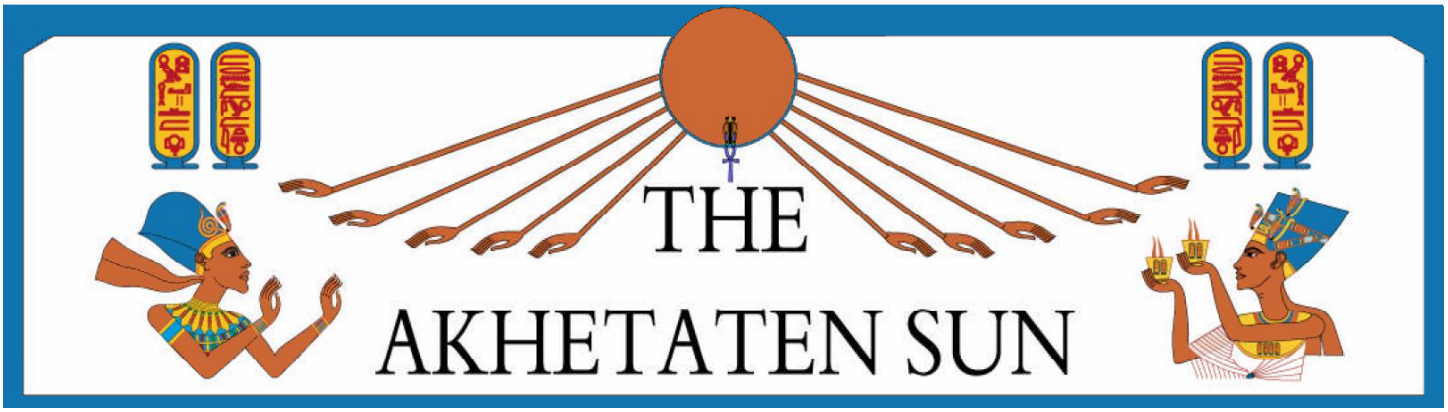

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Officers and Directors

The President's Papyrus

Greetings to all our members! I am very excited with this issue of the Sun. In addition to another informative article by Barry Kemp, we have articles by two new contributors to the Akhetaten Sun newsletter. They are Dr. Lyn Green and Dr. Jerry Rose.

Dr. Green received her doctorate in Egyptology from the University of Toronto for a thesis on "Queens and Princesses of the Amarna Period," and contributed to the catalogue for "The Royal Women of Amarna" exhibition at the Metropolitan Museum of Art, but she has lectured or published on many other areas of ancient Egyptian society including music, dance, banqueting, medicine, and costume. She has excavated in Egypt at the sites of Tell el-Amarna and at East Karnak with the Akhenaten Temple Project. Currently she is researching and publishing blocks from the palaces at Amarna in the collection of the Royal Ontario Museum. She is President of The Society for the Study of Egyptian Antiquities, an organization based in Toronto which supports research into ancient Egypt.

Dr. Rose received his B.A. degree in anthropology in 1969 from the University of Colorado at Boulder where he studied archeology and geology. He earned his M.A. and Ph.D. in biological anthropology, specializing in dental anthropology, from the University of Massachusetts, graduating in 1973. He taught for three years at the University of Alabama in Birmingham before joining the University of Arkansas in 1976. He is currently chair of the Anthropology Department in the J. William Fulbright College of Arts and Sciences at the University of Arkansas, Fayetteville. He developed an interest in the Middle East and has excavated mortuary sites in Egypt and Jordan. He is actively involved with the King Fahd Center for Middle East and Islamic Studies in the Fulbright College of Arts and Sciences and conducts a bioarcheology field school in Jordan each summer. Since the late 1980s Dr. Rose has been excavating and conducting osteological analysis in Egypt. Since 2007 he has been taking groups of qualified students with him for the summer on his excavation at Amarna.

We are very pleased to publish articles by these two highly qualified scholars. Enjoy!!

Floyd Chapman

Analysis of the South Tombs' Skeletons

By Jerry Rose (University of Arkansas, Fayetteville) and Melissa Zabecki (University of Arkansas, Fort Smith)

Readers of the *Akhetaten Sun* are familiar with the ongoing excavations of the South Tombs Cemetery and we would like to provide you with a brief summary of the research conducted on the skeletons by the University of Arkansas team. The project began in 2005 when Barry Kemp had a field team collect the bones from the surface of the narrow valley behind the tomb of Ay and invited me (JR) to Amarna to study them. Although scattered and broken, these bones demonstrated that a great deal could be learned from the cemetery that lined both sides of the valley. The prospect of acquiring information about the lives of Akhetaten's inhabitants convinced Barry to initiate excavation of the cemetery in 2006 and continue it until now.

For the first and second seasons (2006 and 2007) I brought a graduate student with me (now Melissa Zabecki Ph.D. and co-principal investigator of the Amarna Bioarchaeology Project) to help collect the skeletal data. The really unusual and spectacular results encouraged us to expand the Amarna Bioarchaeology Project in 2008 to include a field school organized through the University of Arkansas Office of Study Abroad. Using the three weeks centered around spring break, we brought seven University of Arkansas students to Amarna to learn advanced skeletal analysis techniques, to work as a team to analyze that year's excavated skeletal remains, and to collect data for use in their own individual research projects. In a field school operation, the students register for a university course, pay tuition and the expenses of the trip, and receive a grade for their work. The students were attracted to the field school because of the opportunity to study well preserved human skeletal remains and to work at one of the most famous archaeological sites in Egypt.

The bioarchaeology field school experiment at Amarna worked so well that we were encouraged to expand the scope of its training mission and to recruit students from other universities. To accomplish this mission we moved the time to the end of the spring semester (mid-May to mid-June) and applied for and were fortunate to receive sponsorship and partial funding from the King Fahd Center for Middle East and Islamic Studies at the University of Arkansas. The 2009 Amarna Bioarcheology Field School attracted many applicants, but we could only accommodate 12 students: 5 from the University of Arkansas; 4 from Loyola University, Chicago; 1 from American University, Washington D.C.; 1 from Millersville University of Pennsylvania; and 1 from University College London, U.K. (Fig. 1). We have already selected the 12 participants for this next season from seven different universities.

Figure 1: The 2009 field school with Amarna House staff.

The 2008 bioarchaeology team not only studied the 62 individuals, 13 isolated skulls, and 4 isolated mandibles produced by the 2009 excavation team (see Barry Kemp's report in the Spring 2009 *Akhetaten Sun*), but we brought out from storage and studied all the material excavated since the first (2006) season (154 individuals). The reexamination of all the skeletal remains was conducted for three reasons: first, recent interpretations of evidence for nutritional deficiencies by paleopathologists had changed so much that we felt compelled to recollect data using the new criteria; second, we wanted to see if we could match the many isolated bones to their original skeletons; and third, each of the field school students was required to conduct and write up a report on an independent research project and thus they had to examine all of the skeletons for their own specialized data collection. The condition of the Amarna skeletal material varies from very well preserved intact individuals, to partial individuals, to scattered well preserved bones, and finally to sun bleached bones from the surface. Although many skeletons were found complete and correctly arranged in their graves, others, for example, were only legs with the rest of the body and skull having been scattered across the nearby surface when the ancient grave robbers tore the partially mummified remains apart to look for valuables. Under these circumstances the bones in a grave might be excavated and studied during one season, while the scattered body parts would not be located until one or two years later, but we would not know to whom they belonged. The 2009 field school seemed to be the ideal time to lay out all of the isolated bones on the work tables and then systematically try to match each bone with one of the excavated skeletons (Fig. 2). Skeleton diagrams of each analyzed individual were colored to show which bones were present and which were still missing (i.e. left unshaded).

These diagrams were taped to the laboratory walls, all of the miscellaneous bones were laid out on the tables, and the identified individuals in their storage crates were arranged by number in an adjacent room. A student would pick up a bone, such as a right humerus, check the diagrams to find out which burial numbers were missing a right humerus, and then check each of the actual skeletons until the isolated right humerus was matched with the corresponding left humerus or possibly fitted to a right ulna which would have joined it at the elbow. Although laborious, this process resulted in many of the miscellaneous bones being reunited with their owners, while a significant number of child skeletons were reassembled from their small bones scattered across the tables.

The most basic information that we can collect from each skeleton is sex and age at death. Thus, our first line of research, as we attempt to reconstruct an ancient way of life, is to interpret the distribution of skeletons by age and sex (paleodemography). Finally, knowing the age and sex of each skeleton is necessary for conducting all other specialized analyses, such as paleopathology (the study of ancient disease). When a skeleton is complete, it is easy to determine its age and sex, but when we have only a partial skeleton missing the pelvis and possibly the skull, it can be very difficult, if not impossible. The individual research projects conducted by Amy Chancellor and Blair Viguet enabled us to establish sex and age at death for many of the incomplete skeletons, and thus increased the sample size for our demographic interpretations.

Figure 2: Field school students matching miscellaneous bones to the original skeletons.

The demographic profile of the Amarna skeletons is presented separately for the two excavation locations in the South Tombs Cemetery: the upper location that has been excavated since 2006; and the lower location that was only opened during the 2009 season (see Barry Kemp's report in the Spring 2009 *Akhetaten Sun*, p. 6). Figure 3 shows the percentage of individuals dying within each age category and, although the sample size is small, the lower location shows a normal pattern with high mortality during the first five years of life, followed by low mortality from five to 20 years, and then increasing mortality through adulthood. In both modern and ancient populations older children and teenagers seldom die, except due to accidents and other random events. In contrast, the more numerous individuals from the upper location in the cemetery show an unusually elevated mortality between five and 15 years and an abnormally high number of dead teenagers between 15 and 20 years. This suggests that something unusual was going on and might indicate an aberrant disease phenomenon perhaps similar to the 1918-19 influenza epidemic that differentially killed the young and fit (Barry, 2004).

We know from historical texts that both the King of the Hittites and the King of Alasia (probably Cyprus) claimed that Egyptians brought a deadly epidemic to their lands (Moran, 1992). Might this abnormal distribution of deaths at Amarna provide some evidence that Egypt was incubating or harboring an infectious disease that eventually would strike out into foreign lands? Was it possible that such a disease flowing up and down the Nile played a role or influenced some of the unusual events that characterize the Amarna period? Testing this hypothesis has become central to our research. We need to employ the historic literature and archaeological evidence from known epidemics to develop epidemiological models that we can then use to determine if the distribution of deaths at Amarna is compatible with the hypothesized presence of a highly infectious and fatal disease. We also have to acquire additional financial resources to expand the cemetery excavations to provide the large sample of skeletons that we need to solve this particular puzzle.

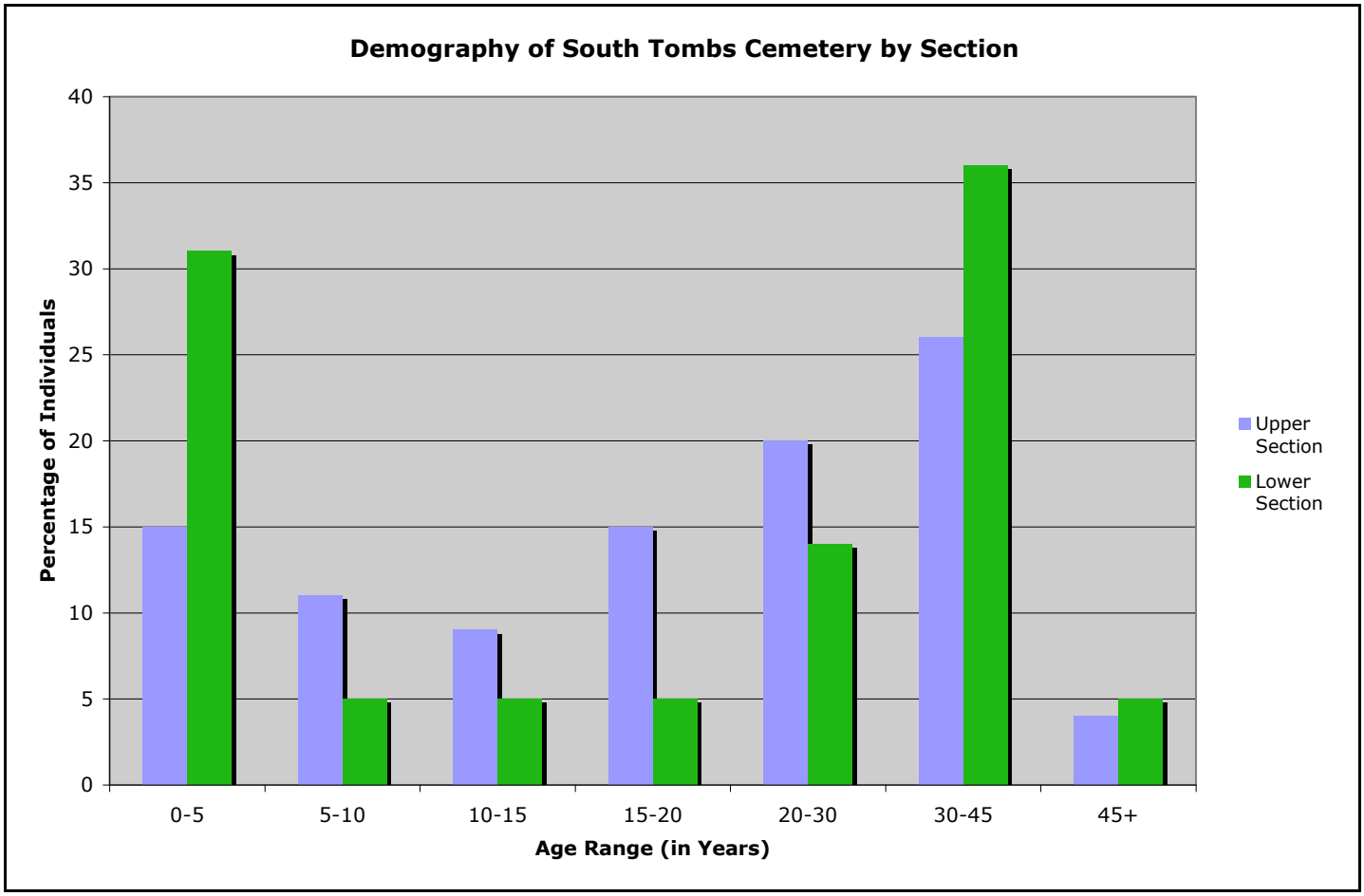

Figure 3: Percentages of individuals dying within each age group for the upper and lower sections of the South Tombs Cemetery, Amarna.

The demographic analysis does tell us that the average age of death for all 154 people whose age can be determined is 22 years, while the average age of all those who survived into adulthood was only 32 years.

These figures suggest that life was short and very stressful at Amarna and we were motivated to explore other measures of stress to better illuminate life there. Economic historians have shown that adult height (or stature) is an excellent measure of total childhood/adolescent nutrition and disease load and so can be used as a reliable relative measure of the quality of life for past populations. Bill Schaffer and Roc Pursely contributed to our reanalysis of Amarna stature using recently published new stature calculation methods and comparative Egyptian data. The average male stature is calculated to be 163cm (5' 4"), while that for females is 153cm (5' 0"). Sonia Zakrzewski (2003), one of our team members, published femur (upper leg bone) lengths for Egyptian skeletal collections dating from the Predynastic to the Middle Kingdom and we have converted them into average heights using newly published formulae specifically designed for Egyptian skeletons.

Figure 4 shows that stature increases from the Predynastic through the Early Dynastic when it begins to decline into the Middle Kingdom. The Amarna people are virtually the same as the Middle Kingdom average, but the men were much shorter than the New Kingdom pharaohs. We wondered if the population was under more stress during the Amarna period than it had been in earlier years. Thus, we divided our sample of skeletons into those who were younger and older than 35 years. Since even males have almost finished growing by 18 years of age and Akhenaten ruled for 17 years, we selected age 35 to divide our sample to ensure that we had a group where no one grew up under Akhenaten's kingship. It is interesting that both males and females who grew up before Akhenaten were taller than those who spent at least some of their growing years under his reign. This suggests to us that health and nutrition might have declined during the Amarna Period and so we need to look at all the evidence for reconstructing childhood health and nutrition.

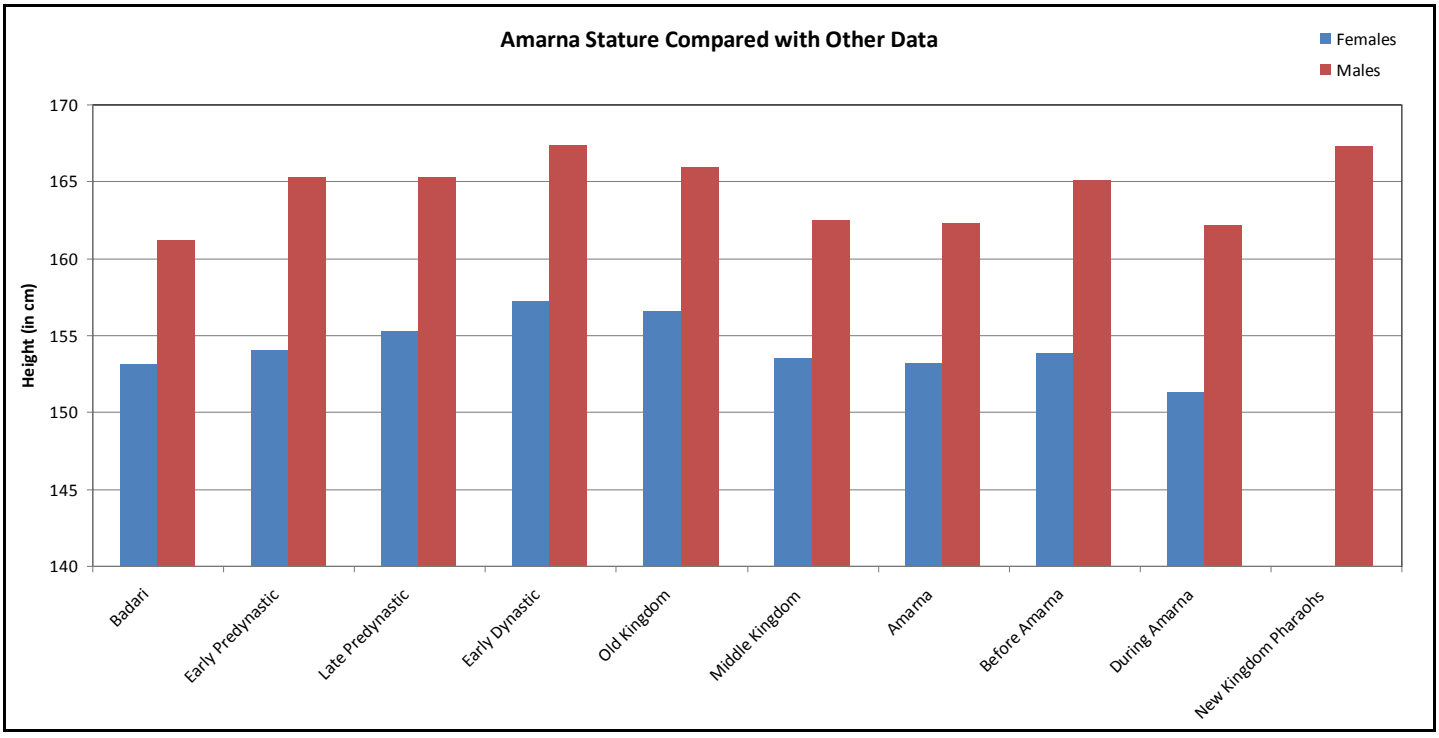

Figure 4: Average statures of males and females from the South Tombs Cemetery compared to statures computed from femur lengths published by Zakrzewski (2003).

Nicole Fumo, Sean Lee and John Gorski all chose research projects to examine Amarna childhoods. Since poor nutrition and frequent or chronic disease will slow the growth of long bones, such as the femur, but have little impact on dental development, comparing the length of the femur to age at death as determined from dental development is ideal for estimating the rate of childhood growth. Figure 5 shows the Amarna femur lengths plotted by dental age in comparison to the published modern "Maresh" growth standards and clearly demonstrates that the Amarna growth rate/pattern is below the modern standard. The graph clearly shows that both the Amarna and modern femur lengths grow more slowly during the late teenage years with the curve flattening out (below the linear projections) to finish at the adult heights. We should note here that we cannot determine the sex of pre-adult skeletons and, thus, all of our comparisons combine both male and female data. This retarded growth rate suggests that the nutritional quality of the Amarna childhood diet was not good.

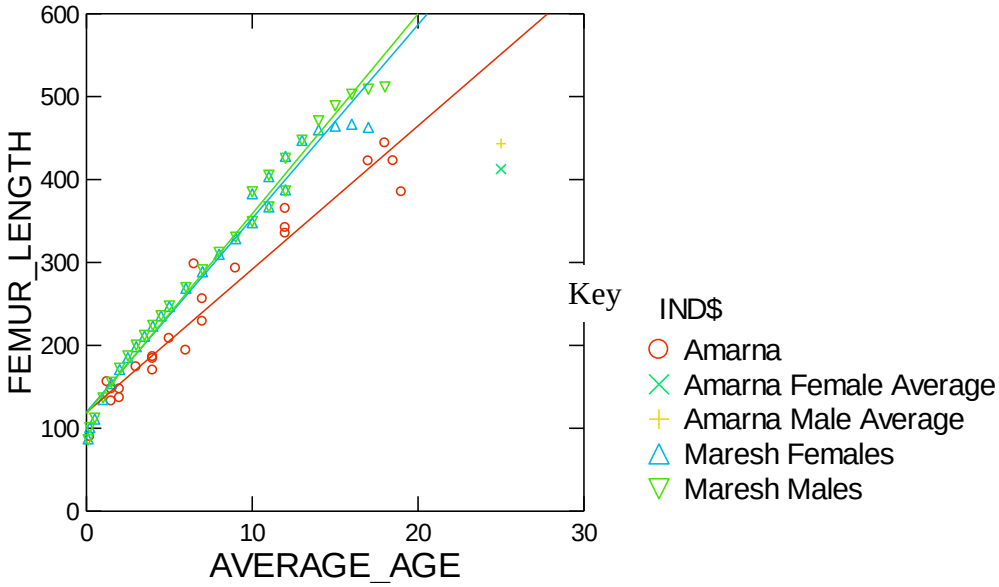

Figure 5: Comparison of Amarna femur lengths plotted by dental age compared to the published modern "Maresh" femur growth standards.

Cribra orbitalia is a pathological lesion of the upper surface (roof) of the eye orbit characterized by pitting and a coral-like elevation of the bone surface (Fig. 6). This lesion is associated with deficiencies of a complex of essential nutrients that include, among others, vitamin B_{12}, folic acid, vitamin C, and possibly iron. The skeletons younger than 18 years show cribra orbitalia at a rate of 61%, while the adults exhibit 39%. These rates are higher than those published for other New Kingdom skeletal collections from Egypt and Nubia and reinforce the notion of serious nutritional deficiencies at Amarna probably associated with a grain-based diet with little access to meat. More than 100 years of research on living populations has demonstrated that if protein consumption is minimal or deficient, then any of the common childhood infectious diseases can slow the production of dental enamel to produce shallow grooves called hypoplasias on the surface of teeth (Fig. 7). Because enamel cannot heal or change itself once formed, hypoplasias seen on adult teeth inform us about the frequency of childhood infections among those people who survived into adulthood. Amarna adults exhibit a 52% rate of individuals with one or more hypoplasias indicating both minimal, if not insufficient, consumption of protein and frequent childhood infections. These results establish that Amarna was not the city of abundance, at least for children, in contrast to Akhenaten's proclamations and the illustrations in the Amarna tombs.

Figure 6: Photograph of a left eye orbit exhibiting the coral like lesion of cribra orbitalia.

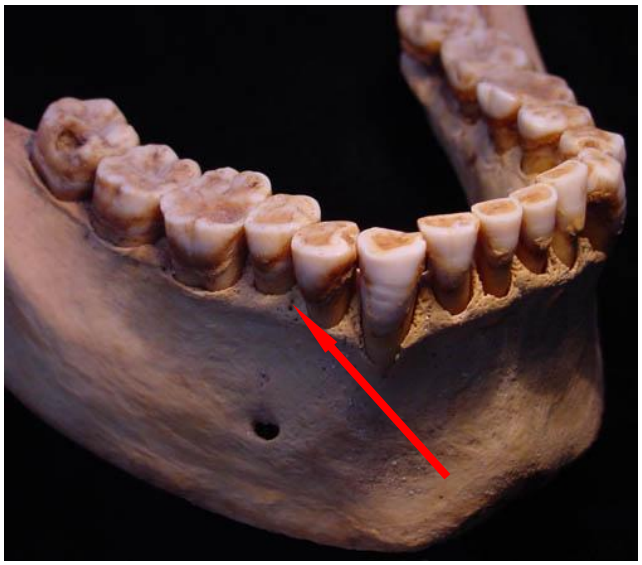

Figure 7: Photograph of a mandible with a canine tooth exhibiting three hypoplasias.

The paleopathology of the adult skeletons and teeth was the focus of research projects conducted by Jessica Kinsey, Dan Neubauer, Brad Rega, and Bryony Simmons. Broken and healed bones were common and equally distributed among the men and women of Amarna. The pattern of which specific bones were broken and where they were broken resembles the patterns common in historic industrial environments. Weapon wounds were not frequent with three males and one female showing healed wounds. Males and females had a roughly equal amount of joint arthritis with males having slightly more after the age of 35 years. Schmorl's nodes are depressed lesions of the vertebrae (spine) that are caused when compression forces rupture the cartilaginous disks that separate each of the vertebra from the one above and below (Fig. 8). These lesions can result from jumping from a height or tripping while carrying a heavy load on one's shoulder or head and 49% of the Amarna adults had at least one damaged vertebra. More serious accidents can cause so much compressive stress that one or more vertebrae actually collapse and collapsed vertebrae are found on 18% of the Amarna adults. All of these trauma-related pathological lesions form a picture of a hard life for both men and women where carrying heavy objects was common and accidents frequent. This is certainly what we would expect to find in the skeletons of a people who built and maintained a large ancient city.

Figure 8: Photograph of lumbar, lower back, vertebra with the arrow pointing at a Schmorl's node.

Malocclusion (misaligned and crowded teeth) is very common today and many parents have spent much time and money taking their children to the orthodontist.

An investigation of the Amarna teeth showed that 29% had perfect bites, while most cases of malocclusion consisted of only slightly crowded mandibular incisors (Fig. 9). Despite consuming a diet high in carbohydrates (bread) only 38% of the Amarna adults had one or more cavities. This is a surprisingly low frequency. However, in 30% of the adults the dental decay had progressed to an abscess which was not only very painful, but resulted in loss of the tooth (Fig. 10).

Figure 9: Two mandibles with one showing good alignment on the right and incisor (front teeth) crowding on the left.

Figure 10: Photograph of mandible with tooth decay and antemortem loss of teeth.

When we began our skeletal analysis in 2006 we really did not know what we should expect to find. We did know that the cemetery sample would be unique among skeletal collections because all the dead were buried during a period of only 15 years. Most ancient cemeteries were used for many decades, if not centuries, and thus the people in the cemetery could have lived at any time during a hundred or more years of history. Thus, an interesting historical event such as an epidemic or war that could have caused an abnormality in the demographic pattern would be averaged out by the normal times. Our short time span offers us a unique opportunity because the Amarna Period is full of interesting events. The interpretations of the Amarna historical record had led us to think that our skeletal analysis would show that life was good for those living at Akhetaten. However, our research to date indicates that Akhenaten's promises of bounty and an easy life were not fulfilled. Childhood nutritional deficiencies existed at a level that was as high or higher than those found anywhere in the Nile Valley at any time. Growth rates were slowed and ultimate adult heights were short. Paleopathological analysis indicates that both men and women worked hard and performed tasks that had high risks of injury. Our most remarkable result is the large proportion of people who died between five and 20 years of age when mortality should be at its lowest. The prospect of being able to establish the existence of an epidemic disease during the Amarna Period is very exciting indeed.

We wish to thank those who have contributed to the Amarna Trust and the King Fahd Center for Middle East and Islamic Studies at the University of Arkansas for their financial support of this research. We also wish to thank Barry Kemp for the invitation to work with the skeletal remains from the South Tombs Cemetery and for his care of the bioarchaeology team during our stay at the Amarna research facility.

Wadi & Cemetery near the South Tombs (photo by Jill Taylor Pepper)

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William L. Moran, *The Amarna Letters* (Baltimore: The Johns Hopkins University Press, 1992).

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Current Work at Amarna: 2010

by Barry Kemp

We are nearing the end of another long season. When I look back in my diary, I see that I arrived to open the house on January 21st, a week before David and Jill brought a TARF group to Amarna for two days of visits, whilst on a tour of Middle Egypt. For a while I was on my own, awaiting the arrival of a group of five artists and model-makers who were to bring to Amarna a set of models to be installed in the Visitor Centre, and who were to work on adding render and details to the skeleton of the full-scale mockup of the house of Ranefer, which occupies the centre of the building (Fig. 1). They came early in February and set to work for three weeks. They did an impressive job, but also revealed a list of further modifications and additions that are needed to make Ranefer's house look more realistic and intelligible to visitors.

Figure 1: The rebuilt house of Ranefer rises through the middle of the new Visitor Centre at Amarna

As they left, the six-week excavation started up at the cemetery of the people of Amarna located behind tomb 25 of the South Tombs group. When we began in 2006, we worked tentatively, uncertain how much was left that was useful as evidence. As time has passed, we have come to appreciate that, despite the widespread robbery of ancient times, the cemetery contains a unique record of the people of Amarna and of their response, when preparing burials, to being in the changed circumstances that Amarna forced on them. Growing more confident, we have developed an efficient and thorough style of excavation and recording, at the same time expanding the scale of the work. So this season's team comprised six experienced archaeologists, backed by a relatively small group of local workmen, divided equally amongst three widely separated parts of the cemetery.

The excavation now supplies information for a research project that goes beyond the annual accumulation of reports. We are starting to create an overall framework for managing and analyzing the data. An essential starting point is accurate mapping, so that all graves, scattered bone clusters and objects can be added to a common map. We have had a good start, from the topographic survey of Helen Fenwick who, as part of her general survey of the desert bay, has provided us with a contour map of the cemetery. What comes next is the need to be able to plot field data onto Helen's map and geographic grid. The sensible solution is a surveyor's electronic total station. This replaces tape measures with distances calculated with the use of a reflected laser

beam, with precise angles and software for the geometry of survey. From a single position, the instrument can record excavation features several hundred metres away on a still day. It cuts down on time, and introduces a high level of accuracy. From time to time, we have borrowed someone else's, but our long seasons make it very desirable to have a total station of our own.

We now have one, thanks to the Members of TARF. At its annual meeting last Fall, The Amarna Research Foundation's board agreed to make an award to the expedition that covered the cost of a total station. This was a magnificent gesture. After enquiries in Cairo, I selected a model in the Sokkia range, sold by a company that maintains a service facility on its premises, which are conveniently located in the central area of Cairo. Our Sokkia station had its first outing as the new excavation grids were being laid out (Fig. 2), and, along with two new Sokkia conventional levels purchased at the same time, remained in use throughout the excavation, and then did service at a second separate excavation that I will describe a little later.

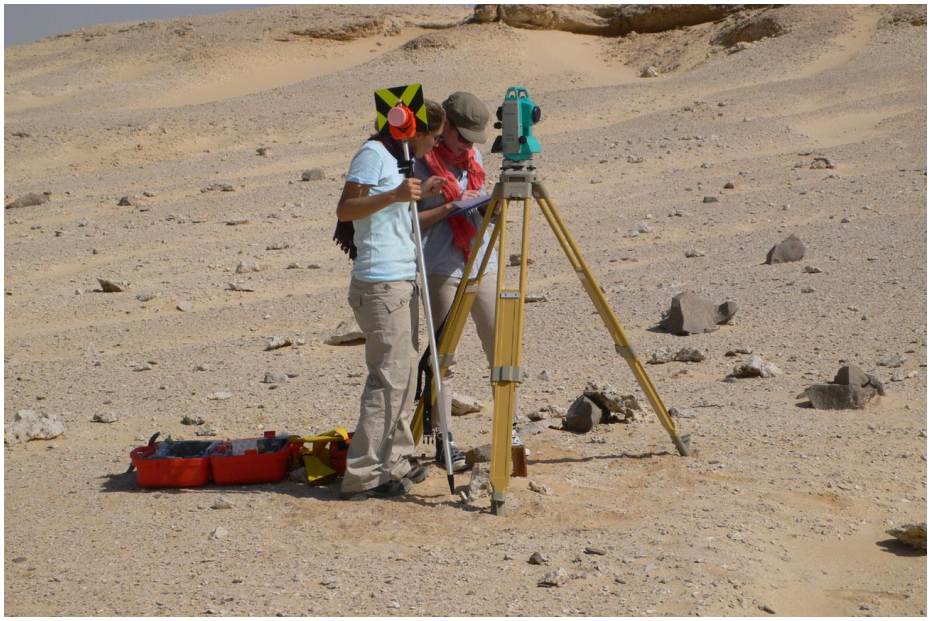

Figure 2: The new Sokkia Total Station (a gift from TARF) on its first day of use at the South Tombs Cemetery

The cemetery is far too large to think of complete excavation. Our anthropologists (Jerry Rose and Melissa Zabecki) consider that a reliable picture of the population can be obtained from a sample of 400 individuals, taken from representative parts of the cemetery. This will also be a sample of suitable size for an account of the material culture surrounding death and burial at Amarna. Our total of individuals from previous seasons was around 150. This year, working with more staff and at three locations, we have added around 70 and, on the archaeological side, have made significant additions to our knowledge.

The three locations are the Upper Site, where we began in 2006; the Lower Site, started last year; and the Wadi Mouth Site, newly opened this year (Fig. 3). One aim of this year's program was to see whether our cemetery overlapped with the rock tombs. An unfinished rock tomb (no. 24A) lies actually just within the wadi mouth. The answer is a clear negative, at least on the east side. Soft bedrock lies just under the desert surface in front of 24A. The people who used the cemetery were so intent upon digging graves into soft sand that, as soon as it petered out, they gave up. Having demonstrated this, the excavation moved on to the edge of the sand bank further into the wadi, and the pattern of burial that has become familiar immediately appeared.

The erosion of the surface at this part of the site, near the wadi mouth, turned out to have been less than elsewhere. This was evident from some graves where part or all of the original covering remained. It comprised a row of stones that both marked the outline of the grave and protected the body from the attention of digging animals. Some of the graves were very shallow, mere scoops in the hillside, so that the danger of animal disturbance must have been very real. The stones were a mixture of the dark rounded boulders that outcrop on the nearby hilltop, and roughly hewn lumps of local limestone. One piece, found lying on the surface of the wadi and outside the excavation area, had been worked into the shape of a pyramid.

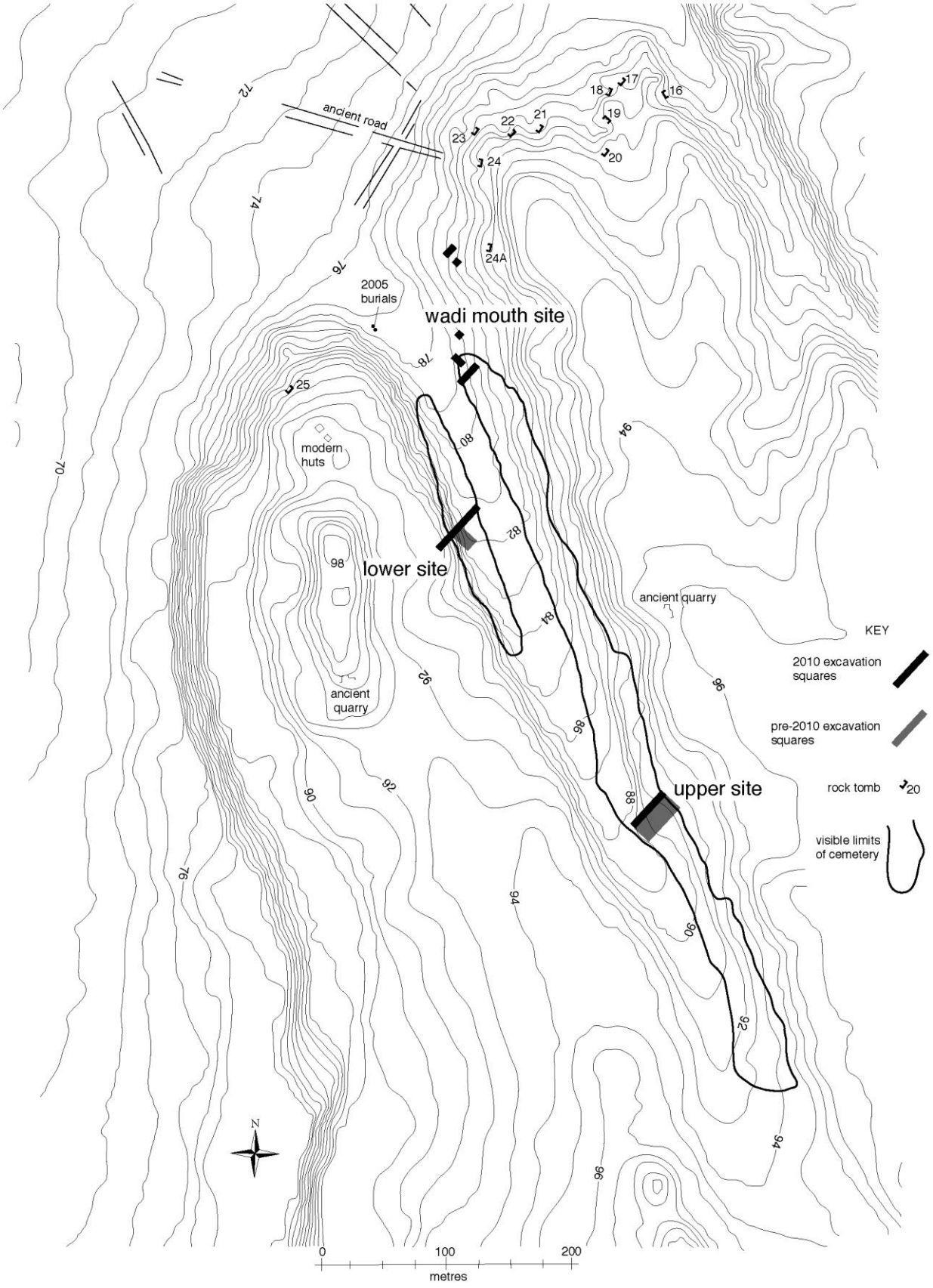

Figure 3: A map of the cemetery, showing (in grey) the two areas of previous work and (in black) the grid squares currently being excavated

As we see the cemetery now, it lies in two parts, on either side of the sandy bed of the watercourse. We have often wondered if originally it ran continuously from side to side. Perhaps centuries later, torrential rains swept the central section away. This year's trench at the Lower Site ran down to the edge of the wadi floor. Excavation encountered grave pits around 1 metre below this level, with the pits themselves descending for a further 70 cm or so. Thus the lower parts of the graves lie well below the wadi floor, and the graves themselves extend to the very edge of the excavation, creating the impression that they are likely to continue beneath the wadi floor. If this proved to be the case for the full length of the cemetery, it would virtually double its size (which we had previously estimated at around 3000 burials). It is also noticeable how, on the upper slope of this part of the cemetery, the graves lie at right-angles to the line of the valley, so that the dead were placed with their head upslope; as the slope flattens out towards the bottom, the orientation of burials turns so that they lie parallel to the valley.

This bottom part of the Lower Site was the last excavated in the season. Two graves, not far apart, contained painted wooden coffins (13262, 13281). The complete coffin box was present in each case, and the rim of the lid, but in a parlous condition (Fig. 4). Most of the wood had been reduced to brownish dust, the decoration preserved by the thin and brittle layer of gypsum that had covered the wood. Some crushing through compression had distorted the sides as well. We were able to retrieve most of decorated surfaces, but in fragments that await conservation. From photographs taken at the moment of discovery, and from a second set taken of the fragments themselves as laid out in the storeroom, reconstructions of the original designs are being prepared.

Figure 4: Coffin (13281) being freed from the surrounding sand.

The drawings of the first coffin (13262) have just been finished (Fig. 5). On either side, the same design was repeated four times: a man making offerings preceded by three vertical columns of hieroglyphs, the first of these a continuation of a band that crossed from side to side over the lid. It is in this band that one expects to read the name of the deceased, the owner of the coffin. The figures and signs have been hastily painted, yet by someone with a steady, practiced hand, who has not hesitated whilst making the strokes. It is worth making this point because, although the signs are tolerably clear, I find the texts untranslatable. The easy solution is to throw up one's hands and to say that this is the work of an ancient illiterate who copied groups of signs taken out of context from other texts: they look good but mean nothing. But fully painted coffins were not common; whoever painted the signs had probably worked in the same style before; and from close at hand came another coffin with readable hieroglyphs and the well-carved limestone stela to be described shortly. I therefore like to think that the hieroglyphs are encoding information but in an unconventional manner. I do not have a convincing answer to what that might be; but I am sure that someone out there does!

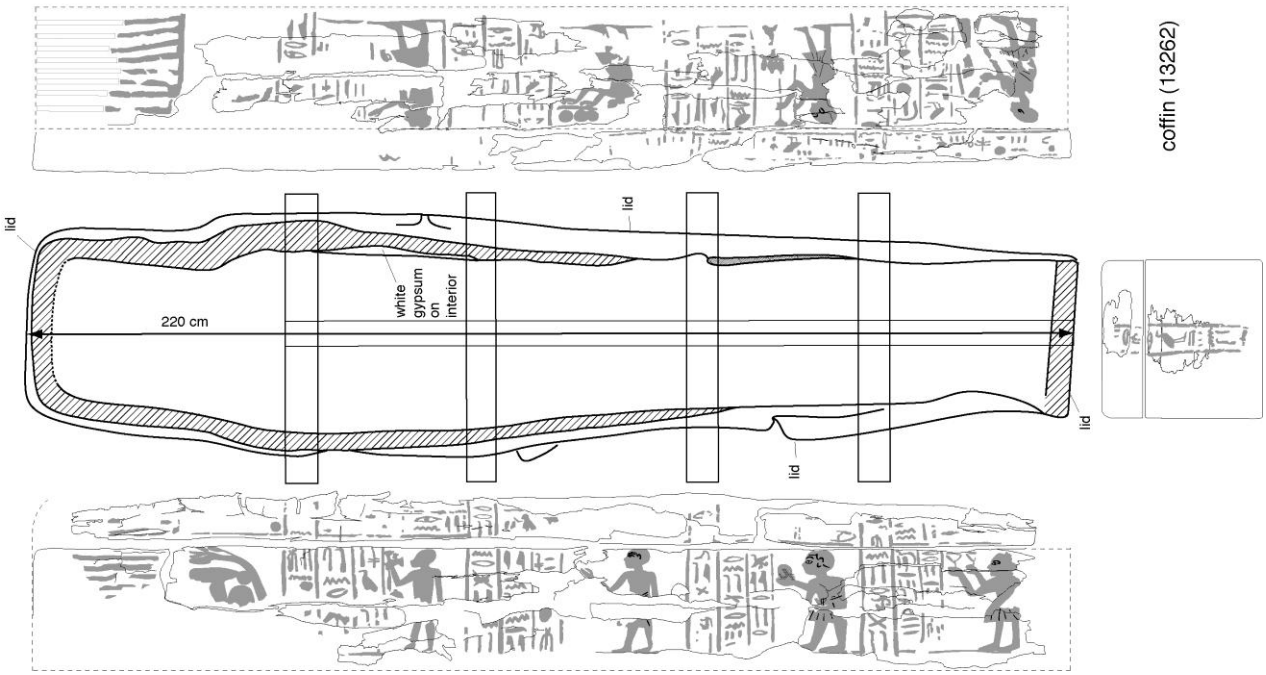

Figure 5: The reconstructed sides of coffin (13262)

From an adjacent grave came a small limestone stela (39938, Fig. 6) cemented into a recess on the front of a small pyramid of limestone, the lower part of which still bore patches of the cement used to attach it to a grave covering. The surface of the stela has suffered erosion, but the outlines of the design are still visible. It shows a couple seated side by side, the man turning back to face the woman, his arm hanging down behind the back of the chair, his body slumped a little, emphasizing the swelling of his belly. Here are people from the city choosing to emulate the royal family's style of informality. Towards the top are vertical columns of eroded hieroglyphs.

Figure 6: Stela from the Lower Site (39938), showing an Amarna couple before a table of offerings. Photo by G. Owen.

Of small finds there were, as in the past, very few. But amongst them is a group of three very small seals made in glazed steatite (39933, Fig. 7), the backs of which are carved as a hippopotamus reclining on its side, head raised. They differ slightly in size and workmanship, and differ also in the incised designs on the base: Taweret, Bes, and a seated goddess. They were found as a group in the bottom of a wooden box coffin at the Upper Site that had otherwise been emptied by robbers. It is hard to believe that their instantly endearing appearance was lost on their owner. Another find from this part of the cemetery was the burial of a woman, on the crown of whose head was a hollow, cone-shaped object of a brittle organic substance (39920). An analysis of the material is going to be difficult to obtain, but it is tempting to see it as the remains of one of the enigmatic cones that are often shown on the heads of men and women in the New Kingdom.

The human bones are, as I write, the subject of study by the group from the University of Arkansas. The anthropologists have just finished cataloguing the 13 children who were amongst the total. They have commented upon the discrepancy between age as given by the degree of tooth eruption, and the expected lengths of long bones for children of given ages. By the age of three, the children had grown only to half of their proper size, a stunting of growth that is a further sign of the stresses under which the people of Amarna were living. But the anthropologists will deliver their full conclusions after the end of their time here.

As the cemetery excavation ended, so another began, in the North City. It represents a further step in the reconstruction of Akhenaten's statue program at Amarna, pursued over many years by Kristin Thompson, now in collaboration with Marsha Hill of the Metropolitan Museum of Art, New York. We have known for many years that, near the end of his work at Amarna, John Pendlebury buried unwanted finds behind his dig house. Local people then dug them up and left statue fragments littering the desert. Having collected what lay on the surface, our final task was to excavate to see if more remained further down (Fig. 8).

Figure 7: A group of three amulets from the same grave in the Upper Site, objects 39933a, b, c.

Pendlebury's workmen seem to have dug three pits almost at random, and these we excavated. Sure enough, more pieces lay within them, along with fragments of hieratic jar labels on the back of which are written excavator's numbers identifying them as from the Great Palace excavations of 1935/6. Mixed in with this material was a crumpled enveloped posted in 1935 from England to Pendlebury at the address of the Turf Club in Cairo, a famous social centre for Brits, finally burnt down by a mob in 1952.

The excavation ended, leaving a large amount of carved material from the old excavations unaccounted for. It is presumably buried somewhere else, but the lack of surface clues creates a dilemma of needle-in-haystack proportions. One place that seemed sufficiently promising to justify examination is a row of circular granaries that lie immediately behind the Pendlebury house. Some granaries of this kind had sunken floors, creating ideal hiding places. But when we opened up an excavation here, it turned out that their floors had been built flush with the desert, and hardly anything remained of them. So, at this point, we called off the hunt.

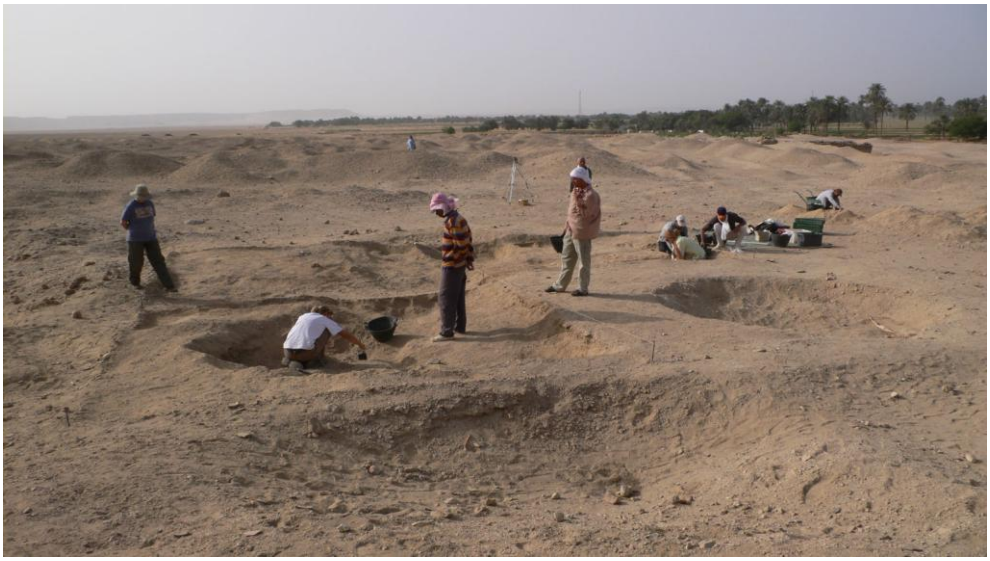

Figure 8: A view of the North City excavation, done to recover discarded Pendlebury stonework. View to the south. The top of the ruined Pendlebury house is visible on the right

One result of this piece of work came as a welcome surprise. Pendlebury's pits (whether they already existed and were only cleaned out by his workmen, or were newly dug in his time) descended through a relatively shallow layer of unexcavated housing that belonged to the North City. From the surface, the area looks to have been thoroughly disturbed by looters. In fact, significant parts of what we exposed appeared to be intact, showing the tops of walls separated by areas of collapsed brickwork from the walls. We did not disturb this material more than we could help. Nonetheless, a certain amount of the original archaeological fill was recovered. This was rich in pieces of faience, some of it similar to what can be found across the whole city, but some of it of high quality, and possibly manufactured on the spot.

Our final work in the field was a stint of just over five weeks at the North Palace, repairing the brickwork, a long-standing obligation we have put ourselves under. Last year we had made a start on the enclosures that had, rather improbably, housed live cattle and gazelle near the royal apartments. Picking up where we had left off, we managed to complete the job. We built up the lowest courses of brickwork in the walls, in the brick piers that supported areas of roof, and in a staircase that led up to what had presumably been a balcony from which the animals could be viewed. Visitors to the palace who walk around to the north side of the barbed-wire enclosure will get a good view of this latest part of the palace to be made intelligible again (Fig. 9).

Figure 9: The completed repairs to the brickwork of the animal enclosures at the North Palace.

The Amarna expedition remains dependent upon the generosity of individuals, including those who express their interest and support through The Amarna Research Foundation. Although times are not easy, we are holding our own and maintaining an undiminished program of work at Amarna. Many thanks to you all.

Barry Kemp, 28 May 2010

Publication announcement:

Kemp, B. and A. Stevens, 2010. *Busy Lives at Amarna: Excavations in the Main City (Grid 12 and the House of Ranefer, N49.18). Volume* I: *The Excavations, Architecture and Environmental Remains*. EES Excavation Memoir 90, London: Egypt Exploration Society and Amarna Trust. With contributions by P. Buckland, A. Clapham, R. Gerisch, A. Legge, E. Panagiotakopulu and C. Stevens.

Kemp, B. and A. Stevens, 2010, *Busy Lives at Amarna: Excavations in the Main City (Grid 12 and the House of Ranefer, N49.18). Volume* II: *The Objects*. EES Excavation Memoir 91, London: Egypt Exploration Society and Amarna Trust. With contributions by M. Eccleston, M. Gabolde and A. Veldmeijer.

These two volumes, respectively of 640 and 574 pages, are available through the Egypt Exploration Society, see http://ees.ac.uk/news/news/57.html

MUSIC IN THE AMARNA PERIOD

by Lyn Green

Our information about music and dance in the late 18th Dynasty and the Amarna Period comes from several sources. Firstly, there are the reliefs from the walls of the tombs of Akhenaten's high officials at Amarna. In Akhetaten the predominant theme for tomb decoration was that of scenes involving the royal family. The lives of the officials themselves did not figure into this scheme, except when those men were interacting with the king and queen in the course of their duties. These reliefs provide us with glimpses of musical performances accompanying royal activities such as banquets and worship in the temple, and scenes of musicians and musical instruments in the interiors of the palaces. Therefore, for depictions of the kind of musical entertainment preferred by the wealthy and well-connected, we have to turn to the tombs of the nobles on the West Bank at Thebes.

Information about the role of music in temple cult and court ritual also comes from the talatat from Akhenaten's lost temples at Karnak, and the relief-decorated blocks from the dismantled temples and palaces of Amarna. The Amarna blocks were moved to Hermopolis for re-use in later buildings (ed. note: see *Where Did Amarna's Stone Blocks Go?* By Barry Kemp, *Akhetaten Sun Vol. 15, No.2 – Autumn 2009*)

Another source of information are the reliefs dating to the reign of Tutankhamen from the temple of Luxor, and the depictions of the Sed-Festival of Amenhotep III in the tomb of Kheruef. The scenes of musicians on the temple walls are part of a traditional Egyptian religious procession, but the information they give us about music is very much applicable to the previous reign.

Finally, there are the small finds, including actual musical instruments, which come from various excavations, including the tomb of Tutankhamen.

Figure 1: The Blind Musicians from the Tomb of Meryre

Music in the Cult of the Aten

Music was an important part of all ancient Egyptian temple ritual and it was no different in the worship of the Aten. The hymn to the Aten proclaims

> "When you give your rays [every land] is in festival….singers and chanters shout out loud for joy in the house of the Benben and in your temple…"

In the reliefs in the nobles's tombs at Amarna, small orchestras of blind musicians are shown sitting on the ground inside the enclosure wall of the *Hwt-Bnbn*. However, the only musicians who approach the altar are the princesses, who play the sistrum while the offerings are made to the Aten. On the Karnak talatat, Nefertiti is sometimes shown playing the sistrum, but also appears making offerings on her own. In the reliefs from the Amarna tombs, it is more common for the princesses to be the musicians. The blind orchestras are also shown in the temple without the royal family, and therefore might be seen as replacing them in performing the all-important duty of ensuring that the Aten is constantly worshipped

In traditional Egyptian worship, music was used to praise and to pacify the gods. Women, in particular, seemed to have this power. The Egyptian word we translate as "to pacify" or "make at peace" is "*shtp*", the same word which appears in a title used by Nefertiti. On the east wall of Ay's tomb, she is referred to as being "one who propitiates the Aten with her sweet voice and with her lovely hands which hold the sistra"

In traditional Egyptian religion, the musicians who are specifically charged with this job are the *shemayet*, who are singing priestesses or chantresses. Their special musical instruments are the sistrum and the menat necklace, both of which are sacred to Hathor, goddess of music and alter-ego of Sakhmet. Due to her connection with the Sun-God, symbols of Hathor, such as the cow horns sometimes seen on the crown of the queen, never really disappear entirely during the Amarna Period, so the use of the sistrum in the temple of the Aten is not really surprising.

A block from the Karnak temple of Aten refers to *shemayet*, so we can be sure that there were still s*hemayet* at the beginning of Akhenaten's reign. At Amarna, sistra are still used to worship the god, and the princesses fulfill the role of these shemayet-priestesses, although they do not use this title.

Another place in which the traditional roles of musicians remained unchanged during the Amarna Period was the celebration of the Sed-Festival. Not only the Aten was praised in song, but the king as well. A block was found which belonged to the Karnak temple which records a hymn sung by the "royal children", part of a scene which was copied almost exactly from the Sed-Festival scenes of Akhenaten's father, as recorded in the tomb of the high official Kheruef. Dancers from the Oases, "meret-singers" and other performers were brought specially for these ceremonies. The most complete representation of the late 18th Dynasty form of the Sed comes from Kheruef's tomb, but talatat from Akhenaten's earliest temples show that his version of the musical portion of ceremonies was very similar to that of his father.

A royal ritual which was always accompanied by music was feasting. Any banquet attended by royalty in ancient Egypt became de facto a ritual event imbued with symbolism on many levels. One of the most important aspects of the banquets depicted on tomb and temple walls in the Amarna Period is the participation of the Aten in the event. According to the beliefs of several ancient Near Eastern cultures, music makes it possible for the gods to partake of offerings. The sound helps to transmit the essence of the food to the deity. It is no surprise, therefore, that all the feasts at which Akhenaten and the royal family appear are also populated by orchestras or Egyptian or foreign musicians.

Musical Instruments: Egyptian and Foreign

The cosmopolitan nature of the late 18th dynasty is obvious in the choice of musical instruments, as in other aspects of life at Amarna. The instruments and musicians who appear in the talatat of the Karnak temples and the reliefs elsewhere are an international group. This should not be surprising since documents from the reigns of Amenhotep III and Akhenaten mention that the kings of Mitanni sent both musicians and instruments. One of the letters from Tushratta of Mitanni mentions that more than three dozen "horns" are being sent to the king's

court. These are not horns in the modern sense, but might be the kind of combination drinking vessel and musical instrument known from much later in Egyptian history. The kings of Mitanni also sent numerous musicians as part of the entourages that accompanied the princesses who came to Egypt as royal brides. The reliefs in the tombs of Ay and Tutu (*ed. note:* South Tombs 25 and 8) offer us intriguing glimpses within the palaces at Amarna where some of these musicians lived. We can see suites of rooms set aside for the palace entertainers, consisting of rooms for storage and rooms for living and practicing. The Egyptian musicians, identifiable by their clothing and "Nubian wig" hairstyles, are grouped together. They are shown playing lyres and lutes and harps in a room adjacent to the room where their instruments were stored. In another suite, women with non-Egyptian hairstyles practice for a performance beside storerooms holding lutes and three types of lyres.

Traditional Egyptian musical instruments, traceable as far back as the Old Kingdom, which also appear in Amarna art include harps and lyres of various kinds. Musicologists describe harps as instruments in which the strings are attached to a single piece of wood, while lyres always have two uprights and a crosspiece. Lyres are represented in the talatat from Karnak in the scenes of banqueting which accompany the sed-festival and in the scenes of banqueting from Amarna tombs. The sound of these harps and lyres was joined by an instrument imported from Western Asia, the giant lyre. This type of stringed instrument is also of great antiquity, going back as far as the tombs of Ur, but it is not until the Amarna Period that it appears in Egyptian art. These instruments are represented in scenes of royal feasting, and in depictions of the palace they can be seen in storerooms. These lyres are shown in the reliefs as if they are as tall as a grown man, and are wide enough to be played by two standing musicians. Although the pictures of this lyre show the musicians standing on both ends of the instrument with their hands positioned on either side of it, they are actually both playing with both hands on the same side of the strings. These instruments and the musicians shown playing them have fascinated musicologists and musicians for a long time, and a replica of the lyre of Ur was actually made a few years ago and played.

Two types of harps are also shown in scenes from Akhenaten's reign. One is playing standing and is shown in many depictions of an all-female orchestra which plays at royal banquets. This is sometimes called the boat-shaped harp.

The other harp seen often at Amarna is sometimes called the arched harp and is played by the blind harpists who sing in the temple courtyards. This harp is smaller than other harps of the same basic type from other time periods and sometimes the neck of the instrument is decorated with a royal head, much as a figurehead decorates the prow of a ship. In the tomb of Meryre, the head decorating the neck of one of the harps wears the khepresh or blue crown. It is very challenging for musicologists to imagine how this harp would have sounded since it has a different number of strings in every representation.

Figure 2: Three Ancient Egyptian Harps

In addition to harps and lyres, there are reliefs which show both women and men playing lutes. The male lute-players are shown in the reliefs from the Festival of Opet in Tutankhamun's reign. Another male lute player appears in the tomb of Ahmes amongst the seated blind musicians. Otherwise the men and women playing lutes are shown standing up. The men participating in the Opet festival are playing their lutes with picks attached to long strings. Because the corners of their mouths are turned down, one scholar has suggested that they are humming. The female lute players from Amarna and elsewhere are often shown naked or in diaphanous dresses, indicating that this musical instrument might have been considered erotically charged when played by women.

Round hand drums or tambourines are also used by musicians in some scenes, particularly those in which women are dancing in groups alongside the royal procession or at reward scenes. For example, in the tomb of Tutu, a group of women are celebrating as the tomb owner is rewarded by Akhenaten.

There is another type of tambourine or hand-drum which also appears in the Amarna Period, a roughly rectangular one. Lise Manniche has claimed that only one of these tambourines is native to Egypt, but the other is an import, although in the tomb of Tutu, both instruments are played by the ladies celebrating the reward ceremony. This is also true of every other representation of this tambourine from the nobles' tombs at Amarna, and tombs from the reigns of Tutankhamen and Ay, so obviously the tambourine is an instrument of the people – or at least of women, who are the only ones depicted playing it.

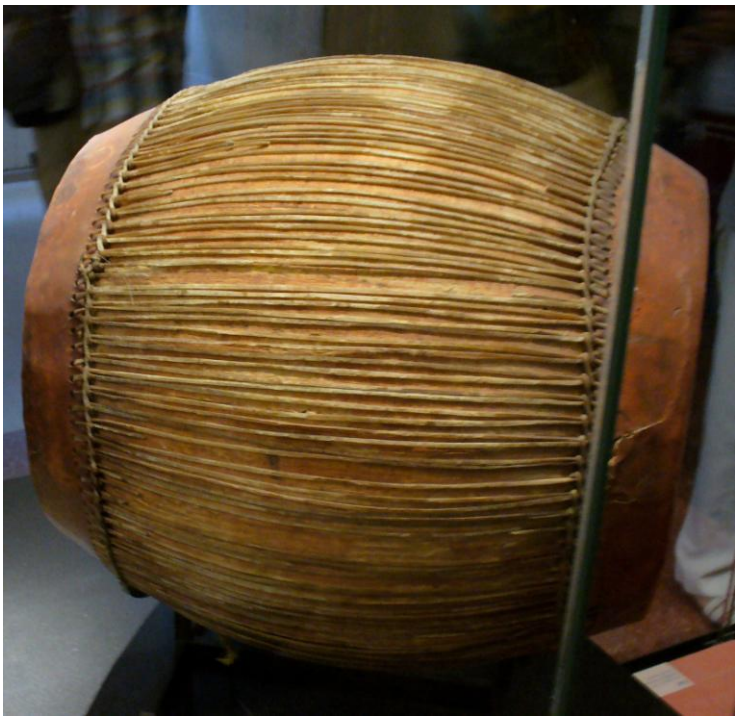

Figure 3: The Barrel Drum

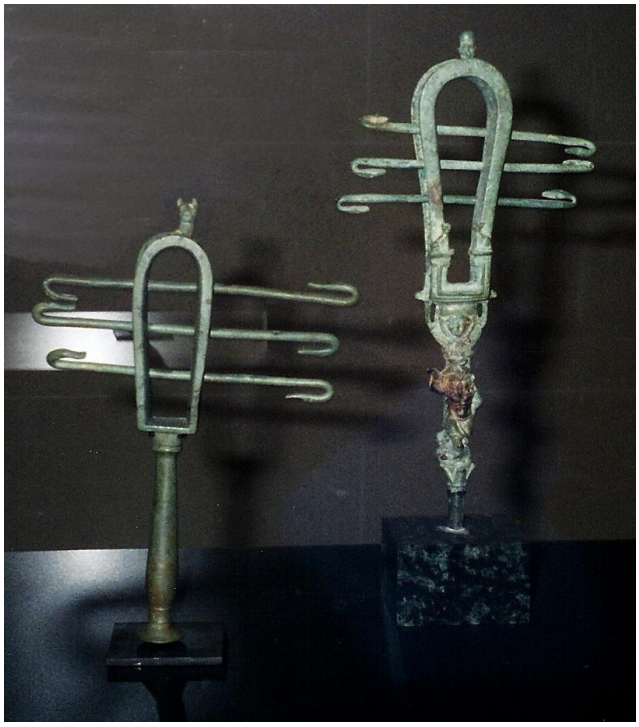

Figure 4: Sistra

The rectangular tambourine appears on reliefs from Hermopolis, all of them showing the tambourine being played by groups of rejoicing women. An actual example of this kind of tambourine still exists, in the Cairo Museum. It consists of a wooden frame covered on both sides with stretched parchment. This instruments dates to the reign of Thutmose III and may not be precisely similar to the ones played in the Amarna reliefs.

The round tambourine is also very closely associated with women and processions, although it is also shown being played by male gods. Although this is the shape of tambourine most familiar to us today, it first appears in Egyptian art in the reign of Amenhotep III. It is shown for the first time in the representations of the Amenhotep III's Sed-Festival in the tomb of the official Kheruef. However, kings who celebrated a Sed-Festival often went out of their way to record that they were following the most ancient records and traditions, so perhaps the round tambourine is much older than previously recognized.

If the tambourines were a musical innovation of the reign of Akhenaten's father, the reign of Akhenaten saw even more new musical instruments. Some of these, such as the giant lyre, have been mentioned above. Others include the "barrel-shaped drum", played by men in processions.

The tomb of Tutankhamen has provided a few real musical instruments for modern musicologists to study. These include a pair of clappers and a trumpet. The trumpet, which unlike modern trumpets had no stops and possibly no mouthpiece, was used for military purposes. It was fashioned from metal with the bell end decorated with incised relief depicting the king, standing before Ptah, wearing the Blue Crown and holding the crook scepter.

The clappers from the tomb of Tutankhamen (sometimes incorrectly called castanets) are inscribed with the names of Queen Tiye and of Meritaten. They are made of hippopotamus ivory, carved from a single hippopotamus tusk, split in half and were tied together. Another carefully preserved pair of clappers was found amongst the ruins of an Amarna palace. Although clappers of various kinds were traditionally used in the worship of Hathor, they were not banned even at the height of Akhenaten's reforms. There was undoubtedly an important solar symbolism attached to the hand shape of the instrument, and it is even possible that the queen's title *wab m awy* (or "pure of arms") refers to these musical instruments, which are also called "arms". Clappers were played by being held in one hand and smacked together.

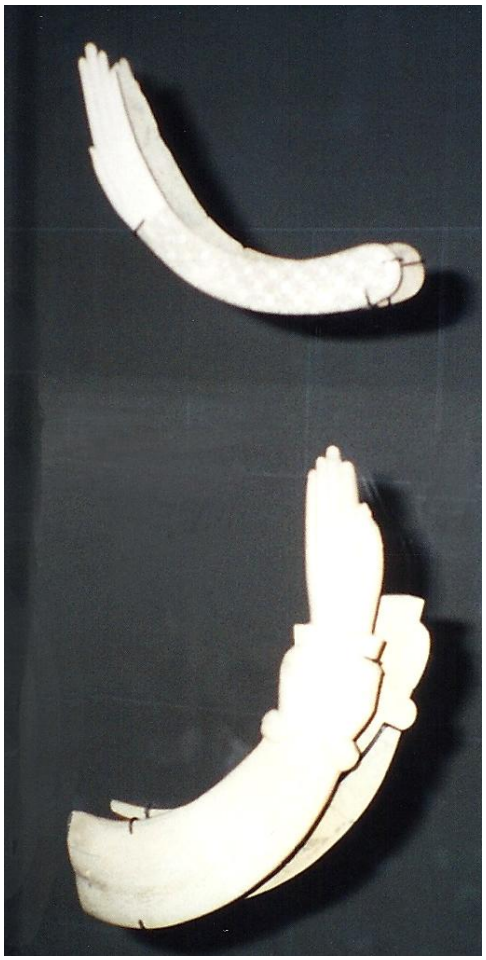

Figure 5: Clappers

Another instrument sacred to Hathor also remained popular throughout the Amarna Period. The sistrum was a rattle used to accompany sacred music, such as hymns. The traditional forms of the sistrum often had a head of Hathor incorporated into its design, which might imitate a shrine or naos. From the reign of Amenhotep III onwards, however, the sistrum could take a shape which somewhat resembled an ankh: a handle attached to a arch. The sistrum is almost exclusively played by women, especially of the upper classes and royal family, although a statue of the god Ihy from the tomb of Tutankhamen shows the deity with a sistrum in hand. In the tomb of Khereuf, a number of women called "royal children" are shown holding a sistrum and singing a hymn to Hathor. The daughters of Akhenaten participate in the worship of the Aten by shaking the sistrum as their parents make offering.

Musicians

The career of musician was open to both sexes in ancient Egypt, although we tend to see a few more female musicians than male. In the scenes of music from the Amarna Period, it has been suggested that some of the foreign musicians may be men dressed as women - a rather problematic assertion - or perhaps even eunuchs. These individuals wear long flounced garments and high pointed hats when performing in the presence of the royal family. However, in the "behind the scenes" reliefs from the tomb of Ay, the musicians wearing robes of this kind are seemingly housed next door to the undoubtedly female Egyptian musicians, which suggests that they too are women. The foreign instrumentalists have their eyes covered when playing near the royal family. By contrast, the female musicians dressed in Egyptian clothing don't seem to have their eyes covered or closed. Lise Manniche suggested that these musicians were regarded as specially privileged in the presence of the god or of the god-king by virtue of being female. By contrast, the male musicians and singers who play outside the temple of the Aten are depicted as blind.

There are representations of male musicians in procession from the temple of Luxor, in reliefs dating to the reign of Tutankhamen. These men play lutes and drums.

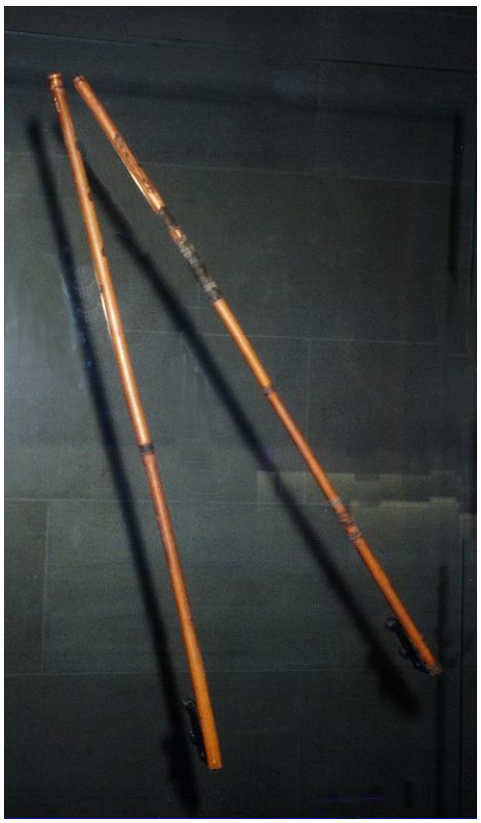

Figure 6: Flute

Judging by the temple and tomb reliefs, there was little distinction made in royal circles between the musicians who accompany ceremonial banquets for the royal family, and those who play in the temple. The musicians who entertain at these royal family gatherings are either all-female orchestras playing harps, lutes etc. or foreign musicians of indeterminate gender playing non-Egyptian musical instruments such as the giant lyre. All of the Egyptian entertainers at royal feasts are formally dressed and a few of them even wear the modius, a headdress reserved for high-ranking noblewomen. The young female musicians of the private tombs have lots of jewelry, but rarely anything that tells us their rank.

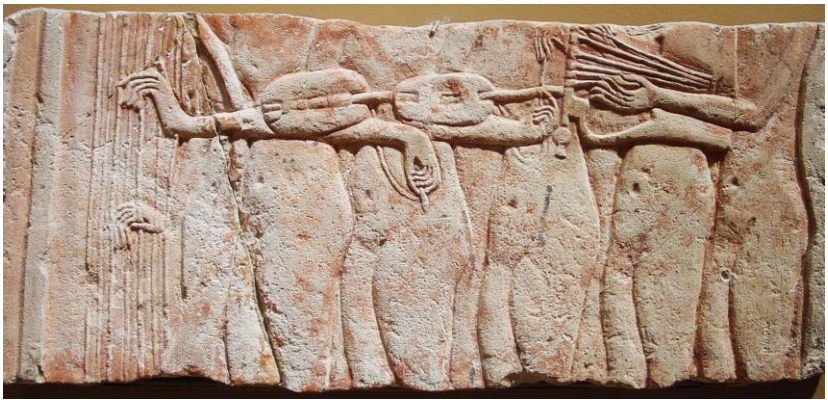

Figure 7: Amarna Lutes and Harp

In 18th Dynasty private tombs, most of the depictions of music are also part of banquet scenes. The entertainment at these non-royal feasts is usually provided by all-female orchestras of various sizes, from groups as small as three to larger bands of musicians and singers. Most of the musicians depicted in such scenes are female. Some of those groups of female musicians are depicted nude, or almost nude. The musicians play lutes, standing harps or kneeling harps and the double flute. The clothing and instruments vary from tomb to tomb. For example, in the tomb of Nakht, the three musicians play boat-shaped floor harp, lute and double flute. In this famous scene, reproduced so often on tourist paraphernalia, one musician wears only a belt of beads. This scene, and other paintings showing nude dancers or musicians, has led to a general conception that entertainers are primarily there to function as symbols of sexuality, fertility and rebirth. However, an analysis of this type of scenes shows that the majority of the musicians depicted in tombs paintings and reliefs are in fact fully clothed. Many of them wear long dresses similar to those worn by the party guests. In the tomb of Nebamun, the musicians seated on the floor wear even elaborate gold jewelry, including large earrings, wigs and scented cones on their heads, indistinguishable from the party guests.

Music and Society in the Amarna Period

In the late 18th Dynasty, including the Amarna Period, musical performance of one kind or another was done by many sectors of society, including the family of the king. Some musicians at least were treated with respect and may have prospered financially. Music and song were essential in both temple and at court during the Amarna Period. In fact, music in some form or other seems to have surrounded Akhenaten and his family at almost all times when they were in public. It should be seen as the essential element of the cultural revolution that has mystified and intrigued us for well over a century.

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Figures 1-6: Bob Litterell

Figure 7: J. Campana

T.G.H. JAMES, CBE: 1923-2009

by David Pepper

Honorary Trustee of The Amarna Research Foundation, T.G.H. (Harry) James, passed away on December 16, 2009. He was born in Wales on May 8, 1923, just after Howard Carter discovered the tomb of Tutankhamun. Harry's early interest in ancient lands was inspired by cigarette cards of the treasures from King Tut's tomb. Treasures which he would later catalog and work on in preparation for the traveling King Tut exhibit first shown at the British Museum. His education in Classics at Oxford University was interrupted by World War II, when he served as a Captain in the Royal Artillery. After the war he returned to Oxford and completed his Classics degree and then when on to study Egyptology ("And why not?" he once told me, "it seemed like a good idea at that time.") Tutored by Sir Alan Gardiner, he learned hieroglyphic and hieratic scripts: skills he put to good use later on at the British Museum publishing two volumes on translations of Egyptian texts from Stelae and Papyri (including the famous Heqanakht Papers).

Harry did field work at two sites in Egypt, documenting a tomb at Saqqara and rock-cut shrines at Gebel Silsila in upper Egypt. He is best remembered as an expert on Egyptian art, however, and his long tenure at the British Museum saw many changes and improvements to the Egyptian Galleries.

I first met Harry during his visit to Denver to lecture at the Ramses II exhibit in 1986. A friendship developed and I was fortunate enough to frequently work in England during the decade of the 1990's and would meet up with Harry several times a year. He loved the wine bar near the museum, and we met regularly to discuss Egyptology and Egyptian Art. I was privileged to attend numerous lectures and conferences with Harry, and his wisdom guided me in my studies of Ancient Egypt. My son was also inspired by him to pursue a Degree in Classics, and his humor and charm stimulated many others to learn more about the daily lives of the Pharaohs. He often brought his wife and son with him on his travels, visiting Denver on several occasions.

He will be missed by all those whose lives he touched. Farewell, my friend.

Egyptian Sculpture Gallery, British Museum

2010 TOUR of AMARNA

by Jill Taylor Pepper

Six people joined the TARF 2010 tour of Amarna. Carlos Borrico from San Francisco, Patricia Barker, Jay and Carol Phillips, and David and Jill Pepper from Denver. After a couple of days to adjust to the time change in Cairo and visiting the usual (but always fascinating) Giza-Museum-Memphis-Saqqara sights, our group set out for our much anticipated trip to Amarna and meeting with Barry Kemp.

We stayed at the Nefertiti Hotel in el Minya, which had nice accommodations, good food, drinkable wine, and was a "convenient" two hour drive from the ferry across the river at el Till. Barry Kemp generously met us at the hotel the night of our arrival and briefed us on the latest discoveries at the dig as well as plans for our next two days. The first day at Amarna was sunny, cloudless, and just the right temperature for exploring. We began at the Southern Tombs and walked up the hill overlooking the Wadi where the University of Arkansas is excavating the workers' cemetery (described in the first two articles). After visiting the tombs we meandered back through the city as Barry pointed out various significant sites (house of Sculptor Thutmose, the Royal Palace, the Small Aten Temple, the Amarna Letters discovery site, etc.), and explained work done by current and previous excavators. After lunch at the dig house we visited the Northern City and the ruins of John Pendlebury's Excavation House. He was the Director of Excavations at Amarna during the 1930's. The next day was very windy, and dust and sand flew across the Amarna Plain as we climbed to the Northern Tombs, and then we made the long trek up to Boundary Stela U. Finally, we ventured up the Wadi to the Royal Tomb which has been well conserved by the Antiquities Service. It was a wonderful two days and Barry made it very special by sharing his time and vast knowledge with us.

We then departed to visit Beni Hasan, Boundary Stela A and the tombs at Tuna el Gebel, and made our way on to Luxor, Aswan, and then home. A highlight of the trip for David and Jill was a fabulous cruise from Luxor to Aswan with TARF members Bill and Nancy Petty on the Neferu-Ra, their Victorian dahabeya houseboat.

Barry showing where Nefertiti's head was found

At the Small Aten Temple

The entrance to the Royal Tomb

Hiking along the trail to the North Tombs

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