

TELL NIMRIN: THE BYZANTINE GOLD HOARD FROM THE 1993 SEASON

by

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with contributions by

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The Find

On May 30, 1993, a cache (L11) of 34 solidi coins and four pendant earrings, all contained in a small trefoil mouth terracotta juglet, was unearthed in N35/W25 at Tell Nimrin (see associated preliminary report, in this volume). The find-spot was on the northern crest of the mound, above and a few meters from the edge of the road cut that marks the north boundary of the present site (Fig. 1). On the E-W axis, it was near the high point of the mound's arch at an elevation of -189.45 m below sea level. This placed the cache approximately 10cm above the floor (L24) associated with E-W (L7) and N-S (L8) walls that shielded the find on two sides and ca. 0.65m below the preexcavation surface above the cache. The immediate context was L10, possibly a small pit(?) of silt clay with small pieces of charcoal, ash, and occupational debris. The manner of deposition of the juglet and contents was not determined.

In field camp, the vessel was reconstructed and catalogued and photographed together with the contents, but no cleaning or further processing was performed on the coins and jewelry. The near-pristine condition of the gold and the desire to preserve information for laboratory analyses made additional field conservation inadvisable.

The coins were assigned TN 1993 registered object numbers (TN93RO) 1-34 beginning with the earliest emperor stamped on the obverse and proceeding to the most recent, as judged by the directors' field readings of the emperors' reigns (Figs. 3a-36b). The next numbers were given to the four earrings (RO35-38; Figs. 37a, 37b) and juglet (RO39; Fig. 2). Based on the names

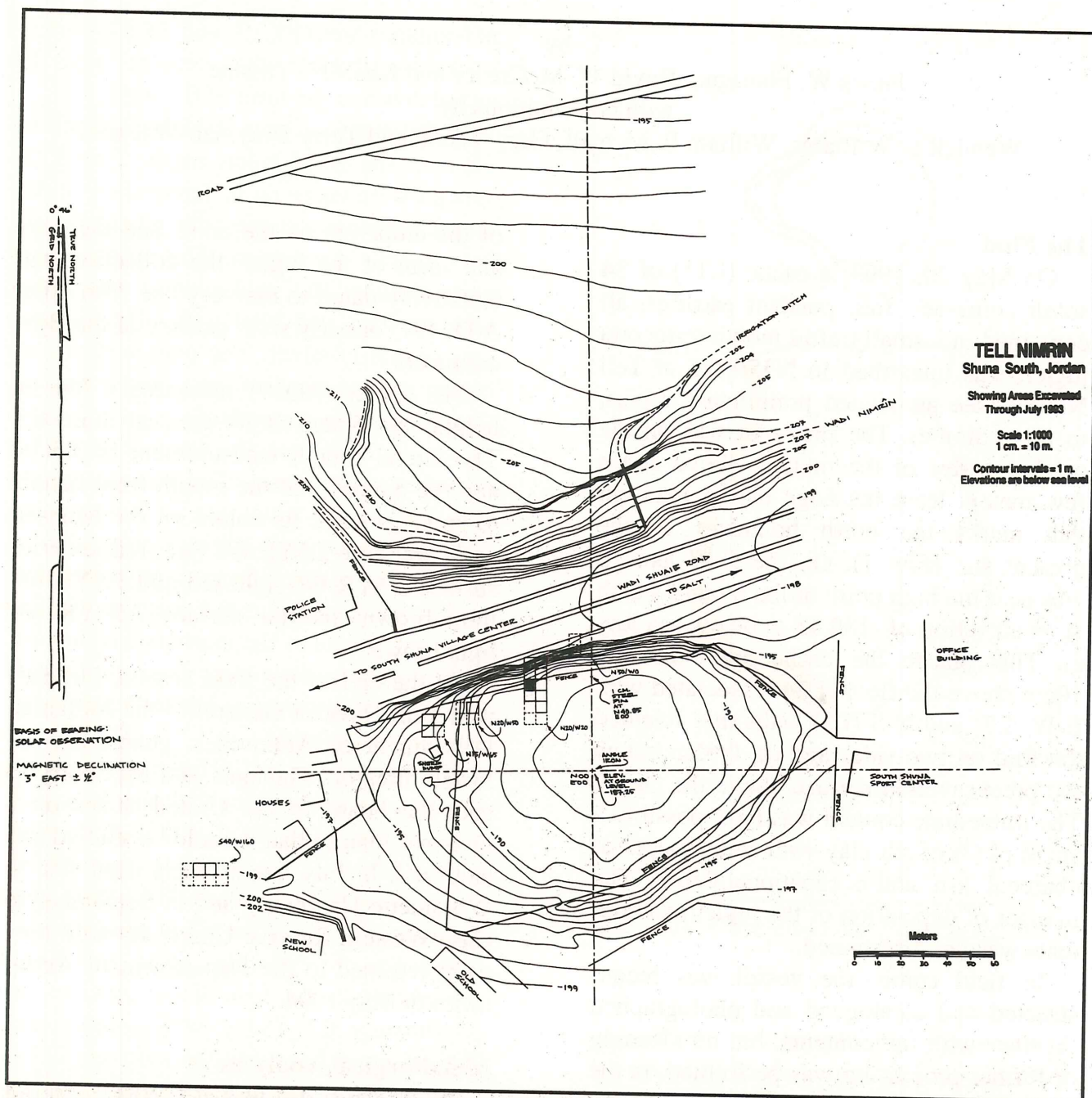
of the emperors on the coins and the ware and form of the juglet, the collection was tentatively dated to the very late fifth (after A.D. 491) or early sixth century of the Byzantine era.

The juglet (RO39) measures 6.7cm in height and 5.5cm at its greatest diameter. The lateral mouth measurement is 3.5cm, and the diameter of the mouth from handle to spout is 4cm. Its colors on the Munsell scale are: core 2.5YR 6/8 light red; exterior surface 2.5YR 6/6 light red and 7.5YR 6/4 light brown; interior surface 7.5 YR 6/4 light brown.

At the end of the field season, Dr. Safwan Tell, Director General of the Jordanian Department of Antiquities, generously allowed directors Flanagan and McCreery to take the hoard to the United States on a one-year loan so that it could be studied and analyzed. In July, the artifacts went first to Willamette University and in September to Case Western Reserve University until they were returned to the Department of Antiquities in May 1994.

Metallurgical Analyses

While the hoard was at CWRU, a series of examinations was arranged there and elsewhere. Dr. Wendell S. Williams, Professor of Materials Science and Engineering at the University, did elemental analyses of the coins and jewelry using electron scanning microscopy (SEM), energy-dispersive X-ray analysis (EDS), density measurement, and weighing. For comparison and to be certain that no surface materials altered the analyses, coins RO1-12 were eventually cleaned with acetone and alcohol, but the remainder were not. The pro-



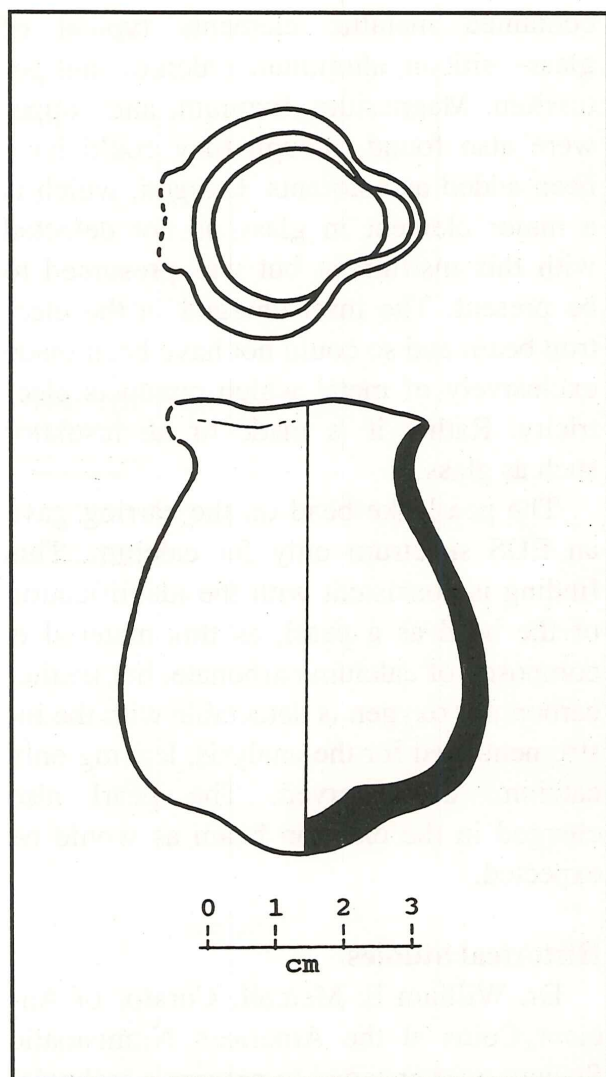
1. Topographic map Tell Nimrin showing location the Byzantine hoard (N35/W25; darkened area).

cess proved not to modify any of the tests. Samples of the jewelry were submitted to the same scanning and X-ray processes. The comments that follow are based on Dr. Williams' preliminary report.

Objectives

The major archaeological issues that motivated the elemental analyses were the coins' composition and whether there had been any debasement of the coinage during

the period(s) represented. Thus, the primary technical objective was to determine the content of copper, silver, iron, lead, and other possible alloys. Several of the coins exhibited small silvery specks on the gold-colored surface, so a secondary technical objective was to identify the composition of these specks. The tests yielded a negative conclusion regarding debasement: the gold was substantially and consistently pure throughout the hoard.



2. Byzantine juglet that contained hoard.

Approach

Because non-destructive techniques were required, scanning electron microscopy (SEM) with energy-dispersive X-ray analysis (EDS) was initially chosen. The instrument was a JEOL 840 Scanning Micro-analyzer located in the Department of Macromolecular Science at CWRU. Later, other tests were run at CWRU, and additional X-rays were made of the coinage at a Cleveland engineering firm and of the jewelry at the Cleveland Museum of Natural History.

A modern British sovereign was used as a reference standard. Its elemental composition was 93.0 wt% (weight percent) gold, 7.0 wt% copper. The corresponding atomic

percentages were 81.1% and 18.9% respectively. No silver or other elements were detected down to the limit of 0.1 wt%.

A flat region of coin RO5 was magnified 950x in the SEM micrograph. Two EDS spectra were taken on different days in different locations on the coin where no silvery specks were seen. The spectra were quite similar. The gold content was calculated at 98.3 and 98.4 wt%. The balance was primarily silver. The coin was thus of higher gold content, at least on the surface, than the reference standard.

Similar EDS spectra were obtained for all coins in the hoard. The general finding was that all the coins are of high quality gold—approximately 98 wt% or higher—at least on the surface. Density measurements performed later indicated that this finding was also typical of the interiors. At the time of this writing, however, those studies are still being analyzed and further calibrations may be forthcoming.

There were small differences in minor constituents of the coins that may be significant. Coins RO1, RO2, RO3, RO5, RO6, RO7, RO8, RO11, and RO16 showed between 1 and 2 wt% silver. The others gave no detectable signal for silver (less than 0.1 wt%). Spectra for coins RO1 and RO20 showed peaks for iron at the level of approximately 0.5 and 1 wt% respectively. The others did not, but the software calculated levels of one or two tenths of a percent for several. A small amount of copper—approximately 0.5 wt%—was present in all the coins according to the analysis of the X-ray data by the software, though no separate peaks for copper were visible in the EDS spectra.

Silvery Specks

Silvery specks on several of the coins were imaged and analyzed. Substantial results were obtained, although the possibility of overlapping spectra must be further

considered here as elsewhere in the analyses. The EDS spectra suggest that the specks are composed not of silver, but of osmium and iridium. These elements are metals of silvery appearance that are in the platinum series in the Periodic Table. They are hard, chemically unreactive, and of very low solubility in solid gold. Thus, if they had been present in the ore, or somehow been introduced during the processing, they would have tended to segregate and form precipitates as the molten gold cooled and solidified. Furthermore, the precipitating would have continued over time, at a slow rate. Thus, from a metallurgical perspective, the EDS identification is plausible.

A third rare but stable metallic element, ruthenium, was also suggested by the EDS spectra from the specks, but its X-ray lines coincide with chlorine. This could have been introduced by salt collected from the atmosphere or handling. A typical salt crystallite on the surface of coin RO12 was imaged and analyzed to illustrate the similarity of the chlorine and ruthenium X-ray peaks. At present, the true composition of the silvery specks is unresolved.

Weights of the coins ranged between 4.14 and 4.52 grams, suggesting attempts at the Roman 24 carat standard.

Earrings

One of the earrings (RO38) was imaged and analyzed by SEM/EDS. (The same tests were run on the others after this report was written. The results were substantially the same as those reported here.) The gold was confirmed to be of high quality, approximately 98 wt% with approximately 1 wt% silver and 1 wt% copper. The spherical gold balls (granulations) on the spacers were very regular and partially sintered together, indicating that high temperatures were used to make this decoration.

The square "jewel" set in the earring

contained metallic elements typical of glass—silicon, aluminum, calcium, and potassium. Magnesium, titanium, and copper were also found, though they could have been added as colorants. Oxygen, which is a major element in glass, is not detected with this instrument but was presumed to be present. The inset charged in the electron beam and so could not have been made exclusively of metal which conducts electricity. Rather it is made of an insulator such as glass.

The pearl-like bead on the earring gave an EDS spectrum only for calcium. This finding is consistent with the identification of the bead as a pearl, as this material is composed of calcium carbonate, but neither carbon nor oxygen is detectable with the instrument used for the analysis, leaving only calcium, as observed. The pearl also charged in the electron beam as would be expected.

Historical Studies

Dr. William E. Metcalf, Curator of Ancient Coins at the American Numismatic Society, was engaged to prepare a technical historical study of the hoard. Dr. Gary Vikan, now Director of the Walters Art Gallery, was commissioned to prepare a similar report on the jewelry. He in turn sought the assistance of Ms. Terry Drayman-Weisser, a conservator at the Walters Gallery, who viewed and analyzed the construction and craft work of the earrings. At the time this report was written their full studies were nearing completion. Summaries of the substance of their work, edited by the directors, follow, beginning with Dr. Metcalf's readings.

Coinage

The hoard consisted of 34 solidi ranging in date (i.e., dates of coins rather than regnal dates of emperors) from Valentinian I

<i>Emperor</i>	<i>Coin Dates</i>	<i>TNRO#</i>	<i>Mints</i>	<i>Num. of Coins</i>
Group I:				
Valens	364-367	1-8	all Antioch	8
Valentinian I	364-367	9-19	all Antioch	11
Group II:				
Leo I	457-473	20-22	all Constantinople	3
Basiliscus and Marcus ¹	475-476	31	Constantinople	1
Zeno	476-491	23, 24, 26, 27, 30	Constantinople	5
		25, 28	Thessalonica	2
		29	Western	1
Anastasius I	491-518	32-34	all Constantinople	3
Total				34

and Valens (A.D. 364-367) to Anastasius I (A.D. 491-518), plus jewelry. The coins were all solidi and seem to fall into two clearly delineated groups:

The latest coins are from the reign of Anastasius and are of the Victory with voided cross reverse type attributed by Bellinger to the years before 498 and by Hahn to the period 492-507 (Bellinger and Grierson 1966; Hahn 1973). One of the group has been gouged (RO32), but the others are among the heaviest in the hoard (RO34 = 4.47 grams and RO33 = 4.51 grams) and have virtually no wear. The coins alone suggest a date very near the turn of the sixth century A.D.

In chronological outline the hoard is similar to two hoards from the synagogue at Horvat Rimmon (Kloner and Mindel 1981). As Grierson and Mays have noted, both of these are unusual in that they contain fractional gold (Grierson and Mays 1992). Fractional gold refers to gold coins that are not solidi—i.e., semisses and tremisses. Thus, the value of the Tell Nimrin hoard at 34 nominal (ca. 32.5 actual) solidi (plus

jewelry) is considerably greater than the other two. Horvat Rimmon I has a total of three solidi, two semisses, and seven tremisses for total nominal weight of 6.33 solidi and total actual weight of 5.75 solidi. Horvat Rimmon II has one solidus, nine semisses, and 25 tremisses for a total nominal weight of 13.83 solidi and a total actual weight of slightly more than 13 solidi.

For Metcalf the greatest surprise in the hoard is the presence of the two Thessalonian solidi of Zeno and the one of western issue that bears his name and presumably was struck at one of the Ostrogothic mints of the west. A comparable coin that has not been satisfactorily attributed is in the Veldrin hoard, but neither Lallemand nor Ulrich-Bansa before her were willing to hazard a mint attribution (Lallemand 1965; Ulrich-Bansa 1994).

It is tempting to see the Tell Nimrin hoard as a combination of two separate hoards, a double hoard as it were: one including the coins of Valens and Valentinian formed in the fourth century; the other including the remaining coins added in the

1. Because Metcalf cites dates of coins rather than regnal dates, he places RO31 before the Zeno coins. The directors' field readings dated the be

ginning of Zeno's reign (before Basiliscus' coup) to A.D. 474. and numbered the coins accordingly.

fifth century. The fact that three coins of Valentinian I share the same reverse, i.e., were struck on the same reverse dye, seems to support this view, but Metcalf warns that caution is in order. (P. Grierson and C. Morrisson, in a private conversation with Flanagan and McCreery on Nov. 19, 1993 in Washington, D.C, saw similar characteristics. In a personal communication, May 31, 1994, Metcalf reported that J. P. C. Kent confirmed the western minting of RO32 and attributed it to Rome, ca. A.D485-490.). Metcalf's hesitation stems from the fact that both Horvat Rimmon hoards include fourth century coins, and the fact that little is known about coin supply in Palestine and Jordan during the fifth century. Hence, he draws no firm conclusion.

Virtually all the coins show scratches, mostly straight lines that suggest graffiti. One Zeno coin (RO22) has traces of surface marking on the reverse. In a CWRU laboratory test, the mark showed lead content consistent with paint. Another Zeno coin (RO29) has the "Z" in the emperor's name stamped in reverse (backward).

Jewelry - General Technical Description

The four earring pendants were examined in the Conservation Laboratory at the Walters Art Gallery in Baltimore, MD. Observations were made by naked-eye, with ultra-violet light, and with 25x magnifications under an optical microscope. The following represents Ms. Drayman-Weisser's report to the directors.

The pendants form two matching sets, the shorter RO35 and RO36 and the longer RO37 and RO38. The shorter pair are both made of gold, each with one inset stone and one pearl. The longer set are also made of gold, with an inset glass and three pearls. The longer set is virtually identical, but RO35 and RO36 differ from each other in several aspects. The most obvious difference is that RO35 exhibits excellent craft-

working (the longer pair is equally fine), while RO36 is poorly executed. Perhaps the latter was made by a less accomplished craftsman to replace a lost or severely damaged original mate to RO35.

Another striking difference is that RO35, as well as the longer RO37 and RO38, have "notches" at the top inner surfaces of their suspension loops, made either during manufacture or from wear. The less elegant RO36 does not have a notch in its suspension loop.

The stones in RO35 and RO36 also differ from each other. Although both are most likely garnet, the stone in RO35 is a dark, purple-red and has a flat surface, while the stone in RO36 is a lighter orange-red and has a slightly convex surface. The glasses set into RO37 and RO38, on the other hand, are too deteriorated for their original colors to be determined visually without scraping away the surface layers. This could not be done because in this examination, as with other analyses of the hoard, only non-destructive procedures were allowed.

All four pendants are devoid of burial accretions except for muddy incrustations in some crevices and a few scattered black accretions on the pearls. The gold appears visually to be fairly pure (an observation that was confirmed in laboratory tests—cf. above), since there is no corrosion, not even a visible layer of oxide or tarnish. The surfaces of the gold elements are mat, which appears to be intentional since the gold is reflective only where the pendant may have been burnished by brushing against the shoulder of the wearer.

Detailed Technical Description of Individual Pendants:

RO35:

Materials: gold, transparent purple-red stone (garnet?), pearl.

Dimensions: length: 2.0 cm overall; diameter of gold wire: tapers from 0.12 to 0.09cm; diameter of gold suspension loop: 0.4cm; diameter of gold ball: 0.15cm; diameter of pearl: 0.44cm setting for stone: length 0.45cm, width 0.45cm; depth 0.47cm.

RO36:

Materials: gold, transparent orange-red stone (garnet?), pearl.

Dimensions: length: 2.1cm overall; diameter of gold wire: tapers from 0.12 to 0.08cm; diameter of gold suspension loop: 0.45cm; diameter of gold ball: 0.17cm; diameter of pearl: 0.47cm; setting for stone: length 0.5 cm, width 0.5cm; depth 0.25cm.

Each of these pendants is composed of six elements. From the top to the bottom of the pendant, they are: 1) a gold wire forming the suspension loop and running the length of the pendant, supporting the other elements and ending in a "knot"; 2) a solid gold ball soldered to the wire at the point where the loop meets the rest of the wire; 3) a gold sheet strip wrapped around to form a bead; 4) a gold diamond-shaped box setting made in four parts—a gold sheet strip for the sides, a square sheet of gold for the back, a square sheet of gold foil within the box parallel to the front of the box (RO36 does not have foil within the box setting), and a stone inlaid in the front of the box (the gold sheet from the sides overlaps the stone to secure it in place); 5) a gold sheet strip bead embellished with twisted wires on both edges (the bead on RO36 is not embellished with additional wires); 6) a pearl. Originally there would have been a hoop from which each pendant was suspended.

The condition of the pendants is generally good. The suspension loop of RO35

is broken through at the top, due either to extreme wear or damage. The gold box setting for the stone in RO36 has been slightly crushed (although it was never as deep as the setting on RO35).

RO37:

Materials: gold, glass, pearl.

Dimensions: length: 4.7 cm overall; diameter of gold wire: tapers from 0.18 to 0.08cm; diameter of gold suspension loop: 0.5 cm diameter of gold ball: 0.16cm; diameter of pearl: 0.58cm, 0.55cm, 0.53cm; setting for stone: length 0.5cm; width 0.4cm; depth 0.45cm.

RO38:

Materials: gold, glass, pearl.

Dimensions: same as for RO37.

RO37 and RO38 are made in a very similar fashion to RO35, but with ten elements each rather than six. From the top of the pendants, the elements are: 1) a gold wire forming the suspension loop and running the length of the pendant, supporting the other elements and ending in a "knot"; 2) a solid gold ball soldered to the wire at the point where the loop meets the rest of the wire; 3) a gold sheet strip wrapped around to form a bead; 4) a gold rectangular box setting made in three parts—a gold sheet strip for the sides, a rectangular sheet of gold for the back, and a piece of glass inlaid in the front of the box (the gold sheet from the sides overlaps the stone to secure it in place); 5) a pear-shaped gold bead made in two parts—a piece of gold sheet wrapped in a funnel shape and a disc of gold sheet pushed out to make a convex form and soldered onto the wire end of the "funnel"; 6) a pearl; 7) a gold sheet strip wrapped around to form a bead embellished with beaded wire (formed from individual beads soldered together) on both

edges; 8) a pearl; 9) a gold bead identical to element 7; 10) a pearl. Originally there would have been a hoop from which each pendant was suspended.

The condition of the pendants is generally good. The central wire of RO38 is bent at an angle of approximately 135 degrees just below the first pearl. The glass insets are very deteriorated on their surfaces.

Jewelry - Historical Significance

The report that follows was provided to the directors by Dr. Vikan.

By general design and "aesthetic" the earrings belong generally to the familiar category of Late Antique jewelry (see esp., Weitzmann [ed.] 1979: 297ff.; Ross 1965: nos. 1-93; and Segall 1938: nos. 93-227). Among their closest comparisons are four pair of earrings in the Dumbarton Oaks Collection (acc. nos. 28.12a, b; 16, 17; 14, 15; 52.7.1, 2 = Ross 1965: no. 1.E-G, I), all belonging to the so-called Piazza della Consolazione Treasure (Ross 1965: 2ff.; Weitzmann 1979: no. 281 [K. R. Brown]). Noteworthy similarities include the soldered gold balls just beneath the suspension loop (1.E; 1.G; 1.I), the rings with soldered balls used as spacers (1.G; 1.I), the conical spacers (1.E; 1.G), and the gold foil boxes containing the garnets (1.I).

The Piazza della Consolazione Treasure is one of the most important groups of Late Antique jewelry discovered in this century. It takes its name from the area of Rome where it was said to have been found in 1908. Comprising a rich variety of elaborate gold rings, earrings, necklaces, and armbands, this poorly documented and still only partially researched and published group is homogeneous enough to suggest single ownership, almost certainly by an aristocratic woman. Dating to the early fifth century is assured not only by a medallion of Emperor Honorius on one necklace

(Zahn 1929: no. 111), but also by the face-to-face marriage iconography of one necklace. This iconography went out of fashion in the mid-fifth century (Vikan 1990: 155-56). The Latin inscription on one ring (de Ricci 1912: no. 815) and the find-spot support western manufacture, although close similarities with the earrings from Nimrin and similarities already noted by Marvin Ross with earrings found in Syria (Fontenay 1887: 103) dictate reconsideration of the question, as does the incorporation of Greco-Egyptian gem amulets on two of the necklaces in the Roman collection (Weitzmann [ed.] 1979: nos. 282, 283).

Summary

The Byzantine hoard from the 1993 season at Tell Nimrin constitutes a major find at an important period at the site. Excavations by Michele Piccirillo in 1980 unearthed a church building with mosaics believed to have been constructed in the sixth century (Piccirillo 1982). That discovery, and this one, demonstrate the richness of Byzantine history and culture at Tell Nimrin.

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3a. Obverse of TN93RO1: Valens.



3b. Reverse of TN93RO1: Antioch mint.



4a. Obverse of TN93RO2: Valens.



4b. Reverse of TN93RO2: Antioch mint.



5a. Obverse of TN93RO3: Valens.



5b. Reverse of TN93RO3: Antioch mint.



6a. Obverse of TN93RO4: Valens.



6b. Reverse of TN93RO4: Antioch mint.



7a. Obverse of TN93RO5: Valens.



7b. Reverse of TN93RO5: Antioch mint.



8a. Obverse of TN93RO6: Valens.



8b. Reverse of TN93RO6: Antioch mint.



9a. Obverse of TN93RO7: Valens.



9b. Reverse of TN93RO7: Antioch mint.



10a. Obverse of TN93RO8: Valens.



10b. Reverse of TN93RO8: Antioch mint.



11a. Obverse of TN93RO9: Valentinian I.



11b. Reverse of TN93RO9: Antioch mint.



12a. Obverse of TN93RO10: Valentinian I.



12b. Reverse of TN93RO10: Antioch mint.



13a. Obverse of TN93RO11: Valentinian I.



13b. Reverse of TN93RO11: Antioch mint.



14a. Obverse of TN93RO12: Valentinian I.



14b. Reverse of TN93RO12: Antioch mint.



15a. Obverse of TN93RO13: Valentinian I.



15b. Reverse of TN93RO13: Antioch mint.



16a. Obverse of TN93RO14: Valentinian I.



16b. Reverse of TN93RO14: Antioch mint.



17a. Obverse of TN93RO15: Valentinian I.



17b. Reverse of TN93RO15: Antioch mint.



18a. Obverse of TN93RO16: Valentinian I.



18b. Reverse of TN93RO16: Antioch mint.



19a. Obverse of TN93RO17: Valentinian I.



19b. Reverse of TN93RO17: Antioch mint.



20a. Obverse of TN93RO18: Valentinian I.



20b. Reverse of TN93RO18: Antioch mint.



21a. Obverse of TN93RO19: Valentinian I.



21b. Reverse of TN93RO19: Antioch mint.



22a. Obverse of TN93RO20: Leo I.



22b. Reverse of TN93RO20: Constantinople mint.



23a. Obverse of TN93RO21: Leo I.



23b. Reverse of TN93RO21: Constantinople mint.



24a. Obverse of TN93RO22: Leo I.



24b. Reverse of TN93RO22: Constantinople mint.



25a. Obverse of TN93RO23: Zeno.



25b. Reverse of TN93RO23: Constantinople mint.



26a. Obverse of TN93RO24: Zeno.



26b. Reverse of TN93RO24: Constantinople mint.



27a. Obverse of TN93RO25: Zeno.



27b. Reverse of TN93RO25: Thessalonica mint.



28a. Obverse of TN93RO26: Zeno.



28b. Reverse of TN93RO26: Constantinople mint.



29a. Obverse of TN93RO27: Zeno.



29b. Reverse of TN93RO27: Constantinople mint.



30a. Obverse of TN93RO28: Zeno.



30b. Reverse of TN93RO28: Thessalonica mint.



31a. Obverse of TN93RO29: Zeno.



31b. Reverse of TN93RO29: Western mint.



32a. Obverse of TN93RO30: Zeno.



32b. Reverse of TN93RO30: Constantinople mint.



33a. Obverse of TN93RO31: Basiliscus and Marcus.



33b. Reverse of TN93RO31: Constantinople mint.



34a. Obverse of TN93RO32: Anastasius I.



34b. Reverse of TN93RO32: Constantinople mint.



35a. Obverse of TN93RO33: Anastasius I.



35b. Reverse of TN93RO33: Constantinople mint.



36a. Obverse of TN93RO34: Anastasius I.



36b. Reverse of TN93RO34: Constantinople mint



37a. TN93RO35 (nearest to scale) and TN93RO36: earring pendants.



37b. TN93RO37 (nearest to scale) and TN93RO38: earring pendants.

