Mediterranean Archaeology and Archaeometry, Vol. 15, No 2 (2015) pp. 81-99

5281/zenodo.16603

METAL JEWELRY FROM BURIALS AND SOCIOECONOMIC STATUS IN RURAL JORDAN IN LATE ANTIQUITY

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Received: 15/10/2014
Accepted: 20/04/2015
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ABSTRACT

Metal jewelry is frequently found in tombs in Jordan dating to Late Antiquity and archaeological data provides a general view of economic prosperity in the region during this period. Metal artifacts recovered from mortuary contexts have long been used by archaeologists as evidence of wealth and socioeconomic status. This paper combines materials analysis with material culture theory to examine the use of metal jewelry in the expression and negotiation of economic status in mortuary contexts in Late Antique Jordan. We contextualize this material within both local and regional social and economic conditions to demonstrate the importance of color in analyzing the choices made by both producers and consumers of metal jewelry.

KEYWORDS: Late Antiquity, mortuary, jewelry, copper, technological choice

1. INTRODUCTION

Metal jewelry is commonly found in tombs in Jordan dating to Late Antiquity (Waterhouse 1998; Rose et al. 2004a). The use of material culture, including jewelry, to express aspects of identity such as status, gender, and ethnicity is well established (e.g. Hodder 1982; Johns 1996; Wobst 1977), especially in mortuary contexts (e.g. Chapman 1981; Frankenstein and Rowlands 1978; Pearson 2000; Randsborg 1973; Renfrew 1986; Shennan 1975; Sørensen 1997). Archaeologists identify variation in socioeconomic status in the past by examining the presence and distribution of prestige technology, objects meant to "display wealth, success, and power", i.e. achieve social goals (Hayden 1998, 11). To be effective prestige goods must have visual appeal and be displayed publicly, and the body is the most important location for the expression of status (Bourdieu 1984; Hayden 1998; Woodward 2007). This use of material culture is stylistic, i.e., meant to communicate information about the wearer (Wobst 1977), but physical dress and adornment may also be a 'social strategy' that informs on aspirations rather than simply reflecting identity (Joyce 2005).

Studies of Roman and Late Antique jewelry have rarely focused on rural provincial communities or made use of explicit theoretical approaches. This paper integrates compositional analysis of copper metal (smelted copper and various alloys) artifacts with material culture theory and archaeological data on the economy of rural northern Jordan to examine the use of metal jewelry in funerary contexts to express and negotiate socioeconomic status during Late Antiquity. Using the concept of 'technological choice' (Lemonnier 1993; Sillar and Tite 2000) we focus on the importance of the color of copper alloys as a critical factor in the choices made by the producers and consumers of metal goods. Though other technological choices in the production process of making metal artifacts are important, as will be shown, we believe color relates most directly to the availability of precious metals and attempts to communicate messages of economic prosperity.

Sillar and Tite (2000, 2) stress that technologies are cultural choices dependent on "the social, economic, and ideological setting," as much as functional requirements. According to their model, choice is exercised at five different stages within a technology: 1) raw materials, 2) tools used in manufacture, 3) energy sources such as fuel and human effort, 4) techniques applied to raw materials, tools, and energy sources to create a product, and 5) the sequence of events in transforming the raw material in to a consumable product. Of these five stages of choice we focus on the choice of raw materials, but when looking at artifacts recovered from burials, whose choices are recovered?

There are essentially three levels of decision-making involved when looking at jewelry in burials. The first level is, of course, the deceased. Though individuals are not directly responsible for placing objects in their own grave, one has to consider that grave goods represent choices made by that person when alive, or, at least represent objects owned by the family of the deceased as they would have been involved in preparing the corpse for burial. The latter represents the second level of choice. Because the dead do not bury themselves, mortuary behavior visible to archaeologists provides information on the real or aspired status of the deceased's family (Cannon 1989). The third level of choice in this scenario could be referred to as technological choice (Sillar and Tite 2000), and also corresponds to Schiffer and Skibo's (1998, 599) "technical choices." This is choice exercised by the producers of metal goods. What choices could be made by these individuals and how were they influenced by consumers and economic conditions?

2. NORTHERN JORDAN AND THE LATE ANTIQUE ECONOMY

A major focus of scholarship on Late Antiquity has been the rural agrarian econo-

my. The traditional view, identified with the work of A.H.M. Jones (1964), relied exclusively on interpretations of ancient texts and the picture of rural life gained from these sources, especially the Theodosian Code, is bleak. Oppressive Imperial taxation created economic stagnation, and, in turn, rural impoverishment and depopulation. Agricultural peasants (coloni) were subject to laws tying them to the land in a system of hereditary obligation, restricting their geographic and social mobility.

This view of widespread economic collapse and decline is no longer tenable in the Near East as decades of archaeological survey and excavation have recorded numerous villages, churches with mosaics, and agricultural facilities such as wine and olive presses dating to Late Antiquity, that together create a picture of a well-populated and prosperous countryside (e.g. Decker 2001; Foss 1995, 2002; Tate 1997 on Syria; Hirschfeld 1997, Kingsley 2001; Parker 1999, on Palestine; Piccirillo 1985; Rose et al. 2007; Uscateau and Martín-Bueno 1997 on Jordan). This region witnessed its greatest population density and agricultural expansion during the 4th through 7th centuries AD (Bar 2004; Parker 1999; Tsafrir 1996). The prevalence of luxury goods found in rural Jordan, such as glass vessels and fine imported ceramics, suggests that many rural farming families would have lived well above a basic level of subsistence (Kingsley 2001, 2003; Parker 1999). An additional boost to the economic prosperity of the region came from its status as the 'Holy Land.' Beginning in the 4th century AD, there was an influx of revenue, both private and government, used to finance the construction of thousands of churches and shrines (Hunt 1982; Kennedy 2000; Kingsley and Decker 2001). The widespread distribution of wine and olive presses in the region attests to the potential for even small landholders to acquire wealth via the export of these profitable agricultural products (Foss 2002; Hirschfeld 1997; Kingsley 2001; Tate 1997; Ward-Perkins 2000).

Voight's (2000) study of 2nd through 6th century jewelry, primarily gold and silver, and clothing fashion in the city of Antioch based on their depiction in mosaics suggests there was an increase in the lavishness of jewelry and dress among the elite in the 4th century. An increase in the use of jewelry after 200 AD was previously noted by Mackay (1949). However, one should not interpret evidence of prosperity as economic equality. Though free, independent, prosperous individuals were present in the Late Antique countryside, wealth was not evenly distributed. In addition to slaves, the Late Antique countryside was populated with free individuals who did not own land but instead worked construction or agriculture on a day-to-day or seasonal basis (Hendy 1985; Maguire 1999; Mayer 2006; Trombley 2003). Hirschfeld's (1997, 60) survey of rural agricultural and herding communities in Byzantine Palestine found significant variation in the size and arrangement of houses and settlements, which he interpreted as evidence of varied economic success. There was no guarantee of economic stability for even relatively wealthy farming families as injury, illness, or crop failure could bring an abrupt reversal of fortune (Banaji 2001; Sodini 2003).

Between the fantastically wealthy and the destitute was a large population of varying socioeconomic status. Defining and identifying a Late Antique 'middle class' is difficult, but this has not prevented scholars from using the term (e.g. Banaji 2001; Ellis 2006; Schachner 2006). There may not have been a socioeconomic category in Late Antiquity equivalent to 'middle class' as found in modern industrialized societies. Rather than attempt to define a 'middle class' for rural northern Jordan in Late Antiquity, we focus instead on 'status' as a socioeconomic concept and the use of material culture in a mortuary context to express not only relative levels of socioeconomic status, but also status aspirations.

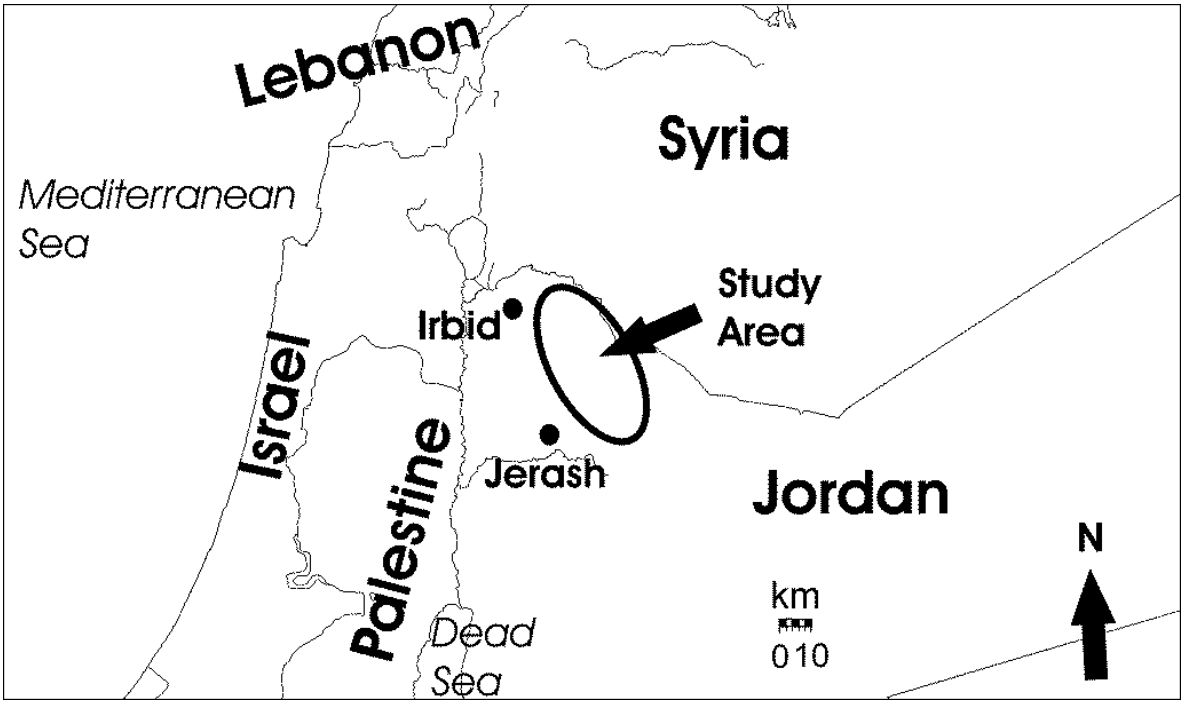

Figure 1 Regional Map.

3. STUDY SITES

During much of Late Antiquity Yasileh fell within the Roman province of *Palaestina Secunda*, Sa'ad and Ya'mun within the province of *Arabia* (Piccirillo 1985) (Figures 1 and 2). Sa'ad had a Byzantine church, Umayyad mosque, wine press, and four cemeteries with a total of 81 tombs. The wine press facility had a storage capacity of 4,204 L, making it one of the largest in northern Jordan. The Byzantine church, dedicated in 572-3 AD, had a mosaic-paved floor with agricultural images including amphora, grapes, and palm trees with dates (Rose and Burke 2004; Sari 2004). Yasileh had two churches each dating to the early 6th century AD, both with finely crafted mosaic floors, a water collection and storage system, a large two-story wine press facility, and three separate cemeteries with a total of 307 tombs (al-Muheisen 1991, 1992; al-Muheisen and El-Najjar 1994). Ya'mun had a church with mosaic floor dating to the mid-6th century AD, four wine presses (one with a capacity for 5,000 L), and four cemeteries with a total of 180 tombs (Rose et al. 2007). These three sites prospered during Late Antiquity owing in part to the export olive oil and wine (al-Muheisen and El-Najjar 1994; Kingsley and Decker 2001; Piccirillo 1985; Rose et al. 2007; Safrai 1994; Sari 2004).

Inhumation underground in caves or tombs carved out of the soft limestone bedrock was common in the Late Antique Near East (Aviam 2004; Patrich 1995). In Jordan these tombs can be divided into two main groups, shaft tombs constructed to accommodate one or two individuals and chamber tombs designed to accommodate multiple individuals (Rose et al. 2004b; Waterhouse 1998). Single-person horizontal shaft tombs are the most common tomb type at the three sites, accounting for 87% of those excavated at Sa'ad, 88% at Yasileh, and 67% at Ya'mun (Rose and Burke 2005). Multi-person chamber tombs in northern Jordan have been referred to as 'family' tombs (e.g. al-Muheisen and El-Najjar 1994; Waterhouse 1998). Some tombs with multiple *loculi* may have belonged to a single family but others, especially those with the largest number of *loculi* (~20), may have been used by other social groups, e.g., Patrich's (1995, 481) "subterranean public burial halls." With the coming of Christianity, the church occasionally took on the re-

sponsibility of burying those without family or funds (Brown 1992). Most tombs used at the three sites examined in this study were used sometime during the Late Roman (135-324 AD) through Byzantine (324-640 AD) periods as determined by ceramic chronology and coin finds (Rose et al. 2007).

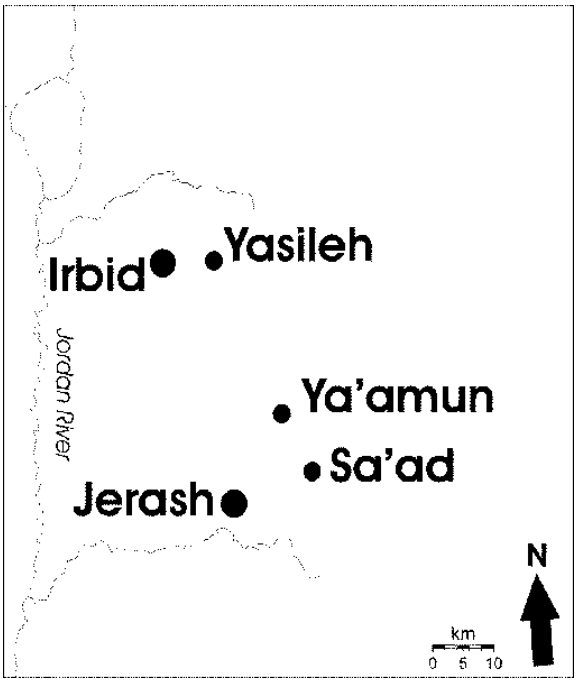

Figure 2 Study sites.

Section 3.1 Metal Burial Goods

Metal burial goods are common in Late Antique tombs at Sa'ad, Ya'mun, and Yasileh, even where there is evidence of looting (Figure 3 and 4). A total of 205 metal artifacts, primarily jewelry, were recovered from tombs at Yasileh, Sa'ad, and Ya'mun including: 125 copper or copper alloy, 56 iron, 12 gold, and 12 silver (Table 1). Due to tomb-robbing, both ancient and modern, undisturbed tombs are rare in northern Jordan (Rose and Burke 2005) and in many cases it is not possible to associate metal artifacts with specific individuals. Additionally, the reuse of tombs, whereby earlier interments were moved within the tomb but not removed, was common during Late Antiquity in northern Jordan and further complicates the assignment of artifacts to individuals (al-Shorman 2006). However, even recently robbed tombs often still contain metal jewelry.

Fourteen horizontal shaft tombs from Necropolis II at Sa'ad dating to the Late Roman (135-324 AD) and Early Byzantine (324-491 AD) periods had no evidence of looting and contained burials of adult men and women and children. These tombs provide an opportunity to glimpse what metal jewelry may have been typically included with the deceased at the time of burial (Table 2).

Table 1. Metal artifacts from ll three study sites.

Artifact	Sa'ad (81 tombs)				Yasileh (307 tombs)		Ya'mun (208 tombs)			
	Copper	Iron	Gold	Silver	Copper	Iron	Copper	Iron	Gold	Silver
Bracelet	42	37		7	10	4	10	15		1
Finger ring	5	24		2	11	1	6	15		
Earring	3		9	1			3		3	
Necklace	1						1			
Hairpin	3									
Clothing	2				2		3			
Toilet	4						5	2		
Pendant	2						1			1
Bell	4						1			
Bead							6			

Table 2. Contents of unrobbed tombs at Sa'ad.

Tomb	Skeletal Remains	Metal Artifacts
2	1 adult	Copper metal – gazelle figurine, bracelet, bell, finger ring, 2 fragments of wire, chain link; Iron – 4 bracelets, 3 finger rings with flat displays, fragment of handle, broken iron chisel.
27	1 individual	Copper metal – bell, bracelet.
30	20-30 year old female	Copper metal – finger ring, 2 hairpins/cosmetic implements, earring, twisted wire bracelet (# 45, brass); Iron – bracelet, finger ring.
38	20-50 year old female & a subadult 8-12 years old	Gold – two foil earrings; Iron – 2 finger rings, 2 bracelets.
39	12-20 year old female	Gold – 2 foil earrings; Silver – 5 bracelets; Copper metal – hair ring, cosmetic implement; Iron – 2 finger rings, belt buckle. Also included were numerous glass beads.
42	child < 6 months	None
44	1 adult, 1 infant	Copper metal – 2 bracelets, necklace (32 chain links). Also glass beads.
45	1 adult	Gold – 2 foil earrings; Copper metal – 3 bracelets; Iron – finger ring, bracelet.
46	1 adult <35 years	Gold – 2 foil earrings; Copper metal – bracelet.
52	1 adult	Silver – bracelet; Copper metal – bracelet, bell.
55	30-50 year old female	Copper metal – cosmetic implement (# 26, unalloyed copper), 4 bracelets (including # 30, unalloyed copper)
56	Subadult	Copper metal – necklace chain (with glass beads), bent wire fragments.
59	20-30 year old male	Iron – finger ring.
65	> 45 years female	Gold – 2 foil earrings; Copper metal – wire

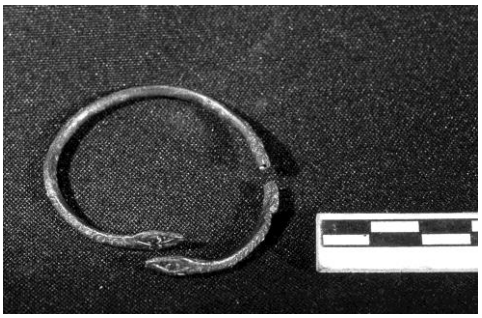

Figure 3 Artifact # 5, brass snakehead bracelet.

Sex determinations were based on measurements of the sciatic notch and age determinations were based on measurements of the pubic symphyses and dental eruption (Williams et al. 2004). The one male burial identified (Tomb 52) had only a single iron ring. Most metal jewelry is associated with females, especially young women, and shows a range of combinations. Of the seven burials not positively identified as to sex four (Tombs 44, 45, 46 and 56) contain either earrings or a necklace, typical of female attire. The remaining three burials (Tombs 2, 27, and 52) contain metal artifacts that could be associated with female burials and the inventory of Tomb 2 in particular appears more similar to what was found in female burials. All women regardless of age were buried with at least one bracelet and one other item such as a finger ring or necklace. Some women had a pair of earrings, a necklace, at least one bracelet, and at least one finger ring and the burial with the most metal jewelry belonged to a young female 12-20 years old (Tomb 39) (Rose and Burke 2005; Rose et al. 2004a). Gold earrings and silver bracelets were recovered from Sa'ad and Ya'mun but copper metal and iron are more common at all three sites. The gold earrings consist of a thin sheet gold foil wrapped around a small carved stone, giving the impression of a greater quantity of gold (Rose et al. 2004a; Rose et al. 2007).

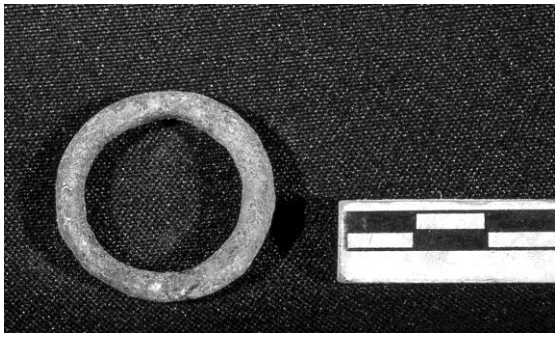

Figure 4 Artifact #35, leaded bronze ring, possibly clothing buckle

For comparative purposes Krug's (1998, in Waterhouse) inventory of artifacts from 350 Roman-Byzantine tombs in Transjordan was consulted. This inventory lists 41 "copper" and 202 "bronze" artifacts, mostly jewelry (Table 3) for a total of 243. The classification of an artifact as copper or bronze was most likely based upon the green surface patina and does not reflect actual composition. Krug (1998) also lists ten silver and 88 gold artifacts. Eighty-four of the 88 gold artifacts are similar to the specimens from Ya'mun and Sa'ad in that they were made using very little gold.

Only small amounts of gold and silver have been found in Late Antique tombs in Jordan but both copper metal and iron jewelry are common (Rose et al. 2004a; Rose and Burke 2005; Rose et al. 2007; Krug 1998). Compositional analyses of ancient copper metals have been used to discuss the historical development of metallurgical techniques (Craddock 1978; Craddock et al. 1998), the standardization of copper alloys (Riederer 2002), ethnicity in the Near East (Ponting 2002a, 2002b), and ethnicity and class in Roman Britain (Bayley 1998; Dungworth 1997). To determine what kind of copper metal was used for jewelry and what that might indicate about socioeconomic status and the availability of various metals, 32 copper metal artifacts were subjected to compositional analysis.

Section 3.2 Compositional Analysis

Thirty-two copper metal artifacts (Table 4) were analyzed using Atomic Absorption Spectrometry. This method was chosen due to its availability at the Archaeometry Laboratory of the Faculty of Anthropology and Archaeology, Yarmouk University, the Jordanian institution associated the excavation of the material and where the artifacts are currently located (Cooper 2000). Samples were obtained using a hand-held mini drill fitted with 1 mm diameter tungsten carbide bits. Initial drillings were discarded in an attempt to extract only bright metal shavings from as deep as possible in the artifact. However, this was made difficult by that fact that some of the copper artifacts were only 1-2 mm thick. Additionally, though all artifacts still contained solid metal cores, some were highly corroded. As a result some corrosion products were incorporated into some of the sample material analyzed, which resulted in low analytical totals for some artifacts. The samples were prepared following Hughes et al. (1976). Samples of metal drillings weighing 0.005 to 0.02 grams were measured using an analytical balance. The initial target weight of 10 mg was not obtained for all specimens but good results were obtained from specimens weighing as little as 0.005 gm as long as clean metal drillings were obtained. After weighing samples were transferred to a 250 ml beaker and dissolved by adding 25 ml of aqua regia (1:3 ratio HNO3:HCl). Samples were then transferred to a 25 ml Erlenmeyer flask and diluted with distilled water before being atomized using a Perkin-Elmer series 939 instrument. The atomic absorption results have an accuracy of ± 2% for the major elements, ± 10% for minor elements between 0.5 and 0.05% and ± 30% for trace elements less than 500 ppm. Twenty-six of the 32 artifacts analyzed are objects of personal adornment, either jewelry such as earrings, finger rings, bracelets, necklaces, and pendants, or otherwise related to one's attire such as clothing buckles/fasteners or hair pins. There are also two keys, commonly worn by women as jewelry, two cosmetic implements, two bells, and a piece of coffin hardware.

The results for major and minor elements are listed in Table 4 and the breakdown according to "Material" is based on Rie-

derer's (2002, 290) suggestion that the presence of alloying constituents such as tin, zinc, and lead in amounts from 1-3% may result from the addition of alloys as scrap, which would contain various amounts of different metals in quantities unknown to whomever was reusing it. Copper is unalloyed relatively pure copper, bronze is an alloy of copper and tin, brass is an alloy of copper and zinc, ternary alloy is composed of copper, tin, and zinc. When lead is present above 3% it produces leaded copper, leaded bronze, leaded brass, or a quaternary alloy. What stands out in the analyzed material is the amount of lead. Thirteen of the 31 artifacts have over 6% lead. Seven of the bronzes have from 7-31% leaded (# 1, 2, 10, 32, 34, 35, 42), there is only one unleaded bronze (#21). Additionally, there is one leaded brass (#28), three leaded copper (# 33, 44, 46) and two quaternary alloys (# 13 and 19). Lead was often added to cast copper alloys as the resultant material is more fluid and easier to pour. Low levels of lead may be unintentionally incorporated into an alloy because it was present in the parent ore or in scrap metal that was added at some point (Riederer 2002), but a large amount of lead in an alloy is probably either an attempt to create a cheaper material by dilution and, or, create an object similar in appearance to silver.

Object	Bronze	Copper	Iron	Silver	Gold
Bracelet	42	20	52		
Finger ring	32	6	36		2
Earring	13	11		4	84
Hairpin	6				
Clothing		2			
Toilet	8				
Bell	33				
Other	68	2		6	2

Table 3 Metal artifact data from 350 tombs (Krug in Waterhouse 1998).

Twelve artifacts are brass (# 4, 5, 6, 8, 12, 14, 16, 18, 27, 29, 40, 45). Early brasses often had up to 28% Zn, the limit that could be achieved with the cementation process. Within a few centuries of the appearance of brass the average zinc content dropped to around 13% (Craddock 1978, 12). Caley (1964) attributed this decline to the repeated loss of Zn as vapor during the recycling of brass and a lack of new Zn sources over time. However, Dungworth's (2008) analysis of coinage demonstrated that the Zn content did not decrease at a constant rate as would be expected in the Caley scenario. Instead, the decreasing Zn content in coinage was intentional debasement of orichalcum (brass coins) (Dungworth 2008), as was done with silver and gold coinage at different times in an attempt to make up Imperial budget shortfalls (Jones 1953).

None of the brasses analyzed have more than 21% Zn. The average Zn content for the 12 brass objects is 16%. Copper alloys with 10-12% Zn would have been yellow in color, similar to bronze and gold (Craddock 1978). The greenish-yellow color typical of brass is only exhibited by alloys with 20% zinc or more. Thus, four artifacts (# 4, 8, 29, 40) with 19% to 21% Zn would have been greener than the other 8 brass artifacts. The material from Jordan corresponds well with the practice of mixing scrap copper metal with newly produced undiluted brass.

There are two unleaded (ternary) alloys of Cu, Zn, and Sn (# 3 and 24) and three artifacts (# 22, 26, and 30) of unalloyed copper. As shown in other analyses (e.g. Unglick 1991; Waldbaum 1983), though there is an increase in ternary (Cu, Sn, Zn) and quaternary (Cu, Sn, Zn, Pb) alloys over time in the Late Antique Mediterranean, probably a result of recycling, unalloyed copper continued to be used throughout

the Roman and Byzantine periods even though the addition of tin, lead, and zinc offered various mechanical benefits (Craddock 1978).

As with analyses of Roman (Craddock 1978) and Romano-British material (Bayley 1998; Dungworth 1995), variable concentrations of tin, zinc, and lead were found, with tin and zinc being inversely proportional. This suggests the recycling of scrap metal was widespread and resulted in proportions of copper, tin, zinc, and lead that were unintentional. Analyses of roughly contemporary material from Carthage (Unglick 1991) and Sardis (Waldbaum 1983) also demonstrate that ternary and quaternary copper alloys increased over time, probably due to recycling (Craddock 1978), resulting in a range of copper alloys being in use simultaneously throughout Late Antiquity. The eight different alloys represented in the material from Jordan would have exhibited a number of different colors including those resembling silver and gold. Can the imitation of precious metals explain, at least in part, the composition of copper alloy jewelry worn by rural inhabitants of Late Antique northern Jordan? How did the color and availability of metals in Late Antique rural Jordan affect choices made by producers and consumers of metal jewelry?

4. DISCUSSION

4.1 Availability of Metals

Until the 1st century BC the majority of copper alloys used in the circum-Mediterranean were bronze, sometimes leaded. By the middle of the 1st century BC brass was being mass-produced for coinage and military hardware in the Roman Empire and by the 1st-2nd century AD it was used for a variety of objects previously made of bronze, especially decorative work (Bishop and Coulston 1993; Craddock 1978; Ponting 2002b). In 1978 Craddock (1978) noted that zinc was approximately one-tenth the price of tin and one-half the price of copper and suggested prices in ancient Rome were approximately similar. In the three decades since Craddock made this observation, metal prices have fluctuated significantly, especially copper (Plunkett and Jones 1999). Nevertheless, the relatively greater availability of zinc made brass cheaper to produce than bronze and there was an increase in the use of brass over time (Craddock 1978).

The political disintegration of the western half of the Roman Empire in the 5th century AD and subsequent loss of tin-rich Britain and Spain is believed to have created a tin shortage that resulted in a decrease in the use of bronze relative to brass in the Near East (Craddock 1979). This trend would have been encouraged by the availability of zinc from sources in Anatolia (de Jesus 1980) and Iran (Allan 1979). However, analyses of post-classical Near Eastern material (e.g. al-Ahmed and Sari 1994; Ponting 1999, 2003) demonstrate tin and bronze continued to be used in the Islamic Near East and historic sources indicate tin from Cornwall was reaching Cyrenaica and Alexandria in early 7th century AD (Mango 2001; Penhallurick 1986). The nearest source of copper to the region is Wadi Feinan in Jordan near the Dead Sea, where mining occurred during the Roman and Byzantine periods (Hauptmann et al. 1992). Neither zinc nor tin are found in the Levant. Tin was imported to Roman Palestine from the British Isles, but so was metal scrap, meaning that tin was probably arriving in a pre-alloyed form and introduced into objects via recycling (Safrai 1994).

Mining and metals were closely regulated by the Imperial government in Late Antiquity. The official in charge of mines was also responsible for state mints, the collection of taxes, and expenditure of state funds. All dealings with base and precious metals were under the control of one official. Mining was restricted at times as a means of state monetary control (Jones 1964; LoCascio 1981; Matschke 2002). Precious and base metal coinage were produced for two separate purposes. Gold and silver were minted for transactions involving the Imperial government such as the collection of taxes and payments to soldiers

and officials. Base metal, i.e., copper and copper alloy, coinage, sometimes heavily leaded, served as a convenient vehicle for small transactions and was distributed to moneychangers for the purpose of recovering gold and silver coins (Jones 1953; Reece 2003).

It was illegal for shop owners to make change for precious metal coinage. If not used to pay taxes it could be exchanged with an official moneychanger for copper-based coinage. Precious metal coins then moved from the moneychanger to a tax collector, and back to the state treasury. There were times when the government mandated the payment of taxes in gold or silver, rather than copper coinage or goods 'in kind', in an effort to bring precious metal currencies back into the state treasury (Reece 1999, 2003). A legal restriction on the transport of gold and silver coinage across provincial boundaries may have further reduced the availability of gold and silver in some areas. According to Reece (1999, 125), "precious metals were almost as sacred as the emperor himself…so they were only on temporary loan to the users."

Neither gold, nor silver are found in significant amounts in the Levant (Moorey 1994; Safrai 1994) and they would have been made even scarcer by government regulations. Government efforts to restrict the circulation of precious metals probably made gold and silver coinage a common source of raw material for manufacturing jewelry (Ogden 1982, 1990; Reece 2003). The availability of metals for smiths in manufacturing and subsequently, for consumers in purchasing, was linked to larger government economic practices. But despite the numerous legal restrictions designed to restrict its availability, gold and silver coinage were circulating in the 4th century AD (Banaji 2001; Reece 1999) and even a family with little income could save a small amount of precious metal coinage to use for a daughter's dowry (Ogden 1982, 263). How did the availability of metals affect the choices made in the manufacture and consumption of jewelry?

4.2. Color

The importance of color in ancient metallurgy has been addressed explicitly by some (e.g. Hosler 2002; Lechtman 1984), and in passing by others (e.g. Hughes 1993; Ottaway 2001; Rahmani 1985; Riederer 2002; Smith 1981). Dungworth (1997, 909) suggested Roman scrap metal alloys in northern Britain could have been recognized by their color and mixed with other material with a specific color of product in mind. Riederer (2002, 290) includes color, along with technical properties and economics, as one of the motives for the use of standardized alloys in Roman metal work as standardization would have allowed for good color quality control. An investigation of modern copper workers in India found they did not always know what proportion of metals were in their copper wares because they used scrap copper alloys of unknown composition (Lahiri 1995, 127). However, color-conscious mixing of scrap metal, or mixing scrap metal with newly smelted metal, would allow metal workers to produce copper alloy objects with a variety of compositions that could be used to mimic gold or silver.

Different metals provide various benefits when alloyed with copper. Tin adds strength, lead increases fluidity for casting, and zinc acts as an anti-oxidant reducing corrosion (Craddock 1978). Though the mechanical properties of tin, zinc, and lead would have been appreciated in a number of contexts it was probably the ability of these metals, individually or in concert, to imitate gold and silver that made them popular for jewelry, as previously noted for copper alloys in Late Antiquity (Ogden 1982, 263; Swift 2003, 347). Many metallurgical techniques were employed for the purpose of creating a specific color (e.g. Hosler 2002; Keates 2002; Lechtman 1984; Saunders 2002), specifically to imitate gold and silver (e.g. Pliny's discussion in Rackham 1952; Johns 1996). Scholars have emphasized the ability of tin to create copper alloys that imitate gold (Hosler 2002, 229; Pigott 1996) or silver (Hughes and Rowe 1983, 14; Meeks 1993; Ogden 1992), depend-

ing on the amount added. Similarly, the golden color of copper-zinc alloys has been discussed by researchers as an important aspect of its popularity (e.g., Craddock 1978; Hamilton 1996; Ogden 1992; Young, 1981). Additions of lead to copper can mimic silver (Hughes and Rowe 1983, 14; Ogden 1992), and when polished, iron can also resemble silver (Johns 1996, 14).

If the goal of metal jewelry consumption was the projection of affluence, color would be important and producers would have sought ways to make metal that looked like silver and gold. This could be done with copper alloys of varying composition to compensate for government restrictions on the availability of gold and silver. Whether these copper alloy objects were actually perceived as being made of gold or silver during their use is difficult to assess. Swift (2003) discounts the ability of imitation jewelry to have fooled people in the past but Ogden (1992) noted that ancient base metals have been recently mistaken for precious metals. Consumers of imitation prestige jewelry likely knew they were not getting a gold or silver item but were unconcerned as such a purchase was an affordable substitute.

4.3 Metal Jewelry, Status, and Emulation

In Late Antiquity jewelry often made explicit statements about one's status, such as membership in the aristocracy or one's office. A hierarchy of metals reflected the social hierarchy with gold and silver associated with those at the top (Johns 1996; Maguire 1999; Ogden 1982; Reece 1999; Stout 2001), but the use of metal jewelry as prestige goods was not limited to wealthy elites. Papathanassiou (2002, 121) suggested the demand for affordable prestige goods (imitations of precious metals and stones) among "the lower social strata," began in the Hellenistic period. In a discussion of Late-Roman bead necklaces and bracelets, Swift (2003) highlighted the imitation of precious metals and stones with cheaper materials such as glass and copper alloys. This imitation of elite materials, and elite people and culture, is best described as "emulation" (Swift 2003, 346).

According to Veblen (1899), who coined the phrase 'conspicuous consumption', accumulation was driven by emulation, the desire to achieve or surpass others through imitation and the possession of wealth. Importantly, Veblen recognized that conspicuous consumption was a strategy practiced by people of every socioeconomic position, not just wealthy elites. Historical accounts of consumption demonstrate the consumption of material goods is motivated primarily by a desire to signal one's social status (Woodward 2007). Inspired by Bourdieu's (1984) study of distinction, Turner (1988) emphasized the role of cultural distinctions in the practice of social status and the creation of social stratification. Differences in consumption correspond to patterns of taste, i.e., social distinctions. Social distinctions make up that aspect of lifestyle visible in one's "gestures, speech, and deportment" (Turner 1988, 67), and we would emphasize material possessions. While high status individuals try to preserve "symbolic distinctions" (Veblen 1899, 447) differentiating them from those of lower status, lower status individuals attempt to blur status boundaries by co-opting higher status distinctions.

Emulating high status individuals by adopting their behavior, dress, and material possessions would be an important tactic for lower status individuals in achieving social goals (Miller 1987). Style is most effective in communicating with those who are socially distant (Wobst 1977). The greater the number of potential receivers of the stylistic message who do not know the sender, the more effective stylistic messaging becomes, and the more successful misleading or exaggerated messages of socioeconomic success are likely to be when communicated via imitation prestige goods. Even if the emulative efforts of low status individuals were not acknowledged by those of higher status, if recognized by one's low status peers such emulation might still result in elevated prestige as it is

the perception of others that determines one's status (Cannon 1989; Clark 1987).

Conspicuous consumption is symbolic accumulation, a tactic used to create inequality, not simply an expression of inequality (Bourdieu 1977; Pydyn 1998; Voutsaki 1997). According to Bourdieau (1977), the accumulation of symbolic capital is as rational as the accumulation of economic capital in that it can result in real economic advantages such as the acquisition of high status marriage partners. The emulative use of jewelry does more than reflect the relative levels of wealth of individuals. It also signals participation in a social arena where stylistic messages indicating wealth may have had real consequences and conferred advantages to middle and lower class individuals. This may have been more likely in larger regional market towns such as Jerash (ancient Gerasa, Figure 1), a commercial center with theaters and markets, than in one's home community of Sa'ad, Ya'mun, or Yasileh because these larger urban centers is where the rural residents of Sa'ad, Ya'mun, and Yasileh would encounter strangers (Rose et al. 2004a). In death the incorporation of metal jewelry would have provided families an opportunity to publicly display status or status goals as elaborate burials are a form of prestige good (Cannon 1989; Hayden 1998).

5. CONCLUSION

Metal jewelry was routinely interred in burials in rural Jordan in Late Antiquity. Dress associated with Late Antique female gender provided greater opportunities for the display of wealth via jewelry (earrings, finger rings, necklaces, and bracelets) than that of males who wore at most a finger ring or bracelet. While gold and silver were relatively rare, copper metal and iron were ubiquitous and were likely valued for their ability to mimic gold and silver. These imitation prestige goods were used to express status and status aspirations in rural agricultural communities during a period of increasing prosperity. The generation of wealth from agricultural products would have created the opportunity for families to contest pre-existing social hierarchies. The inclusion of metal jewelry in burials was an active attempt on the part of families to project affluence in a public setting.

ACKNOWLEDGEMENTS

The Atomic Absorption Spectrometry was performed in the Archaeometry Laboratory at the Faculty of Anthropology and Archaeology while Cooper was in residence at Yarmouk University, Irbid, Jordan in 1999. Artifact photography provided by Belal Degedeh. Funding was provided by the King Fahd Middle East Studies Program, Fulbright College of Arts and Sciences, University of Arkansas-Fayetteville. This research was facilitated through the generous assistance provided by faculty, staff, and students at Yarmouk University and the faculty of the University of Arkansas-Fayetteville, Department of Anthropology, with special thanks to Prof. Jerome C. Rose and Dolores L. Burke.

Table 4 Results of atomic absorption analysis. Amounts shown in wt. %.

Site	ID #	Cemetery/Tomb	Artifact	Copper	Zinc	Tin	Lead	Total	Material
Sa'ad	26	II/55	cosmetic implement	78	1	<1	<1	79	copper
Sa'ad	27	IV/Cave I	earring	74	13	1	2	90	brass
Sa'ad	28	III/Cave I	earring	85	5	3	6	99	leaded brass
Sa'ad	29	IV/1	bracelet	78	21	n.d.	<1	99	brass
Sa'ad	30	II/55	bracelet	82	1	n.d.	0	83	copper
Sa'ad	32	IV/1	bracelet	81	3	5	7	96	leaded bronze

Sa'ad	42	I/3	key	72	n.d.	7	13	92	leaded bronze
Sa'ad	44	I/4	bell	60	n.d.	1	32	93	leaded copper
Sa'ad	45	II/30	bracelet	74	9	1	1	85	brass
Sa'ad	46	I/4	pendant	71	n.d.	2	18	91	leaded copper
Ya'mun	34	I/9	coffin hard-ware	53	n.d.	4	33	90	leaded bronze
Ya'mun	35	IV/78	clothing buck-le	51	n.d.	6	35	92	leaded bronze
Ya'mun	38	II/25	bracelet	73	12	1	1	87	brass
Ya'mun	40	IV/53	necklace	72	19	1	1	93	brass
Yasileh	1	South/26	clothing buck-le	63	n.d.	6	23	92	leaded bronze
Yasileh	2	South/26	clothing buck-le	70	n.d.	8	21	100	leaded bronze
Yasileh	3	South/7	key	84	8	4	1	97	ternary alloy
Yasileh	4	South/6	bracelet	76	21	1	1	99	brass
Yasileh	5	South/35	bracelet	67	11	2	<1	80	brass
Yasileh	6	South/6	buckle frag-ment	90	10	n.d.	<1	100	brass
Yasileh	8	South/8	bracelet	85	12	3	<1	100	brass
Yasileh	10	South/35	finger ring	77	2	4	15	98	leaded bronze
Yasileh	12	South/1	cosmetic im-plement	81	16	2	2	100	brass
Yasileh	13	South/7	bracelet	71	10	4	6	91	quaternary alloy
Yasileh	14	South/7	bracelet	73	17	n.d.	1	91	brass
Yasileh	16	North/232	bracelet	87	14	n.d.	<1	100	brass
Yasileh	18	South/35	hair pin	79	20	1	0	100	brass
Yasileh	19	South/35	coin	65	3	5	28	100	quaternary alloy
Yasileh	21	South/24	bracelet	75	1	6	1	93	bronze
Yasileh	22	South/35	finger ring	85	1	n.d.	<1	86	copper
Yasileh	24	South/35	bracelet	88	9	3	0	100	ternary alloy
Yasileh	33	South/35	bracelet	78	3	n.d.	7	88	leaded copper

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