Early Christian Pilgrimage to a Byzantine Monastery in Jerusalem—A Dental Perspective

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ABSTRACT The presence of 30 morphological traits was scored on over 1,500 teeth from a bone repository located at St. Stephen's, an urban Byzantine monastery in Jerusalem. The frequencies of dental traits found in the sample were compared with frequencies of the same traits in seven other groups (compiled from published data) in order to determine possible biological affinities of the monks. The Mean Measure of Divergence (MMD) statistic was used to statistically analyze the phenetic/genetic similarity among the groups. The genetic background of this group of monks is interesting because historical sources suggest that many foreigners may have been present in monasteries during this time period as pilgrims. Some argue that their presence is exaggerated, however, and that the majority of monks were from the surrounding region. The results suggest that many of the monks were most likely from the region, but that the presence of foreigners (particularly European foreigners) cannot be ruled out using dental evidence.

A multi-year research project led by Dr. Susan Sheridan of the University of Notre Dame has been focusing on the health and daily life of the inhabitants of a Byzantine monastery in Jerusalem. Over 15,000 bone fragments and 1,500 teeth have been recovered from the burial crypt at the monastery. The skeletal remains indicate that approximately 93% of the collection was male and that more than half of the individuals were over age 40 at the time of death (Sheridan, 2000). The present study is designed to determine the possible genetic affinities of the monks.

Empress Eudocia built the monastery of St. Stephen just north of the Jerusalem city walls in AD 428. The monastery was in use during the height of the Byzantine influence in the Near East, until the Islamic conquest in AD 614, at which time it is believed to have been destroyed. This period was a time of great growth and development in the region. Numerous historical records speak of travelers and pilgrims entering the "Holy Land" at this time (Binns, 1994; Chitty, 1966; Hirschfeld, 1992; Hunt, 1982; Wilkinson, 1976). Many people made pilgrimage, eventually returning home to tell others of their journeys. Others remained in the city once they arrived, as is evident by the population growth in the area at that time (Broshi, 1979).

The identity of those who inhabited the monasteries has recently been debated. Historical records suggest that these monks had been pilgrims coming together from all over Europe, Africa, and Asia (Binns, 1994; Hirschfeld, 1992). Israel Hershkovitz (1988:58) uses this idea to argue "the remains in the graves [around a Byzantine city in the Southern Levant] are those of the native population and not of intrusive monks". However, the monks may be members of the native population themselves, and not "intrusive", as often suggested.

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Scholars now question the validity of historical texts, arguing that the historical records may only reflect the lives of the elite; perhaps indigenous people made up the majority of inhabitants in a monastery (Binns, 1994; Hunt, 1982; Wilkinson, 1976). Although Binns (1994) argues that the monks from Asia Minor appear to be underrepresented historically, he also states, "The monks of the Palestinian desert had a double vocation. They were both pilgrims and monks" (Binns, 1994:

Editor's note: Ms. Ullinger's paper was awarded First Prize for 2002 in the Albert A. Dahlberg student research competition sponsored by the Dental Anthropology Association.

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TABLE 1. Morphological traits used in the study

Trait	Tooth Analyzed	Presence	Absence
Shoveling	Upper First Incisor	3-7	0-2
Double Shoveling	Upper First Incisor	2-6	0-1
Interruption Grooves	Upper Second Incisor	+	-
Tuberculum Dentale	Upper Second Incisor	1-6	0
Canine Mesial Ridge	Upper Canine	1-3	0
Carabelli's Cusp	Upper First Molar	5-7	0-4
Cusp 5	Upper First Molar	1-5	0
Enamel Extensions	Upper First Molar	2-3	0-1
Hypocone absence	Upper Second Molar	0-1	2-5
Parastyle	Upper Third Molar	1-5	0
Cusp 6	Lower First Molar	1-5	0
Cusp 7	Lower First Molar	1-5	0
4-cusp Lower Second Molar	Lower Second Molar	4	5,6
Y-groove Pattern	Lower Second Molar	Y	+, X
Deflecting Wrinkle	Lower First Molar	3	0-2
Distal Trigonid Crest	Lower First Molar	1	0
Protostylid	Lower First Molar	1-8	0

13). Despite numerous primary sources, the origins of monks during this period are not well known.

Dental morphological traits are used in the present study to assess the biological relationships among the monks and other groups. Dental morphological traits have been used in numerous studies to test the genetic relationships of groups (Scott and Turner, 1997; Turner, 1987; Irish, 1998; Scott et al., 1983). These traits are strongly controlled by genetics and their use is particularly important when studying a collection such as this one, where the remains are commingled, as the traits are not strongly influenced by sex or side.

MATERIALS AND METHODS

Using the Arizona State University Dental Anthropology System (ASUDAS), the author analyzed the morphological traits of more than 1,500 teeth from Byzantine St. Stephen's. The collection was scored for over 30 traits; however, for this study only 17 crown traits are analyzed because they are the traits that all eight samples have in common (Table 1). The data for the seven other samples are taken from published material.

The teeth from St. Stephen's were mostly loose teeth found in various layers of a collection of bones excavated from underneath a burial bench in the underground crypt of the monastery (Sheridan, 2000). Because most of the teeth were loose, and the identity of individuals impossible, all possible teeth were scored initially for all traits. Then, each tooth type was looked at to determine which side had the most teeth present. The side represented by the largest number of teeth was chosen to represent the group as a whole.

St. Stephen's was compared with seven other samples. The eight samples are labeled Byzantine St. Stephen's (BSS), Ein Gedi (EGD), Lejjun (LEJ), Early Egypt (EEG), North Africa (NAF), Early Near East (ENE), Historic Near East (HNE), and Historic North Europe (HNO). The Ein Gedi sample is taken from Lipschultz (1996). It represents a site occupied from the Late Hellenistic to the Early Byzantine period (200 BC-AD 640). Its location is less than 50 km from Jerusalem, and occupation was contemporaneous with St. Stephen's monastery. The sample from Lejjun, a modern-day site inhabited by Bedouin in Jordan, is taken from Roler (1992). The samples of Early Egypt (1943 BC-258 AD), and North Africa (19th-20th century) were collected by Irish (1993). The Early Near East (8200-1700 BC), Historic Near East (100BC-present), and Historic North Europe (AD 150-present) samples were taken from a variety of sources, as compiled by Hawkey (1998).

Each of the samples was compared with all other samples using the Mean Measure of Divergence (MMD) statistic. This statistic is a relative measure of biological affinity between the populations and assumes that the phenotype approximates the genotype (Irish, 1998). A lower number indicates similarities in phenetic/genetic affinity, while a higher number indicates a dissimilarity.

RESULTS

The MMD values for each sample comparison are presented in Table 2. The Byzantine collection was most closely related to the samples from Historic North Europe, Early Near East, and Early Egypt. The sample was most divergent from the Ein Gedi sample.

The relatively smaller MMDs found when comparing the site with larger, regional groups (comprised

TABLE 2. Mean Measure of Divergence (MMD) values among all groups taken pairwise

	BSS	HNO	ENE	EEG	NAF	HNE	LEJ	EGD
Byzantine St. Stephen's (BSS)		0.113*	0.129*	0.135*	0.148*	0.160*	0.198*	0.395*
Historic North Europe (HNO)	0.113*		0.223*	0.055*	0.101*	0.225*	0.264*	0.191*
Early Near East (ENE)	0.129*	0.223*		0.126*	0.159*	0.069*	0.047	0.301*
Early Egypt (EEG)	0.135*	0.055*	0.126*		0.022	0.127*	0.118*	0.131*
North Africa (NAF)	0.148*	0.101*	0.159*	0.022		0.267*	0.174*	0.108*
Historic Near East (HNE)	0.160*	0.225*	0.069*	0.127*	0.267*		0.059	0.381*
Lejjun (LEJ)	0.198*	0.264*	0.047	0.118*	0.174*	0.059		0.340*
Ein Gedi (EGD)	0.395*	0.191*	0.301*	0.131*	0.108*	0.381*	0.340*	

* indicates a statistically significant MMD value ($P < 0.05$).

of multiple sites), and larger MMDs found when comparing the site with smaller, single-site groups is to be expected. The larger, regional groups should show greater affinity with individual sites, while specific groups making up the regional groups will show less affinity for each other, as the larger groups are meant to represent all the smaller groups. The larger, regional groups will be discussed first, followed by the smaller, single-site groups. The MMD values are also illustrated in terms of these group divisions (see Tables 3 and 4).

DISCUSSION

The St. Stephen's monastery group was found to be dentally most similar to Historic North Europe (MMD = 0.113; SD = 0.024), followed by the Early Near East (MMD = 0.129; SD = 0.027) and Early Egypt (MMD = 0.135; SD = 0.027). The standard deviations for each place them well within range of each other. This indicates that the group from the monastery is fairly closely related to all three groups equally. The Historic North Europe group was not strongly related to the Early Near East group (MMD = 0.223), but was very closely related to the Early Egypt group (MMD = 0.055). This may reflect the large number of people from modern populations in this category (including "American whites"). This similarity presents several interesting questions beyond the scope of this paper; however, this interesting correlation should be noted.

The relation of the St. Stephen's group to both groups in the Near East and Europe suggests that the people inhabiting the monastery were perhaps composed of both indigenous and foreign populations. This result is somewhat difficult to determine, as the Near East is a major geographical crossroads. Nevertheless, the statistics suggest that the inhabitants buried at the monastery are strongly related to both Historic North Europeans and people from the Early Near East.

The comparison of the monastery with single-site samples is also interesting. The group from the monastery is more closely related to modern-day Bedouin from the site of Lejjun (MMD = 0.198) than they are to the Ein Gedi group (MMD = 0.395). The Ein Gedi group lived less than 50 km from the Jerusalem monastery during the same time period, yet are quite dentally dissimilar. However, the large MMD values for the Ein Gedi group compared with almost every other group suggests that the group may have been quite homogenous and endogamous (possibly for religious reasons). It is unclear as to why these two groups are so divergent.

TABLE 3. MMD values between St. Stephen's and multi-site samples

	BSS	HNO	ENE	EEG	NAF	HNE
BSS		0.113*	0.129*	0.135*	0.148*	0.160*
HNO	0.113*		0.223*	0.055*	0.101*	0.225*
ENE	0.129*	0.223*		0.126*	0.159*	0.069*
EEG	0.135*	0.055*	0.126*		0.022	0.127*
NAF	0.148*	0.101*	0.159*	0.022		0.267*
HNE	0.160*	0.225*	0.069*	0.127*	0.267*	

* indicates a statistically significant MMD value ($P < 0.05$).

TABLE 4. MMD values between St. Stephen's and single site samples

	BSS	LEJ	EGD
BSS		0.198*	0.395*
LEJ	0.198*		0.340*
EGD	0.395*	0.340*	

* indicates a statistically significant MMD value ($P < 0.05$)

CONCLUSIONS

The people living in the Byzantine monastery of St. Stephen's are dentally most similar to Historic North Europeans and other people from the Near East. It is quite possible that the teeth scored came from individuals both foreign and indigenous. There are very few contemporaneous samples to compare the Byzantine group to; the one sample available showed that the two groups were very divergent. Future research will compare the group to more samples and focus on gaining more information on groups similar to the monks, particularly those from the Byzantine period.

ACKNOWLEDGEMENTS

I would like to thank Dr. Susan G. Sheridan for allowing me to examine the dental remains, for including me in the project, and for providing the funding for the study. Thanks also to L'École Biblique et Archéologique Française in Jerusalem for access to the collections. I am indebted to Dr. Diane Hawkey who provided an immense amount of direction and made numerous suggestions for this paper. This research was funded through the generous support of the NEH and the Institute for Scholarship in the Liberal Arts at the University of Notre Dame.

LITERATURE CITED

Binns J. 1994. Ascetics and ambassadors of Christ: the monasteries of Palestine 314-631. Oxford: Oxford University Press.

Broshi M. 1979. The population of western Palestine in the Roman-Byzantine period. Bull Amer Sch Oriental Res 236:1-10.

Chitty D. 1966. The desert a city: an introduction to the study of Egyptian and Palestinian monasticism under the Christian empire. Oxford: Basil and Blackwell.

Hawkey DE. 1998. Out of Asia: dental evidence for affinities and microevolution of early populations from India/Sri Lanka. Ph.D. dissertation, Department of Anthropology, Arizona State University.

Hershkovitz I. 1988. The Tell Mahrad population in southern Sinai in the Byzantine Era. Isr Expl J 38: 47-58.

Hirschfeld Y. 1992. Judean desert monasteries of the Byzantine period. New Haven: Yale University Press.

Hunt E. 1982. Holy land pilgrimage in the later Roman empire AD 312-460. Oxford: Oxford University Press.

Irish JD. 1993. Biological affinities of late Pleistocene through modern African aboriginal populations: the dental evidence. Ph.D. dissertation, Department of Anthropology, Arizona State University.

Irish JD. 1998. Ancestral dental traits in recent Sub-Saharan Africans and the origins of modern humans. J Hum Evol 34:81-98.

Lipschultz JG. 1996. Who were the Natufians? a dental assessment of their population affinities. M.A. thesis, Department of Anthropology, Arizona State University.

Roler KL. 1992. Near Eastern dental variation past and present. M.A. thesis, Department of Anthropology, Arizona State University.

Scott GR, Turner CG II. 1997. The anthropology of modern human teeth. Cambridge: Cambridge University Press.

Scott GR, Potter RHY, Noss JF, Dahlberg AA, Dahlberg TA. 1983. The dental morphology of Pima Indians. Am J Phys Anthropol 61:13-31.

Sheridan SG. 2000. 'New Life the Dead Receive': the relationship between human remains and the cultural record for Byzantine St. Stephen's. Rev Bibl 106:574-611.

Turner II CG. 1987. Late Pleistocene and Holocene population history of East Asia based on dental variation. Am J Phys Anthropol 73:305-321.

Wilkinson J. 1976. Christian pilgrims in Jerusalem during the Byzantine period. Palest Explor Q n.s.: 75-101.