



ONE CANVAS, FOUR IDEAS: A DOUBLE PORTRAIT ATTRIBUTED TO GIORGIONE WITH DIFFERENT COMPOSITIONS UNDERNEATH

Anneliese Földes, Johanna Pawis, Heike Stege, Eva Ortner,*
Andreas Schumacher,* Jan Schmidt, Jens Wagner and
Andrea Obermeier

ABSTRACT An interdisciplinary research project on the collection of 15th- and 16th-century Venetian paintings at the Alte Pinakothek in Munich gave rise to art-historical and art-technological research into a hitherto little-noticed double portrait of a scholar with his young pupil. With the aid of stereomicroscopic examination as well as imaging and material-analytical methods – in particular macro X-ray fluorescence scans of the front and back – three further compositions were discovered beneath the visible painting: first a multi-figure drawing of the biblical scene of the 12-year-old Christ among the Doctors, followed by an Arcadian landscape and, directly beneath the current double portrait, the single portrait of a sumptuously dressed figure. As evidenced by cross-section analyses, all four compositions were created in close succession. A notably intricate pattern on the sleeve of the sitter in the single portrait was initially integrated into the subsequent composition before it was discarded. Various aspects – the identification of the two sitters in the double portrait as the Venetian humanist Trifone Gabriele and his pupil Giovanni Borgherini, the innovative portrait type of a figure looking over his shoulder, the similitude of the Arcadian landscape and Giorgione's *Tempesta*, the composition of the drawing recalling works created in early Cinquecento Venice and, last but not least, archival and textual sources on the historical context and possible provenance of the painting – together support an attribution of the work to the Venetian painter Giorgio da Castelfranco, called Giorgione.

1 Introduction

While it is not uncommon to find examples in Venetian Cinquecento painting of a single support used for different compositions – reflecting the artist's decision to discard previously laid out or already executed depictions and overlay them with new pictorial inventions – it is remarkable to find no less than four independent compositions directly superimposed on one canvas. This is the case with a hitherto little-noticed double portrait of a humanist with his pupil from the Bayerische Staatsgemäldesammlungen (BStGS, Bavarian State Painting Collections), which has

been the object of extensive studies and technical analysis by an interdisciplinary team of art historians, conservators and natural scientists within the context of a research project on Venetian painting of the 15th and 16th centuries (Figure 1).¹ Although the painting, which was recorded in the Wittelsbach collections in 1637,² was already associated with Giorgio da Castelfranco (1473/74–1510), known as Giorgione, in an inventory list compiled in 1745,³ it has remained largely undiscussed in art-historical research to date. In the context of the project, the canvas painting – displayed since 2011 in a reconstruction of the historical hanging of the *Grüne Galerie* in the Munich Residenz – was



Figure 1 Giorgione, *Portrait of Giovanni Borgherini and Trifone Gabriele*, 1509/10, oil on canvas, 91.5 × 67.0 cm, Munich, Alte Pinakothek, inv. no. 7452. (Image: Sibylle Forster, BStGS, Munich.)

subjected to a basic survey on site in 2022. In addition to the high painterly quality, pronounced drying cracks were noticed that provided insight into a multilayered pictorial structure which indicated a complex genesis. The reassessment of a pre-existing X-radiograph confirmed this observation and prompted an in-depth technological and art-historical analysis of the double portrait. Investigation with imaging techniques, particularly macro X-ray fluorescence scanning of the back, led to the discovery of three hidden compositions, subsequently providing decisive impulses for the attribution of the painting.

Historical records relating to Giorgione's life are as fragmentary as the established basis of his oeuvre. In addition to a small core of works whose authorship can be considered certain based on documents from the artist's lifetime (such as inscriptions on the backs of paintings and commission documents), or which are recorded in 16th-century textual and visual sources (collection inventories, written accounts such as Marcantonio Michiel's *Notizia d'opere di disegno*, compiled as of 1521), there are but a few paintings that have been consensually accepted by art-historical research. These undisputed works are far outnumbered by contested works – paintings whose authorship and dating are invariably the subject of controversial debate. Although his legacy remains elusive, the impact of artistic inventions and technical innovations credited to Giorgione on Venetian painting and European visual culture is a matter beyond doubt.

The present essay introduces the results of the technological, imaging and material-analytical investigations as well as art-historical findings and hypotheses gained through close interdisciplinary collaboration. As far as the published state of research permits, the art-technological findings are compared with those available on Giorgione's oeuvre.⁴ The endeavour to reconstruct the complex genesis of the Munich work and its four superimposed compositions aims to facilitate and stimulate further scholarly discussion about the painting and its artist.

2 Recent art-historical research⁵

The inventory compiled in 1641/42 of the Kammergalerie of Elector Maximilian I in the Munich Residenz records a painting, then attributed to Leonardo da Vinci, whose unusual subject required a particularly precise description, on the basis of which it can still be clearly identified today: '[ein] Mathematicus in einem blauen weis gefiederten Rokh, sambt seinem Discipl, welcher ein Astrolabium in der handt [haltet], auf Tuech' ('[a] mathematician in a blue coat lined in white, together with his disciple, who holds an astrolabe in his hand, on canvas'). As a double portrait featuring teacher and pupil, the painting combines a novel type of early 16th-century painting dedicated to the humanist topic of education or friendship with the equally innovative looking-over-the-shoulder pose (*ritratto di spalla*). This type of portrait, which originated with Leonardo da Vinci, was adopted early on by Giorgione, who realised its aesthetic



Figure 2 Danese Cattaneo, *Medal of Trifone Gabriele*, c.1530/49, copper alloy, cast, 44.3 mm, New York, The Frick Collection, gift of Stephen K. and Janie Woo Scher 2021, inv. no. 2021.2.22. (Image: © The Frick Collection, New York.)

and psychological potential in rendering a sitter's external and internal stirrings.⁷

Both the piercing gaze with which the teacher in the Munich painting fixes us over his shoulder and his precisely modelled facial features suggest that this is not an idealised portrait or a stereotype, but rather the likeness of an individual. He can be identified with a prominent exponent of Venetian learned culture in early 16th-century Venice: the polymath Trifone Gabriele (1470–1549). His striking physiognomic features correspond to those of a portrait medal (c.1530/49) by Danese Cattaneo in which the sitter is identified as 'Tryphon Gabriel' (Figure 2).⁸ Already acclaimed by contemporaries as a 'new Socrates', Gabriele was a highly esteemed tutor to the offspring of wealthy families with humanist interests.⁹ Among the publications of his students, which, in accordance with the classical concept of oral transmission of knowledge, disseminate Trifone's teaching activities, are the *Dialogo nel quale de la Sphera, et de gli orti et occasi de le stelle, minutamente si ragiona*, published by Giacomo Gabriele in 1545,¹⁰ and the treatise *La Spheretta del Clarissimo Messer Triphon Gabriele*,¹¹ a didactic discourse on the projection of the moving celestial sphere into a two-dimensional coordinate system, in short: on the principle of planispheric representation, which finds its application in the instrument of the astrolabe – the subject of the lesson shown in the Munich painting.

Taking this identification a step further, the logical conclusion is to relate the Munich painting to a work by Giorgione documented as early as 1568 by the artist-biographer Giorgio Vasari in the second edition of his *Vite*: the portrait of the young Giovanni Borgherini with his teacher from Venice, which Vasari had seen in the Florentine palazzo of Giovanni's sons.¹² Since 1926, this reference has repeatedly been associated with a portrait of teacher and



Figure 3 Giorgione's circle, *Portrait of a Teacher and his Pupil*, c.1510 (?), oil on canvas, 47 × 60.7 cm, Washington, DC, National Gallery of Art, gift of Michael Straight, inv. no. 1974.87.1. (Image: Courtesy National Gallery of Art, Washington, DC.)

pupil in the National Gallery of Art in Washington, DC (Figure 3), which, however, has a provenance that cannot be traced in historical records beyond the early 20th century, and which has an attribution to Giorgione that is highly disputed.¹³ Likewise, the appearance and age of the figures depicted in the Washington painting have so far defied all attempts to identify them with Giovanni Borgherini and a personality within his historical context.¹⁴ By contrast, both these aspects can be readily reconciled with regard to the Munich painting: Giovanni Borgherini, the son of a Florentine banker, is indeed documented at a young age as one of Trifone Gabriele's pupils in Venice.¹⁵ Presuming that the Munich painting was created around 1509/10, the latest possible date in view of Giorgione's premature death in 1510, the adolescent Giovanni would be depicted at the age of 14 to 15, and Trifone – who according to other visual sources¹⁶ was largely bald already in his younger years – at the age of around 40.

Since Vasari's knowledge of Giorgione's oeuvre was frequently second-hand and often derived from contradictory sources, the identification of the Munich painting with the portrait of Giovanni Borgherini and his teacher, as thematised by him, does not necessarily permit the inverse conclusion that it is an authentic work by Giorgione.¹⁷ However, unlike in Venice, where Giorgione's paintings were mostly hidden behind the walls of private *palazzi*, Vasari in Florence had direct access to the collection of the Borgherini, about whose art and family affairs he also shows himself to be well-informed in other biographies of the *Lives* (cf. those of Bacchiacca, Pontormo and Baccio

d'Agnolo). And even beyond the question of the sitters' identification, one might observe that the fine touches in the flesh painting (*macchie di color di carne*) and nuanced shading (*tinta di ombre*)¹⁸ of the Borgherini portrait, particularly highlighted by Vasari, find a distinct counterpart in the finely nuanced modelling of the flesh tones in the Munich painting. Therefore, if one accepts the identification of the double portrait with the portrait described by Vasari, subsequent efforts in the reconstruction of the painting's provenance, reception and collection history must proceed from this point.

Further indications may be derived from the context of the ambitious patronage of Salvi Borgherini (1436–c.1515) and his sons Pierfrancesco (1488–1558) and Giovanni, who had their palazzo in Borgo Santi Apostoli in Florence (today's Palazzo Borgherini–Roselli del Turco) decorated by renowned artists, including Andrea del Sarto (1486–1530), who was one of the first Florentine painters to take up the innovative portrait type with a sitter looking over his shoulder.¹⁹ Since the Borgherini had already begun selling artworks from their palazzo in the last decades of the 16th century, it is quite conceivable that the painting found its way onto the art market early on.²⁰ The transalpine art trade, stimulated by the liquidation of estates and collections in these years, offered favourable conditions for the endeavours of the Wittelsbach dukes to expand their collection with Italian masterpieces. The central players in this market were professional art agents such as Jacopo Strada (1507–88), who advised the Bavarian Duke Albrecht V on art-related matters as of

1567. Testifying to his strategies is a list of offers Strada had drawn up in the mid-1570s to present a selection of Italian paintings to potential clients and which he sent to Munich, where it has been preserved in the Bayerisches Hauptstaatsarchiv. It includes '1 alt Quatro von Giorgion de Castel Francho gemacht, mitt 2 figuren'²¹ ['1 old painting made by Giorgion de Castel Francho with two figures'] – a description which applies to the work under discussion here. Although it cannot be determined with certainty whether this corresponds to the double portrait inventoried in the Altes Schloss Schleißheim in 1637, this archival record might provide further circumstantial evidence for the painting's provenance and history.²²

3 Art-technological examinations

3.1 Examination methods and designation of the compositions

The non-invasive examination of the painting included stereomicroscopy, X-radiography (XR), infrared reflectography (IRR) and macro X-ray fluorescence scanning (MA-XRF). The latter was carried out on the entire front of the painting and additionally on the back, as the two early, underlying compositions could only be visualised in this way due to the comparatively low attenuation of the XRF intensities by the canvas and ground. In order to be able to scan a maximum area of the reverse side, the painting was removed from its stretcher and temporarily fixed on a slender working frame.²³ To precisely determine the layer sequences and materials used, 11 paint cross-sections and two samples of the lining adhesive were taken for analyses involving various laboratory methods including light and fluorescence microscopy, scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM-EDX), Raman microscopy, Fourier transform infrared (FTIR) spectroscopy and imaging FTIR. Additionally, four samples of the original canvas were subjected to fibre analysis.²⁴ All information pertaining to the equipment and technical parameters used can be found in the Technical Appendix.

Underneath the double portrait are three further compositions which are independent of each other in terms of their subject matter. In the following, they are named 'compositions 1 to 4' according to the chronological order in which they were created:

- Composition 1: *Christ among the Doctors*
- Composition 2: *Arcadian Landscape*
- Composition 3: *Single Portrait (of a Young Man?)*
- Composition 4: *Double Portrait of Giovanni Borgherini and Trifone Gabriele*

By correlating the technical images with the information gained through cross-sections and stereomicroscopic analysis, it was possible to determine their sequence. Whereas the upper three compositions are painted, the lowest appears to be a linear drawing.

3.2 Painting support and original format

The support consists of two narrow pieces of fabric, joined by a vertical (slightly distorted) seam in the centre of the picture (cf. Figure 4);²⁵ for the execution of the first two compositions (see sections 4.1 and 4.2) the support was oriented horizontally. The fact that the relatively small canvas is composed of two parts is quite unusual and means that the artist began the composition of *Christ among the Doctors* with a seam running across the middle.²⁶ However, the canvas of the *Sleeping Venus* in the Gemäldegalerie Alte Meister at Dresden by Giorgione and Titian (c.103 × 170 cm, original format roughly retained) also consists of two narrow lengths of fabric with a horizontal seam that runs through the face of Venus.²⁷

Both pieces of the Munich work display identical technical characteristics: the fine canvas consists of flax fibres (*Linum usitatissimum*) and has a diagonal twill weave (2/1 S) with an average thread count of 18 × 15 threads/cm (vertical × horizontal). At the current state of research, there is no published evidence of canvases woven in twill weave for Giorgione's work. However, paintings such as *La Schiavona* (London, The National Gallery) by Titian of c.1510/12 attest to the use of twill weave beside the common plain-weave canvas as a support for paintings in Venice at this time.²⁸

The painting has been trimmed on all sides and was folded around the current stretcher at its upper and lower edges by approximately 2 cm (total dimensions of

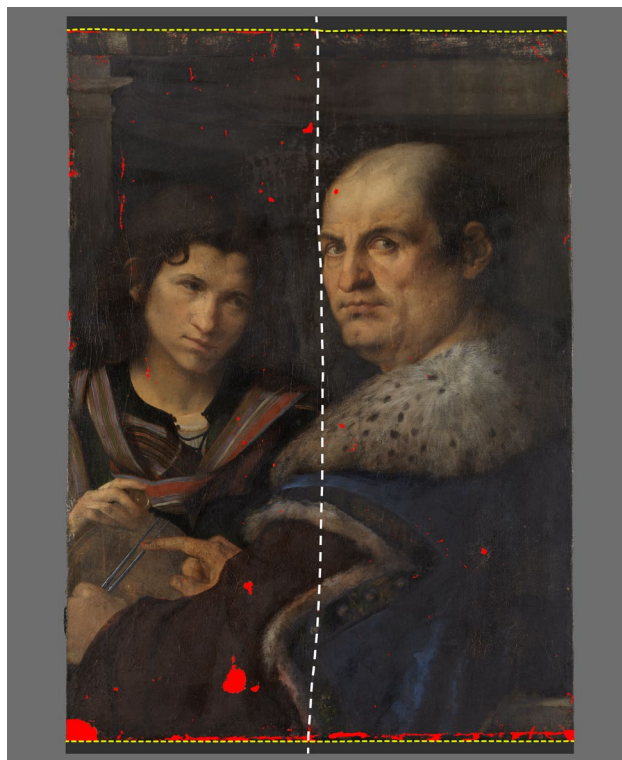


Figure 4 Reconstruction of the original format (grey) and mapping (construction of support, condition): canvas seam (white dotted line), fold-over edge (yellow dotted line), tacking margin (dark grey), paint losses (red). Overlay with a stripped-state photograph taken during restoration in 2010. (Mapping: Anneliese Földes, Doerner Institut; photo: Sibylle Forster, BStGS, Munich.)



Figure 5 (a) X-radiograph, digitalised from analogue film and processed to minimise visibility of stretcher bars; (b) Infrared reflectogram. (Images: (a) Sibylle Forster/Anneliese Földes 2011–24, BStGS, Munich; (b) Jens Wagner, Doerner Institut, BStGS, Munich.)

the canvas today: 95 × 65.3 cm). The original tacking margins no longer exist. The 1641/42 inventory of the Kammergalerie of the Munich Residenz gives the painting's dimensions as c.97.3 × 80.3 cm, which indicates that the present format is the result of a significant reduction in the width of the painting by 15 cm (cf. Figure 4).²⁹ Presumably, both sides were cropped evenly – an assumption which is supported by a copy of the double portrait (96 × 76 cm, canvas)³⁰ in a private collection in Vienna. In the copy, the pupil's striped stole extends further down his arm and the humanist's back is less cropped. It was between the second half of the 19th century and the beginning of the 20th century that the painting was significantly reduced in size, a period in which the undocumented lining procedure³¹ was probably also carried out.³²

3.3 Results of the imaging techniques

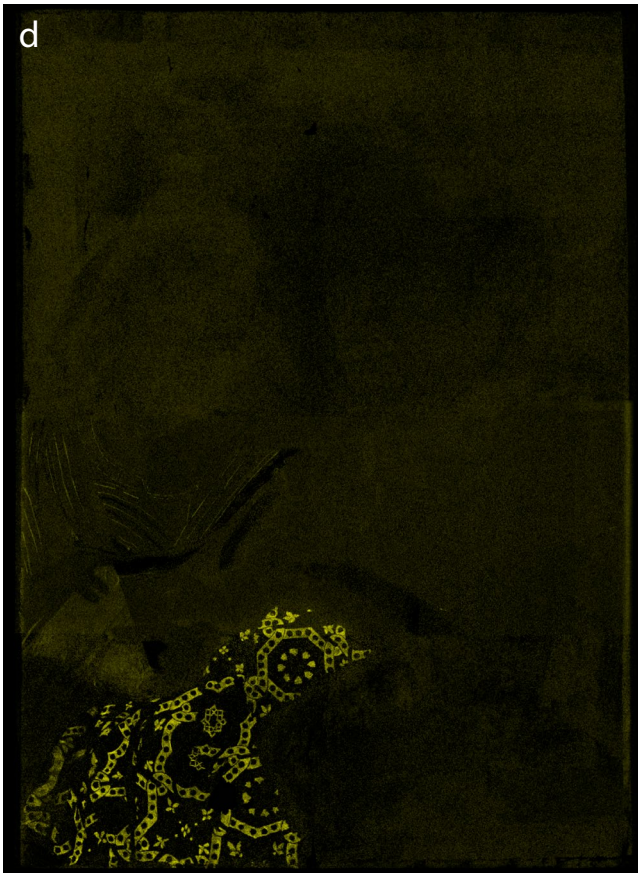
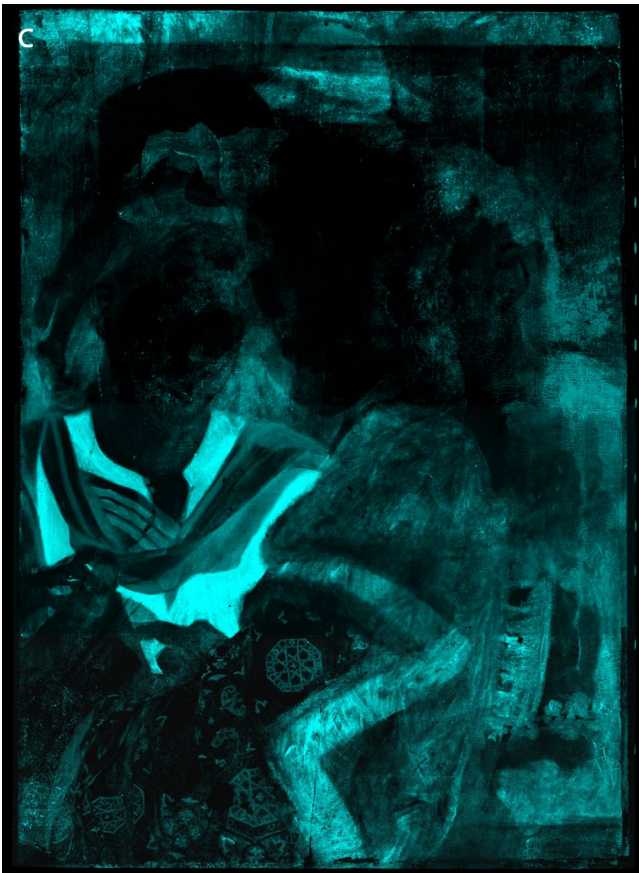
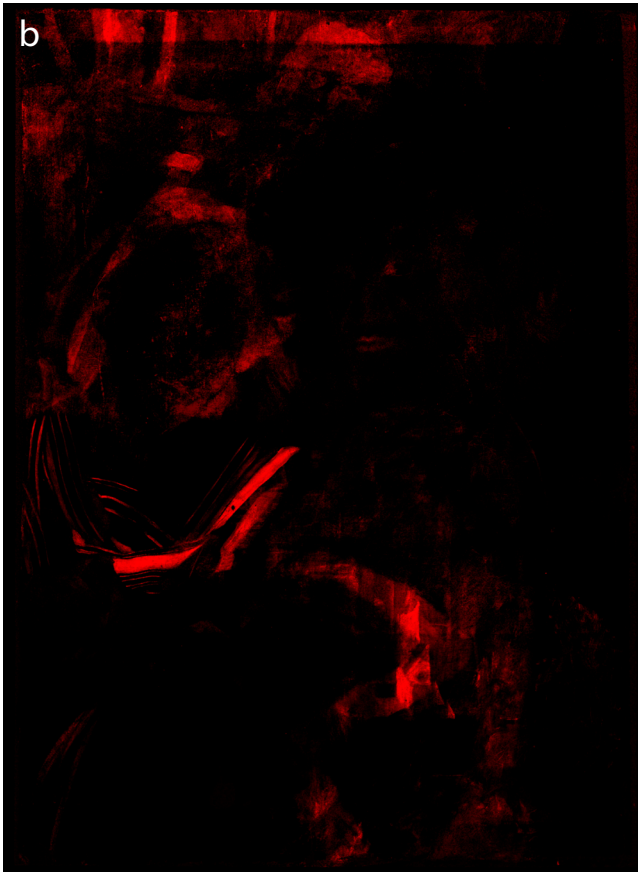
In this section, the most significant results of the various imaging techniques are presented in summarised form. Their interpretation and allocation to the individual compositions are provided in section 4. The XR image (Figure 5a) had already been taken in 2010 in the course of the last conservation-restoration of the painting, while IRR (Figure 5b) and MA-XRF scans of both sides were taken for the scope

of the current research project. The elemental distribution images of lead (Pb), copper (Cu), mercury (Hg), arsenic (As), zinc (Zn), calcium (Ca) and iron (Fe) were particularly relevant for understanding the artist's working process (Figures 6–8).

3.4 Description of preparation layers, pigment palette and general stratigraphy based on cross-section analyses

On top of a sizing covering the canvas – which according to FTIR is proteinaceous – lies the light gesso ground common in Venetian painting in the early 16th century,³³ consisting of glue-bound calcium sulphates with natural impurities of strontium sulphate, iron compounds, silicates and quartz and here also some dolomite. The ground is found mainly in the interstices of the canvas weave, while the tops of the threads are only thinly covered. Comparable gesso grounds (without further priming) have been detected on canvas paintings by Giorgione.³⁴ On the ground of the Munich painting lies a thin unpigmented isolation layer, which according to FTIR imaging is protein-based (Figure 9).

In two cross-sections, a very thin brownish layer containing some vegetable black (Figures 9 and 10) was detected which corresponds to the drawing medium used



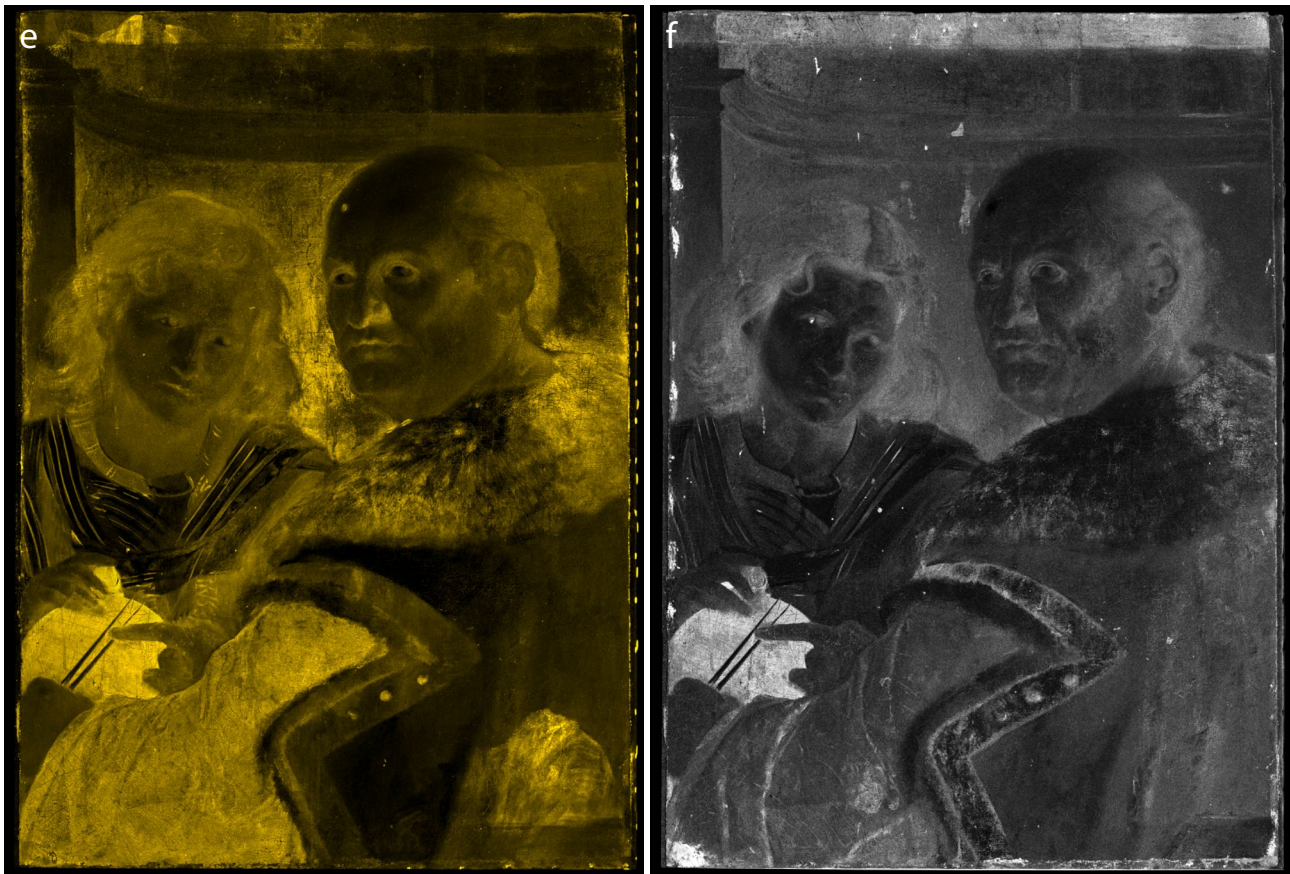


Figure 6 MA-XRF scan of the front. Elemental distribution images of (a) lead (Pb-L); (b) mercury (Hg); (c) copper (Cu); (d) arsenic (As-Kb); (e) iron (Fe); (f) calcium (Ca). (Images: Jens Wagner, Doerner Institut, BStGS, Munich.)

for the group of figures (composition 1). The black particles are partly under the protein-based isolation and partly embedded in it. Binder classification of this layer using FTIR imaging was not possible. MA-XRF indicates that the drawing material also contains a minor amount of zinc (Figure 8a).³⁵ Possible sources of this element are either a zinc-containing iron gall ink or a siccative additive of white vitriol (zinc sulphate) to an oil-bound paint. Zinc vitriol or the zinc soaps produced from it have been identified in oil-bound primings, underpaints and paint layers³⁶ of several early works by Titian created between 1507 and c.1510/12.³⁷ In the case of the double portrait, it is more likely to be a drawing medium obtained by mixing zinc-containing iron gall ink and carbon black. For the Venetian painting *Virgin and Child* (c.1500/4) by Giovanni Battista Cima da Conegliano, which is held by the Städel Museum in Frankfurt, an underdrawing made with zinciferous iron gall ink could recently be visualised using MA-XRF and LED-excited IRR.³⁸ Technical examinations and material analyses indicate that an iron gall ink was used both pure and in mixture with a carbon black pigment, which corresponds to similar findings for other works by Cima. An underdrawing executed with a similar medium could also be documented for the first compositional idea of Leonardo da Vinci's *Virgin of the Rocks* (London, The National Gallery, c.1491/2–9 and 1506–8) using MA-XRF and reflectance imaging spectroscopy (RS).³⁹

In the Munich double portrait, the subsequent paint layers of the different compositions are directly superimposed, and none of the samples contain any intermediate layers of varnish or dirt deposits. This indicates that all four compositions were executed in close succession, without long intervals in between. There are no full-surface cancellation layers separating the compositions; however, locally delimited, thin, black blocking-out sections were found in several places, for example under the blue robe of Trifone (composition 4) and under the green headdress of the sitter in the single portrait (composition 3), and possibly also under the lower section representing the foreground of the Arcadian scenery (composition 2). These appear to be locally applied paint layers serving both to conceal the underlying colour and as part of the following compositional preparation.

Within a single compositional phase, the painting is sometimes richly layered with often two or three layers of paint for the rendering of robes, flesh tones, architecture or landscape (Figures 10–12). The mixture of colours is diverse; for example, all three glaze layers of a violet shade in the blue coat of Trifone each contain a red lake, whereas the blue pigments vary from indigo in the first layer to a mixture of indigo and ultramarine in the second, followed by a final third glaze with ultramarine only (Figures 10 and 17g). The most complex stratigraphy is found in the sleeve pattern of the single portrait with four to five layers of different colours (Figures 12 and 17f).

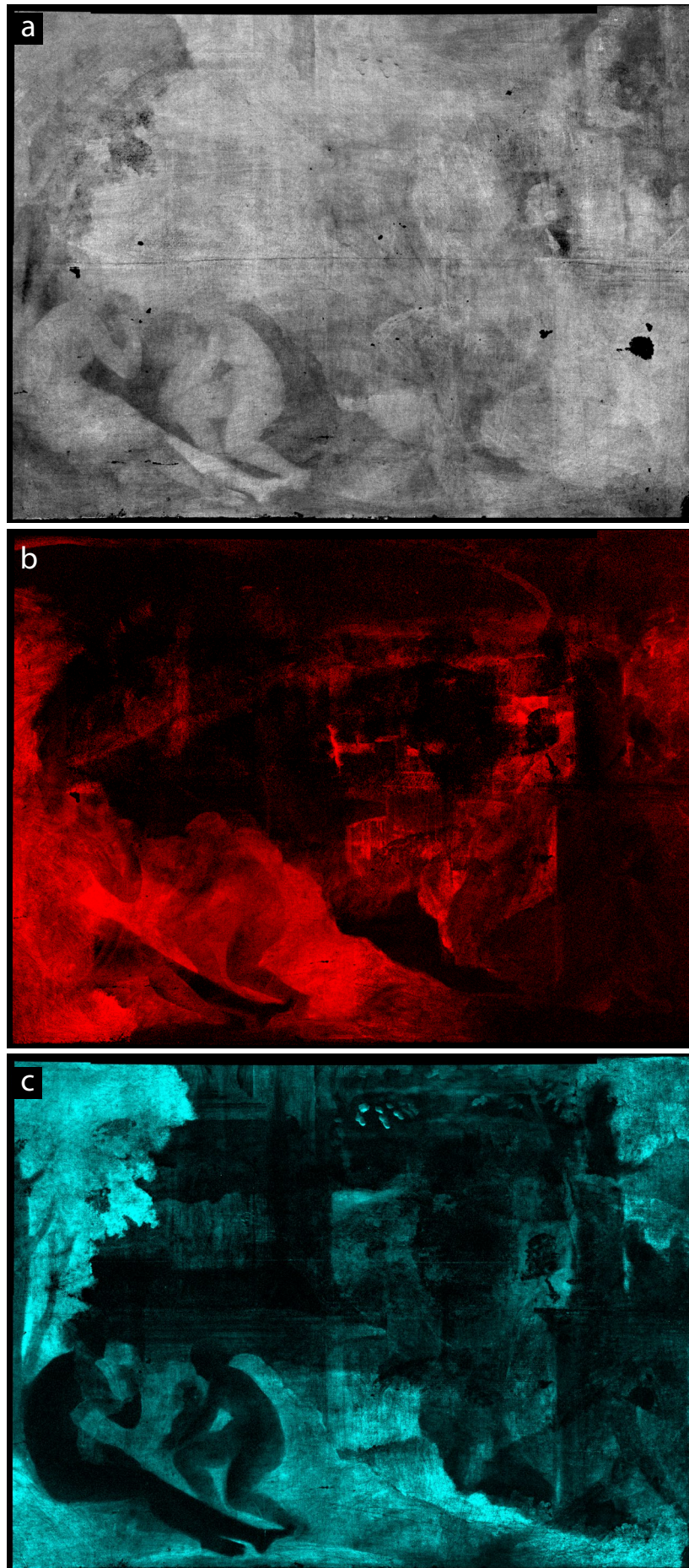


Figure 7 MA-XRF scan of the reverse, turned 90° anticlockwise and mirrored. Elemental distribution images of (a) lead (Pb-L); (b) mercury (Hg); (c) copper (Cu). (Images: Jens Wagner, Doerner Institut, BStGS, Munich.)

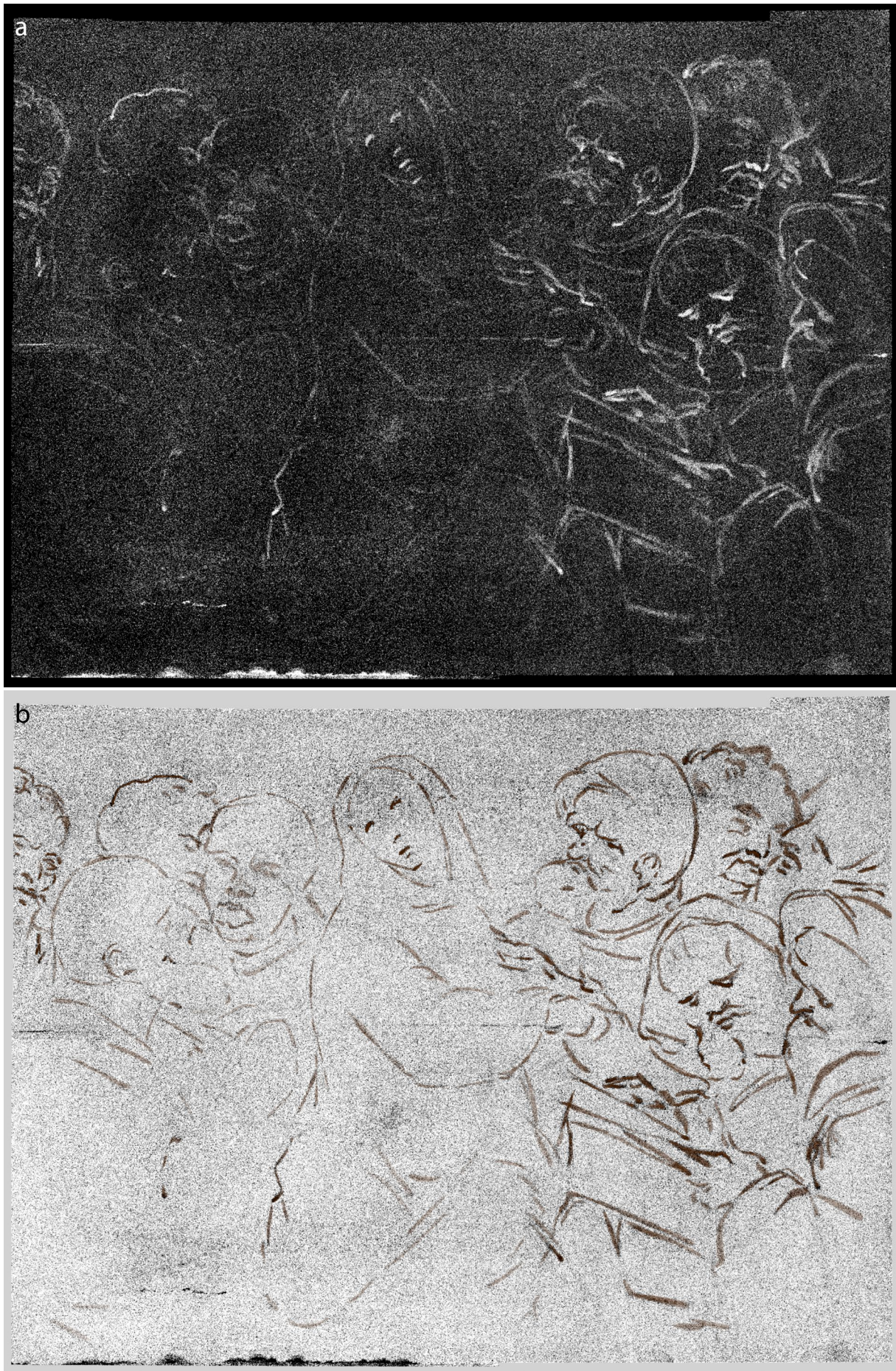


Figure 8 MA-XRF scan of the reverse, turned 90° anticlockwise and mirrored. (a) Elemental distribution image of zinc (Zn); (b) Inverted Zn image in overlay with manually drawn mapping of the detected lines (in brown). (Images: (a) Jens Wagner; (b) Anneliese Földes/Jens Wagner, Doerner Institut, BStGS, Munich.)

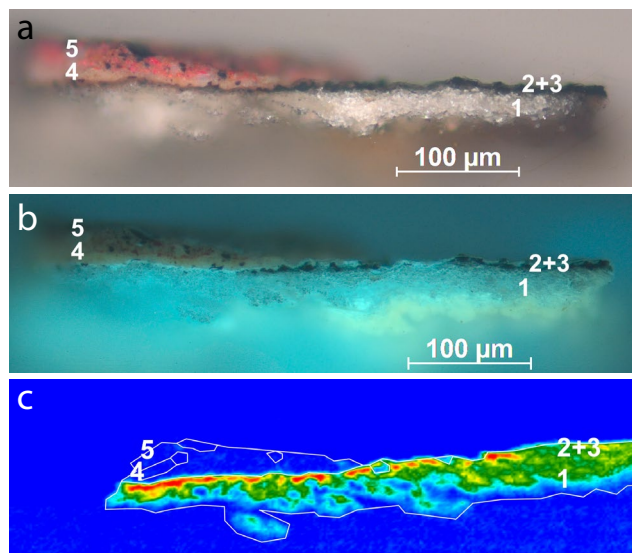


Figure 9 Cross-section from upper tacking edge. (a) Light microscopy in incident light and (b) ultraviolet light; (c) FTIR imaging, amide I protein absorption $1600\text{--}1680\text{ cm}^{-1}$. Stratigraphy: 1 ground I 2 brownish-black drawing layer (composition 1) I 3 unpigmented intermediate layer (isolation) I 4 beige (composition 1?) I 5 pinkish-red (composition 1?). Upper layers missing. (Images: Andrea Obermeier/Ursula Baumer/Patrick Dietemann, Doerner Institut, BSTGS, Munich.)

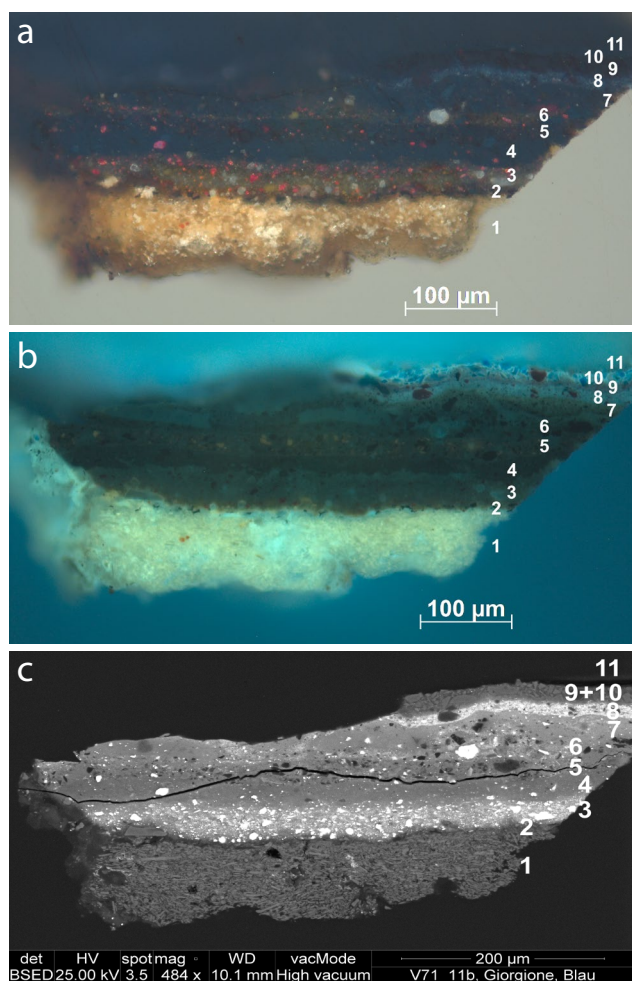


Figure 10 Cross-section from purplish-blue coat of Trifone Gabriele. (a) Light microscopy in incident light and (b) ultraviolet light; (c) Backscattered electron image. Stratigraphy: 1 ground I 2 brownish-black drawing layer (composition 1) I 3 brown-green (composition 2) I 4 black (composition 2 or 3?) I 5 dark brown (presumably composition 3) I 6 brown (composition 3) I 7 black undermodelling (composition 4) I 8–10 violet (composition 4) I 11 varnish. (Images: Andrea Obermeier, Doerner Institut, BSTGS, Munich.)

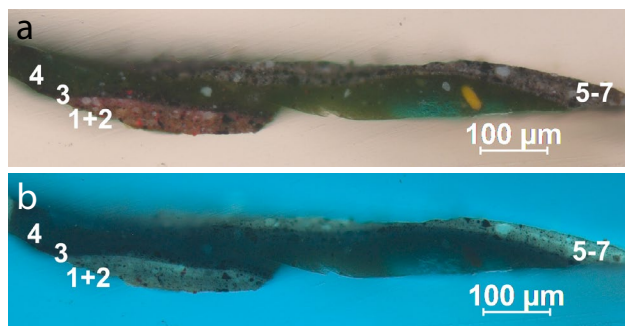


Figure 11 Cross-section from grey architectural background. (a) Light microscopy in incident light and (b) ultraviolet light. Stratigraphy: Lower layers missing. 1 red-brown (composition 2) I 2 pink flesh tone (composition 2) I 3 brown-black (presumably composition 3) I 4 green headdress (composition 3) I 5–7 brownish grey (composition 4). (Images: Andrea Obermeier, Doerner Institut, BSTGS, Munich.)

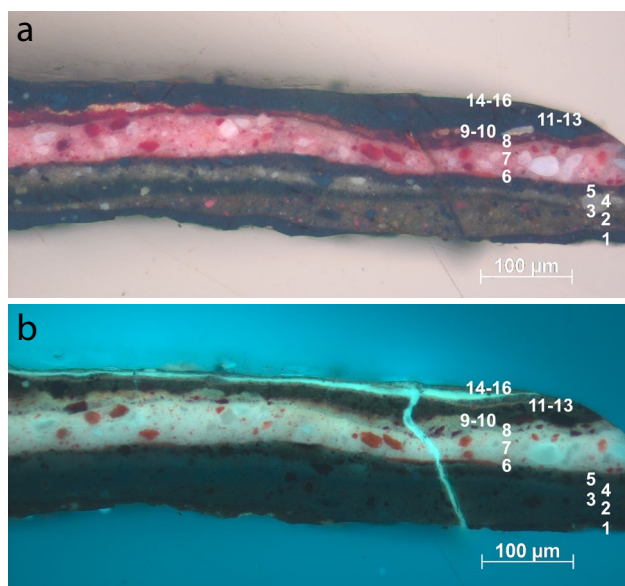


Figure 12 Cross-section from the sleeve of Trifone Gabriele. (a) Light microscopy in incident light and (b) ultraviolet light. Stratigraphy: Preparation layers missing. 1 black (composition 1 or 2) I 2 brown-green (composition 2) I 3 green (composition 2) I 4 grey (composition 2) I 5 black (presumably composition 3) I 6 orange (composition 3+4) I 7 pink (composition 3+4) I 8 red (composition 3+4) I 9 yellow (composition 3+4) I 10 red (composition 3+4) I 11 black (composition 4) I 12 brown (composition 4) I 13 black (composition 4) I 14 varnish I 15 brown (later overpainting) I 16 varnish. (Images: Andrea Obermeier, Doerner Institut, BSTGS, Munich.)

The pigment palette employed in the painting, comprising around 20 colorants and fillers, is extremely rich (Table 1). This reflects the privileged access that Venetian artists had to a diverse array of painting materials through the city's specialised *vendecolori* (colour merchants).⁴⁰ The palette includes at least two, sometimes four different colorants in each primary colour, for example, in the yellow: lead-tin yellow, two different yellow ochres and orpiment, an arsenic sulphide pigment that is very characteristic of Venetian Renaissance painting (Figure 17h). Worth noting at this point is the absence in any significant quantity of blue or green copper mineral pigments in all analysed cross-sections.⁴¹ The analytical data available on pigments of undisputed paintings by Giorgione⁴² is currently still too limited to allow further comparisons.

Table 1 Overview of the pigments and fillers detected in the paint layers.

Colour of the material	Pigment or filler
White	lead white chalk aluminosilicate, quartz, dolomite
Yellow	yellow to yellow-orange ochres lead-tin yellow type I (containing massicot) orpiment
Blue	indigo ultramarine (azurite)
Green	copper green (verdigris type) green earth
Red / Orange	red to red-violet lake(s) vermilion/cinnabar red ochre orange to red-orange ochre
Brown	brown ochre presumably organic brown pigment, possibly Cassel earth (?) (dark, brown (?) lake, yellow-orange fluorescent)
Black	sulphur-rich coal-type black vegetable carbon black lamp black (bone black)

() in minor amounts.

When comparing the three painted compositions 2 to 4, only a few differences in the choice of pigments can be determined. A coarse-grained, gold-coloured ochre and orpiment, and presumably also indigo, were only detected in the single and double portraits. Ultramarine, by contrast, was only found in the last phase of the working process, namely in the humanist's blue to blue-violet coat, which has darkened considerably.

4 Interpretation of the individual compositions

4.1 Composition 1: Christ among the Doctors

The elemental distribution image of zinc, taken from the back of the lined canvas, visualises a multi-figure drawing rotated 90° anticlockwise with respect to the orientation of the double portrait, so set in landscape format, extending across the entire width of the canvas (Figure 8a).⁴³ Our investigations indicate that this is the bottommost composition on the front side of the painting, executed with a zinciferous material, probably a mixture of iron gall ink and vegetable carbon black, directly on the gesso prior to the application of a protein-based isolation (Figures 9, 10 and 17a; see also section 3.4).⁴⁴

Although the Zn image appears rather noisy and some lines register more clearly than others, the drawing can be effectively visualised and interpreted (Figure 8b). The

varying line thickness and apparent accumulation of the medium at the ends of the lines suggest a fluid brush drawing, and the sketch-like character indicates its rapid, spontaneous execution. Variations in the intensity of the signal point to a varying degree of dilution of the drawing medium; dense and broad lines are registered particularly in the right half of the picture, lending an idea of the extraordinary virtuosity of the sketch. With just a few swift and bold brushstrokes, the artist succeeded in creating a dynamic scene while simultaneously evoking a sense of individualism in the faces, which attests to an exceptionally high level of artistic skill.

While no autonomous drawings by Giorgione have survived that are undisputed,⁴⁵ investigations using IRR have revealed preliminary and preparatory drawings for some of his paintings, providing insight into his compositional drawing practice.⁴⁶ These include the *Three Philosophers* (Kunsthistorisches Museum Wien, 1508/9),⁴⁷ a painting on canvas indisputably attributed to the artist, and the widely accepted panels of the so-called *Allendale Group*: the *Adoration of the Kings* (London, The National Gallery, 1506/7),⁴⁸ the *Holy Family* (Washington, DC, National Gallery of Art, c.1500)⁴⁹ and the *Allendale Nativity* (Washington, DC, National Gallery of Art, c.1505/10).⁵⁰ These underdrawings, executed with the brush in a liquid medium, appear more schematic and angular than the figure drawing found under the Munich portrait, yet parallels in style might be recognised in the partially abbreviated indications of the hands and the eye areas, in particular 'the simplified rendition of lowered eyelids'.⁵¹ The Zn image taken from the Munich painting conveys the impression of a swiftly drawn note intended to capture an idea that may or may not have been intended to serve as a preparatory underdrawing. Worth mentioning in this context is that the London investigations into the *Adoration of the Kings* have yielded a further brush drawing in addition to the underdrawing, a 'free improvisation' on the same pictorial theme, laid out on the panel rotated by 180°. ⁵² Furthermore, a preliminary drawing is hidden under the panel *Three Ages of Man* (Florence, Palazzo Pitti, Galleria Palatina, c.1500/10)⁵³ which shows the unrelated subject of the Virgin adoring the Child set in a landscape with architectural forms.⁵⁴

The first of the three compositions present beneath the Munich double portrait appears to be mainly linear in nature; however, it cannot be ruled out that (in a subsequent stage of the working process) some parts were already laid in with colour: at the upper edge of the painting, on top of the isolation layer, there are a locally confined beige and a pinkish red layer which, in view of their colouring, cannot be assigned to the second composition (*Arcadian Landscape*) (Figures 9 and 17a). On the reverse of the poplar support of the *Portrait of a Man* (San Diego Museum of Art, 1506),⁵⁵ primed on both sides, incoherent figure drawings were discovered on the gesso using IRR during a 1992 restoration, which were presumably executed in iron gall ink.⁵⁶ There is evidence that, comparably to the observation regarding the first composition of the Munich



Figure 13 Giovanni Battista Cima da Conegliano, *Christ among the Doctors*, 1504/5, oil on poplar panel, 54.5 × 87 cm, Muzeum Narodowe w Warszawie, inv. no. M.Ob.625 MNW. (Image: Muzeum Narodowe w Warszawie, Public domain.)



Figure 14 Albrecht Dürer, *Christ among the Doctors*, 1506, oil on panel, 64.3 × 80.3 cm, Madrid, Museo Nacional Thyssen-Bornemisza, inv. no. 134 (1934.38). (Image: ©Museo Nacional Thyssen-Bornemisza, Madrid.)

work, certain sections of the figure drawings on the reverse of the San Diego portrait were painted in before this side of the panel was subsequently covered with brown paint and marked with an inscription.

Unlike the drawings on the back of the San Diego painting, the design detected under the Munich portrait can be read as a coherent composition both formally and in terms of its subject: a three-quarter figure occupying the centre of the painting is surrounded by nine other, obviously male figures – three half-length figures in the foreground and six heads in the second row behind them – who are depicted in different postures or views and related to each other by gestures and gazes. While the men's heads are captured with bold brushstrokes and their faces are rendered in a physiognomically concise manner, the artist's interest in the central figure is concentrated primarily on the dynamic twist of its body, which suggests a lively interaction and skilfully links the two compositional halves of the painting: with its head turned to the left, the figure points with its right hand to an open tome that two bearded men are studying in the foreground. In combination with other motifs such

as the headgear of the man on the far right – whose cap features a turned-up brim characteristic of contemporary depictions of Pharisees⁵⁷ – this pointing gesture indicates that the drawing represents the New Testament subject of the 12-year-old Christ among the Doctors (Luke 2:41–7), a pictorial theme which was not very common in Venetian painting until the Quattrocento, but which gained popularity in the first decade of the 16th century. A strong impetus for this increased interest appears to have been provided by pictorial inventions of Leonardo da Vinci and Giovanni Bellini, which no longer survive but have left traces in written sources and were taken up by artists of the following generation. This is evidenced in works by Bernardino Luini (London, The National Gallery, c.1515/30)⁵⁸ and Giovanni Battista Cima da Conegliano (Muzeum Narodowe w Warszawie, 1504/5, Figure 13),⁵⁹ among others, but also by Albrecht Dürer's 'opus q[u]inque dierum' (Madrid, Museo Thyssen-Bornemisza, 1506, Figure 14),⁶⁰ which is clearly the result of an artistic dialogue with Venetian works and was probably created on site in Venice.

The Munich figure drawing likewise reflects these prolific years of mutual exchange and competition in early Cinquecento Venice. Its composition, with the relief-like ensemble of figures extending across the picture plane, formally corresponds to the mode of the *dramatic close-up* (Sixten Ringbom) typical of Venetian devotional paintings of this period. But even beyond formal and motif-based references, the Munich drawing is the record of an engagement with the very same artistic challenges that Dürer evidently also found intriguing when taking up this pictorial theme: the dense staggering of the heads, for example, resulting in a variety of views and expressions, or the marked contrast between the soft face of the boy Jesus and the Pharisees' physiognomies. This complementary juxtaposition of youthful, idealised beauty and the striking features of aged faces can be traced back to Leonardo da Vinci, whose physiognomic studies Giorgione must have been well acquainted with, either through direct contact during Leonardo's brief stay in the lagoon city in March 1500 or through drawings circulating in Venice⁶¹ (reflections of Venetian artists' engagement with Leonardo include, for example, the so-called *Portrait of a Warrior* [Kunsthistorisches Museum Wien, c.1505/10],⁶² the *Christ Carrying the Cross* from the Scuola Grande di San Rocco in Venice [c.1505/10]⁶³ and the *Three Ages of Man*, all of which make use of this artistic device). In the Munich painting, this concept of juxtaposition is echoed not only in the first idea of the dispute between Jesus and the Pharisees, initially sketched on the canvas (composition 1), but also takes form in the final depiction of the discourse between teacher and pupil (composition 4) – an indication that the artist was exploring similar artistic challenges across different subjects. This self-assured approach in taking up and transforming new stimuli and ideas goes far beyond a purely adaptive reception and is thus entirely in keeping with the artistic profile of Giorgione who, with a keen sense for the creations of Dürer and Leonardo, would always develop highly individual pictorial solutions. It is, indeed, primarily the fact that despite

its references to the pervasive artistic dialogue of those years in Venice, the Munich composition cannot be traced back to any specific models that distinguishes it from contemporaneous works catering to the new demand for biblical scenes in half-length format, such as those by the Venetian Rocco Marconi, whose version of *Christ among the Doctors* (formerly Verona, Bragantini Collection, c.1510/15)⁶⁴ is a mere compilation of motifs and figure types borrowed from Leonardo, Dürer and Giorgione.⁶⁵ The artistic ambition reflected in the figural invention – which even in its technical visualisation loses none of its persuasive appeal – further supports the proposition that the bottommost composition on the canvas was created by Giorgione.

4.2 Composition 2: Arcadian Landscape

MA-XRF scanning of the painting's reverse led to the discovery of a second, now hidden composition succeeding the figure drawing: an Arcadian landscape, set in horizontal format (with the orientation of the canvas unchanged compared to that of the previous composition) and painted in colour. Some elements of this depiction are only visible in the scan taken from the reverse, namely in the elemental distribution images of copper, lead and mercury, while others are also partially visible in technical images taken from the front, especially in the Cu map (Figures 7a–c and 6c). From the extensive copper distribution, it can be gathered that green, blue and also brown tones dominate the depiction; cross-sections and stereomicroscopy reveal varying hues of green in the lower paint layers, indicating the presence of painted plants, scrubs or trees (Figures 10, 12 and 17a, f). At the centre on the right edge of the painting, visible in drying cracks, are layers of light blue and white paint that presumably belong to a sky (Figure 17b). By superimposing the technical images and combining them with the stereomicroscopic findings, the composition can be reconstructed to a large extent (Figure 15). Tree trunks and foliage, meadows, a flowing body of water and architectural forms are recognisable elements of a landscape. These seem to be staggered in a way that directs the viewer's gaze into the depths of the picture, where the sky is set high above a chain of hills. Most clearly discernible are two figures in the lower left foreground and, to the left or behind them, tall trees extending to the upper edge of the picture. Two apparently undressed figures are depicted reclining on the ground.⁶⁶ On the right, an evidently female figure sits with her legs bent and her right knee raised, holding something in her arms, possibly a child, to which she is leaning slightly forwards. The left-hand figure, presumably male, raises his right arm upwards at an angle, perhaps to hold a flute. At the right-hand edge of the picture, architectural elements distinctly reminiscent of antiquity can be seen: a pedestal with a cornice running along its upper ledge, bearing the fragment of a column with a base and broken shaft, apparently overgrown with vegetation. In front of the pedestal, or perhaps displayed in relief upon it, an upright figure, probably nude, is depicted in a striding pose. Emerging from

the depth and flowing into a cascade, a river appears to run between the group of figures and the pedestal. The remaining landscape is less clearly discernible: another pedestal seems to loom behind the female figure, whereas in the area above it, only vague shapes register that are difficult to read. At the top right, further foliage frames the corner of the picture.⁶⁷ Below it in the middle ground, fragments of houses, roofs, possibly a bridge, and an arched construction recede into the distance. Due to the complex superimposition of XRF signals from different compositions, some areas and shapes that register in the elemental distribution images cannot be conclusively interpreted or definitively assigned to the individual compositions. The geometric structures visible in the upper left of the Cu and Pb maps might belong to the subsequent composition (i.e. to the presumed architectural background of the single portrait). In some parts of the picture, other shapes lying on top of or underneath the second composition could not be fully visualised.⁶⁸

The technical examinations indicate varying degrees of painterly elaboration in the *Arcadian Landscape*. It may be either an unfinished painting or a far advanced form of a first *invenzione* developed directly in paint – if the latter is the case, it would align with the mode of working Vasari notably labelled as characteristic of Giorgione (if only to thereby establish the contrast between Venetian painting practice and the Florentine tradition of *disegno* he proposed).⁶⁹ The overpainted composition is strongly reminiscent of one of Giorgione's most prominent pictorial inventions – that of the famous *Tempesta* (Gallerie dell'Accademia di Venezia, c.1504, Figure 16)⁷⁰ – which likewise conceals extensive changes made during the working process and continues to give rise to many questions.⁷¹ The posture of the breastfeeding woman in the *Tempesta*, for instance, is echoed in a very similar form in the Munich group of figures. Further elements of Giorgione's enigmatic *poesia*, along with other pastoral inventions such as those documented under his name in the illustrated inventory of the Venetian collector Andrea Vendramin (1627),⁷² also offer direct associations with the second composition of the Munich work.

Complex pictorial geneses featuring considerable compositional changes, many of which could not be fully reconstructed or interpreted so far, and an organic, additive painting process are characteristic of Giorgione's working methods. Moreover, examinations of works attributed to or associated with Giorgione have repeatedly revealed hidden compositions beneath the painted surface: radiographic examinations of the canvas painting *Il Concerto* (Milan, Collezione Mattioli, on loan to the Gallerie dell'Accademia di Venezia, c.1507)⁷³ – which may be identified with a work by Giorgione described in Gabriele Vendramin's inventory as 'tre testoni che canta' (*Three Great Singing Heads*)⁷⁴ – have brought to light small-scale figures interpreted as soldiers in a landscape, a composition that lies beneath the triple portrait (rotated 90° clockwise).⁷⁵ An example for the reuse of a canvas in Giorgione's oeuvre is the so-called *Self-Portrait as David* (Brunswick, Herzog Anton Ulrich-Museum, c.1508/10),⁷⁶ beneath which lies a Madonna that closely corresponds to a painting by his presumed studio colleague

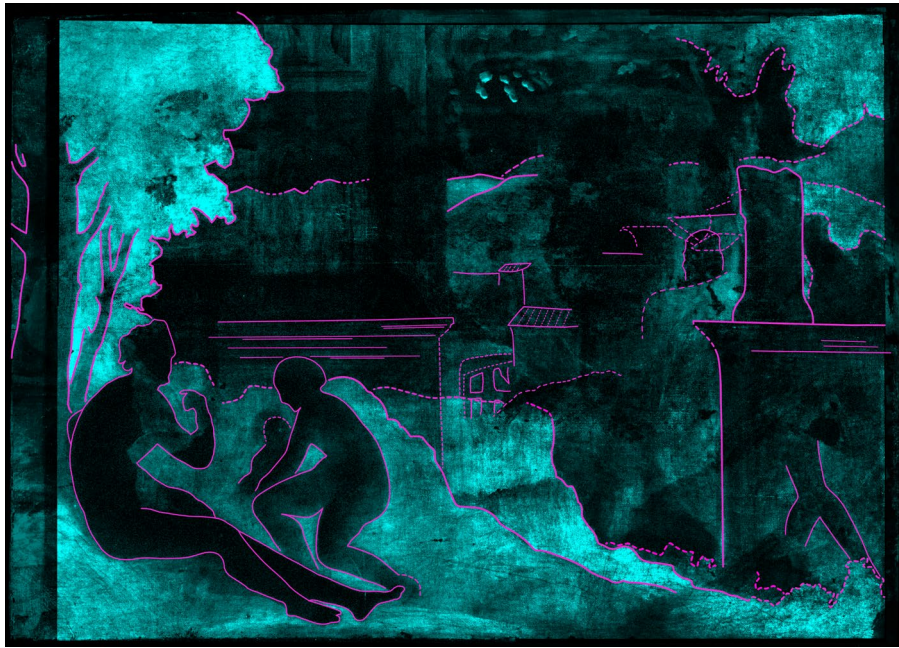


Figure 15 Reconstruction of the Arcadian landscape (composition 2) in overlay with Cu distribution image of the MA-XRF scan taken from the reverse on top of the scan taken from the front (visibility reduced): mapping of outlines and shapes (in magenta) that can be discerned in the technical images and are assigned to the second composition. Less distinct shapes are denoted by dotted lines. (Image: Anneliese Földes/Jens Wagner, Doerner Institut, BStGS, Munich.)



Figure 16 Giorgione, *La Tempesta (The Tempest)*, c.1504, egg tempera and walnut oil on canvas, 82 × 73 cm (Ferino-Pagden and Nepi Scirè 2004, cat. no. 7: 188 [G. Nepi Scirè]), Gallerie dell'Accademia di Venezia, inv. no. 881. (Image: © Gallerie dell'Accademia di Venezia – courtesy of the Ministero della Cultura/su concessione del Ministero della Cultura; any further reproduction or duplication with any means is prohibited.)

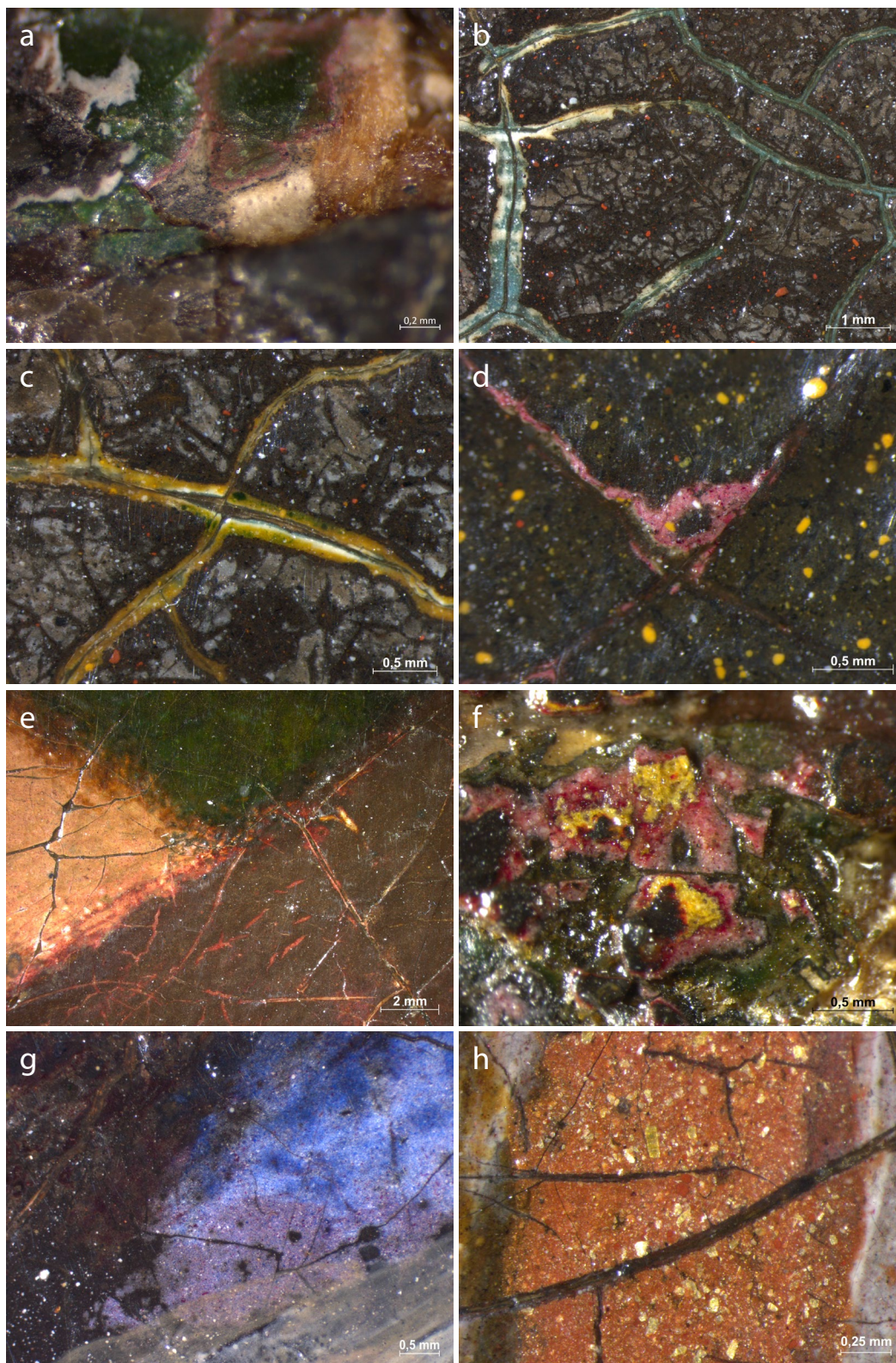


Figure 17 Photomicrographs. **(a)** Upper foldover edge, on the right, in loss: the figure drawing (composition 1), executed in a dark medium, lies directly on the gesso; between this composition and the green layer assigned to the Arcadian landscape (composition 2) is a pinkish-red layer which cannot be definitely assigned to one of the two compositions. **(b)** Trifone Gabriele's fur collar, centre right edge: blue and white layers partially visible in drying cracks which are assigned to the sky of the Arcadian landscape (composition 2). **(c)** Trifone Gabriele's fur collar, centre right edge: a complex stratigraphy of differently coloured layers can be found in cracks; underneath the brown underpaint of the fur (composition 4) is a yellow-greenish layer assigned to the garment of the single portrait (composition 3), and beneath this lie the paint layers of the Arcadian landscape (composition 2). **(d)** Background, between the heads of the two sitters: directly beneath the dark, gold ochre-containing paint of the background (composition 4) is a pink layer containing vermilion which corresponds to the lips of the single portrait (composition 3). **(e)** Brown sleeve, area of teacher's hand: under the brown paint, a layer of red lake shows through which can be assigned to the colourful sleeve of the single portrait (composition 3, initially adopted for composition 4 before being discarded). **(f)** Lower tacking margin, on the left, in loss: remnants of the sleeve pattern (composition 3+4) on a green paint layer assigned to the Arcadian landscape (composition 2); cf. also Figure 12. **(g)** Trifone Gabriele's coat, centre: the originally purple-blue coat of the scholar is multi-layered and contains varying mixtures of red lake, indigo and ultramarine. **(h)** Giovanni Borgherini's stole, left edge: yellowish, glittering particles are incorporated in the orange lines running through the stripe pattern which can be identified as orpiment. (Images: Anneliese Földes, Doerner Institut, BStGS, Munich.)



Figure 18 Reconstruction of the single portrait (composition 3) in overlay with Pb distribution image of the MA-XRF scan taken from the front: mapping of outlines and shapes (in magenta) which can be discerned in the technical images and are assigned to composition 3, including drawing and colour reconstruction of the sleeve pattern. Less distinct shapes are denoted by dotted lines. (Image: Anneliese Földes/Jens Wagner, Doerner Institut, BStGS, Munich.)

Vincenzo Catena. Another point in case is the *Vienna Portrait of a Warrior* – whose attribution to Giorgione is further complicated by its preservation state – which, if rotated by 180°, features an underlying abandoned portrait.⁷⁷

4.3 Composition 3: Single Portrait (of a Young Man?)

On top of the *Arcadian Landscape* and directly beneath the visible double portrait lies another portrait – that of a presumably single figure corresponding to the looking-over-the-shoulder portrait type (Figure 18). Whereas in the

XR (Figure 5a), the face of this hidden figure is visible only vaguely between the two heads of composition 4, Giovanni Borgherini and Trifone Gabriele, it is clearer in the Pb map of the XRF scan (Figure 6a). For this third composition, which represents yet another genre, the support was rotated by 90° clockwise.

The IRR (Figure 5b) shows a broad, semicircular brushstroke above the shoulder of Trifone which seems to belong to an early stage in the development of the third composition and was apparently intended to roughly establish the position of the shoulderline of the sleeve of the left arm of the underlying figure. The artist seemingly began the third composition by first sketching in principal elements. As



Figure 19 Domenico Capriolo (?), *Portrait of a Young Man Wearing a Fur Cape*, 1512, oil on canvas, 117 × 85 cm, St Petersburg, The State Hermitage Museum, inv. no. ГЭ-21. (Image: bpk/Scala.)

already mentioned, in cross-sections taken from different areas, thin black layers were found between the compositions. They presumably served both as local blocking-out sections to cancel the previous pictorial idea and at the same time as underdrawing or undermodelling for the next composition (see section 3.4).

The left arm of the figure in composition 3 largely coincides with that of the humanist visible today (composition 4), yet his sleeve is prominently placed on a parapet and the sitter seems to hold a rectangular object (a book?), which can be recognised in the Cu image as a vague shape in the place of the astrolabe realised in the final painting (Figure 6c).⁷⁸ Adjacent to the head, which appears black in the Cu map due to the ‘shielding’ effect caused by the lead-white-rich paint of the flesh tones, is an elaborately folded, expansive piece of fabric, possibly part of the figure’s headgear. The Pb map and the XR likewise reveal details that, based on their positioning and dimensions, can be assigned to a headdress, whose exact form, however, cannot be reconstructed conclusively and which was presumably altered to some extent through mechanical removal of paint. In a cross-section, this headdress visible in the Cu map can be assigned to a dark green layer containing verdigris and gold ochre particles (Figure 11). A similar layer of paint is also found in varying mixtures of green and yellow pigments directly beneath Trifone’s coat (Figure 17c), which indicates that the person represented in the underlying composition is clad in a yellow-green garment. Other shapes that are difficult to interpret due to

signal overlays may belong to architectural elements of the backdrop. The arched shape tracing the contour of Trifone’s head – as rendered in the IRR, XR and Pb images – may be interpreted as a niche intended for the background of the discarded portrait; corresponding lines can also be seen in the Pb and Cu scans taken from the reverse (Figure 7a, c).

This portrait of a single figure, presumably a young man,⁷⁹ can be imagined as similar to the Giorgionesque *Giovinetto* (St Petersburg, The State Hermitage Museum, 1512, Figure 19)⁸⁰ in terms of the composition and posture of the figure, whose costume and sleeve are strikingly colourful. A similarly conspicuous sleeve presented in an equally prominent position in the foreground of the painting can be identified as a part of the Munich work’s third composition: here, the XR image reveals a distinct textile pattern, the character and modelling of which is even more clearly visible in the IRR (Figure 5a, b). Taking into account the Pb, As and Cu distributions of the MA-XRF scan taken from the front (Figure 6a, c, d) in correlation with the information gained through stereomicroscopy and cross-section analyses, it was possible to reconstruct an unusually intricate fabric pattern in bright contrasting colours (red, yellow, green) (Figures 18, 20 and 21). Red lake was glazed over an opaque pink underpaint mixed from lead white and red lake, which in turn lies on a thin orange-red layer containing ochre and lead white – with this layering technique and modelling of the paint, the artist presumably aimed to achieve the shimmering quality of a silk sleeve (Figure 17e, f). Orpiment was used to create an interlaced pattern consisting of interlocking chains intertwined with white strands; the arsenic-containing yellow pigment was most likely chosen to depict gold threads. The Cu image also shows complex geometric forms, such as octagons containing stars, along with foliate ornament. Through stereomicroscopic examination, this ornament can be correlated with green and black spots which are only visible in a few places under the brown paint of the sleeve and indicate the use of a now darkened copper green and/or a copper-containing black paint.

The design of the sleeve evokes the intricate ornamentation and opulence of Islamicate fabrics. In view of Venice’s unique geopolitical status as a hub for the exchange of goods and knowledge between Christian and Islamic cultures, it can be presumed that the meticulous depiction of the sleeve pattern owes much to a strong familiarity with such precious imported goods, whose fascination and prestige value is widely reflected in Venetian painting during the early 16th century.⁸¹ In the case of the Munich painting, the depicted Islamicate textile appears to be neither of Anatolian-Ottoman origin (referred to as *turchesco* at the time), as is known, for instance, from depictions of so-called Lotto-carpet in paintings from this period, nor is it one of the imported fabrics from the eastern/southeastern Mediterranean (known at the time as *mamelucco*) frequently featured in the narrative cycles of the Venetian *scuole* by Gentile Bellini, Vittore Carpaccio and Giovanni Mansueti.⁸² Instead, it is most likely a silk fabric from Moorish Spain – which is of particular interest to research



Figure 20 Drawing and colour reconstruction of the sleeve pattern (composition 3, initially adopted for composition 4 before being discarded). Combined information from stereomicroscopic examination, X-section analysis and technical images (XR, IRR, Pb/Cu/As distributions of the MA-XRF scan). (Image: Anneliese Földes, Doerner Institut, BStGS, Munich.)

not least because fabrics of this origin were depicted comparatively rarely in Italian Renaissance painting.

Andalusian textiles from the time of the Emirate of Granada (1232–1492) are distinguished by their rich repertoire of motifs based on the symbolic imagery of Islamic architectural ornaments (such as the so-called *zellij* of the Alhambra in Granada): their designs evolve around geometric compositions based on combinations of polygonal and star shapes which often overlap and intertwine to form intricate patterns whose ornamental complexity is emphasised by the elaborate interlacing of strands and ribbons repeating ad infinitum (known as *laceria*).⁸³ Another characteristic feature is their vibrant colour palette dominated by strong reds and greens as well as yellow as a substitute for gold. In the case of the Munich painting, the flowing lines and rounded curves of the *laceria* in combination with the naturalistically rendered *ataurique* (floral and vegetal ornaments typical of Nasrid decoration) indicate that the fabric is a product of late Nasrid artisanry, thus most likely dating from the late 15th century.⁸⁴

Diplomatic and mercantile relations between the Republic of Venice and the Emirate of Granada – alongside Málaga and Almería considered the centre of Nasrid textile production – lasted until the final years of the Reconquista, which culminated in 1492 in the conquest

of the Emirate by the joint forces of Isabella I of Castile and Ferdinand II of Aragón.⁸⁵ Although only few historical textile fragments from Al-Andalus have survived in Italy, both their presence and the esteem in which they were held in Renaissance Venice are attested by material and visual sources – including a cushion made of Nasrid silk kept in the Chiesa di San Rocco, on which the relics of the Venetian patron saint were displayed from 1490.⁸⁶ Visual evidence for the still largely unexplored artistic reception of textiles and artefacts from the Emirate of Granada in Renaissance Venice can also be found in contemporary painting: the robe of St John in the *Lamentation over the Dead Christ* painted by Giovanni Bellini and Rocco Marconi (Gallerie dell'Accademia di Venezia, c.1510/16)⁸⁷ is based on a carefully reproduced fabric pattern whose characteristic colour scheme (red, yellow, green) and ornamentation (bearing the stylised heraldic lions of the Nasrid dynasty) reveal its provenance from Moorish Spain.⁸⁸ Another product of Nasrid craftsmanship that was captured with meticulous attention to detail by a Venetian painter can be identified in Vincenzo Catena's *Warrior Adoring the Infant Christ and the Virgin* (London, The National Gallery, c.1520): a richly decorated horse bridle⁸⁹ which must have been directly accessible to the painter who, according to the inscription on the reverse of the Vienna *Laura*,⁹⁰ was a



Figure 21 Mapping of changes (in magenta) in the double portrait (composition 4) in overlay with stripped-state photograph taken during restoration in 2010: mapping of shapes (in magenta) that can be discerned in technical images, including drawing and colour reconstruction of the sleeve pattern which was initially integrated into composition 4 before being discarded. Less distinct shapes are denoted by dotted lines. (Mapping: Anneliese Földes 2024, Doerner Institut; photo: Sibylle Forster 2010, BStGS, Munich.)

(workshop) colleague of Giorgione. Correspondingly, it can be assumed that the textile depicted in the Munich portrait was modelled on a specific textile known to the artist, who must have been familiar with the exquisite collections of his humanist patrons. This is evident in the painter's attention to detail in the intricate pattern and the subtle folds, made visible where the pattern interrupts to convincingly reproduce the natural drape of silk flatweaves.

This remarkable sensitivity to the materiality and texture of fabrics is a quality that characterises many of Giorgione's works (cf. *Pala di Castelfranco*, c.1500/4)⁹¹ and is perhaps

even reflected in the inventory of the painter's estate compiled after his death.⁹² It also finds a perfect equivalent in the brilliant chromatic effects of Giovanni Borgherini's stole (composition 4), which bring to mind the fashionable flamboyant extravagance of the Venetian *Compagnie della Calza*. The scarf is, in this context, most likely intended as a kind of statement piece to emphasise the youthfulness of its wearer.⁹³ In a similar sense, the sleeve depicted in composition 3 may best be understood both as an expression of painterly bravura and as a signifier of status, age and identity. Whether the looking-over-the-shoulder portrait of a

man sumptuously dressed in bright colours was possibly conceived as a portrait of a person from the Islamic world – in which case the elaborately folded green fabric adjacent to the figure's head might be interpreted as a wrapped turban rather than a *cappuccio* (*chaperon*) or *mazzocchio* (traditional headgear that had already fallen out of fashion but was still worn by some Venetians in the first decade of the 16th century)⁹⁴ – or whether the alterity of the 'exoticizing' dress was more likely intended to characterise a biblical figure in keeping with iconographic tradition,⁹⁵ remains an open question.

Even if it is not possible to fully determine the degree of completion this third composition had attained at the time it was discarded, it can still be retraced to a great extent: in the place where the lips of the figure were located, a reddish-pink layer is detectable under the microscope beneath the grey paint of the visible background, indicating that the face had already been developed to a high degree (Figure 17d). While the sleeve pattern is notably refined in its execution, the Cu image reveals a streaky application of paint in the area adjacent to the sitter's shoulder, implying that this section was only roughly laid out. The backdrop does not appear to have been fully executed either, as only vague shapes could be visualised for this section in the technical images.⁹⁶

4.4 Composition 4: Double Portrait of Giovanni Borgherini and Trifone Gabriele

As is the case with the first two compositions, the question as to why the artist decided to discard the previous composition remains open. Directly superimposed over the described single figure is the double portrait of the young Giovanni Borgherini and his teacher Trifone Gabriele, presumably commissioned by the youngster's family – the uppermost composition visible today.

In general, the IRR (Figure 5b) does not reveal many lines or marks, and the few that have been visualised cannot be identified with certainty as an initial layout for the fourth composition. Observable in the pupil's stole are a few delicate lines defining the trajectory of the stripes and folds of the pattern, probably drawn on a light grey undermodelling later in the painting process. Dark brushstrokes are visible along the contour of Trifone's head: they could be part of the layout for the figure of the teacher, but they also coincide to some extent with the arched shape mentioned above, which might have been intended as an architectural motif (a niche?) for the background of the third composition.⁹⁷ As in compositions 2 and 3, thin black intermediate layers could be detected in certain sections of the double portrait. Partially underlying the flesh tones, for instance, is a black layer which probably again served as a concealing layer and as undermodelling.⁹⁸

This stage in the development of the composition may have already included coloured brush marks and underlayers serving to directly capture coloristic ideas. This is



Figure 22 Photomicrograph showing Trifone Gabriele's head. (Image: Anneliese Földes, Doerner Institut, BStGS, Munich.)

suggested by a bold brushstroke along Trifone's shoulder, clearly recognisable in the Fe map (Figure 6e), to which a gold ochre tone can be assigned by accompanying stereomicroscopic examination.⁹⁹

The final composition includes several changes, some of which are extensive (Figure 21): Giovanni's white undergarment originally extended further up, whereas the neckline of his dark green doublet executed in verdigris (now heavily darkened) was set lower and featured a hem.¹⁰⁰ As is clearly discernible in the Fe map, this hem was decorated with pseudo-Kufic lettering very similar to that adorning the seam of the robe worn by the right-hand figure of the *Three Ages of Man*, who is likewise dressed in vibrant green. The colourfully striped stole was therefore probably added at a later stage in the painting process. In addition, the fingers of both sitters have been slightly modified, which can be explained as an adjustment related to the reworking of the object held by the pupil: perceptible even to the unaided eye is a triangular object or possibly a quadrant as an alternative astronomical instrument that was originally painted in place of the astrolabe. The astrolabe visible today was therefore added only at a later stage, after the doublet had already been completed in copper green. A similar adjustment was found in the *Three Philosophers*, alongside extensive changes in the composition: the old philosopher at the right edge of the painting initially held

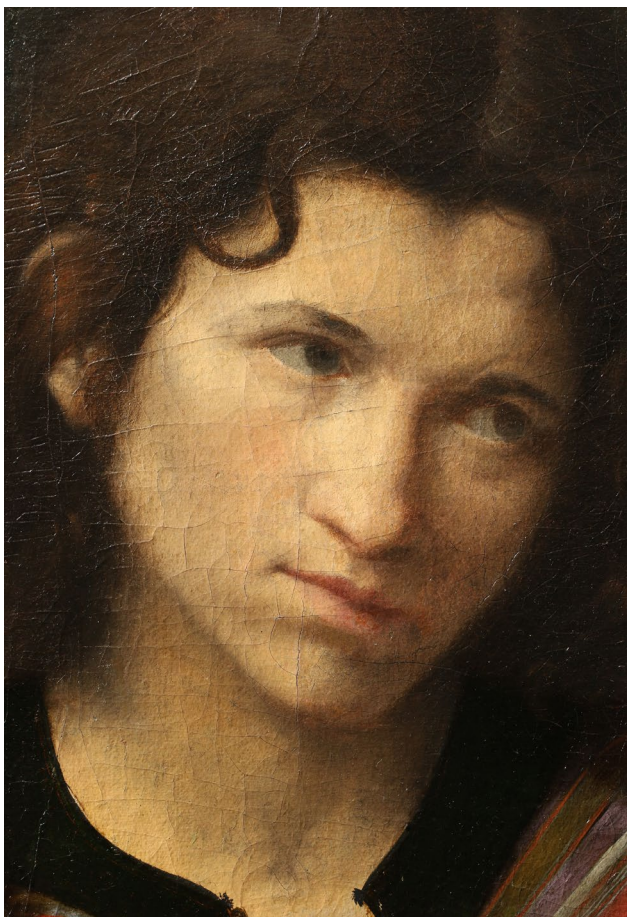


Figure 23 Giovanni Borgherini (detail). (Image: Anneliese Földes, Doerner Institut, BStGS, Munich.)

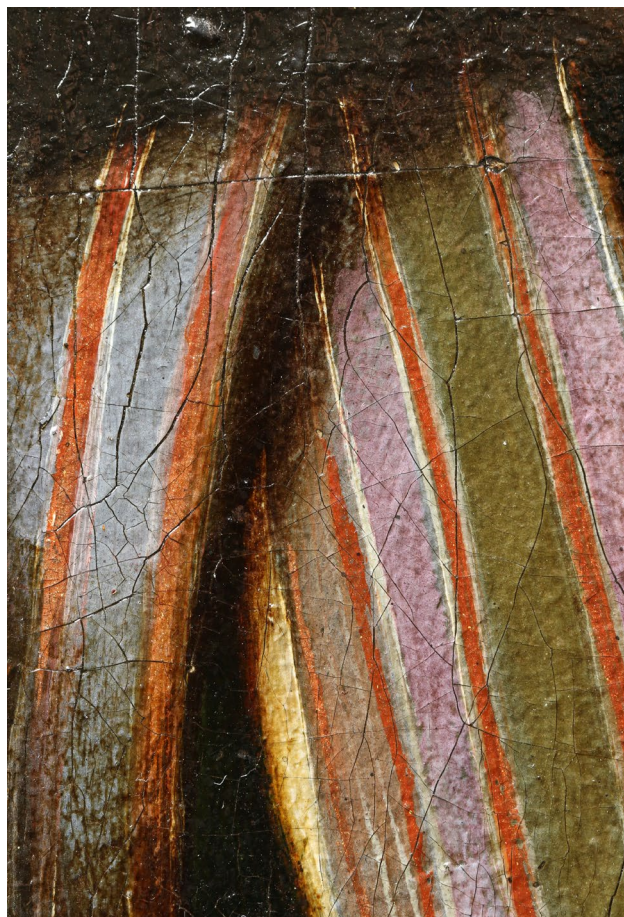


Figure 26 Photomacrograph showing Giovanni Borgherini's colourfully striped stole. (Image: Anneliese Földes, Doerner Institut, BStGS, Munich.)

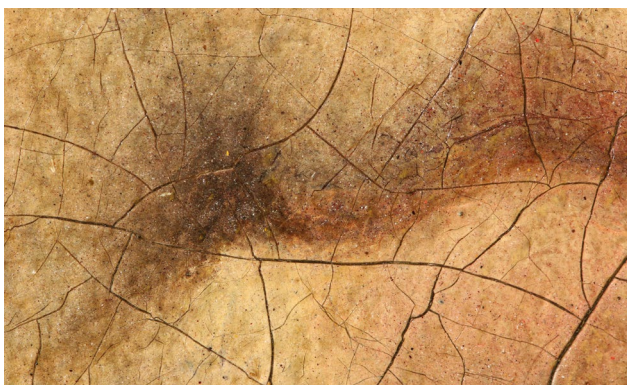


Figure 24 Photomacrograph showing Trifone Gabriele's lips. (Image: Anneliese Földes, Doerner Institut, BStGS, Munich.)



Figure 25 Photomacrograph showing highlights in the purple-blue coat of Trifone Gabriele. (Image: Anneliese Földes, Doerner Institut, BStGS, Munich.)

a different, hard-to-interpret object in his left hand instead of the parchment and compasses.¹⁰¹

Various observations gained from the technical images permit the conclusion that the artist had initially sought to incorporate the patterned sleeve of the single figure (composition 3) into the double portrait as that of the teacher: the signal of the pattern – appearing much weaker and more diffuse in the lower left corner in the Cu and As maps (Figure 6c, d) – indicates that the paint layer was reduced by mechanical means. In addition, this area is overlaid by a shape visible in the Cu map which looks like a folded cuff and suggests that the trim of the sleeve was altered here. The peculiar zigzag-shaped form along the coat's hem, appearing dark in the XR and Pb map (Figures 5a and 6a), can also be ascribed to mechanical removal of paint layers. Here, an up to 5 cm-wide strip of dried paint was scraped out with a sharp tool to adapt the shape of the sleeve: the technical images reveal that the paint layer of the sleeve pattern has a ragged edge, which partly lies beneath the brown sleeve and the fur trimming of Trifone's coat and thus appears to have been changed in form and expanse by mechanical means before being covered by subsequent layers of paint. Due to extensive retouching and the poor state of preservation in this area, it is difficult to distinguish original changes from later ones; the painting of the previous phase(s) is partially exposed here (cf. a strong signal in the Cu map and in the Hg image [Figure 6b]).



Figure 27 Giorgione, *Portrait of a Young Man*, c.1505/10, oil on poplar panel, 69.4 × 53.6 cm, Munich, Alte Pinakothek, inv. no 524. (a) Visible light photograph; (b) MA-XRF elemental distribution image of lead (Pb-L). (Images: (a) Nicole Wilhelms, BStGS, Munich; (b) Jens Wagner, Doerner Institut, BStGS, Munich.)

It is easily conceivable that the artist initially sought to preserve the elaborately designed sleeve pattern – possibly with the intention of portraying the sitters as progressive scholars by alluding to a foreign culture connoted with scientific achievements. After all, the disciplines of astronomy and astrology were understood as originating in the Islamic world, not only on account of the seminal writings of Ptolemy, Ibn Sina (Avicenna), Ibn Rushd (Averroes) and Abu Ma’shar (Albumasar), which had been translated from the Arabic and were printed in Venice and studied at the university of Padua at the time, but also through imported scientific instruments, including in particular astrolabes from Al-Andalus.¹⁰² While the coat painted in precious ultramarine signals the rank of its wearer, who thus appears less as an instructor of algebra than as a *nobile* conscious of his social status, the opulence of the sleeve pattern presumably did not suit a scholar such as Gabriele Trifone, who fashioned himself as a spiritual intellectual interested in neither material nor sartorial luxury.¹⁰³ It is perhaps for this reason that the sleeve was covered with the plain brown of a scholar’s robe:¹⁰⁴ this superimposed layer, whose appearance today is compromised by the effects of ageing and subsequent interventions (cf. Ca map; [Figure 6f](#)), is not a later addition but dates from the time of the painting’s execution. Cross-sections confirm that the same sulphur-rich, coal-type black as was detected in the build-up of the underlying compositions was used for this layer, and

that there is no intermediate layer separating the plain brown paint from that of the intricate sleeve pattern. The late adaptation of the triangular object into an astrolabe might also be related to this. These somewhat unconvincingly executed areas are last-minute revisions that might have been made at the request of the patron or the scholar portrayed.

The original appearance of the background is difficult to assess due to later interventions. The concave shape of the niche has been strongly affected and altered by later over-painting; in addition, the technical images reveal traces of the painter’s search for forms to establish the outlines of the niche. A peculiar observation, which could not be interpreted in more detail, is that the uppermost layer of paint is missing along an approximately 3 cm-wide strip at the upper edge of the painting (see in particular the Pb map; [Figure 6a](#)).¹⁰⁵ As regards the somewhat bulky architectural structure in the foreground, it can be assumed that the parapet which belonged to the underlying single portrait (composition 3) was partially uncovered and left exposed during an earlier restoration and therefore was not originally part of composition 4.

The high painterly quality of the double portrait is best revealed in the well-preserved¹⁰⁶ and subtly modulated heads of the sitters ([Figures 22](#) and [23](#)): viewed from up close, their faces are composed of finely nuanced flesh tints partially blended into one another, as in the depiction of the lips whose contours are softly

blurred (Figure 24). The rich tonal modelling of light and shade was achieved through the use of dark underlayers and wet-in-wet painting completed with brown glazes;¹⁰⁷ harsh transitions from highlights to shadows were gently blended and contours softened through fine hatching.

The resulting relief-like effect lends the figures a pronounced sense of plasticity and volume. The artist skilfully varied his manner of painting to differentiate between the two sitters: the young pupil is softly illuminated and gradually emerges from the dark, the tonal nuances further intensifying the impression of lyrical dreaminess created by the delicate modelling of his curls and the subtle shading of his eyes. The teacher's impressive physical and psychological presence, on the other hand, derives from a focused use of light and painterly precision, reflected in striking details such as the accentuated, single white hairs on his temples or the powerful contrast between his reddened conjunctiva and the sharp highlights in his eyes, which lend the sitter his penetrating gaze. These passages are set against areas that display a looser, more suggestive brushwork, such as in the vibrant highlights of the originally purplish-blue coat, applied with bold and sweeping strokes directly on the deep tones of the garment receding into the shadows (Figure 25). The winter lining of his coat, then again, aptly evokes the texture and feel of the lynx fur by means of rapid, airy brushstrokes.

A high level of painterly skill also becomes evident in the brilliant modelling of light and shadow in the artfully arranged stole, whose naturally rendered drapery attains a vivid materiality through contrasted shading along with colourful highlights set against the iridescent hues of the stripes. The chromatic splendour of the textile was achieved using a variety of colorants ranging from indigo, verdigris and orpiment to vermilion, orange-red ochre and red-violet lake (Figure 26).

A similarly high sense of verisimilitude can also be found in another work held by the Bayerische Staatsgemäldesammlungen, the *Portrait of a Young Man* (c.1505/10),¹⁰⁸ attributed to Giorgione and painted on a poplar panel (Figure 27a). A comparative examination of the two works reveals significant similarities in painting technique and stylistic parallels even beyond the formal exploration of the innovative looking-over-the-shoulder portrait type. Here, too, recent investigations have confirmed that the paint was scraped out in certain areas during the creative process – remarkably in the section of the sleeve as well (Figure 27b). The painting also features a similarly complex stratigraphy built up in layers of different colours that cannot be clearly assigned to specific stages of the painting process, superimposed without any separating varnish or dirt layers and displaying an unusual crack pattern – which indicates that the portrait of the youth likewise conceals at least one other independent depiction, the detailed interpretation of which is the subject of ongoing research.

5 Conclusion

This article brings together a series of arguments that collectively support the inclusion and discussion of the Munich painting within Giorgione's artistic oeuvre. These arguments range from the identification of the scholar depicted in the double portrait as the Venetian humanist Trifone Gabriele, thereby connecting the work to the portrait of the young Giovanni Borgherini with his teacher described by Vasari, to visual, textual and archival sources providing historical context and potential provenance for the painting and its path to the Wittelsbach collections. They also encompass the three underlying compositions: the portrait of a single figure with a meticulously designed Islamicate sleeve set in the novel *ritratto di spalla* portrait mode, the painterly *invenzione* of an Arcadian landscape reminiscent of Giorgione's *Tempesta*, and the composition of the figural drawing of Christ among the Doctors, which recalls works created in early Cinquecento Venice.

While none of the individual clues conclusively proves the proposed identification of the Munich work with the painting described by Vasari or its attribution to Giorgione, the cumulative evidence forms a dense network of references that allow well-founded conclusions to be drawn. Given the inherently controversial nature of (art-)historical findings, due to the fragmentary source material available for reconstructing Giorgione's life and oeuvre, these findings gain support from the results of the technical investigations on the complex creative processes that characterise this painting.

The diverse artistic inventions that were discovered beneath the double portrait and could be deciphered in many aspects testify to a highly inventive way of working. The artist would develop a new composition without completely covering the previous one beforehand; where convenient, he incorporated certain elements into the subsequent depiction and, where necessary, scraped away paint in order to integrate existing forms into the new composition.

It appears insufficient to ascribe this practice of repeatedly discarding pictorial ideas to the most obvious reason typically considered in such instances, namely as a means of saving labour and material, and thus ultimately to economic constraints. Instead, the complex genesis of the Munich painting attests to the resourceful *modus operandi* of an artist who had no hesitation in painting over his own ideas to experiment with new ones. Only the specific changes in the final composition, the double portrait of teacher and pupil, more likely reflect particular requests of the patron or the scholar portrayed. This originative approach aligns with a broader shift in artistic practice that emerged in early 16th-century Venice through the prolific co-competition of a young generation of painters, among them most notably Giorgione, Sebastiano del Piombo and Titian.¹⁰⁹

Ever since Giorgio Vasari published his *Vite*, according to which Giorgione 'established in that city the methods of the modern manner, with its superior harmony and its brilliancy of colouring',¹¹⁰ Giorgione has been regarded as

a pioneer whose (technical) innovations revolutionised Venetian painting. Vasari famously described Giorgione's working practice as painting with the colours themselves ('dipignere [!] solo con i colori stessi')¹¹¹ and thus as a creative process that materialises directly on the support, *senza disegno*, meaning without a preparatory design developed either on paper or on the primed painting. In the model of thought postulated by Vasari of an opposition between Florentine *disegno* and Venetian *colorito* – a dichotomy that continues to inform the scholarly discourse to this day – Giorgione was thus responsible for a profound lack of *disegno*, both in its intellectual and its practical dimension, inciting Venetian painters who followed in his footsteps to merely imitate nature and beguile the eye with beautiful colours. Venetian contemporaries such as Paolo Pino, on the other hand, considered precisely the renunciation of meticulous (drawing-based) preparation ('disegnare le tavole con tanta istrema diligenza'), which he dismissed as a futile effort ('fatica gettata'), as a fundamental prerequisite for artistic creativity itself ('poesia, cioè invenzione').¹¹² The reconstruction of the Munich painting's genesis, in which the artist evidently freely alternated between a draughtsmanly and painterly approach, thus ties in with a discourse on the principles of artistic creativity that reaches back to the Cinquecento.

Continued in-depth and comparative art-technological investigations, ideally conducted in different collections and countries, hold significant promise for consolidating insights into Giorgione's complex working methods while also situating them within the workshop practice of his contemporaries, thus ultimately enhancing our general understanding of his work. The greatest challenge in this context is posed by his limited oeuvre, which remains difficult to define. From a research perspective, it is precisely the complexity of uncertainties and research controversies traditionally surrounding Giorgione's work that makes the discourse benefit from new lines of inquiry which integrate a wide range of methodological approaches across disciplinary boundaries. In this sense, the present paper aims to contribute interdisciplinary findings on a double portrait that has received little attention for a long time to the academic discourse on Giorgione, while also stimulating and facilitating further debate on the aspects of his artistic oeuvre addressed here.

Technical appendix

Stereomicroscopy

Leica M165 C stereomicroscope with stand (Wild); oculars (Wild) 15×; variable lens magnification 0.73–12×; CoolControl LED lighting with light guides in the visible range (coolSpot 25/4000 K) and UV (coolSpot 25 UV/365 nm); converter 0.63×; digital microscope camera AxioCam 105 colour (Zeiss) with AxioVision LE65 Rel. 4.9 software. Leica MZ12.5 stereomicroscope with swivel arm M655* and

mobile floor stand, eyepieces 10×/21B (Leica 10445111), Objective Planapo 1.0× M series, LED illumination cool control with light guides in visible range (cool spot 25/4000 K) and UV (cool spot 25 UV/365 nm), IR 486 UV-IR cut filter 24.5 mm (390–960 nm), c-mount video objective adapter 0.5×; digital microscope camera AxioCam 105 colour (Zeiss) with AxioVision LE65 Rel. 4.9 software.

X-radiography (XR)

Isovolt DS 60 (Seifert), Cr tube type PW 2188/00 (3 kW, Philips), excitation voltage 25 kV, exposure time 150 sec, distance to painting 2.15 m, constant power mode 'P', X-ray film: AgfaStructurix D7 DW, manual mounting from 8 single films 30 × 40 cm.

Infrared reflectography (IRR)

So-called VASARI scanner (developed in-house, stationary), light source: slide projector (lamp wattage 250 W) with heat filter removed, RG 1000 filter. Sensors Unlimited 320 camera with indium gallium arsenide CCD sensor. Rodenstock Rodagon 105 mm lens, BG 39 filter. Camera linked to a computer via RS 422 digital interface (c.12 bit grey-level resolution). High-precision scanner (developed in-house) with triple-axis positioning mechanism for moving lighting and camera in front of the painting easel; image area c.100 × 135 cm; target resolution 10 Px / mm painting surface; software for assembling mosaic images developed in-house (VIPS/IP-based).

Macro X-ray fluorescence scanning (MA-XRF)

Bruker M6 Jetstream macro XRF scanner with the following measurement parameters: Rh X-ray tube 50 kV, 600 μA, no filter, air; detector: spectral range 40 keV, maximum pulse throughput 275 kcps; spot size 100 μm; distance 400 μm; acquisition: normal, 20 ms/px, 1 cycle. Four scans, individual map size c. 25 × 66 cm; scanning time per partial map c. 7h; c.1 million measuring points/partial map; data evaluation with 'deconvolution' using Bruker software; element distribution images of partial images assembled into false-colour images using 'Affinity'.

Cross-section preparation

Eleven samples were removed using a scalpel under the stereomicroscope and were mounted as cross-sections in Technovit resin and polished using Micromesh cloth.

Light and fluorescence microscopy

Axioskop 20 (Zeiss), magnification 50×, 100×, 200×, 500× and 1000×, incident light filter 'DIC', UV filter sets '02' and '18', UV filter set '09' for staining with SYPRO Ruby, VIS light source: halogen lamp 12 V 100W, UV light source: LQ-HXP 120 (Leistungs elektronik Jena) with lamp HXP-R120W/45C VIS (Osram) converter 0.63×, digital microscope camera AxioCAMMRC (Zeiss) with AxioVision 4.4 software.

Scanning electron microscopy-energy dispersive X-ray microanalysis (SEM-EDX)

FEI Quanta 250 with integrated EDAX SDD-Detektor Apollo XL and Octane Elect Plus, Genesis-Software Version 6.31. Samples were carbon-coated. Measurement conditions: high vacuum mode, 25 kV, 30 µA, spot 3.5, 1000 cps, 100s livetime, standardless ZAF quantification.

Fourier transform infrared (FTIR) microscopy and imaging

FTIR microscope Cary 620/660 (Agilent) with focal plane array (FPA) detector, small sample particles were prepared flat on a diamond cell and analysed with FTIR microscopy in transmission mode (range 4000–500 cm⁻¹). For FTIR imaging, a Ge-ATR crystal (large-array ATR) was pressed on cross-sections (range 3950–790 cm⁻¹).

Raman microscopy

Raman microscope Horiba XPlora equipped with three diode lasers (532 nm @25 mW, 638 nm @24 mW and 785 nm @90 mW) and a thermoelectrically cooled CCD detector. Measurement conditions had to be optimised for each sample and spot individually. The analyses were generally carried out with the 100× microscope objective, a 1200T grating, filter values of the laser power between 0.1 and 50%, with typical accumulation time of 5 to 60 s at 3 to 12 accumulations.

Fibre analysis

For the examination, the entire thread cross-section was sampled where possible. The sample was mechanically separated, temporarily embedded in glycerine on a microscope slide and photographed. For the identification, morphological features and the polarisation-optical behaviour were

assessed (the features were observed at about 7 independent locations). A Leica DM 750P polarisation microscope with 10×, 20× and 40× objectives was used for the examination and a DFK MKU130-10×22 eyepiece camera (Imaging Source) was used for documentation.

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Contributions

AF and JP share first authorship: AF carried out the major part of the art-technological examinations of the painting, designed and wrote major parts of the manuscript, while JP carried out the art-historical research on the painting, designed and also wrote major parts of the manuscript. HS coordinated and evaluated the imaging and analytical examinations, designed and worked on the manuscript. EO, the art-technological project leader of the research project Venetian Painting at the Alte Pinakothek, contributed to the design and evaluation of the art-technological examinations and worked on the manuscript. AS, the art-historical project leader and initiator of the research project on Venetian Painting at the Alte Pinakothek, contributed to the evaluation and interpretation of results. JS contributed to the evaluation and interpretation of results. JW was responsible for macro XRF scanning and IRR as well as the related digital image treatment. AO prepared the cross-sections and performed LM and SEM-EDX analyses. All the authors read and approved the final manuscript.

Notes

1. <https://www.pinakothek.de/en/the-museums/research/die-venezianische-malerei-der-renaissance-in-der-alten-pinakothek> (accessed 18 April 2024) and <https://www.doernerinstitut.de/en/projekt/venezianische-malerei-des-15-und-16-jahrhunderts> (accessed 18 April 2024); Emmerich et al. 2024.
2. Inventarium yber Schleißhaim de an[no] 1637, Munich, Bayerisches Hauptstaatsarchiv (BayHStA), HR II, fasc. 40, fol. 12v; for context, see Diemer 1980: 142 and 155, note 91a.
3. The so-called ‘Schleißheimer Verlustliste’ compiled on 20 September 1745 is a list of paintings that had been moved from the Schleißheim Palace, mostly to furnish the Munich Residenz; it lists the painting as ‘Georgeon. Un philosophe montre le combat a son adepte la circumvalence’, BayHStA, HR I, fasc. 209/8, fol. 14r, no. 297. For documentation of the collection history, see Ramm 2009, cat. no. 140: 428.
4. Rossi 2018; Dunkerton 2010; Poldi 2009; Oberthaler and Walmsley 2006; Berrie and Matthew 2006; Ferino-Pagden and Nepi Scirè 2004; Campani et al. 2004; Oberthaler 2004; Rossi and Spezzani 2004; Dunkerton 2002; Anderson 1997; Giebe 1995; Hope and Van Asperen de Boer 1991; Bertani et al. 1989; Mucchi 1978.
5. Garas 2000: 77–9 was the first to introduce the painting into the art-historical discourse on *Giorgionismo* (without committing herself to an attribution), but – with the exception of Fossaluzza 2009: 86 note 80 and Ervas 2018: 75, who included the painting into the oeuvre of Domenico Capriolo without further discussion – her impulse has only recently been developed further. For a more detailed discussion and complete source references on the historical evidence presented here, see Mazzotta 2023: 123–6, 245–6 and Pawis 2023: 136–43, 248–51.
6. Inventory of Elector Maximilian I’s Kammergalerie of 1641/42, fol. 89v, edited by M. Bachtler, P. Diemer and J. Erichsen in: Bachtler et al. 1980: 239, no. XIII, 17 (translation Johanna Pawis).
7. For a recent discussion of this portrait type, cf. Mazzotta 2023.
8. In addition to the medal illustrated here from the Frick Collection in New York, another one is preserved in the British Museum in London (mus. no. G3, IP.1066). The medal is not dated. However, Cattaneo stayed in the Veneto from c.1530 onwards, where he came into contact with Trifone and became a ‘listener of his lessons’ (‘uditore de le sue lettioni’); preceding his death in 1549, Trifone even appointed Cattaneo as the witness to his will (will of Trifone Gabriele, Archivio di Stato di Venezia, Notarile, Testamenti, 1214, no. 993, redacted by Morresi 2001: 95–6, *cedola* cited above: *ibid.*, p. 95). For the dating of the medal, therefore, a time span of c.1530 to 1549 ensues.
9. As a fundamental reference for all subsequent accounts of Trifone’s life and career, see Cicogna 1824–53, 1830, vol. 3, 208–23; for a comprehensive overview see Fortini 1998; cf. also Sgarbi 2015 and Dadaş 2021.
10. Gabriele 1545.
11. Published by Trifone Gabriele’s pupil Giasone de Nores as an appendix to De Nores 1582. This was preceded by an earlier publication in Latin by the same Giasone de Nores in 1553 as part of the volume *In Epistolam Q. Horatij Flacci de Arte Poetica Iasonis de Nores Ciprij ex quotidianis Tryphonis Cabrielij sermonibus interpretatio [...]. Venice: Apud Andream Arrivabenum 1553*. For a critical philological discussion, cf. Sgarbi 2015: 19–22.
12. Vasari 1966–97, 1976, vol. IV: 43; Vasari 1912–15, 1913, vol. IV: 110; Vasari 2008: 19–20.
13. Cf. most recently Piga 2018: 32–4 and Alcamo 2019: 43–9; Brown 2013: 114, note 9 summarises the information on the provenance of this double portrait, brought to the art market in 1923 by an unidentifiable ‘Milanese Doctor’ who in turn claimed his great grandfather had obtained it from a great nephew of the last heir of the Borgherini line who had died in 1718. This account is based on the statement of the buyer (see Brockwell 1932: 69–70), Sir Herbert Cook, who was, however, considerably less certain about the identification of the painting he had acquired when it was first published than subsequent literature suggests, taking up and expanding Cook’s still cautiously formulated thesis (‘It is all very curious and puzzling and offers a problem difficult of solution’, Cook 1926: 24). This was already named by Holberton 1998: 482 as a ‘lack of provenance’; on the Washington painting’s attribution, cf. recently Mazzotta 2023: 125. For a critical review of Cook’s contribution to early 20th-century Giorgione attributions, cf. Greer and Penny 2010.
14. For detailed arguments and references on this, see Mazzotta 2023: 125–6, 246, note 42; as well as Pawis 2023: 139–40, 249, note 54, 250, notes 59–60. Although no (pictorial) source survives that records Giovanni Borgherini’s appearance, two portraits of his elder brother Pierfrancesco are traditionally identified in paintings by Sebastiano del Piombo (*The Madonna and Child with St Joseph, St John the Baptist and a Donor*, 1517, London, The National Gallery and *Portrait of a Man*, 1516/20, The San Diego Museum of Art); for context on both, see Piga 2018: 197–220.
15. Their pupil–teacher relationship is later documented, among other sources, by Donato Giannotti’s *Libro de la Republica de Vinitiani*, written from 1526 onwards, which enacts a dialogue between Trifone as teacher and Giovanni as pupil in a literary form: Giannotti 1540. Given its genre, the dialogical treatise form favoured by many exponents of Renaissance humanism, Giannotti’s publication does not necessarily reflect a single, precisely datable historical discourse. Instead, it offers a literary expression of the interaction between teacher and student. Giannotti repeatedly addresses this relationship throughout the dialogue, highlighting Giovanni’s eagerness to continue the exchange, because, as Borgherini’s literary alter ego notes, ‘[...] your [Trifone’s] varied teaching always gives me an appetite for more’ (‘[...] [p]ercioche la varieta delle cose, che voi ragionate, mi rinfresca sempre l’appetito’), Gianotti 1540: 101, left page (translation Johanna Pawis). For context, cf. Soldini 2014, esp. pp. 37–8.
16. See the engraving from Claude Pernet’s *Illustrissimum, omnique virtutis, et scientiarum laude praestantissimorum virorum icones*, Rome 1625, no. 62 (Pawis 2023: 139, fig. 9). Similar to other illustrations in this collection of portraits, the engraving with Trifone’s portrait is likely to be based on an original from the 16th century, which in this case has not survived.
17. This is documented, for example, by the extensive additions and corrections that Giorgione’s biography in the *Lives* underwent between the two editions of 1550 and 1568; see Sabine Feser’s commentary in Vasari 2008: 9–15. The passage relevant in this context about the portrait of Giovanni Borgherini with his teacher is not yet included in the first, significantly less extensive version of Giorgione’s biography in the 1550 edition. For a critical discussion of Vasari as a source on Giorgione in general, cf. Hope 2008, Hope 2009 and Ruffini 2022.
18. Vasari 1966–97, 1976, vol. IV: 43; Vasari 2008: 19–20; Vasari 1912–15, 1913, vol. IV: 110.

19. See [Mazzotta 2023](#): 126. On the decoration for the *Camera Nuziale* of Giovanni's brother Pierfrancesco, which was dissolved in the last third of the 16th century and originally included paintings by del Sarto, Pontormo, Baccio d'Agnolo, Granacci and Bacchiacca, cf. [Gilbert 1977](#), [Braham 1979](#); most recently and with new source material: [Piga 2018](#): 75–126. For del Sarto's *Holy Family with the Young St John the Baptist*, now in The Metropolitan Museum of Art, New York, painted around 1528 for Giovanni Borgherini, see [Bayer et al. 2017](#) and [Piga 2018](#): 221–34. With regard to one of del Sarto's red chalk studies drawn around 1520 (Staatliche Museen zu Berlin, Kupferstichkabinett, KdZ 12924 verso), one might even ask whether he did not have Trifone Gabriele's striking physiognomy in mind: <https://smb.museum-digital.de/object/98338> (accessed 1 October 2024), see [Brooks et al. 2015](#): 96–9, cat. no. 24 (J. Brooks). With the cursorily sketched shoulder section, del Sarto initially seems to adopt the postural motif of the double portrait, only to modify it in the turn of the head; this approach would be entirely in keeping with his artistic practice: as his former pupil Vasari reports, del Sarto's drawings served less for compositional preparation and more 'as memoranda of what he had seen' (translation quoted from [Vasari 1912–15](#), 1913, vol. V: 118). Cf. [Cordellier 2015](#) as well as [Damm and Korbacher 2011](#): 20, cat. no. 4 (D. Korbacher) for examples of studies based on ancient or contemporary sources that demonstrate that, when drawing, del Sarto was interested not in a detailed record but in an artistic engagement with the object of study.
20. For examples and references, see [Pawis 2023](#): 139–41, 250, note 65.
21. BayHStA, LA 4851, fols. 15b r–v, 15c r, here fol. 15b v (translation Johanna Pawis). On Jacopo Strada with sources, see [Jansen 2019](#), especially pp. 383–429, pp. 576–628 and pp. 900–901; this publication also provides a convincing redating of the list (pp. 617–18).
22. Last but not least, such an early transfer of the painting to Munich would also explain why the painting so prominently described by Vasari, unlike other Borgherini-owned works, is no longer mentioned in Florence from the late 16th century onwards, cf. [Piga 2018](#): 224–5, 244. Last mention, however only adopting and closely paraphrasing Vasari's account of Giorgione's *Vita*: [Borghini 1584](#): 373.
23. This allowed for the back of the canvas to be scanned almost in its entirety, except for an edge section of approximately 0–4 cm, depending on the geometry of the measuring head and the painted area.
24. Two samples were taken from each piece of the composite canvas (from both thread directions).
25. Widths of the single pieces in today's trimmed state: left 31.0–32.4 cm, right 34.3–31.8 cm; original widths presumably just over 40 cm. At the upper and lower edges of the painting, in areas with detached lining, remnants of a fold possibly belonging to a seam allowance can be recognised; selvages are not discernible.
26. Dunkerton states that the maximum width of a handwoven canvas was usually around or just over a metre, but also gives examples of narrower woven linen in Titian's and Sebastiano del Piombo's early oeuvre; see [Dunkerton et al. 2013](#): 10, 11.
27. [Giebe 1995](#): 99, <https://skd-online-collection.skd.museum/Details/Index/294844> (accessed 1 October 2024).
28. [Dunkerton et al. 2013](#): 10, with further examples of the early use of different weaves in Venetian painting.
29. '3 Schuech 4 Zoll hoch, unnd 2 Schuech 9 Zoll braith', equivalent dimensions c.97.3 × 80.3 cm. Inventory of Elector Maximilian I's Kammergalerie of 1641/42, fol. 89v, edited by M. Bachtler, P. Diemer and J. Erichsen: [Bachtler et al. 1980](#): 239, no. XIII, 17.
30. The owner (personal communication) believes their painting can be dated to the 16th century. Their research on the copy, which included the commission of a technical examination, was undertaken independently from our own research; we do not know the copy from direct observation and can therefore only cite the information the owner kindly provided.
31. Identified as glue-paste lining.
32. In an inventory from 1822 (translated here as: Inventory / of the / Royal Bavarian Central Painting Collection / of / Munich / in the building of the Royal Gallery. [...] executed on 24 April 1822 / by / the Director of Royal Bavarian Central Paintings Gallery && / [Johann Georg] Ritter von Dillis; Bayerische Staatsgemäldesammlungen, Inventory Department), here inv. no. 7212, the painting is still listed with the dimensions 2' 11" × 2' 5" (conversion according to the so-called Parisian measure = 94.7 × 78.5 cm).
33. [Hochmann 2015](#): 120.
34. [Dunkerton et al. 2013](#): 13.
35. In addition to iron and a small amount of copper, an extremely low zinc content close to the detection limit was determined on the cross-sections with SEM-EDX, but in this case, the detection sensitivity with MA-XRF is significantly higher.
36. [Dunkerton et al. 2013](#): 15, 24–5.
37. No reports on this have been found for other works by Giorgione, but the still limited scope of research does not allow any conclusions to be drawn on this point.
38. [Gerken et al. 2022](#): 9–13.
39. [Spring et al. 2021](#): 77–82.
40. [Krischel 2019](#); [Hochmann 2015](#): 169–219; [Berrie and Matthew 2006](#).
41. However, in the area that is interpreted as a river of the Arcadian landscape (composition 2), the Cu image of the MA-XRF scan of the reverse shows a strong signal, indicating the possible use of azurite.
42. [Campani et al. 2004](#): 257.
43. Due to trimming and folding of the painting at its edges as well as the geometric limitation of the MA-XRF scan, the visualised area is several centimetres smaller than the original drawing.
44. As the lining has become partially detached along the tacking edges, the reverse of the original canvas could be examined in these areas. It is not primed and no traces of a drawing or paint were found on either the original or the lining fabric.
45. For an overview of the few drawings under discussion as potentially attributable to Giorgione, see [Rearick 2001](#): 9–21, which, although outdated in some aspects, remains the most comprehensive compilation. For revised perspectives and new additions see [Dreyer 2015](#), as well as [Anderson et al. 2019](#) and [Anderson 2021](#), who importantly adds a red chalk drawing found on the last page of an edition of Dante's *Commedia* in the University Library, Sydney, to Giorgione's graphic oeuvre.
46. Cf. [Dunkerton 2010](#): 57; [Poldi 2009](#); [Oberthaler and Walmsley 2006](#): 291–6; [Oberthaler 2004](#); [Rossi and Spezzani 2004](#): 261–5; [Dunkerton 2002](#); [Anderson 1997](#); [Hope and Van Asperen de Boer 1991](#); [Bertani et al. 1989](#).
47. <https://www.khm.at/objektdb/detail/823/> (accessed 18 April 2024).
48. <https://www.nationalgallery.org.uk/paintings/giorgione-the-adoration-of-the-kings> (accessed 18 April 2024).
49. <https://www.nga.gov/collection/art-object-page.41590.html> (accessed 18 April 2024).
50. <https://www.nga.gov/collection/art-object-page.432.html> (accessed 18 April 2024).
51. [Dunkerton 2002](#): 139.
52. [Dunkerton 2002](#): 139–42.

53. <https://catalogo.beniculturali.it/detail/HistoricOrArtisticProperty/0900297809> (accessed 18 April 2024).
54. Bertani et al. 1989: 29–32.
55. <https://collection.sdmart.org/objects-1/info/1163> (accessed 18 April 2024).
56. Anderson 1997: 297–8; Ferino-Pagden and Nepi Scirè 2004, cat. no. 9: 202–5 (J. Anderson).
57. Cf. Schedel's *Nuremberg Chronicle*, published in Latin and German in 1493, with an illustration and explanation of the Pharisees' attire: Schedel 1493: XCVI v (digitised version in the collection of the Bayerische Staatsbibliothek: http://daten.digital-sammlungen.de/bsb00034024/image_266 [accessed 18 April 2024]), as well as comparable headgear in paintings by Bernardino Luini (*Christ among the Doctors*, London, The National Gallery, c.1515/30) and Rocco Marconi (*Christ and the Adulteress*, Gallerie dell'Accademia di Venezia, c.1515/20).
58. <https://www.nationalgallery.org.uk/paintings/bernardino-luini-christ-among-the-doctors> (accessed 18 April 2024).
59. <https://cyfrowe.mnw.art.pl/en/catalog/443813> (accessed 18 April 2024).
60. <https://www.museothyssen.org/en/collection/artists/durer-albrecht/Jesus-among-doctors> (accessed 18 April 2024). For a contextualising overview on Cima's and Dürer's paintings in relation to Leonardo's and Bellini's inventions, cf. Aikema and Brown 1999, cat. no. 52: 294–5 (SCM) and cat. no. 53: 296–9 (IL) as well as, more recently, Metzger 2019.
61. This was already emphasised by Vasari, who cited Leonardo's artistic and technical innovations as having had a decisive impact on Giorgione, to whom he in turn attributed the role of an initiator of the *maniera moderna* in Venice (Vasari 2008: 11, 17–18; Vasari 1966–97, 1976, vol. IV: 42; Vasari 1912–15, 1913, vol. IV: 109–10). Although it is uncertain whether a personal contact during Leonardo's brief stay in Venice actually came about, the presence and reception of Leonardo's works in Venice is well documented; for example, several works listed under Leonardo's name were owned by collectors who also acted as Giorgione's patrons (Anderson 1997: 31–8 including source references as well as the hypothesis that a convolute of drawings by Leonardo circulated in artists' workshops in Venice). For an overview on the subject of the reception of Leonardo's ideas in Giorgione's artistic milieu, cf. Humfrey 1992 and Koos 2006.
62. <https://www.khm.at/objektdb/detail/824/> (accessed 18 April 2024).
63. <http://www.scuolagrandesanrocco.org/home/non-solo-tintoretto/giorgione/> (accessed 18 April 2024).
64. First published by Heinemann 1962, vol. 1: 118, cat. no. 197 bis., vol. 2: 502, fig. 560.
65. Mazzotta 2023: 119.
66. It cannot be excluded that the figures are at least partially covered with drapery. The XR shows a light area on the right thigh of the left figure, possibly indicating folds of a garment.
67. In the sky centrally above the hills is a strong local Cu signal, consisting of quite broad, short and hard brushstrokes (similar in shape to the foliage), where the paint has accumulated along the bottom edge, indicating that the artist might have swept out the brush here.
68. For example, in the images of the reverse XRF scan, a vague shape in the right half of the images blocks the area of the houses. In the Fe map of the front, larger shapes can be seen in the upper left and lower right corners that cannot be assigned to any of the compositions with certainty.
69. Cf. the characterisation of Giorgione's working practice in Vasari's *Vita* of Titian: '[...] usando [...] di contrafarle quanto sapeva il meglio con i colori, e macchiarle con le tinte crude e dolci, secondo che il vivo mostrava, senza far disegno [...] (Vasari 1966–97, 1987, vol. VI: 155), ('[...] he used to [...] paint [...] broadly with tints crude or soft according as the life demanded, without doing any drawing [...]', Vasari 1912–15, 1915, vol. IX: 159). For contextualisation, see section 5 Conclusion.
70. <https://www.gallerieaccademia.it/en/tempest> (accessed 18 April 2024).
71. Ferino-Pagden and Nepi Scirè 2004, cat. no. 7: 192–4 (G. Nepi Scirè).
72. London, British Library, Sloane Ms., 4004; cf. *ibid.*, n. p. the compositions titled 'Favola di Paride' and 'Sacrificio' (reproduced in Borenius 1923, plates 8, 9, 14).
73. <https://www.gallerieaccademia.it/en/concert> (accessed 18 April 2024).
74. Inventory of the collection held by Gabriele Vendramin (1569), cited in Anderson 1997: 333.
75. Poldi 2009: 238–41.
76. <https://g.co/arts/KPcuovC1ep2mRAda8> (accessed 18 April 2024).
77. On the paintings in Brunswick and Vienna cf. Ferino-Pagden and Nepi Scirè 2004, cat. no. 18: 234–6 (S. Ferino-Pagden) and cat. no. 12: 212–14 (S. Ferino-Pagden).
78. A likewise visible triangular form, in turn, is a change belonging to composition 4 (see section 4.4).
79. In the technical images (particularly in the Pb distribution of the MA-XRF scan), the facial features of the person exhibit a softness that suggests a youthful age. Discernible details, such as the subtly tilted head posture and the overall fashionable appearance described below, indicate that it might have formally corresponded to the novel portrait type of the idealised male youth. This lyrical portrait mode, a hallmark of so-called *Giorgionismo* painting in early 16th century Venice, is characterised by the delicate tenderness with which the young sitters are portrayed, lending them a graceful appearance that tends towards effeminacy. On this portrait mode, cf. Koos 2006 and Pfisterer 2006, and in the context of Giorgione studies Anderson 2004 as well as Ballarin 2016 and Dal Pozzolo 2017 (with regard to the so-called *Double Portrait Ludovisi*).
80. <https://www.hermitagemuseum.org/wps/portal/hermitage/digital-collection/01.+paintings/32117> (accessed 18 April 2024). The authorship of this painting, traditionally attributed to Domenico Capriolo or Domenico Mancini, is disputed; cf. Lüdemann 2011, as well as Perini Folesani 2017 with a new suggestion of an attribution to Giovanni Girolamo Savoldo.
81. Cf. Schmidt Arcangeli 2007; cf. Engel 2019, who, contrary to what has long been postulated, demonstrates that Titian's depiction of Islamicate fabrics in the portrait of *Laura Dianti* (1520/25) is not a product of artistic imagination but based on excellent knowledge of the fashionable customs of the Islamic world.
82. For an overview of the comprehensive research concerning the cultural transfer between Christian and Islamic worlds in Venice, see Howard 2005 and Denny 2007.
83. On Nasrid textiles and their import, see Ecker 2004 and Hernández Sánchez 2016. For characteristic early examples, cf. e.g. fragments from the New York Metropolitan Museum of Art's collection of Nasrid textiles, such as inv. no. 29.22 (<https://www.metmuseum.org/art/collection/search/448232> [accessed 5 September 2024]) or inv. no. 46.156.16 (<https://www.metmuseum.org/art/collection/search/450734> [accessed 5 September 2024]).
84. For this later style, cf. e.g.: New York, The Metropolitan Museum of Art, inv. no. 46.156.12 (c.1470), <https://www.metmuseum.org/art/collection/search/450730> (accessed 28 August 2024); The Cleveland Museum of Art, acc. no.

- 1929.379, <https://www.clevelandart.org/art/1927.379> (accessed 28 August 2024). Sincere thanks to Johannes Pietsch, Bayerisches Nationalmuseum, Munich for kindly sharing his expert assessment on the probable dating of the reconstructed sleeve pattern.
85. During the preceding Siege of Granada, Venice had even defied the Catholic Monarchs' embargo, probably in an attempt to maintain trade with the Islamic Emirate, see [González Arévalo 2015](#): 228–32.
86. The cushion is part of the Scuola Grande di San Rocco's holdings to this day: [Caselli and Chiari Moretto Wiel 2013](#), cat. no. 1.1: 46–7 (M.A. Chiari Moretto Wiel) and [Denny 2007](#); sincere thanks to Silviya Banić, Victoria and Albert Museum, London for kindly sharing this reference.
87. <https://www.gallerieaccademia.it/en/lamentation-over-de-ad-christ-virgin-saint-joseph-arimathea-mary-magdalene-martha-and-filippo-benizi> (accessed 18 April 2024).
88. [Monnas 2008](#): 227.
89. [Wilson 2013](#): 3–4. The object depicted in Catena's painting is identical with or closely related to an artefact in the collection of the British Museum, London (inv. no. 1890.1004.1, https://www.britishmuseum.org/collection/object/H_1890-1004-1 [accessed 28 August 2024]). For Catena's painting at the National Gallery, London, see <https://www.nationalgallery.org.uk/paintings/vincenzo-catena-a-warrior-adoring-the-infant-christ-and-the-virgin> (accessed 28 August 2024).
90. Giorgione, Kunsthistorisches Museum Wien, 1506, <https://www.khm.at/en/objectdb/detail/822/?lv=detail> (accessed 5 September 2024).
91. Cf. most recently [Soragni 2022](#): 124–7.
92. The inventory of Giorgione's estate of 1511 published by Renata Segre lists a number of textiles, including a silk velvet fabric (*ceddà*) and a red (*pavonazzo*) coat with fox fur lining, undoubtedly among the most valuable possessions of the otherwise very precarious household ([Segre 2011](#): 386).
93. According to the diarist Marin Sanudo, colourful striped fabrics were considered a declared prerogative of youth ('*da zovene*') in Venice: [Sanudo 1879–1903](#), 1901, vol. 56, entry of 18 August 1532, column 774.
94. Regarding the outdatedness of the *cappuccio* in Venetian fashion around 1500, see [Finocchi Ghersi 2004](#): 115 and 130, note 13 (with reference to the Venetian *nobili* and patrons Pietro and Girolamo Priuli); more generally on Venetian men's headgear customs, cf. [Newton 1988](#): 15–16. An objection to the assumption that the sitter's headgear might correspond to this typical western headdress is its colour (see section 3.4). Venetian *nobili* adhered to a strict republican dress code, wearing almost exclusively black. And while red was a customary headgear colour among Venetian senators and favoured by mainland humanists, and green *chaperons* were not uncommon in Dutch genre painting of the time, a green *cappuccio* would be unlikely for an Italian portrait of this period.
95. See [Monnas 2008](#): 222–30.
96. It is even conceivable that an accompanying figure was envisaged to the left of the figure with the sleeve with an Islamicate pattern, but the technical examinations provide no evidence of this, especially since the interpretation of this area is obscured by the face of the young pupil from the subsequent composition.
97. The broad, semicircular brushstroke above the shoulder of Trifone, in turn, likely belongs to the third composition and was apparently intended to roughly establish the position of the shoulder of the single figure.
98. In the case of the pupil, this black layer covers almost the entire surface beneath the flesh tones, whereas in the case of the teacher it is only visible under shaded areas.
- In Giorgione's *Portrait of a Man* (San Diego Museum of Art, 1506), a dark layer shows through in many areas (face, hair and background) which has been interpreted as a rough sketch ([Ferino-Pagden and Nepi Scirè 2004](#), cat. no. 9: 204 [J. Anderson]).
99. The broad strokes visible in the Cu map ([Figure 6c](#)), roughly indicating the shoulder and arm of the single figure (composition 3), may likewise be interpreted in this way.
100. Delicate decorations on the collar of the doublet, applied with a contrasting orange ochre and orpiment, can be recognised only under strong lighting conditions.
101. [Oberthaler 2004](#): 272.
102. Concerning the open-mindedness towards scientific knowledge of Islamic provenance in Venetian culture, cf. in general [Howard 2007](#): 92, and with regard to the astrolabe in particular, taking the example of a Spanish astrolabe from the 14th century preserved in Venice: [Carboni 2007](#), cat. no. 73: 341 (F. Leoni). On astrolabes as media of intercultural exchange between Islamic Spain and Italy, see [Hernández Pérez 2020](#) and [Barry 2007](#) with reference to Giorgione, in whose oeuvre – corresponding to a boom in astronomical-astrological forecasts in the late 1500s due to political circumstances – cosmographic measuring instruments are frequently found, such as in the *Three Philosophers* or in the fresco frieze of the Casa Marta Pellizzari in Castelfranco (on the latter, cf. recently [Brooke 2024](#)). The popularity of the astrolabe as a subject is also evidenced by other works from the same period and cultural milieu, e.g. Giulio Campagnola's *Astrologer* (c.1509) and the painting *The Horoscope* (Dresden, Gemäldegalerie Alte Meister, 1510/11), traditionally associated with Giorgione and recently attributed to Jacopo Palma il Vecchio, cf. on the latter [Alcamo 2022](#).
103. Cf. Trifone's biography by Giacomo Gabriele, in which he parallels Trifone's frugal lifestyle with fashionable modesty: '[...] not adorning the body, but the spirit with beautiful clothes [...]' (translation Johanna Pawis), ('[...] no[n] il corpo, ma l'animo di belle vestimenta ornando [...]'), [Gabriele 1543](#): 6; cf. also the similar wording in a letter Trifone sent to his nephew, in which the scholar, echoing the topos of humility, states that he prefers clothing made of coarse woollen material ('*grosso panno*') to the costly, finely woven coats of his contemporaries ('*i lor ricchi manti di sottilissime fila tessuti*'), Vatican City, Biblioteca Apostolica Vaticana, Vat. lat. 5182, fols. 219r–23v, here fol. 223r, edited in [Morresi 2001](#): 94. On the interpretation of sources testifying to Trifone's spiritual/ecclesiastical status, see [Morresi 2001](#): 72–4.
104. On the brown sleeve as characteristic scholar's attire, cf. also contemporary astronomers in similar costume in portraits by Marco Basaiti (Lviv, Borys Voznytsky Lviv National Art Gallery, 1512; see [Mazzotta 2023](#): 126, fig. 11) or Giovanni Cariani (c.1520, private collection, most recently Sotheby's, New York, 31 January 1997, lot no. 201).
105. In the course of the last restoration, the uncovered strip was integrated into the background by retouching.
106. Only the flesh tones of the pupil have been slightly abraded in some areas by later interventions.
107. Some shaded areas executed with brown glazes show slight wrinkling.
108. <https://www.sammlung.pinakothek.de/en/artwork/jpexp-q34J7> (accessed 18 April 2024). A detailed analysis of the painting including a discussion of the state of research will be published as part of the comprehensive final publication of the research project on Venetian Renaissance painting at the Alte Pinakothek.
109. We cannot address this comprehensive topic here, but for a recent synopsis of technical innovations in the works of

Giorgione, Sebastiano del Piombo and Titian cf. Rossi 2018; for comparison regarding the advances in painting technique adopted and developed by the late Bellini workshop during these years, cf. Dunkerton et al. 2018.

110. Vasari 1912–15, 1913, vol. VI: 173; Vasari 1966–97, 1984, vol. V: 86–7; cf. Vasari 2004: 13.
111. Vasari 1966–97, 1987, vol. VI: 155; cf. Vasari 1912–15, 1915, vol. IX: 159.
112. All three citations: Pino 1960: 115–16.

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Authors' addresses

- Anneliese Földes, Doerner Institut, Bayerische Staatsgemäldesammlungen, Munich, Germany
- Johanna Pawis, Alte Pinakothek, Bayerische Staatsgemäldesammlungen, Munich, Germany
- Heike Stege, Doerner Institut, Bayerische Staatsgemäldesammlungen, Munich, Germany
- *Corresponding author*: Eva Ortner, Doerner Institut, Bayerische Staatsgemäldesammlungen, Munich, Germany (eva.ortner@doernerinstitut.pinakothek.de)
- *Corresponding author*: Andreas Schumacher, Alte Pinakothek, Bayerische Staatsgemäldesammlungen, Munich, Germany (andreas.schumacher@pinakothek.de)
- Jan Schmidt, Doerner Institut, Bayerische Staatsgemäldesammlungen, Munich, Germany
- Jens Wagner, Doerner Institut, Bayerische Staatsgemäldesammlungen, Munich, Germany
- Andrea Obermeier, Doerner Institut, Bayerische Staatsgemäldesammlungen, Munich, Germany