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# A golden garment? Identifying new ways of looking at the past through a preliminary report of textile fragments from the Pafos 'Erotes' Sarcophagus

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# A golden garment? Identifying new ways of looking at the past through a preliminary report of textile fragments from the Pafos 'Erotes' Sarcophagus

## **Abstract**

A golden garment? A preliminary report of textile fragments from the Pafos 'Erotes' Sarcophagus Diana Wood Conroy and Adriana Garcia Remnants of very fine gold thread and reddish fibre were found among bone fragments in the 'pillow' end of the interior of the Pafos marble sarcophagus in 2001. The placement of the threads suggested a cloth laid over the upper part of the body. The excavator, Dr Eustathios Raptou has described how the sarcophagus had been looted in antiquity, leaving only one jewel and a finial from what must have been rich funerary goods. The textile fragments demonstrated the opulence of the burial, but because of their very fragmentary condition needed microscopic analysis to place them in an accurate context. After examining the fragments in the Pafos Museum in 2008, Diana Wood Conroy applied to the Department of Antiquities in Nicosia for an export licence to take small samples of the mixed gold thread, reddish fibre, bone and dust residues to the University of Wollongong in Australia for analysis under a stereo microscope, and a scanning electron microscope. At present, little is known of Hellenistic to Late Roman textiles from excavations in Cyprus, although the island was famed in historical times for its textile crafts. In her catalogue of known gold fabrics from the Mediterranean, Margarita Gleba found no examples from Cyprus, making the discovery of the Pafos gold fragments significant (Gleba, 2008 'Auratae vestes' in *Purpurae Vestes* 11, 69, 70-75 and 2008 *Textile Production in Pre-Roman Italy* 80-82). It is obvious that the level of skill needed to produce the extremely fine threads demonstrated in the gold textile would be inaccessible to contemporary western hand weavers. The fragments in the Pafos sarcophagus may offer a compelling clue to sophisticated and highly developed textile and funerary traditions. This preliminary report outlines the findings of analyses completed in 2008 and 2009 with Professor Diana Wood Conroy and Dr Adriana Garcia, Honorary Fellow and scientist in the School of Earth and Environmental Sciences at the University of Wollongong.

## **Keywords**

report, textile, golden, fragments, pafos, erotes, sarcophagus, preliminary, garment, GeoQUEST

## **Disciplines**

Life Sciences | Physical Sciences and Mathematics | Social and Behavioral Sciences

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## CHAPTER 4

# A golden garment from ancient Cyprus? Identifying new ways of looking at the past through a preliminary report of textile fragments from the Pafos ‘Erotes’ Sarcophagus

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### Keywords

Textiles, Mediterranean archaeology, microscopic analysis, Cyprus, funerary material culture

### Abstract

In 2001 Eustathios Raptou (Director of the Pafos Museum, Cyprus) excavated a notable marble 2<sup>nd</sup> century sarcophagus, carved with *erotes*, or cherubs. Remarkably the sarcophagus contained textile fragments which appeared to be traces of a gold and purple shroud that had covered the head and shoulders of the deceased. After examining the fragments in the Pafos Museum in 2008, Diana Wood Conroy applied to the Department of Antiquities in Nicosia for an export licence so that further analysis could be carried out at the University of Wollongong. This report traces some of the findings of stereomicroscope and electron microscope analysis of samples of the fibres and sediments from the sarcophagus, which included gold, silk and bone. The structure of the gold thread, once twisted around a core thread, and the identification of silk fibres indicate a high-ranking burial. The discovery of microfossils within the sample placed the archaeological material in the wider context of the physical environment. This study briefly summarises literary and archaeological evidence for gold fabrics and purple-red dyes, and relates the Cyprus gold and silk fabric to ancient trade routes. Many questions remain about the dyes used, about weaving and dye production workshops in Greco-Roman Cyprus, and about the profile and origin of the gold.

This paper shares information, ideas and expertise across creative arts, archaeology and science, developing new networks to provide innovative perspectives on ancient life for scholars and museum audiences.

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### Prelude

Archaeologists and scientists in Australia who investigate the ancient past of Cyprus in the Mediterranean may seem unlikely to offer ideas of social innovation and renewal. Yet the

past is as open to fresh interpretations as the present. Developments in archaeological theory in the post-structuralist phase of late 20<sup>th</sup> century thought allow multiple readings of the past, and an acknowledgement that the past itself changes according to the tenets of the present. So Ian Hodder, under the tenets of post-structuralism, as a post-processualist archaeologist, writes:

The meaning of an object does not lie within that object but within its reading, that is in the link that is made between that object and other objects, words and concepts. As a result the meaning of an object is never static and its reading is never finished. It is always open to new interpretation (Hodder 1989, p.64).

Both the Department of Archaeology and the closely associated study collection in the Nicholson Museum at the University of Sydney have been a focus for Cypriot archaeology, and this paper was developed under the aegis of the Pafos Theatre Excavation led by Professor Richard Green, commencing in Cyprus in 1995 and continuing in 2009. The Nicholson Museum's changing trajectory of display demonstrates that the museum itself can be regarded as an artefact which changes with the different imperatives of history. Begun with the sculptures, funerary relics and ceramics collected by Sir Charles Nicholson in the 1840s in Egypt and Greece, it is one of the earliest museums in the southern hemisphere. In the construction of the 19<sup>th</sup> century display textiles played a small role because of their essential transience in the archaeological record. This absence was aided by patriarchal traditions of classical archaeology that did not 'see' textiles as significant, reflecting the unconscious relegation of textiles as a domestic and feminine activity in the minds of (white, mostly male) archaeologists as an activity that belonged to a feminine space.

Within the field of contemporary archaeology a plurality of 'readings' is advocated. Bjornar Olsen, a feminist archaeologist, wrestled with the relativist dilemma in discussing the post-structuralist readings:

When I argue for a certain reading of the past I have to realize my own position as historically and culturally situated, that my struggle for an alternative view of the past is related to political and social values in a present academic sphere of western capitalist society and has no automatic relevance outside it (Olsen 1991, p.202).

The momentum of late 20<sup>th</sup> century theories has changed the seemingly simple investigation of an object in a museum to an action that is a theoretical crossing-place for a number of systems. The meaning of an object never rests in a particular time and place, is never static, but instead is continually open to reinterpretation by the changing viewer, affected by the present context of ideas. As a young woman working in museums and on sites in Europe as an archaeological illustrator Diana Wood Conroy used to ask, while numbering and drawing objects; what might these objects say if given permission to speak? The opportunity to look at the overlooked textile fragments in museums through the enlarged lenses of microscopes and chemical analysis has indeed given a different voice to ancient cloth through scholars such as Magareta Gleba sifting through museum holdings in Italy and finding a new wealth of knowledge (see Gillis & Nosch 2007; Gleba 2008a and 2008b).

The impetus to work with textiles as a key to unlocking gender, power and ceremony in older societies has come from Professor Wood Conroy's discipline as a tapestry weaver, leading to her understanding of the nuances of material and thread. Dr Adriana García's main research area encompasses microfossils, allowing her to interpret the views through the microscope.

This research combines both the authors' expertise to provide a glimpse into the material evidence and social resonance of ancient textiles. The focus of this paper is the archaeological examination of the textile sample, and its structure and materials in the broad historical context of 2<sup>nd</sup> century Roman society. Due to new developments in museum interactivity, the processes of analysis and discovery can now be experienced by museum viewers through a digital interface.

### The discovery

Remnants of very fine gold thread and reddish fibres were found amongst bone fragments in the 'pillow' end of the interior of the Pafos marble sarcophagus in 2001. The placement of the threads suggested a cloth laid over the upper part of the body. The excavator, Dr Eustathios Raptou, found that the sarcophagus had been looted in antiquity, leaving only one jewel and a finial (an ornamental metal top for a small rod) from what must have been rich funerary goods. The textile fragments demonstrated the opulence of the burial, but because of their very fragmentary condition, they needed microscopic investigation to place them in an accurate context.

After examining the fragments in the Pafos Museum in 2008, Diana Wood Conroy applied to the Department of Antiquities of the Cyprus Government in Nicosia for an export licence to take small samples of the mixed gold thread, reddish fibre, bone and dust residues to the University of Wollongong in Australia for analysis using a stereo microscope and a scanning electron microscope.<sup>1</sup>

At present, little is known of Hellenistic to Late Roman textiles from excavations in Cyprus, although the island was famed in historical times for its textile crafts. In her invaluable overview and catalogue of known gold fabrics from the Mediterranean, Margarita Gleba found no examples from Cyprus, making the discovery of the Pafos gold fragments significant (Gleba 2008a, pp.11, 69, 70-75; Gleba 2008b, pp.80-82). In a discussion of textile conservation, Orlovsky and Trupin have remarked that the archaeologist can feel awe at the survival of such rare fragments, such as these remarkable traces from the interior of an outstanding marble sarcophagus (Orlovsky & Trupin 1993, p.110). As a weaver myself, it is obvious that the level of skill needed to produce the extremely fine threads demonstrated in the gold textile would be inaccessible to most contemporary western hand weavers. The fragments in the Pafos sarcophagus may offer a compelling clue to the sophisticated and highly developed textile and funerary traditions in the 2<sup>nd</sup> century, a time that Edward Gibbon has described as "the period in the history of the world during which the human race was most happy and prosperous"<sup>2</sup> in his vast chronicle *History of the decline and fall of the Roman Empire* (quote found through <http://www.his.com/~z/gibbon.html#1overview>).

<sup>1</sup>The following acknowledgements come from Diana Wood Conroy who initiated the analysis of the ancient fabric:

I appreciate the enthusiasm and interest of Dr Raptou for inviting me to investigate the textile fragments from the Pafos sarcophagus. I would like to acknowledge gratefully the help of Dr Maria Hadjikosta, Dr Marina Igoumenidou, Dr Pavlos Flourentzos and Ms Eutychia Zachariou-Kaila in the Department of Antiquities for expediting the export licence to Australia. The fragments arrived in Sydney in June 2008, thanks to the consistent and timely help of Mr Garth Hunt, the then Australian High Commissioner to Cyprus. I thank the University of Wollongong for essential research funding for the analysis process. Vital technical assistance was provided by Mr Nicholas Mackie, Professional Officer, Electron Microscope Laboratory, School of Materials Engineering at UOW. I would also like to thank Anders Hallan and Tony Nicholas, PhD candidates at the School of Earth and Environmental Sciences, as well as Jade Markham and Aaron Hull in the Faculty of Creative Arts. Both Emeritus Professor Richard Green and Dr Craig Barker from the University of Sydney gave me excellent scholarly advice.

<sup>2</sup> "If a man were called to fix the period in the history of the world, during which the condition of the human race was most happy and prosperous, he would, without hesitation, name that which elapsed from the death of Domitian to the accession of Commodus." Chapter 3, Edward Gibbon (<http://www.his.com/~z/gibbon.html#1overview>)

### Description and dimensions

Tiny threads of gold, some no more than 1 mm long, were scattered through the bone, dust and purple-red organic material collected from the interior of the sarcophagus. The combined material filled a cardboard box 30 cm x 15 cm x 8 cm in the Pafos Museum. Up to ten small sections of gold fabric were still intact, each no more than 15 mm x 10 mm. These were not flat but formed clumps embedded in bone. Four pieces less than 10 mm x 10 mm were selected as samples for microscopy. One piece 5 mm x 5 mm contained dark-coloured threads with gold threads loosely attached. The combined samples weighed 2 grams. Each thread consisted of a flat ribbon of gold twisted around a silk core, about 0.175 mm – 0.2 mm wide x 0.01 mm thick (Figures 2, 3, 5, 6, 7). Very small pieces of silk thread were found throughout the samples, approximately 0.01 mm in diameter (Figures 4, 5, 12 and 13).

### Microscopic methods

The sarcophagus samples were first observed and photographed using a stereo microscope (Leica MZ18A) with a maximum magnification of 200X. Then some sections of the fabric and surrounding particles were separated using a fine brush and mounted on little stubs 'glued' with a special tape for observation/illustration using a scanning electron microscope (JEOL 6490LA). The samples used for the scanning electron microscope (SEM) images were gold coated, while the samples analysed using the attached energy dispersal spectroscopy (EDS) were carbon coated in order to achieve an accurate peak for gold.

The textile archaeologist John Peter Wild has pointed out that SEM has opened up a new world of material detail, enabling the accurate identification of the different characters of linen, wool and silk fibre (Wild 2007, p.3). For example, in a study of a rare 5<sup>th</sup> century BC cloth from Kalyvia, Attica, the archaeologists Moulherat and Spantidaki showed that the material was very fine linen with the presence of silk. Their chromatogram also showed evidence of purple dye from the *Murex* sp shellfish (Moulherat & Spantidaki 2007, pp.164-5).

Figures 2, 3 and 4 show details of the sarcophagus fabric in the stereo microscope magnified 40X, and Figures 4 and 5 demonstrate the key sites in the sample for the EDS analysis comprising gold, bone and silk thread.

### Biological evidence

An unexpected consequence of putting the sample of material under the microscope was the discovery of small marine organisms in the material collected from the sarcophagus (Figures 8 and 9). These remains of marine organisms were found when the debris surrounding the pieces of silk, gold, bones and marble sediments were observed using a stereomicroscope. The microfossils, Foraminiferida (unicellular marine organisms that produce a calcareous shell), segments of Corallinaceae (calcareous red Algae), and the spines of Echinoderms were collected using a fine brush. The specimens were not very well-preserved, which masked some of the useful identification characteristics, especially for the foraminifers. The reworking and external growths of calcareous materials on the Foraminiferida indicated that they probably lived in seas older than those from the time when the burial was performed. Three forms of Foraminiferida were recognized: one specimen of *Triloculina?* sp., two specimens probably belonging to *Rotaliina* (both benthic, living on the sediments), and a planktonic species having very globular chambers. The planktic's characteristics indicated,

most probably, a Neogene age (about 2-25 million years ago). Together with the red Algae and Echinoderm fragments, the association suggests an environment of shallow seas, apart from the presence of the planktic species that usually live floating in deeper waters. However, these could have been carried close to the shore by a storm. It seems likely that the organisms were present in the sediments where the sarcophagus was buried.

Foraminifera in particular are very good indicators of age and environment within the sediments bearing them, although in this case we do not have the evidence necessary for a more accurate reconstruction. More scientific testing would be necessary, for example, the provenance and geology of the sediments associated with the burial. The presence of the microfossils in the samples from the interior of the sarcophagus can give tantalising clues to a larger picture.

### **Condition of materials**

The condition of the fabric in the sarcophagus burial had deteriorated to around ten small sections still adhering together which totalled less than a centimetre square. Part of the fabric was an organic fibre, identified as silk that had decayed, leaving only occasional threads of a purple-red colour within a maze of gold threads (Figures 1 and 3). It is well-known that the existence of metal helps to preserve the shape of fibre that has disintegrated. In the clammy soils of Cyprus ancient textiles rarely survive, and are preserved as ‘pseudomorphs’ in bronze objects, in which fabric was once wrapped around metal.

This phenomenon was described in relation to a piece of linen fabric recovered in Pafos in the House of Dionysios (Conroy 2000). In connection with Lydian textiles, Greenewalt and Majewski commented that knowledge of many ancient textiles depends on the transformations of mineral deposits on metal objects where textile fibres in contact with metal surfaces have been replaced by metal salts during burial in the soil (Greenewalt & Majewski 1980, p.138). Evidence from graves of linen cloth loosely wrapped around a bronze dagger, and knife blades in the Cyprus Museum are documented from Early and Middle Cypriot periods (Pieridou 1967, p.27). Paul Astrom provided a list of such cloth fragments from the Early Cypriot Bronze Age to the Iron Age from burial contexts (Astrom 1967, pp.11-114).

In the case of the Pafos sarcophagus fragments, it appears that the presence of bone has allowed the consolidation of small pieces of the textile, so that the two substances, bone and gold fabric, are bound indissolubly together.

### **Materials: Gold**

Specks of gold were scattered across the ‘pillow’ area of the sarcophagus interior, mixed with bone dust, organic material and inorganic earthy particles. The gold threads in the sample showed pieces of the silk fibres adhering to them (Figure 1). The threads that once held the fabric together in a recognisable structure of warp and weft no longer exist (Figures 2 and 3).

The EDS analyses of gold (Figures 11 and 12) show a peak for Au (gold) and a small amount of Ag (silver), which is commonly the association found. The gold from mines is commonly mixed with a small proportion of silver, evident in other examples of ancient gold (Knudsen 2007, p.104). By comparison, the EDS analysis of ‘modern gold’ thread showed no evidence of gold and was made of carbon with some silica.<sup>3</sup>

<sup>3</sup> Diana Wood Conroy spoke to a hand weaver of silk saris woven with gold thread at Dakshin Chitra, Chennai (Madras), India in February 2009. He told her that the gold thread he used was 90% silver and 10% gold, made around a silk core.

The structure of the gold threads is clarified in the SEM image as a flat ribbon of gold wrapped around a silk core in a Z twist, a technique still used today. If the edges are rounded as in the Pafos sample, the metal strip was probably made by rolling; if the metal strip is sharp-edged it was probably made by cutting a strip from a plate. The gold strip width is consistently 0.2 mm, and its thickness is less than 0.1 mm. There are twists in the gold strip approximately every 0.6 mm (Figure 6.).

### **Bone**

Under the electron microscope, small fragments of possibly cranial bone within the pieces of textile were observed to have a porous aspect (Figure 12). The analysis of bone using EDS (Figure 14) shows a peak for O (oxygen), Ca (calcium), and a small peak for C (carbon) and S (sulphur), both of which are elements that are indicative of bone. Surprisingly, there are other peaks for Si (silica), Mg (magnesium), Al (aluminium), and probably Fe (iron), which can indicate the presence of clays. As it seems that such elements had merged with the bone and into the silk, is it possible that clay was used in the preparation of cosmetics? Another question is whether a dye mordant such as aluminium or iron oxide might be indicated in this analysis. Aluminium and iron are common mordants to fix the dye into the fibre in plant dyeing, such as in the common ancient dye, madder, or *Rubia tinctorum* (Karali & Megaloudi 2008, p.182). More investigation is needed into this area.

### **Colour and dye**

A pronounced reddish-purple hue imbued the gold threads with smaller areas (3 mm in diameter) of strong vermilion red. The reddish material appeared matted beneath the tangle of gold threads (Figures 2 and 3). Some detail of striations in the red-purple fibre, consistent with rows of weaving, can be seen in Figure 4.

The purple colour from *Murex* sp. shellfish was highly ranked as a dyestuff for textiles since prehistoric times. There is abundant evidence for purple dyeing workshops using varieties of the glands of *Murex* sp. shellfish around the Mediterranean, often in conjunction with gold and silk textiles. Karali and Megaloudi have described how the most highly prized colour in antiquity, ‘Tyrian’ purple (from long established dye works in Tyre and Sidon), was produced through a laborious process from tiny sacks or glands in each shellfish, requiring thousands of shells to dye a metre of cloth (Karali & Megaloudi 2008, pp.182-3). A High Precision Liquid Chromatograph (not yet undertaken in the present study) can indicate the presence of shellfish components, such as the indigoid described by Moulherat and Spantidaki (2008, p.164).

The analysis of plant remains and pigment in the sarcophagus samples are not yet clearly determined. The presence of calcium, oxygen and carbon indicate that the bone penetrated the other materials in the process of decomposition. Analysis of the pigment colour in the sarcophagus fragment is presented here, but requires more investigation (Figure 13). At this stage, identification of the dye, whether of shellfish, earth or plant origin, has not been scientifically established.

### **Silk**

Under the microscope, the thread amongst the gold and organic material was identified as silk by its ribbon-shaped filaments (Figure 15). Exactly the same structure was observed in

modern silk under the stereomicroscope. As the product of the silk caterpillar, silk thread need not be spun, but rather is constructed by winding filaments from 30-50 cocoons suspended in boiling water into one fine thread on a reel and in the reeling process the filaments bind together (Papademetriou & Papageorghiou c.1998). The multiple strands, perhaps as many as 50, formed by this reeling process are clearly seen in the SEM image of the ancient silk thread (Figures 15 and 16). The EDS analysis of silk fibre in Figure 17 shows peaks of organic components: carbon, calcium, oxygen and sulphur. As with the bone and pigment EDS analysis, we can see the interpenetration of materials in the fibre.

It is not clear whether the thread has been respun from unravelled silk imported from the silk route described below. The origin of this silk may ultimately be China, via closer centres manufacturing costly cloths, such as Antioch or Tyre (Thorley 1971).

Papademetriou and Papageorghiou explain that silk was produced in Cyprus in Byzantine times, with the industry reaching a high point in the 13<sup>th</sup> to 15<sup>th</sup> centuries. (Papademetriou & Papageorghiou c.1998). According to Rutschowskaya (1990, p.18), silk textiles appeared in large quantities in the necropolises of Akhmin and Antinopolis in Late Roman Egypt. The dead were dressed in their best clothes, which were elaborately figured and coloured. Many of the silk materials for these rich clothes were imported from Syria and further east, as a silk industry was not established in Egypt until after the Arab conquest in 641 AD. Silkworm eggs were introduced into Egypt in c.550 AD. Gold thread was used by Copts in tapestries such as the tapestry ‘Judgement of Paris’, measuring 17 x 15 cm, which was dated as being 4<sup>th</sup> to 5<sup>th</sup> century in Washington DC (Rutschowskaya 1990, pp.25, 112). Although later in date, such a fabric could well be analagous to the Pafos sarcophagus textile with its use of a flying shuttle technique for the gold thread details of figures against a purple ground.

### **Context and structure of gold and purple cloths**

The most renowned surviving examples of Hellenistic Greek funerary textiles are the purple and gold cloths (41 cm x 61.5 cm x 28.5 cm) found in the small gold *larnax* from within a marble sarcophagus excavated in 1977 from the so-called ‘Philip’s Tomb’ in Vergina in Greece, and described in detail by Manolis Andronicos. The cloths surrounded the cremated remains of a woman and the magnificent decoration of the tapestry-like fabric represented twining plant motifs within spiral meanders. Describing the circumstances of the find Andronicos wrote: “The gold, which forms the background setting off the purple decoration, was made from gold ‘thread’; the purple part had disintegrated ... and had coagulated into a mushy mass.” (Andronicos 1993, p.192, plates 156 and 157). Because the woollen warp threads had disintegrated it was not possible to determine the structure of the gold thread, and whether it was twined around an organic core. No microscopic analysis has yet been published although the cloths have been conserved and described by D Cardon and M Flury Lemberg (cited in Gleba 2008a, p.65).

As in the much earlier Hellenistic fabric from Vergina, a close scrutiny of the sarcophagus fragments suggests that the surviving fabric is woven, rather than embroidered. The gold threads could have been inlaid over a ground of purple silk. ‘Inlay’ is formed with a gold thread that floats over finely woven sections of the fabric, usually in a twill weave and forming a pattern. However because of the 2<sup>nd</sup> century date it is more likely that the cloth was tapestry woven, that is, in discontinuous sections of pattern such as the Coptic roundel of the ‘Judgement of Paris’ with gold thread illustrated by Rutschowskaya (1990 p.112). According to JP Wild, in the late 2<sup>nd</sup> century there is hardly any evidence for inlay in Roman textiles – a

technique which developed with the new technology of the horizontal loom, with heddles to lift threads in complex patterns, rather than the earlier vertical, warp-weighted loom. Wild wrote: “All the damask silks from Late Roman burials are in 3/1 twill and all have Z spun warps, with a count of 40-50 warp threads, and 50-60 weft threads per cm” (Wild 2007, p.461). Our sample does not appear to be a damask-woven silk but the thread count accords well with the Pafos gold thread sample, which is *circa* 50 per cm.

### **Context of gold and purple silk cloths: historical background**

According to J Thorley the peaceful reign of Augustus allowed the silk route between China and Rome to flourish, with traders supplying Roman gold and silver, glass, and coral to the east in exchange for silk, in the long route across Parthia, Bactria and Kushan. Citing ancient authors such as Pliny, Martial, Quintilian and Juvenal, Thorley described how the heavy Chinese silk cloth was completely unravelled and rewoven in famous weaving workshops in Tyre, Sidon and Berytus in Syria into a much lighter fabric often combined with gold. The main cities on the trade route were Palmyra and Dura Europus, as well as Petra, Antioch, Zeugma and Damascus (Thorley 1971, pp.71, 76-79).

To Gleba it seemed that as part of the vast and influential trajectory of the silk route from China, the arts of weaving and embroidering with gold threads passed from one great city to another, travelling as a rule westward and northward (Gleba 2008a, p.69).

### **Archaeological comparisons**

Many traces of gold textiles have survived across the expanse of the Roman Empire from Britain in the west to Phrygia and Lydia in the east, and especially around the Black Sea. The dead were buried in costly clothing that often included gold and silk which was dyed purple. The catalogue of gold woven cloths set out by Gleba in 2008a demonstrates the wide scope of golden fabric from burial contexts. The areas with known examples of gold textiles most relevant for the Pafos sarcophagus textile seem to be Lydia in Asia Minor (Greenewalt & Majewski 1980) and Chersonessos on the Black Sea where Ukrainian researchers identified a two ply gold thread that may relate to thread produced in a Cypriot workshop (Gleba 2008a, p.66). Tarentum in South Italy was a production centre for purple dye, and a source of rich textiles in Hellenistic times as can be seen from elaborate Apulian vase-painting. Tyre on the coast of the Mediterranean has been suggested as another centre for both gold thread making and purple dye production. It seems likely that multiple centres of cloth production existed simultaneously over a long period.

### **Literary references**

Because of its shining, aristocratic connotations, gold cloth has appeared in poetry and prose throughout the long history of classical literature.

Descriptions of gold clothing and cloth cited by Gleba and Thorley refer to sources from Exodus in the Old Testament (Exodus 39.3), Homer (Hom Iliad.2.530, Hom. Odyssey 14.468-502) and Herodotus (History of the Peloponnesian War 3.47). In Roman imperial times, Tacitus, Pliny, and Suetonius speak of the emperors' gold clothing. Pliny recorded that Attalus III of Pergamum invented the practice of weaving fine strips of gold into a textile (Pliny, *Naturalis Historiae* xix. 4, cited by Gleba 2008a, pp.61-2). Both Vergil and Ovid refer to Phrygia in association with gold textiles (Vergil. *Aeneid* 3.483, Ovid *Metamorphoses* 6.616.)

Thieves in Apuleius' *Golden Ass* stole silk clothes woven with golden thread (4.7). In 169, Marcus Aurelius raised money for a war campaign by selling his wife's silk and golden clothes (*Scriptores Historiae Augustae* 17:4; *The Deified Aurelian* 29:3 and 45:2). This is a particularly interesting reference, because it is the same approximate date as the marble sarcophagus, and also because of the relationship of Marcus Aurelius to Pafos through the inscription found in the Pafos theatre (Green & Stennett 2002; Nicolaou 2003). Margarita Gleba summarised:

From all these references it is clear that although gold could be woven alone, more frequently it was interwoven with other materials, notably purple wool and silk. This association of the most precious metal with the most expensive dye and textile fibre produced a combination of luxury materials that would have been restricted only to the richest strata of society. (Gleba 2008a, pp.61-2).

### Conclusion

Although very small, the microscopic analysis of the samples from the Pafos sarcophagus gives incontrovertible evidence of a sophisticated luxury textile in the late 2<sup>nd</sup> century. This shows that Cyprus participated in the wealth of trade coming from the east. Dominic Janes demonstrated that the 'treasure society' of late antiquity invested complex meanings and symbolism in high value materials such as silk and gold, which were later adopted by Byzantine culture (Johns 2002, p.197). Purple, gold and silk fabrics continued to resonate in Cyprus as ecclesiastical vestments.

Virtually all gold textiles that survived have been found in funerary contexts, designating a wealthy family. At a time when the city of Pafos was flourishing and rich in public buildings, the person buried in the carved and decorated marble sarcophagus must have been important and high-ranking in society, and was most likely a woman (although the evidence is not conclusive). She/he was embedded in materials sourced from a vast network of trade across the known world of Europe and Asia.

Even at this tentative stage of analysis, a microscopic view, combined with knowledge of the sign of textiles, enables very tiny remnants to speak confidently in a museum context. Innovations in haptic and scanning technologies on the computer screen through an interactive wand or touch screen will soon permit the viewer to move around even a microscopic image in three dimensions, to comprehend and wonder at what was previously inaccessible and invisible.<sup>4</sup> The interpretation depends not only on the scholarly rigour of research but also on the viewer's breadth of reference and openness to an innovative view of the past. In placing such discoveries on view in the museum, new technologies of display can show the full detail and scope of archaeology in a social context and with a revelation of detail that would have been unimaginable to the early curators of the Nicholson Museum.

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<sup>4</sup>H Shidanshidi, F Naghdy, G Naghdy & D Wood Conroy, "3D geometric modelling of hand-woven textile", in IS&T/SPIE 20th Annual Symposium Electronic Imaging Science and Technology, 2008, pp. 31-41. This research was carried out at the University of Wollongong through Hooman Shidanshidi's Master of Engineering project, supervised across Engineering and Creative Arts.

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