

[Vicino Oriente XVI (2012), pp. 227-244]

AN EB IIIB (2500-2300 BC) GEMSTONES NECKLACE
FROM THE PALACE OF THE COPPER AXES AT KHIRBET AL-BATRAWY,
JORDAN

Lorenzo Nigro - Sapienza University of Rome

Il rinvenimento di numerosi vaghi e perle in pietre preziose e semi-preziose durante lo scavo del "Palazzo delle asce di rame" nell'antica città giordana del Bronzo Antico II-III di Khirbet al-Batrawy ha permesso, dopo il restauro e le analisi chimico-fisiche, di ricostruire una preziosa collana a quattro fili, comprendente perle di corniola, cristallo di rocca, olivina, fritta, osso, conchiglia, rame e ametista. Lo studio delle gemme semi-preziose e degli altri materiali utilizzati nella collana ha offerto lo spunto per una riflessione sulle rotte di approvvigionamento di questi materiali pregiati durante il primo fenomeno urbano nel Levante meridionale del III millennio a.C., rotte che si spingevano a sud lungo la Penisola Arabica e il Mar Rosso.

Keywords: necklace; EB III; palace; copper; Khirbet al-Batrawy

1. INTRODUCTION

Since 2005 Rome "La Sapienza" Expedition to Palestine & Jordan has been excavating the EB II-III (3000-2300 BC) site of Khirbet al-Batrawy,¹ which came out to be an Early Bronze Age city, arisen on the top of a hill dominating the valley of Upper Wadi az-Zarqa, and the tracks connecting the steppe and the desert to this riverine environment down to the Jordan Valley to the west.² The city was characterized by a monumental defensive system, with four lines of fortifications, including towers, bastions, and buttresses. Inside the city-walls, the hill was densely dwelt. Public buildings arose on the Acropolis (Area A), on the easternmost terrace (Area F), where a broad-room Temple was brought to light with a circular altar in the forecourt, and inside the northern city-walls (Area B South), where the main city-gate introducing to the city was located in correspondence of a saddle between the hill itself and a neighboring mound.

2. FINDS IN THE PALACE OF THE COPPER AXES

In this area, the northern sector of a huge palace was excavated since 2009, bringing to light two roughly symmetrical pavilions separated by a central corridor, with pillared halls, storerooms, and impressive remains of a monumental architecture made of stones up to the first storey and of wood and mudbricks in the upper ones.³

¹ Excavations were carried out under the auspices of the Department of Antiquities of the Hashemite Kingdom of Jordan and they were supported by Sapienza University of Rome, the Italian Ministry of Education and University and the Ministry of Foreign Affairs of Italy. The DoA Authorities and personnel, the inspector of the Zarqa district, Mr. Romel Gharib, and H.H. Francesco Fransoni, the Italian Ambassador in Amman, as well as the cultural attaché Dr. Natalia Sanginiti deserve our deepest gratitude for their invaluable help.

² Nigro 2006; 2007; 2009; 2010a, 1-66; 2010b; 2011; 2012a; 2012b; Nigro (ed.) 2006; 2008; 2012; Nigro - Sala 2009; 2010.

³ Nigro 2010a, 67-110; Nigro - Sala 2010, 248; 2011.

The palace yielded a great amount of pottery vessels (*pithoi*, jars, but also table services, and cult or symbolic vases, many of them still with their content inside) and other items, including five copper axes and a dagger,⁴ as well as other luxury goods in a fairly good preservation state due to the fierce fire which brought to a sudden end the life of the city around 2300 BC.

2.1. *Hall L.1110*

The Western Pavilion, Hall L.1110, excavated in the seventh (2011) and eight (2012) seasons, proved to be one of the major rooms of the palace. It had a rectangular plan (6.5 × 3.7 m) with a central pillar, W.1163 (fig. 1). There were two doors: one in the north-west corner (L.1272) through the entrance system of the Western Pavilion, and a second one on the northern side (L.1160), directly communicating with Pillared Hall L.1040.

2.2. *Finds in Hall L.1110*

Hall L.1110 was filled up by a 0.60 m thick layer of ashes, charcoals, charred wooden beams and broken bricks, with a big yellowish mudbrick, like those employed as footsteps in the doors of Pillared Hall L.1040, to the west.

Clusters of pottery vessels, objects and disgregated architectural material were found smashed on the floor (fig. 2). North of the central pillar base (W.1163), a sliced flint core and a wooden sickle incorporating a series of Canaanite blades were retrieved together with many bone tools, a wooden tray, and a bowl with inturned rim (fig. 3). A second sickle of the same type was found north of device B.1189 (§ 2.3.).

Roughly 1 m to the north-west, a copper axe (KB.11.B.120) was concealed in a small cavity of the bedrock floor, increasing to five the number of such weapons found in the palace. It belonged to the simple elongated type, with expanded tang and carefully tempered fan blade. Moreover, within the passage to Hall L.1040, door L.1160, two jars were found accompanied by a small cylindrical cup (a measure). Last but not least, an Egyptianizing vessel (1128/76), belonging to the so-called “Lotus Vase” type, represents one of the most noteworthy finds of Hall L.1110; it belongs to the medium-size type, in use during the whole Early Bronze Age.⁵

In the southern half of the room, upon the bedrock step, there was another concentration of pottery vessels, including a red-burnished jug (1128/49), characterized by a highly polished body with net-burnishing on the shoulders. The southern wall (W.1201) of the hall was characterized by a stone-built bench within a niche (B.1188), which hosted a huge *pithos* (1188/1), probably used as container for a liquid (water?).

⁴ Nigro 2010c.

⁵ The nearest comparison is that with the Egyptianizing vessels found in the *cachette* from the Temple of level J-4 at Megiddo/Tell el-Mutesellim (Joffe 2000, 170-174, figs. 8:6, 8:8), which, however, it is not chronologically satisfying, dating back from EB II. EB IIIB specimens similar to vase KB.11.B.1128/76 from Palace B at Khirbet al-Batrawy were found in Palestine in EB IIIB Sanctuary A at ‘Ai/et-Tell (Marquet-Krause 1949, pl. LII:1534, 1536, 1541); see also M. Sala in this volume.

2.3. *The slab-built installation in Hall L.1110*

At the middle of the eastern side of the hall (W.1149), a stone slab-built installation (B.1189) was discovered, to be considered a seat or a raised niche (fig. 4). At the bottom of this device, a series of small jars arrayed along a bedrock step in the floor was deposited, up to the basis of the hall central pillar.

3. THE NECKLACE AND ITS RECONSTRUCTION

Two small jars behind the slab-built seat hold personal ornaments; one, up-side down just underneath the installation (1128/69), contained around 660 beads of different precious stuffs (fig. 5), the other one (1128/43), around half a meter apart, a short lace consisting of sea-shells (KB.11.B.90) and a bone ring (KB.11.B.88) (fig. 6).

3.1. *The beads*

The group of beads was carefully examined and sorted according to the material of each pearl.⁶ They were made of carnelian (258; fig. 7), bone (303; fig. 8), copper (20 but at least other 32 vanished), frit (14; fig. 9), sea-shell (12; fig. 10), olivine (or peridot, a green translucent semi-precious gemstone, 30), hyaline quartz (transparent rock crystal, 14; fig. 11), smoky quartz (smoky rock crystal, 5; fig. 12).

Beads made of gemstones (carnelian, olivine, rock crystal, smoky quartz, and amethyst),⁷ bone and frit, can be divided into five types on the basis of their shape: spherical (mainly made of copper), cylindrical, discoid, bi-conical, and barrel-shaped. The central hole was pierced by an arch drill, obtaining a continuous perforation without steps or interruptions (because of the fun shape of the drill at both side of each bead, bi-conical, discoid, and barrel-shaped beads were more easily alternated to spherical pearls). Beads show inside the passant hole and at their tips smoothed surfaces indicating that the necklace was worn in antiquity.

Small groups of beads were melted together by incrustrated copper pearls, thus suggesting that the beads belonged to a necklace (fig. 13). Moreover, during restoration and analyses, two pierced spacers (KB.11.B.118, and 119), consisting of small rectangular bone plaquettes, were identified melted in a lump of copper and carnelian and bone beads, showing four holes for four strings. This provided an invaluable help for the reconstruction of the necklace (named KB.11.B.101), which incorporated all of the beads.

3.2. *The four strings necklace*

The necklace (KB.11.B.101) was divided into two parts: the upper part with four long strings, and the lower one, consisting of a pectoral, again formed by four strings of gradually reducing length.

⁶ Physico-chemical analyses of the beads were carried out by Prof. Adriana Maras, Dr. Michele Macri, Dr. Ombretta Tarquini and Dr. Ilaria Sacchetti; results of these analyses will be illustrated in a forthcoming paper. The necklace was restored by Dr. Ingrid Melandri.

⁷ For a presentation of these minerals used in jewelry see recently Zöldföldi 2011.

The upper four strings were composed by carnelian beads alternated respectively to bone beads and copper spherical pearls (fig. 14). The pectoral was centered on four noticeable beads: the amethyst, a barrel-shaped smoky quartz bead, a bi-conical orange-red carnelian bead, and a big discoidal dark red carnelian bead.

The uppermost string of the pectoral was presumably composed by alternating olivine and rock crystal (hyaline quartz) beads, letting in the centre the bi-conical amethyst bead, flanked by couples of smoky quartz beads (fig. 15:a). This was the shortest string, but the most precious and lighting one. The reconstruction of the second string of the pectoral is also quite interesting: sea-shells were alternated to frit, bone and cylindrical smoky quartz beads up to the central composition, with the big barrel-shaped smoky quartz bead in between two shells, exactly incorporating it (fig. 15:b). The third string was regularly composed by bi-conical carnelian beads alternated to barrel-shaped frit beads. At the centre of the composition there was a shining orange red carnelian bead (fig. 15:c). The fourth string, which was the longest one, included a central big discoidal dark red carnelian bead, in between bi-conical elongated bone beads. The whole string was composed according to this theory (fig. 15:d).

The overall look of this piece of jewelry was quite ornamental and luxurious, especially if set into the EBA Southern Levantine context. Only a few comparisons can be quoted from the EB II-III Sacred Area at Tell el-Mutesellim/Megiddo (although including only one string),⁸ and at EB III Tell el-Khuweilifeh, where nearly forty faïence beads were found still jointed as part of a one-string necklace, along with sparse carnelian beads.⁹ Multiple four strings necklaces in the 3rd millennium Near East are known from the Royal Cemetery at Ur,¹⁰ usually alternating carnelian, gold and lapis lazuli beads. Their composition is similar - although oddly more rich and spectacular - to that reconstructed for the necklace of Batrawy.

One more comment is required by the amethyst bead, which is a sure Egyptian import.¹¹ It can be reasonably included into a stream of Egyptian items continuing to flow to

⁸ At Tell el-Mutesellim/Megiddo roughly 400 sea-shells and faïence beads were found in the EB II Sacred Area (Loud 1948, pl. 207:1; Nigro 2010, 335-337), possibly offered together with the copper spearhead next to installation B.4034; moreover roughly 90 faïence, quartz, carnelian, jasper, and copper beads were found in the same Sacred Area, probably related to EB III Temple 4040 (Sass 2000, 388, fig. 12:27:3).

⁹ Seger *et al.* 1990, 15-16. Southern Levantine comparisons can be found also at Tell Abu al-Kharaz (Fischer 2008, 94-95, figs. 103, 120:2), where 56 beads made of quartz, aragonite, calcite, and sea-shell were retrieved in an EB II domestic complex (Fischer - Bichler - Hammer 2008, 387-389), and at Tell 'Arad, where a variety of beads made of frit/faïence, carnelian, rock crystal, olivine, hematite, limestone, mother-of-pearl, shell, bone and copper, was found both in an EB I cave (Amiran - Ilan 1996, 30-31, pl. 18), and from the EB II-III settlement (Amiran *et al.* 1978, 54-55, pls. 68-69; Amiran - Ilan 1996, 80-81, pls. 78-79). Finally, a considerable amount of carnelian and frit/faïence beads (together with quartz, aragonite, calcite, malachite, hematite, shell and copper pearls) was found in EB I-III tombs at Jericho/Tell es-Sultan (EB I Tombs K1, K2 and A124 [Kenyon 1965, 19-21, fig. 6:12, 30-31], and EB II-III Tombs A127, D12, F3 and F2 [Kenyon 1960, 92, fig. 28, 125-126, 155-156, fig. 55, 172-173, fig. 65]; Talbot 1983, 794-798), Bab edh-Dhra' (Rast - Schaub 1989, 302-310; Broeder - Skinner 2003), and Lachish (Tufnell 1958, pls. 29.6, 21).

¹⁰ Woolley 1934, pl. 133.

¹¹ Andrews 1991.

Southern Levant also at the mid of the 3rd millennium BC.¹² The Palace of the Copper Axes, in fact, gave back other objects attesting to this Egyptian connection.

4. GEMSTONES, SEA-SHELLS, COPPER AND THE ROAD TO ARABIA AND THE RED SEA

A preliminary evaluation of the different gemstones and materials assembled in the necklace makes it possible to investigate their provenance, which points to long distance trade. The vast majority of beads were made of carnelian, a quite common gemstone, a reddish-orange variety of quartz, available in antiquity in the deserts of both Egypt and Arabian Peninsula. Three different chromatic varieties of orange to red are shown by the beads. Colour is also related to the transparency of the stone, as well as on its reflectiveness.

The discovery of Batrawy suggested that this city was at the northern end of a track connecting the Arabian Peninsula to Palestine, Lebanon and the Mediterranean Sea through Jordan. The main track to south, along the 'Arabah and the eastern shore of the Red Sea, was possibly the road to carnelian (of the two qualities, dark red and orange-red), which was extracted in the wadis of Southern Jordan, the highlands of north-western Arabia.

Moreover, from the same region should come also hyaline quartz, translucent rock crystal, while smoky quartz was extracted in Anatolia (and thus it came from the north, through Syria). The eastern Red Sea shore is the provenance land of olivine, again suggesting that the Arabian track was the easiest road to gemstones.

The single amethyst bi-conical bead retrieved should come from the only known source of this gemstone for pre-classical Near East: the Wadi el-Hudi in Egypt (fig. 16).¹³ On the way from Egypt to central Jordan, one might hypothesize either the well-known track through the eastern Nile Delta, or a direct shortcut to the sea and sea-trade across the Red Sea.¹⁴

Spherical copper beads were alternated to carnelian and bone beads in the upper strings of the necklace. They were made with copper characterized by a presence of arsenic of around 1.5%. This arsenical dose does not allow a direct connection between Batrawy and the copper ores of Wadi Feinan,¹⁵ which were exploited during the Early Bronze III; anyhow, it might have been extracted in the nearby Timna¹⁶ (where, however, such a high date for copper extraction is still not documented).

5. CONCLUSIONS

Finds from Palace B (the Palace of the Copper Axes) at Khirbet al-Batrawy shed new light on the phenomenon of urbanization in 3rd millennium BC Jordan. Along with data from other major fortified sites in Jordan, such as Khirbet el-Zeraqon, Tell Handaqq South, el-Lejjun, Numeira, Bab edh-Dhra', the city of Batrawy testifies to the existence of an urban system similar to that established in nearby Palestine during the Early Bronze Age.

¹² On this topic see: Sowada 2009; Greenberg *et al.* 2012, 97; and M. Sala in this volume.

¹³ Inscriptions in the Wadi el-Hudi date back from the Middle Kingdom (Sadek 1980; Shaw - Jameson 1993).

¹⁴ Two shells might belong to Nilotic species. They might be included into Egyptian imports at Batrawy.

¹⁵ Levy 2007.

¹⁶ Rothenberg 1999.

Monumental fortifications, serial production of pottery and tools, presence of status symbols (maceheads, palettes, metal weapons), wealthy items and agricultural surplus accumulation did suggest that these were typical features of such an early urbanism. International relationships, mainly with Egypt, but also with Syria and Mesopotamia, further corroborate this historical picture. The necklace retrieved in Hall L.1110, at the foot of a built-up seat (a ceremonial one?), is made of gemstones gathered basically from another direction, that is the south. They suggest that the Red Sea - as a sea-faring route - and the Arabian Peninsula were possible poles of extraction of these precious gemstones, which were objects of long-distance trade promoted by early urban entities.

REFERENCES

- AMIRAN, R. - ILAN, O.
1992 *Arad, eine 5000 Jahre alte Stadt in der Wüste Negev, Israel*, Hamburg 1992.
- AMIRAN, R. *ET ALII*
1978 *Early Arad. The Chalcolithic Settlement and Early Bronze City, I. First - Fifth Seasons of Excavations, 1962-1966* (Judean Desert Studies), Jerusalem 1978.
- ANDREWS, C.A.R.
1991 *Ancient Egyptian Jewelry*, London 1991.
- BROEDER, N.H. - SKINNER, H.C.W.
2003 Jewelry and ornaments: W.E. RAST - R.TH. SCHAUB, *Bâb edh-Dhrâ': Excavations at the Town Site (1975-1981). Part 1: Text, Part 2: Plates and Appendices* (Reports of the Expedition to the Dead Sea Plain, Jordan, Volume II), Winona Lake 2003, pp. 566-598.
- DEVOTO, G. - MOLAYEM, A.
1990 *Archeogemmologia: pietre antiche, glittica, magia e litoterapia*, Roma 1990.
- FISCHER, P.M.
2008 *Tell Abu al-Kharaz in the Jordan Valley. Volume I: The Early Bronze Age* (Österreichische Akademie der Wissenschaften Denkschriften der Gesamtakademie 48), Wien 2008.
- FISCHER, P.M. - BICHLER, M. - HAMMER, V.M.F.
2008 Appendix 1. An Early Bronze Age Necklace from Tell Abu al-Kharaz, Jordan Valley: P.M. FISCHER, *Tell Abu al-Kharaz in the Jordan Valley. Volume I: The Early Bronze Age* (Österreichische Akademie der Wissenschaften Denkschriften der Gesamtakademie 48), Wien 2008, pp. 387-389.
- GREENBERG, R. *ET ALII*
2012 Tel Beth Yerah: Hub of the Early Bronze Age Levant: *Near Eastern Archaeology* 75 (2012), pp. 88-107.
- JOFFE, A.H.
2000 The Early Bronze Age Pottery from Area J: I. FINKELSTEIN - D. USSISHKIN - B. HALPERN (eds.), *Megiddo III. The 1992-1996 Seasons* (Tel Aviv Monograph Series 18), Jerusalem 2000, pp. 161-185.
- KENYON, K.M.
1960 *Excavations at Jericho. Volume One. The Tombs excavated in 1952-1954*, London 1960.
1965 *Excavations at Jericho. Volume Two. The Tombs excavated in 1955-1958*, London 1965.
- LEVY, TH.E.
2007 *Journey to the Copper Age. Archaeology in the Holy Land* (Annual of American School of Oriental Research), San Diego 2007.

XVI (2012) An EB IIIB (2500-2300 BC) gemstones necklace from the Palace of the Copper Axes

- LOUD, G.
1948 *Megiddo II. Seasons of 1935-1939* (Oriental Institute Publications 62), Chicago 1948.
- MARQUET-KRAUSE, J.
1949 *Les Fouilles de 'Ay (Et-Tell) 1933-1935. La résurrection d'une grande cité biblique* (Bibliothèque archéologique et historique XLV), Paris 1949.
- NIGRO, L.
2006 Preliminary Report of the First Season of Excavations by the University of Rome "La Sapienza" at Khirbat al-Batrawi (Upper Wadi ez-Zarqa): *Annual of the Department of Antiquities of Jordan* 50 (2006), pp. 229-248.
2007 Preliminary Report of the Second Season of Excavations by the University of Rome "La Sapienza" at Khirbat al-Batrāwī (Upper Wādī az-Zarqā): *Annual of the Department of Antiquities of Jordan* 51 (2007), pp. 345-360.
2009 Khirbet al-Batrawy: a Case Study of 3rd millennium BC Early Urbanism in North-Central Jordan: *Studies in the History and Archaeology of Jordan* 10 (2009), pp. 657-677.
2010a *In the Palace of the Copper Axes/Nel Palazzo delle Asce di Rame. Khirbet al-Batrawy: the discovery of a forgotten city of the III millennium BC in Jordan/Khirbet al-Batrawy: la scoperta di una città dimenticata del III millennio a.C. in Giordania* (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan, Colour Monographs I), Rome 2010.
2010b Between the Desert and the Jordan: Early Urbanization in the Upper Wadi az-Zarqa - the EB II-III fortified town of Khirbet al-Batrawy: P. MATTHIAE - F. PINNOCK - L. NIGRO - N. MARCHETTI (eds.), *Proceedings of the 6th ICAANE Congress, Rome 5 May - 10 May 2009* [sic; 2008], "Sapienza", Università di Roma, III, Wiesbaden 2010, pp. 431-458.
2010c Quattro asce di rame dal Palazzo B di Khirbet al-Batrawy (Bronzo Antico IIIB, 2500-2300 a.C.): *Scienze dell'Antichità* 16 (2010), pp. 561-572.
2010d *Tell es-Sultan/Jericho in the Early Bronze II (3000-2700 BC): the rise of an early Palestinian city. A synthesis of the results of four archaeological expeditions* (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan 5), Rome 2010.
2011 Dominating the River: Khirbet al-Batrawy, an EB II-III City in North-Central Jordan: *Syria* 88 (2011), pp. 59-74.
2012a Khirbet al-Batrawy: *American Journal of Archaeology* 116 (2012), pp. 705-706.
2012b Khirbet al-Batrawy: Rise, Flourish and Collapse of an Early Bronze Age City in Jordan: R. MATTHEWS - J. CURTIS (eds.), *Proceedings of the 7th International Congress on the Archaeology of the Ancient Near East. 12 April - 16 April 2010, the British Museum and UCL, London*, Wiesbaden 2012, Volume 1, pp. 609-628.
- NIGRO, L. (ed.)
2006 *Khirbet al-Batrawy. An Early Bronze Age Fortified Town in North-Central Jordan. Preliminary Report of the First Season of Excavations (2005)* (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan 3), Rome 2006.
2008 *Khirbet al-Batrawy II. The EB II city-gate, the EB II-III fortifications, the EB II-III temple. Preliminary report of the second (2006) and third (2007) seasons of excavations* (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan 6), Rome 2008.
2012 *Khirbet al-Batrawy III. The EB II-III triple fortification line, and the EB IIIB quarter inside the city-wall. Preliminary report of the fourth (2008) and fifth (2009) seasons of excavations* (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan 8), Rome 2012.

- NIGRO, L. - SALA, M.
 2009 Preliminary Report on the Fourth Season of Excavation by “La Sapienza” University of Rome at Khirbat al-Batrāwī in Upper Wādī az-Zarqā’, 2008: *Annual of the Department of Antiquities of Jordan* 53 (2009), pp. 371-384.
 2010 Preliminary Report on the Fifth Season (2009) of Excavations at Khirbat al-Batrāwī (Upper Wādī az-Zarqā’), by the University of Rome “La Sapienza”: *Annual of the Department of Antiquities of Jordan* 54 (2010), pp. 237-253.
 2011 Preliminary Report on the Sixth (2010) Season of Excavation by “La Sapienza” University of Rome at Khirbat al-Batrāwī (Upper Wādī az-Zarqā’): *Annual of the Department of Antiquities of Jordan* 55 (2011), pp. 85-100.
- PINNOCK, F.
 1993 *Le perle del Palazzo Reale G* (Materiali e Studi Archeologici di Ebla II), Roma 1993.
- RAST, W.E. - SCHAUB, R.TH.
 1989 *Bāb edh-Dhrā’: Excavations in the Cemetery Directed by Paul W. Lapp (1965-67)* (Reports of the Expedition to the Dead Sea Plain, Jordan, Volume I), Winona Lake 1989.
- ROTHENBERG, B.
 1999 Archaeo-Metallurgical Researches in the Southern Arabah 1959-1990 Part I: Late Pottery Neolithic to Early Bronze IV: *Palestine Exploration Quarterly* 131 (1999), pp. 68-89.
- SADEK, A.I.
 1980 *The Amethyst Mining Inscriptions of Wadi el-Hudi*, Warminster 1980.
- SASS, B.
 2000 The Small Finds: I. FINKELSTEIN - D. USSISHKIN - B. HALPERN (eds.), *Megiddo III. The 1992-1996 Seasons* (Tel Aviv Monograph Series 18), Tel Aviv 2000, pp. 349-423.
- SEGER, J.D. *ET ALII*
 1990 The Bronze Age Settlements at Tel Halif: Phase II Excavations, 198-1987: *Bulletin of the American Schools of Oriental Research* 26 (1990), pp. 1-32.
- SHAW, I. - JAMESON, R.
 1993 Amethyst Mining in the Eastern Desert: A Preliminary Survey at Wadi el-hudi: *The Journal of Egyptian Archaeology* 79 (1993), pp. 81-97.
- SOWADA, K.N.
 2009 *Egypt in the Eastern Mediterranean during the Old Kingdom. An Archaeological Perspective* (Orbis Biblicus et Orientalis 237), Fribourg 2009.
- TALBOT, G.C.
 1983 Beads and Pendants from the Tell and Tombs: K.M. KENYON - T.A. HOLLAND, *Excavations at Jericho. Volume Five. The Pottery Phases of the Tell and Others Finds*, London 1983, pp. 788-801.
- TUFNELL, O.
 1958 *Lachish IV, The Bronze Age* (The Wellcome-Marston Archaeological Research Expedition to the Near East, Vol. IV), London 1958.
- WOOLEY, C.L.
 1934 *Ur Excavations II. The Royal Cemetery. A report on the Predynastic and Sargonid graves excavated between 1926 and 1931*, London 1934.
- ZÖLDFÖLDI, J.
 2011 Gemstones at Qatna Royal Tomb: Preliminary Report: P. PFÄLZNER (ed.), *Interdisziplinäre Studien zur Königsgruft von Qatna* (Qatna Studien Band 1), Wiesbaden 2011, pp. 235-248.



Fig. 1: Palace of the Copper Axes: general view of destruction layer F.1128 inside Hall L.1110, from west; in the foreground, central circular stone base W.1163.



Fig. 2: Palace of the Copper Axes: detail of destruction layer F.1128 inside Hall L.1110, with *in situ* smashed vessels and objects, from west.



Fig. 3: Palace of the Copper Axes: finds from Hall L.1110.

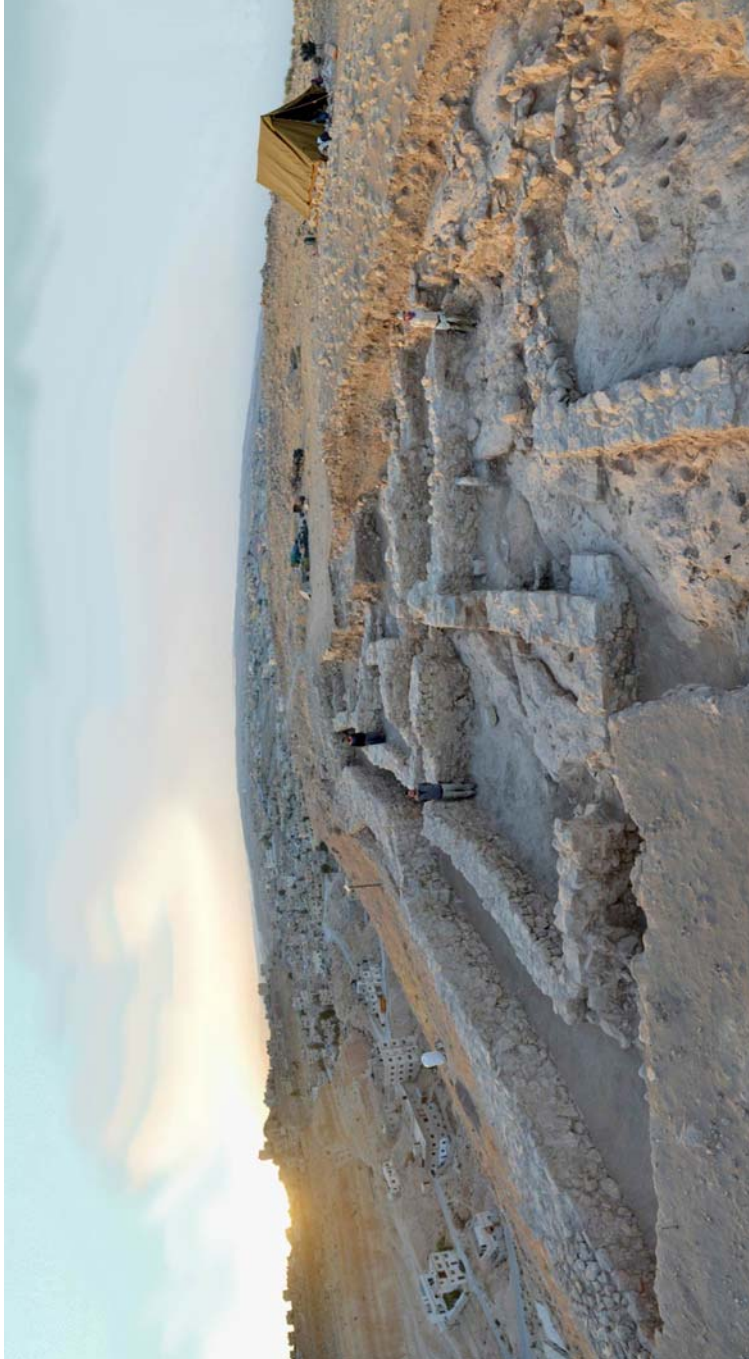


Fig. 4: Palace of the Copper Axes: Hall L.1110 with stone slab-built installation B.1189, erected at the middle of the eastern side of the hall, W.1149.



Fig. 5: Palace of the Copper Axes: retrieval of gemstone and copper beads in Hall L.1110.



Fig. 6: The sea-shells (KB.11.B.90) and the bone ring (KB.11.B.88) being part of a short lace recovered in Hall L.1110.



Fig. 7: Selection of orange-red and dark red carnelian beads of four strings necklace KB.11.B.101 of bi-conical, cylindrical, barrel, and discoid shape.



Fig. 8: Selection of bone beads of four strings necklace KB.11.B.101 of cylindrical and discoid shape.



Fig. 9: Selection of bi-conical and barrel-shaped frit beads of the central pectoral.



Fig. 10: Selection of sea-shell beads of four strings necklace KB.11.B.101.



Fig. 11: Selection of discoid-shaped hyaline quartz beads of four strings necklace KB.11.B.101.

XVI (2012) An EB IIIB (2500-2300 BC) gemstones necklace from the Palace of the Copper Axes



Fig. 12: A smoky crystal barrel-shaped bead of four strings necklace KB.11.B.101.

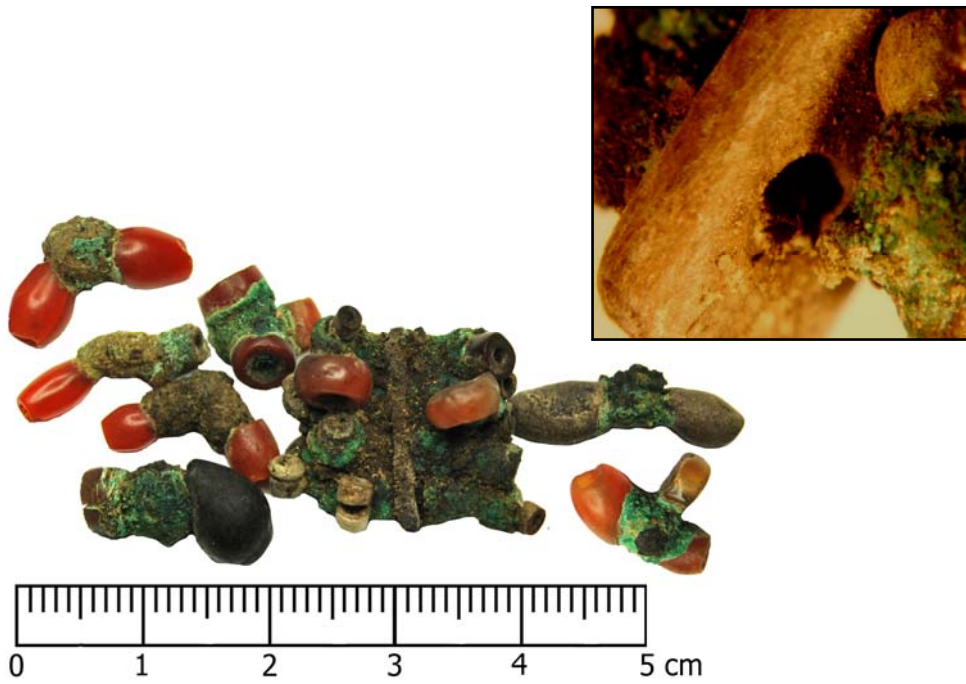


Fig. 13: Small groups of beads of the gemstone necklace melted together with incrustated copper pearls, with bone spacer KB.11.B.118, and a particular of one hole of the other bone spacer, KB.11.B.119.



Fig. 14: The four strings necklace (KB.11.B.101) recovered in Hall L.1110 in the Palace of the Copper Axes, after restoration.



Fig. 15: Details of each central pendant of the four laces of the pectoral (not at scale).

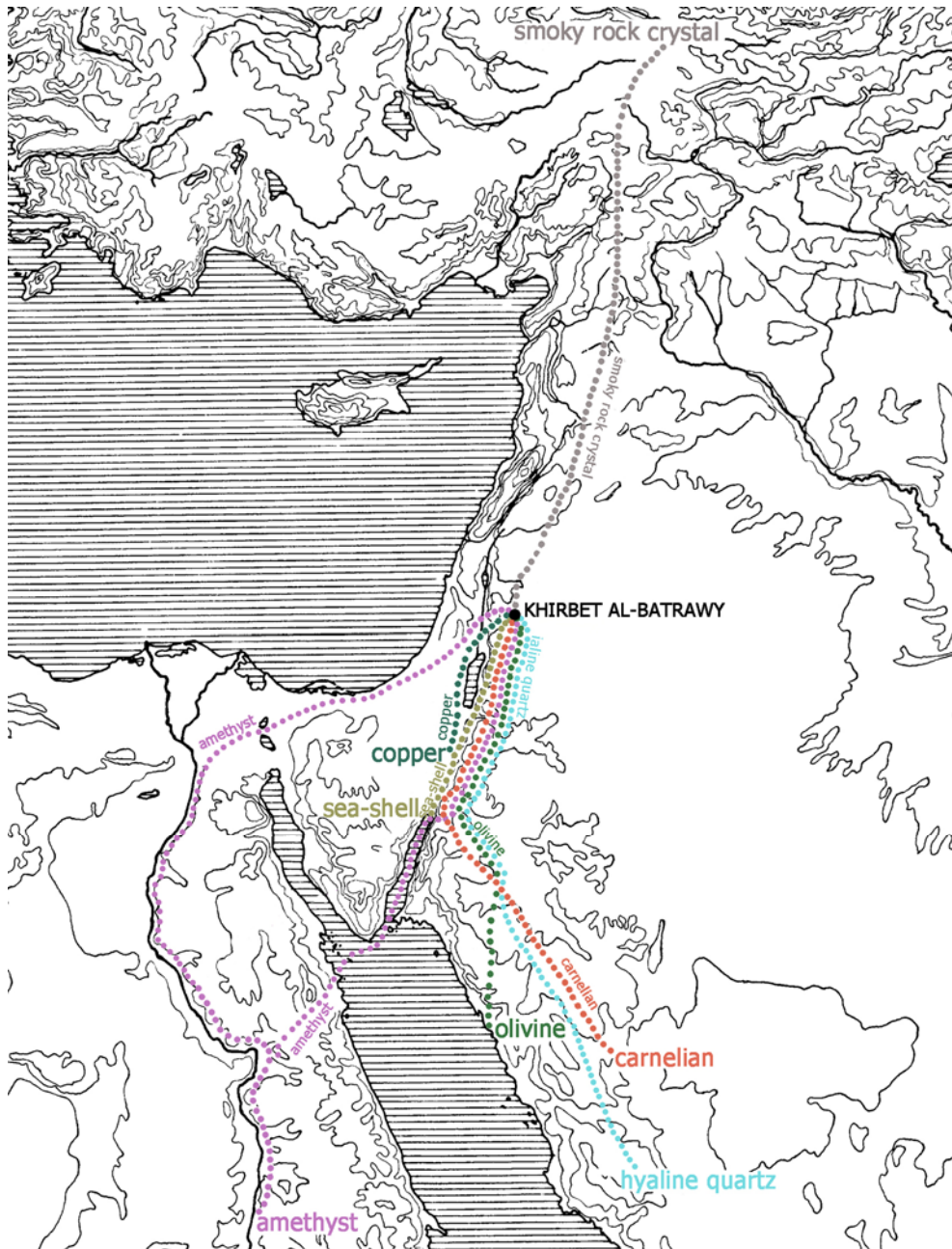


Fig. 16: Tracks of long-distance trade involving gemstones and other precious stuff incorporated in the necklace.