

The aim of COSMOKRATOR Newsletters is to explore any theme concerning ancient and modern astrology, as embodied in the COSMOKRATOR colour model for Planets and Signs, and discussed in its associated booklets

PRIESTESS TIAMATBASHTI'S NECKLACE

As explained in my Newsletter for last year, due to several setbacks since 2015, instead of the usual annual cycle of publishing one Cosmokrator Book a year, the book on Molecules (which includes semi-precious stones) still has to wait another year. That book will consider the harmonics of material and substances, including those of certain lovely materials that have been sought after since the earliest history of mankind - lapis lazuli, carnelian, agates, rock crystal - and also all those coloured silicates we use today for jewellery (as then) in the form of glass.

Following on from my last Newsletter on making planetary and zodiacal necklaces, in my formal academic research the theme expanded to such a fascinating degree that I have decided to extract an entire section from *Catalogue E: The Forward Attack - ForAtt-1*, etc. are entry numbers in the Catalogue - about the meaning of the lion attacking its prey, concerning Second Millennium BC access to semi-precious stones and glass in the Ancient Near East. In the final paragraph I will suggest that the numbers of different types of beads in Tiamatbashti's necklace turn out to have an significance that I cannot prove was intended, but if it was, is somewhat startling in relating precisely to some of the main subdivisions of the Octave we have called the 'Veils of Isis' in our journeys with the Cosmokrator model and its books (only a quarter of them written so far!). For a quick look at the necklace see *Ill.9-128* (note the picture numbering is unchanged from the full catalogue, which can be viewed at www.layish.co.uk, accessed through two levels from the centre square). Since this is an extract, many of the references or cross-references have been left out, but can be viewed in the original on-line version. A warning, too, that many of the pictures are clearer in the on-line Catalogue¹.

Work on this theme for *Catalogue E* inspired more Cosmokrator experimentation involving the stringing of at least 20 more astronomical necklaces which I hope I will be able to share with you in a later Newsletter! The lovely natural minerals involved must of course lead to another *Cosmokrator* 3D model for stones, alongside the two more general models for key Elements and 'chemical' Molecules.

INTRODUCTION

The amber, semi-precious stone and glass grave-goods in Mycenaean Warrior tombs - due to their geographical siting between Europe and the Levant - led us to consider how such materials were obtained. We considered their context in a group of high-status burials where these semi-precious stones abounded - both as seals and in the form of necklace beads.

AMBER

As with other Mycenaean warrior burials of this importance, in the Vapheio grave discussed under *ForAtt-26* - though far from on the plentiful scale seen in the Shaft Grave era - some amber was found

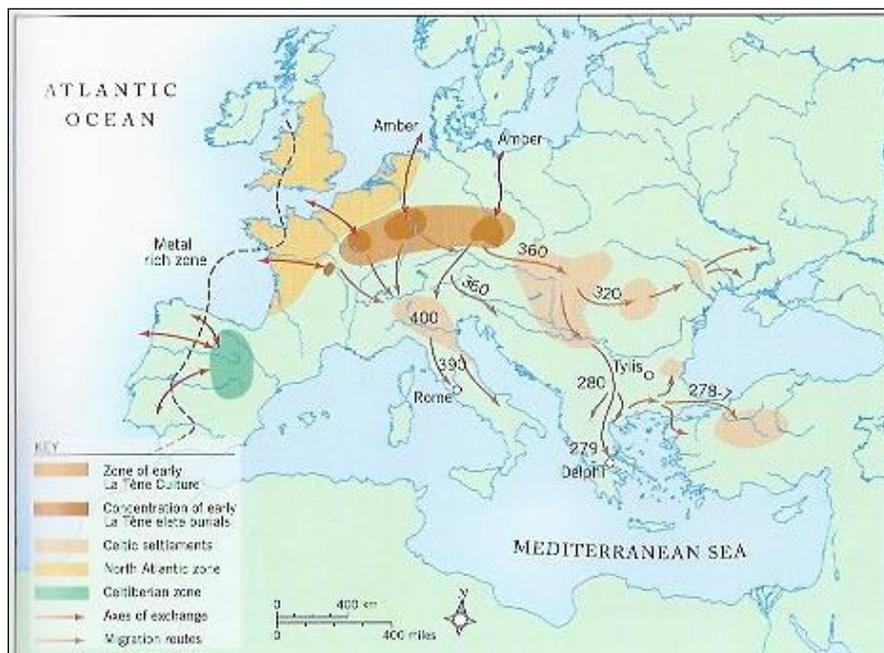
¹ Available on the website from mid-2017 onwards.

amongst the materials at the Vapheio warrior's command. High-status graves dating 2000-1400BC in Wessex can be directly contrasted with Mycenaean ones - for instance, the chieftain of the Bush Barrow



Ill.9- 1: (Left) Amber Cup - Brighton & Hove Museum; (right) Selection of amber beads from disparate fragmentary necklaces or stray beads found at Lake, Wilts, arranged as necklace, bracelets or pendants - BM no. 1895,0723.52 (c.f. Ill.9- 4)

grave near Stonehenge was accompanied by three bronze daggers, an axe, a stone mace-head, gold plaques and gold belt hook. Amber was a feature of several such graves within the orbit of the tin mines, including the tumulus near Hove containing a solid amber cup amongst its treasures (above left). Not far away, at Upton Lovell a female was buried wearing a multi-strand necklace of amber beads with the strands separated from each other by large spacer plates (a reconstruction of a similar



Ill.9- 2: The same routes were followed in Dark Age and Archaic Greek times for both metals and amber - Cunliffe² fig.10.24

necklace is shown above right). As Schofield³: confirms, 'Intriguingly, a particular form of amber spacing bead appears in a few items of jewellery (for example an amber necklace from grave Omicron

² B Cunliffe *Europe Between the Oceans 9000BC to 1000AD* New Haven & London 2011

³ See A Harding et al. 'Amber in the Mycenaean World' *BSA LXIX* 1974 145-172. In later periods the odd piece of amber even found its way to places associated with the Mitanni - mentioned in the text - but in fact a few pieces have also turned up in *Pre-dynastic* sites in Sumer and Egypt..

in Circle B [at Mycenae]) dating to a short time span early in the 16C. This type of bead has its closest parallels in the Upton Lovell necklace from the contemporary Bronze Age Wessex Culture in Britain'. It is argued the huge amount of Baltic amber found in the Shaft Graves (some 1560 pieces) would have come via Britain (specifically Wessex⁴) in probably no more than two one-off consignments c.1600-1500. Smaller amounts of amber, likely to be pieces passed on through the Mycenaean-Mitanni network, have also been found at Enkomi, Alalakh, Ugarit and Aššur - in all of which places the lion-prey subject on related artefacts is part of the cultural message. Begun in the 4-2M, Barry Cunliffe's general map above usefully sums up the by now officially accepted view of the amber and metal trade routes that continued to run between Europe and Anatolia by the beginning of the 1M BC.

NAME OF BURIAL	No. of pieces of amber	
VAPHEIO	1	
DENDRA	1 (+ 60 - see next ill.)	
RUTSI	54	
THEBES	1	
MENIDI	'several'	
PERATI	1 + fragments	

Ill.9- 3: Tally of amber found in Mycenaean warrior graves post-Shaft Grave Era; (right) amber beads from the Ugarit royal palace⁵

Other than at Rutsi, Harding and Hughes-Brock (*ibid.*) recorded just one piece of amber in each of the graves tabled above - all of them of interest for our seal studies since again in each of these particular tombs lion-prey seals were present. But recently in her lecture to the Mycenaean Seminar of 16 March 2016 at University College London, Birgitta Eder told of huge amounts of amber in Tholos Tomb A at Kakovatos-Pylos (initially excavated by Dörpfeld⁶) which from the bead types indicate vast supplies were coming into the Peloponnese from Central Europe - possibly via Italy - confirming the main routes shown in Cunliffe's map held good then. Kakovatos Tholos Tomb A also held odd beads of lapis lazuli,



Ill.9- 4: Amber found in Chamber Tomb 10, Dendra, Midea (enough to make up a necklace) - Persson *ibid.*1942, fig. 97

⁴ *The Mycenaean* (2007) p.65: as we know, there are other S-W England connections, discussed *passim* under Metals and Glass.

⁵ V Matoian *Le Mobilier du Palais Royal d'Ougarit* Lyon 2008 pl.vii,2

⁶ I Kilian-Dirlmeier *Die bronzezeitlichen Gräber bei Nidri auf Leukas: Ausgrabungen von W Dörpfeld 1903-1913* Bonn 2005 (see also W Dörpfeld *Athenische Mitteilungen* 1908)

amethyst and pieces of ivory in pretty much the standard warrior tomb mix⁷. It is worth pointing out that Harding and Hughes-Brock seem to not to have taken into account Tomb 10 at Dendra (excavated by Persson⁸ a decade later than the tholos tomb) which held large amounts of amber (photo above) -far more than they credit to Dendra (so I have added the Dendra Chamber Tomb 10 pieces to their table).

JEWELLERY IN PERSONAL ADORNMENT, CULT AND RITUAL IN THE 2M

The anthropologist Mary Helms⁹ on the evidence of other cultures suggests that a widely travelled person who brings home exotic materials or objects from foreign lands has enhanced status in the eyes of their own society by having seen and experienced what is beyond the reach of most others. Burns (*ibid.*) sees conscious status-assertion as the main motive behind the Mycenaeans' acquisitive marshalling of luxury raw materials and artefacts - whether obtained through booty of war, trading voyages or diplomatic missions (though I suggest later that some iconographic evidence could betray a deeper purpose underpinning such internationalism and the possession of a standard gamut of valuable pieces). Societies like the Mycenaeans actively cultivated their craftsmen, and for the 2M it is revealing that many craftsmen's tombs reveal the high status they were accorded. In this catalogue we have cited the tombs of the metalworker from Ebla in relation to *ForAtt-4*; the metalworker at Shahi-Tump near the Makran coast (*Error! Reference source not found.*) who made the lead weight under *BaLu-4* - and that of a general craftsman of both metal and stones at Gonur (*Ill.9- 31*) to be looked at shortly). The tombs of metalworkers from Eurasia have also been mentioned (e.g. *Error! Reference source not found.*). From as early as the 3M Maikop



Ill.9- 5: (Top) Two of many hundreds of bead-offering necklaces from the Eye Temple, Tell Brak c.3300-3000BC, British Museum (photo author); (below) contemporary shell and carnelian necklace from the Osiris Temple, Abydos¹⁰- Petrie pl.LII top

culture, such skilled and inventive artificers often appear to have had shamanic status since they produced finished artefact fashioned from base materials as if by magic, amounting to alchemy.

There is no need to look in detail at the early genesis of bead-making in the 4-3M, but it is relevant to our understanding of Mycenaean taste - and their international connections in the process - by taking a selective look at stages in the increasing use of semi-precious stones (whether as beads or seals) as they gradually took the place of the then centuries-old practice of using shell, seed, calcite or faience

⁷ There was also a squashed, intense blue glass bowl, which would confirm Erzgebirge origins (see later): these new finds are not yet officially published.

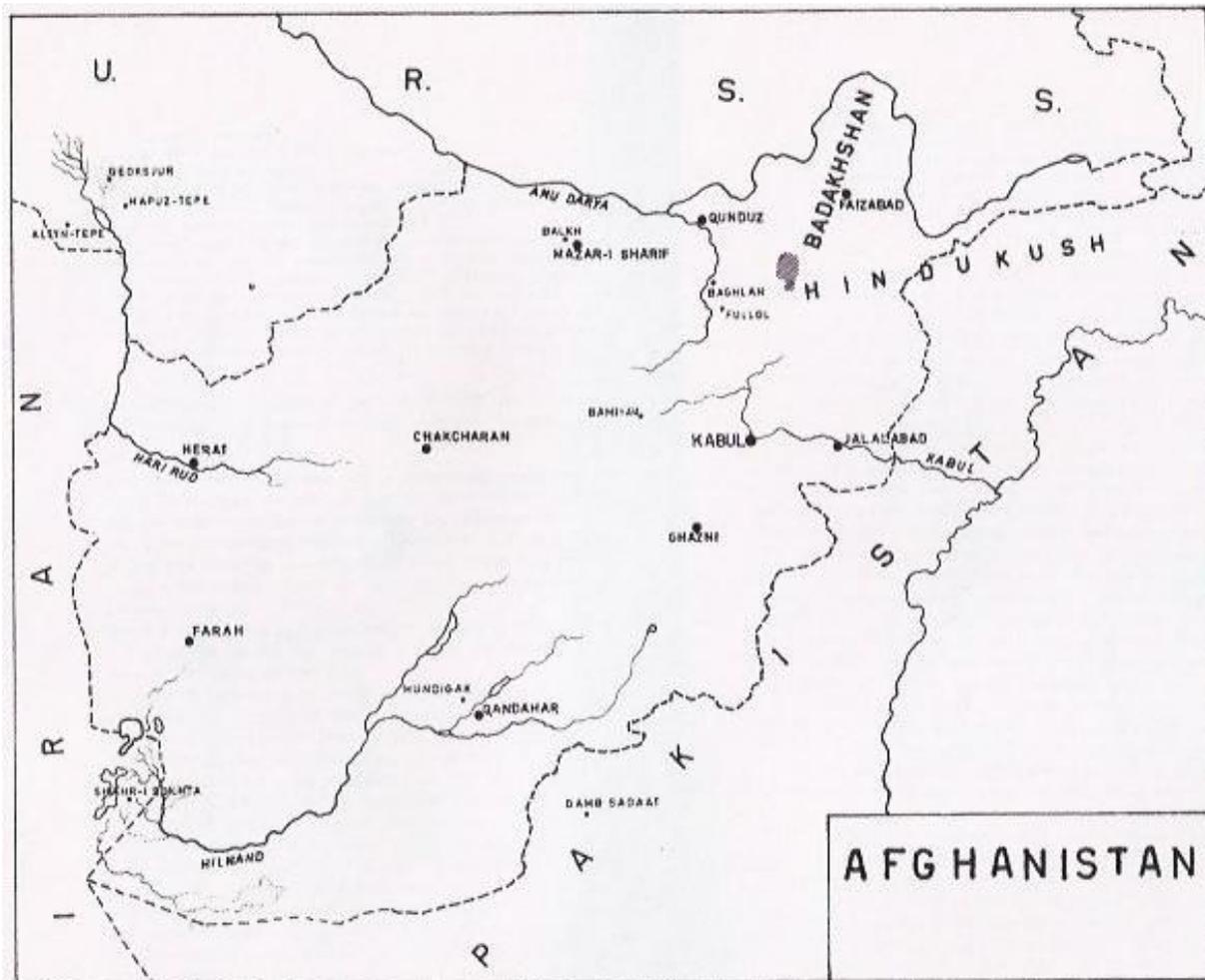
⁸ A W Persson *New Tombs at Dendra near Midea* Lund 1942

⁹ M Helms *Craft and the Kingly Ideal: Art, Trade and Power* 1993

¹⁰ W Flinders Petrie *Abydos I* 1902 London

beads - even if interspersed with the odd small carnelian or lapis lazuli piece as a rare luxury - (above are two such typical late 4M examples from the Tell Brak Eye Temple in the British Museum). Triggering this changeover process Gardin¹¹ saw three main factors coming together that contributed to the 'développement précoce' of the 2M Bactria/BMAC region which presided over its beginnings:

- 'la proximité relative de ressources minières (pierres et métaux) au Badakhshan' (see map below);



Ill.9- 6: Badakhshan (labelled top right on the map) - from Tosi et al. fig.1

- foundations of an already existing trade route westwards dating back to the original 4-3M lapis lazuli trade;
- the agricultural success of sites in the region due to the introduction of irrigation.

It is only during the 2M that traffic in these semi-precious stones began to move into an extended network penetrating beyond Iran and Sumer - then the traffic becomes noticeable in the Levant - and even becomes evident at Mycenaean sites. It is interesting that Van Seters (*ibid.* p.43) mentions how

¹¹ J-C Gardin 'Vers une Géographie Archéologique de l'Afghanistan' *Studia Iranica XI* 1982 97- 110

even amongst food and small pottery offerings made at the temple at Nahariyeh¹² in Palestine, ‘many beads of semiprecious stones and jewellery of bronze, silver and gold in the form of earrings, pendants and a scarab ring [were found]’. Ritual offering of beads and necklaces was common, as we will describe in the Cult Centre at Mycenae - theirs mostly of blue glass - and clearly from its wall-paintings we know they were also integral to the rich parure of the court or temple ladies (though they often pale in comparison with the warrior necklaces using the full gamut of semi-precious stones).

The trade in the kinds of precious stones occurring together in Afghanistan rose and fell even into the 20C, and Arkell’s enquiries¹³ into the bead trade emanating from Cambay even today found examples of agate or carnelian beads siphoned down through India to as far as Darfur, Khartoum, Cairo, Jeddah, Beirut, Persia, Kano and of course around Gujarat itself (including Bombay) where the industry continues (a paper by Allchin on the full detail of India’s age-old manufacture of agate and carnelian beads is discussed later). The spread of these two materials in raw or bead form underlines how in the 2M the inevitable triangle of trading between India, Africa and Arabia that in *Catalogue D* I call ‘the Zanzibar Triangle’ proceeded at full stretch as long as demand from the 2M Aegean world lasted.

MYCENAEAN ACCESS TO LAPIS LAZULI AND OTHER SEMI-PRECIOUS STONES

Burns notes the surprising paucity of lapis lazuli in the Mycenaean archaeological record compared to glass. Those few pieces that did get through were clearly much treasured - in the case of the Vapheio warrior the one lapis lazuli bead on his necklace converted from a ring bezel showing a dog was part of its triple centrepiece. Maran describes a lapis lazuli pendant carved in the shape of a fenestrated axe blade from Mycenae (below right), several of them from the Treasury at Thebes (his fig.11). We have seen throughout our enquiries how stray Near Eastern seals of lapis lazuli arriving in Crete or Greece all through the 2M appear to have been kept as heirlooms. Thus there is not much to say about successful Mycenaean procurement of lapis lazuli as a raw material reaching the Greek mainland: the exception was the Thebes hoard¹⁴, probably a Kassite gift, and a spectacular supply for the Mycenaean *Wanax* there of one of the most prized materials from the ancient near east - even if only in the form of hand-me-down beads and out-of-date seals. Amongst known single lapis lazuli seals imported to the Greek world (some already discussed under *Catalogue D*), one not mentioned so far is described as a gold-



¹² See M Dothan 'The Excavations at Nahariyeh 1954-55' *Israel Exploration Journal* VI 1956 14-25

¹³ A J Arkell 'Cambay and the Bead Trade' *Antiquity* X 1936 292-305

¹⁴ Edith Porada *The Cylinder Seals found at Thebes in Boeotia (Archiv für Orientforschung Vol. XXVIII)* 1981/2

Ill.9- 7: (Left and centre) The lapis lazuli Serpieri seal (owned by the Serpieri family) - from Porada (ibid.) pl.2 (a shrouded figure, probably female - leans forward on a stool placed on a raised dais; (right) Mycenaean lapis lazuli pendant in the form of a fenestrated axe blade - Maran fig.9

capped lapis lazuli seal¹⁵ (above) found with several Mycenaean objects at Vari, not far from Athens. For the two figures on the left, it partly uses Old Babylonian iconography in the elongated Cypriote style, but the enthroned, draped female figure on raised dais approached by a falconer on a lower step is not Babylonian at all, resembling more the type of figure seen on Elamite seals - a telling clue pinning down a Mycenaean link somehow made with Turan at least, if not into Central Asia itself, possibly via the Hittites (the falconer also features in Hittite iconography).

Porada (*ibid.*) noted that Cyprus, often a way-station to the Mycenaean world, in fact in certain periods had such easy access to lapis lazuli that, aside from the seals in the Thebes Hoard she saw as carved in Cyprus, the island had in earlier times had enough to send 110 *deben* in weight as tribute to Tuthmoses III in the 34th year of his reign (revealing one way Egyptian pharaohs were able to obtain the stone). One can only think the reason why large lumps of the raw material have not been found at Mycenaean sites may simply mean that any supplies making their way through Syria from Central Asia were intercepted, fully allocated and spoken for by the time they had been shared out in places like Mari, Ebla or even Cyprus - all of whose courts were able to get their hands on large stocks. This is perhaps borne out by Caubet's¹⁶ survey of semi-precious stones (including lapis lazuli) from the site of Ugarit¹⁷, which she found almost totally deficient of anything of lapis, despite *topoi* referring to this stone in its mythology: as she summed up, 'Sur les 555 sceaux-cylindres catalogués par Pierre Amiet (1992), pas un n'est en lapis, un seul en cornaline (no.184)'. An incident is reported in the texts whereby the Hittite king, having demanded lapis supplies from his Ugarit vassal, ended in forcing his representative Takuhlu to send fake lapis - for which deception he was perhaps unfairly berated - seen by Caubet as a further symptom of the actual unavailability of this blue stone at this westward point at which time the Asian supply chain usually ran out. After a quick check of finds at Alalakh, she found the same lack: no lapis in any quantity was passed on westwards of Aleppo or Ebla (so Cyprus' ability to nonetheless get hold of it is an intriguing question implying preferential supply from elsewhere).

You could say our case for saying the Mitanni must have been middle men between Central Asia and the Mycenaean in relaying semi-precious stone supplies falls down in the case of lapis lazuli, since it was clearly the Kassites¹⁸ (proved from the Thebes hoard) who seem to have had immediate control of the lapis lazuli routes, evident in their relationship with Egypt in the Amarna letters, yet their Mitanni cousins do feature somewhere along that chain since they also offer the stone to the Pharaoh in

¹⁵ E Porada 'On the Complexity of Style and Iconography in Some Groups of Cylinder Seals from Cyprus' in *The Mycenaean in the Mediterranean* conference papers Nicosia 1972, 260-273 and 3 plates

¹⁶ A Caubet "Une demeure d'argent et d'or, un palais de pur lapis-lazuli" in W G E Watson (ed.) *'He unfurrowed his brow and laughed': Essays in honour of Nick Wyatt* Münster 2007 39-43

¹⁷ In a trawl of all Ras Shamra finds in the Louvre other than seals Caubet *ibid.* found only one small carnelian lion from the 1937 excavation; some carnelian, quartz and agate beads from 1938; an agate bead in the form of a duck from 1949 and one amber bead from the 1956 season.

¹⁸ See N Crüsemann et al. 'Prestigegüter und Politik: Aspekte internationaler Beziehungen im 2. Jt. v.' in K Bartl et al. (eds) *Zwischen Euphrat und Indus* Hildesheim 1995 175-192

exchange for gold. They were perhaps most efficacious in dealing with the specifically carnelian - and agate-based - Indian network reaching Egypt or Elam by more southerly routes - of which more later.

OTHER SEMI-PRECIOUS STONES AND THEIR EARLY USE

In our art historical discussion of *ForAtt-19-22* concerning cylinder seals featuring lion-prey groups using the zebu bull, we quoted Jarrige's conclusions about the circle of sites in contact with each other that emerged at the turn of the 3M into the 2M, concluding, 'On pourrait ainsi reconstituer vers 1800-1700, dates correspondant traditionnellement à la fin des villes de l'Indus, un mouvement de population qui, partie de Turkménie méridionale, aurait atteint la vallée de l'Indus, en passant par la Bactriane, et serait ensuite parvenu au Baluchistan méridionale (Mehi) pour arriver enfin au Makran Iranien (Khurab).' And as we know, other evidence then points to Indus and Harappan products travelling in



Ill.9- 8: (Left) Necklace (half-length) of the Mehrgarh type from Mohenjo-Daro - Mohenjo Daro Museum MM1367 (AFC-281); (centre) necklace from the Temple of Ishtar at Mari of agate, amazonite, carnelian and gold- Louvre AO19080, Michel¹⁹ fig.2; (right) typical jewellery found in chamber tombs at Mycenae that included glass, amber, carnelian and faience - illustrated by Piet de Jong

contraflow to the sites of Gilan, Margiana and the Lut Desert (as at Shahr-i-Sokhta), with thriving hubs on this circle of cooperation and interchange being sites such as Hissar III, Altintepe and Kulli - where transitional necklaces of this earliest period were found (*Ill.9- 9* and *Ill.9- 11*).

One key zone at the heart of all this interchange, running on from Badakhshan and known for its copper mines and rich seams of semi-precious stones and marbles, lies at the borders between Helmand, Afghan Seistan and Baluchistan in the Gardan Region of the Chagai mountains. Dales²⁰ quotes A H Savage-Landor's 1902 description of the southern edge of the Seistan depression on the Afghan-Pakistan border where he noted 'the most beautifully coloured stones... such as red and brown jasper and agatescent quartz, chalcedony, white and brown limestone', as well as entire mountains of

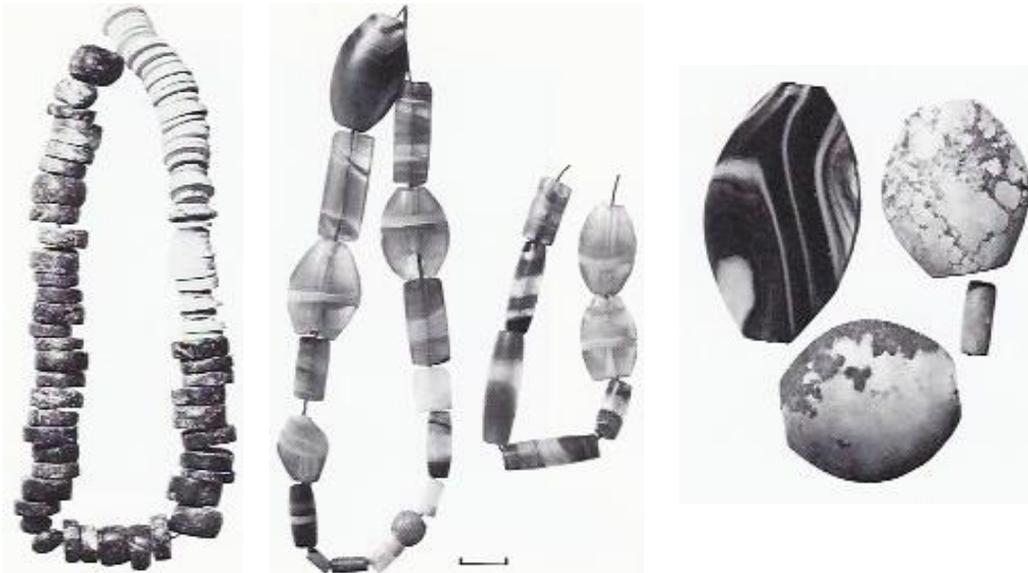
¹⁹ C Michel 'Les Joyaux des Rois de Mari' in A Caubet (ed.) *CPP* 403-432

²⁰ G F Dales 'Hissar IIIC Stone Objects in Afghan Sistan' in *Mountains and Lowlands (Bibl.Mes.7)* Malibu 1977 17-15

‘beautiful white and yellow marble’. Perhaps we can link this area to the kinds of stone seen on the string of beads from the DK area of Mohenjodaro (above left) with its three pendants of banded agate and jasper fixed with gold wire (recently shown at the *Metropolitan Art of First Cities* exhibition²¹). The entry for it states it is made of hollow beads of gold interspersed with banded agate, vesuvianite (greenish grossular garnet), mottled and orbicular jasper (reddish) or fired steatite pieces. Note the three central prize beads - an Asian arrangement recurring on most necklaces we show in this DIVERSION. We have set it against a necklace from Mari (centre illustration above) using stones that could all have come from the Seistan depression.

‘TRANSITIONAL’ NECKLACES

At this period necklaces or short strings of choice semi-translucent beads made of these more beautiful semi-precious stones start to appear in the archaeological record amongst prestige or cultic goods at scores of graves or temples on this circle of interconnected sites. Out of these we pick out Altyntepe, Tepe Hissar, Mari and Uruk for case studies bearing witness to the transition from former commonly used materials like shell, lapis lazuli or calcite (c.f. *III.9- 13*) to the beginnings of the take-up of the



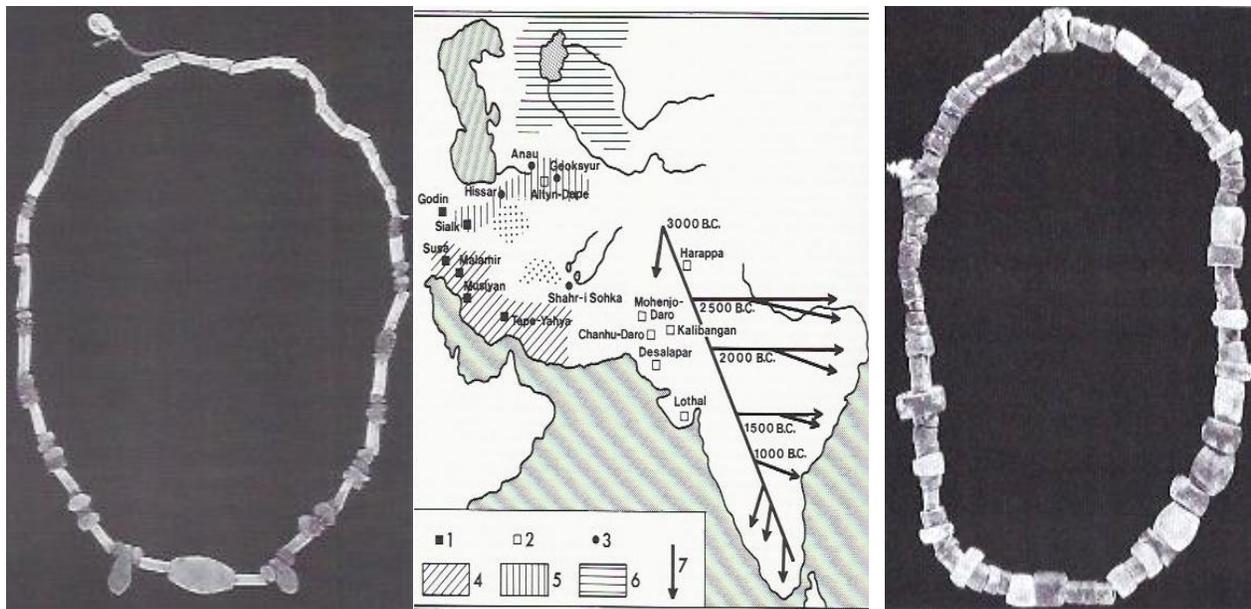
III.9- 9: (Left and centre) Two necklaces from a priest's tomb at Altyntepe, one of calcite and steatite discs, the second of agates and chalcedonies; (right) three large beads from burial 362, top left an agate and the other two elephant ivory -Masson²² pl.XX

chalcedony-based repertoire of India and Afghanistan's mineral heartland. With the simultaneous use of plain limestone discs and striped agates, for Altyntepe the items illustrated on just one plate of Masson's book (above) sum up the story. Similar short strings of choice semi-precious beads (not yet long enough to wear) were also found at sites like Mehrgarh and Sibri, becoming richer and longer at westward sites such as Hissar III (up to then the jewellery record here had consisted of plentiful copper pieces in the form of anklets, bracelets, rings or earrings - all of copper wire). It is this early gradual assembling of single, valued chalcedony beads that links these sites to each other, and from their

²¹ Aruz *ibid.*: (the necklace used to be twice as long but at the Partition of Pakistan and India, was divided into one half for each side!).

²² V M Masson *Altyr-Depe* Leningrad 1981

association with other artefacts held in common - such as metal compartmented seals; copper mirrors; violin-torsoed female figurines; silver trumpets; 'staffs of office' and marble colonettes - clearly people at such places were participants in a chain of shared culture and exchange running down from Margiana/the BMAC, in one direction reaching the Indus Valley, in the other moving south-west through Luristan and down to Susa (see map below) - thence into Mesopotamia to Levantine sites such as Mari, Ur and Uruk, most with a 'transitional necklace' phase as noted in the necklaces from Altyntepe above, in turn preceded by the earliest characteristic Protohistoric mix of limestone, shell and lapis lazuli beads as seen at Tell Brak (above) or pre-Hissar III levels (below). Their use of the kinds of chalcedonies (including agates) that we also find worked to much higher levels of polish in either BMAC or Mycenaean prestige graves (described in the final sections of this DIVERSION) means the positioning of Altyntepe and Tepe Hissar S-E of the Caspian Sea - bestraddling the Eurasian and Central Asian steppe



Ill.9- 10: (Centre) The circle of key Turanian sites in relation to Indus sites and their spread in India 4-3M - Masson *ibid.* fig. 32 (hatched areas mark out phases of the spread of farming); (left and right) Mari 'pre-transitional necklaces' of shell, limestone and lapis - Louvre AO18311' and of limestone and rock crystal - AO18380 respectively²³.

corridors - helps us imagine the kinds of staging post through which such materials could have gradually been relayed westwards from the BMAC source area to places like Mari or Ebla, weaving in with already-existing ancient metal and lapis lazuli trade routes, some eventually even to reach Dendra (Ill.9- 16) - or Kakovatos.

Tepe Hissar in the South Caspian zone had always been a highly active metal-working centre from earliest beginnings, and looking at transitional examples of necklaces from the site that start to incorporate the chalcedonies that appear from Level IIIC, just as at Altyntepe many show the same mixture of white calcite stones (sometimes even marble or alabaster) and lapis lazuli interspersed with

²³ C Michel *ibid.* fig 3 and fig. 7 – both also found in the Temple of Ishtar at Mari

the more recently prized translucent stones now coming in from Margiana and Seistan. So for instance, in Schmidt's excavation report²⁴ the necklace below left (unfortunately not in colour) is described as



Ill.9- 11: Hissar necklaces (left) H3594 that includes small lapis lazuli beads and larger chalcedonies (probably in fact agates); and (right) H2158 mostly made up of alternating rock crystal, lapis lazuli, carnelian and limestone beads - Schmidt figs 139/137

consisting of a large white marble centrepiece; oval beads of brown or milky blue chalcedony (as they look striped they are probably agates); lapis lazuli rectangles, tubes and oblongs (c.f. *Ill.9- 13*); alabaster rectangles, tubes and oblongs; one bluish frit bead and some white and grey limestone discs. This is the kind of necklace still traditionally worn by Yezidi women today (whose eclectic traditions link to both Central Asia and India) - see the picture of one such girl later in this newsletter.

The necklace below right, on the other hand, consists of alternating beads of rock crystal, lapis lazuli, carnelian and limestone, with a centerpiece consisting of a half-black, half-white pebble and two faintly striped agates either side - not so different from the arrangement and choice of stones on the Griffin Warrior's necklace (*Ill.9- 17*) showing the same preference for a tripartite centerpiece as presumed on the Vapheio warrior's rock crystal and amethyst necklace (the absence of amethyst in any of the necklaces shown in this section reinforces the probability that those of the Vapheio warrior came from Europe or Egypt - though there *are* rare sources for that stone in Indian Asia too). On most of these kinds of necklace from Hissar, no metals are included (not even copper), apart from one elaborate parure found on 'Treasure Hill', illustrated below left, which makes a feature of triple threader beads (some still of calcite) and strands of symmetrically arranged chains of small carnelian beads interspersed with 'eye' agates and gold tubes - which we mention here more because of the obvious connection with the multiple thread beading and chains of small carnelian beads in the Enkomi tomb bracelet (shown in the full Catalogue) from a tomb with strong Mitanni credentials due to the two

²⁴ E F Schmidt *Excavations at Tepe Hissar Damghan* Philadelphia 1937

Mitanni seals found in it (see also the similarities in the carnelian and amethyst Aegina necklace (shown in the full Catalogue).



Ill.9- 12: (Left) Parure from Hoard I on Hissar's Treasure Hill - Schmidt pl.XXXV; (right) necklace assembled from beads in Aššur Tomb 45²⁵ (Middle Assyrian) with beads of carnelian, lapis, smoky quartz, onyx and agate 'eye' beads - BBCat-126

To clinch our overview of 'pre-transitional/transitional necklace' samples, below is a necklace²⁶ of gypsum, shell and lapis lazuli discs and tubes strung together recently from some of the *thousands* of



Ill.9- 13: (Left) Modern stringing of some lapis lazuli, gypsum and shell beads from the Uruk Sammelfund

²⁵ R-B Wartke 'Les objets de parure de la tombe no.45 à Assour' in *CPP* 317-340 fig.11

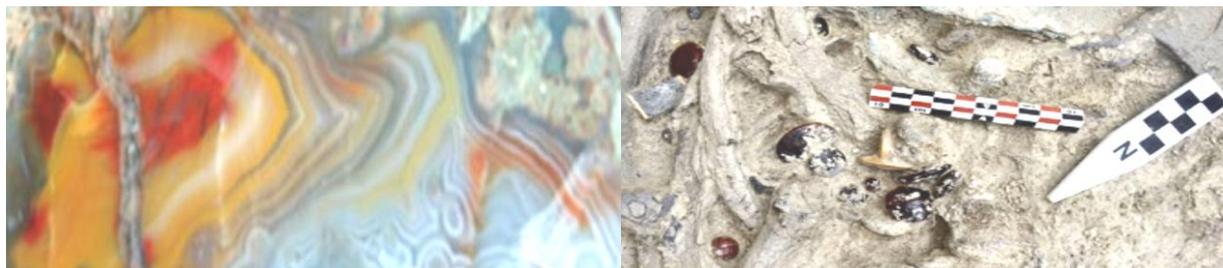
²⁶ Exhibited in the Metropolitan Museum of Art exhibition, *Art of the First Cities* New York 2003 curated by Joan Aruz et al. [AFC]

*c.3300-2900 - AFC-3; (right) transitional necklaces from tombs in the Mochlos Pre-Palatial cemetery²⁷
c.2000 that mix beads of limestone, rock crystal, gold, steatite, chalcedonies, amethyst, carnelian and
faience (including one patterned cylinder seal) - take into account the Mochlos dog lid and seal found
together in Tomb 1 (Error! Reference source not found. and Error! Reference source not found.)*

beads found in the Uruk Sammelfund catalogued by Limper²⁸, dating to the original 4-3M trade between Sumer and Aratta (probably alluded to in the myth of *Enmerkar and the Lord of Aratta*²⁹ as discussed in *Catalogue A*). These are unquestionably *pre*-transitional bead combinations, since chalcedony-based stones were not to reach Uruk until a few centuries later, when several 'transitional necklaces' turn up at Uruk too (Limper *ibid.* pl.15), close in appearance and roughly contemporary with those from Altyntepe and Hissar. Necklaces incorporating chalcedonic stones then appear at Uruk all through the ED and Ur III periods - setting a fashion that reached its height in the Ur III and Old Babylonian period when such stones reached the Aegean (see the Mochlos necklaces above right), and continued to be made into such necklaces in Neo-Babylonian times. Just over the border from Elam, Uruk's temple administration at this time consumed semi-precious stones on a grand scale, justifying Limper's *AUWE 2* report devoted solely to the beads, necklaces and pendants found there, none surpassing the mid-2M priestess necklaces (*Ill.9- 18, Ill.9- 20, Ill.9- 21*) made during a Golden Age in Uruk when easy access to choice coloured stones from Central Asia became as strong as the desire for lapis lazuli.

AGATES AND CARNELIAN: THE ALTERNATIVE SOURCES

As with our enquiry into metal sourcing, there are counter-arguments for where the Mycenaeans could have obtained their agates and carnelian. Geologically, agates are related to carnelian and the other glassy, silicon-based stones (chemical formula SiO₂) such as chert, obsidian, quartzes like onyx - and all the chalcedonies. On a useful website on agates set up by a Cambridge researcher³⁰ we are told: 'Quartz is a major component of the earth's crust ... around 12% by some estimates. Low quartz



Ill.9- 14: (Left) Section of banded agate still unworked - colour changes are dependent upon different mineral traces; ; (right) close-up of some of the seals in situ - including four gold seal-rings - during excavation of the Griffin Warrior's shaft grave

reveals itself in many forms and the collector will be well aware of rock crystal (colourless), amethyst (purple) and smoky quartz (brown). Though the colours may be different, they are all characterized by the same crystal structure Agate and flint seem far removed from rock crystal; indeed fractured agate and flint appear to be more like amorphous glass. Nevertheless, agate, flint, chert and

²⁷ C Davaras 'Early Minoan Jewellery from Mochlos' *BSA LXX* 1975 101-14

²⁸ K Limper *Uruk: Perlen-Ketten-Anhänger (Ausgrabungen in Uruk-Warka Endberichte II* Mainz 1988 (see Pls 4-13 for the Sammelfund beads)

²⁹ S Cohen *Enmerkar and the Lord of Aratta* (University of Pennsylvania PhD) 1973 Ann Arbor microfilms authorised xerographed library copy

³⁰ Further information and detail can be obtained from <http://www.agateworld.co.uk/>

chalcedony are all forms of microcrystalline quartz ... that can often only be classified under a polarizing microscope'. A modern book on agates by Brzys³¹ points out that the preponderance of dramatic and unusual agates are to be found in the Americas, Australia and Central Asia - confirmed with further detail of lesser sites by the official London Museum of Natural History guide on agates (see their general map below ³². Prettily patterned agates are commonly found alongside the rare Saxony silver and tin ores of North Germany or Britain (especially Scotland), but are not outstandingly abundant elsewhere in Europe.



Ill.9- 15: World distribution of agate sources - Natural History Museum handbook 2006, ed. R Pabian et al.

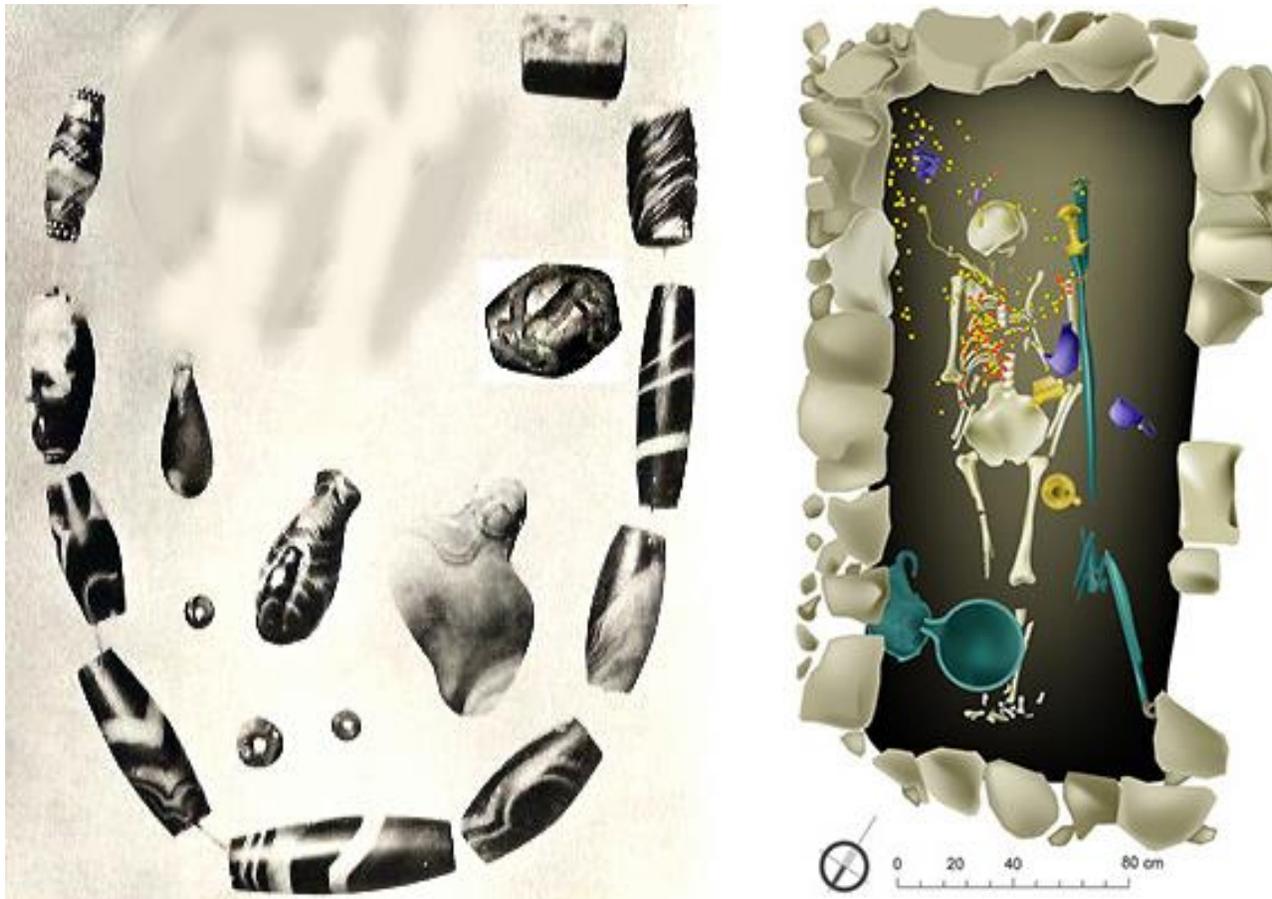
The Mycenaean mostly used the standard orange or red agates which could suggest European sources but brown agates are abundant in the Indus area too, demonstrated shortly. They also frequently used carnelian - which apart from a little in Europe (or some from Egypt) could only have come from India, where it is often mixed in with agates (technically it could be termed a 'non-banded agate'). So again Eurasia or Asia are *both* possibilities, with blue agates only come from the Margiana-Bactria territory.

Mycenaean sourcing of agate is as important an issue as their procurement of tin, amber and glass - the European trade routes for all three of which would, as in Asia, have overlapped. Though they mainly used agates for seals - as, for instance, all three seals under *ForAtt-26f* and several in the Vapheio hoard, from the latter's burial (and spectacularly evident in the Griffin Warrior's shaft grave) we realise they often prized them as beads. There were enough agate beads in the main tholos tomb at Dendra (below) to make a necklace. (Ignoring the single pieces shown inside the necklace arc in the photograph, note the Central Asian-style cabochon setting of the ovoid-cylindrical bead top left, which exactly ties in with prototypes such as those in *Ill.9- 18*).

³¹ Karen A Brzys *Agates Inside Out* Grand Marais Michigan 2010

³² R Pabian et al. *Agates: Treasures of the Earth* London 2006

In theory agates from Germany and Britain could even have been traded via Greece/Italy towards the Levant/Central Asia - but that surely would have been carrying coals to Newcastle. We are thus left with the suspended question of where the Mycenaean obtained their agates, since - just as with the



Ill.9- 16: (Top left) Agate beads possibly intended for a necklace from Dendra royal tomb I- Persson³³ pl.XXVb (most other necklaces in the tomb were wholly made of small gold pieces in the Troy idiom (next illustration, right); (top right) the Griffin Warrior burial showing the cascade of over 1000 semi-precious stone or gold beads and the 50 seals scattered over his breast and top right shoulder, his weapons to the left and gold cups on his stomach -digital reconstruction by Denitsa Nenova

metal routes- given their massive profusion at certain sites in the east (those of Gujurat are studied shortly) there is just as strong a probability they came from Asia via the Indus route into the Levant and onwards. So far we know the Griffin Warrior's profusion of beads and seals (*Ill.9- 14/Ill.9- 16*) consisted of agate, carnelian, amethyst, amber, gold and jasper. When at the end of the catalogue we take an overview of the 4-2M Central Asian diaspora of Indo-Europeans and Indo-Iranians, the bigger picture for how such routes would have arisen socially will become more obvious - but can say straight away that Mycenaean participation in them, if only on the fringes, seems to have been culturally and geographically inevitable - dating back to well before the mid-2M.

The picture of the Dendra beads above with the loose hexagonal amygdaloid (described by Persson as showing a bull with head turned back) shows the Mycenaean using agates interchangeably as seals or

³³ A Persson *The Royal Tombs at Dendra near Midea* Lund 1931

beads (in contrast the Griffin Warrior's actual necklace (below left) uses three opaque striped agates reminiscent of Hissar necklace *Ill.9- 11* right). In the case of the Vapheio warrior, whatever the original use of the seals may have been, the twelve seals on either wrist were turned into bracelets for his burial and there was a profusion of similar types of seal thrown in with the Griffin Warrior too.



Ill.9- 17: The Griffin Warrior's necklace with centrepiece of three spherical banded agates shows the Mycenaean transition from gold-based necklaces (like those of Troy³⁴, top right) to the inclusion of simple hard stones as in the transitional necklaces of Eurasia (Ill.9- 11). The inverted volutes at the fastening ends are seen also on a spoon from Dendra

We also know from the newly discovered large chunks of raw agate and worked pieces from Thebes (*Ill.9- 24*) that larger pieces of agate were used as decorative inlays in the same way as ivory - rather than taking the option of slicing a particularly finely figured agate into flat, irregular beads held in place with cabochon settings as was done to create the centre-piece of the priestess Tiamatbashti's necklace from Uruk (*Ill. 9-128*).



*Ill.9- 18: (Top) Large agates in gold cabochon settings intended as centrepieces, from Gonur tombs - Ligabue *ibid.* ills 67/8 and Sarianidi³⁵ fig. 108. Compare with (centre row) the dedicatory bead to Priestess Tiamatbashti (top left bead in Ill.9- 16) - Finkbeiner *abb.*35.3; and (below) the large unset agate in Pu'abi's belt of lapis lazuli chunks, Ur c.2400, - B.M. (photo author)*

OUTSTANDING BMAC AGATES: SOME CASE HISTORIES

³⁴ K Goldmann et al. *Das Gold des Priamos* Leipzig 1995

³⁵ V I Sarianidi *Gonurdepe: Salaryn we Hudaylaryn Saheri* Ashkabad 2005 (in Turkish, Russian and English)

When we consider one or two large, prize Oxus Civilisation agates, seen in the top row of *Ill.9- 18* (see also *Ill.9- 31* and following shortly), these are unlikely to have been gifts from further west but to have been top quality finds from the area surrounding the Margiana region (archaeologists dealing with the copious amounts of semi-precious stones remaining in the Gonur necropolis even after looting, emphasise there is little sign of any material being imported - other than carnelian from India - i.e. that most materials in the tombs would all have been locally obtained and worked on the spot). These beautiful large bulbous agate beads found in the Gonur tombs are of a quality, size and colour never seen in the West - the favourite setting being gold cabochons at either end to make the piece



Ill.9- 19: (Top) Central 3 beads of the necklace of Tiamatbashti of Uruk -; (lower left) Uruk surface finds of chunks of raw carnelian and chrysoprase; (bottom right) fuller selection of exotic stones found there -van Ess ibid. abb. 52.4/52.2.

threadable onto a necklace as centrepiece or single pendant. It appears it was usually the males who made them the centrepiece of a plain necklace (the two examples from tombs at Gonur -*Ill.9- 18* and *Ill.9- 31* - seem more or less to be counterparts to the Vapheio or Griffin warriors' necklaces), though pairs made into female earrings also occur.

Thus the floruit of trading in exotic stones between Uruk, 'Aratta', Magan and Meluhha was built up on the foundations of 4-3M beginnings (c.f. *Ill.9- 10*), highlighted in the recent Berlin exhibition on Uruk³⁶ which displayed some of the pieces of raw semi-precious stone³⁷ visibly found scattered all over the site and picked up as surface finds along with the microlith borers used to work them³⁸. Larger chunks of agate were often carved into duck-shaped weights³⁹ (note in contrast the small agate duck from Dendra in *Ill.9- 16* (several like it were found in the royal palace at Ugarit⁴⁰ too).

It was at Uruk from this time that two priestess necklaces were found under the threshold of a doorway to a dwelling just outside the NW corner of Uruk's Eanna Ziggurat (probably the Gigparu quarter). A

³⁶ Staatliche Museen zu Berlin *Uruk 5000 Jahre Megacity* Berlin 2013 [*Uruk5000Megacity*]

³⁷ M van Ess & M Hilgert 'Rohstoff Stein' in *Uruk5000Megacity* 298-9

³⁸ R-B Wartke 'Steinbearbeitung von Perlen und Siegeln' in *Uruk5000Megacity* 166-7

³⁹ See *Uruk5000Megacity* abb.47.1 & 47.5

⁴⁰ V Matoian op.cit pl.vii,4

rare colour photo of the most spectacular one of the two - a masterpiece by a craftsman of supreme skill - is shown below. It is a magnificent work⁴¹ made of spaced out agate cabochons with two of the



Ill.9- 20: The full ceremonial agate, gold and carnelian necklace of Tiamatbashti of Uruk (1.7m long) found

⁴¹ The original photographs of the necklaces are given in Limper *ibid.* abb.23 -5 (first published by its discoverer H Lenzen in *UVB VIII* 1937 22ff).

under a step in the priestess quarters - Iraq Museum IM26833- M V Seton-Williams⁴² Ill.83 (Note the 13th, inscribed bead, top right.)

three centre beads consisting of thick, dramatically patterned agate slices held in place by gold frames as well as cabochons. All the gold settings are further embellished with gold filigree wire and circular cloisons that *may* have contained enamel⁴³ (now long since gone). Standing apart, - on the 13th agate, also a cabochon using exactly the same convention as the Bactrian agates in *Ill.9- 18126*) - is a dedication to the necklace's owner, Priestess Tiamatbashti⁴⁴ (in earlier publications transliterated as *Abbashti*). The use of cabochons must date this cultic necklace to roughly the same period as the Bactrian ones - to the early 2M - certainly the cuneiform dedication is by Ur III King Shu-Sin and reads *Tiamatbashti, beloved Naditu⁴⁵ Priestess of Shu-Sin of the Kings of Ur* - possibly even a memento of a Sacred Marriage rite enacted between them. Because the dimensions of the necklace are so large (the centre bead alone is reported as being 9cm/3" high by 10cm/4" wide), Orthmann at the end of her entry on it⁴⁶ repeats suggestions that it may in fact have been made for a cult statue (see one fragmentary example below left), or even worn by the King himself given there are so many precedents (as in the Royal Tombs of Ur) for men wearing necklaces as opulent as those of the females.



Ill.9- 21: Remains of a cult statue with necklace of calcite, carnelian, turquoise and copper beads from Tello, Louvre AO298 - cited by Moorey⁴⁷ - fig.2; (right) reconstruction of Kubatum's necklace in the Uruk Gigparu which includes beads of turquoise

The name *Tiamatbashti* is now the definitive translation for the priestess owner of the Uruk agate necklace, given the myth of Marduk was promoted under the Kassites to justify Marduk's special identity as the Tiamat monster-slayer, and knowing their direct links to Central Asia means they were in the optimum position to obtain such high-quality stones as part of their drive to promote the millennia-long worship of Inanna at Uruk, if it were not for the Shu-Sin inscription we would place the

⁴² M V Seton-Williams *Les Trésors de Babylone* Paris 1981 ill.83 (the beads in a slightly different arrangement)

⁴³ K R Maxwell-Hyslop *Western Asiatic Jewellery c.3000-612 BC* London 1971 p.65 suggests this was the case

⁴⁴ As given in U Finkbeiner 'Die Stadt Uruk im Wandel der Geschichte' in *Uruk5000Megacity 215-223*

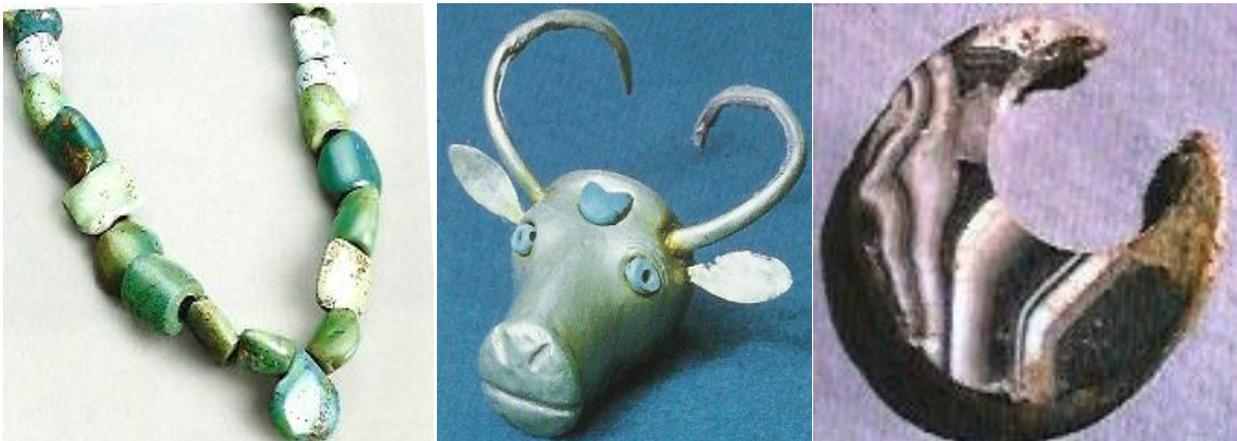
⁴⁵ The role of the Naditu Priestess was to make manifest the presence of the Goddess

⁴⁶ W Orthmann *Propyläenkunstgeschichte XVIII*; see the entry for ill.123b

⁴⁷ P R S Moorey 'Blue Stones in the Ancient Near East:: Turquoise and Lapis-lazuli' in Caubet (ed.) *CPP* 175-188

necklace more to 1500-1400 (certainly not to 1200 as Maxwell-Hyslop does - even if it is a necklace re-using beads from earlier in the millennium).

By this period Uruk was not so much the trade capital of Sumer as its venerable ecclesiastical holy city - sponsored by the kings of Ur and other cities around, including the Kassites of Babylon in the mid-2M (who even added a new temple). The second, less spectacular, necklace found with that of Tiamatbashti (above right) is 1.3m long and has the same inscription on one of its beads - this time with a dedication to Priestess Kubatum (Limper *ibid.* abb.22). It was probably wound round the neck twice, which is how it is shown in the excavation photograph used above right. Allocated to the Berlin Vorderasiatisches Museum, it was 'misplaced' after the WWII bombing of the museum, so unfortunately it has not been possible to rephotograph it (either more clearly, or in colour). What particularly associates it with Turanian and SW Central Asian sources in particular is the unusual inclusion of turquoise beads interspersed amongst the mainly small carnelian and gold ones that form most of it (and one eye agate) - This is a rule-of-thumb difference between the Eurasian and Indus routes: that turquoise mostly made its way by the former network, and even in the millennium before, turquoise



Ill.9- 22: (Left) Turquoise beads from Maikop⁴⁸; (centre) Altyntepe silver-gilt bull-head with turquoise eyes and forehead blazon⁴⁹; compare (right) with an agate crescent found in the royal palace at Ugarit - Matoian op.cit. pl.xvii,3

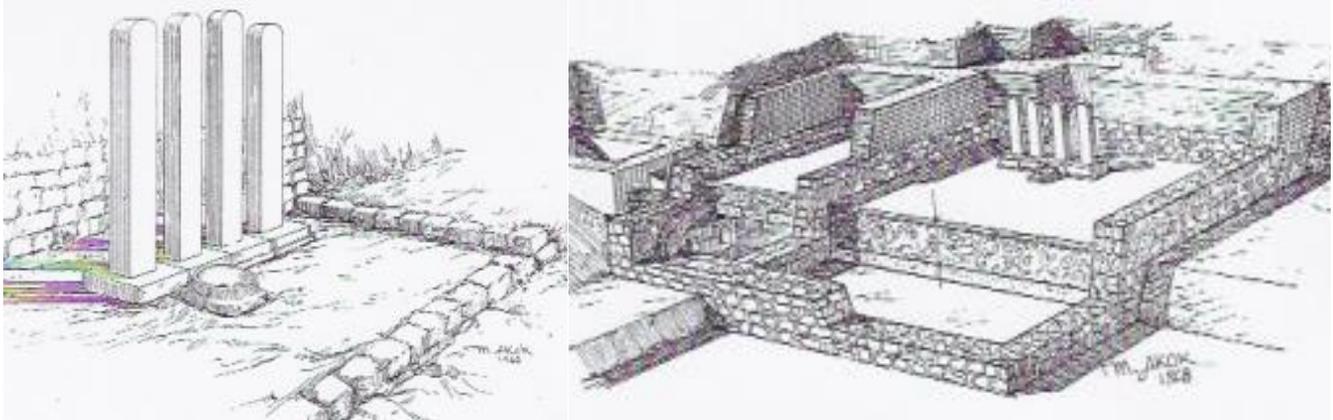
seemed nearly always to follow that more direct westerly route into Eurasia - as shown by the turquoise beads from Maikop above left, even though some made its way southwards into Turan. Pieces of turquoise are found amongst the Hissar beads, and Altyntepe's use of the stone is spectacularly seen in its gold and silver bull-head above. In the case of the Uruk necklace, however, we cannot entirely rule out turquoise sourcing from Egypt's Sinai Peninsula.

Compared to the broken stumps of the Troy stelai of- *Error! Reference source not found.* in the full Catalogue, while we are considering Altintepe, partly as a prelude to the Mycenaean and Gonur élite tombs we will see shortly, at this site midway between Greece and Bactria, it is instructive to look at

⁴⁸ Also exhibited at the Metropolitan *Art of the First Cities* exhibition New York (*AFC-196b*) - found in the main kurgan as part of the warrior's elaborate beard cape of gold, silver, carnelian and turquoise beads - - see also under *Ratt-10* entry and our discussion elsewhere in this catalogue of this pioneer 3M opulence.

⁴⁹ Masson *ibid.* frontispiece

the four still upright baetyls in the open-air sanctuary of the Altintepe citadel illustrated below, considered by T Özgüç in *Altintepe II* to be associated with the cult of the dead⁵⁰ in relation to a tomb complex at one side containing individual lords' tombs built like small houses (as at Gonur, *Error! Reference source not found.*). The tombs contained both males and females - but only one of the three tombs so far excavated was untouched by looters (if each baetyl represents a lord and his retinue commemorated, there is possibly one more yet to be



Ill.9- 23: The four masseboth of Altintepe each one possibly a memorial to a person in a tomb - Özgüç⁵¹ figs 29/32

discovered). Though later than most of the 2M tombs we are comparing, its occupants were buried with the familiar nomadic mixture of gold, silver, bronze and iron items (some of it weaponry, including an entire chariot and horse tackle); necklaces, and the remains of furniture with lavish ivory fittings (see the upcoming DIVERSION on Ivory). The 'transitional' Altintepe necklaces shown earlier, however (*Ill.9-9*), had been found earlier by Masson in a priest's tomb - reminding us that jewellery was associated not only with warriors and queens - but also with priests and priestesses, as in the case of the necklaces of Tiamatbashti and Kubatum.

PROBABLE SOURCING OF AGATES BY THE MYCENAEANS VIA THE INDUS CONNECTION

Interestingly, in the treasury of the Cadmeion at Thebes, apart from the lapis lazuli beads of the main Thebes Hoard (*Catalogue D III. 8-40*) there were also large chunks of raw agate, and four carved banded agate seals of Mycenaean manufacture (two of them shown in colour below⁵² appear to have made use of one such chunk from the Thebes supply).

⁵⁰ Vincenzo La Rosa in his 'Minoan Baetyls: Between Funerary Rituals and Epiphanies' *Aegaeum 8* 2001 discusses the baetyls of Haghia Triada in this light.

⁵¹ T Özgüç *Altintepe II: Tombs, Storehouse and Ivories* Ankara 1969

⁵² Discussed under SEAL GROUP STUDY 4 (*Catalogue D III.8.29*)



Ill.9- 24: (Left) Local flint core used for Neolithic blades from Thebes (though not agate, note the colour); (centre) examples of banded agate seals from the Thebes hoard; (right) banded agate inlays carved in the shape of a lioness' head and part of a wing. Note the dark centre of the agate is judiciously placed as part of the design in all four items⁵³

We just do not know if it was obtained from local Greek sources (which we know of now, but may not have been used at the time)⁵⁴, or whether it is more likely to have come the same way as other rare stones and metals, either from NW Europe⁵⁵ - or Central Asia/India. In other words our task is to assess whether the more modestly coloured Mycenaean agates (none of them are blue) came along with carnelian from the Indus - which also had (and still has) huge sources of less spectacular , mostly brown-red agates - or did they arrive from sites in Europe? Given the chunks of agate at Thebes were found cheek by jowl with lapis lazuli, it is at first tempting to look eastward for the supplier of both (but since in the case of the Thebes lapis lazuli we know it was passed on from Babylon temple surplus it looks more likely the Mycenaean were separately at the end of the Indus-Elam route for their agate and carnelian via the Syrian cities). According to Allchin (*op.cit*) the evidence indicates that in the 3-2M, the Chanhudaro and Lothal areas of the Indus, as well as other sites in Gujarat to a lesser extent (see map below) enjoyed a *floruit* in providing agate, onyx, jasper or rock crystal-supplies (raw or as finished beads) to the West. Initially the trade served EDIII Sumer - there is, for instance,

⁵³ V Aravantinos *The Archaeological Museum of Thebes – Latsis Foundation* e-Book 2010 pp.32 and 80

⁵⁴ Greece is now known to have small outcrops of rather inspid, mainly orange-coloured agates – but did the Mycenaean know about them – or use them?

⁵⁵ Dayton does mention small amounts of carnelian in NW Europe too.



Ill.9- 25: (Left) Pyx from the Ugarit royal palace - Matoian op.cit pl.xviii,2; (right) Basic map of Indus sites 2700-1750 - internet

a surprising number of agate beads in the the Kish strings below left (not as well-known as the Ur jewellery - see also Queen Puabi's pendant in *Ill.9- 18* or the bracelets/necklaces from Ur (below centre) using carnelian).



Ill.9- 26:(Left) Long and short barrel- beads of agate from a Kish burial identified by Mackay as Harappan - Allchin. pl.53; (centre) bracelet based on five long carnelian beads interstrung with small gold and lapis beads from Tomb 1054 belonging to King Meskalamdug of Ur; (right) carnelian necklace from Tomb 55 at Ur with etched beads at centre and nape, proving without question their Indus origin - British Museum (photos author)

AGATE AND CARNELIAN BEAD MANUFACTURE: PREHISTORIC ORIGINS IN GUJARAT AND THE DECCAN

Allchin⁵⁶ writes, ‘From the excavation of the Chanhudaro bead factories, almost the whole sequence of the processes of manufacture has been reconstructed’ - indeed, such primitive processes continue today in workshops in more or less the same area’. I will rely on Allchin’s informative paper to consider the question of Indus agates more deeply since it well summarises research on South Asian stones and bead-making within the wider Indus region - most recently known to have been continuous from studies made during the British Raj onwards - with the overall picture pointing to an agate bead trade going back to Palaeolithic times (see *Error! Reference source not found.* right). After a preamble



Ill.9- 27: (Left) Location of Limodra: Ratnapura in Gujurāt is three miles away near the banks of the Narmada river; (right) Cambay agate bead worker still using horn hammer and bow drill - photographed by Allchin (ibid. fig.34)

explaining the Indus tradition, we will make general comparisons between a handful of Central Asian, Mesopotamian and Mycenaean élite burials where agates and related semi-precious stones feature in abundance, material indicators of what Caubet (ibid. fn. **Error! Bookmark not defined.**) calls the ‘*partage d’idéologie guerrière entre des communautés éloignées*’.

All over the world in the Mesolithic period, humans reached the stage of chipping small blades off a central stone core for the manufacture of tools. If thicker chips were split off, they could be more finely flaked into shape, polished with sandstone and finally drilled with tiny stone awls with the help of water and sand to make beads more lasting than the old kinds made of bone, shell or seed. In India the favoured material for boring holes in such beads was at first carnelian, then andesite (succeeded today by metal drills) - and the variety of stones to hand to make into beads happened to be the agates and chalcedonies that are the subject of this DIVERSION. Already c. 2500 BC the long barrel-shaped carnelian beads (as also the etched carnelian beads as shown above right) found on the necklaces and bracelets of the Royal Tombs of Ur could only have been obtained from the Indus region due to the local technical knowhow of etching, polishing and drilling (from both ends) built up by craftsmen to perfection - slow techniques requiring endless patience and skill. The paler carnelians would usually be roasted to make them redder.

⁵⁶ Allchin acknowledges his reliance on the pioneering paper by E Mackay, ‘Bead Making in Ancient Sind’ *JAOS LVII*, 1 Mar 1937 1-15



III.9- 28: Overall view of key sites on the corridors between the Mediterranean, Turan, Bactria and Indus - Francfort⁵⁷p.105

In the 1960s Allchin visited areas in the same region of Gujurāt that was formerly the heartland of the bead industry in Harappan times. He concentrated on the Ratnapura mining community in Gujurāt a few miles from Limodra (see map above (not to be confused with Ratnapura in Sri Lanka)) situated on the edge of some low hills dividing the Narmadā and Tapti river valleys. Since *Ratnapura* is a Sanskr̥t word meaning ‘full of gems’ Allchin saw these mines as going back at least to an Indo-European, Vedic past, noting that ‘in places the hills appear to consist almost entirely of agate nodules ranging from 8-10cm or even 15cm in length down to small pebbles the size of a large pea...’. Today Ratnapura’s miners still glean these agate nodules from the rocks, sometimes digging down as deep as 9m to reach the bigger pieces in underground galleries much like the layout of the Grimes Graves flint mines in East Anglia, sending them in loads to Cambay, centre of the bead-working industry now, and still based on buffalo horn hammers on bendy canes - and bow drills’. It is best here simply to quote the geological information he presents on his p.92:

Agate and carnelian are found in the hills of Central India; in the south chiefly along the eastern side of the peninsular plateau; and in the west in Gujurāt and Kathiawar. Both stones are subvarieties of chalcedony (SiO₂). Agates ... occur in cavities or vesicles in certain types of Deccan Trap volcanic lavas, found widely throughout the northern Deccan and Western and Central India. Carnelian is like agate but ranges from pale yellowish brown to pink and deep red.... As the Trap rock weathers and disintegrates the nodules of chalcedony, which are much harder than the matrix in which they were formed, are released. Today they are harvested by

⁵⁷ H-P Francfort *et al.* ‘Marhaši et al Civilisation de l’Oxus’ *Iranica Antiqua* XLV 2010 51-223

beadmakers' agents from the gravels of many of the great rivers of India which flow through Trap country, and also dug out or mined from conglomerates in which they have become incorporated, and from the decaying Trap itself.

I gave in *Ill.9- 27* the location point of Limodra to remind ourselves that Arabia and East Africa skirt



Ill.9- 29: (Left) A necklace of carnelian poppy heads (unroasted) made up from beads in 2 tombs from Mari - Louvre AO19037/ AO19082; (right) drawing of a headpiece in Aššur Tomb 45 by W Andrae itemising its stones, quoted by Feldman⁵⁸ - note the cabochon-type beads with spiked pomegranate-type bottom ends

the Indian Ocean on its opposite side (*Ill.9- 28*), borne out by abundant evidence from early European travellers in modern times cited by Allchin who described the export of semi-precious stones in centuries AD as far as Aden and East Africa. This supports our theory that ‘the Zanzibar Triangle’ naturally operated in surges from at least the end of the 4M onwards through to modern times. Visits to the agate mines of Ratnapura evoked surprise that ‘a considerable proportion of the inhabitants of the mining village had African or Negroid features including closely coiled hair’, though today the actual mining is done by Bhil workmen from amongst the local Indian population. What is more, Allchin and his team noticed at Limodra ‘a large mound of iron slag obtained from haematite, from the same deposits as the agates’ - a strong clue, I believe, to the earliest discovery of iron within the same mineral areas as these quartz-based stones.

During the 2M agate routes clearly now extended well beyond Sumer, tying in sometimes with the tin and lapis lazuli network: overall the Indus region was one of the most reliable large-scale funnels for Middle Eastern (including the Gulf⁵⁹) - as also Western - acquisition of metals and semi-precious stones

⁵⁸ M Feldman ‘Assur Tomb 45 and the Birth of the Assyrian Empire’ *BASOR* 343 2006 21-43. Andrae interprets them as priestess necklaces: Feldman as prestige gifts (for the b/wphoto of the headpiece bottom right above (with beads slightly rearranged) see also Caubet & Yon fig.2)

⁵⁹ M-L Inizan ‘La Cornaline de l’Indus et la voie du Golfe au III^m’ in *CPP* 125-136

- including agates (if agates are found in a burial, even if there is no lapis lazuli or bronze, there is usually some presence also of carnelian). The Oxus-Indus complex of sites on and off provided a millennia-long groundswell of mined ores and finished items that penetrated ever westward to fulfill the demand of royal courts, not



Ill.9- 30: (Left) Comparisons made by Merrillees in his original paper between poppy heads and Cypriote base-ring jugs in the University College Egyptology Dept collection at London University (U.C. 13430 & 13440 respectively)- his pls XLIII/III; (right) Minoan clay goddess with upheld arms holding poppies

only for worldly adornment, but also the apparatus of funerary and religious ritual. Thus Caubet⁶⁰ remarks on a carnelian necklace of poppy-head beads found at Mari⁶¹ (above) which might appear to allude to their mind-altering power from amongst the range of sacred ingestions originating in Bactria/Margiana, still farmed there today. Similar poppy-head shaped beads, some grooved, are used on the headpiece from Aššur Tomb 45 shown above) from a slightly later period. (Merrillees (*ibid.* and in other papers reprinted in his honour⁶²) famously concluded that the small base-ring juglets found in Cyprus and other Bronze Age Levantine sites would have contained exported opium, since details in their shaping directly allude to poppy seed heads (see two illustrations from his original paper above left). Quite apart from possible use for ‘highs’, the drug had disinfectant and pain-soothing medicinal uses, and even though Israeli writers⁶³ now state ‘It seems that the one and only positive case as yet of a Base Ring juglet containing opium (from an unprovenanced origin, probably reused) is an exception that proves the rule - Base Ring juglets mainly carried non-narcotic substances’, certainly the likely ritual allusions of poppy-head or pomegranate beads in necklaces would suggest the celebration of divine journeys to the Underworld, and all that entailed in religious ritual. The existence of several Minoan clay ‘Persephone’ figures with upheld arms and poppies on their head (as above) supports this more obvious and profound line of interpretation - backed up by countless small pieces of jewellery in

⁶⁰ A Caubet ‘De l’Indus à l’Euphrate: Quelques Cas de Circulation des Biens et des Savoirs’ in V Lefèvre (ed.) *Orientalismes: De l’Archéologie au Musée* Paris 2012 148-160 fig.2

⁶¹ Described earlier in A Caubet and M Yon ‘Quelques perles de cornaline’ in A M Maier et al. (eds) *‘I will speak the riddles of ancient times’: Studies in Honor of Amihai Mazar* Winona Lake 2006 137-147 fig.1 (taken to be Middle Assyrian in date).

⁶² Robert S Merrillees: and other authors *On Opium, Pots, People and Places* Sävedalen 2003

⁶³ Z Chovanec et al. ‘Is there Opium Here? – Analysis of Cypriot Base Ring Juglets from Tel Beth-Shemesh, Israel’ *MAA XV,2 175-198*

the form of poppy heads from across the 2M archaeological record, our main preoccupation being to emphasise the Central Asian connection - and taking us back to agates.

CENTRAL ASIAN AGATE PENDANTS

We mentioned the *Forward Attack* ring under *ForAtt-26* may actually have been part of the tripartite centrepiece in a two-row necklace of 88 pieces of amethyst and rock crystal round the neck of the warrior (and we know Dayton thought these stones - along with amber - were likely to have come from Europe). The archaeologists of the Vapheio burial thought the two seals showing dogs (the last two of the animal studies in our SEAL STUDY above) might have been the centre beads, with the bronze *Forward Attack* ring possibly the spacer between them (though it really makes little difference if it was actually



Ill.9- 31: (Left) Position at the neck of a 30-35 year-old male in Grave 500 of the cabochon-set blue agate (detail below, shown restored under Ill.9- 18); (right) necklace of the craftsman in Gonur Grave 1200 - both from Ligabue & Rossi-Osmida⁶⁴

used as a ring). The threading practice seen in the necklaces of the Griffin *and* Vapheio warriors - as well as in the Uruk and Caspian Sea area necklaces before them - very much accords also with the Central Asian custom, certainly at Gonur, of élite males placing one, two or three large centrepiece agates at the centre of their burial necklaces, as seen both in the humbler artisan's tomb at Gonur (below right) and that of the man of authority (above left) found with staff of office, lead armband and limestone colonette (centre top *Ill.9- 41*). Jarrige (op.cit. 1985) saw 'les rapports entre l'Asie central méridionale, l'Iran oriental, le Baluchistan et la vallée de l'Indus ... [as being] particulièrement manifestes entre 3500 et 2500 av. J-C', built upon over at least another millennium until the mass invasions of the 'Sea Peoples' (mainly caused by the knock-on effect of various tribes pushing in to the Near East from the very regions just itemized by Jarrige) interrupted the patterns of stone and metal exchange for centuries, at the very time an emergent iron economy usurped tin and copper exchange.

The blue and white agates found north of India in the Bactrian region appear to be prize agates that were a local speciality related to the blue chalcedonies whose precise source we do not yet know - but

⁶⁴ G Rossi-Osmida (ed.) *Margiana Gonur-depe Necropolis* Venice 2002

it is unlikely they came from India. To highlight the ambiguity over the conflicting directions agates and related stones could have come from, immediately following this DIVERSION we will compare the trend in semi-precious grave goods in general as seen in élite graves both East and West. There are precedents in Bactria for a similar mix of stone beads and metal goods as those found in the Royal Tombs of Ur, as in the case of a king like Meskalamdug who was also accompanied by several cylinder seals, bracelets and necklaces in much the same vein as the Vapheio warrior later.

Before that, we should quickly look at glass, often a cheap substitute for the semi-precious stones the Mycenaeans prized - again a material linking the Mycenaean world to both NW Europe or the Near East.

GLASS

Glass is a silicate not much different in composition from the chalcedonies such as the jasper, sardonyx, onyx and striped agates of most of the Vapheio warrior's seal collection.



Ill.9- 32: Glass ingot and moulded glass bottle from 2M Tell Brak of the Mitanni period - Oates⁶⁵ frontispiece pictures

Where only the well-connected élite could obtain the amber and semi-precious materials found in their graves, for everyone else there was glass - and especially sought after was blue glass, often used as substitute chalcedony or lapis lazuli even by the privileged. We look at some basic information on how the Mycenaeans used it, since it gives further pointers to their international connections, again leading us to question why most think the Near East is the source, when stronger evidence points to Europe.

Validated by the descriptions of furniture listed in the Linear B texts of Pylos, at Mycenaean sites elsewhere blue glass seems to have been used extensively, possibly sometimes as a substitute for turquoise or lapis lazuli due to their scarcity, or even in place of rock crystal. As Burns (*ibid.*) puts it, 'a review of artifacts found in the Late Bronze Age Argolid identified only 38 objects of lapis lazuli, compared with more than 15,000 pieces of faience and glass...'. Glass beads said to be from Nuzi (the greenish shade of blue is the clue: see the illustration above) were found in many high-status Mycenaean graves, though in contrast to the warrior graves featuring in this catalogue the only substantial appearance of glass in *female* burials post-Shaft Grave era has been in Chamber Tomb 526

⁶⁵ David and Joan Oates *Excavations at Tell Brak I: The Mitanni and Old Babylonian periods* Cambridge and London 1997

in Mycenae's Kalkani area which contained a necklace gleaming 'with combinations of glass, faience and amber (including two scarabs with the cartouche of Amenophis III on them)'. Several other female burials boasted pendants, sometimes of semiprecious stones but often of glass using a star-shaped design said to be characteristic of Nuzi manufacture. Interpreting these as meaning all Mycenaean glass must have come from the farthest part of the Mitanni Empire initially looked like another weight on the side of the scales making the case for connections between the Mitanni and the Mycenaeans (after all we have a clear sign of intertrade from the remains of a Mycenaean stirrup jar found in the Mitanni level at Tell Brak, described by E B French in the same Tell Brak volume cited in the caption above, p.79). But Mitanni glass is a turquoise-blue glass left behind as the side product of *copper* smelting, and clearly the type of glass used for the ingot and vessel from Tell Brak illustrated above and, as mentioned under the Mycenaeans' *Procurement of Metals* DIVERSION earlier, Dayton 's work completely turns conventional thinking upside down on this matter. He had been led to his study of metals in Europe through their inherent association with intense blue glass in the same silver ore geology, finding that the raw materials for this deeper shade of royal blue glass occur only in West Central Europe, and that cobalt glass - as the side-product of *silver* smelting - was likely to have been exported thence to the Levant, often via Mycenaean trade networks, for them to make *manufactured* objects only, for resale back to the west. In particular he has much to say about the contents of the Uluburun shipwreck which had deep blue cobalt glass ingots on board (c.f. *III.9- 33*) that *must* have come from Europe since the silver-with-cobalt-ore that gives rise to such intensely blue glass as the side-product of silver-smelting is *only* found in the Unetice area of present-day Germany. He concludes:

The only area in Europe where cobalt glass could have been produced, certainly by accident, was in the 'silver-cobalt-nickel-arsenide' belt which runs north from Joachimsthal to Ehrenfriedersdorf in Saxony [the UNETICE region marked on his maps given in Error! Reference source not found. and Error! Reference source not found.]. The rich silver-cobalt ores are found outcropping near the surface and so were accessible to early man. The gangue was rock crystal with the associated fluorite and apatite which would have easily formed the cobalt blue glass. If lead, copper, iron or other minerals had been present there would have been a useless brown/black slag. The blue slag was a valuable material - man's first plastic - and was undoubtedly traded to the Adriatic, Mycenae and Egypt....



Ill.9- 33: (Left) Dayton with experimentally smelted cobalt blue raw glass cake, which on pouring formed exactly the shape of the ingots of the Uluburun shipwreck; (right) a dissected, unpoured crucible from Dayton's experiment shows the hardened blue glass slag and globule of silver at the bottom, proving his theory for the way only Erzgebirge ore separates out in this way

Bass's discovery (1986) of blue glass ingots in the cargo of the Mycenaean ship wrecked off Kaş in southern Turkey further confirms the origin of cobalt glass in Europe. This shipwreck has been dated to around 1400BC, the peak of the Mycenaean trading empire. The 20 blue discoid glass ingots found in it were 7" in diameter and 2" thick, just the size the fairly sophisticated silver-smelting furnace would produce... (To test this hypothesis Dayton replicated the smelting process - see the two pictures above.)

Much recent research has opened many new avenues onto the manufacture and uses of glass in the 2M throughout the Aegean, a useful starting point being the recent colloquium on the subject held in Sheffield⁶⁶ though not adding further to the detail of the angle we take here. The huge amount of glass imported to the Aegean was made clear in both the Uluburun and Gelidonya shipwrecks⁶⁷, where its volume nearly matched the well-known high tonnage of the metal cargo⁶⁸ - with 175 ingots of glass on the former and 200 on the latter. As Bass put it, Gelidonya 'produced twenty tons of artefacts, largely raw materials - seldom, if ever, found at terrestrial excavations'.

In fact, given that on the Uluburun wreck amber and a ton of tin was found - almost the same tonnage as for the round ingots of blue glass - as Dayton puts it, 'It seems much more probable that trade was in the hands of the Mycenaean seafarers, rather than in those of 'Canaanite landlubbers', and that the ship must have been sailing *from* the West to the Levant. In his introduction to Dayton's monograph Lamberg-Karlovsky accepts the official analysis of the glass found on the Uluburun wreck as of different chemical composition from blue glass originating in Mesopotamia and Iran, meaning there is the same ambiguity about tin sources and the spread by 2000 of bronze workshops both East and West - only resolvable by chemical analysis. If cobalt blue glass was coming from the Near East to the Aegean, what, then, is to be said about Dayton's assertion that it was first discovered in central Europe as a by-product of silver-smelting? Lamberg-Karlovsky concluded '[it] would seem to indicate ... different

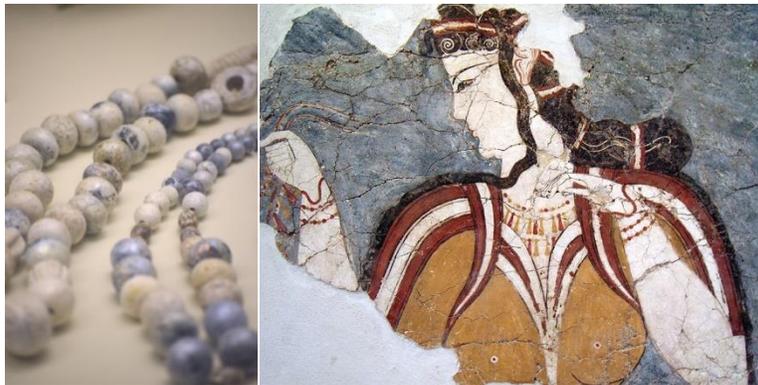
⁶⁶ Papers published in Caroline M Jackson & Emma C Wager (eds) *Vitreous Materials in the Late Bronze Age Aegean* Oxford 2008

⁶⁷ See the papers by Yuval Goren (*ibid.*) and George F Bass 'Cape Gelidonya Redux' in J Aruz et al. (eds) *Cultures in Contact: From Mesopotamia to the Mediterranean in the Second Millennium BC (Metropolitan Museum of Art Symposium)* New York 2013, 54-61 and 62-71 respectively.

⁶⁸ For Gelidonya Bass (*ibid.*) cites 'a ton of tin ingots... [logs of ebony, elephant and hippo tusks] ... 'and ten tons of copper ingots'.

sources were utilized in the eastern Mediterranean and Mesopotamia and Iran. *If so, the sources for Mesopotamian and Iranian blue glass remain to be discovered*'. Where tin was available in several places in Afghanistan (map *Error! Reference source not found.*) and certain pockets of North India, cobalt alongside nickel, on the other hand - the cause of the blueness of cobalt glass - is far rarer than tin.

Cobalt blue glass appears to have proliferated in the Mycenaean world in the form of blue glass beads: not only were they worn by women in cult situations (as depicted in the Mycenae Cult Centre on its wall painting), but some actual necklaces remained on altars there (below) - perhaps as offerings to



Ill.9- 34: (Left) Blue glass-bead necklaces (now corroded) of the type found in the Cult Centre at Mycenae; (right) on a wall painting from the so-called High Priest's House at the Cult Centre, a woman wearing many beads holds up a necklace offering

their equivalent of Ishtar who takes off her necklace at an early stage of her Underworld Journey (and we have seen how, in the Ur III period especially, certain kings ritually dedicated particularly fine beads to the Goddess as enacted by the *naditu* priestess).

Dayton informs us that the earliest cobalt blue glass known comes in the form of beads from Nitra in West Hungary (2495 BC carbon-date), its blue colour due mostly to the cobalt in it - and around the same time the first true 10% tin bronzes appear in the same region (2434BC uncorrected). Dayton reckoned that, with correction, he would 'put the appearance of true tin bronzes in the Unetice culture at about 1800BC, or even later ...as, *apart from the Nitra beads the next cobalt blue beads appear in the Shaft Graves at Mycenae around 1650BC*'. He concludes, 'A feature of the Mycenaean world was the enormous quantity of cobalt blue glass produced (more elaborate bead types are shown below right). In excavations it was discovered alongside a great wealth of metals, tin bronzes (90 bronze swords in Shaft Grave V), much silver and electrum, rock crystal from the Alps, amber from the Baltic, and amethyst found in quantity in the silver and tin mines of Saxony ... [which]... all point to



Ill.9- 35: (Left) Mycenaean sword hilt of blue glass in the Athens Museum formerly covered in gold foil; (right) complex moulded Mycenaean cobalt glass beads

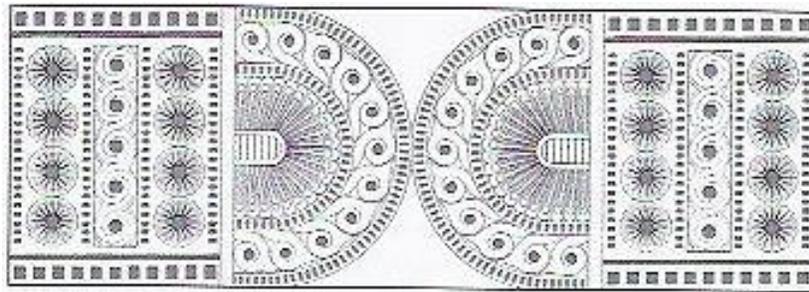
central Europe'. He even tracked down in the Athens Museum a 'one-off' glass sword hilt of cobalt glass from Mycenae (above left), still with gold leaf attached' - not repeated, perhaps, because totally impractical!

In fact much of the silver from the Shaft Graves, Dayton says, was analysed by him and Filippakis (the results never published) and was shown to contain 'significant traces of copper, cobalt, bismuth and nickel. Gold was not present, and is significantly absent in the silver ores of the Erzgebirge'. So, again, the synergy of being able to simultaneously access glass in the same area as the other materials just mentioned is clear-cut. Barfield in his assessment of the Polada culture of northern Italy⁶⁹ similarly talks of the advanced bronze metalworker equipment from there: 'The metal objects reflect a technology derived in its entirety from the Bronze Age cultures lying to the north and east of the Alps, notably Unetice and Strubing *and owe nothing to inspiration from the Mediterranean world*' (my italics). The archaeological record reveals that Mycenae very soon started to make its own glass artefacts in-house, and though it was close to the Laurion silver mines, methods of extracting silver there (mostly from lead) by crushing, cooking and washing, means it cannot have used its own ores to make glass, given the vital trace elements were not present - so it is likely to have continued to import the cobalt glass from Europe in order to start to custom-make its own pieces, even if they did also avail themselves of Mitanni/Nuzi turquoise glass. As Burns tells us: 'The working of glass is recorded in Linear B tablets from Mycenae, *Oi 702-5* mentioning several *kuwanowoko* which most likely should be translated as glass workers' - probably of blue glass in particular (*kuwan* = *cyan*) - in other words, craftsmen rather than miners or smelters.

There is evidence of glass-working undertaken at Tiryns, Midea and Pylos as well, and among other uses we know glass was used as an inlay in combination with fresco painting, or as inlay in architectural decorative schemes. For instance, as the sea-port for Mycenae and coastal gateway to that citadel, Burns cites from Tiryns 'one very spectacular decoration of foreign material: pieces of glass ... inlaid in the carved alabaster frieze decorating the antechamber of the megaron...[and] wider use of glass at

⁶⁹ L Barfield *Northern Italy before Rome* London 1971

the site is suggested by numerous pieces of ‘unfinished glass’...’. Looked at closely, the frieze design (illustrated below) was not pictorial, but repeats the well-worn Minoan opposed double half-ovals with upright rows of rosettes set between lines of small rectangles of glass. Schliemann⁷⁰ described the



Ill. 9- 36: (Top) Reconstruction of glass and alabaster frieze at Tiryns (grey areas represent glass) - Schliemannpl.IV

position of the slabs as fallen to the ground in the Men’s Vestibule, and probably originally fixed as a continuous frieze along the top of the wall. His reconstruction describes in detail the sizes of the different inlaid pieces which, it is now thought, were blue glass *paste* inserts daubed into the gouged-out hollows before drying and hardening. He refers to Homer’s mention of a frieze “like that in Tiryns ...inlaid with blue glass-paste” - a clue indicating the contemporaneity of Homer with just this decoration (Tiryns fell into ruins after 1200). Given the stories about glass being invented in the Diyala region it is worth mentioning the so-called ‘Mycenaean Palace’ at Nippur⁷¹ which validly compares its ground plan with that of Tiryns (all other evidence, however, points to it being Parthian).

Use of glass to create geometric wall cladding has a precedent, of course, in the real rock crystal pieces used to decorate the Throne Room at Knossos in the Neo-Palatial period (*Catalogue D, Ill. 8-138*). Dayton pointed out that ‘no glass has been found in Minoan Crete’ - only the ‘quite un-Egyptian faience’ of pieces like the Snake Goddesses. The Mycenaeans’ use of glass added a shiny and colourful element to the multi-media palette common throughout the Levant and Egypt (alternative materials included shell, limestone, ivory or lapis lazuli) to achieve sheer glitter and ‘bling’. This showiness, achievable as much by rock crystal or amethyst as glass means, I suspect, that not much difference was seen between them all - especially given glass’s beautiful translucent blue that no other easily obtainable semi-precious material could provide at the time - and without the obstacles of distant trade routes or royal monopoly.

Glass is almost pure silicon, and the general view of the invention of ordinary clear or yellow glass (rather than blue) might, after all, give some credence back to Nuzi as being a source. General accounts of the genesis of glass state it was probably discovered by accident when firing pottery⁷² or smelting metal ores either in Mesopotamia or (perhaps more likely, given the high temperatures needed) the metal-rich areas of the Oxus/Indus/Turanian civilizations of the 3M, then flourishing in

⁷⁰ H Schliemann *Tiryns: The Prehistoric Palace of the Kings of Tiryns, the Results of the Latest Excavations* 1885 pp365-9

⁷¹ Clarence C Fisher, ‘The Mycenaean Palace at Nippur’ *AJA VIII,4* Oct-Dec 1905 403-32

⁷² General Internet references to the history of glass

particular in the mid-2M throughout the Mitanni Empire. If it was blue, then for the Near East we must be talking about remanufacture, just as wool was bought in, woven and then resold. Glass was taken up in Egypt too, where it earned the better known reputation today as its provider to the Aegean (though Dayton points out that Egyptian Blue glass always has traces of copper in it - not cobalt or nickel - which again is why the blue is not so vivid, tending towards turquoise hues). For him, there is no doubt deep blue glass, silver and tin ores all came from the Erzgebirge and that 'western Europe was the [true] home of the Bronze Age'.

Thanks to Dayton's research we now understand how rich supplies of both blue glass and bronze swords could appear in Mycenaean shaft graves at the same time - and how their supply routes would inevitably mesh in with already existing trade routes for amber, rock crystal and amethyst (maybe also some of the more spectacular agates Germany is still known for today) - all of which are found in the warrior tombs.

Note: After writing this DIVERSION the book I had ordered on Ebla's beads⁷³ finally arrived, and I will mention some unexceptional pieces from Palazzo G in the DIVERSION ON ENTERTAINMENT. I recommend Pinnock's volume for its usefulness in filling in the detail of the overall history of bead finds throughout Mesopotamia and the Levant, especially her tables showing the breakdown of materials used for beads right across that archaeological record. I trust my own above analyses will complement it, especially in its inclusion of the absolutely crucial Central Asian dimension.

RELEVANCE OF THE ABOVE BEAD STUDY FOR REASSESSING THE VAPHEIO WARRIOR'S TOMB

From our starting point of the *Forward Attack* ring bezel under *ForAtt-26*, our two DIVERSIONS into Mycenaean metal procurement - and now glass, amber, agates and other semi-precious stones - have dramatically thrown into high relief plausible alternative interpretations for the origin of most of the Vapheio Warrior's possessions! The recent discovery of the Griffin Warrior's grave near Pylos with much the same grouping of opulent grave goods - of slightly earlier date - amplifies the view that surrounding a high-status individual with metal weapons and equipment (of bronze, gold and silver) and adorning him with a plethora of semi-precious stones, some as beads, some as seals, was a rite accorded to the few, enjoyed from Greece to Margiana - with princes of Qatna and Byblos between. In the next paragraphs we consider this mid-2M trend at its height from a handful of graves containing assemblages that assert personal control over possessions, signifying contact with the four quarters of the world they shared in. Though Yener⁷⁴ has recently written, 'Stylistic similarities in jewellery and metal hoards that were previously difficult to understand can now be seen as part of an Aegean-Mediterranean maritime commercial interaction and the expression of a rapidly rising élite accumulating and consuming prestige goods for power', he only cross-refers to Helms and the Clines

⁷³ F Pinnock *Le Perle del Palazzo Reale G* Rome 1993

⁷⁴ K A Yener 'Excavations in Hittite Heartlands: Recent Investigations in Late Bronze Age Anatolia' in K A Yener et al. (eds) *Recent Developments in Hittite Archaeology and History: Papers in Memory of Hans G Güterbock* Winona Lake 2002 1-9

within the Aegean theatre: but we have found that by pursuing such implications deep into the Central Asian and Indus domain by the land *and* sea routes that operated so powerfully during the 2M once the Indo-European penetration into the Near East (Hurrian, Kassite and Mitanni) had matured, an extended and richer picture emerges, fully validating Burns's assumptions about how far-reaching Mycenaean acquisitiveness was - perhaps to a greater extent than even he would have expected.

EURASIAN PRECEDENTS FOR MYCENAEAN OR EGYPTIAN SEMI-PRECIOUS STONE DISPLAY:

Many characteristics of the Vapheio burial seem to fit into the Steppe tradition, not only contemporary with the one or two 2M male Gonur tombs we can consider as parallels both here and in the *Iconography Section*, but going all the way back to the 4M Maikop chieftain burials, and other kurgans in Eurasia (see the metalworker's burial discussed earlier under *Error! Reference source not found.*) - some only comparatively recently unearthed. As early as in the original Maikop mound, the local chieftain of the Maikop burial (c. 3500) - whose silver vases came to our notice in *Catalogue C* under **Ratt-10** - wore a many-stranded beaded collar over neck and shoulders consisting of '60 beads of turquoise, 1272 beads of carnelian and 122 golden beads' (Anthony *ibid.* p.289), while under his head was a gold diadem with five five-petalled flowers attached by rivets. He was surrounded by a huge array of arsenical bronze tools and weapons - axes of different kinds with varied functions, and chisels presumably for woodworking - as well as a quantity of ceramic and metal vessels, whether cups or cauldrons. The silver bulls with holes in their backs to hold the silver-covered rods for his canopy were made by the lost-wax method - the earliest-known instance for Eurasia. Perhaps in the end his display of power is effective, not so much for relying on valuable materials gathered together through his influence, as that he used Mesopotamian symbols of status associated with astronomical symbolism: lion and bull figurines to anchor his canopy and the even smaller gold pieces (68 lions and 19 bulls) sewn onto his tunic (as also the Uruk-style animal processions with lion-bull juxtapositioning, including *Rear Attack*, on the two silver vases). We suspect there is something of the same significance to be found in the Vapheio warrior's choice of subject for his ring bezel and other lion-prey seals since, as with similar warrior graves as at Nichoria or Rutsi, we have the lion-bull symplegma (usually on seals) playing its part almost as the armorial focal point of authority at the heart of uncannily similar collections of precious and semi-precious materials and artefacts that together proclaim the man's personal *khvaernah*⁷⁵, or power aura (this is true also of the Dendra Tholos tomb seals and necklace of Chamber Tomb 10 (*III.9- 16*), again found along with precious metal cups and bronze weapons).

Looking to an even earlier precedent, the Second Period Maikop Culture Kurgan 31 burial at Klady (c.3400-3100) is a milestone in the tradition, where the occupant was buried with a huge arsenic bronze sword by his side (literally the first of its kind), along with daggers, axes, cauldrons and other tools such as chisels that were clearly experiments in the early design of such implements (details illustrated under *Error! Reference source not found.*, left). Beads of carnelian, lapis lazuli, gold and

⁷⁵ The Zoroastrian term (referred to and discussed in relation to the kings of Persepolis in *Catalogue B*).

rock crystal were found on him - along with fragments of textiles - of dyed linen, wool and even a cotton-like fabric (cotton cloth was developed in India from c.5000, Anthony states). Amongst the small ornaments with him was a tiny dog of cast silver (the last item in the three rows of small items at the top of *Error! Reference source not found.*). In contrast, due to the huge variety of 131 (mostly unworked) semi-precious minerals (along with necklace fragments of gold) found with the artisan skeleton in the Gonurdepe Tomb 2200/2000 (*Ill.9- 31* right) it is thought to have been a multi-skilled craftsman's grave, of someone who was both metalworker and stone cutter and polisher.

Pinnock (*ibid.*) reminds us that highly prized semi-precious stones or other raw materials were usually monopolised by the royal courts, and by law belonged only to the king, acquired 'on the basis of complete reciprocity and without any need for written accounts' (under our *Tin* heading above we have already shown how this certainly applied to any tin arriving in Mari). She suggests that the presence at Ebla of the two alabaster vase fragments with the cartouches of Kephren and Pepi I on them could point to the city's role in providing lapis lazuli to Egypt (most likely sent via Byblos), so much harder to obtain in Old Kingdom Egypt after the Predynastic period. The later Tod treasure sent to pharaoh Amenemhet II - with its lapis lazuli Elamite and Central Asian pieces and Anatolian silver cups - is further witness to the reach of the precious stones network at full complexity adding leverage to diplomatic tentacles reaching even into Egypt.

At this point we should add Tutankhamun's tomb in the count of rich male tombs during the full flowering of the 'International Style'. Though not a warrior chieftain of the Eurasian or Central Asian type, he was buried in the same way with opulent grave goods including jewellery using liberal amounts of carnelian and lapis lazuli: one way or another Egypt found ways to obtain those desirable semi-precious stones, even tapping into exchange routes leading from the Indus - in the 2M most often through the mediation of the Mitanni, possible during the Amarna period just preceding Tutankhamun - or afterwards when Egypto-Levantine relations improved. Although disabled, Tutankhamun had joined the club of chariot-riders - ultimately a Mitanni innovation - many examples of which they had sent as gifts to Tutankhamun's father and grandfather - and of course actual chariots were found in his tomb. Even if the most recent theory (put forward by Nicholas Reeves) is that he was hurriedly interred in an outer room to the as yet hidden burial chamber of his step-mother, Nefertiti - and that many of the goods may have originally been intended for her - there is no gainsaying that many of the engraved gold pieces amongst them depict lion- or griffin-prey groupings - more a Levantine symbol than a native Egyptian one (*See BaLu-33*).

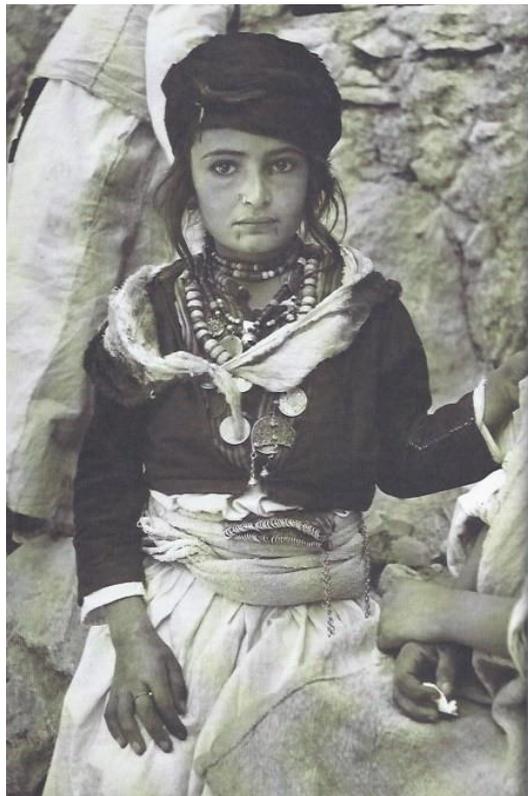
KEY FEMALE BURIALS IN GONUR IN THE LIGHT OF THOSE AT UR AND MYCENAE

When comparing the more or less contemporary Mycenaean warrior graves with burials in the high-status mausolea of the Gonur necropolis (well described in Ligabue et al. *op.cit.*), despite the fact most were looted, large enough quantities of a variety of unusual stones remained in the latter to also bring to mind comparisons with those of Ur . Allowing the gold, silver and bronze treasures to fall to the background, the élite tombs of all these sites reveal the same conspicuous consumption of semi-



Ill.9- 37 (Left) Female figure of chlorite and limestone from Gonur Necropolis tomb no. 1799 - from Ligabue & Rossi-Osmida op.cit.; (centre) similar figure bought on the market in the Centro Studi Ligabue collection - Ligabue & Salvatori ibid. ill. 112; (right) compare with similar materials (plus red jasper) used in a female statuette from Ebla, Palace G - Idlib Museum (AFC-108)

precious materials by top males and females alike. They are comparable, too - for bodies ritually 'dressed to the nines' - not only as in the rare cases of unplundered warrior tholoi such as Pylos, Vapheio or Dendra (the latter dealt with in detail in *Catalogue E*) - but also the instances of the Shaft Grave queens and Gonur priestess queens. Remember also Uruk's priestess necklaces (not associated with burials) dating from a period when the Ur III kings of Sumer held a monopoly over the Elam trade.



Ill.9- 38: Yezidi girl in traditional dress at Lalish, Iraq⁷⁶ - photographed by Anthony Kersting in 1944

⁷⁶ See Richard Wilding 'Return to Kurdistan' *The Courtauld News* XXXIX 2016 30-32

The so-called 'Dog mausoleum' discussed more fully for other reasons later (*Error! Reference source not found.*) included equipment for the preparation of the ritual Soma drink and appeared to be associated more with the priestess buried there than the male added later (we have just mentioned opium in relation to the carnelian poppy-head necklace from Mari at *Ill.9- 29*). Another female burial in the same necropolis included for a typical Oxus type female statue (above left) of chlorite and limestone- the only one found in context with other grave goods apart from a broken example in the Indus zone Quetta deposit (*Error! Reference source not found.*) - as opposed to the many similar figures from looted graves that turned up on the market, bought by private collectors and museums - as above centre. The chlorite blocks making up the torso and Forelegs - with crossed legs suggested by the wide spread of her skirt - are textured all over with sheep or goat-fleece tufts, calling to mind the *kaunakès* garments portrayed on statues, goblets and amulets from the Margiana zone at its widest extent as worn by priestesses or men of high rank from Bactria and Syro-Mesopotamia (multi-media figurines were sometimes used at Ebla - at the end of the line of the Elam trade route - as above right). Indeed, the artisan's tomb at Gonur (*Ill.9- 31* above) contained a collection of stray limestone arms and faces for other such statues, whose humbler materials indicate, perhaps, that these statuettes commemorated a more middle rank of lady. Though not as richly endowed as the Dog mausoleum female in its equipment, Gonur Necropolis tomb no. 1799 nonetheless still included some standard Bactrian female jewellery of the time - consisting of a mixture of gold-sheet covered beads interspaced with carnelian and lapis lazuli beads - uncannily identical in their combination of materials with many Ur necklaces as shown in the necklaces illustrated below



Ill.9- 39: (Left) Bactrian necklace of gold and carnelian - Ligabue & Salvatori ill.64; (right) carnelian and gold necklace from Tomb 1054 at Ur - British Museum (photo author)

(compare also with the unusually high count of carnelian and lapis lazuli in the Egyptian necklaces at *Error! Reference source not found.*). In both principal Gonur female tombs were delicate drinking vessels of silver, and makeup accessories including bronze mirrors and cases for them (e.g. *Error! Reference source not found.*). One of the rectangular bottles with applicator had residues found to contain specks of kaolin powder (not the expected mascara, but face powder, we presume). In general the abundance and high quality workmanship of metal and semi-precious stone grave goods in the élite

female burials of the Mycenaean Shaft Graves, the Royal Tombs of Ur and the Gonur necropolis all indicate a high level of status given to certain women - not necessarily *always* an Āryan cultural feature, but certainly Central Asian/Elamite with a Turkic element thrown in. Clearly, just as at Ur, in Gonur the women paid great attention to their facial grooming and parure, whilst items such as necklaces most directly compare, almost bead for bead, with those of both male or female buried in the Royal Tombs of Ur, which are earlier. At the latter the long pipe beads of carnelian - and sometimes the smaller etched carnelian beads often made the centrepiece - could only have been manufactured in Indus Valley workshops⁷⁷ (see *Ill.9- 26*). Given the regularity of the supply of carnelian to the Aegean, the sustained role of the Mitanni as way-station middle-men seems plausible - such that one feels their presence as much behind the Aegina Treasure (below centre) as definitely proved in Enkomi Tomb 93 (*Error! Reference source not found.*).

Yet we are still left with a smidgeon of doubt about where the carnelian originated - since Dayton states on the very last page of his work on glass that the same area providing the tin ores and blue-glass-containing silver ores - as also the amethysts, chalcedonies and quartzes - is 'also a classic source ... [of] beautiful translucent carnelian..., coral agate, and clear red jasper (traded to ancient Egypt) ...not far from the Baltic amber route. It is no surprise that vast quantities of bronzes dating to around 1800-1700 should be found in the same area'. Does this mean the Mycenaean seal ring of *Error! Reference source not found.* made of a solid piece of carnelian started off as a lump passed along the Indus Valley network - or did it more easily find its way from Europe?



Ill.9- 40: (Top left) necklaces from Bactria mostly of gold and lapis lazuli - Ligabue & Salvatori ill.62;(lower left) sections of necklaces of lapis lazuli and (top right) gold, carnelian and lapis lazuli both from Ur Tomb 1054; (bottom right) individual beads in the Aegina treasure of the same materials, suggesting similar Indus sources - all B.M. (photos author). Astonishingly, on closer inspection the Aegina collection of beads (centre) are individually shaped as a hand clutching a breast⁷⁸

KEY MALE BURIALS IN GONUR IN THE LIGHT OF THOSE AT UR AND MYCENAE

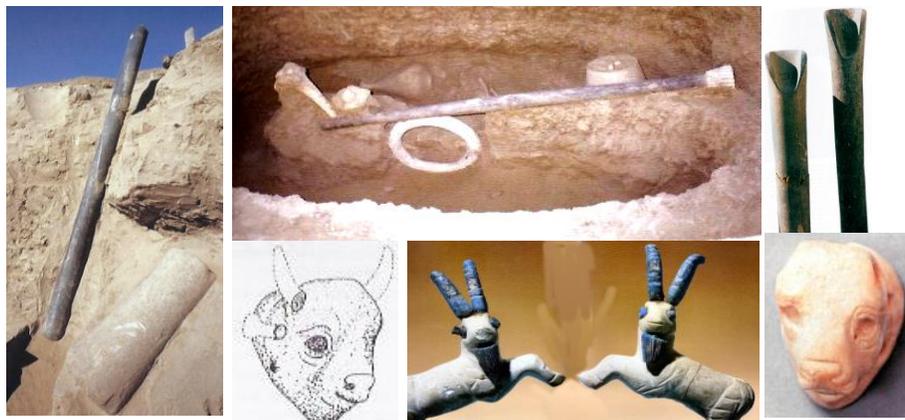
The top male tombs of Gonur - which along with the Eurasian tombs just described I see as prototypes for Mycenaean conventions - were nonetheless rich in locally variant ways from the Mycenaean warrior tombs (as one might expect). Conversely, if Mycenaean also used agates, chalcedonic stones and

⁷⁷ See, for instance, B Barthélemy de Saizieu et al. 'Bead-Drilling: A Look from Mehrgarh and Nausharo' in Ute Franke-Vogt et al (eds) *South Asian Archaeology 2003* Aachen 2005 39-48

⁷⁸ J L Fitton, Nigel Meeks and Louise Joyner *ibid.* in J L Fitton (ed.) *The Aegina Treasure: Aegean Bronze Age jewellery and a mystery revisited* London 2009 - Cat no. 16/ figs 79-84. The reputed association of the Treasure with the tomb of a Priestess of the Temple of Venus/Aphrodite makes the design of these eleven beads fitting, standing in *pars pro toto* for the usual naked figurines of the Goddess cupping her breasts that would have been found all over Syria.

onyxes, they also used amber and glass, barely present in Margiana. Otherwise, as part and parcel of Steppe culture (see maps at *Error! Reference source not found.* and *Error! Reference source not found.*) the male accoutrements of swords and ritual shaft-hole axes (their design based on the human shoulder-blade - *Error! Reference source not found.* shows two examples) crop up in the Bactrian tombs as much as they do in Mycenaean ones - though in fact knives are more common - and latterly start to turn up in Mycenaean warrior tombs. The top men wore necklaces and bracelets in the same way Mycenaean warriors did, but in several high-status male burials there is a mystery about the meaning of several items of ritual equipment which have turned up in different combinations all over Central Asian territory, even as far as the Indus zone, at Quetta (**Error! Reference source not found.**). These items - not at all seen in the Ur or Mycenaean tombs - are the so-called rods of authority/staffs of office, always of the same dark green polished ollare stone, sometimes capped with a macehead and with one end often shaped like a cow hoof (below top right). In room 44 at Togolok-21 an alabaster bull's head⁷⁹ rod finial had special holes for fixing onto such a staff (see drawing and colour photo below). Sarianidi quotes Mary Boyce to point out that the Zoroastrian priest even today holds such a bull-head-topped staff, akin to the bishop's crook. These ritual rods are nearly always paired with truncated colonettes, waisted in the middle and made of different types of strikingly veined coloured marbles - maybe used as a stool or pedestal, often with matching grooved disc (we could conjecture that the item under the arm of the Ophidian Big Man (*Error! Reference source not found.*) may not be a jar, but the end-view of one such colonette). For these there is no parallel in the Sumerian or Mycenaean worlds.

Two intact pairs of staff and colonette from Gonur tombs are illustrated below, the first (left) accompanied only by bone fragments, the second (top centre) by a full male skeleton whose neck jewel we showed earlier in *III.9- 31*. In the latter's burial also (as seen in the same picture below) were a heavy lead arm-bangle and bones with holes bored in them, probably used as drinking tubes (one had poppy residue in it). A badly corroded silver trumpet was also in this second burial (another was found with the priestess in the Dog Mausoleum) - their purpose explained elsewhere.



⁷⁹ F T Hiebert (Fwd C Lamberg-Karlovsky/Pref. V Sarianidi) *Origins of the Bronze Age Oasis Civilization in Central Asia* Cambridge Mass 1994 fig. 9.13(1)

Ill.9- 41 (Left) Staff of office and marble colonette photographed in the dromos soon after excavation, Gonur grave M.077; (centre top) a similar pair of objects, the baton here with ribbed mace-head, in situ in tomb 500; (top right) top shaping of two of the staffs - Sarianidi 2005 fig.88; (centre bottom left) drawing of alabaster bull's head for fixing as mace-head - it may have had horns of a different material inserted, much as (bottom centre) the 3M pair of lapis lazuli-horned limestone ibex illustrated in Ligabue & Salvatori ill.41 (priv.coll); (bottom right) colour photo of same bull head, as is -Sarianidi 2005 fig.136.

An intriguing and telling observation from Hiebert is that at Gonur in Period 2, craft production 'shifts its location from separate production areas to locations *inside* the large fortified building complexes' - as happened also in the Late Period fortified Mycenaean citadels of Pylos - and Mycenae itself - whose Cult Centre (analysed later) was positioned cheek by jowl with the craft workshops⁸⁰ (see our later discussion of the God Hephaistos/Kothar in the Levantine and Mycenaean worlds). For both, craft and ritual were inextricably entwined, though the irregular planning of the rooms at Mycenae, hugging the hillside, contrast with the rectangular precision of the Gonur citadel and Togolok-21 temple building set on the plain.

Both old and new information together give us an overall picture of the Second Millennium up to 1300 as being a golden age for the abundance and use of the same gamut of semi-precious materials across the board. Due to some striking parallels between these burials and of the goods and raw materials they were made from -found in male and female tombs alike - it cannot be ignored that a handful of rare individuals in the Mycenaean world on the fringes of this geographically vast, semi-nomadic warlord-based system of exchange actively benefited and enthusiastically participated in this chain of chieftain connections. By concentrating on the traffic and working of semi-precious stones alone - along with the leitmotif of the lion-bull group - even if we will never know what the precise individual human relationships enabling these exchanges were, we are arguing for an ultimate, if subtle, impact of this vast territory's cultures on the Mycenaean. We have already instanced points of difference as well between East and West - one being that (following suit from the Levant) Mycenae used the *Forward Attack* frequently on its artefacts in association with such personal possessions, while it almost never appears in the Gonur and Indus cultural spheres. Between the two zones the Mitanni did use it, but juxtaposed it with Central Asia-sourced images as a BIVISUAL in order to convey the same message through two cultural idioms - this is borne out by the Mitanni seals we have analysed in depth under this *Chronological Focus*.

Now we finally come back to the original trigger behind our enquiry: the Tiamatbashti necklace.

THE VEILS OF ISIS AND THE COSMOKRATOR MODEL

When we first made the three-dimensional zodiac, coloured according to the hues of the Planets and Signs, in the early booklets accompanying it we explained that through it we would explore the finer and finer subdivisions of the Octave.

⁸⁰ This is turning out also to be the case at the extraordinarily complete Bronze Age site of the same period, at Must Farm, Cambridgeshire <http://www.mustfarm.com/bronze-age-settlement/about/>

The seven canonical ways in which the Octave can be subdivided (whether as sound, colour, or other media) are all used in music, but one or other set of subdivisions manifests especially in a particular realm of knowledge more than another, such as astronomy, or grammar. Let us remind ourselves how the basic octave is made up of a progression of seven notes, ending on the eighth (hence its name). But every musician knows the octave can be further subdivided into semi-tones and microtones - realistically there is the basic octave of seven divisions, plus six further octaves with finer and finer subdivisions matching the **SEVEN DIMENSIONS** known to modern Physics⁸¹. In our terms in the Cosmokrator books we call these modes of subdivision 'THE SEVEN SPANNERS', discussed one by one as we move forward in the series, as shown in the right-hand columns of the Cosmokrator book list (see next page). However, using ancient-world terminology we preferred to describe the SPANNERS as 'VEILS OF ISIS' since according to an ancient Saite inscription on a statue of Isis they both hide - and reveal - the presence of the ungraspable Goddess of the Universe. Syriac Christianity describes God as 'Father to the fatherless and Mother to the Motherless'. We explore His/Her significance later in the series but in modern terms we might call Isis not even the 'Background Radiation' of the Universe but the Vacuum that contains it (Taoism would call Her the Womb/Tomb of the Universe - 'The Mother of All Things'). In our use of Cosmokrator we go with both terms because 'SPANNER' perhaps appeals more to men than women, and to the scientists amongst you - whilst we feel the term 'VEIL' will appeal more to women and to those educated in the Humanities who tend to mistrust technology. They were not always separate - the ancient Greek word for 'art' was *techne*, or 'means of making'. Between them, these two terms should bridge the male-female/science-arts divide. As you can see from our table below pursuing their escalation from the simple to the complex, we number these SPANNERS/VEILS from one to seven, using the entire series of booklets to fully explain their workings and use. The books can be ordered via the Spectra link on either the www.cosmokrator.com website, or via www.layish.co.uk.

Because Cosmokrator in one object combines in it knowledge of nearly all the SPANNERS, or VEILS OF EXISTENCE (certainly NOS 1-5), it usefully prepares the way for the last two, more complex ones coming in at the end of the series (NOS 6-7). And as it has to be physically assembled in the round, its hidden properties are absorbed subconsciously by the maker while sticking it together. Hence we have introduced it to you as the equivalent of a Cosmic all-purpose tool at the outset since, as well as being useful, it serves as a focal point to make sense of the books, and vice versa.

Now if you look back to the picture of Tiamatbashti's necklace, it is made of **13** principal beads, separated by the very small inter-beading - the main spacer beads consisting of **22** carnelian spheres and **36** small ribbed gold spheres, adding up to a chain 1.7m long - all thought to have been strung on a thick silver thread of which only broken pieces remained here and there, meaning the necklace was slightly disordered when unearthed.

⁸¹ String Theory offers 11 dimensions but the extra four are too evanescent to deal with in material terms.

So - whether coincidental or not - the necklace particularly signals *Veils of Isis 4, 5 and 6*, and serves to herald our booklets that will appear in the coming decade describing those finer Octave subdivisions in more extraordinary realms. In the meantime, why not make your own necklace along those lines?

	TITLE	CONTENT	Divisions of Octave	Veil Number	
0	INTRODUCTION TO COSMOKRATOR	Overall coverage and purpose	0	1	
1	SOUND, LENGTH AND COLOUR	Music - the Octave as sound and line length	1 2 3 4 5 6 7 8	1, 2 3	
2	THE VESICA PISCIS AND GEOMETRY	Natural proportional geometry	Irrational ratios	1,2 3	
3	ATOMS & THEIR NOTES	Harmonics of particle physics			
4	THE NATURE OF PLANTS	Organic geometry	7, 19, 27, 28, 29, 30, Moon		
5	MOLECULES AND MUSICAL ANGLES	Platonic solids, 3-D orchestras			
6	ANIMAL-HUMAN SYMPHONIES	3-D organic cosmic resonators			
7	COLOUR AND ASTROLOGY	Weave of number and colour correspondences on the 12 semitones	12, 13, 14, 15, Fortnight	4	
8	TAROT and the ALPHABETS	Complexification of correspondences with the 22 shrutis	20, 21, 22, 23, 24, 25, Day	5	
9	THE 36 DECANS AND ANCIENT ASTRONOMY	The sexagesimal microtones and their derivation from astronomy	6, 36, 360/365, 2200, Sun	6	
10	GREAT PAINTINGS	Use of these laws of correspondence in sacred art			
11	ARCHITECTURE: FROZEN TIME	Implication of the harmonics of astronomy as built into architecture			
12	HARMONY ANCIENT & MODERN	Systems of proportion then and now	10 and the Tetraktys: a non-octaval binding agent		
13	THE SEVENTH VEIL AND THE GRAND SPIRAL OF LIFE	The Pythagorean Comma and tiniest increments	49, 50, 51, 53, 56, 301 and 26,500	7	
14	NORMS AND THE ABNORMAL + Bibliography	Personal transformation - using the Spanners/Veils	9, 27 - Plato's nuptial number		
15	THE UNIVERSE AS A GOD	Anthology from ancient texts & works of art	Totality		
16	THE UNIVERSE AS A GODDESS	Anthology from ancient texts & works of art	Totality		

Ill. 0 - 1: Spectra's Cosmokrator Book Series: The Seven Spanners/Veils are introduced gradually as the subdivisions of the octave are refined

