived and were identifiable. A small copper bracelet, a bead, a necklace pendant and the tooth bud were recovered from locations that suggest the infant was buried with the skull in the eastern end of the grave facing west. The developmental phase of the molar bud indicates an age of birth \pm 2 months for the AA.20:019 neonate.

AA.21 Stratigraphy and History of Use

In AA.21, five large cover slabs were uncovered 0.77m below datum. These were identified as tomb lid architecture, although the layout of the structure was less orderly than many of the others excavated in Areas AA and Z. Beneath the cover slabs, an oval burial pit running E-W was uncovered. At approximately 0.9m below datum, human remains were encountered within the soil stain and remnants of a wooden coffin (AA.21:009). One unidentified pottery fragment, a fully articulated subadult skeleton (primary burial) and an adult individual buried in a flexed position above the child were all found within a coffin that, apparently, was constructed to fit the dimensions of the child. The adult was added later with some degree of difficulty as the individual was substantially larger than the child-size coffin (see **Fig. 8**).

AA.21 Human Remains Analysis

Individual #1: The first individual interred in

the coffin (subadult, primary burial) was buried in an extended supine position with the arms slightly flexed at the elbows and hands resting on the innominates. The right leg was straight, while the left knee was slightly flexed at a 160 degree angle. The AA.21:009 subadult was aged 4 years \pm 12 months on the basis of dental eruption patterns (Ubelaker 1978; White 2000). Permanent central incisors and the first adult molar buds were well-preserved and consistent with this age category. No skeletal or dental pathologies could be detected in this individual. Preservation was poor, particularly for the superior skeletal remains, and the cranium remained as little more than a rounded soil imprint.

Individual #2: Individual #2, an adult, was uncovered above the primary burial within the confines of the decayed coffin outline. The positioning of the skeleton, supine with lower limb flexion, suggests that this individual was manipulated to fit within a space designed for the much smaller subadult. The knees were bent at approximately a 110 degree angle with the feet pressed into the western edge of the coffin. Due to the lack of space within the coffin, the right arm was extended against the adult's side and the left arm was positioned above the chest and pelvic cavities with the hand resting on the left innominate. The shoulders were tilted slightly toward the south (the individual's right) because of the small coffin size.

Morphological and metric traits including the maximum diameter of the femoral head (36mm), the presence of a preauricular sulcus, and an elevated sacroiliac joint suggested a sex estimation of female for individual #2. Preservation was quite poor for this person and additional diagnostic criteria like the pubic and mandibular symphyses could not be analyzed with any degree of accuracy. However, the extremely gracile build of this individual supports the estimation of female. Age was calculated from molar attrition patterns that indicated an age range of 25-35+ years. Dental pathologies included calculus buildup on the maxillary central incisors, two large caries at the cemento-enamel junction in two premolars, and one pit cavity in the occlusal surface of a loose and poorly preserved mandibular molar. A full survey of skeletal pathology and stature estimation were precluded by poor preservation.

AA.23 Stratigraphy and History of Use

AA.23 was excavated down to between 0.6 and 0.75m below datum, where a pit outline was identified (**Fig. 11**). Beneath the pit fill and within the confines of the pit structure, five large basalt tomb cover slabs and associated chinking stones were uncovered 1.45m below datum. One of the five cover slabs was a reused grave marker with an inscription that, due to time constraints, was not read or translated before the end of the field season. Beneath the cover slabs and reused inscription, a layer of pit fill that had apparently silted through the cover slabs into the tomb chamber was identified above a layer of human skeletal remains (AA.23:008). One small ceramic sherd was recovered from this fill and tentatively attributed to the Late Roman, or possibly Early Byzantine, period. Below this, a second layer of partially disturbed human skeletal remains (AA.23:009) was recovered. The soil surrounding the bones contained a few small sherds identified as Late Roman, Roman and Byzantine. Locus 009 contained disarticulated skeletal material in the upper 0.20-0.30m of soil. Beneath these remains, skeletal material was less disturbed, although no individuals were fully articulated.

The organization of remains within the burial pit indicates that the AA.23 grave was reused over time in antiquity. The bones of the first individual to have been interred, the primary burial, were moved to the sides and to the eastern end of the pit in order to accommodate a second individual. The cranium of the second burial was also later moved to the eastern end



11. West half of cist grave AA.23 with skeleton of the subadult (fourth successive burial) exposed on top of the second adult burial whose leg bones protrude on the left (photo by Nathan Contant).

of the tomb to make room for a third individual, in what would have been the third burial episode. The last reuse of the tomb, the fourth burial episode, involved the interment of a small child (**Fig. 11**). During this episode, the third individual was almost completely removed from the pit prior to the deposition of the subadult. Once the child was interred, the third individual was redeposited in the grave. The upper half of the skeleton from the pelvis to the skull was partially articulated indicating that some soft tissue remained on the bones when they were removed and replaced by the subadult. The lower body was disarticulated with bones occurring both above and beneath the subadult. Disarticulation of the majority of remains (with the exception of the subadult) is due to reuse and intentional postmortem movement of remains, whereas commingling is due primarily to settling of bone material over time. The subadult was found lying on the decayed remains of a wooden plank and wrapped in a goat hair shroud or blanket (**Fig. 12**). Skulls of disturbed individuals were found in the eastern half of the pit, while articulated remains of the later burials indicate that individuals were interred with skulls in the west facing east. A copper coin, leather sandal fragments (associated with the subadult), two copper rings and a copper bracelet were also uncovered in this locus.

AA.23 Human Remains Analysis

Articulated Subadult: One fully articulated



12. Cist grave AA.23 showing goat-hair shroud containing subadult shown exposed in **Fig. 11**; some disarticulated bones of the adult replaced above the subadult remain, with the leg bones of the adult below the subadult on the left, as in **Fig. 10** (photo by Nathan Contant).

subadult was uncovered in an extended supine position, with the right and left arms flexed across the pelvis. The remains were wrapped in a goat hair blanket or shroud and the left arm wore an oxidized copper bracelet. Age was calculated from dental eruption patterns at 4 years \pm 12 months. This age category was also corroborated by vertebral ossification. No pathologies were observed.

Commingled adults: A minimum number of three individuals was calculated from the remainder of the AA.23 skeletal material, on the basis of the most frequently occurring sizable element. In this case, long bones, jaw material, and clavicles were most useful in distinguishing individuals. Pelvic and mandibular fragments indicated the presence of two males and one female. For all three individuals, dental attrition patterns and pubic symphyseal face morphology could be used to estimate age. The first of the commingled individuals, sexed male, was aged 17-25 years on the basis of three molar attrition sequences and the presence of early Phase II pubes (19-24 years). A total of three dental caries were observed, one in the right mandibular canine and two in LM₃. Linear Enamel Hypoplasia (LEH) was also present in both mandibular canines.

The second of the commingled adults was identified as female based on pelvic and mandibular morphology. A right pubic symphysis fragment was too poorly preserved to allow for an age estimate, although the presence of lip-ping along the ventral surface is consistent with the age estimate of 45 + years suggested by dental attrition patterns. Extreme and uneven dental wear was observed in this individual along with a relatively high rate of antemortem tooth loss and subsequent alveolar resorption (minimum of ten teeth). No caries were observed in this individual, although it should be noted that the maxilla was extremely fragmentary and several teeth from the upper and lower jaw were either broken or had been lost postmortem.

The third commingled adult was sexed male on the basis of cranial, pelvic and mandibular morphology. Age was calculated at 25-35 years or middle adulthood from dental attrition patterns in three molar sequences. In addition, the pubic symphyses were estimated at early Phase IV, giving a corroborating age range of 26-36

years at the time of death. Dental pathologies included calculus deposits on the maxillary left lateral incisor and right canine, one caries in the LM₃, and the antemortem loss and resorption of the alveoli at LP₁, LP₃, LM₁, RP₃ and RM₃.

Additional commingled skeletal and dental pathologies and/or anomalies that could not be associated with specific adults included calculus deposit on two loose incisors, LEH of one loose canine, a congenital sternal aperture, abnormal ossification of the costal cartilage in the form of osteophytic development of the xiphoid process, and osteoarthritis of lumbar and thoracic vertebrae.

Summary of Burial Data

A summary of all burial data discussed in this article is given in **Table 3**.

Discussion and Preliminary Interpretation

New ceramic evidence from this season was not helpful for further refining the dates of the Area AA cemetery. All pottery for loci associated with grave installations was either Roman, Late Roman or Byzantine, as has consistently been the case in past seasons. Basic stratigraphy and pottery dates are summarized in **Table 4**.

This season's excavations provided additional evidence for themes discussed in past in research (Brashler 1995; Cheyney 1995, 1997, this volume). These include: (1) the prevalence and patterning of grave reuse, (2) questions of population continuity and discontinuity and the use of cemetery space at the site over time, and (3) what appears to be the preferred treatment of subadult individuals and their tendency to be buried with status goods.

The stratigraphy of the Area AA cemetery indicates that graves were intentionally reused over time, although, at present, it is not possible to determine whether use occurred over a relatively short period of time (i.e. within generations) or over much longer periods of time (e.g. 300-400 years). The accumulation of substantial soil fill between remains in some contexts and the evidence for movement of partially articulated individuals (indicating that some soft tissue remained at the time of re-interment) in others suggests that reuse occurred over relatively short, as well as more extended, periods of time. While previous reports have emphasized ar-

Table 3: Summary of burial data from Area AA 1998 excavations.

Burial Locus	Articulated Remains	MNI	Sex	Age	Pathology	Stature	Burial Type	Pottery calls from pit/cist loci	Orien-tation	Objects
AA.19:010	Y	1	F	35-45+	Osteoarthritis, dental caries, alveolar resorption, sacralized 5 th lumbar	145.56–152.66 cm	pit	R/Byz	E-W	coffin, copper ring, nails, hinges, glass, alabaster fragments, earring
AA.19:017	N	3	F	17-23	LEH, caries, healed fracture, periostitis		ossuary			
			M	35-45	Dental caries, alveolar resorption	162.28-170.16 cm				
			F	35-45	LEH, dental caries, alveolar resorption	152.14-159.6 cm				
AA.19:020	Y	1	F	30-40	Dental caries, alveolar resorption, congenitally absent M ³ 'S, LEH, Osteoarthritis	141.7-148.8 cm	pit		W-E	Copper ring, coffin, nail fragments
AA.19:018	Y	1	M?	30-40	Dental caries, alveolar resorption. Osteoarthritis, partially healed fracture		pit		E-W	
AA.20:009 AA.20:015	N	3	M	20-27	LM ₃ congenitally absent, LEH	159.03-166.9 cm	pit	LR/ EByz		
			F	14-18	LEH					
			F	25-35+	LEH					
AA.20:011	Y	1	M	30-40	Osteoarthritis, alveolar resorption	164.13-172.0 cm	pit	none	W-E	Coffin wood
AA.20:013	Y	1							W-E	Coffin wood
AA.20:019	Y	1	subadult	Birth ± 2 mos.			pit	none	E-W	Copper bracelet, bead, pendant
AA.21:009	Y	2	subadult	4 ± 12 mos			pit	UD	E-W	Coffin wood
			F	25-25+	Dental caries					
AA.23:008 And AA23:009	Partially	4	subadult	4 ± 12 mos			cist	LR, R, Byz		Goat hair shroud, copper bracelet
			M	17-25	LEH, dental caries					
			F	45+	Alveolar resorption					
			M	25-35	Dental caries, alveolar resorption ¹					
1. Several other pathologies were noted in the remains from AA.23:008 and 009, though they could not be associated with individuals. See text of report for a description.										

Table 4: Pottery dates from the Area AA tombs for the 1998 season.

Top soil	Locus 001	Roman, Byzantine, Ummayyad, Abbasid, modern debris
Subsoil	Locus 002	Roman, Late Roman, Early Byzantine, Byzantine
Subsoil	Locus 003	Late Roman, Early Byzantine
Cover slabs		
Burial pits		Roman, Late Roman, Early Byzantine, Byzantine

Areas AA and Z as Late Roman/Early Byzantine cemeteries, mounting evidence for successive use helps to answer the question of where the Late Byzantine residents of Umm al-Jimāl were buried. Reuse over multiple generations is also consistent with the archaeological evidence for the frequency of intrusive pits that disturb older structures, as later occupants of the site may have had difficulty relocating graves (Gordon 1987: 35). A clear direction for ongoing research is the radiocarbon dating of individuals from Areas AA and Z where stratigraphy provides relative dating of interments. This should help to clarify periods of use for both the Area AA and Z cemeteries.

A closer examination of subadult individuals is also necessary, though preliminary assessments of associations between infants/children and grave goods suggest two hypotheses that will be discussed in more depth in future publications. First, in the Area AA and Area Z graves, wealth is represented in the adornment of children and infants. This suggests that the Roman and Byzantine period occupants of Umm al-Jimāl utilized a system of ascribed rather than achieved status where kinship relationships and birth rights played an important role in deciding where and how individuals were treated in death. Secondly, the concentration of wealth in the form of moveable objects like jewelry is common in semi-nomadic populations (Ibrahim and Gordon 1987; Kobusiewicz *et al.* 2004; Porter 2002). Insofar as treatment in death can be expected to reflect social organization in life (Peleg 2002; Porter 2002), patterning of grave goods corroborates evidence from site layout and written historical accounts that suggest a mixed subsistence strategy of pastoralism and semi-settled, seasonal agriculture.

UMM AL-JIMĀL 1996: THE EXCAVATION OF TWO MONUMENTAL TOMBS, AREAS BB.1 AND BB.2 (J. Brashler)

Introduction

This article describes the clearing and excavation of two Late Roman/Early Byzantine monumental tombs. These tombs, designated Areas BB.1 and BB.2, are respectively located 1500 and 1000m south of the ancient Byzantine town and early Roman village (Momani and Horstmanshof 1995). Both were excavated with the multiple objectives of: (1) salvaging two disturbed loculus tombs and documenting their architecture, (2) making additions to the growing sample of systematically collected human remains and (3) in the case of BB.1, creating an opportunity for additional site interpretive development. Continuing research interests related to the 1996 field work (de Vries 1982, 1993 and in press; Cheyney 1993, 1995; Brashler 1995) include questions related to spatial and temporal dimensions of mortuary behavior, and aspects of nutrition, health, disease, burial custom, population demography, socio-economic status and site abandonment. Both tombs are similar to the monumental loculus tombs described by Butler (1913) which dot the landscape surrounding Umm al-Jimāl. BB.1 is farther from the ruins than any loculus tomb described by Butler (1913), but was probably associated with the ancient community. A similar outlying tomb was excavated by Bruce Dahlberg in 1984 (Area V; de Vries 1993: 445). The location of the tombs outside both the Roman and Byzantine communities is consistent with the Roman practice of burying the dead outside of the residential community and along roads.

Excavation and Analysis

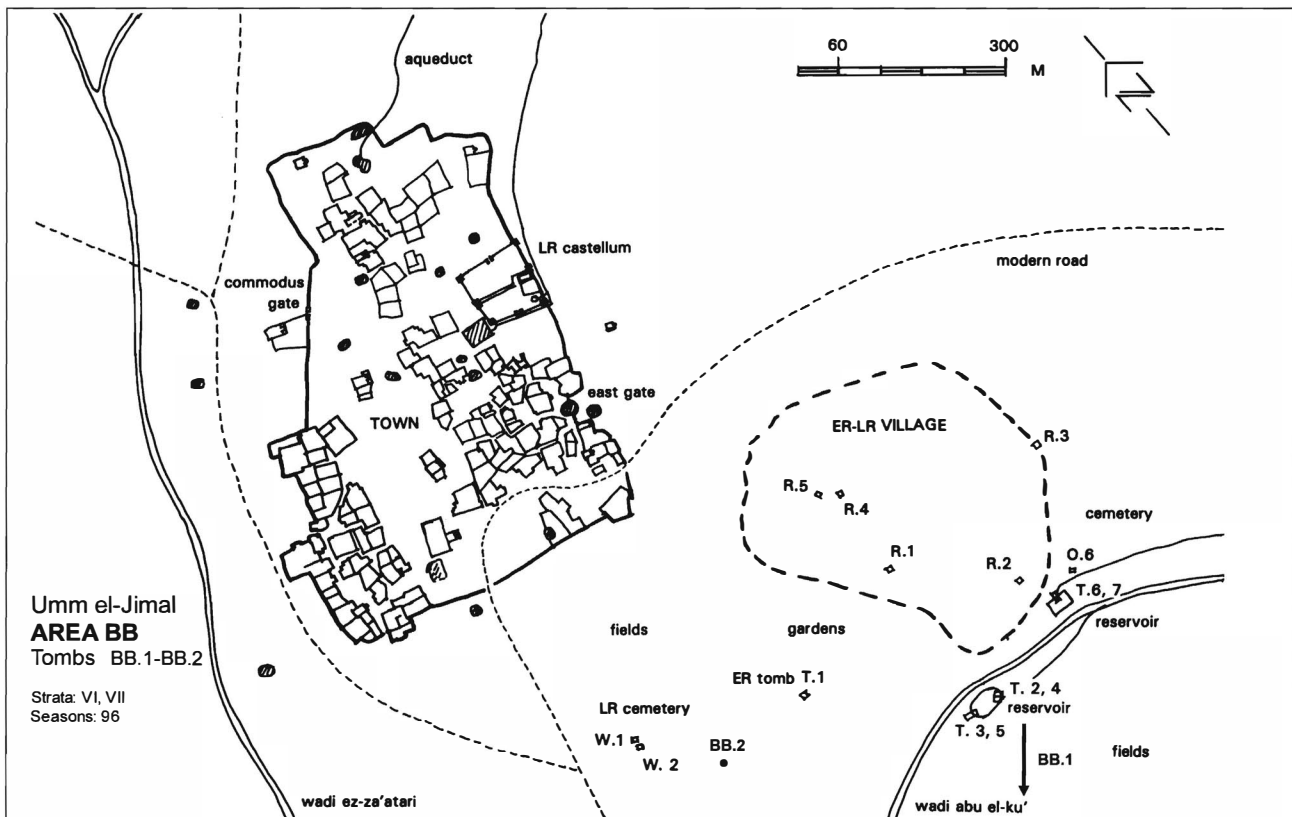
Both BB.1 and BB.2 were easily identified on the surface since they were disturbed by treasure seekers in both the recent and ancient past. As in most burial loculi, there was no way to differentiate deposits since the contents were mixed and disturbed repeatedly by both human and non-human agents, including plant roots, irrigation water seepage, snails, beetles, rodents, tortoises and desert fox occupation. The disordered nature of these deposits was manifested by the lack of any articulated human remains in 23 of the 27 loci from both tombs. Therefore, excavation consisted of clearing remaining soil, rock, human bone, non-human remains and objects from most loculi. Loci containing articulated remains were excavated systematically, photographed and/or drawn, and fill surrounding the remains was screened with 5mm or smaller mesh screen. One locus of BB.1 contained an *in situ* burial which was exposed, photographed and planned before removal.

Tomb BB.1

BB.1 is substantial chamber tomb with mul-

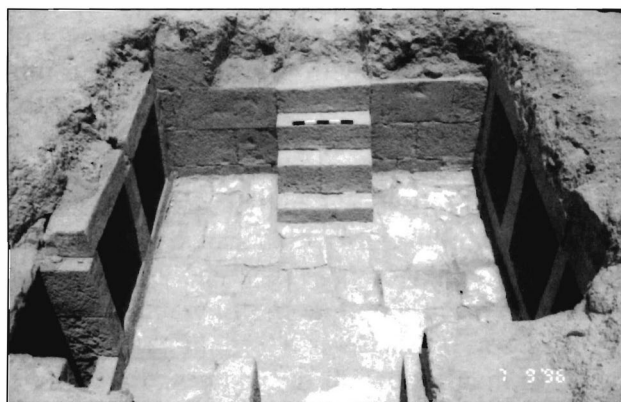
tle loculi, cut into eroded basalt bedrock dipping to the south; this was evident in the floor of loculi situated at the southern end of the tomb (Fig. 13). The tomb is oriented along cardinal directions and consists of a single level of 11 loculi surrounding a main entrance chamber on three sides (E, W and S), all of which were constructed of field and finely dressed basalt blocks. Basalt stones facing the interior of the main chamber and the components of most loculi were neatly dressed, while exteriors of exposed stones from the ceilings of several loculi were crudely field dressed. The roof of the tomb was not preserved. Furthermore, no door was recovered nor is there any evidence for a second floor/storey since the tops of loculi cover slabs were roughly dressed and not likely floor material for a second level of loculi. Given the position of the remaining tomb architecture and infilled soil, it seems likely that the tomb entrance and roof were above ground level.

The floor of the main entrance chamber was paved with flagstone-sized basalt covered with plaster. Plaster was used to point the joints of the stairs, the floor with the walls of the tomb,



13. Location of tombs BB.1 and BB.2 on the Umm al-Jimāl area map.

and within each locus at the contact between walls, floor and, occasionally, ceiling. Beneath the plaster on the floor, two inscription stones were located between the stairs and the entrance to locus BB.1:006 in the NW corner of the tomb, indicating the use of earlier tomb inscriptions in the construction of the existing floor. A probe beneath the flagstone floor produced Late Roman pottery, two small round glass beads, a copper bracelet fragment and a bead fragment, all small objects which could have been introduced through cracks in the floor during various episodes of use, re-use or vandalism. The main chamber was accessed by stairs located at the N end of the tomb (**Figs. 14 and 15**). The SW and SE corners of the tomb contained two large loculi with an indirect access from loculi that opened on to the main chamber. The E, W and S 'walls' of the main chamber each had direct access to three loculi. The main chamber was nearly square, measuring 2.85m N-S by 2.81m E-W. Loculi varied in size depending on wheth-



14. Overview of chamber tomb BB.1 (facing north).

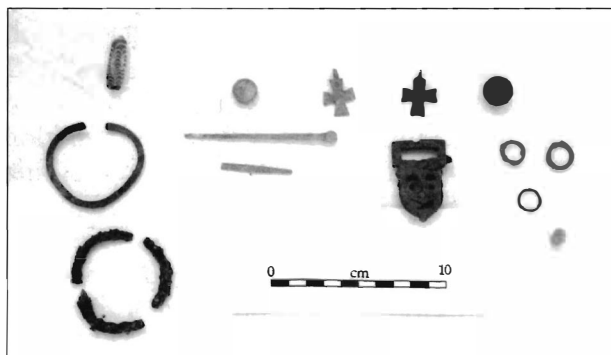


15. Overview of chamber tomb BB.1 (facing west), showing the entrance stairway and three western loculi; the left locus gives access to 'hidden' locus BB.1.009, which fills the corner between the west and south loculi.

er they were corner loculi accessed through another locus, or one of the nine loculi accessed directly from the main chamber. These nine loculi were all approximately 2.4m in length and their interiors approximately 1.2m high, giving overall horizontal dimensions for the tomb of 5.25m N-S by 7.61m E-W.

Fill within the main chamber (BB.1:001, 002) contained a variety of objects, presumably disinterred from loculi. These included several concentrations of Early Roman to Early Byzantine pottery from BB.1:002, located near the floor in the north-west and north-east portions of the main chamber, and numerous objects in BB.1:001 and 002 including glass, a bronze cross, corroded iron and copper fragments, a bone bead, two carved bone hairpins and a bone knob, possibly from a make-up bottle (**Fig. 16**). Individual loculi were constructed with floors lower than the main chamber floor. In some cases (BB.1:009 and 013), the floor may have been formed from eroded bedrock since no small cobble stones were present.

Based on the presence of Early Roman pottery in four loci and the tomb architecture, it is reasonable to hypothesize that the initial construction of BB.1 took place during Early Roman times, perhaps during the first or second century. This would affiliate the tomb with the Early Roman occupation at Umm al-Jimāl (Momeni and Horstmanshof 1995; de Vries 1995). The use of funeral stele with Greek epitaphs in the floor of this tomb suggests that initial construction occurred after the population at Umm al-Jimāl was established and had buried some of its dead. Late Roman pottery occurred in 13 of the 15 excavated loci, suggesting the tomb's heaviest use was during the third or fourth centuries. The adaptive re-use of the inscription



16. Assemblage of small objects from BB.1.

stones may have occurred during remodeling in this period (**Fig. 17**). Early Byzantine pottery in five loci is interpreted as continued use of the tomb as a mortuary facility in the fourth century, while three Umayyad sherds may be evidence of continued use or robbing in the seventh to eighth centuries. Curiously, however, these three sherds occurred in loculi with relatively better preservation, and from which articulated remains were recovered (Loci 006, 011 and 015). In both 006 and 015, the Umayyad sherds were from close to the surface of the loculus fill, while the lower fill was not disturbed, at least by individuals leaving behind Umayyad pottery. Perhaps Umayyad use of the tomb was not robbery, but rather some other use, since the lower portions of these two loci were not disturbed.

Small quantities of human remains, pottery and objects were recovered from only four loculi: BB.1:007, 008, 009 and 010. The number



17. Inscribed tombstones in floor of BB.1, located between stairway and south chamber wall. The closest reading is AKRABH ZABDOU, or "Aqrabe (daughter of) Zabdos"; names are typical of Nabataean - Roman era inhabitants.

of individuals who once reposed in BB.1 will therefore never be known. Architecture of these four loculi was exposed prior to our excavations, and large quantities of rubble, plastic and other modern debris occurred in each. Loci BB.1:006, 011 and 016 had substantial quantities of human bone and a few objects. Locus BB.1:015, which showed the least evidence of disturbance, contained *in situ* skeletal remains and 12 objects (**Fig. 18**). Loci BB.1:012, 013 and 014, which were more disturbed, contained fewer objects and pottery, owing to either re-use or robbery.

The relatively well preserved nature of BB.1:015 provides the best opportunity of any loculus burial excavated to date at Umm al-Jimāl to make projections of total tomb population once minimum numbers of individuals for that loculus are calculated. However, evidence for re-use in the loculus (bones pushed to the sides and back of the tomb, disarticulated skulls and a secondary cremation deposit) provide cautionary evidence of disturbance which could



18. Headless skeleton B.1.015 in Loculus B.1:016.

mean that the contents removed in 1996 excavations represent only a fraction of the total use of the tomb. Work to decipher the taphonomic transformations of the archaeological deposits in BB.1 will be necessary to gain further insights into its history of use.

Tomb BB.2

BB.2 was located during the 1996 survey of existing monumental tombs at Umm al-Jimāl. This is a small N-S oriented vaulted chamber tomb with two loculi (**Fig. 19**), a narrow entranceway defined by a door and side wall architecture, which is situated south of a 3.2m long entrance passage, or *dromos*, with four steps and a sloping plaster lined floor leading from the ground surface to the doorway (**Fig. 20**). The tomb, including its entrance passage, is approximately 6.6m N-S; the E-W dimensions vary from 1.0 m (interior measurement of the

entrance passage), to 0.72m (interior measurement of the small entryway into the vaulted loculi chamber), to 1.8m (interior measurement of the vaulted chamber). Like BB.1, plaster was used to point the joints between the walls and stairs, and the walls and plaster floor of the long entrance passage at the base of the small entryway, but not the floor of the small entry way itself. The two loculi and the vaulting system over them were constructed of well dressed, carefully laid basalt. In BB.2:008, the eastern loculus, one of the cover slabs was a re-used inscribed stone found at the S end of the loculus.

Though human remains were recovered from all loci, the only articulated skeletal material in the tomb was retrieved from the entryway. These remains, though fragmentary and very badly preserved, represent re-use or robbing of loculi in antiquity since they are partially articulated, occur mid-way down through the fill in the long



19. Vaulted chamber of Tomb BB.2, with doorway and fallen door in foreground; the two loculi are not visible.



20. Re-erected door with dromos and entry steps of Tomb BB.2 beyond; taken from top of chamber vault (facing north).

entrance passage, and appear to have been exposed to the open air for a period of time before they were covered by windblown soil. Other evidence of clearing operations in antiquity are the presence of at least five partly restorable lamps, three partly restorable ceramic vessels and large concentrations of broken pottery on and above the steps in the long entrance passageway.

Relatively little bone was recovered from the W loculus (B.2:007) within the vaulted area of the tomb. Pottery from this loculus was Roman, Early Byzantine and Byzantine; objects included two copper bracelet fragments, a thin, possibly modern metal fragment, a copper coin, and a fragment of an iron bracelet. The most unusual discovery in this loculus was a naturally mummified desert fox (*Vulpes* sp.), which was apparently using the far southern end of the loculus as a lair at the time of its death.

The east loculus (B.2:008) within the tomb contained a larger quantity of skeletal material, most notably the remains of an unusually high number of well preserved foetal, infant and juvenile bones in comparison with other loculi excavated in either BB.2 or BB.1. None of these remains appeared articulated, but the surprising number of recovered objects may reflect the larger number of items initially buried in this loculus, given that it -- like BB.2:007 -- was disturbed and contained plastic debris throughout its fill. Objects recovered include a marble fragment with curved smooth surfaces, glass beads, a plaster doll torso (head missing), a bone disc from a juglet, an iron fragment, corroded copper or bronze fragments, a copper or bronze section of chain, a gun shell (from the rear of the chamber) and ca 50 uncarbonized olive pits, most of which were gnawed by rodents.

The use history of BB.2 is complex. Pottery suggests that the initial construction and use of this tomb was Roman, though all but one of the 'Roman' pottery attributions (n = 12) are 'generic' Roman or Late Roman, which might place initial construction of the tomb in the second or third centuries AD. Use of the tomb probably continued into the fourth or fifth centuries, given the eight Byzantine or Early Byzantine sherds. A single sherd each was attributed to the Late Byzantine, Late Umayyad and Late Abbasid periods, which may be related to a period of re-use or robbery. The Late Umayyad sherd was from

Locus 004, above the loculi in a convenient location for tomb robbers to leave their booty and snack food remains (as did the 20th century robbers). The Late Abbasid sherd came from midway through the deposit in the long entrance chamber, and may reflect a visit to the tomb at a time when the chamber had filled halfway with windblown soil and clean-out from earlier uses, as evidenced by the partially articulated remains in Loci 002 and 005. The single Late Byzantine sherd was from Locus 008, the east loculus, and may be related to a late re-use of the tomb in the sixth or seventh century.

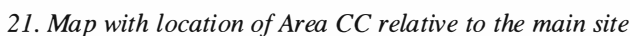
In antiquity, the long entrance passage to the tomb proper would have been open to the air, but it and the small entrance between the door and the tomb were filled with soil, rock and other debris when excavation began in 1996. Although the small entrance to the tomb and vaulted chamber contained plastic bags, tea cups, crisp packets and other remnants of recent digging in the two areas, the fill of the long entrance passage was largely devoid of recent debris. Thus, it is likely that the small entryway to the tomb was covered by a roof that was removed not long before 1996, perhaps so the thieves could gain access. Some architectural elements, including an inscribed stone were recovered inside the long passageway, but the lintel for the door was not found. Possibly the roof and top of the door structure for this part of the tomb were removed, most likely during the recent robbing of the tomb.

The variety of ceramics, unusual architecture and surprising number of infant remains make this tomb stand out from other loculus tombs recorded in the vicinity of Umm al-Jimāl. The apparent over-representation of infants is curious. In other parts of the Roman Empire infants were not always accorded the same treatment as adults. Soren and Soren (1995: 43) and other sources on Roman burial custom suggest that "there was no tradition of burying babies in cemeteries at all" and further postulate that a malaria epidemic may have been responsible for numerous infant remains recovered from a fifth century AD cemetery north of Rome. Thus, the location of a cemetery with numerous infant remains at Umm al-Jimāl may provide tentative evidence of community depopulation prior to abandonment, but much additional research

The two Area BB tombs, along with the Area V tomb are significant additions to the group of chamber tombs published by the Princeton University Expedition survey of 1905 to 1909. The original use of these tombs was in the Roman period (second to third centuries). The fact that both tombs incorporate re-used tombstones with Greek epitaphs indicates that they were not the first tombs of the Nabataean-Roman era at the Umm al-Jimāl settlement. One can therefore envisage a period of about two centuries in which such chamber tombs were being constructed to accommodate the burial needs of elite residents. It is also possible – especially in the case of Tomb BB.1 – that these re-used tombstones were introduced during Early Byzantine remodeling and repairs. Ceramic sequences and artifacts indicate the re-use of these tombs in the fourth to fifth centuries, or

UMM AL-JIMĀL 1998: CEMETERY AREA CC
(J. Brashler, M. Cheyney, B. Boersma, N.
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Area CC is located in an old olive orchard north-west of the main standing ruins (**Fig. 21**). The area is bordered to the north by a road and to the west by a modern cemetery and houses. The purpose of excavations in Area CC was to establish the limits of the cemetery partially excavated in Areas Z and AA in previous seasons. Further goals were to increase the sample size of datable skeletal remains excavated from burial



sites surrounding the site of Umm al-Jimāl, and to establish the relative chronology of the different burial areas.

Strategy and Progress of Excavation

The location of the Area CC units was based on the likelihood of finding grave architecture below the surface, as determined by ground probing. Upturned cover slabs visible through wind deposited and plough disturbed topsoil loci also helped to indicate the presence of graves beneath the surface. Squares were oriented north-south in an attempt to locate graves running in the usual east-west direction. As with all probes and extensions, plans were drawn and photographs taken before excavation.

The general method of excavation in Area CC involved the removal of stratified soil layers in spits of 10cm. Once burial pits were detected, excavation centered on defining the pit outline, excavating the pit contents, articulating the bones and/or objects present, and removing the skeletal remains for analysis. All human skeletal remains were analyzed in the field and shipped to the United States for further assessment.

Summary of Results

CC.1 Stratigraphy and History of Use

Three layers of soil (Loci CC.1:001, 002 and 003), differentiated by color and texture, were excavated to reveal disturbed basalt grave markers or cover slabs (004, 006) within a pit (007) that had been excavated into eroded bedrock (005) sometime in antiquity. Within the pit, in the uppermost layer, disturbed cover slabs, associated chinking stones, Late Roman and Early Byzantine pottery sherds and highly fragmented human bone were uncovered (CC.1:008). Beneath the disturbed cover slabs, a cist grave (CC.1:009) surrounded by a ring of cobblestones (CC.1:011) was revealed (**Fig. 22**). Adjacent to the cobblestones in the pit fill located outside the cist, the presence of metal fragments, remains of a wooden coffin and highly fragmented human remains also indicated that the remains of the cist had been disturbed in antiquity. Human remains within this cist fill (C.1:010) were disarticulated but otherwise well preserved. No other grave goods or pottery were found associated with cist contents, making dating problematic.



22. Tomb CC.1:007 showing cist architecture C.2:009.

CC.1 Human Remains Analysis

Within the single grave (CC.1) uncovered within the confines of the CC.1 trench, a minimum of two individuals were accounted for, primarily on the basis of the duplication of cranial bones, including the full preservation of two distinct frontal bones. Both individuals were less than 50% complete. One possible female was identified on the basis of frontal elevation and nuchal crest morphology. In addition, the maximum diameter of one present, complete left femoral head was 37.5mm, or within the range of expected diameters for females as determined by Stewart (1979; $F < 42.5\text{mm}$). The sex of the second individual was indeterminate, as it was not possible to establish whether the two sex diagnostic elements described above were from the same or separate individuals. The absence of sex-specific male skeletal remains is inconclusive because that may be accounted for by

the disturbed nature of the grave and incomplete preservation of individuals.

Molar attrition patterns indicated the presence of two adult individuals. The first was aged at 17-25 years, or early adulthood, and the second was estimated at 25-35 years, or within the middle adult range, at the time of his or her death (Bass 1995; Brothwell 1965; White 2000). The degree of epiphyseal union in long bones was consistent with age indications from dental wear. Because remains were not articulated and no full diagnostics, *i.e.* skull and mandible or complete innominate, were recovered, it is not possible to associate age and sex for either individual.

The same femur used to estimate sex from femoral head diameter was analyzed to provide a living height calculation using Trotter and Glesser's (1952, 1977) formulae for white females. Because its maximum length was 41.5cm, the living stature range was calculated at between 152.9 and 160.3cm (5'-5'3"). The only pathology preserved in the CC.1 skeletal remains was a small occlusal surface pit caries in a loose and fragmented adult molar.

CC.2 Stratigraphy and History of Use

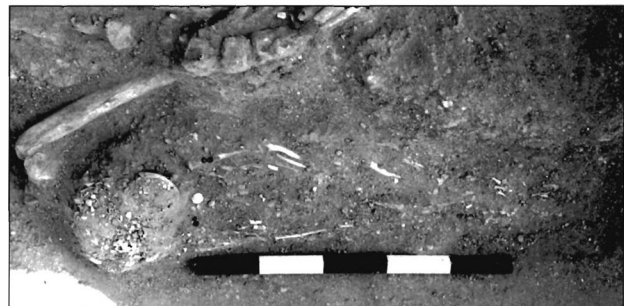
In Unit CC.2, a layer of wind deposited soil (CC.2:001) was excavated to reveal a rocky stratum (002) approximately 45cm below the ground surface. The partial outline of a pit was discovered in the north-east corner of the unit, following removal of an additional sterile soil layer (CC.2:003) below Locus 002. An extension was cut to reveal the entirety of the pit structure. Although the section showed that the pit extended as high as 002, the pit outline did not become clearly visible in plan until reaching the bedrock cap, Locus CC.2:004. Continued excavation of Loci CC.2:001, 002 and 003 throughout the extended unit revealed the outlines of two more pits in excavation unit CC.2. The pits are referred to by the loci which first described them. Pit CC.2:005, the first uncovered, is located near the middle of the square. To the north-east lies pit CC.2:006, and to the south-west pit 007. In the process of exposing the entirety of all three pits, a fourth and much smaller pit outline (CC.2:018) was uncovered.

Excavation of pit CC.2:005, revealed the near complete skeleton of a horse, CC.2:021

(Fig. 23), and an infant, CC.2:025 (Fig. 24). The smaller pit (018) adjacent to 005 contained the tarsals and metatarsals of the horse from 005. The abdominal cavity and tail of the horse were not completely skeletonized and were marked by green soil staining that resembled copper oxidation residues. However, these appear to have a fully organic make-up as no copper or other metals were found in association with the stains, though metal and leather remnants of a bridle or halter were found around the horse's mandible and occiput. The green material was fibrous, filled with hollow tube-like structures and could either be the remnants of fabric of some kind



23. Skeleton of horse CC.2:021 in pit CC.2:005



24. Child burial CC.2:025 against the horse's forelegs; its bones are poorly preserved.

or, more likely, the decaying organic residues left by the interaction between soft tissue and microorganisms. Grave CC.2:005 may have been left open initially, covered only by a tent or wooden structure as evidenced by four possible post stains found to the west and south-east of the CC.2:018 pit. It is possible that the decay process began whilst the remains were exposed, and were later covered by dry soil after partial decomposition had taken place. The fact that the rib cage was packed with soil while maintaining a relatively large volume (i.e. the rib cage had not collapsed) suggests that fill seeped in gradually as or after some of the soft tissue decayed. Laboratory analysis of the stained soil will be reported in future publications.

The infant remains uncovered in pit CC.2:005 were placed next, and inferior to the horse, the head resting on the animal's front legs (**Fig. 24**). Soil stains and the remnants of leather or thick fabric indicate that the child was wrapped in a shroud, blanket or garment, and wore a necklace at the time of deposition. The pit containing the infant appears to have been dug partially into the soil next to the distal forelimb of the horse. Full articulation of the horse's forelimbs suggests that the baby and horse were buried at, or close to, the same time-before substantial decay of soft tissue had occurred in the horse. Small stones located superior to the infant's skull and spine suggest that a pile of rocks was laid to define the space between the infant and the horse's abdomen. Small unidentifiable pottery sherds were also found in pit CC.2:005.

The relationship between pits CC.2:005 and 018 remains unclear. The presence of tarsals and metatarsals in pit 018 indicate that the later was intrusive, having been dug after the deposition and at least partial skeletonization of the horse in 005. The rear legs of the horse closest to pit CC.2:018 were also disturbed, and the sacrum of the horse was found near the eastern end of pit 005. Pit 018 may have been intended for an infant's burial before it accidentally disturbed the horse and infant burial. As discussed in previous reports, new graves are commonly dug into older pits and cists suggesting a period of use substantial enough to allow Umm al-Jimāl residents time to lose track of precise tomb locations (Cheyney, this volume: Area AA). Once the horse burial was disturbed, the

ancient inhabitants apparently stopped excavation, perhaps choosing another location for the intended burial. Pit 018 may have originally been intended for the infant in 005, though the lack of disturbance of the forelimbs of the horse and, as discussed above, the placement of stones between the horse and infant suggest that they were intentionally buried together at about the same time. The most likely scenario at present is that 018 is an intrusive burial pit that was never used. However, it also possible that 018 was dug to hold additional funerary objects, that were either looted in antiquity or removed as part of culturally constructed burial practices. No pottery or other datable materials were found in 018.

The excavation of pit CC.2:006 uncovered Late Roman pottery sherds, small glass fragments and a copper ring along with numerous loose, disarticulated human bone fragments that were concentrated at the center of the pit's southern side. Further excavation revealed tomb cover slabs (**Fig. 25**) and a surrounding rock pavement. These cover slabs were removed and the tomb beneath them excavated. Another concentration of disarticulated bone was found in the center of the pit. A third bone concentration was



25. Tomb CC.2:006, showing partly preserved cover slabs CC.2.023.

discovered below these in the eastern half of the pit (**Fig. 26**). Directly below this bone concentration was an articulated skeleton, running east to west from head to toe, and lying on the left side. The remains of leather sandals were associated with the feet and a small pocket of ashy, burned organic material was found adjacent to the mandible of the articulated interment, perhaps indicative of a ceremonial offering made at the time of burial. The walls of the burial cist were covered with the remains of mud plastering, and a dark soil stain at the bottom of the cist may represent the remains of a coffin or shroud (**Fig. 26**). In addition, a few small water-washed Roman period pottery fragments, a glass bracelet, black glass rings and very small dark glass beads were found associated with the articulated burial. This pattern of skeletal deposition suggests that the primary burials of CC.2:006 were



26. Tomb CC.2:006 showing intermingled human skeletal remains CC.2:032.

moved to the edges of the grave to make room for the fully articulated individual after skeletonization was complete -- a common practice at Umm al-Jimāl (see Brashler 1995 and this volume; Cheyney 1995 and this volume).

Grave pit CC.2:007 was clearly visible in plan, being cut into bedrock (CC.2:004). Surrounding the pit were nine small darkened soil stains that were roughly circular and interpreted as possible post holes. Excavation within 007 revealed a smaller pit within the larger one. Included in this smaller pit was a pierced saltwater shell that may have been used as a pendant, two earrings and the poorly preserved bones of an infant. In addition, an articulated skeleton of a child was discovered in the larger pit 007. Skeletal remains and associated grave goods including Late Roman sherds, two *in situ* copper and amber earrings, glass beads and a necklace pendant with metal clasps were found associated with the fifth cervical vertebra of the child. The CC.2:007 individual was buried in an extended supine position running east to west from head to toe, with the legs flexed 120 degrees. The smaller pit containing the infant was cut into the soil anterior to the child's femurs.

CC.2 Human Remains Analysis

Square CC.2 contained three separate graves (CC.2:005, 006 and 007), and possibly a fourth, abandoned one (CC.2:018), that were all identified within the confines of the original excavation trench. Distinct graves were distinguished in field notes and square supervisors' weekly reports by the locus number assigned to the portion of the pit first recognized during excavation.

Grave CC.2:005 contained the undisturbed remains of a fully articulated horse and a small child aged 2-3 years on the basis of dental eruption patterning and adult tooth bud development. Adult central maxillary incisor buds indicated an age of 3 years \pm 12 months, although the permanent first molar buds were between 2 yrs \pm 8 months and 3 yrs \pm 12 months according to Ubelacker's (1978) standards. Neural arches were fully fused and the ossification of primary fusion centers between the vertebral arch and centra had not yet occurred. Epiphyseal fusion, thus, corroborates an overall age estimate of 2-3 years of age at the time of death. No skeletal

pathology was observable, although a possible dental caries on the buccal surface of a deciduous maxillary central incisor was observed.

Grave CC.2:006 contained the remains of partially disturbed human burials located above a fully articulated individual. A minimum number of four individuals were identified on the basis of duplication of diagnostics, including pelvic, dental and cranial remains. The fully articulated primary burial was identified as a subadult female based on pelvic and mandibular morphology, as well as overall gracility. Although the three other individuals were commingled and only partially complete, excellent preservation of the innominates and mandibles indicated the presence of an additional adult female and two adult males. Where preservation allowed, age for all four individuals was calculated separately for upper and lower jaws and for both public symphyses (Brooks and Suchey 1990). These ages corresponded sufficiently to suggest the association of cranio-dental remains and pelvic elements for the three commingled individuals, and helped to refine age ranges based on both dental and skeletal morphologies. Epiphyseal fusion of long bones was also used to calculate age at the time of death of the articulated burial. Age and sex estimates are summarized in **Table 5**.

Two femurs were sufficiently well preserved to allow for living stature calculation in the field. A right femur associated with the late, subadult

female measured 35.7cm, indicating an antemortem height of between 138.6 and 146.0cm (4'7"-4'9"). A second intact femur (L) was uncovered in the commingled remains above the articulated individual and could not be clearly associated with an individual of known age or sex. However, the maximum diameter of the femoral head suggested that the femur most likely belonged to one of the two males interred in grave 006. A stature estimate of 168.8-176.7cm (5'6"-5'9") resulted when Trotter and Glesser's (1952 and 1977) formula for white males was applied.

A total of seven dental caries were observed – three in loose teeth that could not be definitively associated with particular individuals, and four in the teeth still present in identifiable jaw fragments. The undisturbed, subadult female had one small buccal cavity in LM₂. Linear enamel hypoplasia was also present on the upper and lower incisors and canines of this individual, indicating periods of prolonged disease or nutritional stress during early childhood (the years of dental enamel formation). A 45 degree rotational misalignment of the left mandibular canine, due to crowding, was also noted. In addition to dental pathologies, the female subadult evidenced a partially healed fracture of the superior sternal body. The break was not completely healed at the time of death and, because the individual was so young and at a point in development where osteoblastic activity would have been high (*i.e.* healing should

Table 5: Age and sex estimates for skeletal remains from CC.2:006.

<i>Individual</i>	<i>Sex</i>	<i>Pubic symphysis phase</i>	<i>Dental attrition phase</i>	<i>Overall age estimate</i>
1*	M	Early Phase II 23.4 ± 3.6 yrs.	20 - 25	20 - 30
2*	F	Fragmented, mid to late adult	35 - 40	30 - 40+
3*	M	Late Phase V 45.6 ± 10.4 yrs	35 - 45+	40 - 50
4 (articulated)	F	Early Phase I ≤ 18 yrs	15 ± 36 months	14 - 18

* Commingled individuals uncovered above the fully articulated burial

occur relatively quickly), this injury could be a perimortem trauma. A lytic lesion on the posterior surface of the manubrium indicates that a bone infection was introduced at the sternal fracture site. Hypertrophic muscle attachment sites located superior to the medial epicondyle on the left humeral diaphysis were also noted, and may be indicative of heavy use associated with a habitual, subsistence-related task.

The male individual aged 20 - 30 years had one large, occlusal surface caries in RM₁. In addition, a large buccal abscess associated with the decayed tooth extended from the alveolar ridge down approximately one centimeter into the mandibular body. Rounded, smooth bone formation along the rim of the abscess indicates that some antemortem healing occurred prior to this individual's death. Some osteoarthritis of the vertebral bodies was apparent in all three of the commingled adults.

A large caries at the cemento-enamel junction of RP⁴ was noted in the female adult aged 30-40+ years. Both first maxillary premolars were severely worn, to the extent that the dental roots functioned as occlusal or chewing surfaces for this individual. Antemortem tooth loss and at least partial alveolar resorption were apparent for all maxillary molars and for LP³. Osteoarthritis of the centra, marginal osteophytic development of the articular facets in the thoracic region of the vertebral column, and a possible case of Diffuse Idiopathic Skeletal Hyperostosis (DISH) were also noted. Finally, a healed fracture in a right femoral shaft fragment was observed. It is likely that the fractured femur belonged to this female, as it is found in the smallest of the upper leg bones uncovered among the commingled remains deposited above the articulated burial.

The late adult male, aged 40-50 years, is represented by a complete lower jaw that contains one occlusal surface caries in the LP₄. The RM₁ was severely worn to the extent that the pulp chamber was completely exposed in the occlusal plane. In addition, all lower left molars and the right third molar were absent antemortem with at least partial alveolar resorption in all cases. Consistent with the older age suggested by the pubic symphyses morphology and dental remains, this individual, like all of the commingled adults in this burial, showed signs of

osteoarthritis in the form of severe lipping of vertebral bodies in the thoracic and cervical regions. Finally, calculus buildup was observed in several loose, mandibular incisors, which may have belonged to either this late adult male or to the late adult female described above.

Grave CC.2:007 contained the remains of two undisturbed subadult individuals. A minimum of two individuals could be distinguished on the basis of the duplication of tibiae and by obvious differences in size and developmental phase of non-duplicated skeletal elements.

The undisturbed individual at the bottom of the grave was a subadult of unknown sex, aged 9 years \pm 24 months on the basis of dental eruption and developmental patterns. The roots of the permanent incisors and the adult canine buds were well formed, yet deciduous canines were still present. The first adult molars were fully erupted and the second and third permanent molar buds were at age stages of eight to nine and 11 years respectively (Bass 1995; Ubelack-er 1978). Epiphyseal fusion of growth centers was consistent with dental age estimates. Grave goods, including a pair of earrings found *in situ* (or where the individual's ears would have been prior to decomposition), may suggest that this child was female.

The second individual, a small infant aged less than one year, was uncovered lying on the semi-flexed femurs of the primary burial. It appeared as though the infant was placed on the lap of the first subadult with the skull in the direction of the primary burial's feet. This individual was poorly preserved, represented by only the tibiae and small skull and rib fragments. The thinness of the cranial remains and the size of the long bones are consistent with an age estimate of between birth and one year of age.

The infant was too poorly preserved to analyze for skeletal or dental pathology. However, evidence for Linear Enamel Hypoplasia (LEH) was noted in the central incisors of the child, indicating a period of nutritional or disease related stress during foetal development. Skeletal data is summarized in **Table 6**.

Discussion and Preliminary Interpretations

Excavations in Area CC have expanded the known range of burial practices at Umm al-Jimāl, while providing further evidence for

Table 6: Summary of burial data from Area CC 1998 excavations.

Burial Locus	Articulated Remains	MNI	Sex	Age	Pathology	Stature	Burial Type	Pottery calls from pit/cist loci	Orien-tation	Objects
CC.1:007	N	2	F unknown	17-25 ¹ 25-35	One small occlusal surface pit caries	F 152.9-160.3 cm	cist	Late Roman Early Byzantine	E-W	Metal fragments, Coffin
CC.2:005	Y	1	unknown	2-3			pit		E-W	Horse, leather and metal bridle/halter, post molds, shroud, necklace
CC.2:006	One articulated, Three commingled	4	M	20-30	Caries, abscess, osteoarthritis	168.8-176.7 cm ²	cist	Late Roman	E-W	Glass fragments, copper ring, leather sandals, ash, coffin or shroud, glass bracelet, rings and beads, earrings
			F	30-40+	Caries, severe dental wear, alveolar resorption, osteoarthritis, DISH, healed femur fracture					
			M	40-50	Caries, extreme dental wear, alveolar resorption, calculus, osteoarthritis					
			F	15±36mos	Buccal caries, LEH, partially healed fracture, lytic lesion, muscular hypertrophy	138.6-146 cm				
CC.2:007	Y	2		9-24mos birth-one year	LEH		cist	Late Roman	E-W	Earrings, post molds, saltwater shell, copper and amber earrings, glass beads, pendant with metal clasps
¹ Age and sex estimations could not be correlated for individuals due to commingling. ² The femur used to calculate this stature estimate could have belonged to either of the adult males in this burial.										

those with which we were already familiar (Cheyney 1997). The four (CC.1:007, CC.2:005, 006 and 007) or possibly five (CC.2:018) burial pits uncovered in Area CC this season display evidence of intentional reuse for multiple interments, a tendency to bury individuals in sandals and shrouds within pits, stone-lined cists and / or wooden coffins, as well as deposition in the expended supine position with east-west orientation. Children and infants also tend to be buried with grave goods, especially earrings, bracelets, beads and pendants, suggesting a social structure where status was ascribed at birth and wealth was concentrated in portable goods –

two observations that are consistent with ethnographic evidence from other mixed subsistence strategy groups dependent on settled agriculture and pastoral or semi-nomadic transhumance (Ibrahim and Gordon 1987; Kobusiewicz *et al.* 2004; Porter 2002). As with the other cemetery areas at Umm al-Jimāl, pottery evidence is scant with the majority of diagnostic sherds being Roman and Early Byzantine.

In terms of new finds, the evidence for post holes surrounding some of the burial pits is particularly interesting. These soil stains, as discussed above, have been interpreted as the remnants of temporary structures that may have

sheltered exposed remains for a length of time before cover slabs and chinking stones were used to enclose the graves on a more permanent basis. Remains of these structures may indicate the presence of multi-stage funerary rituals that seem also, on occasion, to have included burnt floral offerings, as in the case of Z.4 (Cheyney, this volume) and CC.2:007. The interment of an infant with a horse is particularly unusual and may be a somewhat extraordinary example of the prestige apparently afforded infants and small children in death in this population. No cut marks or other skeletal anomalies were observable on the horse skeleton that might help to predict the manner or cause of death. However, at present, given what we know of burial practice at the site, the most likely interpretation is that the horse and bridle/halter are best understood as very high status grave goods associated with the associated infant. Radiometric dating of skeletal remains and more detailed assessments of the associated grave objects are clearly a priority. Both may help to contextualize the burial practices and demographic profiles reconstructed from four seasons of burial excavations at the site.

1996 CEMETERY AND TOMB SURVEY

(J. Brashler)

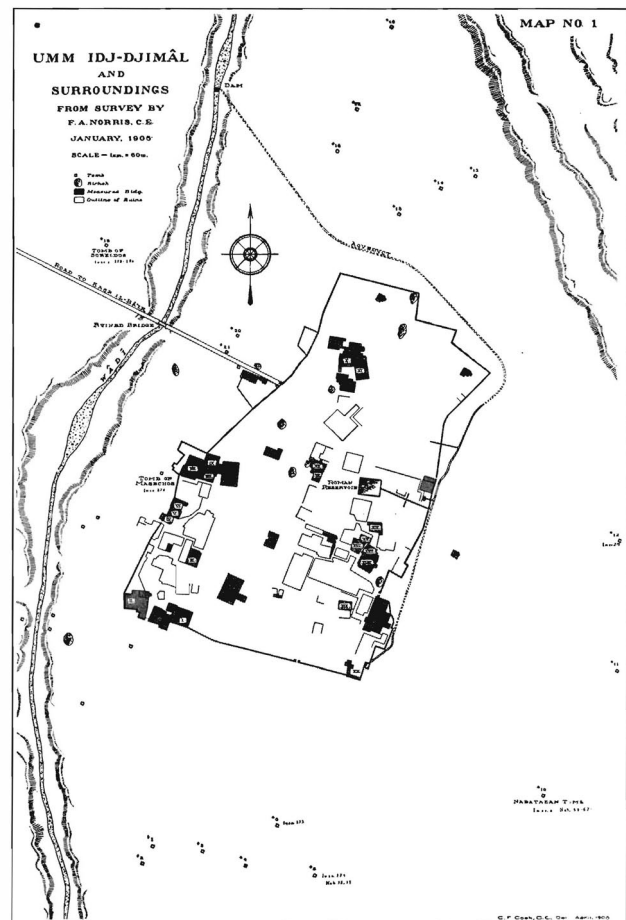
Introduction

A proportion of the 1996 season at Umm al-Jimāl was devoted to a walk-over survey of cemetery and tomb locations, with the objectives of: (1) developing a regional map and database that could be used to interpret spatial and temporal distributions of tombs and cemeteries and (2) to interpret the implications of spatial patterns for understanding and reconstructing the social fabric of people in the ancient community. Of special interest was information pertaining to the chronology, distribution, planning and architecture of tombs and cemeteries as it related to the community, seeking understanding of status, and socio-economic and political organization as revealed through both the professionally excavated burials and the more informal knowledge that current residents have gathered over years of excavation.

Methods and Procedures

No systematic tomb survey has been con-

ducted at Umm al-Jimāl since Butler (1913) recorded a series of monumental tombs in conjunction with his map of the ancient community. Survey began with a review of Butler's (1913) work as well as consideration of previous tomb excavations conducted during the last 15 years. Effort was made to re-locate and map as many of the monumental tombs described by Butler as possible, though the scale and detail of the map (**Fig. 27**) made it difficult to associate tombs still visible with those he mapped. However, all four of the tombs Butler presented in detail were relocated and their current condition recorded. In addition to relying on previous research by Butler and other field seasons, information on tomb and cemetery location was gathered from knowledgeable residents and previous research by de Vries (pers. comm.) about the site and its



27. Princeton University Expedition map of Umm al-Jimāl and surroundings showing location of monumental chamber tombs mapped by F. A. Norris and documented by H. C. Butler in 1905 (Butler 1913). Each tomb is represented by a small square, 21 of which are numbered, excluding 7 to the south-west (photo by Janet Brashler).

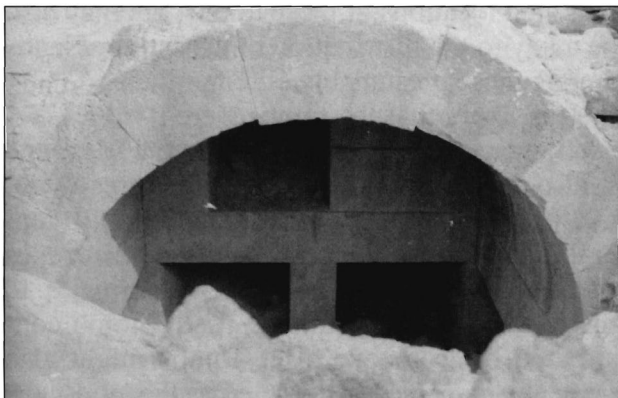
burial facilities. Finally, the modern town of Umm al-Jimāl was riddled with telephone and electric cable trenches during the summer of 1996. A survey of most of the exposed trenches resulted in identification of several new cist tombs and revealed areas where pit and/or cist tombs are not evident from the surface. While a significant area around the community was covered during this survey, numerous undocumented mortuary locations remain to be discovered and documented. Tombs with visible architecture were field mapped, photographed (e.g. **Figs. 28 and 29**) and described, and the architectural team prepared formal drawings of several tombs.

Survey Results

Including the BB.1 and BB.2 tombs excavated in 1996, 21 monumental tombs were visited and described during the survey. In addition, 13



28. Recently quarried vaulted tomb to the east of Umm al-Jimāl (**Fig. 27**, no. 12). Note doorpost to left and dislodged stone door in the middle foreground. The arch of the removed vaulting remains visible in the façade of the three end loculi (photo by Janet Brashler).



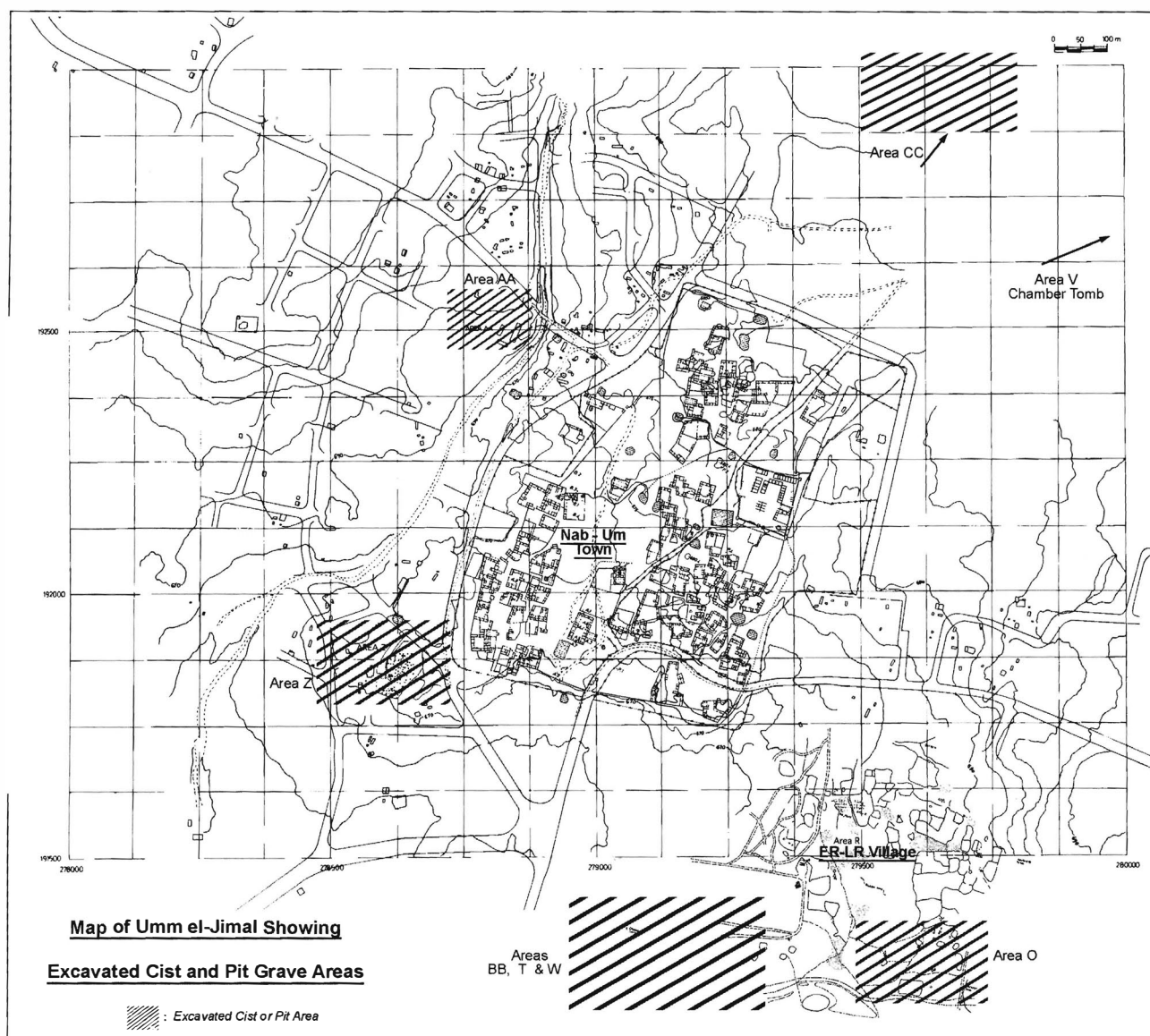
29. Vaulted tomb located on hill overlooking the Early Roman-Late Roman settlement (al-Hirri) from the east, not documented by H. C. Butler (photo by Janet Brashler).

areas of cist and/or pit tombs were noted, including five which that were partially excavated (**Fig. 30**; Cheyney 1993, 1995, Brashler 1995). Work was done in two areas of cist tombs in 1996 and 1998 (see Cheyney and Brashler this volume). While monumental or chamber tombs have discrete locations (**Fig. 27**) based on architecture, cemeteries containing cist and pit tombs have ephemeral boundaries (**Fig. 30**) that are very difficult to define from surface evidence alone. It is possible that cemetery distributions may be more or less continuous in some areas around the ancient community. In the past, limited excavation in cemeteries created a false sense of 'boundedness', though a possible cemetery wall may be present in the cemetery area designated Area AA (Brashler 1995; Cheyney 1995 and this volume).

Spatial Distribution of Tombs and Cemeteries: Pattern and Hypotheses

An extensive series of monumental tombs and cemeteries dot the landscape surrounding Umm al-Jimāl, but few tombs and no cemeteries, with the possible exception of two tombs and one cemetery area, occur within the limits of the Nabataean-Roman-Byzantine town. This pattern suggests the separation of the living from the dead typical of many cultures (in this case, at least for the pre-Christian era in view of the fact that no cist and pit graves excavated outside the settlements have evidence of Christian culture). Reasons for such divisions can be both pragmatic and spiritual. The distribution appears to be to involve a concentration on three sides, the north, west and south, but mortuary facilities do occur in abundance to the east as well. To the north, several monumental tombs have been recorded and a pit cemetery was sampled as Area CC in 1998. Given that monumental chamber tombs exist on all four sides, it is possible that further sampling would reveal that cist – pit burials are also located in all directions around the areas of settlement (al-Hirri, or Area R, in the Nabataean to Roman periods, and the enclosed town from the Nabataean to Early Byzantine periods).

The distribution of monumental tombs is interesting in that they are scattered across the landscape and do not appear to occur in clusters or groups. These may be mausolea for kinship groups, such as extended families or lineages.



30. Umm al-Jimāl Project map of Umm al-Jimāl and surroundings showing locations of excavated areas of cist and pit graves.

This hypothesis may be testable by analysis of epigenetic traits of individuals recovered from the three excavated loculi tombs and, if bone collagen is present, perhaps eventually by DNA analysis. Evidence of extended family relations in these chamber tombs also comes from funerary inscriptions (documented by Enno Littmann in H.C. Butler 1913) in at least three instances: the Nabataean Tomb to the south, the Sareidos Tomb to the west and the Stelae Tomb to the north (Butler 1913: 206-210). This spatial distribution may indicate that kin-based ownership of chamber tombs meant that they were located on agricultural land owned by the respective family groups. This would not only explain the

scattered locations of these tombs, but may also be a key to the distribution of agricultural lands among these presumably elite families.

It is likely that the tombs were used and re-used over, perhaps, one or more centuries, and it also seems probable -- given patterns of re-use (dismemberment, disarticulation and general disregard for the body, and the occurrence of ossuaries) -- that non-kin with no ties to the deceased may also have used a tomb constructed for someone else. Tombs might also present a dispersed pattern across the landscape because they were oriented along a system of roads or paths connecting Umm al-Jimāl to other communities. Certainly in other parts of

Roman Arabia, and also in the western Empire, this pattern has been noted (Toynbee 1971). In fact, it is fairly certain that roads radiated out from Umm al-Jimāl in four directions, roughly matching the locations of chamber tombs on all four sides.

Another dimension of spatial relationships noted is the apparent association between monumental tombs and cemeteries containing cist graves. In the vicinity of at least seven monumental tombs, there are cist tomb cemeteries located within less than 100m. The relationship between these tombs and cemeteries is unclear, but Brashler (1995) has suggested that perhaps the cist tomb cemeteries contain the remains of a population of transhumant herders who had some kind of symbiotic relationship with residents of the community, or perhaps affiliation with specific sub-groups of the community identified by individual family mausolea. Chronological evidence (see below) suggests that the excavated cist and pit tomb cemeteries (**Fig. 30**, Areas O, T, W, Z, AA and BB) are contemporary with the Roman to Early Byzantine construction and use dates for the monumental tombs in their vicinity (Cheyney this volume, Brashler 1995 and this volume).

At present, it is not clear whether cemetery and cist tomb locations described above are discrete and discontinuous, or whether there are more or less continuous distributions in some areas and more discrete cemeteries in others. Evidence from two areas excavated in 1994 and 1996 (Brashler 1995; Cheyney this volume) demonstrates a level of planning and organization in areas 700m apart, but cist tombs also occur between these two areas. Cheyney (this volume) has suggested that these may be continuous. Until large areas are excavated, or architectural features such as cemetery walls from which boundaries can be inferred are discovered, it will be difficult to resolve the issue of whether cemeteries are discrete or continuous with one another.

Finally, the discovery and therefore the known distribution of tombs and cemeteries depends on what is visible on the surface at a given time unless systematic sub-surface investigation is used, as in the case of the probing and trenching in Areas AA and Z (Brashler 1995; Cheyney this volume). Tombs buried beneath more than a

few centimeters of fill or aeolian deposit will not be seen on the surface unless it is removed by professionals or by treasure hunters. In the case of most mortuary facilities at Umm al-Jimāl, the modern day gold-seekers and house builders got there first, but they at least leave traces of the architecture and human remains behind. However, any additional survey research should carefully employ aerial photographs and should consider the issues of landscape, climate and geomorphic processes that might result in the burial or exposure of tombs and cemeteries in the area. Until a much more comprehensive survey is done employing these techniques, it is premature to use cemetery data to make any population estimates for the community as a whole.

Tomb and Cemetery Chronology

Evidence for tomb and cemetery chronology currently derives from two sources: inscriptions and tomb contents, most notably pottery. Only three tomb inscriptions from an assemblage of several hundred at the site appear to date the event of an individual's death and the date of tomb construction or use. Inscription #274 at Butler's Tomb No. 6, south of the ancient town and south of al-Hirri (Area R), refers to the 90th year and AD 195. Inscription #275 at Butler's Tomb No. 5, also in the south, has a date of AD 208, and Inscription #276, which is associated with the Masechos Tomb west of the ruins, has a date of AD 223. No inscribed stones have been found with dates associated with cist-pit cemeteries.

Dating tombs and cemeteries by pottery and other objects provides a more extensive set of cross-dated contexts. All three excavated loculus tombs (Areas V, BB.1 and BB.2) have ceramics that suggest Early Roman or Late Roman construction, with continued use into the Early Byzantine period (forth-fifth centuries) but little evidence for use thereafter, with the possible exception of robbery. In the excavated cemeteries (Areas AA, Z, O, and W), Roman to Early Byzantine pottery is predominant, with little evidence for use after the Early Byzantine period (Cheyney 1993, 1995; Brashler 1995). This begs the question: where are the Late Byzantine and Umayyad burials at Umm al-Jimāl? Small samples might account for the lack of tombs dating to these later periods at the site,

but a radical change in burial practices or locations, or both, which may have been associated with the spread of Christianity and the rebuilding of the Byzantine town (de Vries 1998) can reasonably be hypothesized at this point.

Orientation of Tombs

Monumental tombs are almost exclusively oriented along cardinal directions with one exception. In many cases this orientation provides opportunity for east-west oriented burials, a pattern observed in cemeteries as well (Cheyney 1995 and this volume; Brashler 1995). However, there are two notable exceptions: the north-south oriented BB.2 tomb, and Tomb #3, or Iyaduh Cemetery tomb, which seems to run approximately 42 degrees east of north. While slight deviations from cardinal or magnetic north-south, east-west orientations can be accounted for by orientation of tombs *vis á vis* seasonal shifts in sunrise and sunset, a deviation of 42 degrees may indicate an important exception to what appears to be a strongly held cultural principle with regard to positioning of individuals at death.

Use and Re-Use of Tombs: When Does Re-Use Stop and Robbing Begin?

Many excavation reports on tombs in Syro-Palestine comment on the frequency with which they have been robbed. Excavations at Umm al-Jimāl in 1994, 1996 and 1998, plus the tomb survey, have presented interpreters with challenges in understanding the pattern of use, re-use and subsequent robbing. The activities of snails, insects, roots, irrigation, burrowing, gnawing rodents and larger mammals that have been documented in Areas Z, BB.1 and BB.2 are more than enough to affect burial position and bone preservation. However, it is clear that multiple phases of use and re-use occurred in monumental tombs, with some evidence, as seen in Z.3, of re-use in cist tombs as well.

What appear to be examples of dismemberment and disarticulation of bones or body parts while connective tissue is still present is not unusual and occurs in at least nine separate contexts excavated so far (AA.9, Z.2, Z.3, BB.1:006, 011, 012 and 015, and BB.2:002 and 005) and may have occurred in virtually all the loculi burials in BB.1, BB.2 and Area V. We

must be careful in attributing such dismemberment to motives of robbery when the motive might be simply clearing a space for a newly departed loved one. Only by carefully deciphering the causes of bone movement and deterioration can we begin to understand the patterns and motives of human behavior in the past, as well as the robbery occurring in the present time.

Acknowledgments

Much of the work on this survey was made possible by two individuals, Bert de Vries and Muaffaq Haza who generously shared their expertise. Both have an encyclopedic knowledge of Umm al-Jimāl and this brief summary only begins to capture some of their knowledge related to tombs in the area. Recording of the tombs was accomplished with the able assistance of Roger Kiers. This report will be updated to include subsequent tomb excavations and will be published with a complete map of the tomb locations, fixed with GPS, in the Umm al-Jimāl Project's final report on funerary culture.

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