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Does Colour make a Difference? The Aesthetics and Contexts of Wall-painting in the "Palace of Nestor" at Pylos

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Introduction

In his meticulous drawings of the wall paintings of "the Palace of Nestor", the artist Piet de Jong was "putting in in full detail the actual evidence"[1] he had been able to retrieve from the various fragments that had been recovered during the excavations of the palace at Ano Englianos under the direction of Carl W. Blegen (Blegen and Rawson 1966). In the resulting volume of the "frescoes" from the palace by M. Lang in 1969 (Lang 1969), about two percent of the large corpus of wall painting fragments were chosen for publication, and water-colour drawings were produced for a selection, some of which would go on to become highly significant for the study of Aegean painting and for our view of the aesthetics of Mycenaean polychromy. The large scale figures from the dump on the slope northwest of the palace,[2] the famous "Lyre player and bird" **(fig. 1)** from the Throne Room, and the "Battle Scene" from Hall 64 **(fig. 2)**, are just a few representative examples. Despite the fact that the current approach to the study of ancient wall paintings has changed dramatically since de Jong's and Lang's ambitious project – mainly due to the advanced possibilities offered by modern analytical and imaging techniques – their reconstructions, still constitute a primary source for the study of the Pylian wall paintings.

Nonetheless, the new data obtained through an extensive technological investigation of the wall paintings during recent years,[3] have allowed us to better evaluate their state of preservation, to properly document their structure and composition, and finally to retrieve significant elements from the paint surface that are not visible to the naked eye, regarding both colour and form. Comparison of the old reconstructions with the new evidence encourages us to reconsider established views on what Pylian paintings must have originally looked like, and to revisit the original iconography and polychromy of the decorative mural programs of the palace.

Fig. 6
"Male Figure with Dotted Robe" from the Palace of Nestor at Pylos, Room 5. Reconstruction by P. de Jong. Courtesy of the Department of Classics, University of Cincinnati and the American School of Classical Studies at Athens. Photo J. Stephens.

1. *I am putting in in full detail the actual evidence, and drawing in in pencil only.... The Deer with two Tails, I have abandoned as hopeless, but everything else is going to be done. The Nautilus frieze, the Deer scenes, seated ladies, Boars and horses are ready for colouring...*(Poste Restante, CHORA, Trifyllias, Sunday 1960). From a letter of Piet de Jong to Carl L. Blegen. The American School of Classical Studies Archives.

2. Lang 1969, 57Hnws, pl. N; 51Hnws, pl. O.

3. Brecoulaki et al. forthcoming a.

▲ **Fig. 1**
The "Lyre player and bird" from the Palace of Nestor at Pylos, Room 6. Reconstruction by P. de Jong. Courtesy of the Department of Classics, University of Cincinnati.

Reconstructing colour: Aesthetic preconceptions and actual evidence

Piet de Jong's water-colours were either accurate reproductions of the Pylos wall paintings in the state in which they were discovered (showing the losses, surface damages and possible colour alterations, **fig. 3**), or reconstructed drawings attempting to reproduce the original state, with additions and enhanced rendering of colours.[4] During the first stage of his work, de Jong would draw the preserved evidence in pencil, and during the second stage, he would fill the emerging forms with colour. His idea of what colours should look like on the less well preserved fragments, relied largely upon what was believed to represent a typical Mycenaean painter's palette: a simple and vivid colour scheme emerging essentially from the triad of primary colours red, blue and yellow, in a limited variety of tints, shades and tones. Such a "colour palette" corresponded indeed to the large group of fragments that were recovered from the dump on the slope northwest of the palace at Pylos[5] and other smaller dump deposits, as well as disparate fragments encased in rubble walls or sealed underneath floors, all of which attested to earlier phases of the palace's decoration[6]. Assuming that the same colour

4. Lang 1969, 9; figs 1, 2.

5. Lang 1969, 217-220.

6. Because of the stylistic and iconographic similarity between the so-called "Bull Leaper" from the Wine Magazine at Pylos (in a pit below the floor lever; Lang 1969, 77, pls. 24, 116, 124, C) and the Taureador Fresco from Knossos, Lang proposed a

Fig. 2
The "Battle Scene" from the Palace of Nestor at Pylos, Hall 64. Reconstruction by P. de Jong. Courtesy of the Department of Classics, University of Cincinnati and the American School of Classical Studies at Athens. Photo J. Stephens.

scheme was originally applied to the paintings still preserved on the walls of the palace or detached and dispersed on the floors nearby – notwithstanding the fact that they belonged to a subsequent phase of decoration current at the time of the destruction of the entire edifice in late LH IIIB – de Jong and Lang produced a collection of reconstructions that reflected a relatively homogeneous, monostylistic way of dealing with colour. Lang was convinced that "the apparently somber and subdued colouring of the palace plaster in comparison with that found outside, which was not burned, is certainly a result of the fire and not a chronological difference", although she recognized that "earlier material, especially from Crete shows a much greater use of the primary colours than this palace plaster seems to...".[7] It is true, that the dumped and reused painted fragments, which were protected from the impact of fire and had well-preserved colours, offered more reliable chromatic evidence than those found in the palace, which had been affected by heat, soot and water. The "reconstructed" colours of the wall paintings found in the palace were therefore deliberately enhanced to resemble those of the earlier phases, although the "actual evidence" suggested a different reality.

According to Lang "...the action of the fire seems to have changed some white to blue, much blue to lavender-green, some tan to brown, some yellow to grey or tan".[8] Similar observations on chromatic alterations of colours that resulted from burning had already been made by W. Lamb and G. Rodenwaldt in their publications of the wall paintings from the Palace at Mycenae. Lamb believed that the blue was burnt to violet or turned to green and that the red turned to brown, "producing a sobriety of effect that did not exist in the original".[9] The change of the colour red to brown was also reported by Rodenwaldt10. When de Jong produced his famous reconstruction of the "Lyre Player and Bird" from the Throne Room at Pylos **(fig. 1)**, he certainly felt compelled to consider the archaeologists' assumptions about colour alterations. While in his "accurate" reproduction of this composition, he documented the original colour of the background as dark tan **(fig. 3)**, in his "enhanced" reconstruction he chose a uniform bright red colour instead, displaying a strikingly different effect from the preserved

dating for this fragment to the LH IIIA. More concrete observations on the dating of the older material at Pylos - based on the evidence provided by new wall painting fragments recovered during the recent roof excavations at the palace (conducted under the direction of Sh. R. Stocker) - were presented by E. Egan ("Early Mycenaean wall paintings from the Palace of Nestor") at the conference organized by the Austrian Archaeological Institute at Athens (Social place and space in early Mycenaean Greece, October 5-8, 2016).

7. Lang 1969, 9.
8. Lang 1969, 8.
9. Lamb, 1921-1923, 162, 249.
10. Rodenwaldt 1921, 28.

Fig. 3
"Lyre player and bird" and "Shoulder of a bull", from the Palace of Nestor at Pylos, Room 6. Water colour with colours as preserved by P. de Jong. Courtesy of the Department of Classics, University of Cincinnati and the American School of Classical Studies at Athens. Photo J. Stephens.

original. Likewise, in his accurate water-colour of the "Battle Scene" from Hall 64 **(fig. 4)**, the purplish colour of the background, which documented the actual state of the fragments' painted surface[11], was converted into a uniform bright blue colour in the reconstruction **(fig. 2)**, recalling a typical Egyptian blue hue found on earlier material **(fig. 5)**. The refusal to recognize a more varied, or in any case different, "palette" on the fragments from the palace is also reflected in Lang's description of the procession scene from the Vestibule. On fragments 7H5, 9H5 and 12H5, a background of "burned lavender" – documented by de Jong in his accurate water-colours and clearly visible today as a purple colour **(figs. 6, 7)** – was considered to have originally been blue.[12] However, de Jong did not seem to have always followed Lang's suggested colour alterations. In the case of Room 43, for instance, although Lang had considered the dark brown of the hunting scene's background as an alteration of a green pigment,[13] de Jong chose to reconstruct it as tan[14].

The problem of describing and reconstructing the original colour on the fragments recovered from the palace was not limited, however, to hypothetical alterations from fire, but also to a certain difficulty in perceiving colours that did not belong to the traditional colour scheme of Mycenaean polychromy. The purplish spots, for example, visible, as the viewer sees it, at the top and on the left part on the

11. Lang 1969, plate M, 22 H 64 (actual state).
12. Lang 1969, 38-39.
13. Lang 1969, 41; "The dark background could not originally have been so obscure as it now is in either color or tone. It is likely that it was a green which was changed by the action of the fire".
14. Lang 1969, plate M, 17, 19-20 H 43.

Fig. 4
"Battle Scene" from the Palace of Nestor at Pylos, Hall 64. Water colour with colours as preserved by P. de Jong. Courtesy of the Department of Classics. After Lang 1969, pl. M, 22H64.

background of the "Lyre player and bird", as well as on the upper band on the right wing of the bird **(fig. 8)**, were not considered at all in the reconstruction. The background, despite the fact that it clearly changes to a different colour in the area where the bird is depicted, was entirely filled with red in the reconstructed water-colour **(fig. 1)**; the top and upper border were left white; and the band on the bird's wing was reconstructed in tan, following Lang's description15, although de Jong in his accurate drawing has given it a light pinkish hue **(fig. 3)**. Likewise, on the preserved purple colour on the stripes of the player's garment **(fig. 9)**, Lang saw "stripes of white", while de Jong in his accurate drawing gave the impression that the "white stripes" are areas where the original paint layer had vanished, leaving a greyish ghost underneath **(fig. 3)**. Furthermore, the well preserved purple colour on the background of fragment 19C6, depicting a shoulder of a bull[16] and associated with the "Lyre player and bird" in de Jong's drawing **(fig. 3)**, although it is obviously different in tint to the preserved brownish-tan background of the other fragments, was also thought to have originally been red. In other words, wherever purple was present, it had to become either blue, red, or nothing.

Investigating the materials: A new approach towards colour interpretation

In situ microscopic examination of the wall paintings of the palace, scientific analysis of their painting materials, and replications performed on painted calcite-based mortar testers using historical pigments similar in chemical composition to the ones identified on the wall paintings,[17] suggested that both the extent and the nature of the colour changes needs to be considered to a greater degree than was possible for Lang and de Jong. That the effect of fire has caused subdued tones on a number of painted fragments is certainly true. The grey veil of soot alters the vividness of colours[18] and may provoke a change in its saturation and value. The surface of burnt calcite often shows irregular grey and black shades. High temperatures may also cause damage to the internal cohesion of the paint layer and degrade the chemical structure and physical bonds between the pigments and the binder, as well as to their adhesion to the

15. Lang 1969, 80; "The wings appear to have had four brown bands, two above and two below".

16. Lang 1969, 109-110, pls. 53, 125.

17. Over three hundred colour spots have been analysed *in situ* on various fragments from the palace with non-destructive techniques, and more than one hundred microsamples have been analysed in the laboratory, allowing us to evaluate in a comprehensive and representative way the gamut of materials and techniques applied to the walls of the "Palace of Nestor" (Brecoulaki et al. forthcoming a).

18. Baraldi and Bensi 2006, 15-16.

calcite based plaster. Consequently, the paint layer may flake, crack, partially decompose or become entirely pulverized and fall. Let us now consider in more detail the impact of heating on the pigments that were identified on the wall paintings from the palace.

In all instances where red, yellow and tan hues were examined, natural iron based ochres were identified, with goethite and hematite as the major colouring components. Occasionally other iron oxide minerals were present, such as bernalite, magemate and magnetite[19]. Hematite is a red anhydrous iron oxide, thermally stable up to temperatures of 1200°C in air. The reduction of hematite to magnetite, a black iron oxide, may occur at elevated temperatures and pressures only in a reducing and stable atmosphere, where the level of oxygen is dramatically diminished[20]. The partial transformation of hematite to magnetite has been reported on burnt Gallo-Roman wall paintings from Vallon[21], where the layer of red ochre either shows a local darkening of its surface, or the creation of a black layer between the layer of plaster and the paint film due to reducing conditions. Such alterations, however, do not seem to affect the entire top paint layer, where it is still possible to distinguish the original colour. The most commonly attested decomposition is that of goethite, a yellow to brown iron oxide hydroxide, which is transformed to anhydrous iron oxide (hematite) at temperatures between 140°C and 500°C. The thermal transformation of goethite to hematite has been exploited since antiquity for the production of red iron oxide from yellow earth, and such transformations have frequently been documented on wall paintings from Pompeii and Herculaneum[22]. It is possible that a goethite that has been transformed to hematite may be further decomposed to magnetite in a reducing atmosphere.

Fig. 5
"Bull Leaper" from the Palace of Nestor at Pylos, Wine Magazine (Room 105). Reconstruction by P. de Jong. Courtesy of the Department of Classics, University of Cincinnati and the American School of Classical Studies at Athens. Photo J. Stephens.

What we may deduce from the aforementioned data is that all the fragments in the palace where yellow hues are still preserved should not be considered as having been seriously affected by high temperatures, otherwise a partial or complete transformation of goethite to hematite would have occurred, producing reddish hues. Equally we should consider that the uniform tan or brownish hues that actually exist on the fragments do not necessarily owe their colouration to a thermal transformation of hematite – unless the presence of magnetite is confirmed[23] – and therefore they should not be reconstructed as bright red. It is possible that they may have originally looked brighter and lighter, but in terms of hue they must have remained rather stable. In most of the samples from the palace with a dark brown paint layer hitherto examined, the association of iron and manganese oxides (pyrolusite) suggests the use of umber[24]. It seems therefore, that darker hues of

Fig. 7
"Male Figure with Psi-Decorated Robe" from the Palace of Nestor at Pylos, Room 5. Reconstruction by P. de Jong. Courtesy of the Department of Classics, University of Cincinnati and the American School of Classical Studies at Athens. Photo J. Stephens.

19. X-Ray Diffraction analysis were performed at the University of Chania by V. Perdikatsis (Brecoulaki et al. forthcoming a).
20. Matthews 1976.
21. Bearat 1993.
22. Baraldi and Bensi 2006, 22, 25. The temperature at which this transformation occurs depends on the type of iron oxide hydroxide, its crystallinity, and the presence of chemical impurities (Helwig 2007, 56).
23. Magnetite however, may also be part of the original composition of a red or brown ochre together with other iron oxides (hematite and goethite), quartz, gypsum, anhydrite, calcite and clays.
24. Brecoulaki et al. forthcoming.

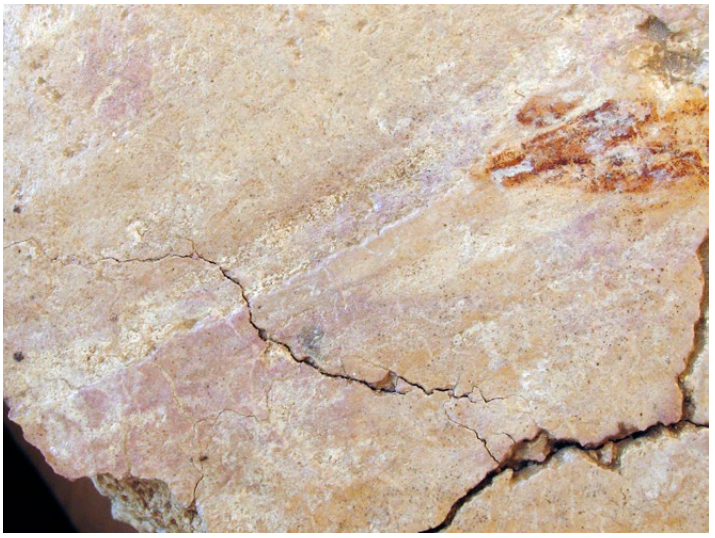


Fig. 8
"Lyre player and bird" from the Palace of Nestor at Pylos, Room 6. Detail of purplish colour of the background. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

Fig. 9
"Lyre player and bird" from the Palace of Nestor at Pylos, Room 6. Detail of purple colour on the stripes of the player's garment. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

brown on the fragments of the palace may also reflect a deliberate choice by the painter and not an alteration due to fire.

The only blue identified on both the earlier material and on the fragments of the late palace is the well known Egyptian blue. However, its use on the paintings that were still in place at the time of the destruction is significantly more restricted than on the earlier material. Lang noted that Egyptian blue "does not seem to be the predominant background colour in the material found inside the palace, as it is in the fragments found in the northwest slope dump, which should indicate that the latest trend before the destruction was away from the blue backgrounds". She considered however that "the apparent infrequency of blue in the palace may be caused in part by the susceptibility of the colour to the action of the fire and its consequent unrecognizability"[25].

Egyptian blue is an artificial calcium copper silicate, stable in all media. Much research has been conducted on this pigment, both regarding its manufacturing process and its uses, which is attested from the third millennium BC, in Egypt[26]. Egyptian blue can be dissolved in hydrofluoric acid and it decomposes when heated to temperatures above 1050°C to form a mixture of cupric and cuprous oxides[27]. Nonetheless, in the current literature no colour alteration of Egyptian blue on burnt wall paintings has ever been reported[28]. A degradation process of Egyptian blue causing a change of its original blue colour to green, has been investigated in depth in recent decades[29], in order to re-evaluate more accurately colour alteration and its aesthetic damage to Egyptian polychromy[30].The deterioration process that affects the

25. Lang 1969, 43.

26. Scott 2016.

27. Riederer 1997. Problems surrounding on process that affects its chemical compositionrom the Roman period. acture and its uses since the third m

28. Baraldi and Bensi 2006, 22; Bearat 1993.

29. Schiegl et al. 1992.

30. Green 2001; Haigh 2013.

chemical composition of Egyptian blue, resulting in the formation of the green pigment atacamite, is called "Copper Chloride Cancer", and it develops in three consecutive stages: the devitrification of the glass phase in Egyptian blue; the migration of chlorine-bearing solutions leading to reaction with copper in the residual glass; and the reaction of copper and chlorine bearing solutions with calcite, allowing the precipitation of basic copper chloride to form atacamite or paratacamite (copper chloride based minerals).[31] While Egyptian monuments are known to contain considerable amounts of sodium chloride – which is the necessary agent for the final transformation of Egyptian blue to copper chloride minerals – this is not the case with monuments in Greece. In fact, Egyptian blue on both Greek and Roman wall paintings is usually very well preserved, as far as colour is concerned. It is possible that because of the large pigment grains it contains in order to maximize its hue, Egyptian blue is more susceptible than other pigments with lower grain sizes (such as ochres for example) to become detached from the plaster and flake or fall. Another factor that is likely to cause a darkening of its original colour is an alteration in the original organic binder that assures cohesion in the paint layer. Discolorations due to the ageing of gum Arabic have been observed on Egyptian coffins in the British Museum collections.[32] The hypothetical transformation of Egyptian blue's original colour to "lavender" or purple due to the effect of fire on the fragments found inside the palace, as suggested by Lang, may therefore not be justified. How do we deal then with all the purple hues that still exist on an extensive number of fragments and originally belonged to painted compositions that decorated the walls of the palace right before it was destroyed?

Purple colour of organic origin may derive either from shellfish ("murex") or lichens ("orchil").[33] An exhaustive literature already exists on purple dye, its methods of production and falsification, and the symbolic values with which it was endowed with during its diachronic history as a textile dye, from the Bronze Age to the end of the Byzantine empire. Notwithstanding the extensive evidence available for the use of purple in the dyeing industry, already attested in Crete as early as the second millennium BC,[34] very little is known about its applications as a painting material. The first occurrence of murex purple on a free sample of a purple material has been documented at Thera, and the authors had associated its use with cosmetics.[35] Moreover, recent analysis of the painting materials on the wall paintings at Akrotiri of Thera identified conchylian purple dyestuff in the form of a pigment.[36] This is the first known application of murex purple in ancient painting, and it may be rightly claimed as an Aegean invention, since this pigment is not attested on earlier Egyptian monuments37. It seems therefore that purple hues deliberately produced with conchylian purple, and not through a mixture of minerals such as red ochre and Egyptian blue, were included in the Theran painters' palette sometime before the middle of the 17th century BC, in order to highlight particular details. It is interesting to note that the use of purple on the wall decorations of Akrotiri is parsimonious, restricted to the walls of Xeste 3 only, a public building with a religious character[38]. On the wall painting of the Great

31. Schiegl et al. 1989, 398.

32. Daniels 2004.

33. Casselman and Tereda 2012.

34. Betancourt et al. 2012; Brogan et al. 2012; Burke 1999; Militello 2007; Nosch 2004; Reese 19
87; Ruscillo 2006.

35. Aloupi et al. 2000.

36. Sotiropoulou 2004; Sotiropoulou and Karapanagiotis 2006; Sotiropoulou et al. 2012.

37. Lee and Quirke 2000, 113.

38. Vlachopoulos 2008; Vlachopoulos 2010; Vlachopoulos 2015.

Goddess (Xeste 3, first floor, room 3a), purple was chosen to depict the petals of the crocuses and to fill the upper part of the flounced skirt of the young girl facing the Goddess. In the "Procession of women" (Xeste 3, first floor, room 3b), both the sleeve of the bodice and the hood of the "Woman with the basket" have purple bands. In a Mycenaean context, the only occurrence of purplish hues on wall paintings comes from Gla, on the horizontal bands of a miniature architectural construction (deposit outside Room 1)[39]. The extensive use of purplish hues at the palace at Pylos is therefore unusual and remains unique in the general context of Aegean painting. It should be noted, however, that purple was not applied in all the rooms of the palace. From the evidence of the preserved fragments, there seems to be a clear preference for this colour in the Throne Room, its Vestibule and Hall 64, where it was primarily used on the backgrounds and accessorily to indicate details. Although purple hues are still well preserved on numerous wall painting fragments from the palace (ranging from pink to lavender and red-violet), a large number of burnt plaster fragments exist where purple paint layers now appear grey, with scanty irregular pinkish or purple spots. Such a dramatic alteration of the original colour may be entirely justified, considering that organic dyes and murex purple in particular, when heated to 150°C, turn to grey and decomposes entirely in temperatures over 200°C. However, organic purple does not change its colour to blue from thermal treatment or any other possible factor responsible for a chemical or physical alteration of its original composition.

As Lang noted, the Egyptian blue background did not seem prevalent in the paintings found inside the palace. What she could not hypothesize, though – considering the time when the Pylos paintings were discovered and studied – was that Egyptian blue's bright colour might have been replaced by purple intentionally, in order to generate a more nuanced and less saturated chromatic harmony. After analysing a representative number of samples with purplish hues from the palace, it is possible to conclude that murex purple, and perhaps also another purple of organic origin,[40] formed part of the palette of a workshop active at the palace of Pylos during the last phase of its wall decoration. We now know that wherever pinkish and purplish hues are still preserved on the fragments **(fig. 10)**, they should be reconstructed as such, while on the damaged surfaces of burnt plaster, grey areas should be suspected to have originally been painted in purple.

Another unusual colour for a typical Mycenaean "palette" is light green, composed of natural copper-based minerals.[41] The identification of malachite, reported by Heaton,[42] on the "Shield painting" from the Old Palace at Tiryns, has so far been considered a unique example of the use of a natural copper green mineral in Mycenaean wall painting. However, Brysbaert and Perdiktsis[43] have recently suggested that the presence of malachite on the Tiryns painting might be due to the aforementioned deterioration process of Egyptian blue, a hypothesis that cannot be justified, since Egyptian blue's decomposition is likely to produce copper chloride minerals only, and not malachite (a copper carbonate). The presence of dark green hues on fragments from the palace at Pylos was mentioned by Lang only in her description of what

39. Boulotis 2015, 377, fig. 9.

40. The other possible purple dye that may have been used together with murex purple is orchil (see note 33). Samples are under investigation by M. P. Colombini at the Laboratorio di Chimica, University of Pisa.

41. M. Peters' hypothesis that green copper minerals were purposefully avoided as painting materials because of their association with the destructive process of oxidation and decay of azurite, seems rather unlikely (Peters 2008, 200-203).

42. Heaton in Rodenwald 1912, 216.

43. Brysbaert and Perdikatsis 2008, 425.

seems to represent the vegetation amidst which the Hunting Scene of room 43 takes place.[44] She recognized traces of green together with "added black" along the lines of the fronds on fragment 13C43, and she suggested that "the common green, when burnt turned brownish-black". Indeed, when malachite is heated in temperatures up to 300°C, carbon dioxide is given off, forming black cupric oxide tenorite.[45] However, in all the areas where dark brown hues were examined, copper was never detected as a major element, thus excluding the possibility of a decomposed natural copper green pigment. Instead, the presence of manganese and iron in the paint layer confirmed the use of umber, a natural brown earth pigment composed of iron and manganese oxides.[46] Another small fragment preserving a greenish hue comes from outside the northeast wall of the palace, described by Lang as "the hinder quarters of a greenish animal with black outlines, ingrowing hairs and vertical dashes to indicate hair".[47] The examination of this fragment confirmed that the production of the greenish hue was achieved through a superimposition of a layer of yellow ochre on top of a layer of Egyptian blue.[48] During the recent study and documentation of the numerous fragments from the palace, it was possible to detect traces of poorly preserved, light green hues. The fragments are from compositions that originally decorated the walls of the Throne Room **(fig. 11)**, and a large fragment was recovered from Hall 64, possibly depicting elements of flora **(fig. 12)** In all of the samples examined, analytical data confirmed the use of natural copper based minerals, including malachite, atacamite and chrysocolla.[49] Because of their poor state of preservation and of Lang's assumption that light green hues were an alteration product of Egyptian blue, they were overlooked and omitted from the artists' palette, as was the case with the purplish hues.

The role of colour: Aesthetic conceptions, painters and "patrons" at the late palace

The recent re-evaluation of colour on the painted fragments at Ano Eglianos offers a new perspective on Mycenaean polychromy, and raises questions about the cultural and social context in which the final wall-painting program at the palace was conceived and produced. What becomes clear from our scientific and visual investigation is that a different language of colour was introduced into the decoration of the late palace at a period prior to its destruction, in late LH IIIB. On fragments coming from earlier contexts, the chromatic harmony generated either by the dominance of blue, red and yellow as a background or by the association of blue, red, and yellow in figural motifs on a white background, represents a well established and coherent colour system built mainly on the flat tints of the primaries. Green hues were occasionally produced by mixing Egyptian blue with yellow ochre (either through physical blending or superimposition), while pinkish hues were obtained by mixing calcium carbonate and red ochre. On the numerous fragments coming from the palace's latest decorative phase, it is possible to observe that at least one workshop introduced new materials and techniques, and achieved new associations of colours by replacing the "direct charm" of the primaries with the more sophisticated contrast of juxtaposed complementaries (in particular yellow/tan and purple). The "identity" of bright Egyptian blue

44. Lang 1969, 128.

45. Gettens et al. 1993, 187; Frost et al. 2002, 136-38.

46. Brecoulaki et al. forthcoming a.

47. Lang 1969, 108.

48. Brecoulaki et al. forthcoming a. Mixtures of Egyptian blue and yellow ochre to produce greenish hues have been reported also at Akrotiri, Thera (Perdikatsis et al. 2000) and on the mainland (Brysbaert, Perdikatsis 2008; Brecoulaki et al. forthcoming b).

49. Brecoulaki 2014, 13-14, fig. 6.

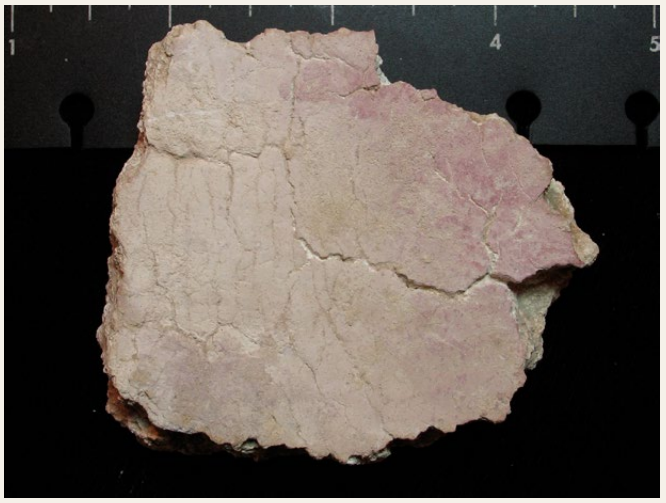


Fig. 10
Fragment with purple colour from the Palace of Nestor at Pylos, Room 6. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

Fig. 11
Fragment with natural copper based green pigment from the Palace of Nesetor at Pylos, Room 6. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

Fig. 12
Fragment with natural copper based green pigment from the Palace of Nestor at Pylos, Hall 64. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

▲ **Fig. 13**
"Naval Scene with Three Overlapping ships" from the Palace of Nestor at Pylos, Hall 64. Courtesy of the Department of Classics, University of Cincinnati. Reconstruction R. Robertson (2014). After Brecoulaki et al. 2015, fig. 8.

shifted to purple, and saturated tones of yellow and red shifted to tan and brown. Natural green copper based minerals were employed to depict vegetation, and brown umber to generate dark backgrounds50. By privileging the harmony of close tones, red-brownish bodies emerged from tan backgrounds[51] and paint layers of close hues (purple and blue) were superimposed, breaking down the uniformity and flatness of the abstract background[52]. It is possible that this new "colour iconography" may have served as a vehicle for the expression of a distinct style in the palace's painted decoration, in spite of the apparent persistence of themes drawn from a common Mycenaean "repository", that often traced their origin back to remote Minoan figurative repertories[53].

The most extensive use of purple is attested on fragments recovered from Hall 64, probably due to the preservation of a significant amount of plaster in this room. Purple was used as a background colour, both to suggest the sea on the recently reconstructed "Naval scene"[54] **(fig. 13)** and to produce an abstract field for the figurative composition on the "Battle scene" **(fig. 14)**. In the "Naval scene", three ships are painted directly onto the white surface of a calcite-based plaster, using yellowish and brownish hues. Most of the fragments suffered from the effect of fire, and a greyish hue dominates the area of the background. The original purple colour had turned to grey, but irregular pinkish and purple areas are preserved, enough to enable the original colour's reconstruction **(fig. 15)**. The chromatic harmony of the entire composition is built on the relationship of purplish and brownish-tan hues. Comparison of the colour scheme adopted for the "Naval Scene" with the bright blue background with thick white and yellow paint on the fragments depicting a sailing ship from an earlier context in Pylos[55] **(fig. 16)**, allows us to visualize the differences in colour sensibility more concretely. The conventional blue background to depict the sea is also used on all the other ship representations hitherto revealed on Mycenaean wall paintings56. In fact, there is no differentiation between the use of a uniform blue colour as a background for a narrative and the use of blue as a narrative element per se (the sea). The choice of purple as a background colour in the "Naval Scene" from Hall 64 may have worked in the same way as the blue colour did, the only difference being

50. Lang 1969, 17, 19-20H43, 13C43, pl. M.
51. Lang 1969, 5H5, pl. N.
52. Lang 1969, 22H64, pl. M.
53. Immerwahr 1990; Chapin 2014; Kramer-Hajos 2016, 136.
54. Brecoulaki 2014, 10-12, figs. 3-5; Brecoulaki et al. 2015.
55. Brecoulaki et al. 2015, 281, figs. 14-15.
56. For the Iklaina ship see Cosmopoulos 2015; a Mycenaean galley on a blue background is also depicted on the wall paintings from Orchomenos (personal communication by J. Fappas), originally reconstructed as a building (Spyropoulos 2015).

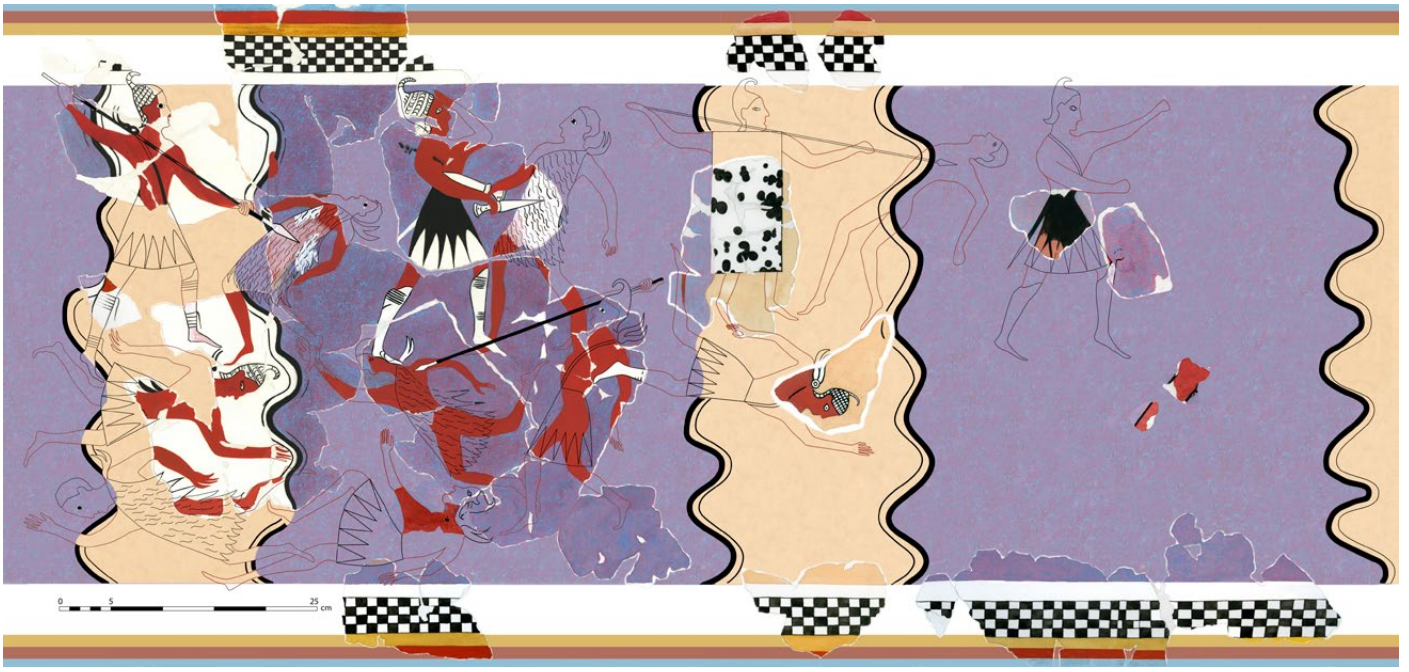


Fig. 14
"Battle Scene" from the Palace of Nestor at Pylos, Hall 64. Courtesy of the Department of Classics, University of Cincinnati. Reconstruction R. Robertson (2015).

that of visual impact. However, we may not exclude the possibility of an artistic intention that would have wished to suggest, through this specific hue, a more "realistic" rendering of the sea's purplish surface at sunset.

Murex purple was also attested on the background of the well-known "Battle Scene" from Hall 64, but the production of this background is different from that in the "Naval Scene". Here, a layer of purple mixed with grains of black was applied as an underpaint, on top of which a second layer of Egyptian blue was superimposed. The layer of blue did not entirely overlap with the purple underneath, allowing the creation of an optical mixture between blue and purple **(fig. 17)**. The resulting effect was of a much darker hue than that of the Naval Scene's "purple sea". This dark purple background changes along wavy vertical black lines that enclose a narrow tan area (see recent reconstruction in **fig. 14**). Due to the significant loss of the paint layer in this part of the composition, de Jong reconstructed the narrow tan area as white, producing a colour association similar to the background of the so-called "Tarzans", recovered from the dump on the North West slope of the hill[57]. The reconstructed background of the "Battle Scene" was therefore restored as bright blue and white, instead of purple and tan, leading Lang to hypothesize that the "Battle Scene" was earlier than other wall paintings of the palace, because of its chromatic affinities with fragments from the northwest slope dump[58]. Nonetheless, as discussed above, the use of purple as a background colour was not restricted to Hall 64. The background of the "Lyre player and Bird" from the Throne Room, as well as the "Procession" from the Vestibule, also presented the same concept of polychromy, with alternating panels of purple and tan or brown. Moreover, purple was used to indicate details of coloured garments (as on the wall paintings from Xeste discussed above), visible on both the skirt of the Lyre player and the tunics of the hunters from Room 43 and 48[59] **(fig. 18)**.

57. Lang 1969, 31Hnws, pl. N.
58. Lang 1969, 43.
59. De Jong in his reconstruction has indicated a purplish colour, but Lang describes it as white (Lang 1969, 69-70 and pl. M, 17,19-20 H43, 13C43, 21H48).

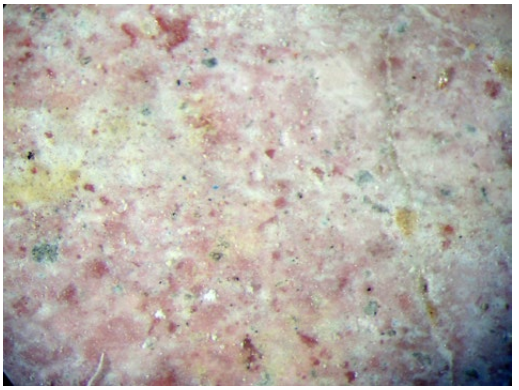


Fig. 15
"Naval Scene with Three Overlapping ships" from the Palace of Nestor at Pylos, Hall 64. Top surface of purple paint layer on the background. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

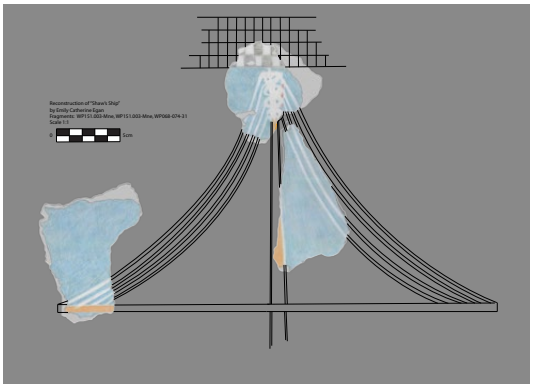
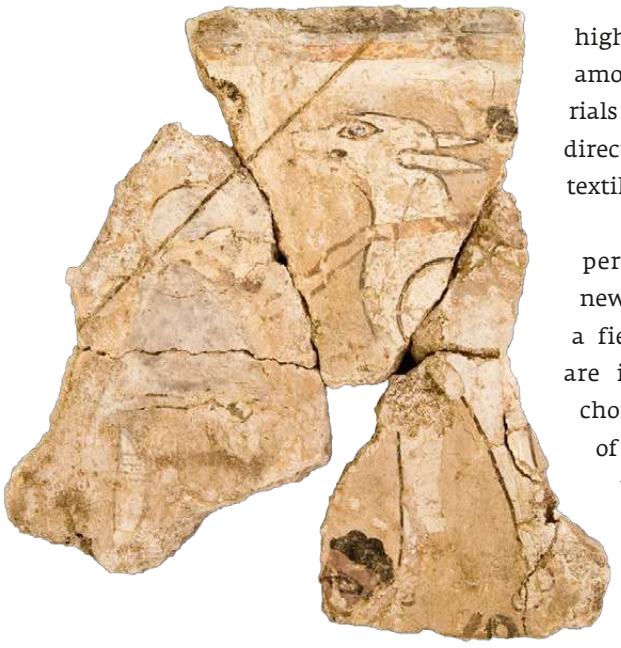


Fig. 16
Fragment with part of a beam and rigging from the Palace of Nestor at Pylos, Room 31. Courtesy of the Department of Classics, University of Cincinnati. Reconstruction E. C. Egan (2015). After Brecoulaki et al. 2015, fig. 14.

The purple colour produced from marine molluscs has primarily served as a textile dye. The earliest known deposits of murex shells on Crete60 (on the island of Kouphonisi, at Palaikastro and Kommos) suggest the extraction of purple in order to dye woollen textiles.[61] During the early Mycenaean period, evidence for a purple dye manufacture comes from Mitrou[62] and Pefkakia[63]. The possible involvement of the ruler himself in textile industry may be implied by occurrences of the adjective *wa-na-ka-te-ro*, suggesting that the significance of this production was not merely economic but political also.[64] Based on Linear B evidence, it seems possible that the word *po-pu-ra* in the tablets may refer to purple produced from marine molluscs (rather than from cheaper plant dyes exploited by the Mycenaean dyers[65]) and that purple dyed textiles are associated with the *wanax*[66]. D. Ruscillo had examined all shells recovered from the excavations conducted by Blegen and Rawson in the area of the Belvedere at the Palace of Pylos and she was able to identify in all of the murex remains the *Murex trunculus* species, known for producing the purple dye used for dying textiles[67]. While there is no evidence suggesting the existence of a textile dying industry at Englianos, Ruscillo suggested that the Murex that had been brought up to the site was sufficient for the extraction of enough purple pigment for a limited use on wall-paintings. The present state of our documentation does not allow us to draw conclusions about the provenance of the purple dye that was used at the Palace. It could have been imported in the form of pigment (as was the sample identified at Akrotiri by E. Aloupi[68]), or it could have been produced *in situ* from fresh molluscs by Pylian craftsmen associated with painters' workshops. At any rate, it is important to consider is that purple seems to have been a colour with a

Fig. 17
"Battle Scene" from the Palace of Nestor at Pylos, Hall 64. Top surface of purple and blue paint layer on the background. Courtesy of the Department of Classics, University of Cincinnati. Photo H. Brecoulaki.

60. See note 34.
61. Nosch 2004, Nosch 2014.
62. Vykukal 2011.
63. Pantou 2010; Kramer-Hajos 2016, 12.
64. Petrakis 2012, 84.
65. Nosch 2014, 7.
66. The Knossos tablets refer to *po-pu-ro2* which has been interpreted as 'purple', and to *po-pu-re-ja* possibly meaning 'female purple dyers' (Palmer 1963, 292, 297, 447). The term *wa-na-ka-te-ro-po-pu-re* in the Knossos tablets likely indicates textiles of 'purple befitting the *wanax* or king' (Burke 1999); on the involvement of the palatial elite in the purple production process, see Ruscillo 2005.
67. Ruscillo 2010.
68. Aloupi et al. 2000.



▲ **Fig. 18**
"Men and Dogs" from the Palace of Nestor at Pylos, Room 48. Remains of purple colour on the hunter's tunic. Courtesy of the Department of Classics, University of Cincinnati. Photo J. Stephens.

high hierarchical value among colouring materials in Aegean societies, directly associated with textile dying.

Although experimentation with new media is certainly a field where painters are involved, and the choice and application of pigments is part of their artistry's micro-context, the local context of colour-ideas and perceptions also affects the artist and his production. Adoption of purple in the wall decoration of the latest phase of the palace may have been incited by a more generalized fashion for purple textiles, perhaps as an expression of the ruling elite's taste for luxury,[69] and could therefore be considered as the outcome of a collective aesthetic rather than as an autonomous artistic phenomenon.

Conclusion

Wall painting is a vital category of material culture that enhances our understanding of Mycenaean societies, but it did not constitute part of the exchange economy, as did other movable artefacts. However, certain materials used as pigments may have been products of craft industries and perhaps also part of trade networks. It is possible that purple dye was imported into Pylos from other centres where a purple industry flourished during the LH IIIB on the mainland, the Cyclades or Crete. It is possible that the noticeable reduction in the use of Egyptian blue might be linked to a difficulty in the procurement of this synthetic pigment, which was not manufactured at Pylos but was an imported material[70]. It is also possible that an artistic idiosyncrasy was responsible for the introduction of innovative colour associations in the decorative scheme of the late palace. Due to the fragmentation of the painting corpus at Pylos, the loss of other polychrome artefacts - such as decorated inlaid furniture, dyed textiles and clothing – and the lack of related textual evidence that would enable us to follow the historical contingency of colour perceptions in this specific historical and cultural framework, we cannot expect to arrive at a plausible understanding of the reasons why new materials and different colour hierarchies were introduced in the palace's painted decoration. It is possible that colour not only served as an artistic expression of aesthetic statement, but that it also played a role in signalling aspects of identity such as status and power. The problem of paint deterioration and pigment alteration is crucial in this regard, since the colours we see today are often different from the ones the Mycenaeans would have viewed. These changes have certainly affected the way iconographies have been reconstructed, leading - as we saw - to misperceptions and erroneous interpretations. While technology now allows a more accurate documentation and evaluation of ancient paintings and polychromy, we still need to be aware of our limitations, imposed both by the partial preservation of the archaeological material, and by our own (inevitable) aesthetic preconceptions as modern viewers.

69. Perfumed oil at Pylos "as an ointment for robes" (Shelmerdine 2008, 106) may have been used on purple dyed textiles in order to eliminate the pungent odour of the molluscs, a disadvantage overlooked by those who prized it as a luxury item (Pliny, *Nat. Hist.* 9.127).

70. Considering the fact that very few imported Orientalia have been hitherto found at Pylos (Cline 2015, 209; on glass beads from Pylos probably imported from Egypt see Polykreti et al. 2011), we may hypothesize that this pigment may not have been imported to Pylos directly from Egypt, but perhaps through other networks of exchange between palatial centres on the Greek mainland.