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Recent research in Cypriot bioarchaeology

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Abstract: *Cyprus has a rich archaeological history that is not always reflected in bioarchaeological research. Complicating factors of fragmentary, commingled, and poorly preserved remains and an historical bias towards art historical and architectural approaches have led to delayed development of modern Cypriot bioarchaeology. This article highlights important research into ancient and recent Cypriot populations and suggests future approaches that might lead to more interdisciplinary work. Included here is a comprehensive bibliography of Cypriot bioarchaeological research.*

Key words: Cyprus: archaeology; bioarchaeology; paleopathology; biodistance; osteology; thalassemia

Introduction

Cyprus and its archaeology are common topics for eastern Mediterranean scholars studying ancient cultures including their art and architecture. Increasingly, Cypriot archaeology is seen as a distinct field rather than a subdiscipline within Near Eastern or Aegean archaeology. This has been driven by an expanding number of anthropological based research programs and excavations. Within this changing environment there has also been an increase in the numbers and scope of bioarchaeological research projects on the island. What has more commonly been left to appendices and chapters in site reports, is now seeing more attention through the development of young scholars and the need for archaeologists to better understand the people who lived at this important eastern Mediterranean crossroads. While true multidisciplinary bioarchaeology within Cyprus is still in its infancy, there are many projects where human remains make up a significant portion of the recovered materials (e.g. Souskious-*Laona* and Kourion's Amathus Gate Cemetery). As more bioarchaeologists are involved in skeletal research on the island the research questions and methodologies become more diverse. This paper will address recent research trends within Cypriot bioarchaeology with an eye toward suggesting new research directions. Part of this will include a comprehensive bibliography of Cypriot bioarchaeological research that the authors plan to update regularly (see **Appendix**).

As with any review article, the scope of the work must be defined. Rather than providing an exhaustive account of all the bioarchaeological work published in the last 10 years, we seek to highlight what we see as the most compelling research questions being asked within individual research and larger field research projects. One or two major research questions are fo-

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cused upon for each time period beginning with the Neolithic period (**Table 1**). Additionally, many questions concerning the biology of ancient Cypriots, such as thalassemia or cultural cranial modification, are not confined to specific time periods.

Table 1. Chronology of Cyprus.

	Phase	Culture	Dates
	Akrotiri Phase		c. 10900–9900 BC
Neolithic	Cypro-PPNA		c. 9900–9000 BC
	Cypro-PPNB		c. 9900–7000 BC
	Early Neolithic	Khirokitia	c. 7000–5500 BC
	Late Neolithic	Sotira	c. 4700–4000 BC
Chalcolithic	Chalcolithic	Erimi	c. 4000–2500 BC
	Philia Facies		c. 2500–2350 BC
Bronze Age	Early Cypriot		c. 2350–1950 BC
	Middle Cypriot		c. 1950–1650 BC
	Late Cypriot		c. 1650–1150 BC
Iron Age	Cypro-Geometric		c. 1050–750 BC
	Cypro-Archaic		c. 750–475 BC
	Cypro-Classical		475–325 BC
	Hellenistic		325–58 BC
	Roman		58 BC – AD 330
	Late Roman		AD 330 – c.700
	Byzantine		AD c. 700–1192
	Medieval	Lusignan	AD 1192–1489
	Venetian		AD 1489–1571
	Ottoman		AD 1571–1878
	British Colonial		AD 1878–1960
	Republic of Cyprus		AD 1960–Present

The ratio of excavated cemeteries compared to the number of cemeteries that have seen significant publication of the human remains is quite low. Using the numbers of excavated cemeteries reported by Keswani (2004, Tables 3.1, 3.2) only 36% or 9 of 25 reported Early Cypriot-Middle Cypriot cemeteries have undergone anthropological study. Of the Late Cypriot cemeteries only 10 of 29 or 34% have had anthropological research. If these figures were based on actual numbers of recorded skeletons compared to those analyzed the proportion would be even lower. The reasons for these figures are many. For many early excavations, skeletal material was considered useless and the art historical focus on fine art objects overshadowed any anthropological research. The other factor that contributes is the Mediterranean climate and the composition of the tombs. The limestone rock-cut tombs that often fill with water in the winter and dry in the summer cause chemical degradation and physical stirring of the skeletal material (Angel 1972b; Fürst 1933). These fragmentary and commingled remains (**Figure 1**) often prove difficult to identify and individuate and methods of excavation and study must reflect this limitation.

Figure 1. Detail of fragmentary, commingled remains from Kourion's Amathus Gate Cemetery, Tomb B14 (photograph by Chris Parks).

Neolithic Cyprus

For many years, the earliest occupation was thought to take place at the site of Khirokitia (7000–5500 BC) in southern Cyprus (**Figure 2**). Over the past 20 years the picture of the Neolithic in Cyprus as an extremely isolated and insular culture has completely changed (Peltenburg & Wasse 2004; Guilane & Le Brun 2003). Earliest evidence of human activity on the island now dates to 12,000–11,500 BP, with the site of Akrotiri-*Aetokremnos* (Simmons 1999). Similar stone tools have been found at sites on both the east and west coasts (Ammerman et al. 2008). Permanent occupation of the island occurs later, in the Cypro-PPNA, only recently defined by dating from excavations at Agia Varvara-*Asprokremnos* (McCartney et al. 2006, 2007). The assemblage from Asprokremnos contains the full range of Levantine stone

tool technology including the small thumbnail scrapers found at earlier sites on the island and projectile points similar to those found in the Middle Euphrates region (McCartney 2007).

The Cypro-PPNB is comprised of four recently investigated sites (Simmons 2007), Parekklisha-*Shillourokambos* (Guilane & Briois 2001; Guilane & Le Brun 2003), Kissonerga-*Mylouthkia* (Peltenburg et al. 2000; Peltenburg 2003), Kalavassos-*Tenta* (Todd 1987, 2005) and Kritou Marottou-*Ais Yiorkis* (Simmons 2003). Human skeletal remains have been uncovered at all of these sites. The burials are found in a variety of contexts from large built pits (*Shillourokambos*), wells (*Mylouthkia*), middens (*Ais Yiorkis*), or subfloor burial pits and spaces between structures (*Tenta*).

In the following Neolithic period, the Khirokitia Cultural Phase (aceramic) and the Sotira Cultural Phase (ceramic) both possess significant amounts of human burials. The remains from Khirokitia number around 250 individuals, most buried beneath house floors (Le Mort 2008). There is a distinct lack of grave goods and elaboration for these burials that suggests a rather egalitarian social structure (Le Brun 2002). Only 12 poorly preserved burials were excavated at Sotira-*Teppes.* These were located outside of the main household area. The bodies were flexed and covered with stones within simple pits. Similarly, there were no grave goods recovered (Dikaios 1961).

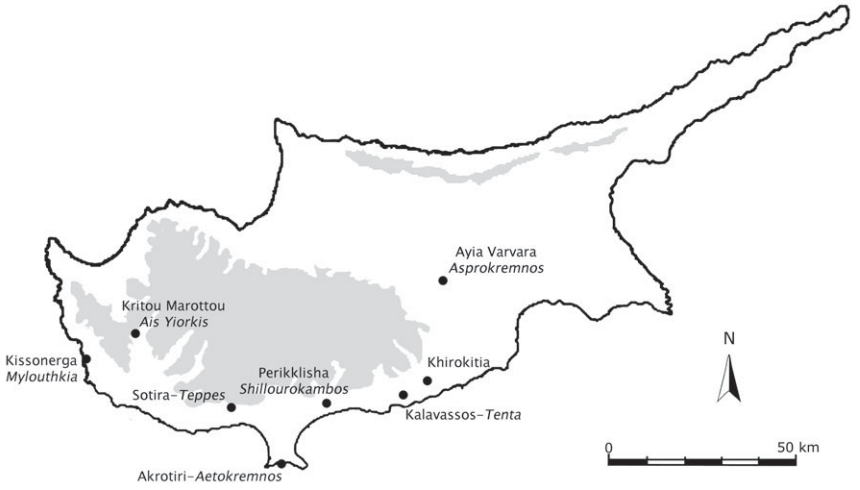

Figure 2. Map of Cyprus indicating Neolithic sites mentioned in the text.

Parasitology

The Neolithic material from Cyprus, particularly Khirokitia, provides an important resource for understanding the origins of the first settlers, their health status and diet. Skeletal material from older excavations at Khirokitia and Sotira was analyzed by J.L. Angel (Angel 1953, 1961) and focused on estimation of biological distance using morphological types to reveal underlying genetics and a full skeletal analysis of health status. The materials from the more recent excavations at Khirokitia and Shillourokambos are currently under study by F. Le Mort.

At Pareklisha-*Shillourokambos,* a significant number of human remains were recovered from a large pit installation, 6m in depth and 6m in diameter. It contained three distinct burials and a collective grave containing the crania of 20 individuals. Another eight burials were recovered in other areas of the site (Crubézy et al. 2003).

Neolithic Cypriots lived in close contact with their natural environment, particularly their domesticated animals. Even today zoonoses, diseases passed from animals to humans, are common in areas where close contact between domesticated animals, their secondary products and humans occur. Furthermore, intestinal parasites can be passed into their human hosts either through diet, uncooked or raw meats, improperly washed vegetables or through contact with decomposing biological materials or feces.

To better understand the parasitic load on Neolithic Cypriots, soil samples were gathered from the pelvic area or below the burials of four individuals from *Shillourokambos* (two samples from one individual) and seven from Khirokitia (one adult and six subadults) (Harter-Lailhegue et al. 2005). Of the 12 samples, five showed parasite egg cases including all four individuals sampled from *Shillourokambos* and the one adult individual from Khirokitia. Four helminths were identified, that can be divided into parasites transmitted in food (*Tænia* sp., *Fasciola* sp.) and through lifestyle and environment (*Ascaris* sp., *Trichuris* sp.). Tapeworms *T. saginata* and *T. solium* are derived from raw or poorly cooked beef and pork, respectively. Liver flukes *F. hepatica* and *F. gigantica* are commonly contracted from the consumption of foods contaminated with cattle, sheep or goat feces. Roundworms or whipworms, *Trichuris trichuria* and *Ascaris lumbricoides,* are some of the most common intestinal parasites in man and are usually contracted through human feces and general poor sanitation.

All four of the sampled individuals from *Shillourokambos* had evidence of at least two parasites. Only one individual from Khirokitia had evidence of parasitic infection. While the specific species of *Tænia* cannot be identified, it is clear that cattle, pig and caprine were part of the diet in the Cypro-PPNB at *Shillourokambos* (Vigne 2001). It is also suggested that the people at Shillourokambos would have been consuming freshwater plants (Harter-Lailhegue et al. 2005). The parasitic load in the sampled individuals from both *Shillourokambos* and Khirokitia indicate that sanitation within the village and contamination of food and water sources was present. Contamination of water supply remained a common health threat through the Hellenistic and Roman periods (Fox 2005) to the modern day (Christodoulou 1959). Parasitological examination can provide information about diet and environment but it also can be used to suggest differential diagnoses for porotic hyperostosis in Cypriot materials. Porotic hyperostosis, the porotic thickening of the cranial vault along with cribra obitalia, could represent thalassemia (Angel 1966, 1972b). Thalassemia is found in modern Cypriots with approximately 16% of the population carrying one copy of thalassemia mutation (Baysal et al. 1992). Molecular genetic testing of the G6PD mutations found in Cyprus points to two periods of mutation, one dating to the advent of agriculture and another dating to around 500 BC (Tishkoff et al. 2001). Anemia of any sort can cause porotic hyperostosis and cribra orbitalia (Janssens 1981; Stuart-Macadam 1989). Perhaps due to taphonomic changes, cribra orbitalia and porotic hyperostoses were not observed, although the one individual from Khirokitia with evidence of parasites also exhibited diploic expansion and a thickened parietal, measuring 9 mm (Harter-Lailhegue et al. 2005).

Future parasitological work in Cyprus will undoubtedly be constrained when these methods are applied to chamber tombs or collective tombs. Secondary treatment, collective burial and taphonomic processes in chamber tombs would make it difficult to identify individual

cases. One archaeological context that has also been successful are latrines (Mitchell & Stern 2001; Mitchell et al. 2008). Also the presence of marine parasites could indicate increased reliance on marine resources though nutritional isotope research from the Aegean islands suggests that fish were not a major portion of the diet in the medieval period (Garvie-Lok 2001).

Chalcolithic

The inception of the Chalcolithic period (~4000–2500 BC) in Cyprus (**Figure 3**) is poorly defined but it is now generally agreed that the beginning of the Chalcolithic occurred around 4000 BC (Clarke 2007). Most of what is known about the Chalcolithic period comes from the Paphos District in western Cyprus. There, a long-term research program has investigated not only the Neolithic and Early Chalcolithic sites of *Mylouthkia*, but also the subsequent Middle Chalcolithic sites of Lemba-*Lakkous*, and Kissonerga-*Mosphilia.* The Chalcolithic period begins with an increase in population and a general reorganization of settlement patterns. Structures consist of monocellular mudbrick roundhouses with floor partitions and an in-floor hearth. The major technological change in the Chalcolithic is the first use of copper implements, likely cold-hammered rather than smelted and the introduction of glassy faience (Crewe et al. 2002). There is also an increase in the procurement and production of picrolite items that continues through the Bronze Age (Cory-Lopez 2005; Swantek 2006).

The most significant recent research has come from Peltenburg and colleagues at two related sites in the Dhiarizhos River Valley, Souskiou-*Vathrykakas* (Peltenburg 2006) and Souskiou-*Laona* (Crewe et al. 2005; Peltenburg et al. 2006). Both sites have substantial cemeteries. The looted cemeteries at *Vathrykakas* has yielded 100 rock-cut, pit, bell-shaped or chamber tombs, the majority of which date to the Middle Chalcolithic. A number of human remains

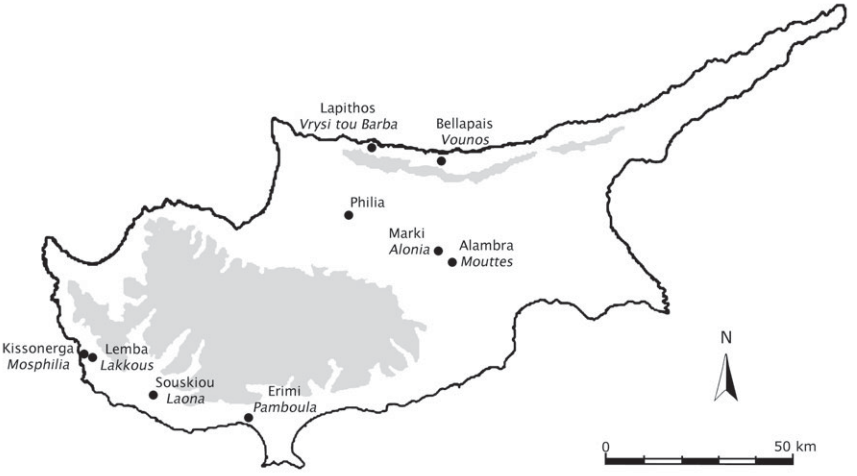

Figure 3. Map of Cyprus indicating Chalcolithic, Early Cypriot and Middle Cypriot sites mentioned in the text.

were recovered (Lunt 2006; Parras 2006a). Souskiou-*Laona* was thought to be similarly looted and investigations have brought to light at least 137 tombs of which 15 have been found intact (Crewe at al. 2005).

Anthropologie de terrain

Despite some unique instances, burial in collective tombs, be they pit, chamber or built tombs, is common from the Chalcolithic until the Late Roman Period (Craps 2007; Fox-Leonard 1997; Keswani 1989, 2004; Niklasson 1991; Toumazou 1987; Steel 1993, 1995). These collective burial groups are formed in a series of depositional events rather than a single instance of inhumation (Keswani 2004:24). With each burial event the preceding remains are moved, disturbed, and taphonomically altered. In some cases this disturbance is incidental but for many instances it is a continuation of mortuary rites into a secondary phase. With each disturbance, information concerning the placement of bodies and their associated grave goods is lost. With the elaboration of mortuary ritual that can be discerned through the Iron Age, detailed analysis of collective tombs and mortuary deposition are particularly important.

Excavation and recording of burial placement and secondary deposition in the Chalcolithic cemetery of Souskiou-*Laona* is currently being studied with an emphasis towards *d'anthropologie de terrain* (Duday & Masset 1987; Duday et al. 1990; Lorentz n.d). This approach fostered by French anthropologists focuses on highly detailed and contextualized mortuary analyses to better understand the decomposition and deposition of bodies within a burial environment. An understanding of anatomical articulations is an important aspect of this approach. Coffins, shrouds or other burial equipment can be deduced from body position, negative space and the persistence of articulations. Within the secondary mortuary contexts of Cyprus an understanding of the "labile" and "persistent" articulations within the skeleton can provide indicators of the duration of primary burial and the level of decomposition with the interment of a succeeding burial.

Early/Middle Bronze Age

The transition from the Chalcolithic to the Early Cypriot Bronze Age (**Figure 3**) marks a significant change in settlement patterns, architecture, ceramics and the exploitation of copper (Clarke 2007). Once again, this transition is unclear as there is a lack of well-stratified sites and a dearth of solid, contextualized radiocarbon dates. The period dating from 2500–2350 BC is known as the Philia Facies, and it is in this distinct phase that elements of material culture, not previously seen on Cyprus, become common. Bronze toggle pins, annular stone and shell pendants, biconical terracotta spindle whorls and distinctive fire hobs appear with increasing regularity along the north coast and the northwest of the island (Webb & Frankel 1999). During this period, cattle also reappear in the faunal record. Instead of being used solely as a source of food, it is likely that cattle were now used for secondary products and for traction (Knapp 1990). The explanatory model for this rapid change in material culture has relied on the migration of discrete groups of people from southwestern (Dikaios 1962; Webb & Frankel 1999) and perhaps eastern Anatolia (Mellink 1991). A competing model suggests indigenous elite competition (Knapp 1990) or the emulation of the elite symbolism

of southern Anatolia (Manning 1993; Manning & Swiny 1994). Webb and Frankel argue for a relatively peaceful integration of these migrants into indigenous culture by the beginning of the Early Cypriot Bronze Age (EC) while maintaining a distinct identity (1999:38). The Early Cypriot (~2300–1950 BC) and Middle Cypriot Bronze Age (MC, 1950–1650 BC), see an increase in population as shown by higher cemetery and settlement density. The sugested elite competition is most clearly depicted in the cemetery evidence. Large numbers of copper and bronze items as well as Red Polished pottery in fantastic zoomorphic and multi-bodied shapes, at times with modeled figures on vessel rims or shoulders are found in EC and MC cemeteries. North coast cemeteries at Bellapais-*Vounous* (ECI–MCII, ~2300–2150 BC) (Gjerstad et al. 1934) and Lapithos-*Vrysi tou Barba* (Stewart & Stewart 1950) provide excellent examples. Keswani (2004) suggests that the increased status competition witnessed in mortuary ritual was a driving force in the integration of migrants into local communities. This competition also spurred the development of copper resources, thus integrating Cyprus within the wider eastern Mediterranean trade networks.

Cultural cranial modification

How a social group identifies themselves is fluid, situational and reflexive (Barth 1969; Jones 1997; Knapp 2008). It is constantly being negotiated and renegotiated. The introduction of the new and unique material culture in the Philia and the elaboration of this material culture into the EC and through the MC, indicate that migrant groups negotiated their identity in a number of ways. Among them is the practice of the cultural modification of the cranium. Cranial modification known in Cyprus from the Cypro-PPNB of *Mylouthkia* and was practiced at least until the Iron Age (Angel 1953; Fox 2003c; Fürst 1933; Lorentz 2002, 2007b; Schaeffer 1935). In Cyprus there are three distinct types of cranial modification: an antero-posterior shortening, evidenced by a flattened occipital and lateral expansion of the parietals and temporals with increased curvature of the parietals at obelion (**Figure 4**); a "Cypriot" type of modification that shows post-bregmatic flattening with the sloping of the parietal toward inion, along with pronounced lateral expansion of the parietals (**Figure 5**), and the third type is the least common and is a circumferential lengthening of the cranium by either binding or the use of bands (**Figure 6**). Plagiocephaly, the non-symmetrical flattening of some portion of the vault, is also seen, but does not seem to be indicative of intentional modification (Schwartz 1974).

Infants in cradleboards are depicted in coroplastic art of the EC/MC (Karageorghis 1991). The figurines are represented in either a flat plank form with the children etched into the surface or full dimensional standing individuals (**Figure 7**). There does not seem to be any indication of bands, pads or neckrolls, although the children do seem to be swaddled. The mother and infant figurines continue into the Late Cypriot Bronze Age (LC). The practice of intentional modification along with the presence of these figurines indicate a strong connection between cranial modification and group identity (Lorentz 2004b, 2007b).

The prevalence of cranial modification in the Neolithic period has been called "ubiquitous" at Khirokitia by Angel (1953) and "universal" by Lorentz (2003b). The Khirokitia series is well-documented as having an extremely unique morphology in the Near East (Angel 1953; Kurth 1958; Kurth & Röhrer-Ertl 1981; Pinhasi & Pluciennik 2004). Angel goes so far as to suggest that Cyprus is the "centre *par excellence*" of brachycrany in the eastern Mediterra-

Figure 4. Examples of occipital modification from Khirokitia (Plate 122 from Dikaios 1953). ↑

Figure 5. An example of the "Cypriot" type of modification from Enkomi (Plate XXIV from Fürst 1933).

Figure 6. An example of the annular binding or band type of deformation from Enkomi (Plate XXXIV from Fürst 1933).

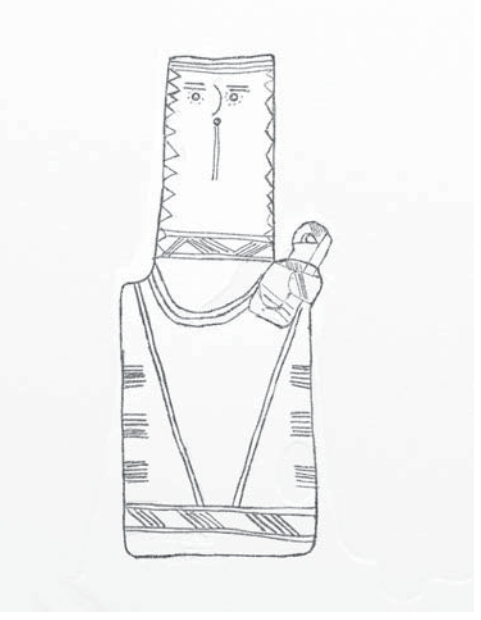

Figure 7. An example of a red polish plank figurine with an infant in a cradle (Plate XXVI from Gjerstad et al. 1934). →

nean and that similar cranial morphology observed in the Aegean and Anatolia may have its source in Cyprus. The cranial index (CI) is a general measure of cranial shape, where a ratio of head breadth to head length can be expressed as a percentage. Individuals with an index of 100 would have a cranial breadth and length of equal dimensions (Bass 1995). On Cyprus, and Khirokitia in particular, cranial indices are heavily skewed toward brachycrany. A CI of 86.5 represents the "relatively undeformed" male and female crania, while CIs of 98.8 and 102.5 represent "deformed" males and females, respectively (Angel 1953:423). The CI for the Bronze Age samples from Enkomi and *Melia* once again demonstrate brachycrany in the relatively unmodified crania with a ratio of 82.4 for *Melia* and 82.1 for Enkomi (Fürst 1933). Study of living populations from early 20th century Cyprus by Buxton (1920b) indicate that brachycrany persists even today with Leukoniko showing a CI of 82.0 and modern Enkomi, Limnea, and Agio Sergios each possessing a CI of 81.3. The persistence of brachycrany from the Neolithic through to the modern era may be more indicative of natural variation in cranial shape rather than ubiquitous modification, either intentional or even incidental. Le Mort recently studied several crania from Khirokitia to clarify the degree of modification and to determine a statistical method for identifying modified crania as well as addressing several nonmetric traits that have been associated with modification, including post-coronal depression, sagittal grooving, extrasutural bones, and occipital depression (Le Mort 2007).

Linear measurements and cranial indices as well as the frontal, parietal, and occipital indices were used to estimate total shape of the cranium and curvature of the constituent bones. On ten fragmentary crania, the cranial index ranged from 80.1 to 112.5, the frontal index from 82.2 to 89.3, the parietal index from 83.6 to 88.7, and the occipital index from 84.9 to 93.7, indicating only slight convexity or flattening. Of the ten crania under study, only two showed unequivocal traits and measurements indicative of intentional deformation. Another recently proposed method uses roughly the same parameters in multivariate and discriminant function analyses (Clark et al. 2007). After first classifying the crania based on visual characteristics, the discriminant function analysis correctly classified the modified group with 85% accuracy. It would be of great utility to attempt such a study on materials from all periods of Cyprus, both to define the range of natural variation and to quantify the two basic types of modification.

Late Bronze Age

The increasing connectivity of Cyprus in the EC and MC periods is fully realized in the Late Cypriot Bronze Age (LC, ~1650–1050 BC) (**Figure 8**). In order to exploit the increasing trade interactions, the once rural, agrarian character of the culture and economy changes in the LC with development of large towns and urban centers on the coasts. Morphou-*Toumba tou Skourou* (Vermeule 1974), Enkomi-*Ayios Iakovos*, and several towns along the south coast of the island are established and develop into regional polities, each with control over some aspect of trade associated with copper and ceramics (Crewe 2007). At the end of the MC, references to *Alashiya*, a nation controlling copper resources, appear in texts from Mari and Babylon. By the LCII period (~1450–1200 BC), texts from Syria, Anatolia and Egypt indicate that the kings of *Alashiya* were seen as near equals to their imperial counterparts.

By the LCIII (~1200–1050 BC), the previous period of wealth and urban growth ends with the destruction or abandonment of many of the large towns including Enkomi and

Kalavasos-*Ayios Dhimitrios*. The surviving urban centers become fortified and others, such as Maa-*Palaeokastro* and Pyla-*Kokkinokremos,* perhaps represent initial movement of Aegean groups into the island. An alternate view suggests indigenous Cypriot strongholds (Fortin 1981; Hult 1983). The data suggestive of an incursion of Aegean population elements include locally produced Mycenaean pottery, Aegean-style cooking pots, handmade burnished wares (HBW), fibulae, and the Naue type II sword, along with other military equipment reflecting Aegean influence. Critique of the migration and colonization narrative provides a different view. Many factors have contributed to a muddled picture of the LCIIC–LCIII (1340–1200 BC) transition to the Iron Age kingdoms in Cyprus, including the Sea Peoples' narrative, the establishment of Philistine centers in the southern Levant, the basis of archaeological models on Classical period texts, and academic and political prejudices (Knapp 2008; Leriou 2002; Given 1998; Maier 1985, 1986). The evidence when reevaluated is more suggestive of continuity with some elements of supposed Aegean origin found in the LCII before the documented wave of destructions (Collard 2008; Iacovou 2005, 2007; Leriou 2002).

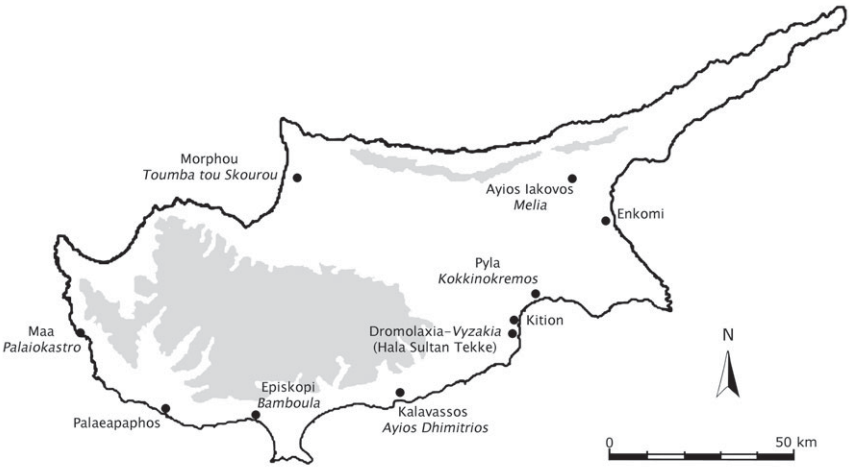

Figure 8. Map of Cyprus indicating Late Cypriot sites mentioned in the text.

Biodistance

Biological distance or *biodistance* is the measurement and interpretation of relatedness or divergence between populations or subgroups of populations based on polygenic skeletal and dental traits (Buikstra et al. 1990:1). The attributes under analysis for the bioarchaeologist are derived from the skeleton and the dentition. These variables can either be nonmetric, discrete skeletal traits (Hauser & De Stefano 1988) or dental traits (Scott & Turner 1997), that vary in presence or degree of expression or quantitative traits that are derived from linear measurements of bone (Howells 1989) or teeth (Kieser 1991). Patterns within the data are then compared to historical or archaeological data (Relethford 2003). This "model-free" approach has largely been replaced by "model-bound" approaches that follow a strict set of statistical and

genetic parameters (Relethford & Blangero 1990). Modern statistical and genetic anthropological biodistance studies within Cyprus have been poorly developed (Harper 2008; Harper, in press). This is largely due to the reliance on the use of types and a focus on the analysis of the cranium (Fox-Leonard 1997; Harper 2008). The muddled history of types and craniometry is well documented (Cook 2006). From a scientific standpoint, the lack of accounting for variability in populations within typologies is countered by the modern statistical and quantitative population genetics approaches. In these approaches, it is the analysis of variation that provides an appraisal of the populations under consideration.

Historical studies of Cypriot biodistance sought to answer questions of the origins of Neolithic Cypriots (Angel 1953; Charles 1966; Kurth 1958; Kurth & Röhrer-Ertl 1981; Pinhasi & Pluciennik 2004) or the relationship of Late Bronze Age Cypriots to the people of Mainland Greece (Fürst 1933; Hjortsjö 1947; Charles 1962; Angel 1972b). There were few questions that focused on continuity within Cypriot populations and any alteration in cranial form was thought to reflect a migration event. Within the past decade, the methods and questions have been modified and updated. Among the methods that have been used with success are studies of discrete dental morphology, including intracemetery variation (Tung 2001), regional and internal relationships (Parras 2004), and craniometrics focusing on evidence for continuity and change in Cypriot populations (Harper 2003).

Dental nonmetric

Nonmetric dental variation in Cyprus has been described before and has only lately been studied within a theoretical framework. There are reports of taurodontism (Lunt & Watt 1998), shoveled incisors (Lunt 1985; Tung 2001; Parras 2004), Carabelli's trait and cusp (Tung 2001; Schulte-Campbell 2003; Parras 2004), six-cusp mandibular first molars (Harper, pers. obs.), fused supernumerary teeth, and large free-standing parastyle of the maxillary third molars (Harper pers. obs.; Lorentz 2006). Agenesis or reduction of the third upper and lower molars, as well as the second premolar and lateral incisor also occurs (Lunt & Watt 1998; Taramides 1983).

A regional study of Cypriot dental morphology has identified several patterns that suggest continuity and contact from at least the Chalcolithic period (Parras 2004, 2006b). Using the Mean Measure of Divergence (MMD) and the Coefficient of θ (Dθ), samples from Chalcolithic (Soukiou-*Vathrykakas*, Lemba-*Lakkous*, Kissonerga-*Mosphilia*) and Bronze Age Cyprus (Enkomi-*Ayios Iakovos,* Ayios Iakovos-*Melia*), were compared to Early Bronze Age Jerablus Tahtani from Syria and Middle Helladic Asine and Lerna from mainland Greece.

The distance matrices derived from the MMD and the Dθ do not correspond very well, likely due to small sample sizes and differing statistical methods. Despite these disparities, the results indicate that the southwestern Cyprus samples demonstrate some affinity with the eastern Cyprus Bronze Age samples. Similarities in the presence of shoveled incisors, interruption grooves, and lower molar groove patterns are observed. External relationships were demonstrated between southwestern Cyprus and Jerablus Tahtani and between eastern Cyprus and mainland Greece. When pooled samples from southwestern Cyprus and eastern Cyprus are compared to published European, North African, Early Bronze Italian, and Natufian samples, MMD and Dθ again show a lack of direct correspondence. Limitations due to the small sample sizes for Enkomi, Ayios Iakovos, and Jerablus, as well as the large temporal and regional span of the materials is problematic. The results for the southwestern Chalcolithic

sites, however, are indicative of the utility of dental morphology research in Cyprus when geographic and temporal range is restricted.

Metric analyses

Often it was only the cranium that was preserved from archaeological investigations, because of an historical reliance on cranial typologies to determine relationships between groups (Angel 1953). One of the first multivariate analyses of Mediterranean craniometrics used principal coordinate analysis and Mahalanobis D^2 on 15 sample groups from Crete, mainland Greece, the Levant and Egypt (Musgrave & Evans 1980). A series from Khirokitia, Sotira and Erimi were also added to this analysis. Not surprisingly, results indicate a difference between Cyprus, mainland Greek and Egyptian samples. More recently, a study of regional variability in the Neolithic period included material from Khirokitia (Pinhasi & Pluciennik 2004). Using a principal components analysis, a small sample of individuals from Khirokitia (n=21) were far removed from other populations based on six cranial variables, suggesting some isolation and possible founder effect. Superficial similarity is seen between Khirokitia, and northern Levantine sites of Basta and Abu Hureyra.

Using canonical discriminant and Mahalanobis D^2 analyses, an initial sample of Cypriot and eastern Mediterranean crania (n=1128) were analyzed to investigate trends of long-term continuity and evidence of change (Harper 2003, in press). Data were gathered in the field and from literature and included datasets derived from J.L. Angel's collected papers housed at the National Anthropological Archives (Harper 2008). Three broad temporal groups by region were constructed in order to maintain sample sizes. "Early" samples consist of Neolithic and Chalcolithic (9000–2500 BC) sites, the "Bronze Age" is constructed from Early through Late Bronze Age samples (2500–1100 BC) and the "Post-Bronze Age" consists of Cypro-Geometric to Roman period sites (1100 BC – AD 400). Thirteen standard craniometric variables were utilized in the analyses and were selected according to availability of variables across samples. Care was taken to gather samples that used standard craniometric measurements as described by Martin (1928). Interobserver error was calculated to test the similarity in measurements between three investigators that collected data on a common sample (Khirokitia; Harper 2003, 2008; Angel 1953; Charles 1962). Individuals with significantly modified crania were excluded from analysis.

The results of previous work at Khirokitia are upheld (Harper, in press). The "Early" material is very distinct from all other samples. The centroid for the "Bronze Age" is also distinct but a shift in morphology is observed with time. The distinctive short, broad cranial vault and short, wide face observed in the "Early" periods demonstrates increasing length with a decrease in breadth and lengthening face in the "Bronze Age". This trend continues into the "Post-Bronze" and samples from Cyprus, Greece and Anatolia reflect increasing connectivity between these regions (Harper 2008, in press).

Iron Age

The transition between the Bronze Age and the Geometric Period (1050-750 BC) was again fraught with changes (**Figure 9**). The long-established urban centers at Enkomi, Hala Sultan

Tekke and Episkopi-*Bamboula* were replaced by new centers at Salamis, Kition and Kourion, respectively. New centers are also founded at Idalion, Amathus and Paleapaphos. It is in this period that evidence of Hellenization of Cyprus can first be found in a tomb from Paleapaphos-*Skales* where a syllabic inscription in Greek is identified on a bronze spit (Karageorghis 1983). In Lapithos, there is evidence for the contemporaneous use of two separate cemeteries with different tomb types (Iacovou 2005). Additionally, the practice of cremation is established in the Cypro-Geometric (Benson 1973). Although never the norm, this reflects the increasing complexity in burial programs following the Late Cypriot period.

Figure 9. Map of Cyprus indicating Iron Age through modern sites mentioned in the text.

Cyprus in the first millennium can be described with the development of internal city-kingdoms and a series of absentee imperial rulers beginning with the Assyrians and ending with the Persian invasion of the island in 499 BC (Reyes 1994). Near the advent of the Cypro-Archaic period (~750–480 BC) the Neo-Assyrian Emperor Sargon II declares on a stele found in Kition, that the "seven kings of the land of Ia" had submitted to his rule in 703 B.C. (Borger 1956). While there is no suggestion of an actual Assyrian presence on the island, this inscription represents the first indication that the urban centers of Cyprus were recognized as city-kingdoms (Iacovou 2008). In 673 BC an inscribed prism from the palace of Esarhaddon names "10 kings of Iatnana" that represent ten identified cities. The kings of these cities are all named and include a preponderance of Greek names as well as Phoenician and others (Masson 1995). It is no surprise then that the multi-ethnic nature of Cyprus in the Cypro-Classical period (480–325 BC) proves troublesome when the Ionians revolt against the Persians. All of the city-kingdoms in Cyprus come to the aid of the Ionians except the city of Amathus. A Persian army comes to Cyprus and lays siege to the hold-out city-kingdoms that do not offer tribute.

Cyprus remains contentious throughout the Classical period until it is taken by Alexander. After his death Cyprus becomes the center of struggle for the partition of his empire.

After initial occupation and rule by the Antigonids, Ptolemy I Soter took control of the island in 249 BC.

The burial customs of the Cypro-Archaic maintain the multi-cemetery precedent set in the Cypro-Geometric. There are examples of rich "royal" tombs at Salamis, Tamassos, Amathus, and Idalion among others. Phoenician-style tombs are found at Tamassos and Idalion and a possible Phoenician style "tophet" near Amathus (Agelarakis et al. 1998; Karageorghis 1992). The tombs at Salamis are unique in that there are horse burials with wagons, ivory furniture and bronze cauldrons. Karageorghis (1969) also suggests that a slave was sacrificed at the burial of an elite. Traditionally this is thought of as a response to Homeric myth (Karageorghis 1982), but this custom is also seen in the Near East (Rupp 1988). Close to the "Royal" necropolis is the cemetery of Cellarka, a complex of over 100 closely packed, stepped chamber tombs used from 700–300 BC. This cemetery was likely built for common folk from the nearby town (Karageorghis 1969).

Paleodemography

Analyses of paleodemography include the accurate determination of sex and estimation of age within a skeletal sample to estimate fertility rates, mortality rates and age structuring within ancient populations (Knudson & Stojanowski 2008). Paleodemographic baseline data is required for accurate estimation of overall health in a population, population growth or decline, and population genetic biodistance analyses where effective population size is a significant component. The study of ancient demography is fraught with difficulties, the most pressing of which are the accurate estimations of age based on skeletal markers.

Within Cyprus, sex determination and age estimation are based on standards developed for North American or Native American populations. These standards, many of which were developed over a half century ago, are constantly being reassessed and revised (Buckberry & Chamberlain 2002; Hoppa 2000; Igarashi et al. 2005; Rissech et al. 2006). Age estimation and sex determination methods derived from eastern Mediterranean populations are virtually non-existent, although modern skeletal collections offer some hope (Çöloglu et al. 1998; Eliopoulos 2006; Eliopoulos et al. 2007; Fox et al. 2003). Forensic identification and research has often driven the collection and analysis of osteological data for local populations. The analysis of individuals from modern Cyprus could possibly provide such data.

Angel provides some of the first paleodemographic reconstructions in his analysis of the people of Khirokitia (Angel 1953; see also Angel 1947, 1953, 1969a, 1969b). These demographic profile estimates were based on actuarial life insurance tables (Angel 1969a; Dublin et al. 1949). Modern life tables have been used to estimate the demographic profiles for southwestern Cypriot Chalcolithic sites (Parras 2004). Le Mort's analysis of the paleodemographic profile of Khirokitia subadults, shows that there is an abundance of perinatal individuals that she suggests may be related to genetic anemias (Le Mort 2000).

Archaeologists have also attempted paleodemographic research based on rough estimates of tomb occupancy, carrying capacity of the landscape, house size and growth, as well as ceramic consumption and discard (Frankel & Webb 2001). This study is strictly demographic with no biological components being considered. Despite this limitation, population estimates can still be useful to the biological anthropologist, specifically when estimates of effective population size are required for population genetics analysis.

Hellenistic, Roman–Late Roman

Hellenistic period burials have been recovered mainly in the west, perhaps due to the movement of the island's capital from Salamis to Nea Paphos. Most tombs remained of the built or rock-cut varieties. Of note is the "Tombs of the Kings" found in Paphos. This necropolis consists of complex atria and peristyle tombs that have their closest parallel in Alexandria. Unfortunately, no human remains were preserved. However, the human remains from the eastern necropolis of Nea Paphos, containing a vast number of Hellenistic tombs, were preserved (Fox-Leonard 1997; Michaelides 1984; Michaelides & Snyczer 1985; Michaelides & Młynarczyk 1988).

Cyprus was annexed by the Ptolemies to the Roman Republic in 58 BC, though Antony subsequently returned it to Cleopatra. In 30 BC, after the defeat of Antony and Cleopatra at Actium, Cyprus became a Roman province. It remained under the control of Augustus until 22 BC, when it was turned over to the Senate for governance along with other territories that were no longer considered to be of strategic importance. Once Rome controlled the entire Mediterranean seaboard, Cyprus was no longer a jumping-off point for armies seeking to invade Syria, Judaea, and Egypt. Rather than confronting the uncertainty of life on the fluid *limites*, Cyprus sat securely in the *Mare Nostrum*, away from the violence and changing fortunes of the frontier provinces.

Politically insignificant, Cyprus remained a small economic powerhouse providing large quantities of copper and timber for the empire (Mitford 1980). Agricultural produce, medicines, fine ceramics, glass, and other manufactured products were additional commodities for trade. A garrison camp is known at Paphos, but no legionary or army garrison is known from the Roman period, although a detachment would have been assigned to the governor. A Jewish revolt quelled in AD 115–117 was reported to have killed over 200,000 people and Jews were banned from returning to the island (Mitford 1980). However, Jewish populations remained on the island, and simply maintained a lower profile. Inscriptions attest to the presence of synagogues and Jewish artisan guilds on the island at this time (Mitford 1980; van der Horst 2003). Trade in fine ceramics, glass, and clay coffins also confirm continued interaction between Cyprus and Palestine (Parks 2003).

Paleopathology

Paleopathology in Cyprus and the eastern Mediterranean has a longer history than many other bioarchaeological approaches (Fox 2005; Fox-Leonard 1997). This is largely due to the work of J. Lawrence Angel and his definition and pursuit of the etiology of porotic hyperostosis (Angel 1964, 1967, 1978). Among other differential diagnoses, Angel linked the skeletal changes he observed in the Late Bronze Age people of Episkopi-*Bamboula* to heterozygous carriers of thalassemia (Angel 1972b; Fox-Leonard 1997; Harper 2008). While Angel's model for the cause of porotic hyperostosis has been expanded (Stuart-Macadam 1989, 1992), it has remained a serious point of research within Cyprus (Domurad 1986a; Fox-Leonard 1997; Harper & Parks 2006).

Of major health and economic concern, malaria was only officially eradicated in Cyprus in 1950 (Christodoulou 1959), and there are many congenital and acute diseases present in Cypriot populations, likely present from the Neolithic period (see *Parasitology* above). The

only full, modern study of paleopathology from Cyprus compared Hellenistic and Roman individuals from Paphos (n=275) to a population from Corinth, Greece (n=94) (Fox 2005; Fox-Leonard 1997). A complete study of health and disease in an archaeological population should include macroscopic, radiographic, and possibly microscopic inspection of bony changes related to chronic disease, trauma, as well as indicators of early life stress such as dental enamel hypoplasias and Harris lines.

The most common pathological lesions observed at Paphos included antemortem tooth loss, caries and periodontal disease, degenerative joint disease and porotic hyperostosis/cribra orbitalia (Fox 2005; Fox-Leonard 1997). Even though people lived with their animals in closed spaces throughout the Late Roman Period (Soren 1985), there is little skeletal evidence for zoonoses other than one individual from a Middle Bronze Age tomb, that has been interpreted as a possible case of brucellosis (Herscher & Fox 1994).

An interesting direction of research includes the comparison of Roman and Late Roman urban sites with rural settlements or monasteries (Rautman 2001, 2003). Substantial urban Roman/Later Roman period skeletal remains are found in Paphos (Domurad 1986a; Fox 2005; Fox-Leonard 1997), Nicosia (Fox et al. 2008) and Kourion (Galloway 1985; Galloway & Birkby n.d.; Harper & Parks 2006). While there are other substantial remains to be found in Limassol and Larnaka, none have been reported in full. Rural populations are known from Alassa-*Ayia Mavri* (Fox 1996), Kalavassos-*Kopetra* (Fox 2003a) and Maroni-*Petrera* (Fox 2003b). What differences are seen between urban and rural populations? Is there a higher prevalence of chronic infectious disease in urban populations? Are examples of zoonoses, such as brucellosis, observed in rural populations? Are there indications of different activity patterns or possibly interpersonal violence (Fox et al. 2008)?

Comparisons indicate differences not only between urban and rural groups but also within these groups (**Table 2**). Three general indicators of health, periostitis, porotic hyperostosis, and dental enamel hypolasias are considered here. Porotic hyperostosis at Kourion seems to be the major health marker in comparison to Paphos and the rural sites. This may have more to do with the local conditions in the Kourion area, namely the large marshes that would not be reclaimed until modern day. Differences in enamel hypolasias may reflect one of two scenarios; that individuals in the rural areas did not survive health insults in childhood or that individuals in rural Cyprus were healthier in childhood than those in urban areas. When

Table 2. Prevalence of pathological lesions for four Roman–Late Roman Cypriot sites.

Sites	Periostitis	Porotic Hyperostosis	Dental Enamel Hypoplasias	Percentage Frequency of Infants & Children	Fractures
Paphos[1] (n=275)	5%	11%	9%	20% (56)	10%
Kourion (n=123)	9%	30%	10%	22% (27)	11%
Alassa-*Ayia Mavri* (n=29)	—	17%	7%	24% (7)	10%
Kalavassos-*Kopetra* (n=21)	—	—	5%	29% (6)	14%

[1] includes some Hellenistic period remains.

demographic numbers are compared it seems that there is a smaller proportion of infants in the urban cemeteries, although these differences may not be significant.

Periostitis of the anterior tibial shaft and fractures can indicate activity patterns and possible traumatic injury. Periostitis is only seen in a few examples from the urban sites, while the rural sites show traumatic injuries such as fractures exhibiting minor difference between urban and rural sites. When these data are unpacked, however, an activity-related pattern emerges. Several individuals show evidence of distal forearm, clavicular, rib, and vertebral crush/wedge fractures that are related to accidental rather than violent actions. Preliminary study of the human remains from St. George's Hill in Nicosia reveals hand, parry and cranial fractures (Fox et al. 2008).

Medieval, Venetian and Ottoman periods

The Byzantine period (Mid-7th century – AD 1191) in Cyprus was characterized by Arab raids from Syria and Egypt (Papanikola-Bakirtzis & Iacovou 1998). The condominium that was agreed between the Byzantine Empire and the Arab Caliphate of Abd Al-Malik (AD 688) neutralized the island and the tax profits were split between the two signators. In AD 965, the island again came under full Byzantine control and was ruled by a string of minor imperial relatives until it was conquered by English King Richard I in AD 1191. It was passed from the Knights Hospitallers to the Frankish Lusignan family in return for the loss of their holdings in the Holy Land. This period was marked by violence, famine, plague and over-taxation. A series of uprisings against, first the Byzantine rulers then the English, the Hospitallers, and eventually the Venetians (AD 1489–1571) characterized the period. This was a constant stress on the population and many moved to the mountains rather than risk exposure to the authorities elsewhere on the island.

Despite all of the difficulties during this period, the land remained valuable. Cyprus was one of the major producers of grain for Egypt and Europe. After the capture of the Holy Land by the Saracens, the profitable textile production centers in the Levant were cut off from the European markets. Cyprus became a major center of cotton and flax production. Due to depopulation from plague and disease, single men were encouraged to settle on the island during the Lusignan and Venetian periods (Coureas 2004) and settlers were brought in from Anatolia during the Ottoman Period (AD 1571–1878) Additonally, slaves are known to have been brought to the island throughout the Medieval and Ottoman periods (Arbel 1993). In more recent times itinerant workers from Syria were brought to the island to work the harvest in the 19th and early 20th centuries (Christodoulou 1959).

Occupational markers

Occupational stress markers are changes in the shape, articular surfaces or other bony manifestations related to repetitive movement and stress (Kennedy 1989; Capasso et al 1998). The etiology of changes in the bone are numerous and many different activities can produce the same changes. Increased or differential osteoarthritis in certain joints (Jurmain 1999), bilateral asymmetry in the size of bones (Marchi et al. 2006) or muscle insertions (Peterson & Hawkey 1998) can all indicate repetitive motion or use of one limb or side of the body over another.

Despite the controversial nature of identifying specific occupations from skeletal markers, cautious research is being pursued.

At the Medieval/Venetian Period cemetery of Athienou-*Malloura* excavations recovered the skeletal remains of at least 45 individuals (Agelarakis 1997; Toumazou et al. 1998). Five of 35 adults show a distinct pattern of notches, grooves, lingual surface attrition of the maxillary teeth (LSAMAT) and degenerative changes of the mandibular condyles, suggesting that these individuals may have used their anterior dentition for the processing of fiber. Microwear analyses of the grooving shows fine parallel striations indicating that the fiber was pulled through the teeth (Harper 2005, 2006). Other bony changes include ischial rugosity associated with bursitis from sitting on hard surfaces, squatting facets, and expanded shafts on the metacarpals associated with repetitive motion of the fingers.

Excavations at Polis Chrysochous have recently uncovered burials from the 7th–11th century that exhibit a pattern nearly identical to that found at later Medieval *Malloura* (Baker et al. 2007). Dental grooving, ischial bursitis, and squatting facets have all been found on one individual and suggest the possibility that the method of spinning using the mouth to wet and hold thread has been used since the 7th century. Similar dental wear associated with the spinning of thread has also been reported from Sinop along the Black Sea coast (Erdal 2007).

Modern Cyprus

Modern Cyprus since British colonial rule (AD 1878–1960) has faced many challenges. One of the major successes was the eradication of malaria in the early 1950s which increased health and productivity (Christodoulou 1959). Another scourge was ecchinococcosis or hydatid cyst disease, a zoonosis spread from infected sheep through dogs to humans. Cyprus was second in the world only to Uruguay with the incidence of this serious disease (Marangos 1951). Both ecchinococcosis and brucellosis may exhibit manifestations that can be recovered archaeologically. A campaign to eradicate these diseases have proven successful through centralization of the slaughter house, elimination of infected dogs, and destruction of the infected sheep offal (Polydorou 1981). Tourism has become the most important industry and with a rising middle class, the standard of living has increased. Concomitant with this increased income there has been a reduction in infant mortality and increase in life expectancy. Recently obesity and metabolic disorders have become an issue with younger generations as traditional diet and activity levels have changed. Aside from accidental death, heart disease is now the primary cause of death (Agathangelou 1985; Republic of Cyprus 1988, 1989).

Molecular biology

The stress placed on the population by the presence of thalassemia has been somewhat relieved by the required genetic testing of all couples requesting marriage certificates by the Autocephalous Greek Orthodox Church of Cyprus. Couples both heterozygous for ß-thalassemia have been discouraged from marrying and the rate of thalassemia has been steadily reduced. Genetic screening has become a part of modern Cypriot life and within the island there has been the foundation of a genetics institute, the Cyprus Institute of Neurology and Genetics (CING). CING has isolated several molecular congenital diseases including Sandhoff disease

(Drousiotou et al. 2000), duschenne muscular dystrophy (Drousiotou et al. 1998), and others. CING has also been responsible for the creation of a DNA bank comprised of samples from family members of those missing from the 1974 Turkish invasion of the island.

Forensic anthropology

One of the other major issues that can be addressed by bioarchaeological methods is the identification of people from the 1974 coup and the Turkish invasion of the island. In 1999, with support from the Republic of Cyprus, a multi-national team headed by W. Haglund from Physicians for Human Rights (PHR) began investigations into the recovery, analyses, and identification of individuals from this bleak period in modern Cypriot history. In 2004, the bi-communal Committee for Missing Persons (CMP) resumed efforts to recover and identify individuals from the conflict. Under the oversight of the Equipo Argentino de Anthropologia Forense, more than 453 individuals have been exhumed and 105 individuals have been positively identified and repatriated (CMP Factsheet, 2008). Increasingly identifications are made through the efforts of molecular biologists led by M. Cariolou at CING-LabFoG, comparing results of DNA from bone samples of the missing with the DNA bank. From September 2008, the CMP has been operating autonomously.

Future of bioarchaeology in Cyprus

The future of bioarchaeological research in Cyprus is promising. The history of research in Cyprus is long with many important figures, as early as Virchow along with Fürst, Gejvall, Charles and Angel. It is most important that the education and training of qualified Cypriot bioarchaeologists continues. There are bioarchaeologists of Cypriot origin to date, but they have all been formally trained outside of Cyprus. The Archaeological Research Unit of the university does not yet have trained anthropologists on staff, nor does the Department of Antiquities. The foundation of the Science and Technology in Archaeology Research Center (STARC) within the Cyprus Institute, is a positive step. STARC seeks development, instruction and use of advanced scientific technologies within archaeology and cultural heritage. Currently one of the research coordinators is a bioarchaeologist (K.O. Lorentz).

In addition to the importance of the education and training of Cypriot bioarchaeologists, is the storage of skeletal materials in the museums around the island. Space constraints are a common issue of museums and can lead to less than ideal storage and curation. Even in light of the rampant construction in Cyprus over the past quarter century, emergency excavations have been able to preserve human skeletal remains and cultural history. One example would include the excavation and preservation by the Department of Antiquities of the largest Hellenistic-Roman cemetery, known to date in Cyprus, due to a one-year moratorium on construction of tourist hotels east of the breakwater at Kato Paphos (Michaelides & Snyczer 1985). Another example is the ten-year excavation of the city block in Nicosia known as St. George's Hill, slated for the construction of the new House of Representatives. It is hoped that with the education of local bioarchaeologists, the Department of Antiquities will be able to create a position that can address the significant wealth of human remains and their safe storage for future study. It is clear from the preceding pages that the future of Cypriot bioarchaeol-

ogy has great potential. There are numerous basic questions concerning ancient populations that have yet to be addressed. Questions asked from a multidisciplinary perspective, drawing on the fields of archaeological science and social science show great utility and promise. With the increasing resources available to bioarchaeologists, archaeologists and their students the pace of research and discovery will only quicken.

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Appendix: Major anthropological research by period & site for Cyprus

Period	Site	Reference
Neolithic	Kissonerga-*Mylouthkia*	Fox 2003
		Lunt &Watt 2003
	Parekklisha-*Shillourokambos*	Crubézy et al 2003
		Harter-Lailhegue et al. 2005
	Kalvasos-*Tenta*	Schulte-Campbell 1979
		Photos 1982
		Moyer 2005
	Khirokitia-*Vouni*	Angel 1953
		Kurth 1958
		Charles 1962
		Le Mort 1994, 1995, 2000
		Musgrave & Evans 1980
		Taramides 1983
		Pinhasi & Pluciennik 2004
	Cape Andreas-*Kastros*	Soliveres 1981
	Sotira-*Teppes*	Angel 1961
		Charles 1962
	Kholetria-*Ortos*	Fox n.d.
	Philia-*Drakos A*	Walker 1975
		Longmore 1975
	Erimi-*Pamboula*	Guest 1936
		Rix 1938
Chalcolithic	Kalavasos-*Ayiou*	Moyer 2004
	Kissonerga-*Mosphilia*	Lunt 1995
		Lunt & Watt 1998

Period	Site	Reference
Chalcolithic	Kissonerga-*Mylouthkia*	Fox 2003
		Lunt & Watt 2003
	Lemba-*Lakkous*	Downs 1982
		Lunt 1985, 1995
	Souskiou-*Vathrykakas*	Parras 2006
		Lunt 2006
	Souksiou-*Laona*	Lorentz 2007
Early Cypriot	Sotira-*Kaminoudhia*	Schulte-Campbell 2003
	Bellapais-*Vounous A* & *B*	Fürst 1933
		Hjortsjö 1947
		Rix 1950
	Dhenia-*Kafkalla*	Tucker & Clegget 2007
	Lapithos-*Vrysi tou Barba*	Fürst 1933
		Fischer 1986
Middle Cypriot	Alambra-*Mouttes*	Domurad 1986, 1996
	Marki-*Alonia*	Moyer 1997, 2006
		Fox 2006,
		Lorentz 2006a, 2006b
	Psematismenos-*Trelloukkas*	Moyer 1985
	Mesoyi-*Katarrakis*	Herscher & Fox 1994
Late Cypriot	Ayios Iakovos-*Melia*	Fürst 1933
		Fischer 1986
	Akhera-*Chiflik Paradisi*	Charles 1965
	Enkomi-*Ayios Iakovos*	Furst 1933
		Hjorstjo 1947
		Fisher 1986
		Fisher & Noren 1989
	Hala Sultan Tekke-*Vizaja*	Schwartz 1974
		Schulte-Campbell 1983
	Kalavasos-*Mangia*	Moyer 1989
	Kalavasos-*Ayios Dhimitrios*	Moyer 1989
	Kalavasos Village Tombs	Schulte-Campbell 1986
	Kition-*Chrysopolitissa*	Charles 1960
	Episkopi (Kourion)-*Bamboula*	Axmacher & Hjortsjö 1959
		Angel 1972b
	Kouklia-*Eliomyla*	Fox 2001
	Kalopsidha	Gjevall 1966
	Kition	Nyqvist 1980
	Various	Buxton 1931
Cypro-Geometric	Paleapaphos-*Skales*	Schulte-Campbell 1983
Cypro-Archaic	Amathus	Domurad 1992
		Moyer 1984
	Amathus-*Western Necropolis*	Agelarakis et al. 1998

Period	Site	Reference
Cypro-Archaic	Idalion	Charles 1964 Schulte-Campbell 1989
	Salamis-Royal Necropolis	Charles 1967
	Salamis-*Cellarka*	Charles 1967
	Mari Village	Fox 1997
	Larnaca-*Ayios Theodoros*	Fessas 1990
Cypro-Classical	Kition-*Ayios Giorgos*	Domurad 1987
	Paphos-*Tremithousa*	Lorentz 2001
Hellenistic	Paphos	Lunt 1980
	Pegia-*Pappara*	Harper 2002
Roman	Kouklia-*Arkalon*	Lorentz 2004a
	Paphos	Domurad 1988 Fox 1997
	Paphos-*Iskender*	Axmacher & Hjortsjö 1959 Charles 1967
	Polis	Fox n.d.
	Vasa-*Kambi*	Angel 1955
Late Roman	Kourion-*Acropolis*	Gallowy & Birkby n.d. Galloway 1985
	Kourion-*Amathus Gate Cemetery*	Parks et al. 1997, 1999, 2000, 2001 Harper & Parks 2006
Byzantine	Alassa-*Ayia Mavri*	Fox 1996
	Kalavasos-*Kopetra*	Fox 2003
	Maroni-*Petrera*	Fox 2003
	Kantou-Alassa	Manolis 1991
Venetian	Athienou-*Malloura*	Agelarakis 1997 Harper 2002, 2006
Ottoman	Nicosia-Podocataro Moat	Harper n.d.
Modern	Episkopi	Angel 1972a
Other Studies and Syntheses		Banton 1951 Buxton 1920a, 1920b Taramides 1972, 1973, 1982 Virchow 1884 Bradwell 1950 Kariolou 1993 Joannides 1952 Lorentz 2004b, 2005 Massari, 1929 Michaelides 1949 Fawdry 1944 Hadjiminas et al. 1979 Marangos 1951 Polydorou 1981

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