Forming the Image

Approaches to Painting at Ayia Irini, Kea and Tell el-Dab^{c}a

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Abstract

This paper compares the techniques and approaches used in painting a frieze at two different sites: Ayia Irini, on the Cycladic island of Kea, and Palace F at Tell el-Dab^{c}a in the Nile Delta. Preparation of the surface (plaster) and the issue of how the pigments were bonded to the wall (*fresco* versus *secco*) are briefly considered. This is followed by an examination of the process of painting: how each image was planned, what pigments were used for what part of the image, the order in which the paints were applied, how they were manipulated to vary hue, tone and intensity, and what final touches were used to delineate form and detail. This comparative study of the process of painting provides insights into the network of artistic interconnections. Despite differences in location, architectural context, relative scale, and probably date, it is clear that the artists of these two friezes belonged to the same tradition of craftsmanship, not only in their use of materials and techniques, but, significantly, in their approaches to forming the image.

Keywords: wall paintings; frieze; Kea; Tell el-Dab^{c}a; techniques; process.

One of the advantages of working intensively on wall paintings from different sites is the opportunity this provides to compare how artists formed their images: what approaches and techniques they used to make a painting. This paper focuses on the Miniature Frieze from the Northeast Bastion at Ayia Irini on Kea[2] and the Hunt Frieze from Palace F at Tell el-Dab^{c}a.[3] Both were executed in Aegean mode, yet both

1 London; email: lyviamorgan@aol.com.

2 Morgan in press; cf. Morgan 1998; Morgan 2013.

3 Marinatos 2000; Morgan 2004; Marinatos – Morgan 2005; Morgan 2006; Marinatos 2010; Morgan 2010a; Morgan 2010b; Morgan, in: Bietak *et al.* 2012/2013, 139–142.

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were far from the pivotal centre of Aegean culture, Knossos on Crete. Both friezes would have covered several walls, at Ayia Irini all four, at Tell el-Dabᶜa perhaps three, on the fourth most likely being the Taureadors Frieze.[4] Both were found in hundreds of small fragments, making it necessary to conceptualize the scenes in reconstructions in order to make sense of them. The Kea fragments had fallen to the ground close to their walls, so the architectural context can be visualized. The Tell el-Dabᶜa fragments were thrown out near the entrance to the palace, mixed with other paintings in a dump, so we can only surmise where the frieze lay, perhaps near, in, or above the throne room.

Of course, the context differs: Ayia Irini was a fortified Cycladic town and, uniquely, these paintings were inside a bastion; Tell el-Dabᶜa was an Egyptian palatial complex and Palace F was a small ceremonial palace.[5] Yet both appear to have had a formal function: banqueting in the bastion, and perhaps in both the reception of foreign visitors. Significantly, both sites were harbours, outward looking rather than inward, and these two buildings were strategically placed to reflect that role.[6]

Physically, the paintings differ in one significant factor: their scale. The Kea frieze was c. 50–55cm high and the numerous male figures were 8–9cm; the Tell el-Dabᶜa frieze was c. 88cm high and the few men were around 28cm tall.[7] Space and the size of figures have implications for the planning of scenes, so there are significant differences between approaches to large-scale wall paintings and narrow friezes.[8] Yet, as both these paintings took the format of a narrow frieze, they provide a good case study for comparative techniques and approaches to image formation.

I begin by briefly considering preparation and approach: plaster and the question of *fresco* versus *secco*. These issues have been much discussed.[9] However, technical studies of wall paintings tend to deal with samples from across a site, in other words from different paintings in different contexts and sometimes even of different dates. It is clear to me, however, that approaches to forming images vary according to the area of wall to be covered and the scale of the elements in the picture, not to mention the particular team involved in the process. In this paper, I examine the technical approaches to forming images in two specific friezes, one from each site. The main part of the paper examines how the image was planned and the paints applied.

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4 Bietak *et al.* 2007.

5 See Bietak 2005; Bietak 2007; Bietak 2013 (with reconstructed plans of the palace).

6 Cf. Morgan 2007; for the position of Palace F: Bietak 2010, 14, figs. 2.2–2.3; Bietak 2013, fig. 1.

7 In the miniature paintings from the Cyclades and Crete, dating to LM IA, figures range from 6–9cm (Thera: Morgan 1988; Doumas 1992, pls. 26–48; Televantou 1994; Tylissos: Shaw 1972; Knossos: Hood 2005, 63–64). In early Mycenaean paintings from the mainland, dating to LH IIIA, figures are c. 20–25cm (Mycenae: Tournavitou 2015; Argos: Tournavitou – Brecoulaki 2015). The Tell el-Dabᶜa frieze, between the two in date (equivalent to LM IB/LH IIA), is comparable to the latter in scale.

8 At Akrotiri on Thera, for example, those working on the large-scale paintings have identified the use of incised lines (e.g. Asimenos 1978, 575), preliminary wash brushstrokes preceding the sketch beneath the fine lime slip (Angelidis *et al.* 2018), and perhaps the use of templates (Birtacha – Zacharioudakis 2000) for the planning stages, none of which is evident in the miniature paintings of the West House.

9 Specifically on Tell el-Dabᶜa: Seeber 2000; Brysbaert 2002; Brysbaert 2007; Winkels 2007.

1. Preparing the Surface

As with all Aegean murals, the plaster of both paintings was lime, despite the fact that at Ayia Irini the walls were of stone, at Tell el-Dabᶜa mud-brick. An initial layer of mud mixed with straw and tiny stones was applied to smooth the irregular surface of the wall, and striations (Kea) or keying ridges (Tell el-Dabᶜa) on the backs of the plaster were made for anchorage.[10] The plaster is in two main layers: a thicker core and a thinner top layer of 0.5–0.7cm (Kea) or 0.4–0.5cm (Tell el-Dabᶜa). A fine lime slip was then applied in preparation for the reception of the paints.[11]

At both sites, the architecture was local in structure and materials, at Ayia Irini allied to but distinct from Crete, at Tell el-Dabᶜa purely Egyptian. Both friezes were constructed by applying the plaster within a frame of two parallel wooden beams set within the wall, evidenced by the bulging profile and flattened edge of many fragments. In both, the plaster and its application were generically Aegean, but locally sourced ingredients were used in its composition.

2. Bonding the Paint

Elsewhere, I have discussed the controversial issue of whether Aegean artists used *fresco* or *secco* technique.[12] Here, I will summarize, with reference to these specific paintings. While in *buon fresco* pigment is applied to fresh plaster, bonding by chemical reaction as it dries, in *mezzo fresco* the surface is dampened after the plaster has dried or the pigment is mixed with lime water.[13] An organic binder may be used with the latter and is essential for *secco* technique, a clear indication of which is the flaking of paint layers as the organic material disintegrates. Most scholars recognize a mixed technique in Aegean painting.[14] What is little discussed is whether artists used *buon* or *mezzo fresco* technique and at what point an organic binder was added. Identification of *fresco* in fragments of plaster is highly problematic.[15] Until recently, organic binders had not been identified in Aegean painting, but new analyses of samples from Phaistos and Pylos have revealed clear traces.[16] At Tell el-Dabᶜa, in separate samples, egg and casein / glue binders have been tentatively identified.[17]

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10 Cf. Seeber 2000, 96–97, figs. 7–11.

11 Ayia Irini: Morgan in press, pl. 69f; Tell el-Dabᶜa (not the frieze): Brysbaert 2007, pls. 15–16. This fine slip, also known as *intonaco*, has been noted in the paintings of several, but not all, Aegean sites, and is also a feature of some Levantine sites with 'Aegeanized' wall paintings: Brysbaert 2008, 151, table 7.2.

12 Morgan in press, Chapter 9.

13 Technique: Seymour 2007, 437–454; historical context: Mora *et al.* 1984, 69–161.

14 See esp. Dandrau 2001; and for a summary of the debate: Jones 2005, 217–220. To these should now be added Brysbaert 2008, esp. 111–128 (a proponent of the use of *buon fresco*); Brecoulaki *et al.* 2008 and Brecoulaki *et al.* 2012 (on the layering of paints in *secco* technique).

15 Cf. Perdikatsis 1998, 106–107. Sampling invariably involves tiny pieces of single colours, usually taken from fragments from different buildings, rather than pieces with multiple colours from a single painting (cf. Chryssikopoulou *et al.* 2000, 129; Brysbaert 2008, 63, 126).

16 Phaistos: Jones 2005, 219; Pylos: Brecoulaki *et al.* 2008, 384; Colombini, in: Brecoulaki *et al.* 2012; Brecoulaki *et al.* in press. Significantly, the samples were of single colours, paint onto plaster, rather than layers of colour.

17 Seeber 2000, 99, table 2 (Seeber comments on the difficulty of analysis owing to the constituents of the soil). The glue was probably gum arabic from the acacia tree (Seeber 2000, 95), one of several binders identified in Egyptian paintings (Lucas 1962, 5–6).

In the Kea frieze, there are signs that the plaster was damp or dampened in the *planning stages* of the painting: in disturbance of the plaster surface visible in the brush strokes of guide lines and the use of string impressions. The yellow ground may have been applied to damp(ened) plaster, but not subsequent colours.[18] At Tell el-Dabᶜa, string impressions or incised lines were applied into damp plaster at the planning stages of some paintings,[19] tool marks have been identified in the reliefs, and occasional fingerprints or disturbance of the plaster layer in brush strokes have been noted.[20] However, none of these observations apply to the Hunt Frieze. Microscopic observations by the conservator Erico Peintner suggested that the red background, in two separate layers of paint over the slip, was mixed with lime but did not appear to have penetrated the plaster, which would indicate that it was applied when the latter was dry or dampened rather than freshly made.[21] Both yellow ground and blue rocks were painted on top of the slip and have partially disintegrated. There are no indications in either frieze of guide lines (*sinope*) beneath the plaster slip (*intonaco*), as would be the case had *fresco* been the main technique.[22] In summary, in both cases, planning may have taken place on damp(ened) plaster, but the majority of the painting process was undertaken in *secco* technique.

3. Planning the Image

Once the wall is prepared, the image must be planned out on its surface. Regardless of painting technique, this crucial step is the driving force of the composition.

3.1 Guide Lines and Sketches

In the Kea Miniature Frieze and in the Tell el-Dabᶜa Taureadors Frieze short string impressed guide lines were used for marking out specific elements: buildings in the former, a maze in the latter. However, no incised or impressed guide lines were used

18 Perdikatsis' analysis revealed secondary calcite in the pigment layer of most of the Kea samples, which implies that the surface had dried before it was applied (Perdikatsis in press, table 6). The secondary calcite would have been formed by lime water used to dilute the pigment and facilitate binding or by adding lime to the pigment to lighten the hue.

19 Seeber 2000, 94; Bietak *et al.* 2007, 47–50.

20 Seeber 2000, 95 (tool marks); Brysbaert 2002, 96 (finger/knuckle prints); Brysbaert 2007, 160 (brush strokes). Brysbaert also cites penetration of Egyptian Blue pigment into the plaster (something that does not easily occur under osmotic pressure as it does for ochres and hence can be a sign of fresco technique). It is unclear from which painting this was observed, but it is not the case in the fragments of the Hunt Frieze. Comparable observations on Cretan paintings have been made (see esp. Cameron *et al.* 1977, 167–169; Brysbaert 2008, 111–128).

21 Personal communication 2012. These microscopic observations were made on site and would need to be confirmed by thin sections. Measurement of the penetration of pigment into the plaster is no longer considered a good criterion for identifying *buon fresco*, which is rather dependent on even diffusion of calcium throughout the thickness of the plaster (Dandrau – Dubernet 2006, 246). Penetration is dependent on the porosity of the plaster in combination with the properties of the pigment, and can also occur to some extent with *secco* technique under post-depositional osmotic pressure (Perdikatsis *et al.* 2000, 115–116; Jones 2005, 219). The opposite case – no penetration of pigment into the plaster – would, however, be a clear indication of *secco* technique.

22 Brysbaert (2002, 99) writes of "colouration of the surface below the painted surface at Tell el-Dabᶜa (…) evident where the top surface (painted *intonaco*) had flaked off or was eroded away (…)". In my observations of the Hunt Frieze, sketches are painted onto the *intonaco*, not beneath them, and the flaking is of the pigment rather than the slip.

in the Hunt Frieze, as there are no architectural or geometric elements. On the other hand, preliminary painted sketches are observable in both friezes under discussion. At Kea, pink sketches mark the buildings, often adjacent to the tiny string impressions. At Tell el-Dabᶜa, pink, light red or pinkish ochre sketches define the juncture between rocks and ground and mark the contours of animals and men.

3.2 Applying the Ground Colours

In both friezes, the background colours were applied in a specific order, with attention to the relationship between plaster surface and the adhesive qualities of pigments. The Kea ground is yellow ochre, with blue for sea below; the Tell el-Dabᶜa ground is red and yellow, with mainly blue for the rocks below. Ground colours were applied first to smooth plaster (red before yellow in the case of Tell el-Dabᶜa[23]), while, for technical reasons, blue was applied onto rougher plaster. Blues have a larger grain size than the earth colours of red and yellow (see below), and therefore adhere less effectively to a smooth surface, regardless of the method of bonding.[24]

Transitions between ground and blue were planned. At Kea, the yellow was diluted to a faint hue at the intended juncture, creating a smooth and unobtrusive transition, while avoiding a green appearance in places where the relatively thin blue paint overlaps yellow. At Tell el-Dabᶜa, the juncture was marked by sketch lines and the paints were applied more thickly, precluding a subtle transition.

In both, certain areas were left as reserved plaster when the ground colour was painted: at Kea, the buildings, at Tell el-Dabᶜa, the animals and the white boots of the men. These are the areas that were planned with sketches. Planning and reserving the figurative was crucial for the Hunt Frieze, owing to the larger scale and the dark red ground, which would be harder to paint over than light yellow.

4. Choosing the Colours

There is close accord in the pigments, but there are also some distinctions.[25] It should be noted that analyses at both sites were taken from samples across different paintings, not all from the friezes in question. White is calcium carbonate, matching the lime plaster; black is carbon from soot or charcoal; red and yellow are ochres, primarily haematite or goethite; blue is Egyptian Blue (cuprorivaite). There are some differences in the subsidiary components of the ochres (eg. illite and kaolinite at Kea, limonite at Tell el-Dabᶜa), as is to be expected given that the source would have been local. At Ayia Irini only, amphiboles were identified mixed with Egyptian Blue in one sample, and in

23 Red was painted first at the top, continuing down or contrasting with yellow below, then rocks at the bottom. Cf. Becker 2016, 33; Becker this volume, on the large-scale animals and plants in F00505 from Palace F. He observes that the painters started at the top with yellow ground, but, in contrast to the Hunt Frieze, it appears that the griffin was painted next, before the ground below.

24 Lucas 1962, 351; Mora *et al.* 1984, 142–143. This applies to all blue pigments. Cf. Arts Council 1969, 15: blues had to be *secco*, bound with glue (not egg yolk, which would discolour the blue), applied to a rough surface for better adhesion. For identification of roughened surfaces for blue pigment in Aegean plasters, cf. Brysbaert 2002 (Tell el-Dabᶜa); Brysbaert 2008, 113.

25 Kea: Majewski – Reich 1973; Peredikatsis 1998; Perdikatsis in press. Tell el-Dabᶜa: Brysbaert 2007, 155–160.

two, pyrolusite, a manganese mineral, was identified as an alternative black.[26] However, neither of these results came from samples of the Miniature Frieze.

At Tell el-Dabᶜa the mixing of several ochres was reported, with haematite and calcite to create pink, or haematite and goethite to produce orange.[27] While mixing also occurred at Ayia Irini, the discovery of many pieces of raw ochre in the site revealed an extraordinary variety of natural hues, from pale pink through yellows, orange and reds.[28] There are no such remains of raw ochre from Tell el-Dabᶜa to compare.

Making allowance for differences in subject matter, the use of individual colours for particular elements is comparable. However, in the Kea frieze there is a wider range of colour in the landscape of plants, river, marsh, rocks, sea and sky than in the rocky landscape and plants of the Tell el-Dabᶜa frieze (Pl. 1.1–4); while in the Tell el-Dabᶜa frieze, there is more variety of colour in the depiction of animals (white, pink, black, or dappled dogs, versus white at Kea, and ochre or pink deer, versus ochre at Kea, Pl. 1.5–6) and men (red or pink depending on the background colour, versus only red, Pl. 1.7–8).

5. Applying the Paints

Some paints were applied over another colour, others adjacent. In the former, the order of painting is clear, since the top colour frequently flakes revealing the one beneath; in the latter, minimal overlapping at the edges of the colour allow one to observe the order of painting under magnification.

In the Kea frieze, there is more consistency in the order of painting landscape than there is in the painting of figures. A distinct, though not inviolable, order of painting the rocks is discernible (Pl. 1.1): blue-grey, then pink, red, and ochre, in that order. Black was painted at the end, white blobs on top of the blue-grey, and ochre plants last. On the whole, landscape was painted before the figures. Limbs were sometimes painted after clothing, sometimes before. Women's skin was applied thickly in white over the ground, not reserved in the plaster.

In the rocks of the Tell el-Dabᶜa frieze (Pl. 1.2), a thin white slip, smoother than the plaster on which blue was painted, was applied to those areas that were to be pink or ochre. The rock was mostly (but not invariably) painted in the following order: blue, pink, red and ochre, white, red or black veining and black delineation. Rockwork higher in the picture plane was painted over the ground colour, with a thin white slip between the red ground and the blue, facilitating adhesion and lightening the hue. Rocks were painted before animals. Dogs were sometimes painted in two layers (Pl. 1.8), first pale pink or pale ochre over the reserved plaster, then a coat of white. Lions and leopards also have a thin layer of white over the reserved plaster for manes and underbellies, painted after the yellow ochre body, occasionally over it. Ungulates sometimes have their white legs painted over the red ground, even though the bodies were reserved. The men were painted over the red or yellow ground, though in Pl. 1.8 the white boot began as reserved plaster, over which white was added. Here the man's boot (right) overlaps the white of the dog, demonstrating

26 Perdikatsis 1998, tables 2–3.
27 Brysbaert 2007, 155, 157.
28 Morgan in press, Chapter 9, pls. 72–74.

that the animal was painted first. Details (red collars or blood, blue claws, white clothing) were painted over the colours of bodies. Black outlines and details were added last. On a lion, for example, the order of painting would be: pink outline sketch / red ground reserving the body of the lion / yellow ochre body / white mane and underbelly, pale blue eye, blue claws / red hairs of the mane, nose, outline to the eye / black outline to the body. For the plants, painted over the ground colour, red stems usually preceded blue leaves.

There are, then, distinctly similar patterns of artistic behaviour in the order of applying paints. Both began with colour at the top of the frieze, followed by blue at the bottom. In both, the main elements of the landscape appear to have preceded the human action. The pattern of painting red stems before blue leaves in the Tell el-Dabᶜa Hunt Frieze is matched in the Plant Panels in the room adjacent to the Miniature Frieze at Kea. Remarkably, the order of painting the rocks is closely matched: blue, then pink, red, ochre, white (or white, ochre). Black details were consistently added last.

6. Varying Hue and Luminosity

Pictorially, landscape lends itself to the varying of hue (colour), tone (light and dark) and intensity (opacity and translucency) through the technical processes of combining, layering, and diluting pigments. The Kea and Tell el-Dabᶜa painters (like those of Thera and Crete) were masters of these techniques, notably in the multicoloured rock. Red overlapping dilute pink (mixed with water or perhaps gum to achieve translucency and luminosity) creates a sense of depth. In the Kea frieze, remarkably, dilute pink is applied to parts of the sky's horizon, as well as to descending and ascending rocks (Pl. 1.1). In the riverine grasses, a sense of movement and depth is achieved through varying degrees of dilution of the yellow ochre, and by contrasting pale blue and blue-black blades of grass, the former lightened through the addition of lime or through differential grinding of the silicate pigment,[29] the latter darkened through the addition of black and dilution of the resultant tone (Pl. 1.3). The blue of the rocks is toned down through layers of pigment – blue then dilute black – especially along the upper contours of the rockwork, which creates an illusion of depth (Pl. 1.1) while distinguishing it from the brighter blue of the sea. In the Tell el-Dabᶜa frieze, black also overlies the blue of the rocks (which is brighter than at Kea), but as streaks, as though delineating the interiors of the stone, rather than as a layer to manipulate tone (Pl. 1.2). Black over blue, as observed at both sites, is less common in Aegean painting than blue over black as a darkening device.[30]

White was applied for certain details in *impasto* technique, using a spatula or brush, as the penultimate act of painting, prior to black outlines. *Impasto* is a particular feature in the Kea frieze, used for highlights on the rock (Pl. 1.1) and spume on the sea. It is seen in Cretan painting, but not in Theran, and at Tell el-Dabᶜa it was used only for the white inflorescence of certain plants.

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29 See esp. Tite *et al.* 1987, 42, 45.

30 Besides Kea and Tell el-Dabᶜa it is known at Akrotiri (Vlachopoulos – Sotiropoulou 2013, 254, 'Porter's Lodge') and Miletus (Brysbaert 2008, 116). Blue-black over lighter blue, which would have the same effect, has been observed at Chania (Photos-Jones *et al.* 2003, 311–315, 371).

Green, which was not used as a pigment in either painting, is perceptually achieved by overlaying blue on yellow (or vice versa) in a relatively translucent layer, or by mixing the two. This is a particular feature of the plants in the Tell el-Dabᶜa frieze and was also used to effect in the large-scale plants at Kea. In the Tell el-Dabᶜa frieze, blue reeds on red ground have an undercoat ranging from white through buff to ochre, providing alternate contrasting light blue and blue-green (Pl. 1.4), while for the rocks, irregular strips of intense blue are contrasted with ones of dull greenish-blue (Pl. 1.2).

Layering or mixing was commonly used in the Tell el-Dabᶜa frieze to achieve variety of hue: lions, leopards and deer have subtly different hues through the mixing or layering of ochres, some more pink (Pl. 1.6), others more orange (Pl. 1.4); white dogs and some ungulates have a buff hue created by layering dilute pink or pale ochre then white (Pl. 1.8); men's skin is distinguished from the red ground by a top layer of pink (Pl. 1.8, top right); black was painted over red to darken it on a few plant stems; and occasionally diluted black was used for leaves, a greenish hue being a result of the yellow ground beneath. The orange-pink hue of some of the rocks, like that of the deer, was achieved by layering two hues, while a few rocks have an unusual light plum colour, probably the result of mixing pink-red with a hint of blue.

7. Completing the Image

A notable difference is that the Tell el-Dabᶜa men are outlined in black (consistently when on red ground, sometimes on yellow), while those of Kea are not (Pl. 1.7–8). One likely reason is scale, the former being larger;[31] another may be date, black outlining being a feature of Mycenaean painting; or influence from Egyptian wall painting, in which figures are outlined in dark red (occasionally in black).[32]

In the Kea frieze, the white skins of two women and parts of their garments are outlined in black, while another (against a blue-black window) has her arm partially outlined in yellow ochre. The men's white garments are outlined in black, often with internal folds or creases. Architectural features (windows, masonry, cornices etc.) are defined in black. There are no women or buildings in the Tell el-Dabᶜa frieze to compare.

In the Tell el-Dabᶜa frieze, red and black outlines were used: black for men and white animals (dogs (Pl. 1.8), goats, griffin), red for a black dog and for lions (on yellow ground). Calf muscles of men and features of white animals are delineated in black, while ears, ankles, claws etc. of lions are defined in red (Pl. 1.4), as is the antler of a fallow deer.[33] Red lines demarcate the white belly of leopards and lion and the head of the griffin. Eyes are outlined in red (deer, lions, leopards) or black (griffin).

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31 The life-size male figures from Palace F are also outlined in black: Aslanidou 2005, 464, 467.

32 It is difficult to gauge the dating of the less frequent use of black outlines, given that in older publications of tombs the illustrations are not in colour. I have not made a study of this, but on the whole it seems that black was used from the mid rather than early 18th Dynasty, so later than the Tell el-Dabᶜa paintings. A good example is the Tomb of Menna (TT 69), datable to Thutmose IV–Amenhotep III, in which the outlines of the figures range from pinkish dark red through to black (Hartwig 2013, 19 (dating), 144). Cf. Mekhitarian 1978, 54 (Kenamun, TT 93), 77, 87 (Menna, TT 69), 110 (Nebseny, TT 108). Black outlines are more common in 19th Dynasty painting: e.g. Mekhitarian 1978, 147 (Ipy, TT 217), 149, 151 (Senedjem, TT 1).

33 Morgan, in: Bietak *et al.* 2012/2013, fig. 7.

Finally, the painted surface of some of the Tell el-Dabᶜa fragments has a slight gleam. It is unlikely that the painting was polished, as this would have damaged the upper layers of paint.[34] Resin was used in the conservation of the fragments,[35] and it is unclear whether the gleam is due to that, or whether wax or a varnish such as acacia gum was applied at the end of the painting process to intensify the saturation of colours.[36]

8. Conclusions

A comparison such as this, between two paintings of the same format (albeit with minor differences in scale and date), should ideally be set within the context of a wide range of sites. It is, however, not common in studies of ancient wall paintings to find analyses of the *process* of painting – how the artists formed the image as a whole. This brief comparative study could, therefore, potentially provide insights into the network of artistic interconnections between painters and patrons of the time. There is no implication here that the artists of Kea and Tell el-Dabᶜa were the same, but that they belonged to the same tradition of craftsmanship is clear.

Plaster and pigments are closely comparable. More striking are the correspondences in planning the picture and applying the colours. When craftsmen travel, they use materials and methods common to their cultural milieu, sourcing equivalents locally as needed. But how they proceed in planning and building up an image is more revealing as to training, workshops, and specific traditions. At the planning stages, there is fundamental accord as to approach, with individual differences rooted in discrepancies in scale and subject matter. Both made preliminary markings on the plaster as guides for the composition, pink brush sketches for large figurative areas (Tell el-Dabᶜa) and buildings (Kea), the latter also with incised lines. Both separated areas above and below into ochre ground and predominantly blue beneath, and both began painting at the top of the frieze. In both, the areas of plaster destined for red or yellow was smoothed, while that destined for blue was roughened to facilitate bonding. In both, areas that were to be white were left reserved, the ground colour painted around them. At Tell el-Dabᶜa this principle extended to ochre animals. Differences are due to scale: tiny figures and animals were painted *after* the ground (Kea); larger animals were sketched *before* (Tell el-Dabᶜa).

Allowing for differences in subject elements, the range and use of colours is comparable. There is, however, greater subtlety in the variety of hues in the landscape of Kea, and a wider range of hues for animal skin at Tell el-Dabᶜa. Significantly, there are distinctly similar patterns of artistic behaviour in applying the paints. Landscape was usually painted before figures. Green is absent as a pigment but subtly achieved perceptually by layering of yellow and blue. The order of applying the colours of rocks is strikingly closely matched. Black is applied over blue to tone down the hue (Kea)

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34 Cf. Chryssikopoulou *et al.* 2000, 123, 125 on experimental replication of the painting process, in which polishing at the end was unsuccessful, contra Cameron's experience (Cameron *et al.* 1977, 165–166). These experiments were with *fresco*, not *secco* technique.

35 Brysbaert 2007, 152.

36 Wax has been identified as a method of providing sheen on some 18th dynasty paintings (Lee – Quirke 2009 [2000], 110). Erico Peintner (personal communication 2012) suggests that gum arabic (acacia) may have been used on parts of the painting as a varnish, aiding cohesion of the blues in particular as well as providing a light gloss; cf. note 17 re. gum arabic as a binder.

or to define internal details. Black was consistently applied last. Both the outlining and the larger scale of the Tell el-Dabᶜa frieze are intimations of a slightly later date than the Kea frieze. That the artists of the two sites belonged to the same tradition of craftsmanship is clearly visible, not only in the materials and techniques used, but also, significantly, in their common approaches to forming the image.

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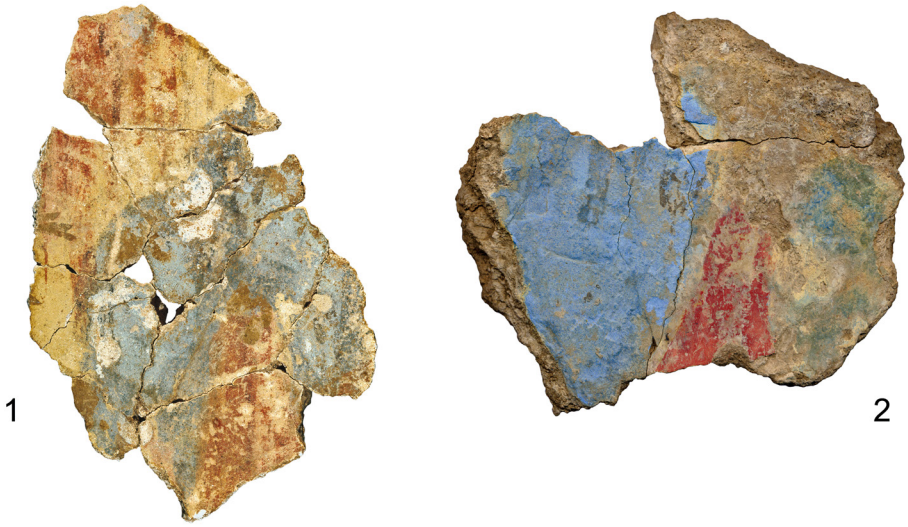

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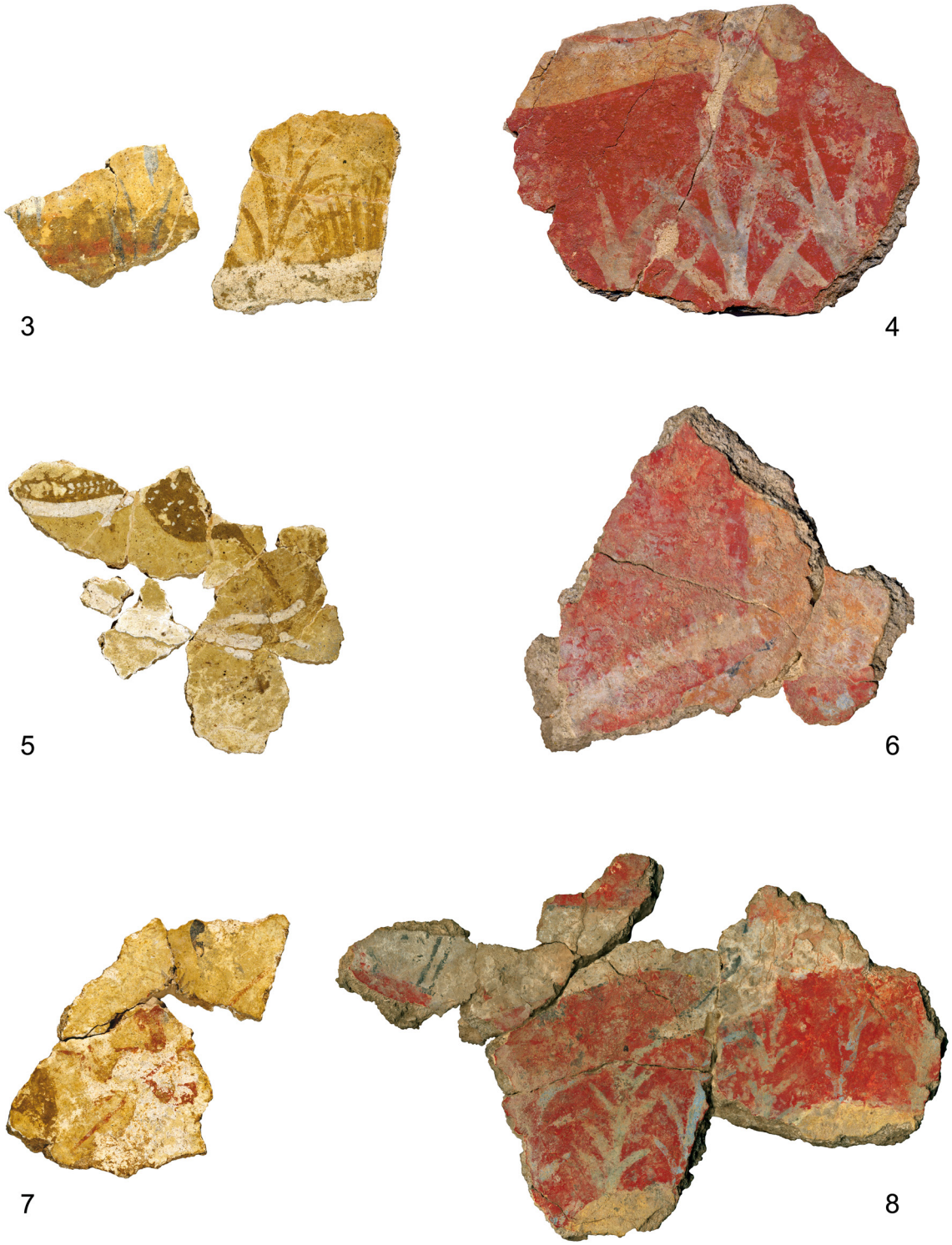

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