Kermes

Nicolas Poussin

TECHNIQUE PRACTICE CONSERVATION

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Nicolas Poussin

TECHNIQUE PRACTICE CONSERVATION

a cura di

Helen Glanville, Claudio Seccaroni

Numero doppio speciale di 160 pagine
in occasione del 350° anniversario della morte di Nicolas Poussin

Questo numero speciale di Kermes*, nell'ambito delle celebrazioni per il 350° anniversario della morte dell'artista (1594-1665), esce in concomitanza con la mostra "Poussin et Dieu" che il Musée du Louvre presenta nella primavera del 2015. Omaggio al "pittore-filosofo", il volume si pone quale strumento scientifico di riferimento che riporta lo stato dell'arte negli studi tecnici poussiniani e accompagna la mostra come adeguato complemento al catalogo per la comprensione scientifica delle tematiche.*

Siamo lieti di poter presentare ai lettori questo numero speciale doppio (94/95) di 160 pagine dedicato alla tecnica esecutiva e alle problematiche di conservazione delle opere di Nicolas Poussin: un numero dedicato dunque ad un solo artista, ma con una tale ampiezza internazionale di orizzonte critico ed un tale livello scientifico dei contributi da renderlo utile ed interessante per lo sviluppo complessivo del discorso contemporaneo sugli studi delle opere d'arte e sulle loro problematiche di restauro e conservazione. Come è spiegato nella "Nota introduttiva", questa pubblicazione segna lo stato dell'arte dopo vent'anni dagli studi raccolti sulla rivista francese *Technè* nel 1994 in occasione della mostra al Grand Palais di Parigi "Poussin: 1594-1665". Oggi una nuova mostra al Louvre, "Poussin et Dieu", ha fornito l'occasione per attivare un dibattito internazionale – quasi un convegno ideale con sede in *Kermes*, che i curatori hanno saputo e potuto organizzare grazie alle loro riconosciute specifiche competenze – a cui hanno aderito con entusiasmo oltre venti autori, proponendo significativi ed estesi studi che hanno richiesto l'allestimento di un numero doppio di pagine.

Kermes è grato agli autori che hanno voluto portare il loro contributo su queste pagine e rivolge un particolare segno di riconoscenza ai curatori che hanno dato vita a questa rete internazionale e armonizzato così diversificati e ricchi contenuti per un confronto costruttivo, tenendo in conto anche le esigenze e i tempi tecnici della rivista. E, fondamentalmente, un compartecipe grazie ai propri lettori che nel passare degli anni hanno dato a *Kermes* la forza e il senso di svolgere il ruolo di riferimento nazionale e internazionale per la cultura contemporanea del restauro e della conservazione.

Kermes si presenta dunque ai suoi lettori con questo numero doppio e monografico, ed occorre allora rendere conto di questa particolarità, ancorché non del tutto inedita nella storia della rivista. Si è trattato di prendere al volo la possibilità offertaci, grazie alla generosa e direi illuminata disponibilità di Helen Glanville e di Claudio Seccaroni, collega del nostro Comitato di Redazione, di raccogliere per il nostro pubblico una straordinaria opportunità, quella di presentare una raccolta di studi di altissimo livello concentrati su uno dei massimi artisti della storia pittorica dell'Occidente. Poussin è un artista che innamora tutti coloro che soltanto lo abbiano guardato con attenzione di occhi, di mente e di cuore, e che presenta la *noblesse* del grande secolo francese temperata da una dolcezza dei sentimenti che potremmo riconoscere come italiana e più specificamente romana. Nella città eterna Poussin scelse di vivere anche quando gli si offrivano prestigiose opportunità di rientro nella capitale d'Europa, Parigi.

Naturalmente, secondo l'identità di *Kermes*, l'angolo di visione che ci presentano questi studi è quello della conservazione, in una dimostrazione esemplare d'interazione fra ricerche storico artistiche e tecnico-scientifiche; in direzione di uno scopo comune, porre la comunità internazionale del restauro al servizio di questo massimo fra gli artisti del grande Classicismo seicentesco. Siamo particolarmente lieti che sulle nostre pagine sia presente anche un saluto di un decano degli studi poussiniani, Pierre Rosenberg, già Président-directeur (oggi onorario) del Louvre, che conosce e ama come pochi il nostro Paese (che io ebbi il piacere d'incontrare per la prima volta a metà anni Settanta, nella Galleria Estense di Modena). E con questa annotazione chiudo questo circolo virtuoso che riunisce idealmente intorno alla nostra rivista la comunità internazionale del restauro, e che si ripromette di creare interesse ed affezione sperabilmente duratura per *Kermes* anche presso pubblici di altri Paesi, che ne avessero fin qui una conoscenza episodica e indiretta.

Giorgio Bonsanti
garante scientifico

Come in occasione di altri numeri speciali, nel fascicolo sono presenti le recensioni e la sezione "Cultura per i Beni Culturali": nonostante la corposità dei contributi ricevuti *Kermes* non ha voluto rinunciare a questo ulteriore forte segnale e invito alla pluralità – pensieri, scuole, nazioni – che è la cultura viva.

Andrea Galeazzi
direttore

Si ringrazia il *Laboratoire d'archéologie moléculaire et structurale*, CNRS-UMR 8220, Université Pierre et Marie Curie (UPMC-Paris 06) per avere fattivamente sostenuto la pubblicazione

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NUMERO 94/95

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LA RIVISTA DEL RESTAURO

GLI ARTICOLI

LE RUBRICHE

SPECIALE

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

a cura di *Helen Glanville, Claudio Seccaroni*

In copertina: Nicolas Poussin, *Rebecca al pozzo* (1660-65), olio su tela, 96.5 x 138 cm, particolare, Fitzwilliam Museum, University of Cambridge. *© Fitzwilliam Museum, Cambridge.*

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LE RUBRICHE
GLI ARTICOLI

CULTURA PER I BENI CULTURALI

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Kermes

Nota introduttiva dei curatori
Editors' Introductory Note

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Helen Glanville*
Laboratoire d'archéologie moléculaire et structurale, CNRS-UMR 8220, Université Pierre et Marie Curie, Paris.
Formerly Hamilton Kerr Institute, University of Cambridge

Claudio Seccaroni
ENEA, Roma

Alle spalle della mostra allestita nel 1994 per il quarto centenario della nascita dell'artista al Grand Palais di Parigi (*Nicolas Poussin. 1594-1665*) vi fu un lavoro gigantesco sul fronte dei restauri e dello studio delle opere, quest'ultimo condotto dal Laboratoire de recherche des musées de France (LRMF, ora C2RMF). La mole e l'importanza dei dati raccolti furono tali da progettare una pubblicazione scientifica ad hoc, che costituisce il primo numero di *Technè*, rivista del LRMF, che significativamente ha come sottotitolo "La science au service de l'histoire de l'art et des civilisations".

Quel numero monografico su *Poussin et la peinture française du XVII^e siècle* ha rappresentato una pietra miliare per gli studi sul pittore e per le pubblicazioni scientifiche del settore. Successivamente, proprio grazie allo stimolo di tale pubblicazione gli studi scientifici e i restauri delle opere di Poussin sono continuati, affrontando soprattutto dipinti fuori di Francia, giacché il raggio di azione del LRMF si era, giustamente, concentrato sulle opere presenti nelle collezioni pubbliche francesi, e solo nel Louvre è conservato il 16% circa della sua intera produzione pittorica[1]. Fuori dal raggio d'azione era però tutto il grande nucleo di dipinti presenti nei paesi anglosassoni, con il grande e solido edificio di studi poussiniani cha poggia sulle figure di Anthony Blunt e Denis Mahon, e la predilezione attribuita dai collezionisti inglesi a quest'artista. Non per nulla la mostra del Grand Palais si è poi trasferita, con un nuovo catalogo, alla Royal Academy di Londra.

A oltre venti anni da questa esposizione ne è stata allestita un'altra al Louvre (*Poussin et Dieu*, dal 2 aprile al 29 giugno 2015), che ha riacceso l'interesse e i contatti dei poussinisti anche sul fronte degli studi tecnici. Da questa fitta rete di contatti è nata dunque l'idea di un secondo volume, una sorta di *Vent'anni dopo*, in cui raccogliere spunti e riflessioni su quanto è avvenuto dopo quel fatidico 1994.

Kermes ha aderito con entusiasmo a tale iniziativa dando ospitalità agli studi, come se si trattasse di un convegno, ideale perché fisicamente non è avvenuto, ma reale per la pluralità internazionale dei contributi, presentati grazie ad un intenso scambio di informazioni e un vivace confronto internazionale.

Generalmente nelle presentazioni di una qualsiasi raccolta di studi, se ne percorre velocemente la struttura ricordandoli uno alla volta e, nei casi più fortunati, evidenziando il filo rosso che li unisce (se c'è). Vorremmo, invece, dare un altro

Behind the 1994 exhibition Nicolas Poussin 1594-1665 *held at the Grand Palais in Paris to mark the quarter centenary of the birth of the artist, lay a huge endeavour comprising restorations and technical studies of paintings, the latter undertaken by what was then the Laboratoire de recherche des musées de France (then LRMF, now C2RMF). The sheer volume and importance of the data acquired resulted in an* ad hoc *scientific publication that became the first number of* Technè *(the journal of the laboratory) which – significantly – has as its subtitle "Science at the service of the history of art and civilizations."*

That monographic issue on Poussin and French painting of the 17*th* century *was a milestone for studies devoted to the artist, and for scientific publications in the field. Subsequently, and as a result of the stimulus provided by this publication, scientific studies and restorations have continued especially on paintings held outside of France; quite reasonably as the radius of action of the LRMF had been concentrated on works held in French public collections (the Louvre alone holds roughly 16% of Poussin's entire œuvre.)[1] However, outside of this radius of action, was the considerable nucleus of paintings present in Anglo-Saxon countries with its great and solid edifice of Poussin scholarship shouldered by the figures of Anthony Blunt and Denis Mahon, and the predilection shown by the great British collectors for the works of the artist. It comes as no surprise then, that the exhibition after the Grand Palais should move, with a new catalogue, to the Royal Academy in London.*

*More than twenty years later, another exhibition devoted to the artist but at the Louvre (*Poussin et Dieu, *2 April-29 June 2015), has re-ignited both interest and contacts between Poussin scholars, and on the technical front also. This gave birth to the idea of a second volume – a kind of* Twenty years after *– in which to bring together reflections and ideas which have emerged since 1994 with that ground-breaking publication.*

It is with great enthusiasm that Kermes *supported this initiative hosting the studies, as though these were part of a conference, 'ideal' in that it never took place physically, but very much real in terms of the international plurality of its contributions, presented here thanks to lively exchange of information across frontiers.*

Generally speaking, in the introduction to a collection of studies, the content of the publication is skimmed through and the contributions referred to individually and, in a few happy instances, the thread which links them (should there be one) is

taglio, indicando la struttura ideale di questa raccolta, quali sono le tematiche emerse e quali, invece, si pensava venissero affrontate e invece non lo sono state.

La struttura è molto semplice: una prima parte generale su teoria e pratica in Poussin, anche in relazione col contesto italiano che lo ha accolto, seguita da una serie di casi studio relativi a dipinti preferenzialmente presenti nel mondo anglosassone (Gran Bretagna, Stati Uniti e Australia) con l'eccezione di un dipinto in Francia non approfondito negli studi pubblicati nel 1994 e due tele rimaste a Roma.

Ai casi studio, ordinati seguendo in linea di massima l'ordine cronologico con cui sono stati realizzati i dipinti, è stata posposta una tabella riassuntiva delle caratteristiche delle tele impiegate da Poussin, che integra le informazioni concernenti i dipinti del Louvre pubblicate nel citato numero monografico di *Technè*[2].

Tra i risultati più interessanti venuti alla ribalta a partire dalla fine degli anni '80 vi è la scoperta di indicazioni sulla superficie dipinta per la costruzione prospettica (ossia l'impronta lasciata sulla superficie del dipinto per la determinazione del punto di fuga e il tracciamento delle linee che ad esso convergono), di cui si parla più volte in questo volume.

A proposito di prospettiva, i dati forniti dagli gli studi contenuti in questo volume, consentiranno in futuro di definire in maniera migliore un elemento essenziale della pittura di Poussin, la prospettiva del colore, già presente nella definizione che fa Leonardo fra le varie prospettive. Lo studio dell'uso del colore in Poussin è ancora nella sua infanzia in confronto a quello sui supporti e il tipo di preparazione, sinora gli argomenti maggiormente frequentati negli studi tecnici sul pittore.

Altro punto di interesse, spostandoci più in profondità, è la piena caratterizzazione dei supporti, che consente di stabilire se questi siano o meno stati ricavati dallo stesso telo, il che ha portato a stabilire contatti molto stretti tra più opere, su alcune delle quali la critica aveva in passato espresso delle perplessità.

Ulteriore dato da sottolineare è la frequenza e l'utilità con cui sono state impiegate le riprese IR in trasmissione dai musei americani, una tecnica diagnostica che al di qua dell'Atlantico e in Italia, in particolare, è pressoché sconosciuta[3].

Tra gli aspetti che non vengono alla ribalta in questa pubblicazione è l'indagine di pigmenti gialli, in particolare l'incidenza dell'ossido ternario di stagno piombo e antimonio che Barbara Berrie della National Gallery of Art di Washington e Ashok Roy della National Gallery di Londra hanno scoperto nel 1998 e che è associato alla pittura romana degli inizi del XVII secolo, e a Poussin in particolare[4].

Altro aspetto della ricerca che sicuramente avrà ulteriori sviluppi è lo studio riguardo alla tipologia dell'underdrawing e dell'abbozzo – quest'ultimo se in forma grafica o pittorica. Analogamente, si spera che la natura dei leganti impiegati da Poussin rappresenti un aspetto della sua tecnica che potrà essere oggetto di una ricerca sistematica.

Fino ad oggi è stato quasi assunto *de facto* che il legante deve essere olio, ma sappiamo dalle fonti che almeno nelle prime fasi della sua carriera l'artista era rinomato per la sua abilità nella pittura a guazzo[5], e c'è una serie di descrizioni che si riferiscono all'aspetto opaco delle superfici durante il restauro dei dipinti.

Giunti a questo punto, dopo aver ringraziato tutti quanti hanno collaborato a questo progetto fornendo un contributo o mettendo generosamente a disposizione le informazioni, auguriamo a tutti buona lettura.

brought to the fore. We would like to take another slant – putting forward the ideal structure of this collection of articles, pointing out which aspects have emerged, and which others which one might have expected to be present, but have not in fact been engaged with.

The structure is simple: a more general first section dealing with theory and practice in Poussin, but placed within the Italian context of which he was part, followed by a series of case-studies on paintings mostly from Anglo-Saxon countries (Great Britain, USA and Australia), with the exception of one painting in France which was not taken into consideration to any great extent back in 1994, and two canvases which had remained in Rome.

The case studies have been put into the roughly chronological order of execution, and at the end of the publication you will find a table summarising the characteristics of the canvases employed by Poussin which will complement the information published in the Technè *monograph*[2] *on Poussin referred to above.*

Among the most interesting results which have come to the fore since the end of the 80s, is the discovery of indications in the paint surface used for the perspectival construction of the composition (for instance the mark left indicating the placement of the vanishing point, and the traced lines converging on it) which are referred to on several occasions in this volume.

Still on the subject of perspective, the data provided in the studies will allow one to better define in the future an essential element in Poussin's painting, that is the representation of aerial perspective, or the perspective of colour as it is defined by Leonardo. The study of Poussin's use of colour is still in its infancy in comparison to that of his supports and grounds, which to date are the aspects which have received most attention in technical studies on the painter.

Another interesting aspect, delving deeper into the subject, is the complete characterisation of the support which enables one to establish whether or not a canvas has come from the same bolt, which has resulted in confirming close links between works which had in the past been a source of perplexity among the art historians.

Another aspect to be highlighted is the frequency with which transmitted IR images have been used by American museums, a diagnostic technique little used this side of the Atlantic, and which in Italy is practically unknown.[3]

With regard to aspects which do not come to the fore in this publication is the investigation of yellow pigments, and in particular the incidence of the ternary oxide of lead tin antimony which Barbara Berrie of the National Gallery of Art in Washington and Ashok Roy of the National Gallery in London had discovered in 1998 and which is associated with painting in Rome in the beginning of the 17th century, and with Poussin in particular.[4]

Another aspect of research which will no doubt in the future be developed further, is the investigation of the nature of the preparatory underdrawing and sketching – the latter, whether in a graphic or paint medium. Similarly, it is to be hoped that the nature of the binding media used by Poussin will be an aspect of his technique that will receive systematic investigation.

To date it has been almost assumed de facto *that the medium must be oil, but we know from the sources that at least in the early stages of his career he was renowned for his skill in painting in an aqueous medium* – a guazzo,[5] *and there have been a number of descriptions referring to the matt appearance of his paint surfaces during restoration of the paintings.*

At this point, it only remains for us to thank all those who have collaborated to make this publication possible, and to wish to all "buona lettura!"

Note

* Helen Glanville vorrebbe espressamente ringraziare il J.Paul Getty Museum di averla invitata come studiosa per un periodo di tre mesi; CHARISMA per averle accordate tre borse per studiare gli archivi tecnici del C2RMF e del Prado; LAMS e l'Hamilton Kerr Institute, Università di Cambridge – sostegni fondamentali per lo sviluppo dei propri studi sulle opere di Poussin.

[1] Trentasei dei duecentoventiquattro dipinti assegnati con certezza al pittore nel catalogo di Jacques Thuillier (Thuillier 1974).

[2] Ravaud 1994, pp. 33-34.

[3] Tra i pochi che vi hanno fatto ricorso in maniera sistematica è Andrea G. De Marchi nelle indagini sulle tele di provenienza Aldobrandini appartenenti alla Galleria Doria Pamphilj di Roma. De Marchi 2004. Per la bibliografia scientifica sull'argomento si rimanda alla nota 1 del contributo di Marcia Steele in questo volume.

[4] Roy 1998. Il pigmento è stato determinato su quattro dipinti della National Gallery di Londra: *Bacco nutrito dalle ninfe* (1627 ca.; NG 39), *Cefalo e Aurora* (1627-30; NG 65), un'*Adorazione dei pastori* (1634 ca.; NG 6277) e un'*Annunciazione* (1657; NG 5472), cui si deve aggiungere il *Martirio di sant'Erasmo* (1628-29) della Pinacoteca Vaticana, successivamente indagato. Seccaroni 2005, p. 189.

[5] Bellori 1672, pp. 410 e 412.

Notes

* Helen Glanville would like to express her gratitude to the J.Paul Getty Museum for having invited her as a scholar for a period of three months; CHARISMA for having provided funding to study the technical archives of C2RMF and the Prado; LAMS and the Hamilton Kerr Institute, University of Cambridge – support crucial to the development her own studies of the works of Poussin.

[1] *Thirty-six of the two hundred and twenty-four paintings with certainty to the artist in the Jacques Thuillier's catalogue (Thuillier 1974).*

[2] *Ravaud 1994, pp. 33-34.*

[3] *Among the few authors who have used this technique of investigation in a systematic way is Andrea G. De Marchi on the canvases of Aldobrandini provenance belonging to the Galleria Doria Pamphili in Rome. De Marchi 2004. For the scientific references about this technique of investigation, see note 1 in the contribution of Marcia Steele in this issue.*

[4] *Roy 1998. This pigment has been found on four paintings in the National Gallery, London:* The Nurture of Bacchus *(ca. 1627; NG 39),* Cephalus and Aurora *(1627-30; NG 65),* The Adoration of the Shepherds *(ca. 1634; NG 6277), and* The Annunciation *(1657; NG 5472). To these paintings has to be added the successively investigated* Martyrdom of S. Erasmus *(1628-29) in the Pinacoteca Vaticana. Seccaroni 2005, p. 189.*

[5] *Bellori 1672, pp. 410 e 412.*

Fig. 1 – Nicolas Poussin, *The Triumph of Bacchus*, 1635-36, oil on canvas, 128.3 x 151.8 cm, The Nelson-Atkins Museum of Art, Kansas City, Missouri, Purchase: William Rockhill Nelson Trust, 31-94, detail with Apollo driving his chariot (Photo: John Lamberton).

Du progrès en histoire de l'art

On Developments in the History of Art

Pierre Rosenberg
de l'Académie française
Président-directeur honoraire du Musée du Louvre

Kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Il seroit fort à propos que laditte corniche fut dorée d'or mat tout simplement, car il s'unit très-doucement avec les couleurs sans les offenser.

Lettre de Poussin adressée à Chantelou en date du 26 avril 1639 à propos du cadre de *La Manne*. Jouanny 1911, p. 21.

J'ei oublié à vous dire que la nostre dame que je vous ei enuoiée n'est vernie qu'auec du blanc d'œuf. Vous la pouués faire vernir auec d'autre vernix qui la rendra plus fraiche.

Lettre de Poussin adressée à Chantelou en date du 27 juin 1655; on aura reconnu dans la «Nostre Dame» la *Sainte Famille avec saint Jean et sainte Elisabeth* de l'Ermitage. Jouanny 1911, p. 436.

L'ouvrage est dû à la parfaite et exemplaire collaboration de conservateurs, de restaurateurs et de scientifiques venus de tous pays.

Qu'Helen Glanville m'ait généreusement demandé d'écrire quelques lignes en introduction à un livre essentiellement consacré à l'analyse scientifique de chefs-d'œuvre de Poussin, témoigne de sa part d'une grande ouverture d'esprit. J'ai souvent, trop souvent, manifesté un certain scepticisme, un scepticisme certain, à l'égard de ce genre de recherches dont l'utilité m'a parfois paru contestable.

Ces travaux ne veulent-ils pas trop souvent décider de ce qui est vrai et de ce qui ne l'est pas, départager et distinguer la copie de l'original, trancher et affirmer, au nom de la vérité scientifique, de la paternité des œuvres, en quelque sorte se substituer à l'historien de l'art dont l'attribut majeur, à mes yeux, demeure son œil?

Le livre tel qu'il se présente à nous apporte sur bien des points les réponses – osons le mot définitives – à des questions qui bien souvent sont débattues de longue date. Les tableaux de Poussin ici étudiés proviennent de musées de France (Rouen), d'Italie (Rome), d'Angleterre (Dulwich), mais surtout des Etats-Unis (Cambridge, Cleveland – deux tableaux –, Hartford, Kansas City, Richmond). S'y ajoute un petit panneau bien connu, aujourd'hui en collection particulière en Suisse. Ils couvrent l'essentiel de la carrière de Poussin, de *l'Amor vincit Omnia* de Cleveland et des deux petites *Bacchanales d'enfants* autrefois Chigi, aujourd'hui à Rome, à l'*Achille parmi les filles de Lycomède* du musée de Richmond, en passant par le *Triomphe de David* de Dulwich, l'admirable *Crucifixion* de Hartford, les deux *Sainte Famille* de Cleveland (et non de Washington) et du Fogg Art Museum, soit environ trente ans de la carrière de Poussin.

Ces œuvres sont arrivées à nous parfois en parfait état (Cambridge), en d'autres cas dans des conditions de conservation bien précaires (*L'Orage* de Rouen, *La Crucifixion* de Hartford). J'ai personnellement contribué à la réhabilitation de certaines d'entre elles – je songe en particulier à *L'Amor vincit*

This publication is the fruit of a perfect and exemplary collaboration between curators, conservators and scientists brought together from all countries.

That Helen Glanville should have generously asked me to write a few lines to introduce a book essentially devoted to the scientific analysis of masterpieces by Poussin, shows a certain open-minded ness. I have often, all too often, asserted a certain degree of scepticism, and assertive scepticism at that, towards this kind of research which has seemed to me at times to be of rather questionable usefulness.

Do not these publications all too often aim to assert what is true, authentic and what is false, to decide between and distinguish the copy from the original, to settle the question and affirm in the name of scientific truth the authorship of a work, that is in some way to supplant the art historian whose major attribute – in my eyes – is his "eye".

The publication here before us provides a number of answers – let us be brave and use the word « definitive » – to questions which have long been an issue of debate. The paintings by Poussin studied here come from museums in France (Rouen), Italy (Rome), England (Dulwich), but mostly the United States (Cambridge, Cleveland – two paintings), Hartford, Kansas City, Richmond). Add to this a small panel, well known today, in a private collection in Switzerland. They span the greater part of Poussin's career, from Amor vincit omnia *in Cleveland and the two little* Bacchanals *once in the Chigi Collection and now in Rome, to the* Achilles among the daughters of Lycomedes *in the museum in Richmond, via the* Triumph of David *in Dulwich, the admirable* Crucifixion *in Hartford, both the* Holy Family *in Cleveland (not the one in Washington) and the one in the Fogg Art Museum, that is a period of about thirty years of Poussin's career.*

*Some of these works have reached us in perfect condition (Cambridge), and in other instances in precarious condition (*L'Orage *in Rouen,* The Crucifixion *in Hartford). I have contributed in person to the rehabilitation of a certain number amongst them – I am thinking in particular of the* Amor vincit

Omnia de Cleveland et au *Triomphe de Bacchus* de Kansas City, une des trois *Bacchanales Richelieu,* toutes deux refusées plus ou moins catégoriquement aussi bien par Anthony Blunt en 1966 que par Jacques Thuillier en 1994 –, les deux tableaux sont aujourd'hui unanimement considérés comme de la main de Poussin. Elles sont l'objet d'études scientifiques minutieusement étayées qui font usage des instruments les plus perfectionnés de la recherche, radiographies, ultraviolets, infrarouges, lumière rasante, que sais-je encore, et s'interrogent sur l'origine des pigments utilisés par le peintre, en un mot sur sa méthode de travail. Les poussinistes quels que soient leurs camps, attributionnistes à l'ancienne mode, spécialistes du marché de l'art, iconographes et iconologues, historiens des idées, partisans de savantes analyses interprétatives de plus en plus nombreux aujourd'hui, ne peuvent plus écarter les résultats obtenus. J'ai été particulièrement sensible dans le présent ouvrage aux recherches sur les points de fuite sur lesquels Avigdor Arikha d'une part, Keith Christiansen d'autre part, s'étaient interrogés à propos des deux versions de *L'Enlèvement des Sabines* du Louvre et du Metropolitan Museum of Art de New York.

Comme l'affirme ici même Sheila McTighe, toute vision plus large de la pratique de Poussin doit dorénavant prendre en compte et intégrer ces nouvelles données techniques.

Omnia *in Cleveland and the* Triumph of Bacchus *in Kansas City, one of the three* Richelieu Bacchanals, *both of which were more or less categorically refused both by Anthony Blunt in 1966, and by Jacques Thuillier in 1994 – and are now unanimously considered to be by the hand of Poussin. They are the object of meticulously supported analyses which rely on the most advanced investigative techniques, using everything from x-rays and IR radiation, ultra violet fluorescence, raking light –* que sais-je encore *… – or the origin of certain pigments used by the painter, in brief seeking to understand his working method. Poussin scholars – whatever their allegiance – whether attributionists of the old school, specialists in the art market, iconographs and iconologists, historians of ideas or the growing number of partisans of erudite interpretative analyses, none can now dismiss the results of these investigations. In the present work I was particularly struck by the research carried out on the vanishing points in the paintings, an aspect on which both Avigdor Arikha on the one hand and Keith Christiansen on the other, had explored in relation to the* Rape of the Sabines *in the Louvre and the Metropolitan Museum of Art, New York.*

As is stated in these pages by Sheila McTighe, any broader vision of Poussin's practice from now on cannot but encompass and integrate these new technical data.

Combiner les regards sur les œuvres de Nicolas Poussin

A Combined Vision of the Works of Nicolas Poussin

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

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La recherche interdisciplinaire dans le domaine de l'histoire de l'art prend aujourd'hui de nombreuses voies par l'intermédiaire de collaborations entre historiens de l'art, scientifiques et restaurateurs. L'histoire technique de la peinture ainsi décrite conduit à considérer conjointement l'histoire de la couleur et celle de la société contemporaine de l'artiste. Les historiens et les sociologues tels par exemple Pierre Francastel, John Gage et Michel Pastoureau, ont abordé ces aspects mais se sont souvent confrontés à des difficultés méthodologiques car la vision des œuvres d'aujourd'hui ne correspond pas toujours à celle qui avait été voulue par l'artiste car certaines couleurs ont pu changer au cours du temps, sous l'effet des agents atmosphériques et de la lumière, parfois d'accidents ou de simples abrasions de la couche supérieure de peinture qui sont à l'origine de modifications parfois importantes de la tonalité de la peinture.

Ce numéro de la revue *Kermes* consacré à l'analyse technique minutieuse de plusieurs tableaux de Nicolas Poussin, révèle la richesse des enseignements issus de la mise en œuvre de nouvelles méthodes d'analyse physico-chimiques et de l'observation détaillée des gestes et des matières employés lors du processus de création artistique. De nombreux moyens sont mis en œuvre pour révéler avec le plus grand détail la nature d'un pigment, ses impuretés, l'ajout d'un liant et les effets créés par les mélanges. En 1994, le premier numéro de la revue du Laboratoire de recherche des musées de France (transformé en Centre de recherche et de restauration des musées de France), *Technè*, était consacré aux études des œuvres de Nicolas Poussin. Les différents dossiers abordés ont permis de préciser les supports, les enduits de préparations, les techniques de mises en place et les changements de composition sur certaines œuvres de l'artiste. Aujourd'hui, les dossiers abordés dans ce volume appréhendent de manière très nouvelle, plus globale, la matérialité des tableaux et la replacent dans le contexte des pratiques et des connaissances techniques de l'Italie du XVIIe siècle.

Les démarches explorées pour l'étude de différentes peintures sont multiples: elles combinent l'observation précise à l'imagerie scientifique, l'analyse de prélèvements à celle directe, non invasive, par différentes spectrométries visible, infrarouge, de fluorescence des rayons x, diffraction de rayons x, etc. Elles décrivent les liants, les pigments, les superpositions et les juxtapositions de couches de peinture, afin de souligner, par exemple, la préférence de Poussin pour empiler les couches opaques plutôt que d'employer des gla-

Interdisciplinary research in the field of art-history is progressing along several paths because of the collaboration between art historians, scientists and conservators. Thus described, the technical history of paintings leads one to take into consideration the history of colour at the same time as that of the society in which the artist practiced. Historians and sociologists such as for instance Pierre Francastel, John Gage and Michel Pastoureau have tackled these questions, but have often encountered methodological difficulties in that the appearance of the paintings today, does not always correspond to that desired by the artist as certain colours may have altered over time with the effect of atmospheric agents and of light, or as a result of accidents, or simply through the abrasion of the top layer of paint, all of which can at times result in serious modifications in the tonality of the painting.

This volume of the journal Kermes *devoted to the meticulous technical analysis of several works by Nicolas Poussin, reveals the wealth of knowledge acquired through the implementation of new methods of physico-chemical analysis taken together with the detailed investigation of the handling and materials deployed during the process of creating the work of art. A number of different means have been employed in order to investigate in the greatest detail the nature of a particular pigment, its impurities, the effects of the addition of a medium as well as the effects created by mixtures. In 1994, the first number of the journal of the Laboratoire de recherche des musées de France (now Centre de recherche et de restauration des musées de France) –* Technè *– was devoted to the investigation of works by Nicolas Poussin. The different case studies enabled one to specify the nature of the supports, that of the preparatory ground layers, the compositional techniques and compositional changes in certain works by the artist. Today, the case studies present in this volume approach the materiality of the paintings in a very new, more global and integrated way, placing it within the context of the practices and technical knowledge of 17th century Italy.*

The approaches explored in the study of the different paintings are manifold: they combine detailed observation with scientific imagery, the analysis of samples with direct non-invasive analysis using different types of spectrometry – in the visible part of the spectrum, infrared, x-ray fluorescence, x-ray diffraction etc. They describe the binding media, the pigments, the superimpositions and the juxtapositions of paint layers, underlining for example Poussin's preference for the layering of opaque layers rather than employing transparent glazes as was

cis transparents alors bien connus chez d'autres artistes contemporains ou plus anciens. Des sous-couches monochromes contribuent ainsi parfois à la réalisation des carnations élaborées ensuite avec un subtile mélange de pigments pour créer les bonnes tonalités ainsi que les effets de lumières ou les reflets.

Revenons sur trois aspects techniques qui montrent la richesse du travail sur la matière:

– La réalisation de la couleur verte semble aussi avoir été un défi technique important. Poussin semble ne jamais avoir employé le pigment vert-de-gris bien connu pour son instabilité et sa capacité à s'assombrir au cours du temps. Aux côtés des terres vertes, des mélanges complexes de pigments sont observés par l'analyse : ils associent des pigments jaune de plomb et d'étain à l'outremer, ou bien dans une pratique associée à Claude le Lorrain, des terres contenants des oxydes de fer jaune, rouge, vert, du noir de carbone (de charbon de bois ou d'os), de la calcite et un outremer très clair, appliqué au dessus d'une sous-couche sombre brun-rouge.

– La question de l'élaboration des liants s'impose également lors de l'observation des œuvres. Il semble que, dans certains cas, Poussin a utilisé une matière picturale faiblement liée par la matière organique afin de créer une surface mate qui peut paraître similaire à l'aspect d'une fresque. En partant des analyses, des reconstitutions des mélanges et des superpositions de couches devraient dans l'avenir nous permettre de préciser l'intention de l'artiste.

– D'autres observations permettent de mieux comprendre comment le peintre a su échafauder une véritable stratégie pour guider le regard du spectateur et renforcer l'unité émotionnelle de sa composition en construisant une perspective géométrique précise, issue d'un petit point marqué dans la matière picturale et qui est encore visible sur la couche supérieure de la peinture du *Achilles among the Daughters of Lycomedes* (1656), mais aussi par la direction des regards et l'unité des tonalités employées pour installer une atmosphère calme ou orageuse.

Très érudit, Nicolas Poussin a évolué dans sa pratique technique à la suite de ses multiples contacts et lectures lors de ses séjours à Rome. Il a notamment étudié les textes de Léonard de Vinci lorsqu'il préparait des dessins pour l'édition française imprimée du *Traité de la peinture*, parue en 1651. Il échangeait avec les scientifiques, antiquaires et philosophes présents dans son entourage romain, celui du cercle du secrétaire du cardinal Barberini, Cassiano Dal Pozzo. Jacques Thuillier précisait dans son article dans le *Technè* de 1994 («Poussin et le laboratoire»)[1]: «Peintre soigneux dont la démarche ne laisse peu de place au hasard, Poussin n'est pas de ces artistes dont le laboratoire a le privilège de retrouver ses secrets». Le travail de laboratoire ne cherche en effet pas ici à mettre en évidence les pratiques mystérieuses de son atelier mais de bien comprendre comment le peintre a réalisé son œuvre dans son ensemble, avec une précision remarquable qui l'a conduit à devenir un théoricien de la couleur et des pratiques picturales et à inventer des œuvres d'art qui exploraient la nature de manière nouvelle. Rappelons, si besoin est, cette réponse très célèbre de Nicolas Poussin à Vigneul de Marville lorsque celui-ci lui demandait «par quelle voie il était arrivé à ce haut point de perfection qui lui donnait un rang si considérable entre les plus grands peintres de l'Italie.» Poussin lui répondit: «Je n'ai rien négligé.»

the custom among many of his contemporaries and past masters. Thus at times monochrome underlayers contribute to the working up of flesh tones which are subsequently finished with subtle mixtures of pigments in order to create the right tonalities as well as effects of light and reflections.

To return to just three technical aspects which will give an idea of the variety of the work carried out on the physical materials of the paintings:

– The creation of green hues seems to have posed a considerable challenge. Poussin never seems to have employed the green copper based pigment verdigris*, the instability of which was well known, as well as its tendency to darken with time. Analysis shows the use of complex mixtures of pigments alongside that of green earths: lead tin yellow in association with ultramarine blue or else – in a practice associated with the name of Claude Lorrain – earth pigments containing yellow, red and green iron oxides, carbon blacks – charcoal or bone – calcite and a pale shades of ultramarine, applied on top of a reddish-brown underlayer.*

– Examination of the pictures also raises the question of the binding media used. It would seem that in certain cases Poussin used a poorly bound paint so as to create a matt effect reminiscent of the appearance of fresco. Basing oneself on the analyses, reconstructions of the mixtures and layer structures should in the future allow us to clarify the artist's intention.

– Other observations allow us to better understand how the painter successfully constructs a veritable strategy in order to guide the eye of the spectator; reinforcing the emotional unity of the work, building up a precise geometrical perspective around a small point marked in the paint and still visible on the surface of Achilles and the daughters of Lycomedes *(1656), but also through the direction of the glances of the actors in the scene, and the unity of the tonalities employed to install and instil a calm or stormy atmosphere.*

Very learned, Nicolas Poussin evolved in his painting technique through his many contacts and his reading. Most pertinently he studied the texts of Leonardo when preparing the illustrations for the printed edition of the Traité de la peinture *published in Paris in 1651. He discoursed with the scientists, antiquaries and philosophers who made up his entourage gathered around Cassiano Dal Pozzo, secretary to Cardinal Barberini. In his article in* Technè *in 1994 ("Poussin et le laboratoire")[1] Jacques Thuillier described Poussin as a "Careful painter, whose approach leaves little place to chance, Poussin is not one of those artists whose secrets the laboratory has the privilege of unveiling." Indeed, the work in the laboratory is here not attempting to reveal mysterious studio practices, but rather to understand in depth how the artist has created his work seen as a whole, with that extraordinary precision that led him to become in his pictorial practice almost a theoretician of colour, and to create works which explored nature in a new way. Let us remind ourselves – should there be the need – of Poussin's famous retort to Vigneul de Marville, when asked "by what path had he arrived to this high degree of perfection which gave him such lofty standing among the greatest painters of Italy," to which Poussin replied: "I have neglected nothing."*

Notes

[1] Thuillier 1994, p. 13.

Poussin's Practice: A New Plea for Poussin as a Painter

Kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Sheila McTighe

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Technical studies of Poussin's paintings have been fewer in number than those devoted to artists such as Rembrandt or Velazquez. For a historian of 17th century art, the present volume of *Kermes* is all the more welcome. It adds much to the studies published as volume one of *Technè* in 1994, coinciding with the four-hundredth anniversary exhibitions in Paris and London, and those that accompanied the Cleveland exhibition devoted to Poussin's *Madonna on the Steps* in 1999.[1] Perhaps it is time to reflect on the information that has been discovered, and to integrate it further with what we know about Poussin's art from other sources.

With its appearance of perfect resolution and finality, Poussin's art seems to have sprung fully formed from his head, rather than being crafted by his hand. His contemporaries describe him working alone, primarily on small paintings for private collectors. His solitude is one of the foundations for the myth of Poussin as a purely intellectual painter. It is as if instead of labouring in a workshop stocked with tools and assistants, he practiced his art in a library or study. His biographers speak of him laying down his brushes to go out walking on the Pincio while expounding his ideas about art to a reverent group of followers, earning him the epithet *peintre-philosophe*. Technical studies since 1994 have complicated this view of Poussin, by giving us a view of a pragmatic man at work. I would like to suggest that what we now know of Poussin as a painter shows that he manipulated the tools of his trade – even the texture and consistency of pigments, the painted grounds of his canvases – into elements that not only create the illusion of representing the world, but also communicated ideas and values in their own right.

In response to this new information from scientific study of his works, we need to expand the reach of what we call artistic practice. The creative practice of an artist may not solely concern the physical construction of their artwork. It is bound up with the entire apparatus of their artistic expression, including their emulation of artistic forebears, the intellectual genesis of the paintings, their reflections on their own craft, and the works' address to their audiences. Scientific examinations shed light on these issues when they are in dialogue with other forms of research. The empirical study of Poussin's practice and the interpretive analysis of his works should have much to say to one another, but this dialogue is only at its beginning.

The art historical literature on Poussin has rarely discussed his workshop as a place where he crafted his paintings. His practice as a whole has received much less attention than his involvement with ideas about painting, his adoption of neoStoic ethics, his knowledge of antiquarian culture, and his approach to narrative and allegory, all summed up by that epithet of *peintre-philosophe*. My question, directed at both the art historical and the scientific studies of Poussin, is simply how do we do justice to his pragmatic creative process and, at the same time, address his paintings as complex and highly thought-out representations of stories, passions and ideas? How might the scientific examination of his works bring together the *peintre* and the *philosophe*? The question has more urgency in that it arises from an old split in the Poussin literature that shows no signs of going away.

His actual procedures in his studio were painstaking, according to the accounts of four eyewitnesses. Modelling wax into small lay figures, he draped them in cloth, refined their poses and composed them into figural groups from which he sketched his compositions. The wax models were placed on a board, which would allow the artist to plot the composition in perspective from a specific viewpoint.[2] At least one account describes his "grande machine" as a box-like structure, with openings to control the placement of light and shadow. All of which tells us that Poussin was not a painter who created forms spontaneously, revising extensively while he applied pigment to canvas. X-rays and infrared reflectography of many paintings have confirmed this, as the studies in this present volume show. There were very few alterations of the main figures in a painting such as the Dulwich *Triumph of*

David of 1631-33, for example, but rather a lot of tinkering with the details of architectural settings to make them frame and interact with the figures.[3] This is consistent with what has come to light through radiography and IR reflectography of the *Madonna on the Steps* of 1648.[4]

Much of Poussin's work was thus done in preparation for each painting, before he picked up his brushes, as he found the "pensée," the thought, or the "disposition" for his compositions. In creating the "grande machine" and drawing from it, Poussin focused on one central issue: the posed body and its expressive affect, the figure as it communicates the passions of the soul. This fundamental aspect of his creation can be studied through his drawings, as well as through his statements in his letters to patrons and friends.

There are nevertheless surprises in the underlayers of Poussin's paintings, particularly in the paintings done prior to his stay in Paris in 1640-42. During his early years in Rome he seems to have regularly painted over partially finished canvases left standing for some time in his studio, which complicates the issue of their dating and place in his oeuvre.[5] After his return from Paris in 1642 at the height of his success in Rome, this thrifty practice stops. The notable exception is his *Landscape with Pyramus and Thisbe*, the last and largest work for his great Roman patron Cassiano Dal Pozzo, finished in 1651 but revealed by radiography to have been begun as a very different kind of landscape around 1646.[6] I will return to this case below, for the landscape's transformation raises far-reaching interpretive questions, which we would not be able to ask without the scientific examination of this work.

Other types of technical examination also reveal information about what lies underneath, even in the very underlayers of paint. Poussin's preparatory grounds, changing as he moved from Rome to Paris and back to Rome again, give us new tools to use in dating his works, one that can provide a check on the dating provided by documents or by connoisseurship. The mid-brown ground he used in Rome up to 1640 was consistent with what was in use by most other painters in Italy at the time. When he went to Paris in 1640, he quickly adopted a reddish ground overlaid with a grey second layer, which was then current in France. After his return, he carried on using the red-grey double ground, which gave warmth to his figural compositions, but he retained the brown Italian ground for the cooler tonalities of his landscapes. Interestingly, the chemical make-up of his red ground used in Rome differs from the one he used in Paris; he was adapting local pigments to a foreign use.

As we learn in this present volume of *Kermes*, studies of the weave of his canvases also give us new ways to address problems of attribution and dating. Two of the three *Bacchanales* painted for Cardinal Richelieu's chateau in Poitiers, the *Triumph of Silenus* now in the National Gallery, London and the *Triumph of Bacchus* in the Nelson-Atkins Museum in Kansas, have occasionally been described as contemporary copies rather than autograph works.[7] As so often happens, the discussion revolves around the connoisseur's impression of the works' quality, raising doubts which are notoriously difficult to prove or to dispel. The computer analysis of the woven pattern in the canvas used as supports for these paintings[8] reveals that the three *Bacchanales* examined were all on canvas cut from the same bolt of cloth. The two paintings' different quality of finish may have been due to pressure on Poussin to complete this important commission quickly. But we do know that a number of good contemporary copies were made of the Richelieu works. The two paintings in question may indeed have been made by copyists using canvas found in the artist's own workshop. In that case they were made under the eye of the artist himself, rather than after they left his hands. It would seem that at least on occasion in Rome Poussin did indeed have a proper workshop, a place where he directed a team of workers in order to complete a cycle of works.

There was a time when the authorship of Dulwich's *Triumph of David* was also called into question, but if any doubts lingered, the scientific examination during restoration has put its attribution beyond question. Burnstock's and Plender's analysis of pigments in this work in the present volume, moreover, can tell us something important about the larger sense of Poussin's practice as a painter. They report that his use of "leanly-bound oil paint to create blond matte surfaces" reflects his aim to emulate Domenichino's famous fresco of *The Flagellation of St. Andrew*, a key work for Poussin in the late 1620s and early 1630s. Thus Poussin chose to represent the very look of fresco on plaster by means of an idiosyncratic use of "thin over fat" layers of oil pigment, one that also involved using "metal soaps" in the paint to create a scattering of light reflected from the paint surface, similar to the effect of fresco. Important to note here is that Poussin's very use of drawing in this work also involved an emulation of Domenichino's fresco. A pricked, full-scale cartoon for the left side of the painting survives in Chantilly. Virtually unknown elsewhere in Poussin's extant oeuvre of drawings, his use of this cartoon for an oil painting annexes the very techniques of a fresco painter for his emulation of Domenichino.

Poussin's emulation of past art may lie behind another of the techniques laid bare by recent examinations, the incisions into the painted ground that mark out the perspective vanishing point and orthogonal lines in his works. Poussin's perspective is an important junction between his theory of painting and his practice. It is an area where he certainly emulated Leonardo, whose manuscript *Trattato* containing some general remarks about optics, light and shadow he illustrated while it was in the hands of Cassiano Dal Pozzo.[9] A version of this treatise was then published simultaneously in Rome and Paris during 1651, the same year of his *Pyramus and Thisbe* scene.[10] Poussin's ideas about perspective

Fig. 1 – Nicolas Poussin, Selfportrait (1650), oil on canvas, 98 x 74 cm; Paris, Louvre, inv. no. 7302.

nonetheless may have evolved during his later career. In a lost letter to the French printmaker and perspective teacher Abraham Bosse, as reported by Bosse himself, Poussin seems to repudiate Leonardo's treatise. Without doubt, however, Poussin was consistently and very deeply concerned with perspective, as he wrote about it in a famous letter to the French minister Sublet de Noyer in 1642, speaking of 'prospect' or perspective as a way of 'seeing with reason.'[11]

First discussed in relation to the Louvre's *Rape of the Sabine Women*,[12] Poussin's perspectival incisions have now also been found in the *Landscape with Pyramus and Thisbe*,[13] *Achilles among the Daughters of Lycomedes* in the Virginia Museum of Art and other major works of the second half of his career. These latter studies have found a further point of great interest: small holes at the vanishing points, where a pin was pushed into the canvas, through all the upper layers of paint. Poussin used it as a 'point de repère' until the work was nearly complete. With a string attached to that pinpoint, he could verify the orthogonals' placement, ensuring that his architectural masses would strictly comply with the perspectival recession. Where the incised line corresponds to an architectural edge there are traces of charcoal in the incision, as the artist both defined space and outlined forms, enhancing their relief.[14]

I can add somewhat to Sawyer's account of

how this perspective practice sits within other 17th century examples. Claude Lorrain's biographer Filippo Baldinucci described just such a pin-and-string operation as the basis of Claude's drawing and painting of landscapes. There is much more to say about the significance of this in terms of other artists working in Rome at mid-century than I can pursue here. However, a basic analysis of the perspective that Poussin left outlined in his paint surface shows that his, like Claude's perspective, was a distant-point system rather than an Albertian *costruzione legittima*. That is, he drew his orthogonal lines to a central vanishing point but also made forms recede to two side or distance points, which for Poussin were always located at the lateral edges of his canvas. This yields the characteristic central ellipsis of space that he exploited invariably for his landscapes from the 1640s onward. It differs from the spatial structures of Claude's works, where the distance points were always located outside the bounds of the canvas, which creates the sense that the image is a segment of a larger world continuing beyond the frame. Poussin's visible world was self-contained within its frame, as if on a stage.

The result of this self-contained perspective framework can be seen in the *Landscape with Pyramus and Thisbe*, where the hole marking the vanishing point has been located, again piercing the upper layers of paint.[15] The overarching subject of the painting, a storm and its effects on people caught within its violence, was one associated with Leonardo in the *Trattato* published with Poussin's illustrations in 1651. This unusually large painting completed in the same year of 1651 was at least in part an emulation of the great Renaissance artist. It was also the last work made for Poussin's Roman patron Cassiano Dal Pozzo, who had so prized the manuscript notes of Leonardo in his library. Time had passed since Poussin had last served Cassiano. The great collector was no longer in a high position after the 1644 death of Urban VIII and eclipse of the Barberini family. It is all the more interesting to see that the fortunes of this painting also changed: X-rays show a different landscape painted underneath the storm scene, a calm scene rather than a tempest. As Maek-Gérard showed, architectural motifs in this earlier composition are nearly identical with motifs in Poussin's painting of Baptism for the second series of Seven Sacraments, made for his French patron Chantelou. This repetition may mean that the first campaign of painting on this canvas was undertaken around 1646, the date of the *Baptism*.

More strangely, a passage in one of Poussin's letters to Chantelou in June 1648 seems to allude to this subsequent transformation. He wrote "je souhetterois sil estoit possible que ses set Sacrements feussent convertis en set autres histoires où feussent représentees vivement les plus estranges tours que la fortune aye jamais joué aux hommes …"[16] He wished to transform the Sacraments into other subjects, where the strangest tricks of fortune played on men would be vividly represented, but he went on to say that few men are exempted from fortune's 'tempestes.' This is a case of Poussin's letters revealing something that first seems an abstract, philosophic statement meant to comfort his patron, then proves to refer to something more concrete about his art. The x-rays of the *Landscape with Pyramus and Thisbe* now show us that the sentiment expressed to Chantelou in Paris then bore fruit in the actual transformation of Cassiano's canvas in Rome from an image similar to the Sacrament of Baptism into an image of fortune's storms, directed at a patron who was himself a victim of ill fortune.

The genesis of this painting, and the letter about the storms of fortune should also be placed together with Cassiano's – and to some degree Poussin's – involvement with the clandestine group of libertine intellectuals in Rome and Paris, such as Gabriel Naudé and Guy Bourdelot. The idea that men were subject to Fortune, the principle of unstable change ruling over nature, was a key tenet of neoStoicism, to be sure, but also of the more deliberately atheistic outlook of these figures who held Cassiano and Poussin in high esteem.

Such are the surprises that scientific examination of paintings can uncover. The ability to look under the surface of the paint to trace the creative genesis of the work leads us to the intended effect the painting was meant to have on its patron, a man suffering fortune's vicissitudes, and to the intellectual context in which that patron moved. I suppose the moral of the story is that the many kinds of evidence about Poussin's practice as a painter need to be woven together, the visual with the verbal, the evidence of the eye and that of the text. To do so would heal some of the rifts in Poussin scholarship.

The phrase in my title, "a plea for Poussin as a painter," comes from Denis Mahon's title to an essay of 1965 in which he argued against the long-standing view of Poussin as *peintre-philosophe*.[17] In my own plea for Poussin, I want to use the phrase in a different sense. For Mahon, to study 'Poussin as a painter' meant attending to the visual evidence offered by the paintings themselves. However, this attention to painting as painting entailed chucking out all extraneous intellectual baggage. The artist's understanding of classical antiquities had its impact on both the subjects and the manner of his paintings, for example; there is a wealth of concrete evidence to support this assertion, but this was not an area that appealed to Mahon's eye and was downplayed in his approach to Poussin. The complexity of Poussin's subjects was pared away, as Mahon used his extremely sensitive eye mainly to date the paintings and to chart an evolution for Poussin's paintings away from "the Baroque," and toward the "classic" style. This has proved somewhat too rigid a framework for Poussin's development. Mahon at times went against good contemporary evidence, including statements by the

artist's biographers (for example, in the dating of the *Landscape with Diogenes* to the late 1650s, as opposed to Félibien's statement that it was made in 1648). To follow Mahon's views, you had to give his eye a greater authority than documents.

By contrast, the writings of Anthony Blunt placed the artist in relation to the changing intellectual contexts in Rome and Paris (including the circle of erudite libertines). Blunt's early and rather flawed work on the chronological development of Poussin's art aroused Mahon's ire. However, despite some dodgy dates for paintings, Poussin emerged from Blunt's 1967 monograph as an artist embedded in a rich intellectual culture, centered on the antiquarian and scientific interests of his patron Cassiano Dal Pozzo. What Mahon rejected with his 'plea for Poussin as a painter' was ultimately not just Blunt's chronology, but the intellectual apparatus that underpinned that chronology. Mahon's many publications were, in general, attempts to drive a wedge between abstract *Seicento* writings about art and the painterly, sensual imagery that he preferred, whether in the early works of Guercino or the Titianesque phase of Poussin's career. His plea for Poussin was directed thus not just at Blunt in the first instance, but ultimately against Panofskian erudition, and the assumption of a great burden of classical and Renaissance culture riding on the shoulders of the artist. The same kind of incisive rebuttal was also directed against Rensselaer Lee and later Charles Dempsey, with their discussion of Poussin's relation to the 'ut pictura poesis' tradition of painting and poetry as 'sister arts.' It was all too abstract for Mahon's view of Poussin 'as a painter.' Yet it is hard to think of a Renaissance idea that is more pertinent to Poussin's expressive aims.

Mahon's attitude has its parallels in the work of later art historians, who also saw a stark opposition between a visual approach to the works, and an intellectual approach – usually presented as over-intellectual, with interpretation of any kind dismissed as over-interpretation. Close visual analysis, along with simplicity and clarity of writing about Poussin's work is, of course, worth achieving. But simplicity may come at too high a cost if it requires us to it throw the baby out with the bath water, by negating Poussin's own concerns for joining up theory and practice in his art. If we call Mahon's kind of 'plea for Poussin as a painter' a conservative approach to his oeuvre, it nonetheless has a curiously symmetrical counterpart in one strand of new American art history, in the writing of T.J. Clark and his students. There, a frustration with dry iconographic studies has led to the attitude that one can best serve Poussin's works through poetic descriptions of the paintings and personal musings, cut free from historical evidence or any reference to earlier scholarly studies of his works. The end result is not so dissimilar to Mahon's plea for Poussin as a painter. It is a rejection not solely of intellectual complexity, but of the historicity of Poussin's career and its potential difference from our modern expectations.

What I have begun to learn from the evidence gathered in these studies of Poussin's creative process is that the *peintre-philosophe* saw his own techniques as meaningful, beyond their pragmatic functions. In his self-portrait for Chantelou of 1649, he depicts several canvases stacked against the wall behind his likeness (Fig. 1). In the leftmost painting, intersected by the edge of the canvas, a woman wears a crown decorated with an eye, and holds her arms out in an embrace to an unseen figure. Bellori tells us that she represents the friendship of artist and patron. Her resemblance to Ripa's personification of Disegno or design has been noted, and her role as an allegory of painting has been analysed.[18] She bears a close resemblance to a woman crowned with an eye in one of Charles Errard's illustrations for the 1651 publication of Leonardo's *Trattato* where the eye and its proximity to the mind signified the art of perspective. Poussin did indeed identify painting with perspective, for it brought about reasoned seeing.

In the other framed canvas just behind the artist, there is nothing represented except an inscription laid on top of that grey-over-red ground that we now know underlies all his figural paintings made after 1640. The inscription declares Poussin to have been born in Les Andelys, but so too, in its way, does the painted ground. It was a sign of his Frenchness, and another form of identification with his French patron in Paris. And it is a clever play with pigment: the ground is the ground of the actual painting, yet it also re-presents the ground of a fictional painting. In this work in which he entrusts his effigy, Poussin was willing to let pigment and canvas be the very signs of his painterly identity.

Notes

[1] Sawyer 1999.
[2] Blunt 1967; Bätschmann 1990.
[3] Burnstock and Plender, in this issue.
[4] Sawyer 1999.
[5] Thuillier 1994.
[6] Maek-Gérard 1988 and 1994.
[7] Wine 2001.
[8] Erdman *et alii*, in this issue.
[9] Cropper 1980.
[10] Kemp 1990.
[11] Jouanny 1911, p. 143.
[12] Arikha 1983.
[13] Maek-Gérard 1988 and 1994.
[14] Sawyer, in this issue.
[15] Maek-Gérard 1994.
[16] Jouanny 1911, p. 384.
[17] Mahon 1965.
[18] Winner 1983.

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Nicolas Poussin: Creation and Perception

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Too easily have we accepted, and indeed still do accept, an image of Poussin which owes much to the figure-head, model and emblem of the classicising faction at the Académie Royale de Peinture et Sculpture: the 'Poussiniste' *par excellence*. He is perceived as a cerebral, intellectual painter and not the *sçavant peintre*,[1] a humanist embued with the culture and philosophy of antiquity, the poet in paint described by those who knew him well and had not only seen him at work, but were painters themselves, such as Charles Le Brun[2] and André Félibien.[3] The received image is that of a painter for whom paint (*la couleur*) was deemed of little consequence, because fruit of the hand rather than the mind. But this is an image distorted by the lens of the subsequent generation, a Cartesian one, for whom the mind was to become divorced from the hand. Theory and practice, for Poussin as for his contemporaries,[4] were firmly bound together, as he was to write to his friend and patron Paul Fréart de Chantelou in 1647: "It is exceedingly difficult to judge well if one does not possess in this art great [knowledge] of both Theory and Practice together."[5] Indeed, even Galileo in his *Dialogo sopra i due massimi sistemi del mondo* published in 1632, was to mock those artists who knew all of Leonardo's precepts, but were incapable, as he put it, to even paint a stool.[6]

1

Fig. 1 – Detail of the engraving with the portrait of Poussin in Bellori's *Vite*, "DE LUM.ET.UMB." is clearly visible on the spine of the folder. Bellori 1672, p. 405.

For the painter, paint and colour are the chosen means of expression, as words and their handling are for the poet. In a famous letter, Poussin draws this parallel between the practice of the painter and that of Virgil who "would accommodate the sound of his verse with such artifice that it truly seems to put before our eyes with the sound of his words the very subject that he is treating, so that when he is speaking of love one can see that he has skilfully chosen some sweet and pleasing words which are gracious to the ear," whilst a warlike subject, or a battle, would elicit words that "are harsh and unpleasing, and cause fright when heard or spoken."[7]

He was indeed a philosopher-painter, but a philosopher not in the sense that the term is understood nowadays. For Lomazzo for instance (the blind painter-art theorist cited by Félibien, whose various volumes on the nature of painting, and treatises on its processes, were in the Barberini library to which Poussin had unparalleled access)[8] the painter had to be a philosopher in order to understand the reasons underlying the appearance of things, so as to then be able to re-create them that they might appear real: "… the true painter needs to be a philosopher through and through, in order to be able to thoroughly penetrate the nature of things … in this way all representations will appear real, and not fictive."[9]

The paintings of Poussin, through the medium of paint, are not an illustration of their subject, but the very expression and physical embodiments of it. The Humanistic ideas, ideals and beliefs of which his paintings are an expression, are those which flourished in the Medicean court at the time of Marsilio Ficino, Pico Della Mirandola, Leonardo (to name but a few) and were to be revived in the circle of Cassiano Dal Pozzo and Francesco Barberini. The embodiment of these in the paint-

ings was not confined to a material Antiquarianism translated by Poussin into formal elements, or formats (for instance the quotations from antique remains, or frieze-like compositions), nor to the provision of texts or subject-matter on which he relied, but is also to be found in their material expression.

The background

For the figure of Painting debating with her sister Poesy the supremacy of their respective arts in Félibien's *Songe de Philomathe*, the art of painting has primacy as it comes closer to the divine as a means of expression. Not only because images can express the ineffable in a way that words can only describe, but also because, as Painting explains speaking in the first person: "I employ signs to make myself understood, as this is the language of the greatest of the Gods, and the first language through which he made himself and his will known to men."[10]

Poussin would have already been exposed to the neo-Platonic ideas in which he would bathe once in Rome whilst still in Paris, before his departure for Rome, frequenting the person as well as the writings of his mentor and patron Giambattista Marino.[11] In Marino, we find clear expression, both in poems and his theoretical writings, of the idea that the painter's hand is "the hand that imitates that of the creator"[12] : that God is the original painter (the *summum artifex*) of the universe, and nature and man his creations. Giambattista Marino's *Dicerie sacre* to which this idea was central, was published in 1614.

His *Diceria sacra* on *Painting* opens with a hymn to the Sun, the same Deity sung and praised throughout the ages as a symbol of God the Creator. We find the Sun present in Poussin's definition of the *Art of painting* written at the very end of his life to Fréart de Chambray[13] who had sent him his translation of Leonardo's *Trattato*: "It is an imitation made with lines and colours on any surface of all that is seen beneath the Sun, its end is Delectation."[14]

On Poussin's arrival in Rome in 1624, Giambattista Marino introduced his *protégé* to Cassiano Dal Pozzo and Francesco Barberini, and thence to the erudite circle which they had created around them. In this circle the Humanists' longing to trace back all religions to a common origin, went hand in hand with a desire to read and understand this "great book of the world."[15] The scientific concerns and enquiries of the time (Galileo and Kepler for instance, were both intimately linked with the Barberini/Dal Pozzo circle, in addition to less traditionally accepted scientific figures such as Athanasius Kircher and Matteo Zaccolini) were not divorced from what we consider now the "Humanities": science was Natural Philosophy, and the artist a philosopher. To cite Plotinus, much loved and read in this circle: "the arts do not limit themselves to the imitation of what one sees, but are in pursuit of the causes of which nature is made."[16]

Thus, the scientific advances of the time were not artificially separated from – but merged with – the philosophical, literary, musical and artistic; elements of all are to be found translated into paint by Poussin. Most pertinently perhaps, because most clearly in evidence, are the manuscripts of Leonardo and those of Matteo Zaccolini.[17] In addition to the *Museo cartaceo*[18] (for which Cassiano is justly renowned) a less well publicised aspect of Cassiano's lifework was the supervision of the publication of Leonardo's writings on painting: the *Trattato della pittura*. For this he not only set Matteo Zaccolini to study the manuscripts and prepare them for publication,[19] but he also commissioned illustrations for it from Poussin. In addition, he had a copy made of the four volumes of Zaccolini's own *Della Perspettiva* for the Barberini library, sections of which Poussin had his brother in law Jean Dughet copy for his own use, and which were still in his possession at his death.

Zaccolini was to take Leonardo's studies on light, optics and both linear and aerial perspective, and over a period of two decades attempt to rationalise Leonardo's observations, calculations and theories on the behaviour of light and the perception of colour. He translated these into a system which could be of practical use to the painter, and all this in a language which, as we shall see, strongly reflects the neo-Platonic cultural climate of the time. Félibien wrote that no other painter showed such an understanding of Zaccolini's work, and that all that Poussin had learnt from Zaccolini could be found in his paintings: "There has not been a painter who had greater knowledge than this Father of the rules of perspective and who had better understood the reasons underlying [the appearance] of light and shadow. His writings are in the Barberini Library and Poussin who had had a considerable portion of them copied, made of them his study. As certain of his friends saw these [writings] in his hands, and that he spoke knowledgeably of optics, and that he employed it with considerable success, it was thought that he had composed a treatise on light and shadow. However, it is true to say that he did not write anything on

2

Fig. 2 – Detail of the engraving of the frontispiece to the *Life* of Poussin in Bellori's *Vite*, with the motto "LUMEN ET UMBRA" beside the female figure, interpreted as Painting. She points to drawn solids outlined on a flat surface, and behind her are solids set upon a stage with the inscription *Lumen et umbra.* Close inspection of the engraving shows that they are not outlined. It is hatching – light and shadow – which gives them volume. Bellori 1672, p. 407.

3

Fig. 3 – Engraving for the frontispiece to the *Preface* of the first edition of Félibien's *Conférences de l'Académie Royale de Peinture et Sculpture de 1667*, with the Virgilian motto *Mens agitat molem* ("Spirit animates matter") surrounded by the attributes of the arts. Félibien 1668, not paginated. The same engraving is to be found heading all of Félibien's *Entretiens*.

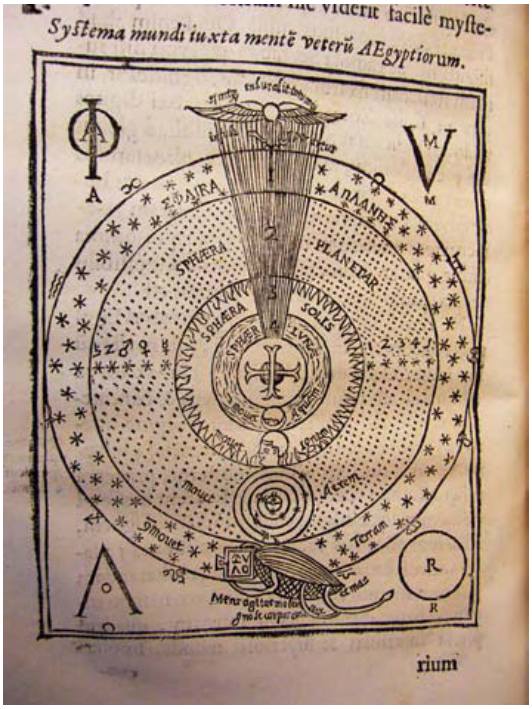

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Fig. 4 – Illustration from Athanasius Kircher's *Prodromus* (Introduction to Coptic and Aegyptian); a schematic representation of the conception of the nature of the Universe according to the ancient Egyptians (*Systema mundi iuxta mentem veterum Aegyptiorum*), Kircher 1636, p. 270. (a) Each sphere corresponds to an element (water, fire, air, and earth). The four symbols of the elements spell "philo/amor" (love), which for the neo-Platonists was the link that bound the universe together. (Image with thanks to the London Library, St. James', Rare Books Collection). (b) Detail of the lower part, with the Virgilian verses "(Spiritus intus alit totamque infusa per artus) Mens agitat molem et magno se corpore miscet" (*Aeneid*, VI, 724-727).

this subject: he contented himself with demonstrating in his own paintings what he had learnt from Father Zaccolini."[20]

To date, the Zaccolini manuscripts have not been studied in any depth in relation to Poussin's painting practice. Pioneering studies on sections of the manuscripts have been written by both Elisabeth Cropper[21] and Janis Bell,[22] and in the pages of *Kermes*, Paola Sannucci[23] has explored the relationship of Zaccolini's teachings to Domenichino's practice. It is in Domenichino's studio that it is thought that Poussin would have first met Zaccolini, when the latter was acting as Domenichino's "mathematics" master.

This essay is an initial attempt to relate the writings of the good Father on colour and perception to Poussin's use and handling of materials, within the additional context of the writings of his contemporaries, both in terms of the creation of the paintings, but also their perception.

"De lumen et umbra"

Galileo was to describe painting as "that faculty which imitates nature with light and with shadow."[24] and we find *De lumen et umbra* (of light and shadow) appearing in both of the engravings which head Bellori's biography of the artist, whom he knew well. (Figs. 1-2) The juxtaposition of these terms needs to be understood on several levels, as it would have been at the time: at once the use of light and shadow to recreate volume on a flat surface, but also light and darkness as the source of colour. Since Aristotle, colour had been conceived as the interaction between light and darkness with a scale of values in syntony with that of musical tones, these in their turn reflecting the "music of the spheres." Colour harmony was thus perceived as a reflection of that of the spheres. And as we shall see, the harmony that Poussin achieved in his paintings is consistently spoken of by his contemporaries in terms of musical harmony. On a metaphorical level, *De lumen et umbra* juxtaposes spiritual light (*lumen* and *mens)* which brings life to inert matter, dark and heavy (*molem* and *umbra*.)[25]

The Virgilian motto that heads both Félibien's *Conférences* and *Entretiens* (Fig. 3) "Mens agitat molem" (mind/spirit animates matter), also reflects the vision and understanding of the act of artistic creation as a divine act: fruit of the divine spark within man – the God within – both the artist and God breathing life into heavy matter (*umbra*) with the light of their intellect and soul (*lumen*). The Virgilian extract appears in this latter context in Athanasius Kircher's introduction to the Coptic language (the *Prodromus*) published in Rome in 1636, again under the *ægis* of Cassiano Dal Pozzo.[26] (Fig. 4)

Nor is it fortuitous that Félibien has named his interlocutor in the *Entretiens* Pymander, the instructor of divine mysteries in the Hermetic texts[27] which were Marsilio Ficino's earliest translation from the Greek for Cosimo de' Medici, preceding that of Plato's *Timaeus*. All the richness and ambiguity encapsuled within *De lumen et umbra* would have resonated with those who saw with the "eyes of the understanding."

In his *Diceria sacra* devoted to painting, Marino describes God creating the world as though he were a painter: "He began to make drawings with light and shade. See, here is the day, and the night; the highlights distinct, the outlines of the shadows softened by the sweetness of the lights … See how when the sun rises in the east, the brush of light

dipped into the colours of dawn, little by little he begins to paint the sky; how divinely mixing black with the light, and hatching the air with strokes of light and darkness, he begins by sketching out the day on a field of ultramarine blue …"[28]

Poussin's practice follows the path of creation. His *pensées*, monochrome wash drawings, (Figs. 5-6) show him studying light and shade and the spatial elements of the composition as a whole, as well as within individual groups; he studies the interrelation of figures and of limbs in terms of formal expressivity, but also of space, that is in terms of light and shade. They show his awareness that the illusion of space and relief on a flat surface is a tonal perception, and therefore depends on the depiction of a correct relationship between light and shade. The world we see is modelled through light, and painting recreates "all kinds of objects which only exist through light and shade, and it is through the secret of a science all divine, that I know how to deceive the eyes," to use the words of the figure of Painting in Félibien's *Songe de Philomathe*.[29]

In a letter to Carlo Dati, Poussin relates the monochrome paintings of the Ancients (and those of Giulio Romano and Raphael) to his own practice " as we are wont to do with our drawings, shaded with water-colour and highlighted with white, in order to then colour them."[30] Technical evidence is emerging (see essays in this issue) that confirms this, and suggests that there is indeed some kind of initial tonal *ébauche* underlying the final composition of his paintings[31]. That is, the technique of the *pensées* (drawings modelled with dark washes), was translated into monochrome paint on the canvas, thus in the first instance creating the space with the figures within it, before further translating these tonal relationships into colour relationships in the final painting.[32] The painter Le Blond de la Tour, who had watched Poussin paint, describes how "Having then sketched it on the canvas, he [Poussin] would lay on the finishing touches ("la dernière main") having painted and repainted [the composition];"[33] that is adjusting the hue to the correct relationship in terms of the immediate context (the *campo*, see below), and the harmonic unity of the work as a whole.

This multiplicity of layers of paint, all thin and varying in opacity, over an initial *abbozzo* layer consisting in mixtures of pigments that would give various monochromatic tonalities, is what is found in several of the works analysed.[34] It is likely that because of the thinness of the finishing touches that these have often been lost through repetitive cleanings,[35] or else are no longer visible because with time they have become more transparent, allowing the effect of the underlayer or ground to predominate. This is particularly disturbing when this layer is dark[36] (see for instance the *Crucifixion* in the Wadsworth Atheneum and *L'Orage* in the Musée des Beaux-Arts in Rouen, discussed in essays in this issue.)

The laying in of a composition in monochrome is not as a technique unique to Poussin,[37] but his translation of tonal effects into colour is.

5

Fig. 5 – Nicolas Poussin, *The Rape of the Sabines*, 110 x 80 mm, drawing, pen and brown ink, brown wash over graphite sketch, Royal Collection, inv. no. 911904. Royal Collection Trust, © Her Majesty Queen Elizabeth II 2015.

Fig. 6 – Nicolas Poussin, *The Rape of the Sabines*, 115 x 196 mm, drawing, pen and brown ink, brown wash over graphite sketch, Royal Collection, inv. no. 911903. Royal Collection Trust, © Her Majesty Queen Elizabeth II 2015.

6

The world as stage: Poussin's "grande boëtte"

In his *Diceria sacra* on painting, Marino goes on to describe the divine process of creation. Having created the skies and earth and waters with his brush "Nor did he [God] show himself less skilled and learned in modelling and sculpture, at times working in relief; rather, as a judicious painter who makes clay or plaster models for the figures that he must paint on a flat surface, he composed the human statue of clay and mud."[38]

We know from contemporary descriptions (Bellori, Sandrart, Le Blond de la Tour) that this is the practice that Poussin followed in many of his compositions, modelling figures and then setting them on a stage in order to study them in relation to the fall of light. We are told that these were figures modelled in soft wax[39] which would allow them to be refashioned easily. We know from Bellori that he was also skilful in the modelling of figures in clay, and that together with the sculptor Duquesnoy he would model as well as sketch from the

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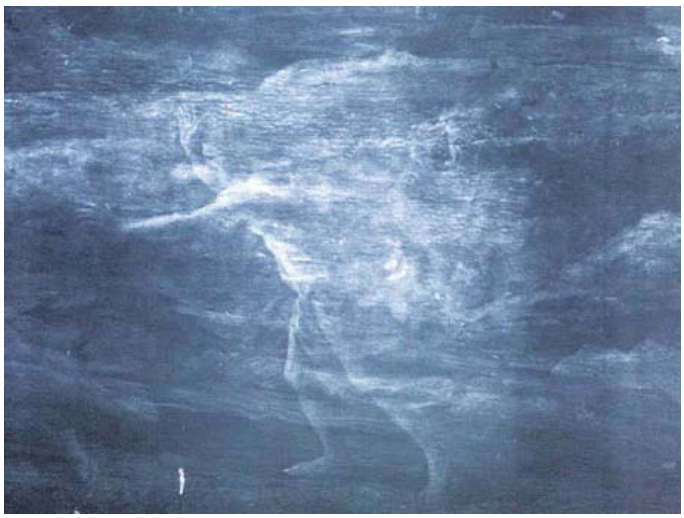

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Fig. 7 – Nicolas Poussin, *Pyramus & Thisbe* (1651), Städel Museum, Frankfurt. Detail with Thisbe, (a) visible light and (b) x-radiograph (© Städelmuseum, Frankfurt).
The naked form of Thisbe can be discerned painted on top of the landscape, before being clothed by the painter's brush.

antique.[40] In *Della pittura* (one of the texts that we know from Félibien that Poussin admired,) Leon Battista Alberti advises the painter to work in three dimensions because "from sculpted things you learn to copy, and you also learn to understand and portray highlights … And it may well prove more useful to exercise oneself in relief than in drawing."[41] Both with wax and clay the creative process involves the scraping away as well as the laying on of material in order to create form, and we find evidence of this ease with these opposing creative processes in Poussin's handling of paint: both laying on paint and scraping through it to reveal an underlying layer or the ground, creating both *positive* and *negative* borders, differing in sharpness and effect. The technique is easier to discern in x-radiographs than from the present surface of the paintings.[42]

Once set on the stage, the figures would be modelled unclothed and then sketched by Poussin: formally in terms of the expressiveness of limbs and gestures of individual figures and groupings, but also spatially in terms of light and shade within a grouping, and then within the composition as a whole. (Figs. 5-6)

The figurines would then be draped with wet cloth in order to study the fall and modelling of the drapery over the limbs and body. As Carl Villis rightly remarks in his essay on the *Crossing of the Red Sea* in Melbourne,[43] it is to be noted that this practice is not confined to the drawings (the *pensées*). As a creative process it is not solely preparatory in that it is repeated at the painting stage, on the canvas, and suggests that this sketching is truly a way of thinking through a figure and its positioning and expressiveness at every stage of creation. This is confirmed by what we see in the x-radiographs and IR reflectograms of many paintings: naked forms have been fully painted, and are then clothed. For instance the limbs of Thisbe can be seen in the x-radiograph beneath her wind-swept drapery as she flings herself on the lifeless body of Pyramus, (Fig. 7) as can those of the officiating priest in the IR reflectogram of the Dal Pozzo *Extreme Unction*. (Fig. 8) In certain paintings, with the passage of time, the limbs or bodies have become visible to the naked eye (see for instance in the figure of the River God in *Venus presenting her Arms to Aeneas* in Rouen.) (Figs. 9-10) Another contemporary source, the Comte de Brienne who also saw Poussin at work, tells us that he would begin with sketching from the "modèle postiche" (that is a mannequin or artificially constructed figure, in the case of Poussin modelled by him in wax or clay) before turning to the live model.[44]

This use of small scale models to establish the composition is a practice associated with such artists as Titian, Tintoretto and Barocci, considered traditionally to be at the other end of the spectrum to Poussin, seen by the later *Académie* to be the proponent and apogee of the Drawing faction.[45]

The stage with the figures would then be set within a box,[46] and the lighting carefully controlled in order to study the fall of light and the position of shadows within the composition so as to reproduce an organic whole, as in nature. An aspect which has received less attention is the considerable emphasis put by Le Blond on Poussin's concern with the lighting conditions of the final location of the painting, so that this be taken into account and replicated when painting the composition. If the lighting and view-point (therefore the height at which the painting is hung, and angle from which it is lit) do not correlate in the creation and the viewing of a work, then neither the linear nor the aerial perspective will work.[47] This concern was also voiced by Accolti in his *Inganno de gl'occhi* of 1625, as was the importance of the lighting being consistent throughout the composition. In the wake of Leonardo, Accolti stressed the importance of sketching figures in the same light as that of the setting into which they would be placed, if the composition were not to appear false.[48]

Equally important for the rendition of space and relief to be convincing to the viewer, is the use of a single eye when observing the composition; that is, it is essential to observe both the subject matter to be painted, and the finished painting from a single view-point, with monocular vision. That this was important to Poussin can be gaged by the fact that he introduced a single eye-hole into the front of his *boëtte cube,* from which view-point he

8a

8b

Fig. 8 – Nicolas Poussin, *Extreme Unction* (1638-40), detail of the anointing priest, (a) visible light and (b) IR reflectogram 1100 nm. © Chris Titmus, Hamilton Kerr Institute, University of Cambridge. The outline of the unclothed form suggests that the naked form was first sketched in, and then clothed. The whole composition is a carefully orchestrated stage setting. The IR also shows that the position of the folds in the drapery covering the body and limbs was altered several times, and there are many interesting pentiments visible, which will be published in an essay devoted to the technique of the painting.

would study and then draw the composition.[49] The importance of monocular vision for the reproduction (and perception) of space and relief on a flat surface, is something that Poussin would have encountered in Leonardo's *Treatise on painting* with which he was more than familiar.[50] For the composition to work spatially as originally intended by the artist, requires the beholder to replicate the artist's original point of view.[51]

The process of creation: figure, and ground [52]

It is not easy to create the illusion of space and relief/volume if painting on a white surface, which is why Leonardo (who was using the traditional white gesso ground to paint on), would begin by working out his compositions in monochrome, as his unfinished paintings show, in order to establish the tonal balance of the whole, before introducing colour.[53] The use of a coloured rather than a white ground, by providing the mid-tone to a figure or composition makes it easier to create the illusion of volume and space even with the simple introduction of highlights and shadows, as the practice of tinting paper prior to drawing shows.[54]

The use of coloured grounds and priming layers in paintings was well established by the time Poussin was painting. However, it was Zaccolini in his theoretical writings, and Poussin in practice on the basis of what he had learned from Zaccolini,[55] that finessed the importance of the colour and tonality of the ground and the immediate background (what Zaccolini calls "il campo", literally the "field") if what was painted was to appear as "real objects, neither represented nor a fiction."[56]

The term *campo* can be understood in two ways which are complementary rather than mutually exclusive: in the material sense both as ground/priming layer or the immediate background of a particular object or figure, but also as ground in a perceptual sense as used by *Gestalt* psychologists, and by extension as the colour context of any one particular hue or area. I shall be discussing the importance of *il campo* to Poussin's practice in relation to underlying philosophical aspects as well as practical painterly advice, as both aspects are present in Zaccolini's writings.

"Art is not a different thing than nature" [57]

This is one of Poussin's *Osservazioni* on the nature of painting which is relayed to us by Bellori at the end of his biography of the artist; it links the artist's creation of a painting with that of the natural world by the greatest of all artists God (the *summum artifex*.) Neo-Platonic in origin this parallel is

Fig. 9 – Nicolas Poussin, *Venus and Aeneas* (1639), oil on canvas, 105 x 142 cm, Musée des Beaux-Arts, Rouen. © Musée des Beaux-Arts, Rouen.

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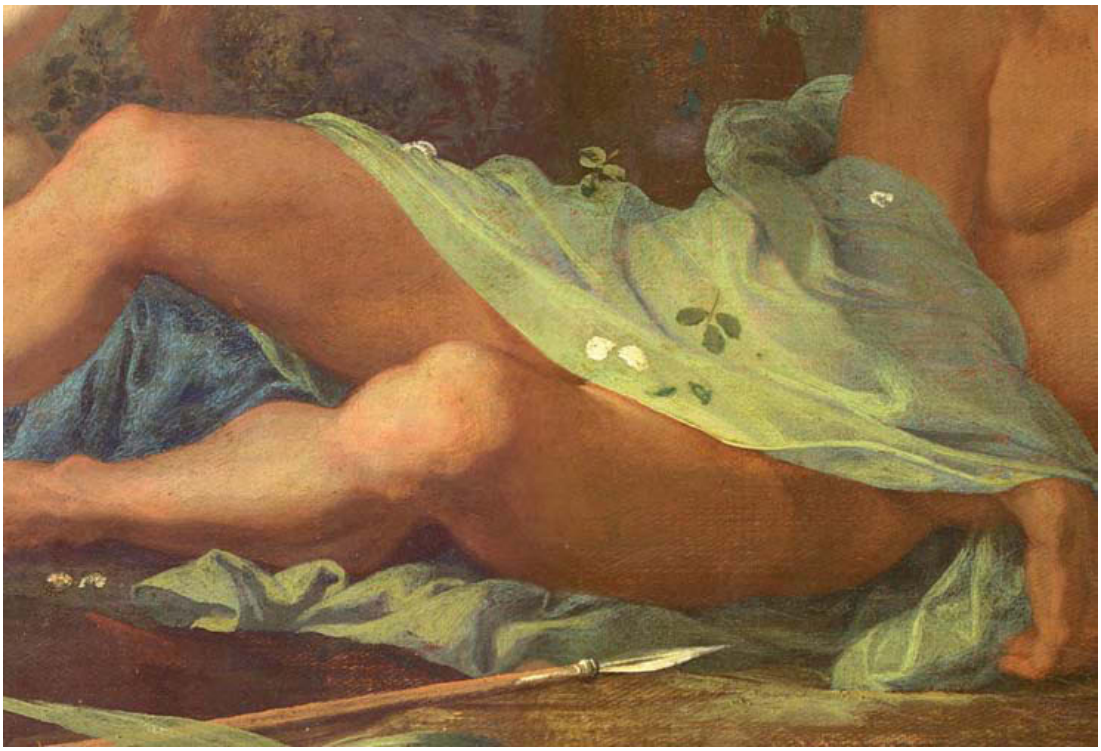

Fig. 10 – Nicolas Poussin, *Venus and Aeneas*, Musée des Beaux-Arts, Rouen, detail of the river god, the drapery was painted over the completed nude figure.

10

omnipresent in Marino as in the writings of Lomazzo, Leonardo's follower. It lies at the root of Leonardo's observations and experiments to comprehend the laws governing appearances: the painter needing therefore to first be a natural philosopher,[58] so as to then be able to emulate with paint the processes of nature dictated by these laws. This link between the painter and God the creator is found clearly stated by Zaccolini in the introduction to the second volume of his treatise on the perspective of colour, when he makes the distinction between "true painting created by nature" which is "placed before the eyes of the painter," and painting, which is "feigned painting,"[59] deceiving the eye. Leonardo also referred to painting as the grand-child of nature and therefore related to God.[60]

Zaccolini – and in this he follows Plotinus[61] - also puts the emphasis on the painter observing and then emulating the processes of divine cre-

ation (rather than limiting himself to an imitation of its products) if he wishes to convincingly reproduce the effects of the created world on the canvas. "The painter in imitation [...] of nature" writes Zaccolini, will like God begin by creating the sky, the sea and the land before peopling these with living creatures. So the painter must, like the Creator, "begin by painting the ground where he wishes to place his figure, or any other thing, and then on top of this he will please himself in imitate the natural object, and the ground [*il campo*] will show him the correct relationship/tuning [*accordamento*] between the lights and the shadows, and with what degree of strength he will need to place the highlights or the lights and the darks ..."[62]

That this is indeed the process followed by Poussin in certain compositions, can be seen most clearly in x-ray and IR images: for instance in *Landscape with Diogenes*, the IR image shows that the figure of Diogenes was painted once the landscape was completed,[63] as was also the figure of Eurydice in *Orpheus and Eurydice* or Pyramus and Thisbe in the painting in Frankfurt (Fig. 7). The paintings emphasize the consonance of human action with the natural world "for if man is a little world" wrote Pico Della Mirandola in his *Heptaplus* "then certainly the world is a great man."[64] Poussin is not painting figures against a backdrop to which they are not related; the figures, their emotions and hence their actions, both reflect and are a reflection of the natural world that surrounds them.

It is interesting to ponder though, that in the case of the pendants *Le temps calme* and *L'Orage* for instance, the x-radiographs do not show the figures painted after the landscape, which suggests that Poussin had a different vision of the subject and composition, and the relationship between the human protagonist and his surroundings.

In order to bring home the importance of the role played by the ground and background (*il campo*) to the appearance of both figures and objects, and the necessity of laying this in first before the figure in order to establish the correct relationship for the latter to appear "real", Zaccolini gives the example of worthy contemporary painters who having first painted their figures complete with lights and shadows to their satisfaction, having then proceeded to paint the background to these figures (contrary to the "fatti di natura" – what nature dictates), found themselves forced to begin all over again because as "the object will appear either darker, or lighter, depending on the field/ground [*il campo*] on which it is placed,"[65] the figure that they had painted appeared completely differently once the background had been painted round it,[66] and was no longer fitting.

Using white as an example, he writes: "a barely luminous white placed beside a black, will appear entirely white, and a weak black, confronted with the purest white, will appear utterly black, which [effect] will also occur with light and dark areas, and with all colours ..."[67]

That is light and shadow are perceptual phenomena, and relative, as is colour. There is no such thing as an absolute colour,[68] and brightness and shadow can only be judged in relation to one another. This had already been observed by Aristotle, and Alhazen,[69] both of whose work had been integrated within Leonardo's own observations; but it is only with Zaccolini that perceived colour (what he and Leonardo before him term apparent colour) is systematically observed and analysed,

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Fig. 11 – Nicolas Poussin, *Eliezer and Rebecca at the Well* (1660-65), oil on canvas, 96.5 x 138 cm, Fitzwilliam Museum, University of Cambridge.

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Fig. 12 – Nicolas Poussin, *Eliezer and Rebecca at the Well*, detail of the white sleeve of the kneeling woman (a) visible light and (b) IR reflectogram 1100 nm.
© Chris Titmus, Hamilton Kerr Institute, University of Cambridge.
A stroke of ultramarine (appears light in IR), a physical blue, is in juxtaposition to the blue-grey modelling of the sleeve which is a mixture of optical mixing between layers (pale over the dark undermodelling giving a bluish effect). This is enhanced by the proximity of the orangey tones of the underlayer/ground as well as the dress. The principles of what are now termed complementary colours, were perfectly well understood at the time. The monochrome undermodelling contains some form of carbon black, which shows up dark in IR.

so as to then be translated effectively into painterly practice.

It is quite clear from the treatise that unlike Newton (but like Leonardo and Aristotle before him) Zaccolini makes a clear distinction between apparent colours in nature that are the result of optical interaction and light (*lumen*), and the coloured materials, the pigments (*umbra*), at the disposal of the painter: "[although] air is a transparent body, it cannot be imitated except with opaque colour, and as a surface, making it end at the surface of the painting [itself], which is an opaque body."[70]

What makes Zaccolini's observations remarkable, is the fact that he understands that so long as the painter can emulate with paint the relationship, the ratio almost, perceived in nature between two hues whether tonally or in terms of colour, and give his painting the organic unity which light gives to the outside world, despite the fact that the painter can never match the luminosity of colour found in nature because he is using material pigments not light, he will achieve the effect of luminosity convincingly.

In practical terms this means that the painter will have to mortify certain colours, mixing them with other appropriate materials or pigments, in order for these colours not only to match what is seen in nature, but also to appear right in the immediate colour context within the painting. That is, Poussin was implementing Zaccolini's teachings with his own observations, and matching with material pigments the effects and colours of light observed in nature.

Again using white as an example, Zaccolini advises that: "it must not be made completely white, as when it is exposed by the side of something dark, it will appear to be much lighter than it is [in reality], and can appear of great whiteness although it has been mixed with a dark [pigment] which mortifies it."[71]

This "mortification", this toning down and chromatic alteration of the pure pigment (lead white) whether with the addition of chalk to alter its opacity and create an optical effect with the under-lying layer, or with that of different pigments to take into account the colour reflected from neighbouring drapery or the "interposition of air" with distance, is what we can see for instance in the detail from the linen sleeve of the kneeling maiden in the Fitzwilliam *Eliezer and Rebecca at the Well* (Figs. 11-12), where the optical and physical juxtaposition and layering jostle and reflect to produce at normal viewing distance a perception of off-white linen.

To retain a musical parallel so dear to the 17th century, the composition need only be transposed into a lower, a more corporeal key as befits earthly creation, whilst retaining the harmonic relationships (the tonal distances) of the celestial original.

A painting for Poussin must, like a piece of music, be an organic and organised whole, an integer, and not a sum of its constituent parts. No element can be either added or removed without altering the whole, as each part is related both to its neighbour, the immediate grouping, and the whole.[72] And this is as true for paintings such as those by Poussin, as it is for poetry and music.

"M. Poussin" writes Félibien "would represent his figures with a greater or lesser degree of liveliness, according to the subject that he was treating. For, having worked out the true degree of strength and diminution to be found in colours, he would use these so skilfully that in his Works one notes a harmonic direction such as is found in pieces of music."[73]

Consonance and harmony: apparent colours and material pigments

The consonance and harmonic unity which are such a hallmark of Poussin's paintings and which in the natural world are the result of all that we see being bathed in light, are achieved through the skilful handling of both material and perceived colour. The subject is vast, and in this essay I shall confine myself to touch on aerial perspective, that is the handling of colour that takes into account the effects of the interposition of air, an aspect which was particularly praised in Poussin's works by his contemporaries, and which will give an idea of the complexity and depth of thought which underlie Poussin's practice.

Arguably Zaccolini's most important contribution to the study of colour is the rationalisation of the effects of aerial perspective. Coined by Leonardo, the term "aerial perspective"[74] incorporated both his observations on the effects of this phenomenon (that not only do objects appear smaller with distance and lose their outlines, but that they will also appear increasingly blue), and his insistence that the artist take these effects into account when painting.

Zaccolini's major advance was to match this optical effect to a colour scale (Fig. 13), and it is this that made the observations of practical use to the painter. It should be noted however, that the practical transposition of his 'teachings' into paint, seems to be confined to the works of Poussin with a more restricted or reductive use of these visible in the works of Domenichino.[75] Zaccolini observed that colours are not affected equally over distance, and that those whose nature is closest to that of the air (black, blue, green) "take on" the blueness of the air before colours whose nature is furthest, such as red or yellow. Based on these observations, he created a scale of precedence as a guide for the painter.

These observations, and to a degree Zaccolini's own terminology (for instance the use of the phrase the "interposition of air" as the cause of aerial perspective) are to be found in Félibien's *Entretien V*, a dialogue largely devoted to the nature and perception of colour both in nature and painting: "objects will alter in accordance with the nature of their colour, and depending on the [nature] of the air, and different distances."[76] Evidence of the influence of his teachings – whether directly from a copy of the manuscripts or through Poussin's oral instruction, to which both Félibien and Le Brun were party – is also to be found in Le Brun's *Conférence* on *La Manne*,[77] and to a degree in that delivered by Sébastien Bourdon on Poussin's *Christ Healing the Blind of Jericho*.

In order to explain the phenomenon Félibien takes the example of red and green, simplifying the language, making a digest of the theory, which as a result is much easier to assimilate than in Zaccolini: "For example, if red and green are placed at the same distance, they will produce a different sensation to the eye/sight, not only in terms of their inherent qualities as colours; but also because green is better able than red to take on the colour of the air which is blue,[78] it will therefore appear further away, as it will lose more of its true colour, as this will merge more easily than red with the colour of the air. So much for the quality [that is kind] of colours placed in the same kind of air and at the same distance."[79]

This means that for instance the green would need to be mortified to a different degree than the red (and with a different pigment), in order to replicate the natural effect.

A strong experimental flavour permeates Félibien's text, echoing the kind of observations noted by Leonardo as well as Zaccolini, and one can imagine that just as the *Preface* to the *Conférences* is accepted as reflecting Poussin's views on painting, observations and reflections such as the above would have been the stuff of his *discours* during

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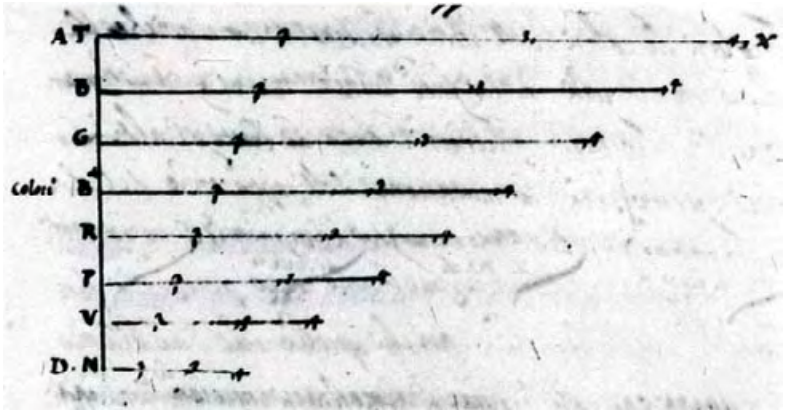

Fig. 13 – Matteo Zaccolini, *Prospettiva del Colore*, scale of precedence diagram for colours taking on a bluish tint with distance, that is aerial perspective. Florence, Biblioteca Laurenziana, ms Ashb. 1212-ii, fol. 41.

Fig. 14 – Nicolas Poussin, two details from *Venus and Aeneas* in the Musée des Beaux-Arts, Rouen: (a) Venus' hair and (b) Gorgon's hair.

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the evening walks with his friends on the Pincio, holding forth on the subject of optics.

"Let us see how a colour behaves at a particular distance, but in two different situations, in which the air in one is thicker than in the other. If a figure clothed in white (or if you prefer a figure made out of marble or plaster) is placed in a spot where the air is rarified, it is certain that it will appear whiter and closer than a similar figure placed in thicker air, although they are at the same distance, and of the same size and whiteness, because the greater thickness of the air in which it stands, will dampen/muffle its whiteness, and will make it appear bluer. This is why it is very difficult to provide any sure rules for the weakening of colours according to perspective [meaning aerial perspective] since this will depend on the disposition of the air, the light with which they are lit, and even the strength of the colour in itself".[80]

That is, there are too many variables for a theoretical rule to apply. The idea that the eye must be the final judge (as is the ear rather than any rule when it comes to tuning an instrument correctly), is a leitmotif which runs through the literature of the period. Theoretical rules are made but for guidance only, not to be adhered to uncritically. The eye will be judge of what is right, or rather, what appears to be right. Sculptors, wrote Galileo, "imitate things as they are, [painters] as they appear: things are [materially speaking] in one way only, but will appear in an infinite number of ways."[81]

Material colour: pigments

The consonance and unity in Poussin's paintings is not only achieved through light and 'apparent colours'. When Le Brun speaks of a little yellow being present in every part of *La Manne*, because that is the colour of the light,[82] we have no confirmation if this is materially true, or whether it is (or rather was, as the painting has aged) perceptually true.

From recent analyses, it is beginning to look as though Poussin would also use pigments in a way which suggests that their choice was ordered by more than just visual effect, that the pigments used and the objects or subjects depicted are linked. For instance in Rouen's *Venus Presenting Her Arms to Aeneas*, the green drapery of the River God (Fig. 10) is painted using the same green earth as is found in the landscape of which he is both part and the personification. Venus' flowing locks on the other hand are distinguished from the hard metallic sheen of the Gorgon's coils rooted to the gilded shield in the foreground, also by the nature of the pigments used to paint them: a yellow earth mixed with lead white and calcite, rather than the harder *metallic* pigment (lead tin yellow) used in the representation of the Gorgon's locks (Fig. 14)

There are several examples which show Poussin's very specific use of lapis lazuli, which as a pigment had a worth way in excess of its high market value (which is what is usually cited).

The closer a part of creation is to the divine, the more it partakes of the nature of God. Among living creatures man is nearest to God because of all creation he is the only one to have a dual nature "… he is so made as to embrace at one and the same time the earthly and the divine."[83]

Of the insensible parts of creation, the stones from which most pigments are made, lapis lazuli is closest to God because it symbolises the heavenly through its colour (which partakes of the heavens,) as well as its origin (Afghanistan, through time identified with the location of earthly paradise.)[84]

As we have seen above, the Creator in Marino's *Diceria* in his work of creation creates the blue of the sky, out of darkness and light. Not a physical blue, an optical blue as Leonardo correctly interpreted when he wrote "Nero e bianco fa azzurro"[85], a blue created in the beholder's eye. A celestial, immaterial azure that Marino links directly with lapis lazuli, ultramarine blue.[86]

Padre Lana Terzi (a familiar of Cassiano's entourage in the 1650s, and of Athanasius Kircher in particular) in his treatise on painting writes: "… I will add ultramarine blue which produces the most wonderful effect in all colours, and in particular if used in moderation in the flesh, as it gives a certain air, a heavenly glow which makes it sweet and beautiful. Moreover, as in each material body over and above the four elements of which it is composed there is light, and where this is missing, the body remains dark, without light …"[87] and this is indeed what is found in the late *Eliezer and Rebecca at the Well* (Fitzwilliam Museum) (Fig. 11). Lapis lazuli not just in the blue garments whatever their tonality, but in the greens and greys of the landscape, as well as in the flesh. And similarly in the *Triumph of Bacchus* (Nelson Atkins Museum, Kansas City, see Fig. 1 in Twilley essay in this issue) in which God/Apollo and his incarnation in Christ/Bacchus are at the core of the divine subject – lapis lazuli is found scattered throughout the picture, the divine spark to be found in every element of the created universe. Similarly in *L'Orage* in Rouen, lapis lazuli is found not only in the brilliant blue drapery, but in the mixtures making up the sky, the mountains, the greenery and the pool in the foreground.[88]

That lapis lazuli had a symbolical importance for Poussin, seems to be further confirmed when upon analysis it was found being used in the mixture of pigments making up the priming layer of the *Holy Family* in the Fogg Museum.[89] There can have been no colouristic or chemical reasons for adding it to the mixture, and certainly no financial benefit. Taking into account for instance that the Louvre *Assumption* is also painted on a piece of blue silk,[90] this imperceptible inclusion of the celestial colour and the stone in sacred works suggests that its symbolical importance cannot be dismissed.

Colour as a bearer of meaning

The importance of colour as a bearer of meaning is clearly expressed by Le Brun in his lectures at the Academy on Poussin's *La Manne* (1667) and *The Ecstasy of S. Paul* (1671), but has perhaps been

overlooked or misinterpreted because of the *idée reçue* that Poussin was not interested in what would later be considered to be the mechanical aspects of his art: paint and pigments, *la couleur.*

Le Brun, when justifying his choice of a painting by Poussin for analysis (rather than that of an Old Master), states that this is because the latter have so altered in appearance in the intervening years, that they no longer have their initial desired effect. He goes on to say that he has chosen a painting by Poussin having seen the paintings at the time they were painted, and as "the paintings still have the same lustre, and the colours the same vivacity as when he was laying on the finishing touches,"[91] in addition to having often conversed with the artist, he felt he could voice his opinion with a fuller and more certain knowledge than his fellow artists who were analysing works by Raphael or Titian.

Le Brun is here referring to the material expression of the *pensée* as translated into paint, that is *la couleur*, which is an acknowledgement in itself that colour is a bearer of meaning in the paintings of Poussin.

It is not an end in itself, entrapping the senses, but as is the case with all beauty, it can lead to delectation of the soul through the eye: "… painters do not only work with their hands, and their works are not only created for the pleasures of the eyes" says Le Brun "they can also satisfy and instruct the spirit."[92]

The distinction between the eye of the senses, and the perception which leads to spiritual understanding is also clearly expressed by Zaccolini: "the valiant painter can nobly vie with the very work of nature, which painting resembles, alive to the eye of the most intelligent, although the work of the painter will not appear lifelike as in nature to the simple glance of everyman, because the eye and the vision of a discerning and penetrating mind are not at all like those of the common man, who only pays attention to simple surface appearance, without penetrating further."[93]

Writing to his friend and patron Paul Fréart de Chantelou, Poussin castigated him for judging the painting he had received from him with undue haste, reminding him (and us) that: "those things in which there lies perfection must not be looked at in haste, but with time, judgement and intelligence; the same means must be used to judge them well as to make them well."[94]

Author's notes and acknowledgments

The translations are the author's own unless otherwise specified, and all mistakes to be imputed to her. The texts of the originals have been provided, if particularly ambiguous, alongside the English translation, and suggestions for alternative/better renditions will be gratefully received.

Acknowledgements and thanks to David Bonford for having invited me to the J. Paul Getty Museum which gave me the opportunity over three months to access not only the wonderful holdings of the Museum, but also the Research Institute and the Conservation Departments; to CHARISMA for funding archival visits to C2RMF and the Prado, as well as the Fitzwilliam Museum and the Hamilton Kerr Institute, for all their help.

Appendix 1

Text and translation of the passage in Le Blond de la Tour's letter of 1669 on Poussin's working methods (transcribed and published in *Thuillier* 1960, p. 146):

"Cét homme admirable & divin inventa une planche Barlongue, comme nous l'appelons, qu'il faisoit faire selon la forme qu'il vouloit donner à son sujet, dans laquelle il fesoit certaine quantité de trous où il mettoit des chevilles, pour tenir ses manequins dans une assiète ferme & asseurée, & les ayant placés dans leur scituation propre & naturelle, il les habilloit d'habits convenables aux figures qu'il vouloit peindre, formant les drapperies avec la pointe d'un petit bâton, comme ie vous ay dit ailleurs, & leur faisant la teste les pieds, les mains & le corps nud, comme on fait ceux des Anges, les élévations des Païsages, les pièces d'Architecture, & les autres ornemens avec de la cire molle, qu'il manioit avec une adresse & avec une tranquillité singulière: Et ayant exprimé ses Idées de cette manière, il dressoit une boëtte Cube, ou plus longue que large, selon la forme de sa planche, qui servoit d'assiete à son Tableau, laquelle boëtte il bouchoit bien de tous costés, hormis celuy par où il [c]ouvroit sa planche qui soutenoit ses Figures, la posant de sorte que les extrémités de la boëtte tomboient sur celles de la planche, entourant ainsi & embrassant, pour ainsi dire, toute cette grande machine.

Ces choses estant préparées de la façon, il considéroit la disposition du lieu où son Tableau devoit estre mis. Si c'estoit dans une Eglise, il regardoit la quantité de fenestres, & remarquoit celles qui donnoient plus de iour à l'endroit destiné pour le mettre, si le iour venoit par devant, par le côté, ou par le haut, s'il venoit de plusieurs côtés, ou lequel dominoit davantage sur les autres. Et après toutes ces reflections si iudicieuses, il arrestoit l'endroit où son Tableau devoit recevoir son véritable iour, & ainsi il ne manquoit jamais de trouver la place la plus avantageuse pour faire des trous à sa boëtte, en la mesme disposition des fenestres de l'Eglise, & pour donner tous les iours & les demy-iours nécessaires à son dessein. Et enfin il fesoit une petite ouverture au devant de sa boëtte, pour voir toute la face de son Tableau à l'endroit de la distance; & il pratiquoit cette ouverture si sagement, qu'elle ne causoit aucun iour étranger parce qu'il la fermoit avec son œil, en regardant par là pour dessigner son Tableau sur papier dans toutes ses aptitudes, ce qu'il faisoit sans y oublier le moindre trait ny la moindre circonstance; & l'ayant esquissé ensuite sur sa toille il y mettoit la dernière main, après l'avoir bien peint & repeint."

Translation

"This admirable and divine man invented an oblong board (*planche Barlongue*), the name we've given it, which he had made for him according to the format that he wanted his subject to have, and in which he made a certain number of holes into which he would then place dowels, which would hold his mannequins/figurines on a solid and firm base; and having positioned them where they belonged naturally, he would clothe them as befitted the figures he wished to paint, and with the point of a small stick, as I have told you elsewhere, he made their heads, hands and feet and the body naked as one makes those of *putti*, and the elevations of the landscape, the pieces of architecture/buildings, and the other ornaments all out of soft wax, which he worked with remarkable skill and ease: and having expressed his thoughts in this manner, he put up a box, longer than it was wide, according to the shape of the board which served as a base for his composition, and this box he would ensure was sealed on all sides with the exception of the section covering the plank on which his figures were held, placing it so that its edges should fall on those of the plank, thus encircling and embracing, as one might say, the whole of this great machine. Having prepared everything in this fashion, he would then take account of where the painting would be placed, if in a church, he would take into consideration the number of windows, and take note of those which gave more daylight to the spot where the painting was due to hang; if daylight came from in front, or from the sides, or from above, or if it fell from several directions, or which direction dominated above all the others. And having judiciously reflected on all these things, he would determine from where his painting would receive daylight, and thus he never failed to find the best place to make the holes in his box, in the same disposition as the windows of the church, in order to place all the highlights and half-lights that his drawing required. And finally he would make a small opening to the front of the box, in order to be able to see the whole front of his composition from the viewing-point (*l'endroit de la distance*). He would place this opening so wisely that it never produced any extraneous light because he would block/close it with his eye, from here observing, in order to draw his composition on paper with all his skill (*dans toutes ses aptitudes*), and this he would do without overlooking the smallest trait or detail (*circonstance*); and having then sketched it [the composition] on his canvas, and having painted and repainted it, he would lay on the finishing touches."

Notes

[1] "It is thus that this learned painter has shown himself to be a true poet, having composed his work within the rules which the Art of Poetry requires should be observed in works for the stage" ("C'est en quoy ce sçavant Peintre a montré qu'il estoit un veritable Poëte, ayant composé son Ouvrage dans les regles que l'Art de la Poësie veut qu'on observe aux pieces de Theatre.)" Le Brun's *Conférence* on Poussin's *La Manne*, 5 November 1667. Félibien 1668, p. 206.

[2] Charles Le Brun, painter, colleague and friend of Poussin; he was the first director under Colbert of the Académie Royale de Peinture et Sculpture; in 1642 he accompanied Poussin back to Rome.

[3] André Félibien, also a painter to whom we owe so much of our information on Poussin's thought, as this essay I hope will show. Arriving in Rome in 1647, he was in close if not daily contact with Poussin, and watched him at work. He was the first secretary to the *Académie* under Le Brun.

[4] For instance Roger De Piles quotes Pythagoras "The theory is nothing without the practice" in his notes to Alphonse Du Quesnoy's *De arte graphica*, which poem – translated in 1750 by Dryden as *The art of painting* – reflects the iseas of Poussin's artistic milieu in Rome in the 1640s. Du Quesnoy 1716, p. 100.

[5] "Le bien juger est très difficile si l'on n'a en cet art grande Théorie et pratique jointes ensemble." Letter of 24 November 1647, Jouanny 1911, p. 372.

[6] "Sì come ci son molti che sanno per lo senno a mente tutta la poetica, e son poi infelici nel compor quattro versi solamente; altri posseggono tutti i precetti del Vinci, e non saprebber poi dipignere uno sgabello." Galilei 1897, p. 60.

[7] "Il semble qu'il mette devant les yeus avec le son des paroles les choses desquelles il traicte, de sorte que où il parle d'amour l'on voit qu'il a artificieusement choisi aucunes parolles douces plaisantes et grandement gratieuses à ouir, de là où il a chanté un fet d'Arme ou descrit une bataille navale ou une fortune de mer il a choisi des parolles dures aspres et déplaisantes de manière que en les oyant ou prononsant ils donnent de l'epouventement." Letter to Chantelou, 24 November 1647, Jouanny 1911, p. 374.

[8] See Schütze 2007a and 2007b.

[9] "… il vero Pittore dovrebbe essere tutto Filosofo, per poter ben penetrare la natura delle cose … Che in questo modo tutte le rappresentationi parrebbero cose vere, non rappresentate, nè finte … " Lomazzo 1590, pp. 37-38.

[10] "Je me sers des signes pour me faire entendre, puis que c'est le langage du plus grand des Dieux, & le premier par lequel il se fit connoistre aux hommes, & leur exprima ses volontez." Félibien 1688, p. 319.

[11] Giambattista Marino was an Italian poet and theorist who was renowned during his lifetime, although now largely disregarded. He combined the erotic and sensual in his poetry, with strongly pantheistic leanings in his sacred prose works, the *Dicerie sacre*, which probably reflect his youth in the Naples of Giordano Bruno and Tommaso Campanella. He was a good friend of both Caravaggio and Poussin (quite an achievement!)

[12] "La mano imitatrice de la man creatrice". Marino 1620, p. 72, referring to a *S. Sebastian* by Titian (see also Glanville 2014b).

[13] Roland Fréart de Chambray was responsible for the translation into French of Leonardo's *Trattato della pittura* which he published in 1651 in Paris, simultaneously with the Italian version which Cassiano had so lovingly incubated, and for which he had commissioned illustrations from Poussin.

[14] "C'est une Imitation faicte avec des lignes et couleurs en quelque superficie de tout ce qui se voit dessoubs le Soleil, sa fin est la Délectation." Jouanny 1911, p. 462.

[15] Federico Cesi, Prince of the Accademia dei Lincei in Rome, as cited in Stanić 1994, p. 46.

[16] Author's translation from the French: "… les arts ne se bornent pas à imiter ce que l'on voit, mais [qu]'ils sont à la poursuite des raisons dont est faite la nature." Plotinus 2008, p. 412.

[17] *De Colori* (vol. 1); *Parte Seconda, Prospettiva del Colore* (vol. 2); *Prospettiva Lineale* (vol. 3); *Della Descrittione dell'Ombre prodotte da Corpi opachi rettilinei* (vol. 4). Florence, Biblioteca Laurenziana, ms Ashb. 1212 i-iv. Small piece of paper stuck in this last volume with *De Lumine et umbra*, written in 17th century script on wove paper.

[18] Cassiano commissioned hundreds of drawings after the antique remains in Rome, which make up what is known as the *Museo cartaceo*, the paper museum; Poussin was both a contributor and a user.

[19] This did not see the light of day until 165. See above note 13.

[20] "Il n'y a point eû de Peintre qui ait mieux

sceû que ce Pere les régles de la perspective, & qui ait mieux compris les raisons des lumieres & des ombres. Ces écrits sont dans la Bibliotheque Barberine, & le Poussin qui en avoit fait copier une bonne partie, en faisoit son étude. Comme quelques-uns de ses amis les voyoient entre ses mains; qu'il parloit sçavamment de l'Optique, & qu'il s'en est servi avec beaucoup de bonheur, on a crû qu'il avoit composé un traité des lumieres & des ombres. Cependant il est vray qu'il n'a rien écrit sur cette matiere; il s'est contenté d'avoir montré par ses propres peintures ce qu'il avoit appris du Pere Zaccolini …" Félibien 1685, pp. 252-253.

[21] Cropper 1980 and 1996.

[22] Bell 1988 and 1993.

[23] Sannucci 2009.

[24] "Intendesi per pittura quella facoltà che col chiaro e con lo scuro imita la natura." As cited in Panofsky 1954, p. 32.

[25] "L'intelligence n'est donc pas séparée de la nature de Dieu, elle lui est unie comme au soleil sa lumière. Cette intelligence est le Dieu qui est en nous …" *Pymandre*, livre I, XII (Ménard 1866, p. 81).

[26] Coptic was thought at the time to have been the language of the ancient Egyptians, and therefore the language of Moses. Kircher 1636, p. 270.

[27] At the time thought to have been the sacred writings of Hermes Trismegistus, contemporary of Moses, thus bringing together disparate religions to a common source.

[28] "Diedisi di piú a far disegni di chiaro oscuro. Ecco il giorno, & la notte; i lumi distinti col profilo dell'ombre, l'ombre rischiarate dalla dolcezza de' lumi …Vedere quando spunta il Sole dall'Oriente, come il pennello della luce, intinto ne' colori dell'Aurora, incominci pian piano a miniare il Cielo; come divinamente il nero col chiaro mescolando, & tratteggiando l'aria di fosco, & di luminoso, faccia prima in campo d'azurro oltramarino quasi un'abbozzo del giorno …" Marino 1614, p. 12r-v. Marino then goes on to quote Isaiah "Ego Dominus, & non alter formans lucem, & creans tenebras." Isaiah 45,7.

[29] "Qui n'existent que par des ombres & des lumieres, & par le secret d'une science toute divine avec laquelle je sçay tromper les yeux." Félibien 1688, p. 315.

[30] "Li monochromata di Zeuxis, Parrasio, Apelle et altri erano allumati et ombrati, dimostrando il piano et il rilevato, il remoto e'l vicino, e d'un sol colore, ò di cinabro, ò di bianco, ò di gialdo, ò d'altri, come noi vediamo nel Vaticano quelli dipinti da Raffaello e di Giulio, ò come noi costumiamo di fare i nostri disegni ombrati con aquarella et allumati con bianco per colorirli poi." Cited in Herklotz 1994, p. 23.

[31] For instance this is suggested by the image of the manganese map in the autoradiograph of the painting the Berlin *Rinaldo and Armida* (my thanks to Claudia Laurenze and Andrea Denke for this information), as well as what has been found in the Dal Pozzo *Extreme Unction* and the late *Eliezer and Rebecca at the Well*, both in the Fitzwilliam Museum, Cambridge.

[32] It is interesting to note that what Poussin and Zaccolini (and Alhazen and to an extent Leonardo before them) had worked out from observation – that spatial perception is quite distinct from colour perception – has now been confirmed from the study of the visual brain see for instance Hubel 1995, Livingstone 2002 and Prof. Zeki's writings. As Zaccolini clearly postulates, what colour and spatial perception share on the other hand, is the relativity of the processes involved.

[33] "L'ayant esquissé ensuite sur sa toile, il y mettait la dernière main, après l'avoir bien peint et repeint." See Appendix 1 for full text and translation.

[34] This is impossible to establish unless several samples are taken, so that one can compare the hue and tone of underlayers from one area of the painting to the next. For many paintings analysed, the sampling has been restricted to one or two, in order to establish the components of the ground.

[35] See contributions by Villis, Foulke.

[36] Sometimes, the thin modelling layers which contain some lead white, are visible in the x-radiograph but not in the painting itself, so that the subtlety of halftones, or the thin scumbles uniting shadow to highlight, or background to contour of flesh, can be better appreciated in the x-radiograph than the painting …

[37] Deriving originally from Leonardo's practice, it can also be seen in Correggio's unfinished *Allegory of Virtue*, and it was Domenichino's practice in his frescos.

[38] "Nè meno nella Plastica, & nella Scultura dimostrar si volse dotto & esperto; prendendo talvolta a lavorar di rilievo; anzi pure a guisa di giudicioso Pittore, il quale assai sovente quelle istesse figure ch'egli hà da colorire in tavola, riduce in modello di stucco, ò di terra, compose l'humana statua di limo, & di fango." Marino 1614, p. 12v.

[39] *Cera molle*. See Appendix 1.

[40] Bellori 1672, pp. 411-412.

[41] "Ma da le cose scolpite impariamo a tirare la simiglianza, e i lumi veri … Et per aventura gioerà piu essercitarsi fingendo, che col pennello." Italian version of *De Pictura*. Alberti 1547, p. 41.

[42] See for instance essay on *L'Orage* in this issue.

[43] See p. 64 in this issue.

[44] "Quand un peintre habile a ébauché un tableau d'après le Modèle postiche, il le finit sur le modèle animé. C'est ainsi qu'en usoit M. poussin. Je l'ay vu pratiquer à mr Quesnel et à mr Le Brun. Cette observation est de moy." Comte de Brienne (1693-95) in Thuillier 1960, p. 211.

[45] Inevitably such a statement is reductive; line drawings will reproduce detail, and a picture in terms of an accumulation of individual details. Line drawins cannot reproduce the "whole" of a painting in which all elements are inter-related as bathed by light, and are therefore an organised, organic, integer. There are of course drawings by Raphael which are consistent with this latter interest. The Rubéniste/Poussiniste debate dates from after the death of Poussin.

[46] See De Grazia 1999; Bätschmann 1990; Arikha 1983; and essays (Ffoulke, Villis) in this issue.

[47] Padre Lana Terzi is equally insistent: "Primieramente si osservi dal pittore il luogo, in cui dovrà essere collocata la sua opera" ("First, the painter must observe the spot in which his painting is to hang"). Lana Terzi 1670, p. 153 (and the concept is repeated at p. 155).

[48] Accolti 1625, p. 111.

[49] See Appendix 1.

[50] He would have studied it well, having been commissioned by Cassiano Dal Pozzo to produce drawings to illustrate Leonardo's teachings.

[51] "Non si può vedere esattamente se non in un sol punto." ("It cannot be seen correctly except from a single spot.") Zaccolini ms, vol. 1, f. 159.

[52] Principles of *Gestalt* psychology, for useful discussion and overview see Gombrich 1960 and Gibson 1966.

[53] See for instance the unfinished *Adoration* in the Uffizi; Keith 2011 and Glanville 2012.

[54] The three-tone drawings of the Carracci for instance.

[55] See note 20.

[56] Lomazzo 1590, pp. 37-38. See note 9.

[57] "L'arte non è cosa diversa dalla natura, ne può passare oltre i confini di essa." Bellori 1672, p. 400.

[58] See note 9.

[59] "Real Pittura fatta dall'istessa Natura" which is "posta avanti l'occhio del Pittore" and painting, which is "la finta Pittura." Zaccolini ms, vol. 2, f. 3v.

[60] "Se tu sprezzarai la pittura, la quale è sola imitatrice de tutte l'opere evidenti de natura, per certo tu sprezzarai una sotile inventione, la quale con filosoficha e sotile speculatione considera tutte le qualità delle forme, mare, siti, piante, animali, herbe, fiori, le quali sonno cinte d'ombra e lume … Et veramente questa è scientia et legitima figlia de natura, perché la pittura è partorita da essa natura, ma per dir più corretto, diremo nipota de natura perché tutte le cose eviddenti sonno state partorita dalla natura delle quali cose è nata la pittura. Adunque, rettamente la chiameremo nipota d'essa natura et parente d'Iddio." Farago 1992, p. 194.

[61] See passage cited in the introduction to this essay, and note 16.

[62] "Però il Pittore immitatore dei fatti di natura, fa rà primieramente il Campo dove egli farà la sua figura, o qualsivoglia altra cosa, e qui sopra di quello a suo piacere vada immitando l'obbietto naturale, che il campo gli dimostrerà l'accordamento dei lumi e delle ombre, e con qual forza dobbiamo ponere i lumi, o chiari, e gli oscuri, per dare perfettione a quello habbiamo ditto." Zaccolini ms, vol. 2, f. 74r.

[63] Le Chanu 1994, fig. 13, p. 50.

[64] *Heptaplus*, in Della Mirandola 1964, p. 173.

[65] "L'obietto si dimostrerà tal hora più oscuro, e talhora più chiaro, secondo i campi in cui campeggia …" Zaccolini ms, vol. 2, f. 76r.

[66] "Havendo esperimentato e visto succedere il simile à valenti pittori dell'età nostra, i quali avendo finita la figura di tutto punto conforme al gusto della loro intelligenza con le ombre, e lumi à luoghi loro, nondimeno per havere riserbato il campo da farsi doppodetta figura, si è visto che la figura appare di altra maniera." *ibidem*, f. 74r.

[67] "Il debilmente bianco e lucido, alla presenza del nero, si dimostrerà del tutto bianco, e quello che sarà debilmente nero, al paragone di esquisita bianchezza,

apparirà del tutto nero, il che succederà anche nei campi chiari, e negli oscuri, et in tutti gli altri colori," ", si haverà risguardo all'osservazione di natura, la qual c'insegna, che sia il campo dell'aere, essendo già in sua perfettione ivi campeggiano gl'uccelli, che hanno da nascere con il loro volo, con anche il vapore condensato con globosi giramente (?) in nube … e così/con? Tutte le pioggie, e ogni impressione meteorologica reale et apparente succedono nel campo dell'aere, doppo di chè ella è già stata stabilita, e con tutte le piante et animali, che in lei campeggiano, ritrovano il campo fatto di tutta perfettione, parimenti i pesci et animali di mare, ritrovano il spatioso campo dell'acqua prima di loro stabilito, e con ogn'altra cosa creata, perciò le stelle campeggiano nel Cielo co' gl'altri pianeti, però il Pittore immitatore dei fatti di natura, farà primieramente il Campo dove egli fare la sua figura, o qualsivoglia altra cosa, e qui sopra di quello a suo piacere vada immitando l'obbietto naturale, che il campo gli dimostrerà l'accordamento dei lumi e delle ombre, e con qual forza dobbiamo ponere i lumi, o chiari, e gli oscuri, per dare perfettione a quello habbiamo detto." *Ibidem*, f. 74r.

[68] Perceived colour will depend on context, surface, lighting, reflections.

[69] Alhazen is cited directly by Félibien in *Entretien V* in a passage relating to the relativity of perception of light and darkness. Félibien 1679, pp. 34-35.

[70] "Perciò l'aere essendo corpo diafano, non si può imitare se non sotto colore di opacità, e di superficie, riducendola a terminare all'istessa superficie nella Pittura, la quale è corpo opaco". Zaccolini ms, vol. 1, ff. 127v-128r.

[71] "Si deverà fare, che non sia del tutto bianco, poiché alla presenza esposto al lato di cosa oscura si dimostrerà assai più chiaro di quello che sarà, et talhora potrà apparere di molta bianchezza, benché in se stesso habbia mistione oscura che lo mortifichi," Mixing of many pigments in order to achieve the exact tone and hue seen in nature is common to many painters after Titian, if concerned with replicating the effects of natural light. Zaccolini ms, vol. 2, f. 76r.

[72] Which is also the essence of Gestalt theory.

[73] "Ainsi M. Poussin representoit ses Figures avec des actions plus ou moins fortes & des couleurs plus ou moins vives, selon les sujets qu'il traitoit. Car ayant trouvé les veritables degrez de force et d'affoiblissement qui se rencontrent dans les couleurs, il sçavoit si bien s'en servir qu'on remarque dans ses Ouvrages une conduite harmonique de mesme que des pieces de musique." Félibien 1668, not paginated (antepenultimate page of the *Préface*.)

[74] Félibien makes the point that it is only called a kind of perspective by analogy with linear/geometrical perspective, although it cannot have hard and fast rules in the same way, and that ultimately, the eye must be judge. "Cependant je vous diray, que c'est improprement que l'on appelle Perspective aërienne, ce qui regarde la diminution des couleurs, & ce n'est que par analogie qu'on la nomme ainsi." Félibien 1679, pp. 20-21.

[75] See Sannucci 2009 and Glanville 2012.

[76] "Les corps se changent par la nature de leur propre couleur selon les airs & les distances differentes." Félibien 1679, p. 25.

[77] "Pour Moyse & ceux qui l'environnent, on voit qu'ils ne sont éclairez que d'une lumiere éteinte par l'interposition de l'air qui se trouve dans la distance qu'il y a entr'eux & les autres qui sont sur le devant du Tableau; & qu'ils reçoivent encore moins de jour selon que chaque figure est plus éloignée, selon sa situation, & encore selon la couleur de ses vestemens, les uns estans plus capables que les autres de faire paroître avec plus de force la lumiere qu'ils reçoivent." Félibien 1668, p. 100.

[78] This is the simplification: air is not blue, it appears blue.

[79] "Par exemple le vert & le rouge mis dans une mesme distance feront une sensation differente à notre veuë, non seulement par les qualitez propres de ces deux couleurs; mais parce que le vert estant plus capable de prendre la couleur de l'air, qui est bleuë, que non pas le rouge, il paroistra plus éloigné, puisqu'il pert davantage de sa veritable couleur, qui se confond plus aisément que le rouge avec celles de l'air. Voila quant à la qualité des couleurs dans un mesme air & dans une mesme distance." Félibien 1679, pp. 23-24.

[80] "Voyons ce que fait une mesme couleur dans une mesme distance, mais dans deux situations differentes où l'air soit plus epais en l'une que l'autre. Si une personne vestuë de blanc ou une figure de marbre ou de plastre, si vous voulez, est posée dans un lieu où l'air soit purifié, il est certain qu'elle paroistra plus blanche & plus proche qu'une autre qui sera dans un air plus épais, quoy qu'elles soient dans une égale distance, & de pareille grandeur & blancheur, parce que la grande épaisseur de l'air où elle se trouve esteindra son blanc, & la fera paroistre plus bluastre. C'est pourquoy il est fort difficile de donner des moyens asseurez pour affoiblir les couleurs selon la perspective, puisque cela dépend de la disposition de l'air, de la lumiere qui les éclaire, & encore de la force mesme des couleurs." Félibien 1679, p. 24.

[81] "Imitano le cose com'elle sono, e questi [painters] com'elle appariscono: ma perché le cose sono in un modo solo, et appariscono in infiniti." Letter to Cigoli, 26 June 1612. Galilei 1872, p. 148.

[82] "Le jaune & le bleu estans les couleurs qui participent le plus de la lumiere & de l'air, M. Poussin a vestu ses principales figures d'estoffes jaunes & bleuës; Et dans toutes les autres draperies, il a toûjours meslé quelque chose de ces deux couleurs principales, faisant en sorte que le jaune y domine plus qu'aucune autre, à cause que la lumière qui est répanduë dans son Tableau est fort jaunâtre." Le Brun, *Sixième Conférence*, 5 November 1667, Félibien 1668, pp. 100-101.

[83] "… il est constitué de manière à embrasser à la fois le terrestre et le divin." *Pymandre* (Ménard 1866, p. 127).

[84] Bucklow 2009, pp. 43-74.

[85] Richter 1970, vol. 1, p. 164, and see Glanville 2012, p. 64 and notes 23 and 24.

[86] See note 28.

[87] "… porrò alquanto di azzurro oltramarino, il quale cagiona un mirabile effetto in tutti i colori, ed in particolare usato moderatamente nella carnagione, poiche le dà una cert'aria, e lume celeste, che la rende suave, e dolce. Inoltre, perche in ciascun corpo reale oltre li quattro elementi, de' quali è composto, evvi mescolata la luce, e dove questa manca, resta il corpo oscuro, e tenebroso …" Lana Terzi 1670, p. 151.

[88] See p. 99 in this issue.

[89] Rikke Foulke essay in this issue.

[90] Delbourgo 1960, p. 54.

[91] "Mais comme il a eü l'avantage de converser souvent avec ce grand homme dont il entreprend de parler, & que les Tableaux, ont encore le mesme lustre, & la mesme vivacité des couleurs qu'ils avoient lors qu'ils y donnoit les derniers traits, Il en pourra dire son sentiment avec plus de connoissance & de certitude que des autres." Félibien 1668, p. 77.

[92] "Les peintres ne travaillent pas seulement de la main, ni que leurs ouvrages ne sont pas faits seulement pour le plaisir des yeux, mais qu'ils peuvent encore satisfaire et instruire l'esprit par cette belle partie toute spirituelle que Monsieur le Poussin a fait entrer si heureusement dans tous ses ouvrages." Le Brun, *Conférence académique*, 10 January 1671. Lichtenstein 2006, tom. I, vol.1, pp. 398-399.

[93] With the rules of perspective the "coraggioso Pittore potrà generosamente gareggiare con l'istessa opera di Natura, nella quale si [rammembra? rassembra?] la Pittura, viva all'occhio dei più intelligenti perché l'opera del Pittore non [rammembra? rassembra?] similitudine alla vivezza di natura per lo sguardo semplice di ognuno che sia, poiche altrimenti è l'occhio e lo sguardo dell'intelligente perspicace, che quello della volgare gente, che attende solamente alla semplice apparenza della superficie, senza penetrare più oltre." Zaccolini ms, vol. 4, f. 112r.

[94] "Les choses esquelles il i a de la perfection ne se doivent pas voir àlla haste mais avec temp jugement et intelligence, il faut user des mesme moiens à les bien juger comme à les bien faire." Letter from Paris, 20 March 1642. Jouanny 1911, pp. 121-122.

Supporti e preparazioni: aspetti delle scelte esecutive di Poussin a confronto con le tecniche pittoriche dell'ambiente romano (1620-70)

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Paolo Bensi

Benché quasi tutta la produzione di Poussin si sia sviluppata su supporti tessili, c'è un dipinto su tavola, il *Battesimo di Cristo* di collezione privata svizzera, che merita un'attenzione particolare ed è accompagnato da una documentazione precisa, attraverso la corrispondenza dell'artista. La tavoletta (30 x 23 cm) era destinata a Jean Fréart de Chantelou, fratello di Paul Fréart de Chantelou, grande amico dell'artista. Viene citata nel 1645 e soprattutto nel 1648: il 22 giugno Poussin annuncia a Paul Chantelou che il dipinto è stato abbozzato e che si tratta di una piccola tavola di cipresso. A settembre è terminata e il 19 settembre il pittore risponde ai ringraziamenti di Jean citando Montaigne: il dipinto sarebbe stato eseguito "non pour bon, mais tel que j'ai peu fere". In tutte le pubblicazioni recenti il supporto del quadro è sempre indicato come cipresso, anche se non risultano eseguite analisi botaniche di conferma[1].

Il cipresso è un legno raro in pittura, si conoscono esempi altomedievali e quattrocenteschi, in particolare in Toscana; nel XVII secolo si nota tuttavia un aumento di interesse nei suoi confronti[2]. L'esempio più noto è la prima versione della *Caduta di Saulo* di Caravaggio, per la quale era prescritto, nel contratto di committenza dei dipinti della cappella Cerasi in Santa Maria del Popolo (24 settembre 1600), esplicitamente l'uso di tavole di cipresso. Tale versione è stata identificata con il dipinto della collezione Odescalchi di Roma, oggetto di analisi che hanno confermato la specie legnosa in oggetto: non è stata ancora invece ritrovata la prima versione della *Crocifissione di san Pietro*, che dovrebbe essere stata eseguita sullo stesso legno[3].

Anche a Venezia il supporto riscuote un certo apprezzamento, come è testimoniato dall'inventario seicentesco della collezione Nani, che elenca otto opere su cipresso, tre di Sebastiano Mazzoni, tre di Pietro Liberi, una di Pietro Bellotti e una di Pietro Negri. Mazzoni e Liberi erano attivi sulla scena pittorica dagli anni Trenta, Bellotti e Negri dagli anni Cinquanta[4]. La tecnica del Liberi, che dovrebbe aver soggiornato a Roma tra il 1635 e il 1639, aveva attirato l'attenzione dello Zanetti, che la classificava secondo tre *maniere*: la terza, "per gli ignoranti", prevedeva "una estrema attenzione e diligenza … in questa servivasi per il più di tavole di cipresso, armate e preparate con somma cura"[5]. Ci sono pervenute di tutti gli artisti citati opere su tavola ma non mi risultano essere state rese note eventuali analisi della specie arborea. Sappiamo anche che Nicolas Regnier possedeva a Venezia un *Autoritratto* di Tiziano descritto nel 1666 come eseguito su cipresso, ma quasi sicuramente si trattava di un dipinto del genero Pietro Della Vecchia[6].

In Francia risultano utilizzati nel Seicento la quercia, il noce e i legni di conifere; per quanto riguarda l'ambiente romano il solo caso che conosco sinora di supporto in cipresso, oltre alla citata *Caduta di Saulo* di Caravaggio, è la *Sacra famiglia adorata da sant'Antonio da Padova*, attribuita al Cavalier d'Arpino, databile intorno al 1605 (Mosca, Museo Puškin)[7].

Per quanto riguarda le fonti il manoscritto di Richard Symonds, databile al 1649-51, cita vari tipi di legni, basandosi sulle fonti antiche, Plinio in particolare: pioppo nero, salice, carpino, sorbo, sambuco, fico; tace però sulle specie effettivamente in uso a Roma in quegli anni – pioppo e salice sono comunque citati anche da Cennino Cennini, ed il primo certamente era di gran lunga il preferito. Utilizzerò in più occasioni il testo di Symonds, edito da Mary Beal, perché frutto delle esperienze dirette di questo pittore inglese nella bottega di Giovanni Angelo Canini, allievo del Domenichino[8].

Sappiamo che il cipresso compare negli appunti di Leonardo da Vinci, assieme al noce, al sorbo e al pero ed è noto come gli scritti leonardeschi siano stati oggetto di interesse nel Seicento, ma il brano dove egli parla dei legni non è presente nella raccolta che venne pubblicata in Francia nel 1651, e che Poussin ben conosceva per aver preparato le illustrazioni del volume pubblicato da Fréart de Chambray[9]. Il Baldinucci nel 1681 riporta alla voce *Arcipresso* notizie sul suo uso in architettura "massimamente per far porte … non è soggetto a tarli", ma non parla di un utilizzo pittorico[10].

Quali possono essere state le motivazioni della

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scelta di Poussin? Da un punto di vista pratico il cipresso risulta essere un legno di ottima qualità, resistente sia all'umidità che agli insetti xilofagi, essendo ricco di resine. Quest'ultimo aspetto costituisce però anche un limite per il suo utilizzo pittorico, dato che gli artisti temevano che le resine potessero infiltrarsi nella preparazione, danneggiando gli strati di colore. Brandi ha ipotizzato che la scelta di Cerasi per le tavole caravaggesche della cappella fosse collegata alla volontà di proteggere le opere dall'umidità elevata del luogo, ma certo queste non erano le intenzioni dell'artista francese[11].

Ritengo che nella scelta abbiano avuto il loro peso sia considerazioni pratiche, data la qualità del legno, sia valenze simboliche connesse al materiale. Nell'antichità il cipresso era considerato simbolo di fertilità da una parte e di immortalità e incorruttibilità dall'altra, per la sua resistenza all'acqua e al fuoco: la freccia di Eros, lo scettro di Zeus, la mazza di Ercole, secondo la tradizione, erano intagliate nel suo legno. I poeti latini cominciarono ad inserirlo nel simbolismo funerario, attraverso il mito di Ciparisso, cantato da Ovidio nelle *Metamorfosi*, mentre il medioevo cristiano lo considerava un albero sacro, utilizzato per costruire la croce di Cristo, assieme al cedro, all'ulivo e alla palma. Giambattista Marino riprende la vicenda di Ciparisso nell'*Adone* (*Allegoria* iniziale del V canto): "Per Ciparisso mutato in cipresso, siamo avvertiti a non porre con ismodamento la nostra affezione alle cose mortali, acciocché poi mancandoci, non abbiamo a menar la vita sempre in lacrime ed in dolori", un'interpretazione del mito che ben poteva essere consona al pensiero stoico di Poussin[12].

Nella produzione del nostro artista si riscontrano altri cinque casi di utilizzo di tavole, un numero non trascurabile, scalati lungo tutta la sua carriera: quello di maggiori dimensioni è il *Matrimonio mistico di santa Caterina* di Edimburgo (126 x 167,5 cm, del 1630 circa), che però una parte della critica attribuisce a Charles Mellin. L'unica opera di cui sia stato studiato il supporto sembra essere la *Traslazione di santa Rita da Cascia* (Londra, Dulwich Picture Gallery, 1635 circa), che risulta essere di pioppo; si tratta di una tavola riutilizzata, dato che in radiografia mostra una figura sottostante di ninfa sdraiata, una prassi questa piuttosto frequente per i dipinti su tela nella prima fase romana dell'attività dell'artista[13].

Nel 1645 Poussin aveva scritto a Chantelou che il *Battesimo* avrebbe dovuto avere le stesse dimensioni dell'*Estasi di san Paolo* del 1643 (Sarasota, John and Mable Ringling Museum) e c'è da chiedersi se anche quest'ultimo, che comunque è più grande (41,5 x 30 cm), sia stato dipinto su cipresso[14]. In ogni caso va sottolineato come nella sua lettera l'artista senta la necessità di citare in modo esplicito il supporto prescelto. Certamente in questo apprezzamento possono essere confluiti sia gli eventuali significati simbolici, sia il fascino di un materiale collegato al mondo antico, sia la qualità del materiale, levigato e compatto – adatto a stesure meditate, come si è visto nel caso del Liberi – aspetti che il pittore mostra sicuramente di gradire nel caso delle tele, come vedremo.

Per quanto concerne la preparazione della tavoletta, abbiamo le indicazioni di Canini, che, secondo Symonds, nei dipinti ad olio poneva un primo strato di gesso temperato con colla di pergamena, seguito da una stesura di *ogliaccio*, da identificarsi con olio cotto mescolato con i cosiddetti 'residui di tavolozza' (probabilmente di colore complessivo grigio o bruno), che serviva a ridurre l'assorbimento del legante da parte della preparazione gessosa: dovrebbe corrispondere all'"olio che si neta li peneli", citato da Giovan Battista Volpato alla fine del Seicento come componente delle imprimiture delle tele[15]. Alcune indicazioni ci possono venire dai trattati spagnoli seicenteschi: nell'*Arte poetica* di Felipe Nunes (1615) sopra lo strato di gesso e colla di pelle di guanti viene consigliata un'imprimitura di terra d'ombra ad olio con agenti essiccativi, come il minio. Troviamo annotazioni analoghe nell'*Arte de la Pintura* di Francisco Pacheco (1649), che cita come supporti il noce e il cedro, mentre nel *Tractado* anonimo del 1656 si suggerisce di preparare le tavole solo con uno strato di terre[16]. Anche in Italia nel *Prodromo all'Arte Maestra* di Francesco Lana Terzi (1670) non si parla più di gesso ma solo di imprimitura, la stessa consigliata per le tele – terra d'ombra ben macinata, con un poco di biacca e terra rossa con olio di lino: ricordo che il Lana, gesuita, originario di Brescia, visse a Roma negli anni Quaranta-Cinquanta e fu allievo di Atanasio Kircher[17]. Naturalmente solo delle analisi microstratigrafiche su prelievi dal *Battesimo* potrebbero chiarire l'esatta natura degli strati preparatori.

Per quanto riguarda i dipinti su supporti tessili, grazie alle accurate indagini svolte sulle opere di Poussin in Francia, edite nel 1994, e ad altre successive su tele di diversi musei, siamo informati in modo più esaustivo rispetto a qualsiasi altro artista del Seicento operante in Italia, salvo forse Caravaggio, ed altri dati sicuramente arriveranno dai contributi alla presente pubblicazione. Sappiamo in tal modo che per la prima opera nota, *La morte della Vergine* (definita da Wright *La morte di santa Monica*; Sterrebeek, chiesa di San Pancrazio, prima del 1624), eseguita in Francia, si serve di un tessuto a struttura semplice di 13 x 15 fili/cm^2. Nei primi anni italiani (1624-30) sceglie tele semplici, piuttosto rade, le cosiddette "tele romane", con densità da 7 x 7 a 9 x 10 fili/cm^2, in linea con la prassi degli artisti coevi operanti a Roma: questi tessuti impartiscono ai dipinti un aspetto caratteristico, imprimendo sulla superficie una rete di crettature a maglia quadrata, in molti casi evidenti e piuttosto disturbanti; in Francia non risultano molto apprezzati[18].

Dalla metà degli anni Trenta si orienta però verso tessuti più compatti, che arrivano a 12 x 20 fili/cm^2, e si serve abbastanza spesso della tela saia, ad andamento diagonale, anche di 21 x 12 fili/cm^2. Durante il soggiorno parigino, per *Il Tempo sottrae la Verità agli attentati dell'Invidia e della Discordia* usa una tela semplice fitta, di 20 x 20 fili/cm^2. Al ritorno in Italia nel 1642 si orienta

verso tessuti di struttura serrata, semplici o diagonali, che arrivano anche a 21 x 26 fili/cm^2. Poussin evidentemente apprezzava la compattezza e la resistenza di questi ultimi, anche se una densità troppo elevata avrebbe potuto causare qualche problema conservativo, non permettendo agli strati di preparazione un minimo di penetrazione tale da garantire un aggancio soddisfacente.

Tali scelte si discostano in modo abbastanza significativo dalle tendenze della produzione pittorica italiana, che sceglie in prevalenza tele piuttosto rade anche dopo il 1640. In base ai dati pubblicati dai ricercatori del Louvre si può notare come solo Guercino, Reni e in parte il Mola scelgano nel Seicento avanzato tele fitte, semplici o saie; anche Lorrain dipinge in genere su tele molto compatte, mentre il cognato di Poussin, Dughet, usa tessuti con strutture più rade[19]. Propongo da parte mia alcuni dati tratti da indagini effettuate in Italia negli ultimi anni sui pittori operanti a Roma tra il 1630 e il 1670. L'*Estasi di santa Teresa* e il *San Martino Vescovo e santi* di Gregorio Preti (1650-55, Taverna, Catanzaro, rispettivamente chiesa di Santa Barbara e chiesa di San Martino) hanno una densità di 6 x 6 fili/cm^2 [20]. Crescenzio Onofri e altri paesaggisti della seconda metà del secolo della collezione Doria Pamphilj utilizzano tele di 8 x 10, 9 x 9 fili/cm^2 e simili; allo stesso modo i quadri di Dughet della stessa collezione anche dopo il 1650 sono di 6 x 7 e 9 x 7 fili/cm^2 [21]. L'*Apparizione di Cristo a sant'Ignazio* del 1668 di Pietro da Cortona (Pistoia, chiesa dello Spirito Santo) è su un tessuto di 7 x 7 fili/cm^2, e ancora nel 1672 il bozzetto con la *Gloria di santa Marta* del Gaulli (Genova, Museo dell'Accademia Ligustica di Belle Arti) è eseguito su una tela di 10 x 10 fili/cm^2 [22].

Nella scelta della densità dei supporti hanno naturalmente un peso importante le dimensioni del dipinto, dato che una superficie vasta necessita di un tessuto leggero e le tele rade hanno appunto tale caratteristica, oltre ad un prezzo inferiore. Infatti il dipinto di Pietro da Cortona, che si serve della "tela romana" classica, è di 376 x 288 cm, e i due di Gregorio Preti, di densità molto bassa, sono di 221 x 145 e 240 x 145 cm: il bozzetto di Gaulli è di però piccole dimensioni.

Nella produzione di Poussin la correlazione tra dimensioni e densità non appare sempre stretta. Nei dipinti del Louvre del 1627-30 in effetti tele di 7 x 7 o 7 x 9 fili/cm^2 compaiono in opere di 165 x 241 e 301 x 242 cm, secondo gli stessi di criteri di Pietro da Cortona per le sue grandi composizioni di quegli anni e al pari delle scelte degli altri artisti coevi, ed adotta tessuti più serrati per formati minori. Negli anni Trenta per opere di ampia superficie, accanto a tele rade – *Il ratto delle Sabine* (159 x 206 cm con 9 x 7 fili/cm^2) e *La danza in onore di Priapo* (São Paulo, Museu de Arte, 373 x 166,5 cm con 8 x 10 fili/cm^2) – troviamo però una saia di 21 x 12 fili/cm^2 per *Camillo e il maestro di scuola di Falerii* di 252 x 265 cm. A Parigi esegue *Il Tempo sottrae la Verità,* già citato, del diametro di 297 cm su una tela molto fitta: purtroppo non conosciamo le caratteristiche tessili dell'*Istituzione dell'Eucarestia* e del *Miracolo di san Francesco Saverio*, risalenti anch'essi al soggiorno parigino e di vaste dimensioni; c'è da supporre che si tratti di tele abbastanza compatte, visto la diffusione minoritaria in Francia dei tessuti radi[23].

Al ritorno a Roma si orienta su tessuti serrati, come si è detto, anche per opere di dimensioni piuttosto grandi, come il *Paesaggio con Orfeo ed Euridice* (120 x 200 cm, saia di 12 x 20 fili/cm^2), *La morte di Saffira* (122 x 199 cm, saia di 11 x 20 fili/cm^2), *La Fuga in Egitto* (Lyon, Musée des Beaux Arts, 146 x 216 cm, tela di 17 x 17 fili/cm^2) e l'incompiuto, estremo, *Apollo e Dafne* (155 x 200 cm, tela di 17 x 15 fili/cm^2)[24].

Mi soffermerò ora su due particolari tessuti utilizzati da Poussin, la seta e il damasco di lino. La prima, tinta in azzurro, costituisce il supporto dell'*Assunzione della Vergine* (Parigi, Louvre, 1650, 57 x 40 cm), un materiale ben poco utilizzato in Francia[25]. La seta ha un'antica tradizione in pittura ma non a livello quantitativo, dato che, a fronte della preziosità e del prestigio che l'accompagnano, presenta notevoli problemi conservativi, dovuti alla fragilità delle fibre a contatto con l'acidità dei leganti oleosi delle preparazioni e degli strati pittorici, nonché alla scarsa adesione degli stessi al supporto[26]. Veniva usata per realizzare stendardi e gonfaloni processionali, in genere con tessuti tinti in rosso o in verde, di cui si conoscono esemplari seicenteschi, come la bella e ben conservata *Madonna del rosario*, di Pellegro Piola (Genova, Museo dell'Accademia Ligustica di Belle Arti, fine degli anni Trenta)[27]. Anche Symonds esegue nella bottega di Canini uno stendardo su seta con *San Francesco* ("Taffeta for S.Francis bandiero"), a tempera, tecnica più adatta dell'olio alle fibre seriche[28]. Non è certamente questa la tipologia dell'opera di Poussin, che si può invece accostare ad alcuni dipinti di Guido Reni, che tuttavia hanno dimensioni e funzioni diverse da quelle dell'*Assunzione*. Com'è noto, secondo Malvasia l'interesse del pittore bolognese per i supporti in seta sarebbe stato motivato curiosamente da motivazioni di tipo conservativo: presente all'apertura di una tomba medievale nella chiesa di San Domenico a Bologna avrebbe costatato che la veste di seta del defunto si era conservata, al contrario degli indumenti di lino, andati in polvere, e dall'episodio avrebbe tratto la convinzione della maggiore durata dei tessuti serici. Secondo il biografo bolognese il pittore eseguì su tali supporti la *Pala della peste* (Bologna, Pinacoteca Nazionale, 1631-32), che nasce come gonfalone, il *San Michele Arcangelo* (Roma, chiesa dell'Immacolata Concezione), che Poussin poté ammirare dopo il 1635, e la *Madonna Assunta* per Spilamberto, ora conservata nella Pinacoteca di Monaco di Baviera (1640); notizie analoghe sono riportate anche da Bellori[29].

Poussin per l'*Assunzione*, come si è visto, si è servito di una stoffa tinta in azzurro, probabilmente con indaco, colorazione di cui conosco applicazioni solo in tele di lino, facenti parte di apparati per la Settimana Santa, a Genova (Museo Diocesano, anni Trenta del Cinquecento) e in Sicilia, nel Sette-Ottocento[30]. Nella produzione dell'artista francese la seta rimane sinora un caso isolato,

apprezzata probabilmente per la grande compattezza (40 x 20 fili/cm^2) e la preziosità: ignoriamo se siano intervenute, come nel caso di Reni, anche considerazioni sulla sua, presunta, durata nel tempo.

Rispetto alle considerazioni di Ravaud e Chantelard del 1994, che giudicavano il ricorso a tele damascate di lino (note anche come "tele di Fiandra") eccezionale nel XVII secolo ed episodico da parte di Poussin, abbiamo acquisito negli ultimi anni dati che modificano in buona parte la situazione[31]. Tessuti dalla struttura complessa con motivi in rilievo di losanghe intrecciate, abitualmente utilizzati per tovaglie di pregio, comparsi nella prassi pittorica dalla fine del Quattrocento, fungono da supporti a numerose opere seicentesche di scuola emiliana, dove appaiono molto diffuse, e lombarda, ma anche di altri ambiti regionali, e un buon numero di esse furono dipinte a Roma e nel Lazio. Tra gli esempi più noti da tempo di queste ultime vanno annoverate tre opere di Caravaggio, ma si conoscono anche quadri del Domenichino (1622-25), di Salvator Rosa (due tele, 1656 e 1659), di Claude Lorrain (1662)[32]. A questi casi segnalati da Claudio Seccaroni, posso aggiungere, in base alle mie osservazioni personali, la *Presentazione al Tempio* di Andrea Sacchi (Perugia, Galleria nazionale dell'Umbria, 1651), *San Gerolamo* e *San Sebastiano* di Ribera nella chiesa della Certosa di San Martino a Napoli (1651) e *Sant'Alessio* di Luca Giordano (Napoli, Galleria Nazionale di Capodimonte, 1664). Per la *Nascita di Maria*, eseguita a Roma nel 1604 da Cristoforo Roncalli, il Pomarancio, per il Duomo di Reggio Emilia, abbiamo anche la conferma da parte di documenti, che parlano di fornitura al pittore di una "truvaglia di Fiandra"[33]. Dai dati archivistici si deduce che i damaschi di lino erano stoffe piuttosto costose, ma molto probabilmente i pittori si avvalevano anche di tovaglie usate.

In questo quadro tecnico Poussin si inserisce sinora con cinque opere, *Il regno di Flora* (Dresden, Gemäldegalerie, 1631), la *Crocifissione* (Hartford, Wadsworth Atheneum, Museum of Art, 1645-46), il *Paesaggio con Diogene* (Parigi, Louvre, 1648), *L'esposizione di Mosè* (Oxford, Ashmolean Museum, 1654) e una *Sacra Famiglia* (San Pietroburgo, Ermitage, 1655), come gentilmente mi segnala Helen Glanville[34]. Come si vede si tratta complessivamente di un utilizzo tutt'altro che episodico, destinato ai dipinti di formato piuttosto grande, dato che *Flora* è di 131 x 181 cm, la *Sacra Famiglia* di 172 x 133,5 cm, la *Crocifissione* di 148,5 x 218,5 cm, il *Mosè* di 149,5 x 204,5 cm e il *Diogene* di 160 x 221 cm, il più grande, con una riduzione di 18 x 20 fili/cm^2. L'artista poteva apprezzare sicuramente alcune caratteristiche di questi tessuti, come la compattezza, l'eccellente resistenza meccanica, la possibilità di lavorare su grandi superfici senza cuciture, e forse la possibilità di sfruttare i motivi decorativi in rilievo per ottenere particolari effetti ottici ed estetici. Questi dati confermano comunque la predilezione dell'artista per i tessuti ad alta densità anche per composizioni su grandi superfici.

Sporadico è infine l'impiego da parte di Poussin di altri tipi di supporti rigidi, come il rame, molto diffuso a Roma nella prima metà del secolo, o i diversi tipi di materiali lapidei, scelti in numerose occasioni da Jacques Stella, suo collega ed "amorevole amico", per usare le parole di Bellori[35]. Ci sono infatti pervenuti solo due dipinti di Poussin su rame, raffiguranti il medesimo soggetto, l'*Orazione nell'orto*, entrambi in collezioni private. Si tratta verosimilmente di due esperimenti confinati all'inizio del primo soggiorno romano, forse sollecitati da due importanti committenti. Il primo, di 62 x 49 cm, è stato realizzato per Cassiano Dal Pozzo nel 1624-25; il secondo, di 60,5 x 47 cm, è stato realizzato per i Barberini (ringrazio Claudio Seccaroni per la segnalazione).

Per quanto riguarda gli strati di preparazione disponiamo di una banca dati che si va continuamente arricchendo. Personalmente vorrei portare una riflessione sul ruolo che potevano svolgere a Roma negli anni di Poussin gli artigiani specializzati nella lavorazione e vendita di tele pronte, spalmate di preparazione, coloro che verranno chiamati "imprimitori" o "mesticatori".

La categoria doveva essere attiva in alcuni centri italiani già alla fine del Cinquecento e comunque all'inizio del XVII secolo, come si può dedurre da indizi documentari. Paolo Farinati annota a Verona nel suo *Giornale* nel 1593 di aver ricevuto da un suo cliente "un telar con la tela": non si parla esplicitamente di preparazione ma sembra corretto ipotizzarne la presenza[36]. Esplicito è invece il documento che attesta la consegna a Napoli nel 1625 al pittore Domenico Antonio Bruno di un telaio e di una "tela imprimuta", come anche la testimonianza relativa a Pietro Ricchi che nel settembre del 1671 chiede ai committenti "tele imprimite" per alcuni quadri da eseguire a Padova[37].

I documenti concernenti Firenze sono abbastanza consistenti, a cominciare da una notizia riportata dal Baldinucci nella vita di Giovanni da San Giovanni, secondo cui l'artista si forniva di materiali pittorici da un certo Grassino, "marmajo", che aveva una bottega di "mesticare tele e vendere ogni sorta di colore": ciò doveva avvenire nei primi anni del secolo, entro il 1636, anno della morte del pittore[38]. Qualche anno dopo era ben noto in città il "Mangiacani mesticatore", a cui si rivolgevano Cesare e Vincenzo Dandini e più tardi Piero Dandini, "il quale per lo più faceva mestiche cattive con terretta … d'onde n'è seguito, che molti lor quadri hanno patito", come scrive nell'Ottocento Targioni Tozzetti[39]. Baldinucci spiega nel *Vocabolario* che la *terretta* è l'argilla con cui si fanno i vasi, estratta a Roma nei pressi di San Pietro e in Toscana a Montespertoli[40].

Ancora Baldinucci annota, nella vita del Passignano, "in quel tempo per ordinario si facevano in Firenze cattive mestiche, cioè a dire con terretta e terra d'ombra, e senza biacca": anche in questo caso lo scrittore si riferisce agli anni tra la fine del Cinquecento e i primi decenni del Seicento (il Cresti muore nel 1638)[41]. Si evidenzia qui quello che sarà un atteggiamento ricorrente delle fonti sei-settecentesche, la critica alla cattiva qualità dei mate-

riali utilizzati dai mesticatori, dovuta, come scriveranno alcuni, alla sete di guadagno. Nonostante ciò gli imprimitori fiorentini acquistano nel corso del XVII secolo un'importanza crescente, operando sempre più spesso anche nel campo del restauro: la dinastia dei Mangiacani interviene su opere delle collezioni medicee dalla fine del Seicento sino agli anni Venti del Settecento[42].

Abbiamo indicazioni sia indiretta che dirette sull'attività dei mesticatori romani: Symonds annota che Canini preferiva preparare le tele personalmente, perché temeva che gli artigiani ("ordinary imprimers") non ponessero nell'impasto la biacca, da lui ritenuta fondamentale per stabilizzare le preparazioni: è la stessa osservazione negativa fatta Baldinucci[43]. Mostra un atteggiamento analogo a Venezia Pietro della Vecchia, che delegava agli allievi "imprimere e parecchiare le telle, non servendosi egli d'altre telle, che di quelle preparate in casa sua"[44]. Sappiamo inoltre da padre Resta che Gregorio Preti a Roma negli anni Trenta aveva lavorato per "bottegari" e in particolare per il "coloraro Nasini alla Sapienza"; sulla scorta dei documenti fiorentini è molto probabile che i venditori di colori, che avevano attività multiformi, fornissero anche tele preparate, come poteva avvenire anche per questo Nasini, che doveva avere una certa fama[45]. Appare piuttosto chiaro quindi come negli anni Trenta-Quaranta il ricorso alle tele pronte per l'uso fosse una prassi diffusa anche a Roma.

Poussin allude in modo vago, in una sola occasione, agli strati di preparazione, in una lettera a Chantelou del 15 novembre 1655, in cui descrive un dipinto che sta per eseguire – *Il riposo della santa Famiglia durante la fuga in Egitto* (San Pietroburgo, Ermitage) – per il quale ha fatto approntare ("apareiller") la tela, molto probabilmente nel suo atelier, ma non si può escludere il ricorso ad una bottega specializzata[46].

Le indicazioni delle fonti e la testimonianza di Canini concordano sul fatto che i fornitori risparmiavano sulla biacca e preparavano le tele solo con argille colorate di mediocre qualità ("terrette") e con terra d'ombra (contenente ossidi di ferro e di manganese), con il risultato di ottenere mestiche poco stabili, a causa, aggiungiamo noi, dell'igroscopicità dei materiali argillosi; l'assenza di biacca o di minio, compensata solo in parte dalla presenza di ossidi di manganese, inoltre non ne favoriva l'essiccamento; un altro aspetto negativo poteva essere l'emergere eccessivo nel tempo dei toni bruni dovuti alla terra d'ombra, per effetto di un'accresciuta trasparenza degli strati di colore sovrastanti con l'invecchiamento, a causa del cambiamento dell'indice di rifrazione dell'olio e della formazione di saponi oleosi di piombo: il fenomeno era già stato segnalato dall'Armenini alla fine del Cinquecento[47].

Non c'è però unanimità di pareri nella trattatistica sulle preparazioni considerate più valide: Giambattista Volpato, raccomanda alla fine del Seicento di servirsi di "terra da boccali, terra rossa et un poco di terra d'ombra", dove per "terra da boccali" si intendono argille più o meno colorate, utilizzate nella produzione ceramica. Anche padre Lana consiglia nel 1670 una miscela di "terra d'ombra ben macinata, con un poco di biacca e terra rossa". Come si vede in queste ricette compare la terra d'ombra, il cui uso è sconsigliato da Baldinucci anche nel *Vocabolario*, dove viene definito "un color maligno", troppo siccativo, che "fa variare i coloriti"[48].

Canini, che critica l'uso del gesso delle preparazioni di tipo tradizionale, applicava dapprima un'apprettatura di colla animale, poi uno strato di *ogliaccio*, l'impasto oleoso di residui di tavolozza già descritto nella preparazione delle tavole: una preparazione di questo tipo, a cui sono aggiunte anche ocre, è stata riscontrata nel *San Michele arcangelo* di Francesco Cozza, della fine degli anni Cinquanta (Roma, chiesa di Santa Maria del Carmine alle Tre Cannelle). In alternativa si serviva di un impasto a base di biacca, ocra rossa, poco nero e poca "creta", da intendersi come argille chiare di tipo caolinifero, o calcite, carbonato di calcio, in due sottile strati, di colore complessivo carnicino. Una mestica color carne era già stata consigliata da Armenini, in una ricetta che prevedeva anche l'aggiunta di vernice[49].

Cerchiamo di capire quali siano le scelte di Poussin rispetto a queste indicazioni, come si vede non del tutto coerenti, delle fonti. Conosciamo le caratteristiche del dipinto più antico sinora noto, *La morte della Vergine*, ora a Sterrebeek ma eseguito a Parigi, dove la mestica di base dalle prime analisi risulta formata da biacca, minio, nero carbonioso e ocre di colore aranciato (in alcuni campioni si è notato un secondo strato più chiaro)[50]. Nei dipinti esaminati dai laboratori francesi del primo periodo romano si è notata un'assoluta prevalenza di preparazioni brune, formate prevalentemente da calcite (circa il 30%) e terre ferruginose marroni, a basso contenuto di ferro (10% circa), con piccole quantità di composti di piombo per facilitare l'essiccamento dell'impasto. Indagini successive hanno permesso di precisare che nella *Strage degli innocenti* di Chantilly (1625-30) è presente anche jarosite, un solfato di ferro e potassio di colore giallo, che è stato rilevato anche nella serie di Giovanni Baglione con *Le Muse* e nel *San Giovanni Battista* di Guy François, molto probabilmente eseguito durante il suo soggiorno romano: questo materiale sembra essere caratteristico delle preparazioni eseguite a Roma[51]. L'unico caso che sembra scostarsi da questa tendenza è il già citato *Camillo e il maestro di Falerii* (1637), in cui l'impasto di base è rosso-bruno e comprende biacca, ocra rossa più ricca di ferro e nero, molto simile a quello rinvenuto nel *Trionfo di Anfitrite* di Charles Dufresnoy del Museo di Lille, eseguito a Roma in quegli anni[52].

In genere le mestiche risultano applicate in un solo strato, raramente in due, in questo caso con tonalità simili. Negli ultimi anni si sono aggiunti i risultati di analisi svolte i diversi centri di ricerca, in genere allineati con i dati dei laboratori del Louvre, con qualche variante. Così nel *Trionfo di Davide* (Londra, Dulwich Picture Gallery) del 1631-32 circa, si è notato un primo strato bruno rossiccio di

ocre, nero carbonioso e piccole quantità di biacca e gesso, seguìto da uno strato grigiastro, con maggiori quantità di biacca, che doveva fungere da sottomodellato, presente anche in *Venere e Mercurio* dello stesso museo (1627 circa)[53]. La preparazione bruno-rossiccia della *Danza in onore di Priapo*, del 1634-38, è analoga a quelle ora descritte, anche se risulta stesa in due strati, di cui curiosamente il primo è più chiaro di quello superiore (in genere si verifica il contrario)[54].

Disponiamo di dati di confronto per le caratteristiche di quadri eseguiti in quegli anni a Roma. In due opere presenti in musei russi di Tommaso Salini e Michelangelo Cerquozzi abbiamo substrati bruni (più chiaro in quella di Cerquozzi) di ocre, calcite, nero, senza biacca (quello di Cerquozzi contiene anche un po' di gesso)[55]. Anche nei dipinti di Pietro da Cortona analizzati per la mostra del 1997 è presente la stessa composizione, però con significativi quantitativi di biacca; lo stesso è stato verificato in un quadro di Claude Lorrain del 1637-38 (priva di biacca) e in due tele di Gregorio Preti degli anni Cinquanta[56].

Date le caratteristiche delle mestiche di Poussin, con terre povere di ossidi di ferro e l'assenza, nella maggior parte dei casi, di biacca, che corrispondono alle descrizioni delle imprimiture delle tele vendute pronte, potremmo ipotizzare che in questa prima fase il pittore abbia fatto ricorso a supporti preparati da mesticatori: non sono stati trovati composti del manganese, la terra d'ombra è assente e possiamo quindi pensare di avere a che fare con mescolanze di sole *terrette* e creta. Va detto tuttavia che la scelta di risparmiare sulla qualità delle terre e sulla quantità di biacca poteva anche essere stata sua.

Tra le opere eseguite a Parigi nel 1641-42 il Louvre ha analizzato il *Tempo e la Verità*, riscontrando un impasto rossiccio di ocre ricche di ossidi di ferro, con poca biacca, caratterizzato dalla presenza di quantità piuttosto elevate di barite (solfato di bario). Questo minerale può comparire in tracce in preparazioni sei-settecentesche, anche in quadri italiani, dato che in natura è associato a composti del calcio, soprattutto al gesso. È stato usato intenzionalmente, soprattutto come adulterante della biacca nelle mestiche, a partire dagli inizi dell'Ottocento. Le analisi dei laboratori francesi lo hanno individuato in quantità rilevanti nelle opere eseguite a Parigi a partire dagli anni Venti del Seicento, soltanto negli strati di preparazione, a cominciare dalla *Felicità pubblica* di Orazio Gentileschi (1624-26)[57]. Più che un fatto casuale, si tratta quasi sicuramente dell'iniziativa di alcuni mesticatori parigini, molto probabilmente desiderosi di risparmiare sulle quantità di biacca e di ocra introdotte nel miscuglio delle preparazioni. Analisi svolte negli Stati Uniti hannno individuato solfato di bario nella mestica rosso-arancione della *Sacra Famiglia* del Detroit Institute of Arts (*Madonna Roccatagliata),* avvalorando l'ipotesi che sia stata eseguita durante il soggiorno parigino[58]. Appare evidente come Poussin si adegui in Francia alla prassi dei colleghi, acquistando tele già confezionate: si noti come nella *Morte della Vergine,* eseguita nella capitale una ventina d'anni prima, la barite non compaia.

Tornato a Roma si serve nel corso degli anni di diversi tipi di preparazione; esaminandole possiamo cercare di accostarle a quelle utilizzate da due artisti con cui ebbe stretti rapporti, il cognato Dughet e Claude Lorrain, con cui probabilmente condivise le scelte dei materiali e dei fornitori. Possiamo così notare che, incrociando i dati dei laboratori del Louvre con quelli più recenti di altri centri di ricerca, tra il 1645 e il 1650 l'artista si avvale prevalentemente di strati di base rossi; su dieci opere prese in considerazione, sei sono di tonalità rossiccia, due sono brune, una bruno-arancione e una gialla: si tratta di tele delle collezioni del Louvre, della *Sacra Famiglia sulle scale* (Cleveland Museum of Art, 1648) e della *Sacra Famiglia* del Fogg Art Museum di Cambridge (1650 circa)[59].

Le prime sono formate da una miscela di ocre rosse e gialle ad alto contenuto di ferro, calcite e quasi sempre biacca, piccole quantità di nero carbonioso; in due casi sono stati rilevati solfati, probabile indizio della presenza di jarosite, che abbiamo visto essere un materiale distintivo della produzione romana. Si tratta quindi di mestiche di migliore qualità rispetto a quelle impiegate nel primo periodo romano, frutto di una più oculata scelta dei materiali o della preferenza accordata a mesticatori più abili. Bisogna tenere conto di un aspetto interessante; come aveva già fatto sporadicamente nel periodo giovanile, Poussin a Parigi applica sul substrato rosso un'imprimitura grigiastra, come molti suoi colleghi francesi, interponendo tra la preparazione e il colore uno strato che raffredda le tonalità, da non confondere con le imprimiture grigiastre localizzate, poste sotto gli azzurri in varie opere[60]. Nello stesso modo si comporta con le mestiche rosse usate a Roma, ponendo strati grigi in diverse opere esaminate al Louvre, bruno-grigio nel quadro di Cleveland e bruna nella tela di Cambridge, composta da un miscuglio eterogeneo di pigmenti che fa pensare agli avanzi di tavolozza[61]. Tali strati potrebbero essere interpretati come sottomodellati, a cui è già affidata una funzione di impostazione delle figurazioni, tuttavia nell'*Autoritratto* del 1649-50 il pittore si rappresenta davanti ad una tela coperta uniformemente di grigio, senza una modellazione di forme pittoriche, ed effettivamente il dipinto ha nella sua stratigrafia una stesura grigia sulla preparazione gialla. Strati uniformi grigi posti su preparazioni rosse o marroni si possono notare in dipinti non finiti di scuola francese, come il *Ritratto di tre uomini* dei fratelli Le Nain (Londra, National Gallery), e anche di scuola italiana, come il cosiddetto *Omaggio a Velazquez* di Luca Giordano (Londra, National Gallery): su di essi gli artisti abbozzano le figure[62]. Sono propenso a pensare che Poussin acquistasse tele già pronte per praticità, per poi modulare con le imprimiture i fondi fortemente colorati, come faranno nel secolo successivo a Venezia ad esempio Canaletto e Tiepolo, il cui ricorso a imprimitori di professione è documentato[63].

In due opere analizzate di Lorrain del 1647 e del 1654 si serve di preparazioni marroni a base di

biacca e ocre, di colore meno intenso di quelle di Poussin, nel primo caso ponendo anche un'imprimitura bruna[64].

Tra il 1651 e il 1664 il nostra artista utilizza preparazioni di varia tonalità: su sette dipinti analizzati, compresa la *Fuga in Egitto* di Lione (1657), tre sono rosse, tre brune ed una gialla; nella *Fuga* è documentata un imprimitura grigia. Si tratta di strati di base in cui la biacca è praticamente assente, sostituita dalla calcite e le terre sono povere di ferro, con un livello di qualità che appare più basso rispetto agli anni precedenti, quasi un ritorno alla prassi antecedente al soggiorno a Parigi. Per quanto riguarda Lorrain, negli anni Sessanta fa scelte opposte a quelle di Poussin, avvalendosi di preparazioni rosse o arancioni, ricche di biacca e di ocre di buona qualità, prive di calcite; vi sono sempre imprimiture brune più o meno scure. Dughet sceglie invece mestiche praticamente identiche a quelle del cognato, ponendo, ma non sempre, strati successivi grigi o rossicci. Sembra quindi che Lorrain adoperi substrati diversi da quelli di Poussin, mentre i tre artisti sono accumunati dal ricorso a imprimiture di tono più spento[65]. Mi auguro che le ricerche confluite in questa pubblicazione e nella mostra di Parigi amplino i dati in nostro possesso e migliorino le nostre conoscenze nei settori dei supporti e delle preparazioni e in genere degli aspetti tecnici della creatività di Poussin.

Desidero ringraziare Helen Glanville per avermi coinvolto in questa bella impresa culturale e per tutte le informazioni fornite con grande cortesia.

Note

[1] Jouanny 1911, vol. 5, pp. 303, 383-385, 393; Wright 2007, p. 184.
[2] Bruzzone 2011, pp. 253-259.
[3] Cinotti 1983, pp. 535-541; Sarlatto 2008; Seccaroni 2010.
[4] Benassai 1999, pp. 201-204.
[5] Zanetti 1771, vol. 4, p. 380; Ruggeri 1996, p. 96.
[6] Dal Pozzolo 2011, pp. 31-32.
[7] Bergeon 1994, p. 67; Markova 2007, p. 58.
[8] Beal 1984; Cennini 2003, cap. CXIII, p. 142.
[9] Pavesi 2004, pp. 97-133.
[10] Baldinucci 1975, p. 12.
[11] Cinotti 1983, p. 536.
[12] Levi d'Ancona 1977; Cattabiani 1998, pp. 174-177.
[13] Beresford 1998, p. 185.
[14] Jouanny 1911, vol. 5, p. 303.
[15] Beal 1984, p. 83; Merrifield 1849, p. 733.
[16] Veliz 1986, pp. 3-4, 66, 113.
[17] Lana Terzi 1977, p. 255; Bensi 2012, p. 243.
[18] Ravaud 1994; Postec 2003, p. 92; Sanyova 2003; Wright 2007, p. 19.
[19] Ravaud 1994, pp. 26 e 33-34.
[20] Bagnato 2004, pp. 178 e 182.
[21] Capanna 2012, pp. 40-41, 44-45, 48-49, 89-91.
[22] Chiarini 1988; i dipinti presenti nelle collezioni del Louvre anche posteriori al 1643 sono eseguiti su tele rade: Ravaud 1997. Baccheschi 1983, p. 52 (le osservazioni sulla riduzione della tela sono di chi scrive).
[23] Ravaud 1994, pp. 33-34: laddove non indicato diversamente in nota i dati si intendono tratti dal presente saggio. Ravaud 2009, p. 82. Per le tele di Pietro da Cortona degli anni Trenta: *Schede* in Masini 1997, pp. 35-128.
[24] Ravaud 2010.
[25] Ravaud 1994, pp. 30 e 34.
[26] Torrioli 1990, pp. 76-80.
[27] Baccheschi 1983, pp. 43-44.
[28] Beal 1984, p. 183.
[29] Malvasia 1841, vol. 2, p. 42. Per le opere di Reni citate si veda: Pepper 1988, pp. 273, 281, 295; Bellori 2009, vol. 2, pp. 531-532.
[30] Cataldi Gallo 2008.
[31] Ravaud 1994, p. 30.
[32] Seccaroni 2010, pp. 59-60.
[33] Bensi 2013.
[34] Seccaroni 2010, p. 60. Per la *Crocifissione* di Hartford si veda il contributo di J. Cadogan, S. Kornhauser e Patricia Sherwin Garland nella presente pubblicazione.
[35] Bellori 2009, vol. 2, p. 434. Per la produzione di Stella su supporti lapidei: Rinaldi 1990, p. 238; Bergeon 1994, pp. 68 e 74.
[36] Farinati 1968, p. 76.
[37] Nappi 1992, p. 31; Dal Poggetto 1996, p. 14.
[38] Baldinucci 1974-75, vol. 4, p. 248.
[39] Bellesi 1988, p. 102.
[40] Baldinucci 1975, p. 176.
[41] Baldinucci 1974-75, vol. 3, p. 445.
[42] Incerpi 2011, pp. 18-30.
[43] Beal 1984, pp. 85-86.
[44] Temanza 1963, p. 75.
[45] Leone 2004, p. 30.
[46] Jouanny 1911, vol. 5, pp. 438-439.
[47] Armenini 1988, p. 143.
[48] Merrifield 1849, pp. 731-733; Bensi 2012, p. 243; Baldinucci 1975, p. 176.
[49] Beal 1984, p. 86; Furci 2013, p. 38; Armenini 1988, p. 143.
[50] Sanyova 2003, p. 100.
[51] Duval 1994; Martin 2008, p. 63.
[52] Martin 2008, p. 65.
[53] Si veda il contributo di S. Plender e A. Burnstock nella presente pubblicazione. Glanville 1986.
[54] Gorokhova 1999, p. 20.
[55] Ravaud 2009, p. 83.
[56] *Schede* in Masini 1997, pp. 35-128. Per il dipinto di Lorrain: Groen 1988. Bagnato 2004, pp. 70-82.
[57] Duval 1994, p. 37; Martin 2008, p. 62. Per la presenza di composti di bario nei giacimenti di gesso: Seccaroni 2002, p. 63. Tracce di barite sono state rilevate nelle preparazioni di dipinti di Caravaggio: si veda almeno Moioli 2001, pp. 148-153. Per l'uso in quantità rilevanti dai primi dell'Ottocento: Bensi 2009.
[58] Sawyer 1999, p. 154.
[59] Duval 1994, pp. 40-41; Sawyer 1999, p. 154.
[60] Duval 1994, pp. 37, 40-41; Martin 2008, p. 63.
[61] Duval 1994, p. 37; Sawyer 1999, pp. 149-150 e 155.
[62] Duval 1994, p. 37; Bergeon 1994, pp. 71 e VIII, fig. 11 (per il dipinto dei Le Nain).
[63] Bensi 2002, pp. 86-87 e 99.
[64] Groen 1988.
[65] Groen 1988; Duval 1994, p. 37; Ravaud 2010, pp. 186-187.

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Qualche osservazione sui *Baccanali di putti* della Galleria Nazionale d'Arte Antica in Palazzo Barberini

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Fig. 1 – Nicolas Poussin, *Baccanale di putti*, 74,5 x 85,5 cm, tempera (e olio?) su tela, Roma, Galleria Nazionale d'Arte Antica in Palazzo Barberini, inv. 2592.

Fig. 2 – Nicolas Poussin, *Baccanale di putti*, 56 x 76,5 cm, tempera (e olio?) su tela, Roma, Galleria Nazionale d'Arte Antica in Palazzo Barberini, inv. 2593.

I due *Baccanali di putti* (Figg. 1-2)[1] sono stati acquisiti dallo stato italiano nel 1979 e assegnati alla Galleria Nazionale di Arte Antica in Palazzo Barberini. In origine appartenevano ai Chigi, essendo citati negli inventari dei beni del cardinale Flavio Chigi (1631-1693) nel 1666 e nel 1692[2]; successivamente, passarono per via ereditaria nel 1914 alla famiglia Incisa Della Rocchetta, dalla quale sono pervenuti alla sede attuale, colmando una grande e importante lacuna nelle collezioni pubbliche romane[3] .

I due *Baccanali* sono stati restaurati da Gabriella Gaggi sotto la direzione di Rosanna Barbiellini Amidei e presentati in una mostra di restauri nel 1985[4]; in questa sede si recuperano le poche informazioni sulla tecnica allora pubblicate, affiancandole e integrandole con quelle desumibili dall'attenta visione delle due tele e da riprese fotografiche nell'IR effettuate per questa occasione[5], non essendo stato possibile programmare ulteriori indagini scientifiche.

Le due tele hanno differenti dimensioni e non è possibile che in origine le avessero[6], quindi non costituiscono formalmente dei *pendants*, sebbene siano strettamente accomunabili oltre che per la provenienza, anche per soggetto e soluzioni tecniche, il che ha fatto sì che fossero ricollegate a un passo del Bellori, in cui si ricorda il sodalizio che all'inizio delle loro carriere ebbero Poussin e Duquesnoy: "Viveva egli in compagnia, et in una medesima casa con Francesco Fiammingo Scultore l'uno, e l'altro studioso molto di avanzarsi, onde si applicarono insieme attentamente alle cose antiche. Con la quale occasione si diede anch'egli à modellare, et à fare di rilievo, e giovò molto à Francesco nello incamminarsi alla bellezza, e proportione delle statue, misurandole insieme, come si vede quella d'Antinoo. Fecero ancora studio sopra il Giuoco de gli Amori di Titiano nel Giardino Ludovisi, che hora si trova in Ispagna; li quali Amori essendo di ammirabile bellezza, Nicolò non solo copiavali in pittura, ma insieme col compagno li modellava di creta in bassi rilievi, onde si acquistò una bella maniera di formare li putti teneri, de' quali si sono veduti alcuni scherzi, e baccanali à guazzo, et ad olio di sua mano, fatti in quel tempo"[7].

È proprio l'indicazione del guazzo, peraltro sempre specificata in relazione ai due *Baccanali* citati negli inventari Chigi[8], che ha portato la critica a identificare i *Baccanali* di Palazzo *Barberini* in due di quelli realizzati durante lo studio intrattenuto col Duquesnoy sull'*Offerta a Venere* di Tiziano [ora al Prado]. Questi due *Baccanali*, infatti,

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nonostante le verniciature cui sono stati sottoposti, mostrano un aspetto magro/mat, che poco si accorda con l'olio. Certo il colore pastoso non è nemmeno quello della tempera a colla (identificabile col *guazzo* delle fonti cinque e secentesche), mentre appare più affine alla tempera *tout court*. Purtroppo, durante il restauro non sono stati effettuati prelievi dalla pellicola pittorica, in modo da dirimere la questione della tecnica, e nel catalogo sono stati classificati come "tempera e olio", forse non molto lontano dal vero.

Alla scelta della tecnica fa comunque riscontro la maniera di procedere, coi volumi definiti per macchie di colore, come se si trattasse di un semplice abbozzo, senza le finiture che torniscono le epidermidi e sfumano i passaggi di luce (Fig. 3), come invece il pittore usa generalmente nei dipinti a olio, lasciando ovviamente fuori quelli tardi, come ad esempio l'*Apollo e Dafne* al Louvre, che proprio per tale motivo è stato definito incompiuto, o il caso analogo dell'*Agar e l'angelo* ex Altieri, anch'essa, come si è detto, confluita nella Galleria Nazionale d'Arte Antica in Palazzo Barberini (Figg. 4-5). A ben riflettere, la scelta di questa tecnica si accorda perfettamente con la situazione descritta da Bellori, in quanto essa sicuramente consentiva tempi molto più brevi rispetto all'olio, proprio quelli che erano necessari per fissare velocemente le idee scaturite dalle visite dei due sodali alla Villa Aldobrandini di Magnanapoli, dove erano conservati i dipinti realizzati da Tiziano per lo studiolo di Alfonso d'Este[9].

Il modo sciolto di procedere dipingendo 'a macchia' dei due *Baccanali* è in perfetta sintonia con i veloci schizzi sulla carta in cui Poussin acquarellava figure, forme e masse chiaroscurali dopo aver accennato con la penna esili contorni; ciò è subito evidente se si confrontano alcuni dettagli delle due tele di Palazzo Barberini con i due disegni riportati in questo stesso volume nel saggio di Helen Glanville (cfr. figg. 5 e 6 a p. 19).

Il supporto impiegato nei due dipinti ha armatura a tela, con tramatura molto fine e serrata (18 x 20 fili/cm)[10]. Una tessitura così fitta è insolita per i dipinti del primo soggiorno romano di Poussin (invero abbastanza anche per quelli del secondo periodo, soprattutto se si escludono le saie e i dipinti su seta)[11], ma si spiega con l'atipica tecnica utilizzata in questi due *Baccanali*, con strati pittorici sottili e la preparazione, anch'essa sottilissima (al punto da far credere al loro antico proprietario che in entrambi i casi fosse stata impiegata una "tela sottile tinta di rosso senza preparazione")[12], lasciata spesso a vista. Le caratteristiche omogenee tra i supporti, tali da farli ritenere derivati da un'unica pezza, consentono di confutare precedenti ipotesi in merito all'esecuzione dei due dipinti in momenti cronologicamente distinti[13], posizioni peraltro non condivise dal resto della critica.

Le tele sono ricoperte da un sottilissimo strato preparatorio di colore rosso-bruno, che lascia perfettamente a vista la tramatura, soprattutto nelle zone in cui il colore della preparazione è stato intenzionalmente utilizzato 'a risparmio' nei mezzi toni e nelle ombre dei bruni e degli incarnati. In passato la tramatura così a vista aveva fatto supporre che il pittore avesse impiegato una tela preparata col gesso solo sul retro, "con la funzione di assorbire l'eccesso di liquido della tempera"[14], che l'estensore della scheda storico-artistica nel catalogo del 1985 mette in relazione con analisi pioneristicamente pubblicate da Otto Grautoff riguardo a una *Scena bacchica* nella Staatliche Gemäldegalerie di Kassel, ma che invece dicono

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Fig. 3 – *Baccanale* 2592, particolare dei due putti che si abbracciano sulla sinistra.

4

Fig. 4 – Nicolas Poussin, *Agar e l'angelo*, olio su tela, 98 x 73 cm, Roma, Galleria Nazionale d'Arte Antica in Palazzo Barberini, inv. 2608. Particolare con la figura di Agar.

5

Fig. 5 – Nicolas Poussin, *Agar e l'angelo*, olio su tela, 98 x 73 cm, Roma, Galleria Nazionale d'Arte Antica in Palazzo Barberini, inv. 2608. Particolare con la figura dell'angelo.

6

esattamente il contrario, ossia che una spessa preparazione bianca a base di gesso ("Kreide") stesa in tre o quattro strati rende la superficie pittorica totalmente liscia ("vollkommen glatt")[15]. Un prelievo dal retro del *Baccanale* 2592 effettuato durante il restauro ha indicato la presenza di gesso e polisaccaridi[16], ma il fatto che tale materia non ricoprisse la tela sotto il perimetro del telaio ha escluso l'ipotesi di una sorta di apprettatura per irrigidire la tela prima di dipingerla, lasciandola scoperta sul recto[17]; d'altra parte, che si trattasse di un intervento legato a un restauro era stato già compreso da molto tempo[18].

Sopra la preparazione rosso-bruna è stato eseguito il disegno con medium secco che ha lasciato una sottilissima traccia (Fig. 6). I tratti appaiono limitati ai contorni strettamente indispensabili, e rare volte il tratto è stato ripetuto per variare seppure di poco l'ingombro delle figure (Figg. 7-8).

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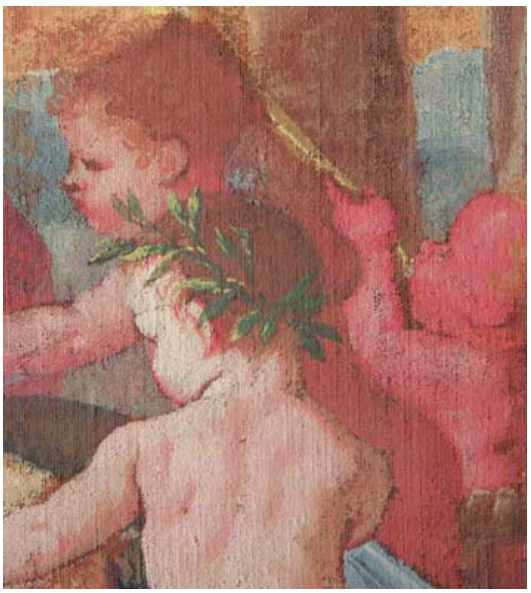

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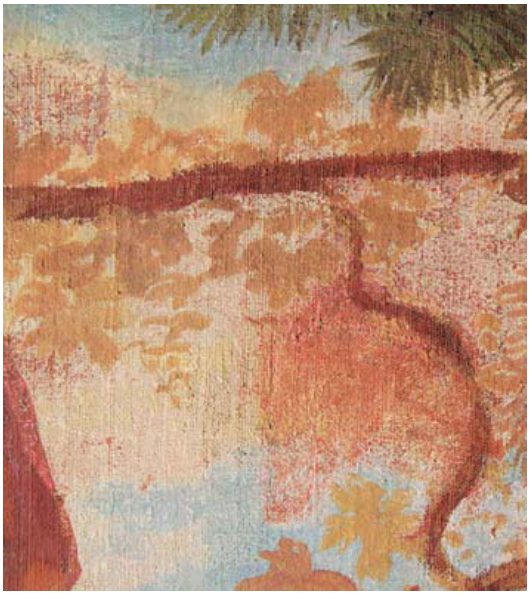

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Fig. 6 – *Baccanale* 2592, particolare dell'albero sul lato sinistro del dipinto, riflettografia IR.
Fig. 7 – *Baccanale* 2592, particolare delle gambe e della pancia del putto bocconi accanto a quello seduto con l'anfora, riflettografia IR.
Fig. 8 –*Baccanale* 2592, particolare del putto seduto con l'anfora, riflettografia IR.

Fig. 9 – *Baccanale* 2593, particolare con le teste dei tre putti davanti alla palma.
Fig. 10 – *Baccanale* 2593, particolare della pertica che sostiene il drappo.


11a


11b

Sopra tale disegno si è poi proceduto a stendere il colore a macchia, senza troppo lavorare i passaggi di tono per sfumare e tornire i volumi. Allo stesso modo, nei limiti del possibile, sono state pure limitate al massimo sovrapposizioni di stesure di colore differenti. Come si è già accennato, la preparazione è stata di frequente lasciata a vista o coperta da sottilissime velature scure nei mezzi toni e nelle ombre dei bruni e degli incarnati, nonché nei passaggi tra le differenti campiture, soprattutto tra gli incarnati di personaggi differenti (Figg. 9-10). Nelle parti più in luce, invece, i passaggi tra due campiture distinte sono stati enfatizzati con sottili pennellate di colore bruno molto scuro o nero.

Solo in un caso, nel *Baccanale* 2592, è stata rilevata quella che sembra essere una linea di costruzione, costituita da un tratto obliquo (Fig. 11). Tale tratto non mostra in ogni caso un legame diretto con quanto rappresentato nelle adiacenze e, allo stesso tempo, non costituisce una delle diagonali della composizione.

Pentimenti rispetto a quanto impostato col disegno sono rari, seppur significativi, stranamente fre-

Fig. 11 – *Baccanale* 2592, probabile linea di costruzione in corrispondenza delle porzione di cielo compresa tra i due tronchi: (a) visibile e (b) riflettografia IR.
Fig. 12 – *Baccanale* 2593, particolare delle corna dell'ariete, riflettografia IR.
Fig. 13 – *Baccanale* 2593, particolare del canestro con pomi tenuto inclinato dal putto all'estrema destra, riflettografia IR.
Fig. 14 – *Baccanale* 2593, particolare delle stoviglie metalliche che si vedono tra le zampe dell'ariete, riflettografia IR.


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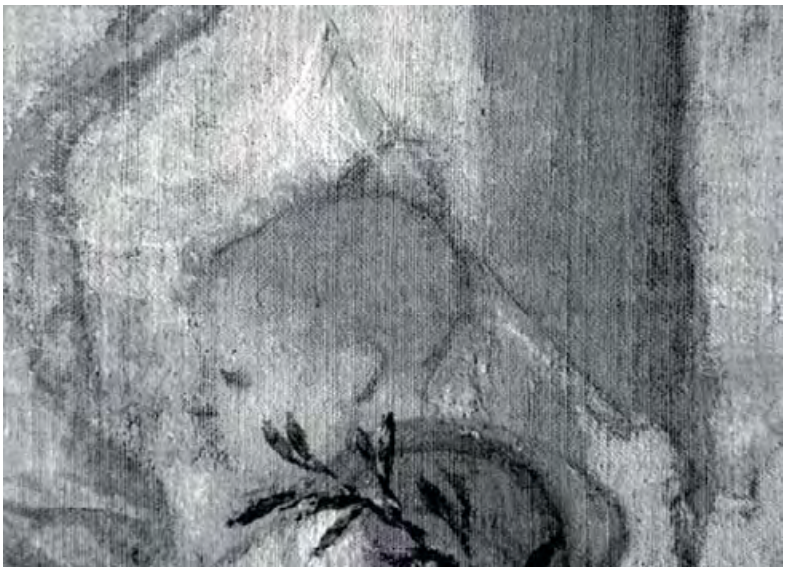
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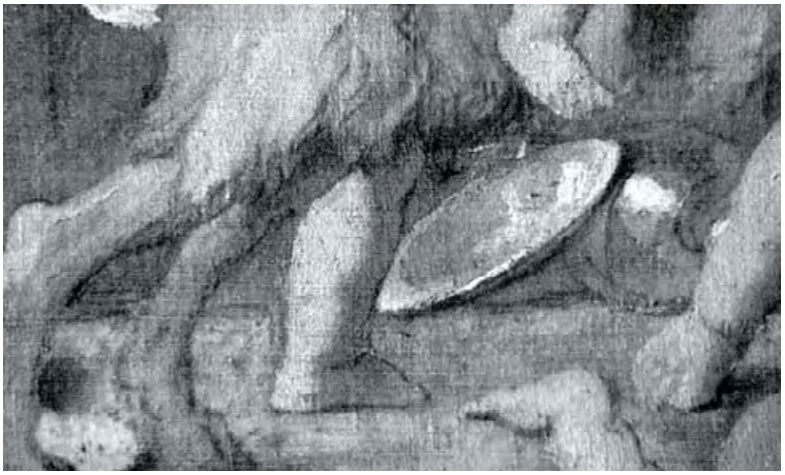

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Fig. 15 –*Baccanale* 2592, particolare delle stoviglie metalliche che si vedono tra le zampe dell'ariete, riflettografia IR.

quenti nella composizione con meno figure, il *Baccanale* 2593. Le corna dell'ariete bianco sono state disegnate molto più lunghe rispetto a quanto dipinto (Fig. 12), il canestro con pomi tenuto dal putto all'estrema destra era stato impostato con un manico non dipinto (Fig. 13) e, soprattutto, lo strumento suonato dal secondo putto a destra, in secondo piano, ha mutato la forma del padiglione (Fig. 14). Questo, disegnato a campana, è divenuto conico nella redazione pittorica, il che rende conto di un adeguamento "antiquariale", assimilando lo strumento a una sorta di piccola buccina. Nel *Baccanale* 2592 è stato invece riscontrato un unico pentimento, se così si può chiamare, e concerne la forma delle stoviglie di metallo che si intravedono tra le gambe dell'ariete: quella in secondo piano era anch'essa un piatto, disposto quasi frontalmente (Fig. 15).

Note

[1] 74,5 x 85,5 cm, inv. 2592; 56 x 76,5 cm, inv. 2593.

[2] Amadio 1998, p. 147. 1666: "Un quadro in tela di 3 palmi con Cornice tutta dorata con un Baccanale dipinto a guazzo mano di Monsù Pusino … Un quadro in tela da testa con cornice tutta dorata con un Baccanale dipinto a guazzo, mano del sud.o Pusino" (Biblioteca Apostolica Vaticana, Archivio Chigi, 702, c. 59v). 1692: "Un Quadro in Tela di 3 p.mi, con Cornice tutta dorata, con un Baccanale dipinto a Guazzo mano di monsù Possino … Un Quadro in Tela da testa, con cornice tutta dorata, con un Baccanale similm.e dipinto à Guazzo mano del sud.to Possino", (Biblioteca Apostolica Vaticana, Archivio Chigi, 700, cc. 52, 61). Si veda anche nel Getty Provenance Index Databases, Items 0005-0006 from Archival Inventory I-249, dove "guazzo" è erroneamente trascritto "quarzo".

[3] Ai due *Baccanali* ex Incisa Della Rocchetta si è poi aggiunta l'*Agar e l'angelo* di Palazzo Altieri (olio su tela, 98 x 73 cm, inv. 2608), acquistata nel 1983 in un'asta Finarte, dotando in questo modo il museo di due opere pressoché degli esordi e di una della fase estrema del pittore, essendo l'*Agar* solitamente ritenuto un frammento di una composizione rimasta incompiuta alla morte del pittore, ottenuto con un taglio lungo il bordo sinistro, nella direzione indicata dall'angelo ad Agar. Per verificare la consistenza di quest'ipotesi il quadro è stato smontato dalla cornice e parzialmente aperta la rifinitura di carta gommata che copre tutto il perimetro. La tela originale, molto fina e fitta, gira sul telaio solo in alcuni punti, dove è anche possibile vedere i buchi e le deformazioni tipiche della trazione di vecchi chiodi. Questo bordo appare molto irregolare, arrivando appena al limite del telaio in molti punti e girando non oltre il centimetro in altri. Tutto ciò non sembra dunque suffragare l'ipotesi sopra ricordata, a meno che il taglio sia avvenuto quando ancora la tela e la preparazione erano sufficientemente elastiche, ossia a pittura ancora fresca, in modo da adeguarsi alle tensioni sviluppate dall'ancoraggio sul nuovo telaio, dopo il cambiamento di formato.

[4] Bon Valsassina 1985, pp. 80-89. Tranne i contenuti tecnici, le informazioni presenti nel catalogo sono state in buona parte ripetute nel catalogo di una successiva esposizione, sempre a Palazzo Barberini. Vodret 1995, schede 3-4, pp. 48-53.

[5] Le riprese sono state effettuate con fotocamera digitale SONY V1-DSC, obiettivo Carl Zeiss 7/28 e filtro con limite di sensibilità 0.95 µm.

[6] È stato verificato che il *Baccanale* di dimensioni minori (inv. 2593) mostra lungo tutto il perimetro le deformazioni ad arco dovute al tensionamento della tela sul telaio mediante chiodi, quindi se riduzione v'è stata, dev'essere stata di piccola entità. L'antico proprietario ha infatti rilevato che "la tela originale fu foderata e sensibilmente ridotta su tutti i lati, come mostrano i lembi dipinti inchiodati sul telaio" pur concordando sul fatto che i due dipinti non avessero in origine le stesse dimensioni. Incisa Della Rocchetta 1951, p. 39.

[7] Bellori 1672, pp. 411-412. Questo brano dalla *Vita* di Poussin ha un corrispettivo in quella di Duquesnoy: "Grandi erano gli studi, ne' quali egli si esercitava, habitando insieme con Nicolò Pussino, dove l'amistà, e la consuetudine con questo raro ingegno fù molto utile, ed opportuna à lui per sollevarsi alle forme antiche più belle, modellando le statue di maggiore stima … si applicò tutto à studiare li putti di Titiano, con occasione che nel Giardino Ludovisi vi era il celebre quadro de gli Amori, che giocando si tirano pomi, donato dopo al Rè di Spagna. Espresso Titiano mirabilmente i putti nell'età più tenera, e con delicatezza si avanzò sopra ciascuno. Se ne invaghì Francesco, e li tradusse in varij gruppi di mezzo rilievo, e seco insieme li modellava Nicolò Pussino su la creta. Di qui Francesco prese lo stile bello de' putti che gli hà fatto tanto honore nella scoltura, e che egli eseguì meglio di ogn'altro, con lo scarpello, come anderemo hora descrivendo alcune inventioni di sua mano". Bellori 1672, pp. 270-271.

[8] Cfr. nota 2; agli inventari del 1666 e del 1692 deve essere aggiunto anche quello del 1698, relativo all'eredità del cardinale Flavio Chigi (Biblioteca Apostolica Vaticana, Archivio Chigi, 1805, cc. 118 e 119).

[9] La pittura *a guazzo* era solitamente impiegata per progetti e realizzazioni veloci, soprattutto per il teatro e per apparati effimeri. Bellori testimonia che Poussin aveva dato prova di un'eccezionale rapidità esecutiva in questa tecnica immediatamente prima della partenza per Roma: "L'anno 1623. nel quale li Padri Giesuiti celebravano la Canonizzatione di Santo Ignatio, e di San Francesco Xaverio, li scolari di Parigi havendo intrapreso un magnifico apparato, facevano dipingere li miracoli di questi due Santi, fù introdotto Nicolò al lavoro, con sei historie grandi à guazzo, che per la molta pratica acquistata, egli terminò in altrettanti giorni, con la celerità maggiore". Bellori 1672, p. 410.

[10] Nel catalogo del 1985 la direttrice del restauro descrive il supporto del *Baccanale* 2592 come un "lino leggero appartenente a una tovaglia o comunque a un oggetto di uso domestico" (Bon Valsassina 1985, p. 86), mentre la restauratrice, in maniera più sobria e corretta, lo qualifica come una "tela a trama molto fitta e sottile (probabilmente di lino) ad armatura tela" (Bon Valsassina 1985, p. 87); il divario tra le due posizioni è poi aumentato col tempo, fino a portare la direttrice del restauro ad affermare "il supporto del dipinto è costituito da un modesto oggetto casalingo, una tovaglietta ricamata a punto smerlo" (Vodret 1995, p. 50).

[11] Ravaud 1994, pp. 33-34.

[12] Incisa Della Rocchetta 1951, p. 39.

[13] Vodret 1995, pp. 48 e 52.

[14] Bon Valsassina 1985, p. 86.

[15] Grautoff 1914, vol. 1, p. 413. Tali informazioni erano state già da molti lustri correttamente interpretate da Giovanni Incisa Della Rocchetta, nell'articolo sui due *Baccanali*, quando erano ancora di sua proprietà. Incisa Della Rocchetta 1951, p. 40.

[16] Bon Valsassina 1985, pp. 88-89.

[17] Bon Valsassina 1985, p. 87.

[18] "La tinta bianca sul rovescio della tela fu data perché la vernice stesa sulla pittura a guazzo non passasse da parte a parte". Incisa Della Rocchetta 1951, p. 39.

Transmitted Light Infrared Imaging of Two Paintings by Poussin at the Cleveland Museum of Art

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Marcia Steele

Transmitted light infrared imaging has become a more common technique for examining paintings in recent decades. Because they reveal infrared absorption of all the layers of the painting, these images have specific advantages and can provide additional information when combined with other methods of examination, such as reflected IR images and x-radiographs.[1] Two paintings by Poussin in the collection of the Cleveland Museum of Art make good candidates for comparison using transmitted IR images, specifically in combination with x-rays; an early larger work from 1625-27, *Nymphs and a Satyr (Amor Vincit Omnia)* (CMA 1926.26) (Fig. 1) and his later masterpiece *The Holy Family on the Steps* from 1648 (CMA 1981.18) (Fig. 2).[2] When comparing overall images and details, Poussin's artistic finesse of the later painting becomes apparent. Specifically, the differences in the handling of the flesh tones are easily distinguished with these imaging techniques as well as microscopic surface examination.

In traditional IR reflectography, the light source and the IR imager or camera are set up facing the front of the painting. Simply put, it is used primarily to reveal layers just below the paint surface, in particular, the underdrawing in carbon black, which absorbs the IR radiation on a light ground layer that reflects it. The image provided differentiates the IR absorbency and/or reflectance of materials.[3] In transmitted IR, the lights are set up to illuminate the back of the painting, penetrating the canvas, ground, and paint layers, with the IR camera positioned at the front of the painting.[4] (For a description of the setup used at the Cleveland Museum of Art, see following section by Dave Piurek). Since the light (or radiation) passes through the painting from one direction, from the back through the front of the painting, or vice versa, the ability of the various layers and materials to absorb or to scatter IR radiation is diminished compared to IR reflectography where the IR radiation is penetrating as well as reflecting back off the surface. In transmitted IR, the transparency of a pigment such as lead white, which is low absorbing in IR, is increased by the elimination of surface reflection. Areas containing this pigment appear dark on the transmitted light image while they are lighter on an IR reflectogram. Additionally, transmitted IR images can uncover artist changes masked using other examination techniques.[5]

While both Poussin canvases at the Cleveland Museum of Art have been lined, it is apparent that they have similar transparency in normal transmitted light (Figs. 3 and 4).[6] Transmitting light through the painting and capturing the image with a con-

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Fig. 1 – Nicolas Poussin, *Nymphs and a Satyr* (*Amor Vincit Omnia*), 1625-27, oil on canvas; 97 x 127.5 cm. The Cleveland Museum of Art, Gift of J. H. Wade, 1926.26.

Fig. 2 – Nicolas Poussin, *The Holy Family on the Steps*, 1648, oil on canvas; 73.3 x 105.8 cm. The Cleveland Museum of Art, Leonard C. Hanna Jr. Fund, 1981.18.

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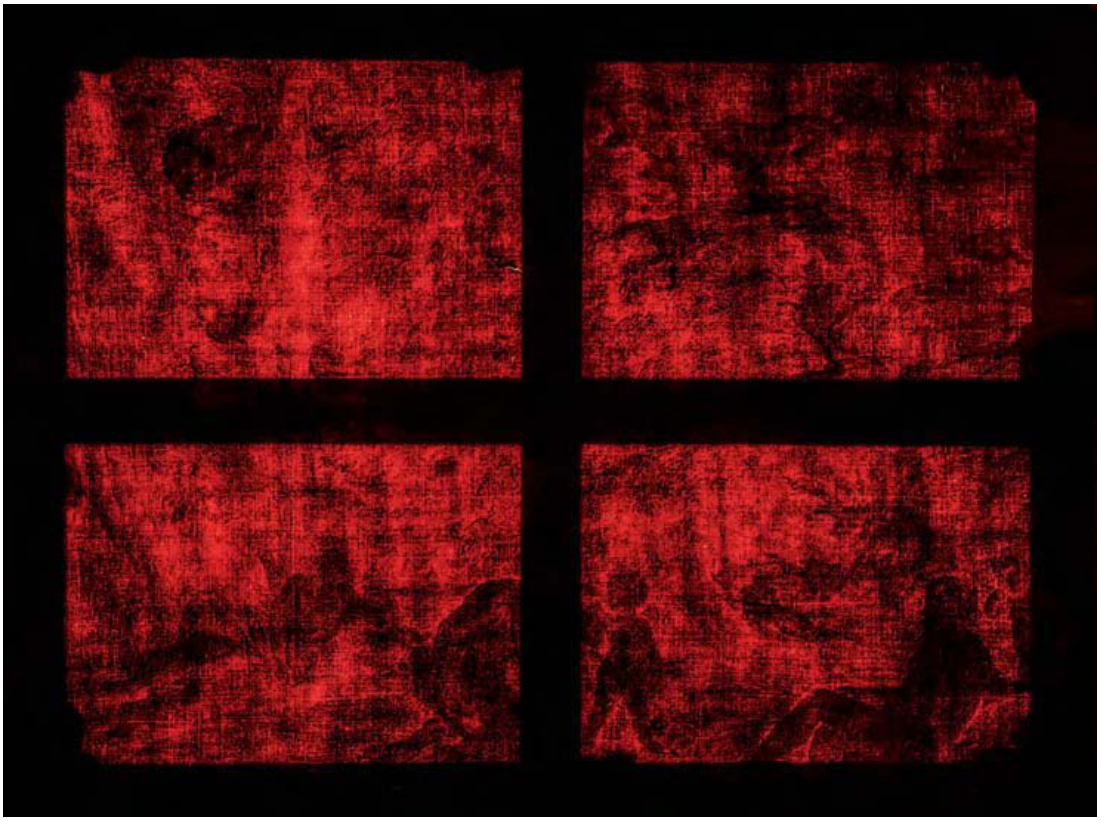

Fig. 3 – *Nymphs and a Satyr*, normal transmitted light.

Fig. 4 – *The Holy Family on the Steps*, normal transmitted light.

ventional camera reveals the varying thickness of the paint layers as well as the ability to transmit and/or absorb both IR and visible light through the painting.[7] Therefore, it is the first step in our procedure and is followed by capturing the transmitted image with the Osiris IR camera.[8] Comparing visible light details with the x-ray, overall and transmitted light IR aids in understanding the relationships of the different materials in the painting. For example, the thicker highlight in Christ's forehead in *The Holy Family on the Steps* appears white in the normal light and x-ray, but dark in the transmitted IR, where it is absorbing more IR than the surrounding area. The paint in the forehead blocks the transmitted normal light, while in the x-ray it is quite radio-opaque. (See Fig. 13)

In transmitted IR, the most striking contrast of the two paintings is the appearance of the figures. In the earlier painting of *Nymphs and a Satyr*, they register as dark while in the *Holy Family*, the flesh

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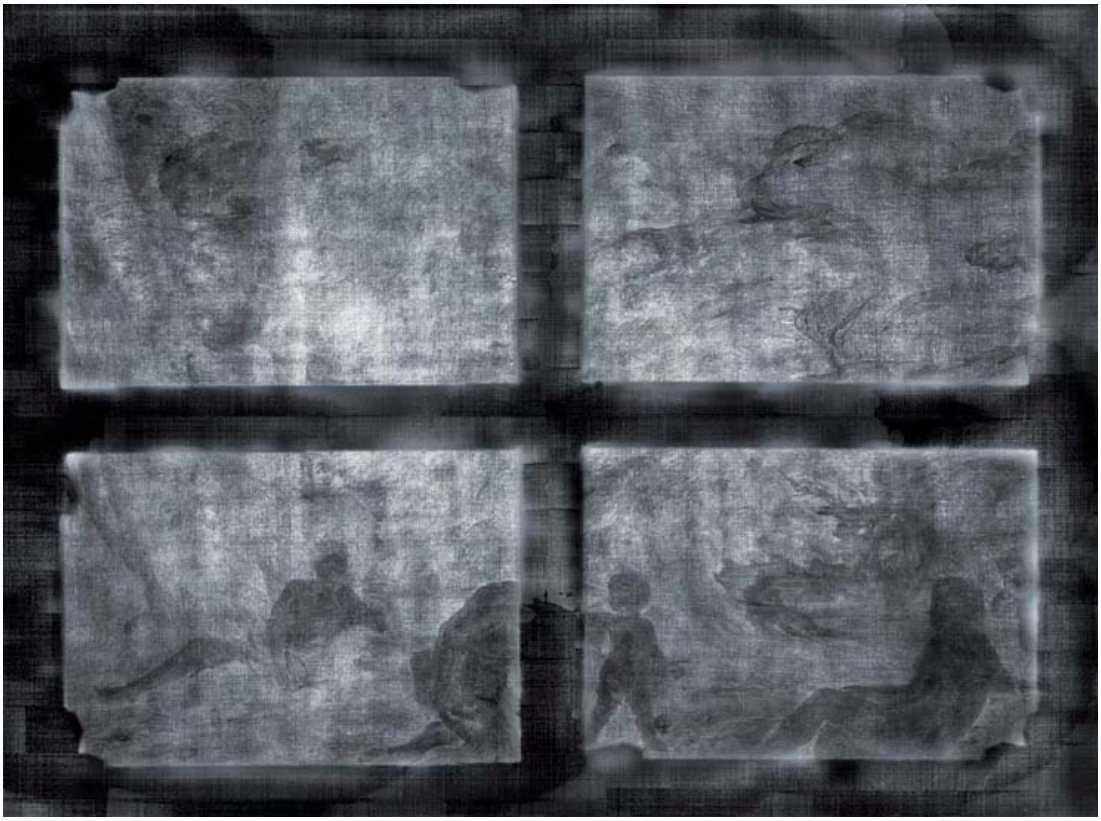

Fig. 5 – *Nymphs and a Satyr*, transmitted IR.

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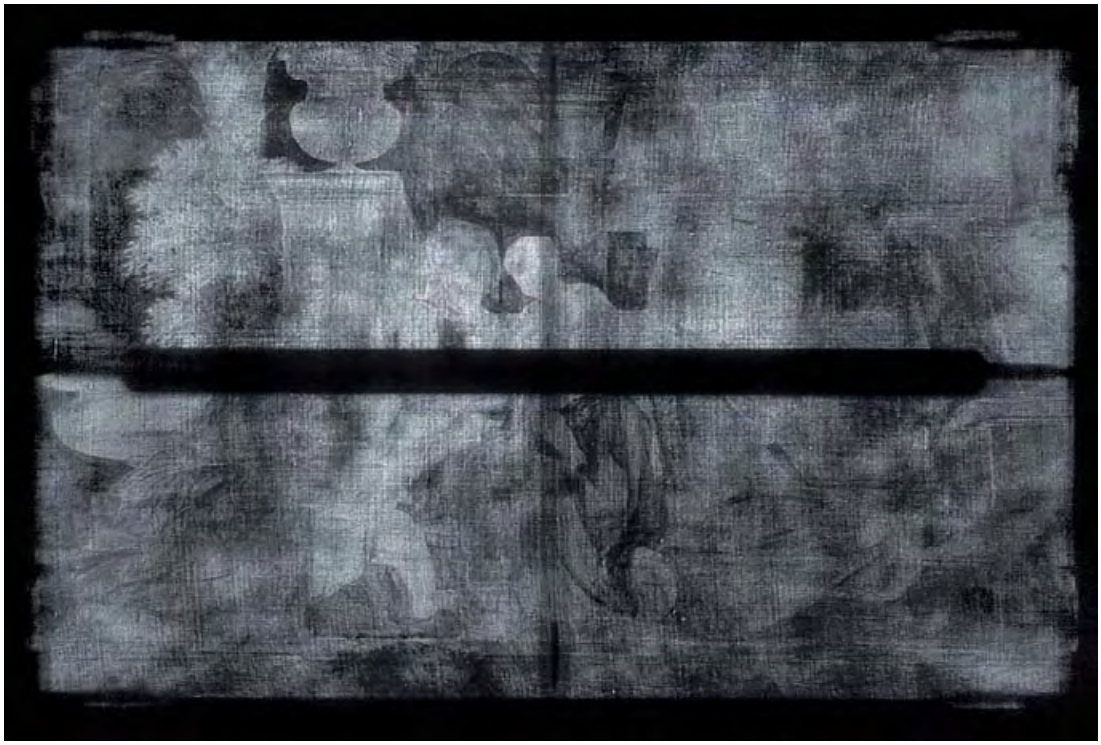


Fig. 6 – *The Holy Family on the Steps*, transmitted IR.

tones of the Virgin, Christ, and St. John are quite light.[9] In the earlier painting the background of *Nymphs and a Satyr* appears rather amorphous with only the thin strands of the edges of the clouds decipherable as dark curves (Fig. 5). This suggests the uniformity of the transparency of the pigments used throughout the background in the ground and paint layers, as well as lack of compositional alterations. In the image captured with transmitted IR, the background of *The Holy Family on the Steps* shows distinct architectural forms as well as the vases and orange tree in the left of the composition (Fig. 6). It also reveals changes to the upper left architecture only partially visible with the x-ray. See for example, the arch above the heads of Mary and Christ near the top of the painting, which was later painted out.[10]

Overall comparison of the x-rays of the two paintings shows that the earlier *Nymphs and a Satyr* was painted on a looser weave canvas with

Fig. 7 – *Nymphs and a Satyr*, x-ray.

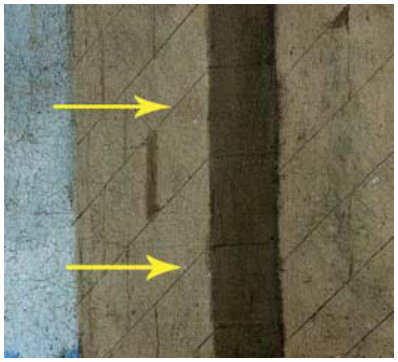
Fig. 8 – *The Holy Family on the Steps*, x-ray.

thicker threads and the areas of the trees and foreground are generally darker in appearance than the *Holy Family* x-ray (Figs. 7 and 8).[11] The darkness is probably attributed to more limited use of radio-opaque pigments in the mythical scene. The x-ray of the *Holy Family* reveals numerous changes in the background and more prevalent use of radio-opaque pigments throughout the background. The x-ray of *Nymphs and a Satyr* reveals that the distant embracing figures, as well as the prominent female figure on the right, were added over the background. The reclining foreground nude has fine contours of radio-opaque pigment absent in the other figures, which are shrouded in the shadow of the trees. (These fine thick contours appear as very thin dark lines in the

transmitted IR image.) An overview of the brushwork and handling of the flesh tones in the x-rays of the two paintings reveals that the figures of the nymphs and satyr were laid in with rapid, coarse brushwork. The flesh tones have consistent opacity throughout each figure as well as from figure to figure. In contrast, the flesh tones of the members of the holy family are more delicately handled with more contrast within each figure, as well as from figure to figure, indicating Poussin's reliance on glazing and more economical brushwork. The use of incised lines is seen in both x-rays. Those in the *Holy Family* primarily relate to the perspective, for example, in the brickwork of the walls that flank the right and left of the composition (Fig. 9).[12] In the other painting of *Nymphs and a Satyr*, they appear to be placement marks for the figures. For instance, they are found in the leg and head of the central putto and are also visible microscopically (Figs. 10 and 11).

Surface examination of both paintings with magnification illustrates Poussin's use of monochrome underlayers that have been observed in other paintings by the artist.[13] In *The Holy Family on the Steps*, Poussin varied the value of the underlying gray layer according to the corresponding area of shadow or highlight to follow. The tonality of these underlying layers creates subtle differences between the figures. For example, green gray lies below Mary's hand, where warm dark gray is beneath the dark shadows of Elizabeth's face. Luminous orange contours of the figures are created using bright orange and rich red glazes.[14] The contours of the figures in *Nymphs and a Satyr* lack the glazes found in the *Holy Family* and are defined instead with more opaque applications of orange, pink, and red. While no cross sections have been taken of *Nymphs and a Satyr*, microscopic examination shows a narrower range of monochrome underlayers with light tan used in the sky and background and only minor variations of gray and brown in the flesh tones. The sky is similar in distribution of ultramarine blue pigment throughout except for the thicker contours of the clouds.[15] The landscape is painted with thin layers of brown and green, with lighter green highlights created using higher concentrations of yellow. In contrast, Poussin made significant changes in the upper left background of *The Holy Family on the Steps*. For the sky, he used two layers of ultramarine blue. The lower layer is darker and was applied to cover the warm brown ground.[16] The upper layer of brilliant blue imparts a cooler tonality and was used for darker shades in the clouds.[17]

Comparison of the central figures in each painting reveals only the most intense highlights in the foreheads of Mary and Christ register as dark in the transmitted IR image, indicating a specific placement and use of pigments that absorb the IR wavelengths. In contrast, the main figures in the other painting are almost completely dark. Comparing the IR transmitted detail of the head of Christ in the *Holy Family* with that of the central putto in *Nymphs and a Satyr* reveals that in both cases the contour is carefully delineated and stands out from the surrounding area (Figs. 12 and 13). Overall, the head of Christ does not absorb the IR wavelengths as much as the head of the putto, which is likely a result of the materials used in the two different areas.[18] For the head of the putto, Poussin painted the light color of the flesh tone in a fairly uniform consistency and thickness over a light gray underlayer. He then used a reddish brown to set in the placement of the eyes, mouth, and nostrils, as well as for the shadows and base color for the hair. Bright red was employed for his lips and nose tip. This same red pigment was muted with more white and used for the flushed cheeks. The eyes were finished with a pink orange color to define the shape of the eyes with dabs of light gray for the pupils. The base color for the hair was accented with golden locks and lighter gold highlights for the curls. In short, Poussin built up the flesh tone in a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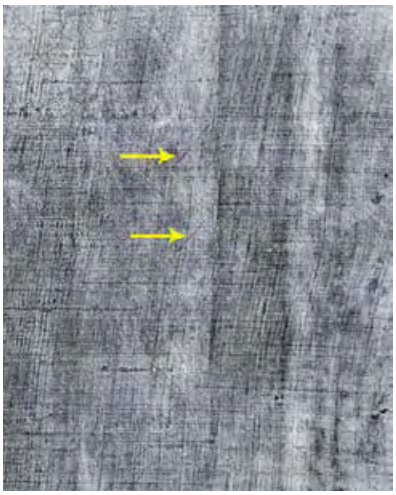
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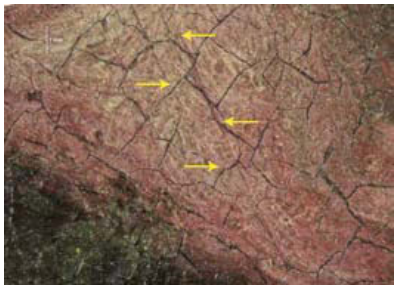
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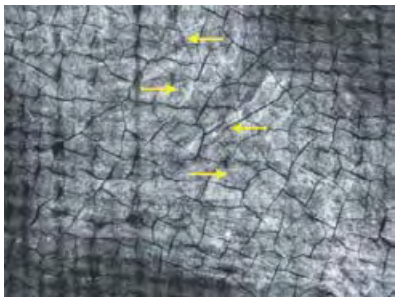
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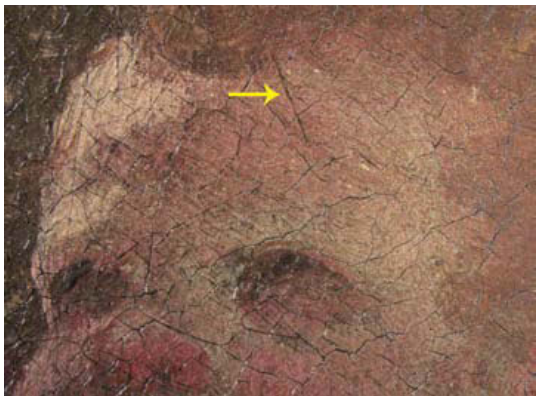
Fig. 9 – *The Holy Family on the Steps*, detail of incised lines in normal light and x-ray in right wall.

Fig. 10 – *Nymphs and a Satyr*, incised lines in normal light and x-ray in foot of central putto.

Fig. 11 – *Nymphs and a Satyr*, incised lines in normal light and x-ray in head of central putto.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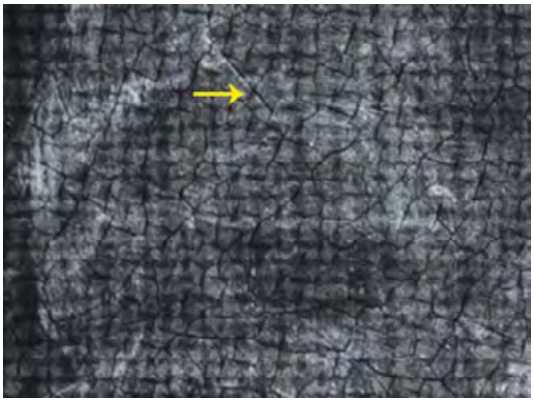
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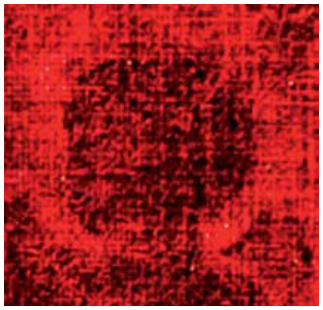
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12c


12d


13a


13b


13c


13d

Fig. 12 – *Nymphs and a Satyr*, visible light, transmitted visible light, transmitted IR and x-ray detail of the central putto.

Fig. 13 – *The Holy Family on the Steps*, visible light, transmitted visible light, transmitted IR and x-ray detail of the head of Christ.

Fig. 14 – *Nymphs and a Satyr*, microscopic detail of the eye of the central putto.

Fig. 15 – *The Holy Family on the Steps*, microscopic detail of eye of Christ.

Fig. 16 – *Nymphs and a Satyr*, visible light, transmitted IR and x-ray detail of the left foot of the central putto.

Fig. 17 – *The Holy Family on the Steps*, visible light, transmitted IR and x-ray detail of the left foot of the baby John the Baptist.

Fig. 18 – *Nymphs and a Satyr*, visible light, transmitted IR and x-ray detail of the foot of the left nymph.

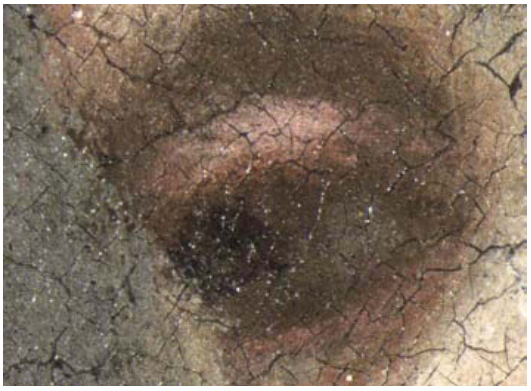
Fig. 19 – *The Holy Family on the Steps*, visible light, transmitted IR and x-ray detail of Joseph's foot.

fairly straightforward manner, starting with the base light flesh tone for the overall shape of the head and using other pigments on top to define the shadows and other details. In contrast, the face of Christ in the *Holy Family* was created using the light flesh tone only where needed for the highlights of the cheeks, nose, forehead, and chin. Here, Poussin adjusted the transparency and thickness of the uppermost paint layers, using the color of underlying passages for the shadowed side of the face. The transition between highlight and shadow was blended with a thin glaze of red creating the flush of the cheeks. The eyes were created with finer detail and accents of color in the eyelid that are absent in *Nymphs and a Satyr* (Figs. 14 and 15).

The x-rays details of these same areas are also differentiated by the use of radio-opaque pigments in each (Figs. 12 and 13). In the *Holy Family*, the head of Christ appears as a combination of extremes of dark and very light passages, confirming Poussin's use of lead white only for the highlights. The forehead and cheeks are bright in relation to the eyes and hair. In the latter two areas, the ground was used for an undertone and only thinly covered. Here, the use of underlying tones for shadows, eye placement, and hair contour shows a much more sophisticated approach to the creation of forms. The x-ray of the head of the main putto in *Nymphs and a Satyr* reveals more consistent use of radio-opaque pigment with facial features that are recognizable through the buildup of paint described above. Extending the comparison to the bodies of the two central figures, the x-rays confirm, as well as accentuate the differences. Again, the shadows of the putto are fully visible as brushstrokes with a shadow painted on top, whereas the body of the Christ child in the *Holy Family* displays more contrast between lights and darks, reflecting subtle layering and use of underlying tones for shadows.

Unfortunately, the crossbar of the stretcher in the *Holy Family* blocks the faces of St. Elizabeth and Joseph in the transmitted IR image, but a comparison can be made between of the feet in each painting, in conjunction with the x-rays. For example, the foot of the baby John the Baptist in the *Holy Family on the Steps* and the proper left foot of putto in the other painting (Figs. 16 and


14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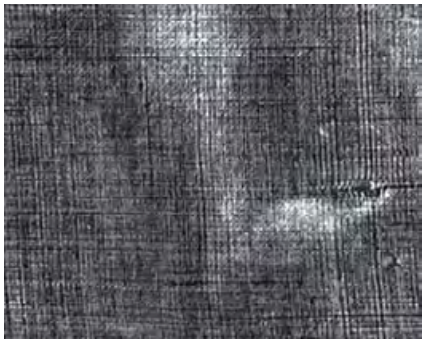
16a


16b


16c


17a


17b

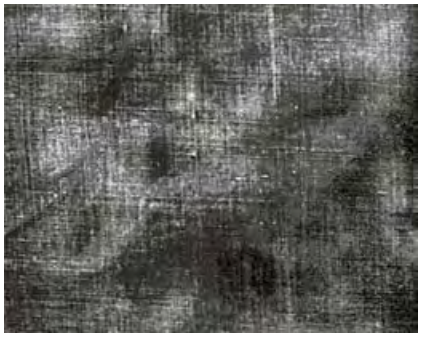

17c


18a


18b


18c


19a


19b


19c

17). Like the other figures, the main difference in transmitted IR is the dark appearance of the flesh tones in the *Nymphs and a Satyr* compared to the light forms seen in the *Holy Family*. Again, the handling of paint in the *Holy Family* is much more sophisticated. The toes are created with a juxtaposition of bright white for the highlights and the underlayer for the shadow and a fine thin glaze of red to blend the highlights and shadow and accent and enliven the heel. In the *Nymphs and a Satyr* the foot is more simply painted with a more generous application of reddish glaze and the toes merely described by outlining in brown over the flesh tone.

Comparing two other feet with transmitted IR shows that Joseph's foot in the later painting is barely distinguishable as only a vague dark shadow, whereas the form of the foot of the left nymph in *Nymphs and a Satyr* is clearly visible (Figs. 18 and 19). Corresponding details of each area in the x-ray reflect the subtle handling of Josephs' foot. The only recognizable anatomical features present are the highlights along the top of the foot and big toe, the bone to the fourth toe and the area just below the little toe. In contrast, the foot of the nymph has similar density of pigment throughout, with slightly more radio-opaque pigment around the toes, top of the foot, and heel. Microscopically,

the nymph's foot is built up with an additional layer of paint over the base light brown color, containing a concentration of red particles; the spaces between the toes are simply articulated with single strokes of opaque brown paint on top. The foot of Joseph, by contrast contains subtle blending between the highlights and shadows of varying thickness over a dark gray layer. A fleck of white highlight is found in the big toenail. A final bright red accent on the side of the foot by the little toe gives the foot animation that is lacking in the other painting.

In conclusion, when viewed together the variety of technical images provides information that gives a fuller understanding of the technique and materials used in two paintings by Poussin at the Cleveland Museum of Art. The combination of transmitted IR images and x-rays shows a stark contrast in paint handling and layering between the painting from 1625-7 and that of a more mature artist in 1648. The differences are further exemplified and understood through microscopic examination. These imaging techniques, in particular transmitted IR, could be used in the examination of other Poussin paintings to deepen our understanding of the working methods in different periods of his oeuvre.

Notes

[1] For technical information about this technique, see Kushel 1985 and Rischer 2006. Further extensive research into the appearance of different pigments in transmitted IR has not been published. Personal communication, Jiuan Jiuan Chen, Assistant Professor, Art Conservation Department, SUNY Buffalo State, New York, December 8, 2014.

[2] *Nymphs and a Satyr* measures 97 x 127.5 cm; *The Holy Family on the Steps* is 72.3 x 105.8 cm.

[3] For paintings with red or dark ground layers, IR images done in the more usual fashion, with lights and camera facing the painting, usually provides little information regarding changes or underdrawing.

[4] This can also be done by illuminating the painting from the front with the camera facing the back of the painting, but focusing can be more difficult. The lining and lining adhesive seem to interfere with the image only if a painting is lined with lead white adhesive. Generally, the side offering the least impediment to the passage of IR radiation should face the camera.

[5] Conservators most often use x-rays to discern changes and underlying paint layers. Transmitted IR has the advantage of transparency of materials that would otherwise be obscured in x-rays. For example, lead white is quite absorbent in x-rays, appearing white on x-ray film, but the same pigment poorly absorbs the IR wavelengths; areas containing this pigment appear dark in the transmitted IR images of the Poussin paintings. It should be noted that conservators customarily use x-ray film to observe x-ray absorption of different components. Paint layers containing higher atomic numbers (such as lead white or cadmium yellow) absorb or block x-rays better than those with lower atomic numbers. In the films that are customarily used for observation and publication, these areas painted with pigments such as lead white or cadmium red appear whiter than those painted with pigments containing iron or carbon.

[6] *Nymphs and a Satyr* was lined with wax-resin adhesive in 1968. *The Holy Family on the Steps* was relined with wax-resin adhesive and thin paper interleaf in 1981. The secondary support for both is Belgian linen.

[7] Paintings with multiple layers can appear quite dark during the capture phase but, when manipulated in photoshop, a surprising amount of detail can be obtained.

[8] The camera used at the Cleveland Museum of Art is an Osiris from Opus Instruments. The sensor is an InGaAs array, sensitive to wavelengths from 0.9 to 1.7 microns. The images were captured with a Barr H Filter, limiting the range from 1.5 to 1.8 microns (or 1.7 in this case since that is the higher range of the Osiris IR imager).

[9] Another painting by Poussin, *Holy Family with the Infant St. John the Baptist and St. Elizabeth,* ca. 1650-51, in the Fogg Art Museum, also has a transmitted IR image in which the figures and flesh tones appear similar to *The Holy Family on the Steps*. See Steele 1999, pp. 150-151.

[10] For extensive discussion of the changes in the background, see Sawyer 1999, pp. 114-119.

[11] *Nymphs and a Satyr* has a thread count of 8 vertical and 9-11 horizontal threads. *Holy Family on the Steps* has 20 vertical and 19-20 horizontal threads.

[12] Sawyer 1999, p. 124.

[13] Glanville 1986, p. 25.

[14] Sawyer 1999, p. 121.

[15] Elements present with x-ray fluorescence indicate the presence of ultramarine blue.

[16] The painting has a double ground, with an initial red layer, covered in varying brown and gray layers beneath the paint.

[17] Sawyer 1999, p. 123.

[18] The double ground in the *Holy Family* painting has been analyzed and contains primarily iron and silicon, with lesser amounts of aluminum and lead, and trace amounts of calcium and other elements in the lower red ground. The upper brown/gray ground varies in thickness and consists of primarily lead, with relatively high amounts of iron and silicon, and trace amounts of calcium and other elements. The ground of *Nymphs and a Satyr* was only analyzed using XRF and the resulting spectra has major peaks for lead, calcium, and iron, a minor peak for sulphur, and trace peaks for silicon, potassium, and barium. It is probably a mixture of lead white, calcium sulphate, earth pigments, and barium carbonate or sulphate.

Kermes
NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

The Cleveland Museum of Art Painting Conservation

Transmitted IR Photography Setup

David Piurek

Materials and tools needed

– Three people are needed for setup
– Two Easels similar in size
(Preferably identical vertical H-Frame easels)
– Two straight wooden 2 x 4's
– Measuring tape
– Level
– Clamps (six C-clamps
and four small thumb clamps)
– Bendable mending plates
– Multi-purpose board
– Black opaque fabric
– Black Volara foam
– Scissors / Knife
– Double stick tape
– Screw driver
– Screws
– Push-pins
– Two photo lights
(CMA uses Interfit Stellar Halogen 1000)
– IR imager on tripod

David Piurek
Conservation Technician for Paintings and Frames at The Cleveland Museum of Art.

Procedure

Fig. 1 – Position the two easels side by side facing the same direction.

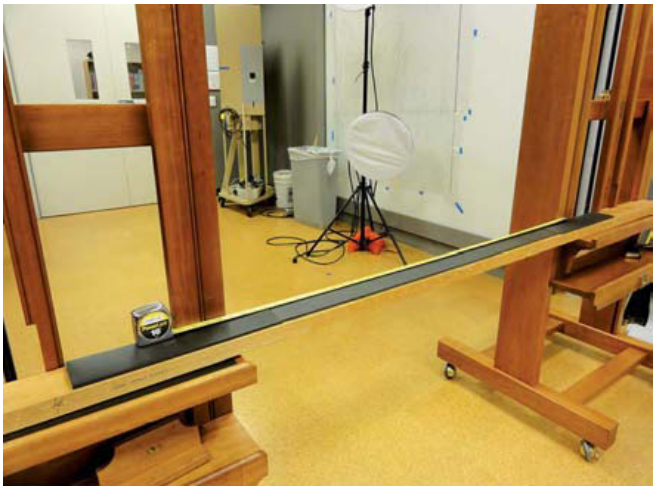


Fig. 2 – Measure width of painting. Position easels at a distance so that the vertical stretcher bars will lean up against the vertical posts of both easels preventing the painting from ever falling backward.

Fig. 3 – The easel will cover approximately ¾ inches of the vertical stretcher bars. Lock wheels on each easel.

Fig. 4 – Clamp one 2 x 4 to the lower bottom tray shelves of the easels.

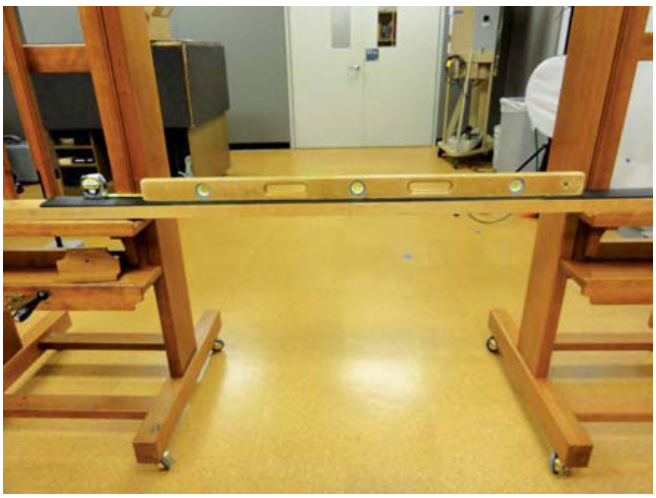


Fig. 5 – Level 2 x 4 and use black Volara foam to pad all surfaces that come in contact with the painting.

Fig. 6 – Clamp the other 2 x 4 to the top sliding brackets of the easels, make sure to place clamps where they won't touch the painting when lowered into place.

Fig. 7 – Before proceeding double check and make sure the structure is sturdy, ensuring all clamps are tight and strong.

Fig. 8 – Place painting on the bottom 2 x 4, up against the vertical posts of both easels. Lower the top sliding brackets on both easels until top 2 x 4 secures the painting.

Fig. 9 – While one person holds the painting in place, another measures the distance from the painting surface to the front edge of the top 2 x 4. This distance will be needed to bend the padded mending plates into a Z shape.

Fig. 10 – Screw padded mending plates into the top 2 x 4 so it lightly touches the face of the painting along the top edge preventing the painting from falling forward.

Fig. 11 – Cut multi-purpose board and clamp to easel frame in order to fill in any gaps and block out light coming from behind.

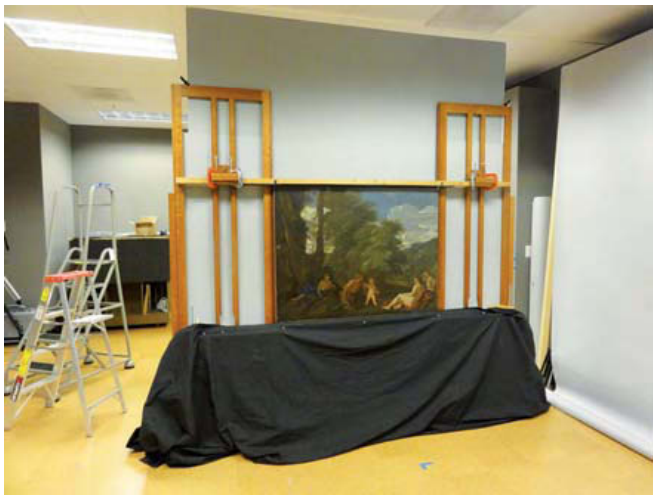


Fig. 12 – Use opaque black fabric to block any additional light, use push pins and small thumb clamps to secure.

Fig. 13 – Block out stands are also used to obstruct unwanted light.

Fig. 14 – Place lights behind the painting at a distance, about three feet.

Fig. 15 – Use a rheostat on the lights to prevent excess heat buildup on the back of the canvas. Monitor the temperature of the painting throughout the process.
(Keep lights off when not in use).

Fig. 16 – Set up IR imager on tripod.

Fig. 17 – Do the focusing while lights are on.

Note

This is a work in progress that we are continually aiming for improvement, for example using opaque black fabric suspended from the ceiling would eliminate the need for multi-purpose board and thumb clamps, making the setup more efficient.

Technical Examination and Conservation of *The Triumph of David* by Nicolas Poussin

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NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Sophia Plender, Aviva Burnstock

1 *Introduction*

In 2004, the Dulwich Picture Gallery London commissioned the conservation and technical examination of Nicolas Poussin's *The Triumph of David* (Fig. 1).[1] This major work, painted in Rome, ca. 1631-33 is one of Poussin's first great masterpieces. The image derives from the Book of Samuel that describes David's triumphal entry into Jerusalem after defeating the Philistines' champion, the giant Goliath, by firing a blow to his forehead using a slingshot.

Poussin's pictorial influences for the composition include an engraving by Giorgio Ghisi after Giulio Romano's *The Triumph of Scipio* (ca. 1533) and Domenichino's fresco of *The Flagellation of Saint* Andrew in the oratory of Sant'Andrea in San Gregorio al Celio, Rome (1608-9).[2]

The Triumph of David was in the collection of paintings from the London picture dealers Noel Desenfans and Sir Francis Bourgeois that was bequeathed by Bourgeois in 1811 to Dulwich College. The painting was one of the key pictures acquired by Desenfans in 1795 (through Jean-Baptiste-Pierre Le Brun, French artist and dealer) from the sale of the collection of Charles-Alexandre de Calonne former finance minister of France.[3]

The present study investigated the materials and techniques used for *The Triumph of David*, together with its condition and conservation history, and these results were considered in the 2004 conservation treatment. These provided new insights into the development of the composition during painting indicated in the x-radiograph taken at the Courtauld Institute of Art, London (Fig. 2).[4] The radiograph shows that Poussin reworked the composition several times, both in the background architecture and in the foreground figures, before finally settling on this arrangement, leading to some debate over the painting's date.[5]

The methods used in this study included examination of paint samples prepared as cross-sections using light microscopy that provided infor-

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Fig. 1 – Nicolas Poussin, *The Triumph of David*, oil on canvas, London, Dulwich Picture Gallery DPG 236.

Fig. 2 – X-radiograph.

Sophia Plender
Consultant Conservator at the Dulwich Picture Gallery, London.

Aviva Burnstock
Head of the Department of Conservation & Technology at the Courtauld Institute of Art, Somerset House, London.

mation about pigments and the order of application of paint layers. Pigments were identified using a combination of light microscopy supplemented by elemental analysis using SEM-EDX. The results were interpreted together with evidence from x-radiography and IR imaging. Details of the methods are given in the Appendix.

2 Condition and conservation history

The painting is generally in good condition and the original twill woven canvas has only a few small old restored tears and the tacking margins appear original and uncut. Structural treatment carried out in 2004 included removal of a degraded lining canvas that probably dated from the early 19th century. The old lining had lost adhesion to the original canvas, and the fine craquelure in the paint layer showed cupping and was no longer securely adhered in some parts. The relining was done using plain woven linen and glue paste. The stretcher dates from the same period as the old lining. Some conservation had been carried out soon after WWII and minor adjustments to repaints and varnish were carried out in the 1980s; these included retouching on the paving stones, in the sky at the top left, and the damaged eye of the central child. The varnish had yellowed and become slightly opaque. The paint surface is in good condition apart from small losses due to scratches and to the tendency of some parts to fracture between layers. There were spots of brown stain in the lighter passages and dark residues of aged varnish caught in the surface texture. There is some wear in the paint surface and in some parts the paint has become more transparent with time, which is likely to have affected the intended gradations in tone.

3 Painting materials and techniques

The painting materials and techniques derive from close examination of the surface, and informed by evidence from technical images and analysis of paint cross sections. Eleven samples of paint were prepared as cross-sections for examination of the layer structure. Samples were taken after removal of varnish and most old repaint and prior to re-varnishing. The tendency of the paint to fracture between layers may be attributed to the extensive changes to the composition made by the artist. This meant that some samples were limited to the upper few layers of paint.

3.1 The support and ground layers

The painting support comprises a single piece of twill woven canvas (thread count 11 x 22 per sq.cm).

The original canvas was prepared with a reddish brown ground containing red, brown and ochre-coloured iron oxide pigments, charcoal, a few particles of lead white and calcium sulphate. Several paint samples show inclusions of lead carboxylate soaps, in different stages of crystallization. Some low protrusions that originate from lead white in the ground or paint, are visible in some areas of the paint surface, and contribute to its light-scattering quality. Both lead soaps and organic inclusions are visible in paint cross sections in UV light. A layer of variable thickness composed of different proportions of iron oxide pigments, charcoal and lead white is applied over the ground and is evident in several samples (Fig. 3). This is likely to have functioned as a tonally modulated underpaint for the composition, indicating areas of light and shadow in dark brown to pale buff or grey. A similar grey undermodelling was identified as part of Poussin's technique for *Venus and Mercury* (DPG 481) at Dulwich, painted in his early years in Rome around 1627.[6]

Fig. 3 – Cross section of paint from the pink paving stone showing the ground containing calcium sulphate, iron oxide and lead white and charcoal superimposed by a warm grey undermodelling layer composed of lead white, charcoal and ochre followed by the whitish paint of the tile that probably contains some faded red lake.

3.2 Pigments, medium and painting technique

Many passages of paint show relatively rough, leanly-bound surface characteristics that might account for the general light-tone of the painting and its pastel-like appearance. While the mattness appears even over the surface of the unvarnished painting, temporary saturation of the paint with white spirit revealed the more subtle tones of light and shade that were clearly intended by the artist.

The blending of strokes of paint, for example for the draperies and flesh is consistent with the use of a drying oil medium. Analysis of the paint medium by White using chromatography with mass spectrometry (GC-MS) identified the use of linseed oil for blue, green red and yellow painted passages.[7] One sample taken from the yellow brown glaze over the yellow dress of the central figure identified a combination of heat bodied linseed oil with a trace of pine resin. While it is possible that Poussin used a special combination of oil and resin for this area, the presence of resin may in this case be related to a trace of residual varnish. Poussin's use of oil medium for comparable works, *The Adoration of the Golden Calf* (ca. 1630) and *The Finding of Moses* (1651) at the National Gallery London has been confirmed using the same method of instrumental analysis.[8] White analysed samples from the grounds from the National Gallery paintings that are similar in colour and inorganic composition to that used for *The Triumph of David*, together with samples of black, brown white, green, mustard-coloured and red paints. All the samples showed P:S ratios characteristic of linseed oil. Samples from the sky from the later work (*Moses*) was found to be bound in

walnut oil, that was perhaps preferred for painting light coloured passages due to its tendency to yellow less than linseed oil. Both the National Gallery paintings were observed to be leanly bound and have a similar matt appearance of ground and paint evident in *The Triumph of David*.

Examination of the surface of *The Triumph of David* highlighted Poussin's preference for the application of superimposed opaque paint layers without transparent glazes, contrasting with the more traditional practices used by artists painting in oil in the 17th century and earlier.

Flesh painting technique is carried out in a single layer, with highlights added after the underlay was dry (Fig. 4). In many areas, such as the soles of the centrally seated woman's feet, the paint layer for the flesh appears unmodulated. Here and elsewhere, the darker paint for shadows has become more transparent producing an increased contrast between light and shade, and has the overall effect similar to dramatic stage lighting.

Some of the changes made during the development of the composition can be seen in the paint surface; the arcading originally planned for the architecture is evident in the surface texture; the first position of the right leg of the woman pointing at David at the lower right is evident where the upper paint layer has become more transparent; in the left foreground in the group of three women, the initial brushstrokes marking the position for the buttocks of the central woman can be seen beneath the upper paint surface.

There are small holes in the paint surface in the centre of the circle made by the curve of the arches initially planned, most likely made by the compass point.

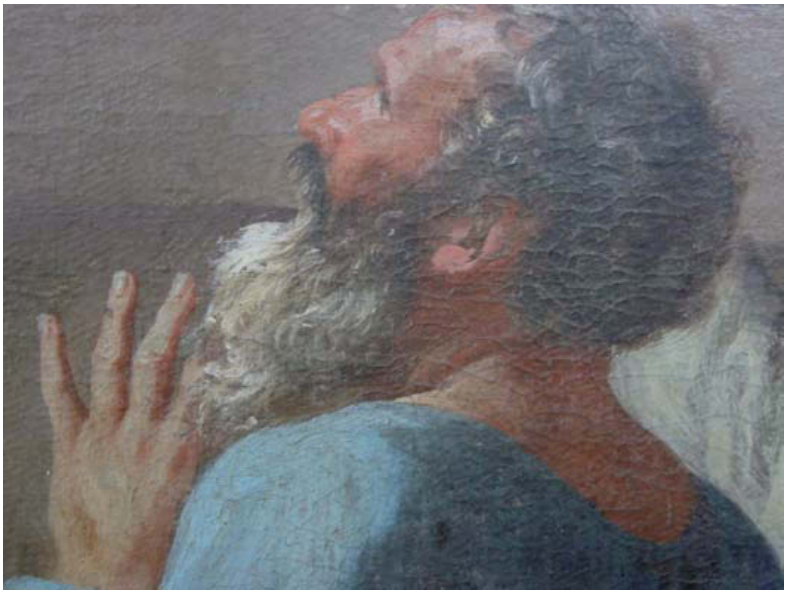
The dark lines of fluting in the pillars and the parallel line of the masonry supporting the pillars were scored with a point, pressing and pushing aside the paint layer when still wet. The architecture of the doorways was marked out in the same way. The horizontal masonry line between the first and second figures following David has been distorted in order to avoid visual awkwardness. It is not parallel with the line above, unlike in the rest of the painting where lines are parallel.

Strong light and dark shadow play an important part and the choice of colours, alternating warm and cool tones, contributes to the drama and rhythm of the composition as it moves through the pictorial space. Yellow, orange and red alternate with cool blue and greens, David wearing red is flanked by figures wearing blue enhanced by dramatic lighting.

3.2.1 Development of the Composition and Pentimenti

Changes to the current composition were noted by Professor Stephen Rees Jones, based on his interpretation of an x-radiograph. The original radiograph, housed at the Courtauld Institute has now deteriorated, the good photograph of the x-radiograph provided an opportunity to review evidence for the development of the composition supported by interpretation of the IR images, surface examination and study of the paint layers.

Considerable changes were made during the development of the composition, and some of these are visible on the surface, and are more clearly evident in the x-radiograph. One of the significant alterations includes the temple portico that was painted initially with arcading, as in Giulio Romano's *Triumph of Scipio*. This was replaced by the double row of fluted columns and the pedimented doorways between them.



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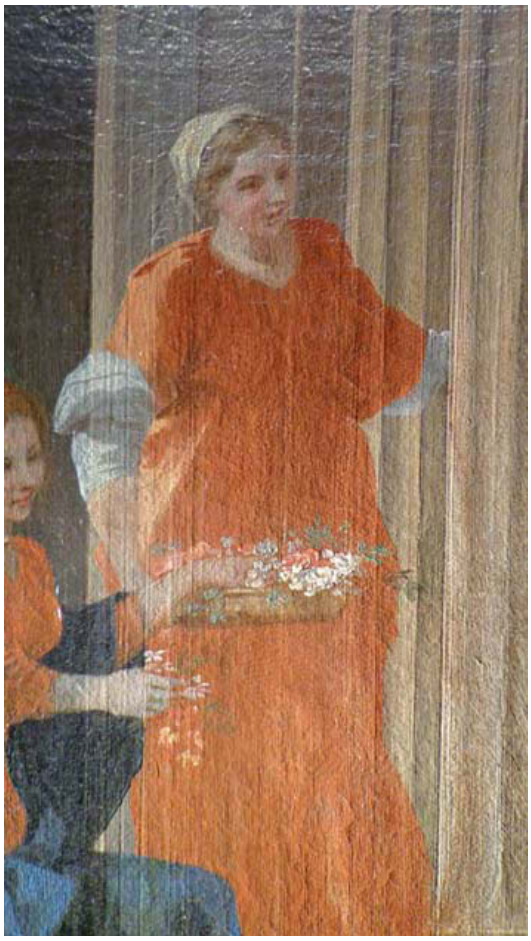

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Fig. 4 – Bearded man behind David showing flesh painting technique applied in a single layer, with highlights added after the underlayer was dry.

Fig. 5 – Raking light detail showing the figure added at the right of the centre group after the pillars were painted.

Fig. 6 – Brushstrokes indicating the position of the woman's buttocks visible beneath her dress.

Fig. 7 – IR reflectogram showing that the right knee of the woman pointing at David has been lowered to open the space behind her.

Changes were also made in the arch at the left, painted initially as a portico with a square opening, with an entablature supported on columns at the left and pilasters at the right with other buildings visible beyond. These other buildings were painted over with the sunset sky but they can be seen through the arch as dark shapes where the sky paint has become more transparent with time. Trees were painted over the sky and finally the figure disappearing behind the pillar was painted. This figure and the buildings painted over with sky can be seen more clearly in the IR image.

Changes were made to the groups of figures emerging between the columns. A figure was added at the right of the left hand group after the pillars were painted and figures were added to the centre group (Fig. 5). The x-radiograph revealed that the group of three women at the left were originally painted further to the right, but were moved in order to open up more space in front of the trumpeter. This may have been achieved with the aid of a drawing, such as the pricked cartoon at Chantilly and the drawing at Windsor[9]. There is a very similar group of women at the left of Giulio Romano's version of the composition. Brushstrokes to mark in the line of the buttocks beneath the yellow skirt of the central woman can be seen in the paint surface and show clearly in the x-radiograph (Fig. 6). Changes made in the groups emerging from the temple and the underpaint around the head of the man holding the scroll can also be seen. The right knee of the woman pointing at David has been lowered a little to open the space behind her. This can be seen in both the x-radiograph and more clearly in the IR image (Fig. 7).

The paint for the arcading and the original position of the group of three women appear patchy and pale in x-ray and seem to have been scraped back when the changes were made.

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Both the x-radiograph and the IR images show the reserve left for the trumpet when the architecture was painted. The trumpeter must have been drawn in first. The figures in the foreground probably all follow prepared drawings and there are no pentimenti apparent in these figures apart from the right knee of the woman pointing at David.

3.2.2 Pigments

3.2.2.1 Blue – Natural ultramarine is the only blue pigment used in the painting. The artist used ultramarine in a variety of shades and particle sizes to create opaque blue passages of sky paint, pale powder-blue drapery and deep blue shadows. The sky is painted using relatively large coarsely ground particles of ultramarine including some deep blue particles, with paler material used almost pure as a glaze over a layer of ultramarine and white.

The deep blue shadow of the drapery of the woman's sleeve (third woman from the left, wearing yellow with embroidered neckline) again uses a medium rich layer of deeply coloured and coarsely-ground ultramarine with a small proportion of lead white over a dark reddish brown underlayer. This underpaint, applied over the reddish ground, contains iron oxide earth pigments, charcoal and a little white. The same mixture of pigments in different proportions is indicated by its presence in samples from other areas and may be part of the initial laying in of the light and shadowed parts of the composition.

Ultramarine is used again for the dark blue shadow over lighter blue drapery of the central seated woman with her back to the viewer, with a raised left hand. A sample from the dark blue fold on her shoulder showed ultramarine and charcoal, modified with a few particles of umber, over two layers of paint with a turbid medium blue appearance, paint comprising lead white and charcoal.

Some passages of ultramarine have an uneven, patchy appearance, especially in the costumes of the figures flanking David; the old man and the central seated woman. The unevenness is due partly to abrasion but perhaps also to deterioration that has been linked with the effects of acidity on the pigment.[10] The optical effect is a lightening or light scattering that has altered the balance of light and shadow. The IR image provides an indication of how the original tonal balance of the folds of the woman's dress is not disrupted (Figs. 8 and 9).

3.2.2.2 Green – Two samples taken from draperies suggested the use of some complicated pigment mixtures. The pale green highlight from the drapery over the breast of the pointing woman on the right of the composition consists of a mixture of a green iron oxide earth pigment, pale blue finely-ground ultramarine and lead white, applied over a layer of medium-rich yellow ochre paint. By contrast, a sample from the dark green of the same drapery, taken near the woman's shoulder contained a mixture of pigments that has previously been characterised as "Claude mixture" green, containing green, red and yellow iron oxide earth pigments, charcoal, lead white and pale blue ultramarine, applied over a darkish red-brown underlayer.

3.2.2.3 Yellow and brown – Poussin mixed yellows in a range of different hues for different purposes. The yellow dress of the woman on the far left of the painting is mottled, possibly due to deterioration and the formation of lead soaps. Bright yellow highlights are applied for example for the golden clasp of the pointing woman's cloak. It was possible to take only one sample of yellow, this was from the drapery of the standing figure of a man holding a paper scroll. This sample showed a layer of lead tin yellow with a few particles uppermost of a bright orange arsenic sulphide. The yellow layer is applied over a grey underpaint of charcoal and white. Here, the figure is painted over a change in the architecture that is evident in the x-radiograph.

High quality iron oxide earth pigments of intense brown, red and yellow hues are used for the background pillars (left), the paving stones, and for the shadows of the pinkish drapery of the pointing woman. Mixtures of iron oxides are used together with varying proportions of charcoal and lead white, to underpaint the composition indicating light and shadow, and consistently red-brown ochre has been used for the ground. Yellow ochre was used as a scumble for the highlights over the ultramarine and white paint of the sky. Several paint samples, including mixtures of green and blue green paint contained colourless particles of calcium that may have been coloured yellow lake pigment that has not survived.

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Fig. 8 – Deteriorated ultramarine drapery showing increased light scattering at the surface,

Fig. 9 – Corresponding IR detail of the drapery in Fig.8 showing folds in the underlayers now not visible in the final painted image.

3.2.2.4 Red – Vermilion is used, for example, in the cloak of the pointing woman in the lower left corner of the painting, and for the deep red of the soldier and the old man. Most passages of paint containing vermilion show an uneven darkening of the surface characteristic of mercuric sulphide pigment. Here, as in other paintings, the reason for the unevenness is not known. A sample taken from the drapery under the bottom of the pointing woman's child showed a single layer of vermilion and some large fluorescent inclusions similar to

those organic inclusions found in underpaint and ground layers.

Red (brown and yellow) iron oxide earth pigments are used as underpaint for vermilion draperies.

3.2.2.5 Black and white – Lead carbonate white and charcoal black are mixed with other pigments for every stage of painting. Charcoal is used mainly coarsely ground, to modify the hue and intensity of the under painting layer, and mixed with ultramarine in the shadows of the darker passages of drapery. Poussin's evident passion for ranges of blue hues included a shade made using lead white and charcoal that appears optically blue.

Conclusions

Poussin's use of leanly bound oil paint to create blonde matte surfaces for *The Triumph of David* may reflect the textures and appearance of Domenichino's Flagellation fresco that influenced the composition. Technical study showed that the surface layers of paint are very leanly bound while fluid underpaint used to designate areas of light and shade is richer in medium and organic material, and that the light scattering of the paint surface may be enhanced by the formation of metal soaps in the paint.

The leanly bound paint of the upper layer has a tendency to flake off in some passages. Abrasion may be due to past cleaning methods and the presence of metal soaps.

Poussin achieved a range of intense blue and paler pastel shades using different grades of natural ultramarine pigment, modified with charcoal and white, and with umber to create range of tones. This conscious use of pigments is also evidenced in his choice of a range of high quality iron oxide earth pigments, used for the reddish ground and notably in different combinations to create tonal variety in drapery, architecture and other compositional elements. Lead-tin yellow and an arsenic sulphide orange-yellow pigment were used for highlights. Passages of paint containing lead-tin yellow show the characteristic formation of metal soaps and where arsenic sulphide orange is present there is a mottled deterioration of the paint surface. Blackening of vermilion paint is also evident in red draperies in *The Truimph of David.*

Further interpretation, based on evidence from the x-radiograph, of the original composition and sequence of alterations made by Poussin in paint was compromised by the fragmentation of samples between paint layers, and limited sample sites. Analysis using non- invasive XRF not available at the time of study would provide useful evidence for the evolution of the painted composition.

Appendix

Analytical methods and materials

Paint samples were prepared as cross sections embedded in Tiranti slow setting polyester resin type SW (www.tiranti.co.uk/) and examined using a Leica Aristomet light microscope. Elemental analysis was carried out on carbon sputter-coated paint cross sections using a JEOL S100 Scanning Electron Microscope coupled with an Oxford instruments windowless x-ray detector at Kings College London. Staining tests for organic media were carried out directly on paint cross sections, using Rhodamine B fluorescent stain for oil and counter stained using Amido Black for protein, both obtained from Sigma-Aldrich (*www.sigmaaldrich.com/United-Kingdom*).

Acknowledgements

William Luckhurst, Kings College London, for use of SEM-EDX.

Notes

[1] *Triumph of David*, oil on canvas, 118.3 x 148.5 cm, London Dulwich Picture Gallery DPG 236, Bourgeois Bequest 1811. Blunt 1966, no. 33.
[2] Verdi 1995, cat. no. 24, pp. 186-187; Waterfield 1994, no. 24 p. 94.
[3] Salomon 2010, pp. 11-14.
[4] Rees Jones 1960.
[5] Mahon 1960.
[6] Glanville 1986.
[7] Report by Raymond White, National Gallery Scientific Department, National Gallery London, 16th November 2004, medium analysis of samples from *The Triumph of David*, Dulwich Picture Gallery.
[8] For the analysis of the medium used for *The Adoration of the Golden Calf* (NG 5597) see Mills 1979, p. 67 and White 1998, p. 90; for *The Finding of Moses* (NG 6519) see Mills 1989, p. 71.
[9] Friedländer 1939-74, vol. 1 nos. 29 and 30, p. 14.
[10] Klaas 2011.

The Crossing of the Red Sea in the National Gallery of Victoria, Melbourne

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NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Laurie Benson, Carl Villis

A *Brief Introduction to* The Crossing of the Red Sea *and its restoration*

Laurie Benson

The chronology and life of Nicolas Poussin's *The Crossing of the Red Sea* (Fig. 1) and its pendant, *The Adoration of the Golden Calf* (National Gallery, London), is well known and thoroughly documented.[1] Both were commissioned in 1632 for the wealthy Amedeo dal Pozzo, marchese di Voghera (1579-1644), the elder cousin of Poussin's most influential Roman patron and supporter, Cassiano dal Pozzo (1588-1657). Poussin completed both paintings in 1634.[2]

The Crossing of the Red Sea is an impressively theatrical conflation of elements drawn from the Old Testament book of Exodus XIV, chapters 26-31, specifically 26-28:[3]

> *26:* And the Lord said unto Moses, Stretch out thine hand over the sea, that the waters may come again upon the Egyptians, upon their chariots, and upon their horsemen.
> *27:* And Moses stretched forth his hand over the sea, and the sea returned to his strength when the morning appeared; and the Egyptians fled against it; and the Lord overthrew the Egyptians in the midst of the sea.
> *28:* And the waters returned, and covered the chariots, and the horsemen, and all the host of Pharaoh that came into the sea after them; there remained not so much as one of them.

Amedeo's reaction to the painting is not recorded. We know he died in 1644 and both works were last recorded with the dal Pozzo family by Luigi Pietri Scaramuccia, a visitor to Turin in 1674.[4]

That *The Crossing of the Red Sea* is among Poussin's finest works is unquestioned. Giovan Pietro Bellori made reference to the work in the very first biography of Poussin published in 1672,[5] and it is also briefly mentioned in letters by Poussin, although he writes about producing a reduced version with only twenty-seven figures as opposed to the incredible eighty-nine that are present in this painting.[6] Being such a well-documented and outstanding example of Poussin's work, the bibliography for the painting is immense.

The Crossing of the Red Sea today

Carl Villis has eloquently articulated here why the painting, now almost four hundred years old, cannot appear today as it did when Poussin painted it. Although the changes in the appearance of *The Crossing of the Red Sea* affected by the recent treatment are subtle rather than radically overt, this shift is absolutely critical to the reading and enjoyment of the painting. Poussin's brilliant use of colour and light that is integral to this extremely complex composition was, to a degree, masked. Poussin has precisely layered frieze-like figure groups that diminish in scale and are elemental to the astonishing depth and enormity of space he has created. The artist has used contrasting rich colour to both distinguish individuals and link disparate groups, and colour draws the eye to key parts of the painting that convey the intense drama of the narrative. Colour helps create the visual harmony that is the hallmark of Poussin's finest work and his controlled use of strong colour is one of his outstanding contributions to Baroque art. It is a legacy that influenced many generations of artists who followed him, including Jacques-Louis David and Paul Cézanne.

Laurie Benson
Curator of International Paintings and Sculpture before 1980, National Gallery of Victoria.

Carl Villis
Conservator of European paintings before 1800 at the National Gallery of Victoria.

Fig. 1 – Nicolas Poussin, *The Crossing of the Red Sea*, (1632-34), oil on canvas, 155.6 x 215.3 cm, National Gallery of Victoria, Melbourne, Felton Bequest, 1948 (after the 2011-12 treatment).

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Fig. 2 – *The Crossing of the Red Sea* before the 2011-12 treatment.

Fig. 3 – Photograph under ultraviolet light before the 2011-12 conservation treatment. The black patches throughout the upper half of the painting reveal the largest areas of retouching left by the previous restorer to mask the abraded original paint surface.

It is also now evident that Poussin very carefully manipulated the play of light on the landscape as well as in the sky to reinforce the sense of depth he created in the composition. The sense of careful gradation of light to create depth was obscured until the recent treatment of the work. Consequently, a discernable sense of unity between land, sea and sky has returned, making it far more visually coherent and appealing.

The conservation of The Crossing of the Red Sea

Carl Villis

From the beginning it was clear that the project for the restoration of Nicolas Poussin's *The Crossing of the Red Sea* would bring its own unique set of challenges and surprises. This was perhaps inevitable, given the painting's status as one of the greatest treasures of the National Gallery of Victoria, and the noteworthy sponsorship of the restoration by BNP Paribas during the Gallery's 150th anniversary year (2011).

Yet these matters were only the lead-in to what has proved to be a fascinating process of discovery and transformation of Poussin's marvellous work, which stands as a superlative example of 17th century figurative and landscape painting. Thanks to new technical analysis and the timely re-emergence of a high-quality replica, our knowledge about the painting has been substantially enriched and redefined throughout the course of the treatment. This new-found understanding was the key to a comprehensive restoration campaign aimed at reinstating some of the lost visual and tonal harmonies of the painting.

The painting before treatment

The Crossing of the Red Sea had been earmarked for cleaning and restoration well before work commenced in late 2010. For many years there had been a perception that the vitality of the work was diminished due to a yellowing varnish. To some viewers a more disturbing impact came from old damage in the upper half of the painting, specifically the mountain landscape and the stormy sky. Compared to other Poussin paintings from the 1630s, these details appeared unnaturally heavy and lacking in definition, and seemed somehow disconnected from the bustling human activity of the lower half of the composition.

The painting had been cleaned by the prominent London restorer Horace Buttery in 1960 after its appearance at Anthony Blunt's landmark Poussin exhibition held at the Louvre in May of that year.[7] Soon after, it was displayed in the National Gallery in London alongside its original pendant, Poussin's The *Adoration of the Golden Calf*, 1633-34, before its return to Melbourne in 1961.[8] The London exhibition provided the opportunity for both newly cleaned paintings to be viewed together, where they were favourably received.[9]

It was perhaps indicative of a long-running history of condition-related problems that the Melbourne picture was sent to Buttery so soon after its previous cleaning. Anthony Blunt recalled to art historian Franz Philipp that the painting had been restored in London in 1947, the year before it was purchased by the Felton Bequest.[10] A lapse of just thirteen years between cleanings suggests that there was dissatisfaction with appearance of the painting. Buttery, who was picture restorer to the Royal Collection, was the Melbourne Gallery's preferred option for the treatment of some of its most valuable European paintings.[11] It is likely that his brief was to resolve some pre-existing problems with the sky and landscape.

The extent of Buttery's restoration can be seen in a photograph of the painting under UV light, taken before the 2011 treatment. (Figs. 2-3) The dark passages which stood out from the rest of the painting revealed the large areas of retouching required to cover a worn original surface. This indicated the painting had suffered significant abrasion across its upper half, specifically in the clouds, the blue sky, mountains and trees.

Technical examination

Poussin's preparatory techniques

As with any major conservation treatment, the cleaning of *The Crossing of the Red Sea* could not proceed without thorough documentation of

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its condition and an investigation into the materials and techniques used by the artist. Consequently, the painting was examined with x-radiography,[12] (Fig. 4) IR reflectography (Fig. 5) and UV light photography, (Fig. 3) It was photographed before treatment and then continually throughout the cleaning, varnishing and retouching process. Eighteen cross section paint samples were also taken from the painting before treatment.[13] (Figs. 6-8)

The information drawn from this process laid a foundation of understanding about the material content of the painting, its history and changed appearance, as well as an insight into Poussin's working methods.

In addition to documenting the surface condition of the painting, there were two other areas of particular interest that came into focus during the technical examination: Poussin's characteristically rigorous technique, and an enquiry into the extent of colour change in the painting over the past centuries. One part of the painting illustrates both of these issues – the blue-draped male figure helping to retrieve armour from the water. (Figs. 9a-b)

Radiography of this figure revealed an important facet of Poussin's painting process. It showed that the artist first painted the figure completely unclothed and only added the drapery at a later stage when the flesh paint was dry; the form of the body is clearly discernible through the deep blue drapery covering the lower waist and legs, which is mostly transparent in the radiographic images. This same unconventional method was found in at least six other figures in the painting, including the four principal figures in the foreground. It is uncommon to find draperies painted on top of a completed nude figure; usually one would expect to see the drapery integrated with the figure during an earlier phase in the process – for example, in a preparatory drawing or painted sketch rather than on the canvas. Many artists would have considered Poussin's approach to be uneconomical; however, it does appear consistent with what we know about the painter's meticulous working practice.

Giovan Pietro Bellori's first-hand account of the life of Poussin, based on direct contact with the painter and published not long after Poussin's death in 1665, provides us with invaluable insights into his character, beliefs and working habits.[14] Bellori describes Poussin's painstaking method of gradually working up his compositions from initial sketches through to the final product. The artist would begin with an initial series of sketches done in pen and wash to establish a broad plan for the composition. A number of

Fig. 4 – X-radiograph.

Fig. 5 – IR reflectogram.

Fig. 6 – Cross section of a paint sample taken from along the top edge of the painting, where pale blue of the sky begins to meet the dark cloud; (a) normal and (b) UV light.

Fig. 7 – Cross section of a paint sample taken from the rich blue drapery of the pointing figure between the kneeling white-turbaned foreground figure and the central blue-clad foreground figure; (a) normal and (b) UV light.

Fig. 8 – Cross section of a paint sample taken from the flesh tone of the white-turbaned foreground figure in the area of the shoulder; (a) normal and (b) UV light.

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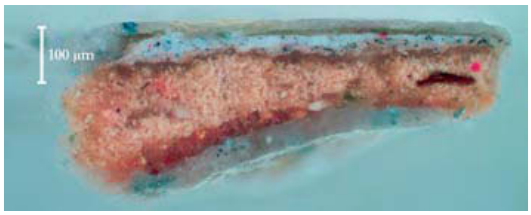

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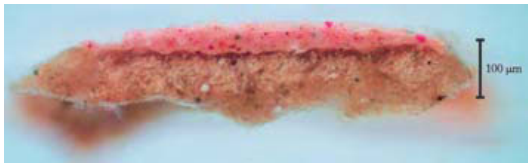

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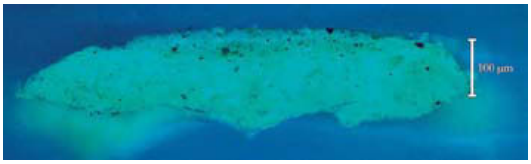


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Fig. 9 – Detail of the central foreground figure, (a) after conservation treatment and (b) X-radiograph. The radiography reveals the complete form of the figure beneath the blue drapery, demonstrating Poussin's method of constructing semi-clad figures first as nudes and only later adding draperies.

Fig. 10 – Nicolas Poussin, *Crossing the Red Sea*, pen and brush and brown wash over sketch in black chalk, 18.5 x 26.0 cm, The State Hermitage Museum, St Petersburg, Transferred from the Collection of the Academy of Arts, Petrograd, 1924 (inv. no. OR-14541) © The State Hermitage Museum.

Fig. 11 – A stereomicroscope detail of a paint loss from the blue drapery of the central foreground figure. This area had been covered by two layers of old retouching which had covered parts of the blue. Once removed, remnants of the drapery's original pale blue tone were revealed.

sketches relating to *The Crossing of the Red Sea* have survived.[15] Several of them do not resemble the final scene, but one, now in the Hermitage Museum, St Petersburg, sees Poussin working the image into the form we are now familiar with, suggesting the painter habitually worked through many possible variations of composition before settling on a plan. (Fig. 10)

Next, to refine the individual figures and groups, he would make a three-dimensional model of the scene with small nude figures sculpted from wax, 'in order to see the natural effects of light and shadow on the bodies'.[16] Following this, another set of little sculpted figures ('bozzette di mezzo palmo') would be made to determine the arrangement of draperies over the human forms. This would be followed by yet more developed drawings of nude figures in watercolour.

This rather elaborate process reveals Poussin's primary visualisation of his figures and groups as naked sculptural forms which would only later be adorned with drapery, as we found in the primary figures of *The Crossing of the Red Sea*. The habit may have come from Poussin's career-long study of Greco-Roman sculpture as inspiration for his painting.[17]

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Darkening of colours

Examination of the blue drapery of the central figure also provided insight into another critical feature of the painting: a darkening of the colours and tones. During the examination it was noted that a cluster of paint losses in the blue drapery were covered with two successive layers of restorer's retouchings. Some of these extended past the paint losses over to the undamaged parts of the original lapis lazuli/lead white surface, effectively covering them for decades or possibly centuries. This appears to have shielded parts of the blue surface from the worst effects of overcleaning and light exposure. When these old retouchings were later removed, they revealed a pale blue from the original paint surface that was far brighter than the rest of the surface. (Fig. 11)

This suggests that the intensely deep blue of the drapery on the central figure – which forms part of the signature trio of primary colours that confront the viewer – was originally intended to be quite pale in appearance. An examination across the entire passage of blue revealed other scattered residues of the pale blue upper layer, suggesting that a very thin pale lapis lazuli and lead white finishing layer was present on top of a darker toned under-layer. (Fig. 7) The loss of the pale layer by abrasion may explain why other passages of the

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painting – such as the clouds – now appear so dark.[18] (Fig. 6)

Concerning flesh tones, sample 3, taken from the shoulder of the white-turbaned foreground figure, was made up of vermilion mixed with lead white and a small quantity of black. (Fig. 8)

Colour and tonal changes in Poussin's paintings

The change of colours and tones in paintings over time is a phenomenon which has been widely observed in paintings from all ages. Explanations for these shifts in appearance can vary, depending on – among other things – the chemical nature of the artist's materials, the environments in which the paintings are housed, and the processes to which paintings are subjected. There are probably very few components of any painting which stay immune to the effects of oxidation, time and human intervention. Indeed, the issue with most old paintings is not whether change in appearance has occurred, but to what degree the change has occurred.

Colour and tonal change has been acknowledged as an important consideration in assessing the appearance of Poussin's paintings.[19] In particular, it is clear that some of his paintings now display an exaggerated contrast between the darkest areas and the brightest, with the result that the brighter elements – for example, the figures and the sky – can appear somewhat isolated from their surrounds. Where this phenomenon has occurred, the subtle shifts within the middle tones, which play an important role in establishing the effect of volume and spatial recession in an image, can be lost. This appears to be the case with *The Crossing of the Red Sea* where many darker passages such as the clouds, foreground, hills and even the water appear tonally flat, leaving the figure groups seemingly suspended in indeterminate space.

Up to the time of treatment, no dedicated examination of colour change in Poussin's paintings had been carried out. One theory for the darkening was that the paint layers have gradually become transparent, revealing a dark priming layer beneath.[20] Many paintings made by artists working in 17th century Rome (including, on occasion, Poussin) carried a dark brown ground layer. This, however, was not the case with *The Crossing of the Red Sea*. Cross sections of paint samples from the painting demonstrate that Poussin chose a thick pale ground layer containing calcium carbonate (chalk), silica and iron oxide. (Fig. 6) It is unlikely this type of ground layer would substantially darken the image; in fact, it would tend to have the opposite effect if the paint layers became more transparent.

While it is possible that many of the greens, browns and greys of the painting have darkened due to chemical change within the pigment or from exposure to light, the discovery of the pale paint around the blue losses suggests, in this case at least, that abrasion of pale uppermost layers of paint may be responsible for the altered tonal and chromatic values in the painting.

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Treatment

Removal of old varnish and retouchings

Following the examination and documentation process, the painting was cleaned. As the varnish and overpaint were removed, the full extent of wear and tear on the surface of the painting became evident. Abrasion across the top half of the painting was the most disturbing feature, particularly in the clouds. No part of this area was unaffected by what must have been severe scraping of the surface during a past treatment.

Old photographic records suggest that this damage took place – or was revealed – during the 1947 cleaning. The earliest photograph of the work published in Otto Grautoff's 1914 catalogue (Fig. 12) shows the painting with its sky noticeably different from a later reproduction taken after 1947 and published in Blunt's catalogue for the 1960 exhibition.[21] (Fig. 13)

On this evidence it appears that the soft outer edges of the clouds and a pale top layer of the upper central band of cloud were removed, creating a jarring division between the upper and lower parts of the painting. Detail images of the painting

Fig. 12 – Photograph of the painting published in the book *Nicolas Poussin* by Otto Grautoff, 1914. It shows that the painting's sky was considerably different in the early 20th century.

Fig. 13 – Photograph taken following the 1947 cleaning but before the 1960 restoration, it confirms that the appearance of the painting was markedly changed by the 1947 treatment.

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Fig. 14 – Detail taken after the removal of old varnish and retouchings in 2011. The pale patches in the dark clouds indicate the areas of strongest abrasion.

Fig. 15 – Detail taken after the removal of old varnish and retouchings in 2011. Cleaning of the painting revealed extensive loss of detail in the right mountain peak and of the trees in the wooded landscape.

Fig. 16 – Detail taken after the removal of old varnish and retouchings in 2011. In the lower half of the painting, the abrasion to the paint surface resulted in numerous speck losses which were strongly evident in the flesh tones.

taken after the 2011 cleaning reveal the extent of abrasion in these critical areas. In the clouds abrasion can be seen extending through the paint and ground layers, occasionally even down to the raw canvas. (Fig. 14)

Similarly, the twin mountain peaks and wooded landscape on the left were abraded to the point that a significant degree of original detail was lost and partially repainted by restorers in successive restorations. (Fig. 15)

The lower part of the painting had also suffered from harsh cleaning, although in some respects the result was different. (Fig. 16) Rather than the effect of uniform abrasion across the surface, the lower half displayed numerous small pit-like losses across the surface, particularly in the areas of flesh paint.

Lost details revealed

Once the layers of old varnish and overpaint were removed, the painting was revarnished,[22] preparing it for the next stage of treatment – retouching of the lost and worn areas of paint.[23] The challenge of this phase lay in the number and extent of damaged areas across the surface. In places where the paint losses were small and dispersed across the surface, the damaged passages could be reintegrated with discreet applications of retouching paint. However, in the more broadly abraded areas where entire layers of paint had been largely worn away, a more reconstructive process would be required to bring greater definition to features which had lost much of their original form.

In 1960 Horace Buttery was faced with this unenviable task, with very little information to assist him in the reconstruction of the lost passages. It is possible, though unlikely, that he may have referred to old photographs or two 17th century copies of the work: an engraving made by Etienne Gantrel in the 1680s, (Fig. 17) and a tapestry of the image made by the Gobelins workshop in Paris, also dating from the 1680s. (Fig. 18)

Both the engraving and tapestry show the image reversed. When they are inverted to match the original, they display certain discrepancies in detail which reveal them to be less than exact replicas of the original painting. Nevertheless, they do indicate a lively arrangement of clouds and a receding landscape marked by intervals of light and shade, features which appeared mostly lost in Poussin's worn original. Without the aid of useful copies or documentary photographs, Buttery could only hope to partially rectify what remained of the worn surface, with little scope for actually retrieving some of the lost detail. This would probably have been the same objective for the 2011-12 treatment had there not been a major turn of events which would dramatically affect its outcome.

The Gallery's records for *The Crossing of the Red Sea* had long contained a reference to a painted replica made in Paris during the 1680s by none other than Charles Le Brun (Fig. 19), France's most influential painter in the second half of the 17th century, a colleague of Poussin and a strong adherent to his theories.[24] The painted copy had not been recorded since 1773, when it was sold at auction in England, and was presumed lost or destroyed.[25] It did not resurface in public until late 2009 when the NGV was contacted by the Iris and B. Gerald Cantor Center for Visual Arts at Stanford University in the United States. The museum had just received the lost replica on loan from a private collection in the San Francisco Bay Area where it had been held since the 1960s.[26]

The re-emergence of this painting from obscurity enabled us to gain more than a glimpse into the past of the Melbourne Poussin. Although the Stanford replica has some minor structural and surface problems (not least a discoloured varnish), it is

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Fig. 17 – Etienne Gantrel (engraver), *Passage through the Red Sea*, after Nicolas Poussin, engraving, 56.3 x 74.3 cm (image); 63.5 x 82.4 cm (sheet). Research Library, The Getty Institute. The image has been printed in reverse to provide a direct comparison between the painting and the engraving.

18

Fig. 18 – Jean-Baptiste Mozin (workshop of), *Le Passage de la Mer Rouge* (1685), after Nicolas Poussin, basse-lisse weave, wool, silk and gold thread, 335.0 x 488.0 cm, Paris, Mobilier National (GMTT 34/3). The image has been printed in reverse to provide a direct comparison between the painting and the tapestry.

undoubtedly far better preserved than Poussin's original, particularly in those areas where Poussin's is so notably worn.

This high-quality replica was painted to the same dimensions and proportions as the original. The transcription of composition and detail from the original is remarkably faithful but for one odd exception: the copyist completely omitted the red-brown 'pillar of fire' along the far-right edge of the painting. The omission of this crucial detail – for it represents God to whom Moses appeals – is inexplicable yet deliberate.[27]

A comparison between the two paintings seems to confirm the key theories about the changes which have taken place in the original. A major difference in tonal values is evident in many areas, with the landscape, sky and water all now significantly darker in Poussin's original.

In the Stanford replica the viewer is able to see more delicate modulations of the effect of sunlight across both the figures and the landscape, while in the Melbourne original it is only the figures which seem to capture the light and retain their luminosity. The flattening of the brown and green tones of the topographical details in Poussin's original made it particularly hard for the eye to register exactly where in the landscape the figures were located, particularly the row of smaller background figures. It was only by looking at the replica that one could confidently recognise that the figures were placed on a raised escarpment in the middle distance.

Another stark indication of the tonal change is evident in the blue drapery of figures. The replica reveals a far paler blue than we now see in the original, which appears to corroborate the findings of the examination of the paint surface around the old loss described earlier.

It is, however, the wealth of detail in the sky and landscape of the replica which provides us with the most intriguing insight into the alteration which has taken place in the original *The Crossing of the Red Sea*. (Fig. 20)

Rather than the surviving solid bank of dark grey cloud left with the original, the replica shows that there were in fact two separate strata of grey clouds. (Fig. 21) One, through the centre and top edge of the painting, is a pale grey-blue band of high cloud, which tapers out to thin streaks across the sky over the twin mountain peaks. Thin trails of bright white highlights give definition to the underside and edges of this cloud. Separate from this upper cloud, and far closer to the scene involving Moses, is a heavy cluster of dark storm clouds in the top right corner of the painting. These are clearly intended to be the clouds described in the Old Testament which were to come between the armies of Egypt and Israel, providing darkness to one side and light to the other (Exodus 14:20).

Like the pale grey upper cloud, the dark clouds of the Stanford replica also trail off, not horizontally but downwards towards the sea, perhaps representing heavy falling rain. These clouds also contain some bright white lines and outlines, giving form to the individual clouds which make up the mass.

On the Melbourne picture it is clear that the band of pale upper cloud had darkened and lost most of its energetic highlights, as well as the distinctive thinning streaks of grey where the cloud

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Fig. 19 – Charles Le Brun (attributed to), *The Crossing of the Red Sea* (after Poussin), oil on canvas, 158.1 x 213.4 cm, Private collection, on loan to The Iris and B. Gerald Cantor Center for Visual Arts, Stanford University, USA.


20a


20b

Fig. 20 – (a) Nicolas Poussin, *The Crossing of the Red Sea*, detail, before conservation treatment, 2011-12. (b) Attributed to Charles Le Brun, *The Crossing of the Red Sea* (after Poussin). When viewed side by side, a darkening of tone is evident in many areas of the Melbourne painting, particularly in the blue passages. Also notable is a comparative lack of definition in the foreground and landscape.


21a


21b

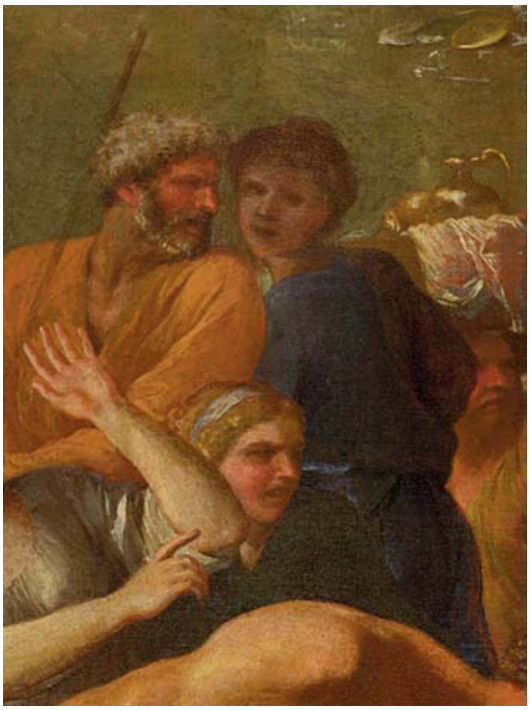
Fig. 21 – (a) Nicolas Poussin, *The Crossing of the Red Sea*, detail, before conservation treatment, 2011-12. (b) Attributed to Charles Le Brun, *The Crossing of the Red Sea* (after Poussin). A comparison of the damaged upper half of the Melbourne painting with its Stanford counterpart reveals the loss of critical details of the mountains, landscape and clouds.

trails off. It had largely merged with the lower dark clouds below to form a single, triangular blanket of heavy grey and black in the upper half of the painting. Harsh cleaning of the dark thunderclouds resulted in the complete loss of their wispy edges, exposing the pale blue sky which was originally intended to serve as a layer of underpaint.

Dozens of other instances of lost detail from the painting have come to light through the rediscovery of this important copy. It has proved crucial in answering one particular problem which had previously troubled some viewers. In amongst the main throng of figures was a face, possibly of a woman, with her head turned towards the viewer. (Fig. 22) Two features of this face appeared incongruous with the surrounding figures: it was far sketchier in execution than any other, and it did not sit comfortably with the body on which it rested. In fact, with the face shown nearly front-on, the neck appeared unnaturally contorted, with the body turned around in the opposite direction.

Instead, the Stanford replica revealed the back of a head and a pair of ears. The corresponding figures in both the engraving and the tapestry appear to confirm that the Stanford figure was the one Poussin left, suggesting the one present on the Melbourne painting was a later restorer's addition. However, close examination of the NGV face before and during cleaning indicated that the

22a



22b

Fig. 22 – (a) Nicolas Poussin, *The Crossing of the Red Sea*, detail, before conservation treatment, 2011-12. (b) Attributed to Charles Le Brun, *The Crossing of the Red Sea* (after Poussin). The face of the blue figure in the Melbourne painting was initially thought to be the work of a restorer, but was later shown to be Poussin's first attempt at the figure; he modified it by turning the figure away from the viewer. The original figure resurfaced in the 1947 cleaning of the painting.

'wrong' face was indeed original to the painting. When the paint surface was viewed under stereoscopic magnification it displayed similar characteristics in craquelure and pigment composition to other areas of original paint. So how could it be that other 17th century copies of the painting contradicted the information on the original? The likely answer is that Poussin initially sketched the figure looking out towards the viewer but for some reason was unhappy with it, so he repainted it, with the new head turned around the other way. In time, probably during the 1947 cleaning, Poussin's revised head was scrubbed off, revealing the earlier version beneath. The reason the earlier head now sat so uncomfortably on the blue-clad body was the result of a modification made by Poussin when he reworked the figure. In order to show the figure turned away, he had to add the right shoulder to what was previously a side-on view of the figure. This modification was now visible as a pentimento of darker and thinner paint.

Reconstruction of lost detail

Thanks to the unexpected discovery of the Stanford replica, it was now possible, for the first time in generations, to envisage how *The Crossing of the Red Sea* must have once appeared. The full harmonies of Poussin's carefully arranged tones and colours, along with his integration of figures into the landscape, could now be better understood. In the treatment of old paintings it is exceptionally rare to find such a valuable early record of the appearance of an artwork. There was no question that the copy would be critically important in the campaign to recover some of what the painting had lost. But it posed an interesting question: is it appropriate or even desirable to attempt reconstruction of something now irrevocably lost to the original work?

The answer depends entirely on the individual's viewpoint. Convincing arguments can be made for either a highly reconstructive course, or one with minimal intervention. Both methodologies can claim fidelity to the artist as a guiding principle, with the reconstructive approach placing primacy on the legibility of the image left by the artist: that it is most important to provide the viewer with a reasonably intact manifestation of the image in order for it to be properly appreciated and understood. The latter gives priority to respecting what remains of the original hand of the artist and to the entitlement of the viewer to easily identify which parts of the painting are original and which are not. Underlying this philosophy is a recognition that changes in the appearance of an artwork need not necessarily be remedied, and that viewers are capable of filtering out the effects of change or damage when they look at a work of art.

Cultural factors play a big part in how we choose to conserve and view old paintings, which is why conservation theory and practice can vary so greatly from one country to another. At the same time, many conservators across the world recognise that retaining fidelity to the image, the artist's hand and the physical history of the picture need not be mutually exclusive.

Each of those factors influenced the decision-making behind the restoration of *The Crossing of the Red Sea*. Most critically, key details of the mountain landscape, the trees and sky were partly reconstructed with the aid of the Stanford replica because abrasion of the original paint surface in those areas left their original forms almost illegible. However, there were other features which were altered by abrasion – for example, the darkened blues, browns and greens – which were not retouched to match the replica because the darkening was not considered to be compromising the overall legibility of the painting.

The guiding philosophy throughout the treatment was to keep the intervention to the minimum

required to make the less intact parts of the painting work harmoniously with its well-preserved passages, respecting at the same time changes that have occurred as a result of the passage of time.

Acknowledgements

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Notes

[1] Cifani 2000, p. 564. Cifani and Monetti discovered banking details of the Galli Tassi family, who were Amedeo's chief bankers, that confirmed the two paintings were paid for by instalments, starting in July 1632.

[2] Ferretti 1985, p. 618.

[3] Philipp 1964, pp. 80-99. Philipp here deconstructs the iconography of the painting in the context of extant preliminary drawings.

[4] Ferretti 1985, p. 617.

[5] Bellori 2005, p. 314.

[6] The author is grateful to John Payne for laboriously counting the principal figures in the painting.

[7] Blunt 1960, cat. no. 37.

[8] *The Adoration of the Golden Calf* was restored around this time by Herbert Lank (personal communication, David Bomford, 2010).

[9] Keith Sutton, Round the London art galleries, 'The Listener', 2 February 1961, p. 232.

[10] Philipp 1964, p. 96 n. 58.

[11] In 1955 a precedent was set when the Gallery sent Giambattista Tiepolo's *The Banquet of Cleopatra* to Buttery for restoration. Over the following decade the practice of sending the Gallery's most valuable paintings to specialist restorers in Europe continued: *The Madonna and the Child,* formerly attributed to Jan van Eyck, was cleaned by Paul Coremans in Brussels in 1958, and Thomas Gainsborough's *The Rt. Hon. Charles Wolfran Cornwall* was cleaned by Buttery in 1961.

[12] The painting was x-rayed in 2003 and digitally assembled by the author and John Payne in 2011. Poussin's practice of painting drapery over naked figures is evident in the radiographs and is discussed in main text of this article, along with his reworking of the turned figure in blue. Beyond these important modifications, the radiographic image reveals no substantial reworking of the arrangement of figures. However, there appears to be more significant reworking of the landscape. The shape of the mountains in the upper left portion of the painting reveals that the left of the two peaks was originally considerably lower than first intended, while the waters to the right of Moses appear to have been paler and more turbulent than they now appear. Another curious alteration is evident in the radiograph: in the landscape, where the row of small background figures are gathered atop the rocky escarpment, an indeterminate form - perhaps representing the wash of a crashing wave against the shore - is clearly visible. Another feature of the painting which is clearly visible in the radiographic image is the stitching of the horizontal join in the canvas in the upper third of the painting.

[13] They were analysed by Deborah Lau, CSIRO scientist, by means of EDS and Raman particle analysis.

[14] Bellori 2005, pp. 323-325.

[15] Other preparatory drawings by Poussin for *The Crossing of the Red Sea* are in the Hermitage (inv. nos. 14540, 14542), and two in the Louvre (see Friedländer 1939-74, vol. I, nos. 20, 21, plates 12, 13). The dating of the three Hermitage preparatory sketches has been a subject of debate. Friedländer (1939) and Blunt (1979) believed the drawings related to the Melbourne *Crossing* of 1633-4, but Rosenberg (1995) asserted that they instead relate to a later version from the late 1640s, a painting which was never completed.

[16] Bellori 2005, p. 323.

[17] McBurney 1994.

[18] Lead white, which is responsible for the pale tone of the passage of blue, is considered a highly permanent pigment. It is not affected by light exposure but can darken on contact with pigments containing sulphides, including ultramarine, though this is unlikely to occur in oil paint films. See Gettens 1993, pp. 71-72.

[19] Wine 2001, p. 296; Van Eikema Hommes 2004, p. 109.

[20] Wine 2001, p. 296. The author comments: 'In common with many paintings by Poussin, for example NG5763, the visual appeal has suffered mainly because the increased transparency of the paint with age reveals more of the ground colour beneath'. For a discussion on the process of increased transparency in oil paint films, see Van Eikema Hommes, pp. 37-39.

[21] Grautoff 1914, pp. 150-151; Blunt 1960, cat. 37.

[22] The old natural resin varnish and retouchings were removed with solutions of acetone in odourless mineral spirits. Some older insoluble retouchings were removed by scalpel under magnification. Infilling of old paint losses was done with Modostuc acrylic filler. The painting was revarnished with an MS2A modified polycyclohexanone resin, 30% w/v in mineral spirits. The varnish solution contained 2% v/v Tinuvin 292 hindered amine light stabiliser.

[23] In-painting was done with powder pigments bound in solutions of the MS2A varnish resin.

[24] Le Brun accompanied Poussin on his return to Rome from Paris in 1642.

[25] The Christie's Robert Strange sale, 5 March 1773, lists a copy of *The Crossing of the Red Sea* 'by Charles Lebrun' (lot 107).

[26] Thanks to the research of Lynn Roberts and Sarah Grandin, a provenance for the Stanford *Crossing* reads as follows: from the Robert Strange sale in 1773 the work was purchased by someone named Parsons and then perhaps acquired by Sir Thomas Rumbold for his home, Woodhall Park. It may then have passed to Samuel Smith, who purchased Woodhall and its contents about 1801. Alternatively it may have been acquired by his heir, Able Smith, when he inherited and redecorated the estate in 1834, for he had the painting reframed by Smith & Son, a leading London framer. *The Crossing the Red Sea* remained in the house until the family sold it and dispersed its contents in 1931 – at which time it was evidently re-attributed to Poussin. The parents of the present owners purchased it in the 1960s.

[27] The Etienne Gantrel engraving of *The Crossing of the Red Sea* also shows the image without the pillar, suggesting in all probability that the engraving was made not from Poussin's original but from the 'Le Brun' replica.

Poussin's Materials and Techniques for *The Triumph of Bacchus* at the Nelson-Atkins Museum of Art

Hermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

John Twilley, Nicole Myers, Mary Schafer

Poussin and The Triumph of Bacchus

Around 1635, Nicolas Poussin received one of the most prestigious commissions of his career from Cardinal Richelieu, chief minister to King Louis XIII and one of the most important French collectors of the time. Richelieu was seeking décor for the Cabinet du Roi in his newly constructed château in Poitou, France. While virtually nothing is known of the circumstances of the commission, by spring 1636 Poussin had completed two paintings in a series dedicated to the classical subject of the Bacchanal. On May 19, 1636, Richelieu learned from the Marquis Pompeo Frangipani that "two paintings of Bacchanals" created by Poussin according to his "wishes and intentions" were traveling from Rome to Poitou in the company of Gaspard de Daillon, the Bishop of Albi.[1] Although the letter does not give titles or descriptions, the two paintings are generally believed to be *The Triumph of Bacchus* and *The Triumph of Pan*. While the location of the originals has long been a subject of debate (an issue to be explored in-depth below), they are almost unanimously considered today to be the versions housed respectively at the Nelson-Atkins Museum of Art, Kansas City, Missouri (Fig. 1) and the National Gallery, London. (Fig. 2) Similar in size, the triumphs of Pan and Bacchus functioned as pendants and were installed on the same wall in the Cabinet du Roi on either side of a window.[2] A third painting by Poussin, *The Triumph of Silenus*, a version of which is also in the National Gallery, London, had joined the Bacchanal series in the Cabinet du Roi by 1646.[3] (Fig. 3) Beginning in 1665 and lasting through the 1800s, numerous high-quality copies were made in varying sizes of each painting in the series, attesting to the Bacchanals' great popularity and success.[4]

The absence of complete provenances for the Bacchanal series from the Château de Richelieu coupled with the presence of numerous 17th century copies, many of high quality, has caused over the years a great deal of confusion about which surviving paintings were part of the original commission. There is also speculation that some of the originals may not have survived at all. Indeed, the attribution of *The Triumph of Bacchus* in Kansas City was the subject of intense debate in the 20th century by Poussin specialists whose arguments centered on issues of quality, condition, and style. On the occasion of the production of a scholarly collection catalogue of its French paintings, the Nelson-Atkins has launched an extensive conservation and scientific study of *Bacchus* in an attempt to elucidate and resolve any lingering hesitations surrounding its authenticity. Because the direction of this ongoing research focuses on the question of copy versus original, it is worthwhile here to give a brief outline of the "paintings' provenances."

The Bacchanals remained with Richelieu until his death in 1642, at which time they were inherited along with the château by the Cardinal's great-nephew, Armand-Jean de Vignerot du Plessis, 2nd Duc de Richelieu. They continued to pass down through the Richelieu family until the second quarter of the 18th century, at which time the originals in the Cabinet du Roi were sold and replaced with copies.[5] There is no documentation of the Richelieu sale, though it must have happened between 1740, when they appeared in an inventory, and 1741, when *Pan* and *Bacchus* appeared at the Samuel Paris sale in London.[6] Amazingly, the two paintings were kept together through successive sales in London from 1741 through the first half of the 19th century. It was only in 1850, at the 4th Earl of Ashburnham's sale, that the pendants were split up and sent their separate ways. *The Triumph of Pan* entered the Morrison collection and is today at the National Gallery of London, while *The Triumph of Bacchus* was purchased by George William Frederick Howard, 7th Earl of Carlisle. It was his descendant, the Honorable Geoffrey William Algernon Howard, who sold the picture to the Nelson-Atkins in 1931. Regarding *The Triumph of Silenus*, there appears to be no trace of what happened to the original painting following its sale from the Richelieu collection. Of the version of *Silenus* in the National Gallery, which is considered to be the original by Pierre Rosenberg, Hugh Brigstocke, and recently Henry Keazor, nothing is known of its provenance before 1801.[7]

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1

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While together as pendants, both *Pan* and *Bacchus* were considered to be the original paintings sold from Richelieu's descendants. Nevertheless, by 1925, doubts had been cast on both paintings' authenticity. That year, an exhibition held at the Petit Palais in Paris displayed the Kansas City *Bacchus* alongside a *Triumph of Pan* in the Musée du Louvre's collection that was then considered to be the original version. Speaking of the *Triumph of Bacchus*, Paul Jamot noted in the *Gazette des Beaux-Arts*: "It's the execution here that fails. It is exact, correct, but of a sort of cold and dead perfection. It's enough to compare the two paintings. They have been distanced from each other in the rooms of the Petit Palais, for the *Triumph of Bacchus* could not have withstood being next to the *Triumph of Pan* … The only valid explanation is that we are dealing with an original on the one hand, and a copy on the other. An excellent copy, contemporary to the original, made in the [artist's] studio, perhaps, but a copy nonetheless".[8]

Ironically, Jamot's hunch that one of the two had to be a copy was correct, though he chose the wrong painting. The *Triumph of Pan* on loan to the exhibition from the Louvre is now universally accepted as a copy of the prime version in the National Gallery, London. This confusion over authenticity within the Bacchanal series reveals the complexity of the connoisseurial issues at hand, particularly as attributions often hinge on such direct comparisons.

While the National Gallery's *Pan* was eventually returned to Poussin's oeuvre in the 1960s, the opposite was true for the Nelson-Atkins' *Bacchus*. Though a few doubts were cast in 1925, *Bacchus* retained its status as the original in the majority of art historical texts until the mid-1960s, when Walter Friedländer and Anthony Blunt revived Jamot's hesitation. Friedländer penned that the Kansas City painting was "without doubt a copy."[9] Blunt de-attributed the painting in his 1966 catalogue raisonné, calling it a copy after a lost original based on stylistic discrepancies with the National Gallery's *Pan*, which he accepted as authentic. In comparison with *Pan*, Blunt considered the Nelson-Atkins' *Bacchus* to be too "cold and mechanical in handling" with "nothing of the delicacy and sensitiveness" of the National Gallery's *Pan* to be by the hand of the artist. "If it is in fact the picture painted for Richelieu," he conceded, "the only possible explanation would be that Poussin … broke his normal rule and employed assistants."[10]

A similar argument has been made for the version of *Silenus* in the National Gallery, London. Blunt and Humphrey Wine, among many others, have considered it to be a copy of the missing original from the Bacchanal series.[11] Wine's argument is based largely on the painting's inferior quality vis-à-vis *Pan* and the assumption that Poussin would not have sent a substandard work to such an important patron as Richelieu. Nevertheless, Wine concedes that in spite of the difficulty assessing the painting due to its worn condition, "the view that NG 42 [*Silenus*] is autograph is not unreasonable." He notes the similarity of *Silenus*'s double ground and pigment compositions with those of *Pan*, as well as "the quality of paintwork in parts."[12] Indeed, both Rosenberg and Brigstocke have argued for the authenticity of the picture, with the former suggesting that *Silenus*'s "ruined" and perhaps unfinished state are factors to be considered in its evaluation.[13] Brigstocke finds the similarities in style, technique, and nearly identical palette between *Silenus* and *Pan* to defy mere coincidence. He has proposed that the notoriously slow-working Poussin may have been forced to ship *Silenus* before it was properly finished in order to meet the demands of his powerful patron.[14]

Returning to the question of the authenticity of the Nelson-Atkins *Bacchus*, what do we make of its nearly identical provenance with the now uni-

versally accepted National Gallery *Pan*? Blunt proposed a few imaginative scenarios to explain how *Pan* could be an original while *Bacchus* a copy, a difficult argument to make since the two are believed to have gone directly from Richelieu's descendants to a collector in London by 1741. In one of his hypotheses, Blunt posits that the Richelieu family sold the presumed copy of *Bacchus* as the authentic version along with the original *Pan*, and then discreetly sold the original *Bacchus* to another buyer at a later date. Per Blunt, the Nelson-Atkins' painting is a very good copy of the original presumed to have been lost. Despite the fact that Blunt's theories lack documentation and, as in the example given above, are unpersuasive, the demotion of the Nelson-Atkins' painting gained traction. In critical publications dating from 1966 to the late 1970s, *The Triumph of Bacchus* is typically categorized as a copy of a lost original. A notable exception to this general rule is Pierre Rosenberg, who maintained the possibility of the painting's authenticity throughout this period and began arguing for its reattribution to Poussin in 1977.[15]

Art historians including Blunt were slow to change their minds, however the tides turned in 1981, when the National Gallery of Scotland held a Poussin exhibition and installed the Nelson-Atkins' *Bacchus* next to the National Gallery's *Pan*, which had just been cleaned. When seen side by side, an overwhelming consensus emerged among specialists that both paintings were indeed original. Blunt retracted his opinion on *Bacchus*, stating "I am now fully convinced by seeing the Kansas City *Triumph of Bacchus* ... next to the Morrison (now National Gallery) *Triumph of Pan* ... in its cleaned state that they form an exact pair."[16] While the majority of Poussin experts today consider the Kansas City *Bacchus* to be authentic, its acceptance into the artist's oeuvre has often been made with caveats or assumptions concerning its style and/or condition, as will be explored further below. Of the pendants, Blunt noted "that Poussin painted them in a hurry ... without real love and with the assistance of studio hands" as a means of explaining what he perceived as their inferior quality (he identified the chariot in *Bacchus* as an example of a weak area painted by assistants.)[17] Although Poussin is not generally believed to have used studio assistants – in opposition, it should be noted, to standard 17th century studio practice – Blunt is willing to make this exception, suggesting that Poussin may have been rushed and sought help to complete this important commission on time.[18] Brigstocke also pointed out areas he perceives to be substandard in quality, such as the poor modeling of the putto in the left foreground and the woman with blue drapery at the far right.[19] Rather than finding the handling to be problematic, Rosenberg has argued that Poussin prioritized the conceptual idea of the Bacchanals over style and the virtuosic effects one might expect from the artist.[20]

Most major publications produced after 1981 – including a new catalogue raisonné published by Christopher Wright in 1985[21] – claim the Kansas City painting to be the original. Nevertheless, some doubts still lingered as late as 1994 by noted Poussin scholar Jacques Thuillier, who maintained the view he first expounded in his 1974 catalogue raisonné that the Nelson-Atkins' *Bacchus* is a copy. In his book on Poussin, Thuillier indicated:

"Macendrew and Brigstocke think that it is a question of an original that was brutally treated during an old cleaning, which is possible. But it might also be a question of (and it is more likely) a good old copy (by the hand of Jacques Stella?). Only x-radiography and a comparative study of the canvas support would allow for these doubts to be lifted."[22]

Though Thuillier has since passed away, his latter commentary will be reprinted in a second edition of that 1994 publication by Éditions Faton in spring 2015, continuing his doubts and plea for more extensive research on the picture.

3

Fig. 1 – Nicolas Poussin, *The Triumph of Bacchus*, 1635-36, oil on canvas, 128.3 x 151.8 cm, The Nelson-Atkins Museum of Art, Kansas City, Missouri, Purchase: William Rockhill Nelson Trust, 31-94 (Photo: John Lamberton).

Fig. 2 – Nicolas Poussin, *The Triumph of Pan*, 1636, oil on canvas, 135.9 x 146 cm, National Gallery, London, bought with contributions from the National Heritage Memorial Fund and the National Art Collections Fund, 1982 (© The National Gallery, London).

Fig. 3 – After Nicolas Poussin, *The Triumph of Silenus*, probably about 1637, oil on canvas, 142.9 x 120.5 cm, National Gallery, London. Bought, 1824 (© The National Gallery, London).

Condition of The Triumph of Bacchus

During the long debate over the status of *Bacchus*, the condition of the painting has frequently been cited as a factor that has negatively impacted its reception. For example, Blunt eventually conceded in 1978 that it could be "a much overcleaned original" that had lost "all the finer touches which give life to the other pictures [Bacchanals]."[23] Mérot would repeat this sentiment in 1990, adding the painting is "worn," while Thuillier portrayed *Bacchus* as having been "brutally

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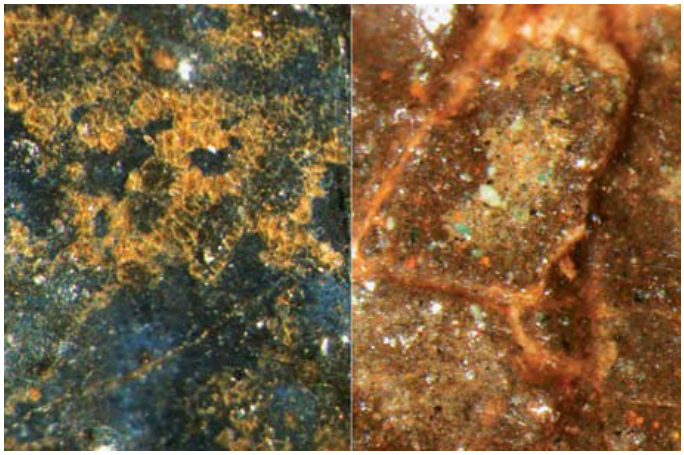

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Fig. 4 – *The Triumph of Bacchus*, crizzled varnish residues on blue drapery (left) and cupped area of brown background (right). Field of view: 2.75 mm each (Photos: John Twilley).

Fig. 5 – *The Triumph of Bacchus*, IR image detail (950-1050 nanometers) showing the leftmost edge of dark, underlying foliage (black arrows) and a faint tree along the right edge (white arrows) (Photo: John Lamberton).

Fig. 6 – *The Triumph of Bacchus*, radiograph composite (Radiographs: Joe Rogers and Mary Schafer; Image composite: Robert Erdmann).

treated during an old cleaning."[24] These descriptions, however, overstate the extent of damage. Indeed, paint abrasion has occurred on the Nelson-Atkins painting, skinning the upper points of paint formed by the underlying canvas texture and, in some cases, exposing the canvas, but the resulting damage is rather subtle.

Bacchus was cleaned by Marcel Rougeron shortly before the Nelson-Atkins acquisition in 1931, and although conservation records are incomplete between 1940 and 1970, the current wax-lining and replacement stretcher indicate that conservator James Roth performed a subsequent treatment. The 1981 examination of the painting, performed in advance of the exhibition at the National Gallery of Scotland, described the synthetic varnish as a "pebbly, milky" film; needless to say, *Bacchus* would benefit from future cleaning, as the discolored varnish layers impart a slight gray tonality overall.[25] Additionally, beneath these varnish layers, residues of natural resin varnish are present in the interstices of the paint and throughout the upper right sky, and in other areas, irregular patches of natural resin varnish have an effect on compositional elements. The effect is pronounced on the blue drapery of the central and rightmost females where crizzling of the yellow-brown, natural resin varnish flattens the highlights and shadows of the gathered fabric. (Fig. 4) Crizzled varnish is also a factor responsible for the hazy appearance of the brown terrain below the figures on the center right.

Broadly speaking, two conditions impact the

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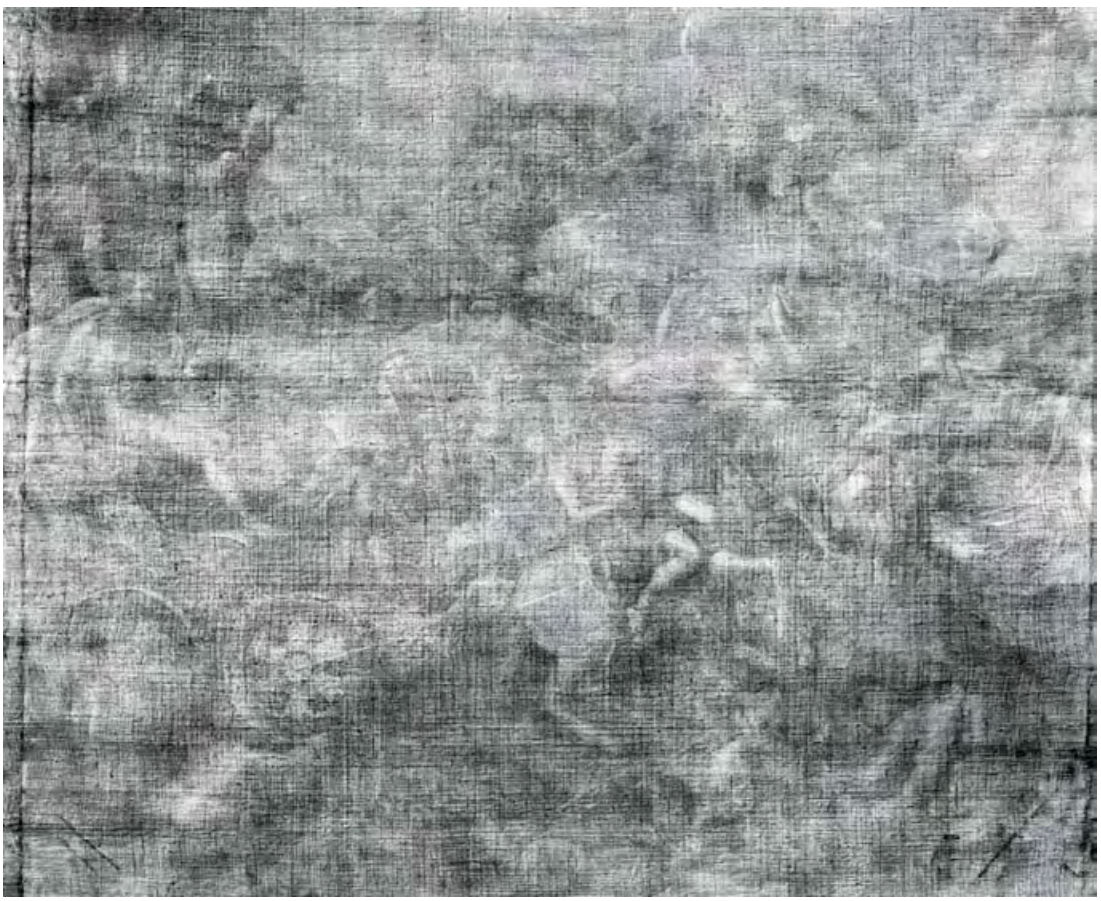

perception of the painting today: limited surface losses due to prior cleanings (exacerbated in some locations by surface disruptions above lead-soap formations) and incomplete removal of discolored and crizzled natural varnish residues prior to revarnishing. However, based upon the initial results of pigment analysis it is possible also to exclude a number of common pigment deterioration phenomena as playing no role in perceptions of *Bacchus*.

Poussin made no use of verdigris in the painting with its potential for darkening. Indeed, he used no copper pigments of any type for the blues or the greens. Therefore, foliage colors have not been impacted by their discoloration. Similarly, we have found no evidence of the use of smalt, either as a blue pigment or as a siccative in other colors. Therefore the graying of smalt is not a factor. The singular blue pigment in the painting is ultramarine which survives in good condition unless abraded.

Poussin employed red lake pigment sparingly and that which survives retains strong color. While we cannot exclude the possibility of missing glazes containing yellow lake pigment, no evidence has been found for yellow lakes whose fading might influence the surviving colors. Finally, the possible role of lead tin yellow deterioration, contributing to a loss of intensity in the yellows, remains under evaluation. As will be shown below, lead tin yellow is of highly variable composition in *Bacchus* and is occasionally, though not exclusively, associated with lead soap formations. Others have noted the depletion of lead from lead tin yellow during soap formation that would have the effect of decolorizing the pigment.

Artist changes and The Triumph of Bacchus

Poussin's working method, as described by his contemporaries, was a meticulous process in which the composition was gradually developed in advance of painting using numerous pen and ink drawings and studies of illuminated, wax forms.[26] Although only two preparatory drawings of *Bacchus* are known to survive, the eleven sketches associated with *Pan* imply that Poussin followed a similar procedure in the completion of the Richelieu commission.[27] Despite the artist's careful process, numerous artist changes – both substantial alterations as well as minor shifting of forms – can be identified on *Bacchus* using infrared imaging, radiography, and magnification. Evidence of significant compositional changes, a subject that has been overlooked in discussions of the painting's authenticity, signals a level of reworking and decision-making over the course of painting that would be unexpected and imprudent for a copyist to undertake.

Infrared imaging conducted with an infrared-adapted CCD camera in the range of 950-1050 nm reveals dark shapes beneath the upper right sky (Fig. 5) extending 14-1/2" toward the central

Fig. 7 – *The Triumph of Bacchus*, infrared image detail (950-1050 nanometers) showing the earlier position of Cupid's quiver (Photo: John Lamberton).

Fig. 8 – *The Triumph of Bacchus*, infrared image details at 950-1050 nanometers (bottom) and 1285-1530 nanometers (top) showing straight trumpet that becomes visible at the longer bandpass wavelength (Bottom photo, IR-CCD: John Lamberton; Top photo, IR vidicon: John Twilley).

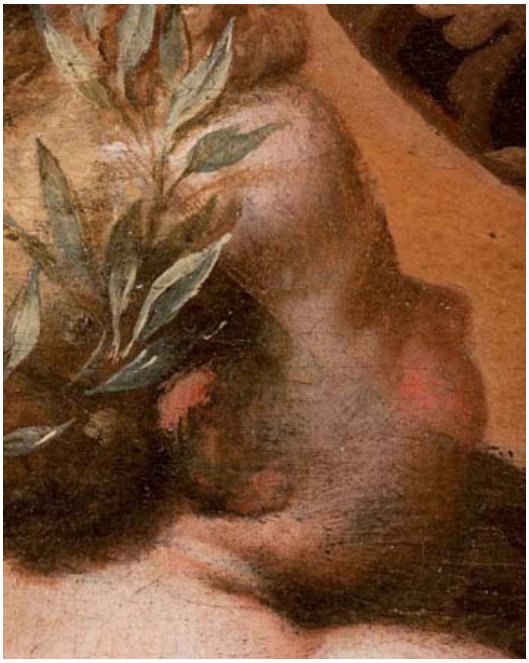

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Fig. 9 – *The Triumph of Bacchus*, detail showing addition of the lower left putto atop the previously completed chariot wheel (Photo: Mary Schafer).

sky that correspond to an early placement of trees that once balanced those on the left.[28] Underlying green paint is observed using magnification, and radiography confirms that, in the early stages of blocking out the sky, this area was held in reserve. (Fig. 6) The subsequent overpainting of the trees becomes significant when compared to *Pan* and *Silenus*, for as Christopher Wright previously noted: "all three [Richelieu] compositions are set against a tree-filled landscape where the trunks form elaborate patterns except in the Triumph of Bacchus where they only occupy the left hand part of the background."[29]

Three noteworthy changes among the bacchanal figures are visible today as pentimenti. Cupid's quiver of arrows, now located on the chariot near his feet, was initially located along his proper left side. The shape of the former quiver, a dark cylindrical form, differs slightly from the flattened version evident in the final painting. (Fig. 7) Pentimenti reveal that red fabric once draped across the central trumpeter's shoulder, and the height of his proper left arm was repositioned. More striking in terms of compositional changes, infrared images at longer wavelength reveal that his dramatic serpentine horn was previously a much simpler instrument with a flared end, not unlike the horn depicted on the left side of *Pan*. (Fig. 8)

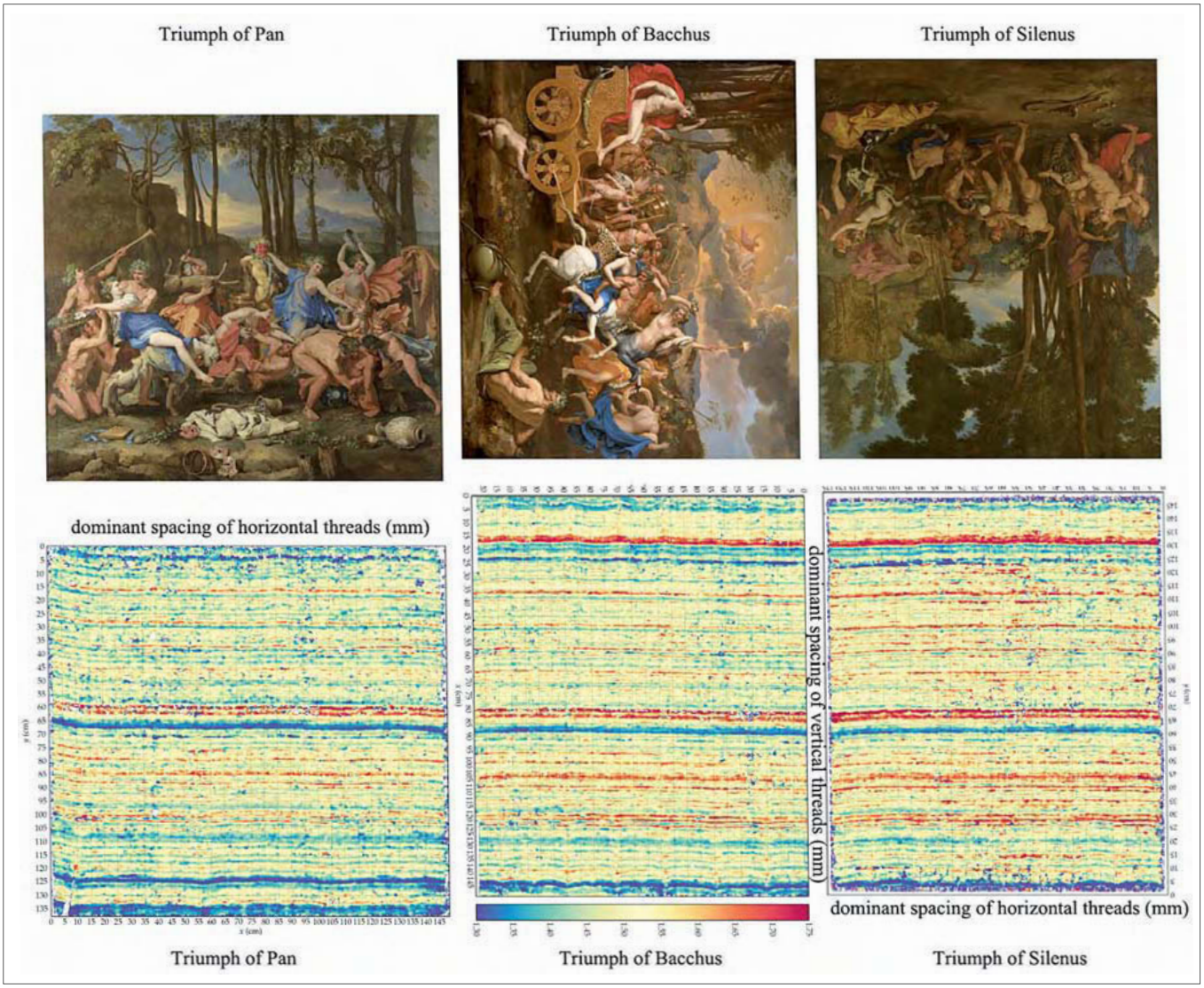
Finally, although Poussin typically left figures in reserve, two compositional elements were introduced in the later stages of painting *Bacchus*. The lower left putto climbing out of the river bank was painted on top of the fully completed chariot and foreground, perhaps in an effort to balance the river god on the opposite corner. The curving demarcation of the chariot wheel beneath his face and the prominent, underlying foreground colors influence the tonality of the thin flesh tones. (Fig. 9) Infrared imaging confirms that the overturned vase in the central foreground was also added on top of the established foreground.[30]

Automated canvas weave comparisons

The task of identifying technical features that would either link, or differentiate, *Bacchus* from the more-widely accepted *Pan* was expected to be a lengthy and difficult process with a highly uncertain outcome, given that most copies of the type date from the 17th century and could be expected to employ similar materials. Furthermore, success in such an effort would demand a heavy commitment of time from others to participate in the comparisons. For these reasons the Nelson-Atkins team first embarked on a collaborative comparison of the canvas weaves with academic researchers Robert Erdmann and C. Richard Johnson of the Thread Count Automation Project. While the lack of a direct match between weave anomalies in each canvas would not preclude *Bacchus* from being part of the Richelieu commission, a match between them would be one of the strongest possible links. Under that outcome, the case for more detailed palette studies would be bolstered and the ensuing results would have much greater significance for the broader study of Poussin's technique.

Existing radiographs of *Pan* were digitized and provided by the National Gallery, London, for comparison with *Bacchus* through this process, resulting in a very close match of their warp thread-spacing variations. When subsequently performed on radiographs provided for *The Triumph of Silenus*, also graciously provided by the National Gallery, its warp spacing variations also matched to a very high degree those of *Pan* and *Bacchus*, providing compelling evidence that all three paintings were executed on the same bolt of canvas.[31] (Fig. 10)

The unexpected similarity of this third canvas led to closer scrutiny and, ultimately, to validating refinements of the method. Since certain types of variability in the warp are almost certain to derive from physical variations specific to a given loom, it appeared that some variations in spacing could be expected to repeat in all canvases woven on that loom – perhaps over years – and not to indicate that the canvases were, in fact, one and the same. Three potential criticisms of the whole-canvas automated analysis method were identified: (1) the method had not been validated against canvases with known spacing; (2) both the alignment among the canvases and the apparently high similarity of their spacing patterns, though based on mathematical methods and devoid of error-prone visual measurements, were only qualitative; and (3) the automated analysis procedure operates on swatches of canvas including groups of threads that would not make maximal use of individual thread anomalies. In responding to these issues, Robert Erdmann and his colleagues at the University of Arizona developed a "manual" procedure by which the thread spacing maps could be augmented by single-thread transits of the canvas.[32] The sequence of center-to-center thread spacings for the warp threads along such a transit should provide a good characteristic sample of the "can-



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vas fingerprint" for the warp threads in that canvas. Extraction and quantitative analysis thus addresses each of the above criticisms: (1) the thread spacings are directly measured, so their statistics can serve as the ground truth for validating the automatic method; (2) the similarity between two spacing sequences is easy to quantify and interpret; and (3) the method operates at the level of individual threads so even single-thread anomalies can be detected.

This form of evidence, connecting the three works to a single canvas as it does, is unaffected by variations between the conditions of the paintings though it in no way diminishes judgments of aesthetic or artistic quality that bear on questions of the master's role versus that of assistants or copyists. As most art historians consider the National Gallery's *Silenus* to be a copy, how does one explain its coming from the same bolt of fabric as the original *Pan* and *Bacchus*? Wine has suggested that an independent copyist with access to Poussin's studio could have painted a replica of *Silenus*.[33] To explain the canvas weave match in this scenario, it is possible that a scrap of canvas left over from *Pan* and *Bacchus* was used to make the copy. Nevertheless, this hypothesis is not without problems. Since *Silenus* is comparable in scale to *Pan* and *Bacchus*, it is hard to imagine that such a generous portion of canvas would have gone unused and/or made available to an independent artist working outside of Poussin's studio. Another possibility is that a copyist could have purchased canvas at Poussin's supplier from the same bolt of cloth around the same time. The odds of this happening seem even lower, however, given the numerous suppliers of art materials that must have existed in Rome during the 17th century to support its flourishing art market.

As for an independent copyist making the replica in Poussin's studio, Wine cites the replica that Angelo Caroselli made after Poussin's *The Plague of Ashdod* as an example of a copy made shortly after the original's production, perhaps in the artist's atelier.[34] Poussin completed *The Plague of Ashdod* and delivered it to Fabrizio Valguarnera in February or March 1631. Just six months later, Valguarnera went on trial and both the original Poussin and a copy of it by Caroselli were documented in an inventory of his possessions.[35] Though Wine suggests Caroselli may have made the copy in Poussin's studio, it is equally plausible and probably more likely that he painted it once it

Fig. 10 – Rotated and aligned warp thread spacing maps for all three canvases, shown with the painted compositions in the same orientations and at the same scale. Their sequence is arbitrary. The color scale represents local deviations from the mean warp thread spacing, with blue and red corresponding to the minimum and maximum spacings, respectively (*Pan* and *Silenus* images courtesy of the National Gallery, London; *Bacchus* courtesy of the Nelson-Atkins Museum of Art; Diagram: Robert Erdmann).

entered Valguarnera's collection, that is, in the five or six months between his acquisition of the original and the appearance of the copy in his inventory. Ultimately, one wonders if Poussin would have allowed an independent artist to enter his studio and make a replica of his painting on canvas he had purchased, unless of course it was for his own financial gain (considering that Valguarnera directly paid Caroselli thirty-five scudi for the copy,[36] that seems unlikely.)

It thus seems very probable that Poussin bought the canvas for all three pictures and painted them in his studio within a relatively narrow timeframe. While *Pan* and *Bacchus* are documented as arriving at the Château de Richelieu in 1636, *Silenus*'s date of execution is unknown. It is generally believed, however, to have been completed and delivered shortly after *Pan* and *Bacchus*.[37] The fact that all three canvases were cut from the same bolt of cloth supports this supposition that the three Bacchanals are relatively contemporaneous.

Scientific study of the palette and stratigraphy

The canvas weave match between the *Triumph of Bacchus*, *Triumph of Pan*, and *Triumph of Silenus* casts a strong light on the positions that have been taken over the years regarding their authorship. Two clear issues exist for which sufficient information is presently lacking. What differences of material usage distinguish Poussin's work and, closely coupled with that, what role, if any, did studio assistants play in his practice? Scientific analysis cannot settle the question of whether Poussin admitted independent copyists to his atelier or employed assistants. However, refinements in the ability to draw distinctions among otherwise similar materials can be expected to contribute substantial additional information beyond simple pigment identifications to better distinguish among these closely-related works. To the authors' knowledge, no analyses carried out up to this date have suggested that Poussin used any specific materials that would have been novel or exceptional for his time. Therefore, it is axiomatic that identifying distinctive traits of his work requires attention to unique uses that he made of common materials and idiosyncrasies of otherwise common materials that reflect habit or an underlying procedural philosophy unique to Poussin. Identification of the pigments comprising his palette is an essential point of embarkation. However, it is in the identification of variants among similar materials available in his day, combinations used for his specific effects, and changes wrought on those materials by his preparation procedures that one could expect to discover new characteristics of the artist.

Methods appropriate to the task are required for these distinctions to be made apparent. Well-established non-sampling methods such as x-ray fluorescence spectrometry (XRF) and, more recently, in-situ x-ray diffraction (XRD) analysis, are highly desirable from the standpoint that they may be employed widely without constraint.[38] Nevertheless, even with advances brought by greater computational power and mathematical modeling they suffer from the inherent fact that they present aggregate, rather than individual responses from the multilayered paint structure, often compounded by the lack of response from major components of one or more constituents. For example, iron is one of the most common elements in 17th century pigments and can be responsible for any color of the spectrum other than white. Its various species have greatly differing x-ray diffraction intensities and within individual species those intensities vary, based upon conditions of their formation. Lead, ubiquitous in 17th century painting, may be present in many well-defined crystalline phases identifiable by XRD but it is also routinely present in non-particulate form combined with the organic phase of the medium in consecutive strata at the same location.

In a study covering 155 examples by a range of artists, Alain Duval attempted to quantify the average major element concentrations from their grounds by energy dispersive x-ray spectrometry performed in the scanning electron microscope.[39] He included nine works by Poussin that he presented in this context of broader 17th- and 18th century painting practice. By working from cross sections, he bypassed the issues that are inherent to non-sampling methods in the analysis of superimposed layers, methodology that, in any case, was in its infancy at that time. Arriving at quantitative totals entailed a range of assumptions about how to allocate the responses for individual elements to specific categories, such as lead in particulate form and lead dissolved in the medium as a siccative. (The particular difficulty of recognizing the presence of fine-grained, red lead oxide on the basis of optical microscopy, when its color cannot be distinguished from its surroundings in a colored ground, is described.)

Duval identified a small number of mineral inclusions such as barite, for which electron microscopy methods are particularly well-suited for unambiguous identification, and proposed that these served as indicators for certain trends in his results. However, mineralogical classification of the more variable, and abundant, iron-containing species were not exploited. Optical microscopy, while employed, was descriptive in nature, referring to homogeneity, translucency, and color rather than mineralogical identifications.

In a subsequent paper Duval has presented the results of this experimental protocol on the grounds of 26 works by Poussin. He classified the ground layers into three types based upon color and dominant elemental composition.[40] He defined these as ferrugineous soils, ochres, and iron oxides, based upon their proportions of alumina, silica, and iron.

It is possible that non-sampling methods whose responses are inherently aggregate sums will yet contribute significantly to finding distinctions among Poussin's works by, for example, the appli-

cation of statistical methods to large numbers of analyses that allows norms and outliers to be identified. However, this implies that large numbers of works be extensively tested and methods be established for removing the contributions of overlying restoration toning layers. The influence of wear and cleaning losses in diminishing the contributions of the affected top layers, and the proportionate enhancement of response from the underlying layers, appear not to be amenable to accurate estimation. For a museum collection containing a single example attributed to Poussin, a significant contribution is still possible and a start may be made using established methods.

In order to obtain the most concise information possible about the elemental compositions of the individual pigment types in this single painting a heavy reliance has been placed upon electron beam-excited x-ray spectrometry of individual pigment particles in the scanning electron microscope (SEM-XES.) Samples for this purpose were prepared as embedded cross sections and fracture sections presented without further preparation, apart from a conductive coating of evaporated carbon. Cross-comparisons have been made with optical microscopy and UV fluorescence microscopy, with a few confirmatory identifications carried out by Raman spectroscopy. Polarized light microscopy has then been used to correlate differences in color and optical properties with individual species. This has led to progress in the case of *The Triumph of Bacchus* presented below as a step toward making finer distinctions among the works attributed to Poussin and his circle.

The painting has an overall double ground consisting of a ruddy red-brown layer followed by one with a warm buff color. Traces of gypsum sometimes encountered on the underside of the most-complete sections of the lower ground could be indicative of the preliminary use of a very thin gypsum-based priming. The lower, ruddy ground is comprised mostly of earth pigments with a very low content of lead white, while the upper buff ground consists of lead white tinted by yellow, orange, red, and black pigments, including several forms of hydrated iron oxides, and traces of vermilion and charcoal. (Fig. 11)

Lead white pigment particles in the buff ground vary markedly in shape, size, and crystal structures. Their size variation is extreme, ranging from less than one micron to over 50 microns in diameter. Both large agglomerates of fine crystals and coarse, splintery fragments of individual crystals are intermingled with very finely ground and highly dispersed ones. The opacity is markedly different for large agglomerates of fine grains and the coarse grains of similar size. It seems unlikely that all of the lead white experienced the same grinding conditions and therefore that lead whites of differing coarseness and qualities were intentionally combined with a desired objective in mind.

A group of five cross sections near the right side of the painting demonstrates that the space for the blue-draped bacchante was left in reserve when painting the brown background and shows the artist's approach to the depiction of blue drapery. The blue is underlain by a layer consisting mostly of coarse charcoal in lead white, whose thickness varies in response to the depth of blue color required at that point. The great variations in coarseness of the lead white seen in the upper ground are also characteristic of lead white in the black underlayer paint. Traces of umber have been added to the black underlayer in its thickest applications. The upper blue consists of natural ultramarine mixed with lead white in proportions that vary in accordance with the depth of color required. Lead white in this blue layer is consistently of fine particle size.

In contrast to the treatment of the blue drapery, the peach-colored scarf swirling around the left arm of the same figure was painted over the brown

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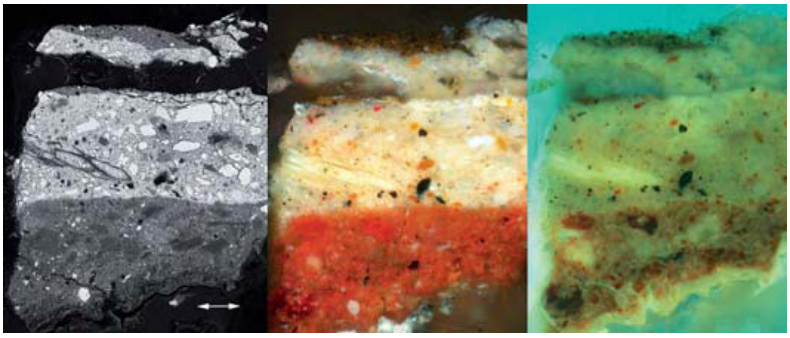

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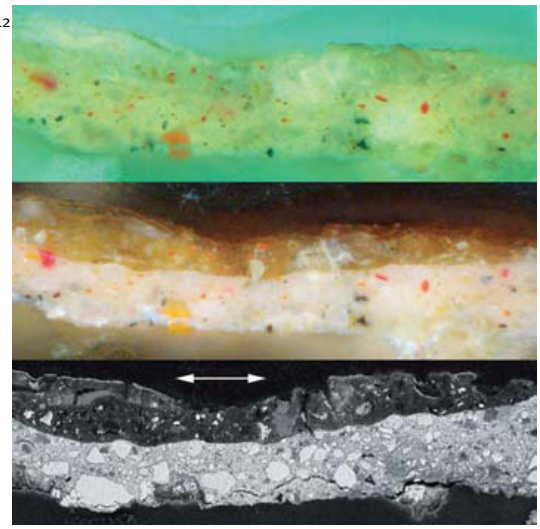

Fig. 11 – Cross section from brown background (adjacent to the rightmost bacchante in an area affected by cupping and old varnish residues, see Fig. 4 above) showing thick applications of the double ground beneath worn brown paint. Note bisected plant fiber on left side of upper, lead-based ground. Left to right: Backscatter electron image; normal reflected light; ultraviolet fluorescence. Scale bar: 40 microns (Photos: John Twilley).

Fig. 12 – Cross section of the pink scarf of the rightmost bacchante with a sequence of three layers starting with the upper ground. A thin layer of lake pigment, most visible at the left end of the sample, was applied atop the light brown paint surrounding the figure. Its upper surface bears a coating of lead compounds visible as a light band in the SEM view. Top to bottom: ultraviolet fluorescence, normal reflected light, backscatter electron image. Scale bar: 40 microns (Photos: John Twilley).

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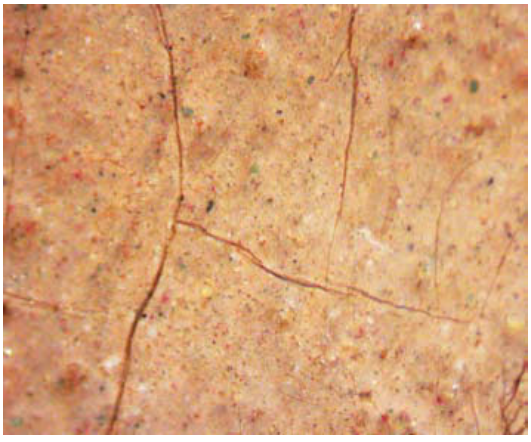

Fig. 13 – Flesh of the female centaur, showing coarse particles of vermilion, green earth, and lead tin yellow. Field of view: 2.75 mm (Photo: John Twilley).

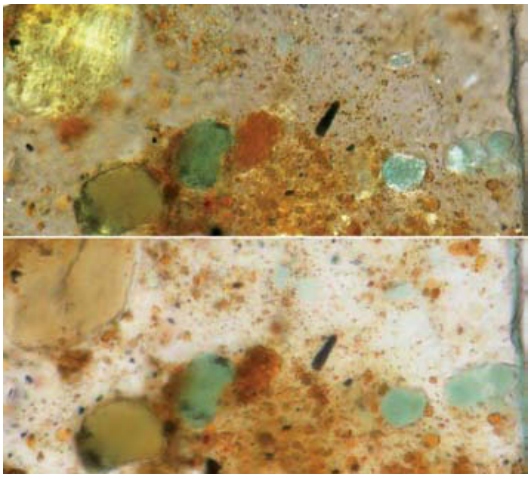

Fig. 14 – Uppermost pigments from the vine leaf wreath of the rightmost bacchante, shown here adhering to the rear of a varnish fragment. A total of six large green earth particles are visible, ranging in color from yellow-green to aquamarine and with birefringence ranging from strong to nearly isotropic. Top: transmitted light with crossed polars. Bottom: normal transmitted light. Field of view: 100 microns. (Photos: John Twilley).

Fig. 15 – Red lead highlights from leaves of trees removed from the upper right sky, exposed by abrasion of the overlying dark sky paint. Field of view: 4 mm (Photo: John Twilley).

background rather than left in reserve. It consists of a layer (now thinned by abrasion and prior cleanings) pigmented mostly by an alumina-based lake. The layer has a high proportion of non-particulate lead associated with the medium but very few, and finely dispersed, lead white grains. The scarf has minor formations of lead soaps within the top layer and its surface bears a coating of sub-micron thickness. The coating consists of lead-containing alteration products formed from interaction of this non-particulate lead and environmental sulfate. (Fig. 12) A second sample taken from the segment of the scarf between left hand and buttock where the underlying layers are more complicated exhibits the same surface alteration phenomenon atop the lake layer, confirming that the condition affects the scarf as a whole and is related to the formulation of the lake-rich top layer.

The bright yellow-orange robe of the woman bearing the serpent on a staff is constructed in two layers. The lower one is comprised of a high concentration of an orange iron earth that is more fully described below, with small amounts of alumina-based lake, vermilion in widely varying coarseness, and lead white. The highlights applied to this layer consist of lead tin yellow type I.

The light-complexion flesh tones contain a wide variety of tinting pigments in low concentrations, the coarser grains of which are identifiable in the surface of the paint itself. These include coarse vermilion, lead tin yellow agglomerates, ultramarine, and green earth in both pale and deeper shades. (Fig. 13) In addition to the coarse species identifiable on the top surface, polarized light microscopy of the pale flesh shows it to be preponderantly lead white colored by the same isotropic orange iron earth that is widely employed throughout this painting, traces of fine charcoal, and fine vermilion. Shadows employ thin, transparent applications of charcoal and additional vermilion. A cross section of Bacchus's flesh in the elbow shadow shows that the flesh was painted directly atop the upper buff ground.

Two flesh samples from the serpent bearer were taken for comparison with Bacchus. The highlight flesh color of the thigh was sampled at a location where the artist raised the hem by extending the paint of the thigh above the initial placement of the hem. Accordingly, a layer rich in lead tin yellow lies between the single-layer flesh paint and the buff ground. A darker, redder shade at the knee below this revision also contains two paint layers atop the buff ground. In this case, the first is a thin underlayer of orange comprised of a yellow iron earth and vermilion (the latter used in widely varying particle sizes.) The second is a pink mixture based on lead white containing vermilion, with traces of ultramarine and umber. Both of these flesh shades contain recognizable coarse particles of green earth in their surface like those visible on Bacchus, though with less coarse vermilion.

As noted above in the condition description, there are no copper greens employed in *Bacchus*. All greens are based upon green earths or combinations of green earth and yellow. Direct observation of the paint layer often discloses large differences of particle size and color among the green pigments that have been related to elemental composition, optical behavior, and transmitted light color. Five samples were studied that include green applications: the upper leaves of the sapling projecting from the hill near the right edge; foliage barely above the top of the same hill; the sparse tree standing against the orange sky beneath Apollo; a leaf in the wreath of the rightmost bacchante; and shadow green from the robe of the river god. All of the greens incorporate the sparing use of lead tin yellow type I. The greens tend to be drab in this painting, verging on brown, as a consequence of the use of yellow and brown iron earth pigments in combination with lead tin yellow and green earth. Therefore, the brown coloration of much of the foliage is purposeful and not a consequence of the decomposition of green pigments based upon copper compounds or smalt, pigments that do not occur in this painting.

All green earths owe their color to iron but individual examples vary widely in their mineral contents.[41] Analyses of green layers averaged over the entire layer show that both magnesium and potassium were systematically present along with the requisite iron and silica. However, by conducting elemental analyses on individual grains, at least two classes were found to be present, one of which contains potassium iron silicate with very little magnesium and another in which magnesium is prevalent and potassium

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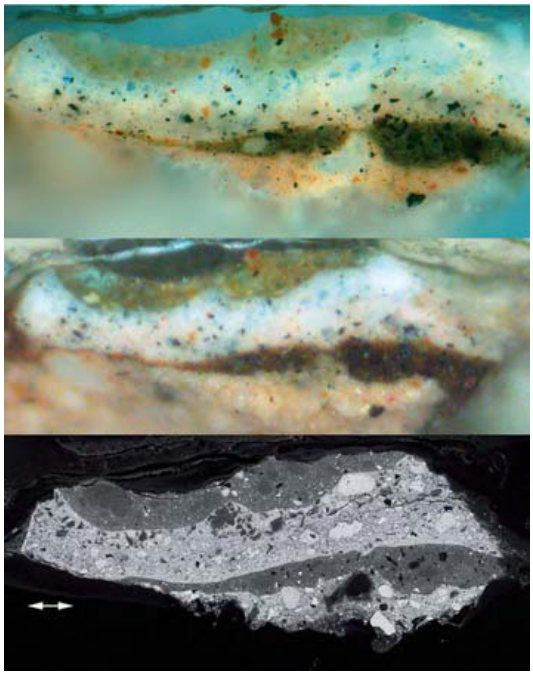

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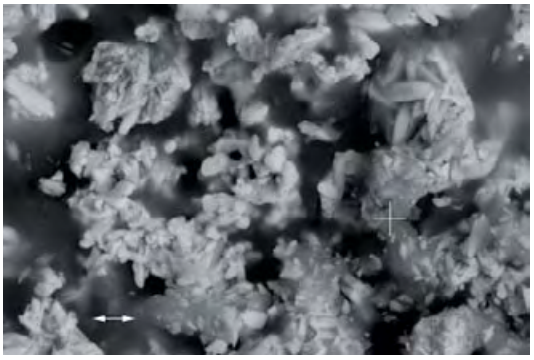

diminished. In cross sections where the colors of large individual grains were apparent, their color often differed in accordance with these compositional differences. Additional distinctions were found when optical properties accessible in polarized light microscopy were examined. Rounded grains of three distinct green earth types can be found, each with its own color, internal crystal structure, and degree of birefringence. (Fig. 14) Yet another green earth, with deeper green saturation, stronger pleochroism and occasional splintery morphology, occurs in other samples. Up to this point attempts to differentiate these isolated mineral grains on the basis of Raman microspectroscopy have not been successful due to background fluorescence. Improved characterization of the green earth minerals is a priority for future work.

Two cross sections from areas in the sky on the right that were taken with other objectives fortuitously provided glimpses of the trees that were overpainted in that area. The trunks of the trees were painted atop the upper buff ground rather than over the colors of the sky using a very dark brown mixture. (Fig. 15) The composition of this layer as a whole is very high in siliceous earth pigments, including the orange iron earth widely used throughout the painting, and low in lead, with only small and widely-spaced particles of lead white. The layer contains plagioclase feldspar and owes its dark color to bone black and charcoal (some of it extremely coarse) used together, with umber. (Bone black occurs elsewhere in mixtures of darker browns and, sparingly, in the ground, rather than as a black pigment in its own right. It was not encountered in the black that is used as an underlayer for blue, for example.)

In the midst of the darkest clouds in the sky, above and to the right of the torch in the region of overpainted trees, there are a few very small exposures of intensely orange pigment. Some of these are visible only due to abrasion losses where faint surface relief from the overpainted foliage has left thin spots in the grey clouds. (Fig. 16) Examined by polarized light microscopy, the particle size of the orange is at or below one micron and it exhibits anomalous interference colors characteristic of red lead. Raman spectroscopy confirms the identification of this phase as minium. Its role in this location, high in the sky in the middle distance ahead of the light emanating from Apollo, may have been to represent sunlight reflecting off the leaves of the trees originally painted there. Due to its extremely fine particle size it is possible that well-dispersed minium could be present in mixtures at low levels that have gone unrecognized, however, a careful search of the cross sections for red grains correlating with high atomic weight particles in backscatter electron images from the SEM, other than vermilion particles, has not revealed any examples. Nor was minium encountered in any other Raman spectra.

The condition, composition, and particle size of lead tin yellow in *The Triumph of Bacchus* are all highly variable, with many coarse particles consisting of sintered, porous agglomerates. (Fig. 17) The proportions of lead to tin vary between the extremes of pure tin oxide to nearly pure lead oxide, with color variations ranging from nearly white to the more typical lemon yellow. Because lead soap formations are sometimes evident nearby in the same layers, it is not possible to rule out a role for extraction of lead from the lead tin yellow by free fatty acids in the medium. Nevertheless, the distinctive tin-depleted spheres documented by others in extreme examples of this decomposition phenomenon were not found in cross sections from *Bacchus*.[42]

18

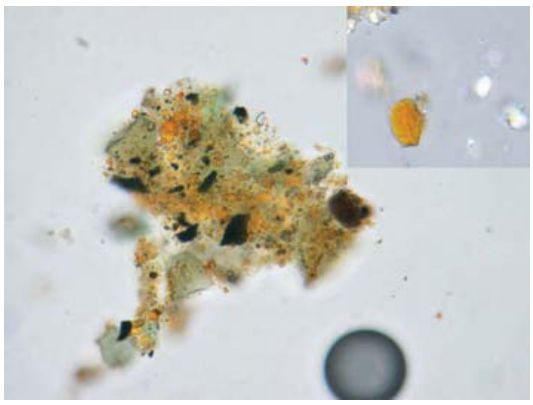

Fig. 16 – Cross section of a leaf on the horizon along the right edge, showing a sequence of six layers starting with the upper ground. The dark layer atop the ground is the trunk of an overpainted tree, followed by two pale blue shades that constitute the sky. The uppermost green leaf contains large particles of more than one type of green earth accompanied by lead tin yellow and brown earth pigments. Top to bottom: ultraviolet fluorescence, normal reflected light, backscatter electron image. Scale bar: 40 microns (Photos: John Twilley).

Fig. 17 – Fracture surface through a porous grain of lead tin yellow from the pink scarf on the right shoulder of the rightmost baccha-nte. Lead and tin proportions vary greatly among analyses of LTY grains in both cross sections and fracture fragments. In spite of occurrences of both tin oxide and nearly pure lead compounds, neither lead oxides nor cassiterite were detectable in Raman spectra that systematically corresponded to that of lead tin yellow type I. Backscatter electron image. Scale bar: 2 microns (Photo: John Twilley).

Fig. 18 – Partially dispersed pigments from the overpainted tree along the right margin, showing large pale green earth particles, charcoal and abundant, isotropic brown pigment used throughout *Bacchus*, transmitted light, field of view: 135 microns.
Inset: single large particle of iron silicate brown, between crossed polars, exhibiting minimal birefringence and lack of iron coatings on the grain. Diameter: 12 microns (Photos: John Twilley).

One of the principle ingredients of the paints and of both grounds used in *Bacchus* is an orange iron earth pigment that is not typical of such pigments. Several dozen individual grain analyses from all paints in which it occurs demonstrate that it contains only iron and silica. One of the most common materials yielding such an analytical result would be detrital quartz particles bearing hydrated iron oxide coatings, a type of sedimentary grain abundant in many geological environments. However, the isotropic or very weakly birefringent optical behavior of these grains demonstrates that they are not typical detrital quartz and they do not possess iron coatings that are resolvable by either optical or scanning electron microscopy. (Fig. 18) Instead, their color appears uniform, rather than localized on their surfaces, in those grains large enough to have been bisected during sample preparation. Improved characterization of this pigment is another priority for future work.

Sharp-edged fragments of colorless quartz and feldspar occur sporadically in the paints and both grounds. These would not be surprising in the ruddy ground where earth pigments are so prevalent but they can often be found in layers where earth pigments are used very sparingly such as the upper, buff ground. Some are visible directly in the surface of the flesh paint used for Bacchus. Their lack of both rounding and staining by iron compounds suggest that these are not detrital sedimentary grains incorporated along with the earth pigments. They do not appear to be purposeful additions and for the moment we presume that they are wear-particles from stone implements used for grinding certain of the pigments.

Conclusion

In his opening essay for a series of papers on Poussin laboratory studies published two decades ago, Thuillier identified the Bacchanals commissioned by Richelieu (including a fourth painting postulated by some to be part of the original series) as a case amenable to clarification by the application of scientific study: "There is little chance that for these four works, painted over a short period of time and with the same destination, Poussin would have changed the type of canvas and preparation, or that his handling would have evolved much. A comparative study of the four works in question, focusing simultaneously on the canvas, preparation, and macrophotographs (and where necessary chemical analyses, the originals having been painted in Rome and the majority of copies in France), would suffice, if not to resolve the problem, then in the very least to shed useful light on the debate."[43]

The Nelson-Atkins' study has had the good fortune to draw upon computational methods that allow forms of canvas comparison not foreseen in 1994 to implement one of those goals and to take important steps toward a refined characterization of the pigments employed.

With regard to the latter, identification of the palette used for *Bacchus* by scientific methods, with particular attention paid to the distinguishing idiosyncrasies of individual mineral species in mixtures often treated as groups, such as "green earth" and "yellow ochre," can be expected to further link, or differentiate, the Bacchanals at such time as comparable information becomes available from the National Gallery paintings. We have seen that the predominant orange-brown pigment in the painting is a hydrated iron silicate differentiated from frequently-encountered iron earths by its absence of clay and quartz, and from yellow ochres that are often based upon the hydrated iron oxide goethite. Minerals with this composition and optical behavior, such as hisingerite, are relatively uncommon and often derived from the geological alteration of olivine. Refinements in the differentiation of the multiple green earth minerals shown to be present in *Bacchus* may provide key points of comparison with the other Bacchanals. Lead white, with its diversity of particle sizes and crystal forms, and lead tin yellow, with its porous agglomerates and highly varied tin/lead proportions, are but two of the common pigments whose morphological comparison may yet prove distinctive for the paintings.

With regard to the computer-automated weave analysis, the surprising results have established compelling evidence that the canvases of *Pan*, *Bacchus*, and *Silenus* were cut from the same bolt of canvas. The close warp thread match between *Bacchus* and *Pan* combined with the painting's provenance and artist changes bolster the widespread belief that the Kansas City painting is indeed authentic. The unexpected triple match between *Pan*, *Bacchus*, and the National Gallery *Silenus* raises important questions, however, about the relationship between all three paintings, as well as prevalent notions of Poussin's studio practice.

Given that *Pan*, *Bacchus*, and *Silenus* were painted in Poussin's studio around the same time, how then do we explain the differences in style and quality that have raised attribution issues for each painting over the course of time? As in the case with *Bacchus*, and perhaps also *Silenus*, condition alone cannot explain all of the objections raised concerning attribution. Did Poussin, as Blunt has tentatively proposed, employ studio assistants in the production of his paintings? Is it time to rethink or complicate the wide held belief that Poussin, counter to common 17th century artistic practice, worked alone on his major commissions? Or, as Brigstocke has asked in relation to *Silenus*, "is it a question then of an original painting, however disappointing, by Poussin?"[44] Do we need to revise our understanding of Poussin and accept him as an artist who was, at times, uneven in his style and handling of paint? While the Nelson-Atkins' study does not offer a resolution to these questions, it attempts to promote further discussions concerning Poussin's materials and artistic practice as well as issues of quality, technique, and consistency not just between different paintings in his oeuvre, but within individual works themselves.

Acknowledgements

The authors wish to thank the conservation representatives of the National Gallery, London, for making digitized versions of their radiographs available; Robert Erdmann, and C. Richard Johnson, of the Thread Count Automation Project, for their conduct of the three canvas comparisons; Helen Glanville for sharing her observations during joint examinations of the Nelson-Atkins' *Bacchus*; Joe Rogers for radiography of *Bacchus*; Kenneth Brummel and Brigid Boyle for their curatorial research assistance; and Elisabeth Batchelor for coordination of conservation resources. Funding for the scientific study was provided from the Nelson-Atkins' endowment for conservation science by the Andrew W. Mellon Foundation.

Notes

[1] Pompeo Frangipani to Cardinal Richelieu, May 19, 1636, Correspondance politique, Rome (1636), microfilm P 7511, vol. 57, folio 171, Archives du Ministère des Affaires Étrangères, La Corneuve, France. "... due quadri de' Baccanali, che il Poesino Pittore hà già forniti conforme al desiderio, et intentione di lei." Cited in Thuillier 1994, p. 154.

[2] Bassani 2011, pp. 314-315.

[3] Blunt 1966, p. 96; Wine 2001, pp. 358, 364 n. 58. The three triumphs by Poussin were recorded by Willem Schellinks and Lambert Doomer during a visit to the château in 1646. There is some debate about how many paintings made up Richelieu's Bacchanal commission in total. Though all of Poussin's earliest biographers describe four Bacchanals, the earliest dating to 1672, Poussin scholars today are in agreement that only three paintings were originally installed in the Cabinet du Roi on the subject of the triumphs of Pan, Bacchus, and Silenus. There, they were installed alongside five early 16th century Italian paintings by Mantegna, Perugino, and Lorenzo Costa that had come from Isabella d'Este's Studiolo at the Mantuan court. See Rosenberg 2011, pp. 129-135, for an excellent summary of the issues surrounding the Bacchanals in the Cabinet du Roi.

[4] On the known copies after the Bacchanal series, see Blunt 1966, pp. 97-99.

[5] The copies are now at the Musée des Beaux-Arts, Tours.

[6] Rosenberg 2011, pp. 131-132; Vertue 1933-34, pp. 105, 117. In a notebook entry from 1741, Vertue mentions that several pictures by Poussin were "lately" "[b]rought over from Paris," and that he saw "with great pleasure" the *Triumph of Bacchus* that year.

[7] Rosenberg 1994, p. 226; Brigstocke 1996, pp. 209-210; Rosenberg 2011, p. 132; Wine 2001, pp. 380, 383 n. 40-42.

[8] Jamot 1925, p. 103. "C'est l'exécution ici qui pèche. Elle est exacte, correcte, mais d'une sorte de perfection froide et morte. Il suffit de comparer les deux toiles. On les avait éloignées l'une de l'autre dans les salles du Petit Palais, car le *Triomphe de Bacchus* n'aurait pas pu supporter le voisinage du *Triomphe de Pan*. ... La seule explication valable, c'est que, d'un côté, nous avons affaire à un original, de l'autre à une copie. Copie excellente, contemporaine de l'original, faite dans l'atelier, peut-être, mais copie tout de même." Translation by Nicole Myers.

[9] Friedländer 1965, p. 43, as "sans doute une copie."

[10] Blunt 1966, p. 98.

[11] Ibid., p. 99; Wine 2001, p. 380. Denis Mahon, Jacques Thuillier, Alain Mérot, Richard Verdi, Christopher Wright, and Delphine Bastet are among the Poussin scholars who consider the National Gallery *Silenus* to be a copy of a lost original. See Rosenberg 2011, p. 132.

[12] Wine 2001, p. 380.

[13] Rosenberg 1994, p. 226; Rosenberg 2011, p. 132.

[14] Brigstocke 1996, p. 209.

[15] Rome 1977, pp. 168-170.

[16] Blunt 1982a, p. 707.

[17] Blunt 1982, pp. 327-328; Blunt 1978, p. 422.

[18] Blunt 1978, p. 422.

[19] Edinburgh 1981, p. 52.

[20] Rome 1977, p. 170.

[21] Wright 1985, p. 178.

[22] Thuillier 1994, p. 254. "Macendrew et Brigstocke ... estiment qu'il s'agit d'un original brutalement traité par un nettoyage ancien, ce qui est possible. Mail il peut s'agir aussi (et c'est plus probable) d'une bonne copie ancienne (de la main de Jacques Stella?). Seules la radiographie et l'étude comparative de la toile de support permettraient de lever les doutes." Translation by Nicole Myers.

[23] Blunt 1978, p. 422.

[24] Mérot 1990, p. 275; Thuillier 1994, p. 254. See note 22.

[25] Examination report by Forrest Bailey, March 6, 1981, Nelson-Atkins conservation file 81.02.16.

[26] Blunt 1967, pp. 242-244.

[27] Wine 2001, p. 350.

[28] A similar modification to a tree grouping in an earlier phase of painting was discovered on Poussin's *Armida and Rinaldo* (Gemäldegalerie, Berlin) by means of neutron autoradiography. See Laurenze-Landsberg 2004.

[29] Wright 1985, p. 53.

[30] The authors gratefully acknowledge this observation by Helen Glanville during a joint examination of *Bacchus* at the Nelson-Atkins Museum of Art, September 2014.

[31] Erdmann 2013. An earlier digital version exists online: http://erg.mse.arizona.edu/Erdmann_Reuniting_Poussins_Bacchanals.pdf (accessed January 8, 2015.) Details of the automated procedure are provided in Appendix I.

[32] Erdmann 2013, pp. 10-17.

[33] Wine 2001, p. 380.

[34] Wine 2001, pp. 18, 380. The prime version is located at the Musée du Louvre, while the copy is at the National Gallery, London.

[35] Costello 1950, pp. 261-263.

[36] Ibid., p. 263.

[37] Wine (2001, pp. 376, 380) proposes a date of about 1637 for the National Gallery's *Silenus*.

[38] Eveno 2010; Viguerie 2010.

[39] Duval 1992.

[40] Duval 1994, Appendix 2.

[41] Grissom 1986.

[42] Boon 2004, p. 71, fig. 6.

[43] "Il y a peu de chances que pour ces quatre œuvres, peintes sur un laps de temps assez court et avec la même destination, Poussin ait changé de type de toile et de préparation, et que sa touche ait beaucoup évolué. Un dossier comparatif des quatre exemplaires en question, portant à la fois sur la toile, la préparation, des macrophotographies (et le cas échéant des analyses chimiques, les originaux ayant été peints à Rome et la plupart des copies en France), suffirait, sinon à résoudre le problème, au moins à éclairer utilement le débat." Translation by Nicole Myers. Thuillier 1994a, p. 18.

[44] Brigstocke 1996, p. 209. "S'agirait-il alors d'une peinture originale, quoique décévante, de Poussin?" Translation by Nicole Myers.

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NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

The Crucifixion by Nicolas Poussin in the Wadsworth Atheneum Museum of Art, Hartford, Connecticut

Jean Cadogan, Stephen Kornhauser, Patricia Sherwin Garland

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An Introduction to the Painting

Jean Cadogan

The Crucifixion by French artist Nicolas Poussin (Fig. 1) depicts the central episode in the life of Christ about which key beliefs of Christianity have been formed.[1] Poussin, a deeply religious man, has painted his subject both as a dramatic narrative and as a central tenant of his faith.

Christ on the cross occupies the center of the composition; to the left and right are the thieves crucified with him. The three crosses form a huge arc in depth; the cross of the thief on the left is seen from behind. Groups of figures are arrayed laterally and in depth around the crosses. In the foreground two soldiers toss dice for Christ's garments, as described in the gospel of Matthew (27:35): "And when they crucified him, they divided his garments among them by casting lots." Behind them a man dismounts a ladder from which he has broken the legs of one of the thieves, as described by John (19:32-33): "So the soldiers came and broke the legs of the first, and of the other who had been crucified with him; but when they came to Jesus and saw that he was already dead, they did not break his legs." To the right the centurion holds a spear, which he has just used to pierce the side of Christ, again according to John (19:34). At the far right stands a group of mourners: Mary, the mother of Christ, accompanied by John the Apostle and other women as related by the gospels (Matthew 27:55-56; Mark 15:40-41; John 19:25).

At the moment of Christ's death, according to Matthew (27:51-54), "the earth shook, and the rocks were split; the tombs were opened, and many bodies of the saints who had fallen asleep were raised … When the centurion and those who

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Fig. 1 – Nicolas Poussin, *The Crucifixion*, 1645-46, oil on canvas (after treatment), The Ella Gallup Sumner Fund and Mary Catlin Sumner Collection Fund.

were with him, keeping watch over Jesus, saw the earth-quake and what took place, they were filled with awe, and said, 'Truly this was a son of God!'" Poussin has shown the central actors at this moment of intense drama and emotion. The centurion on a rearing horse, having pierced Christ's side with his spear, watches as water and blood flow from the wound, uttering his statement of faith. The gestures of Mary, John, and the other mourners are awe-struck, and a mounted soldier at the right raises his hand in wonder. In the foreground, a corpse rises through broken rocks, inspiring fear in one of the gambling soldiers, who raises his dagger. Again in accordance with the biblical passage, the sky is darkened, and the landscape desolate; "It was now about the sixth hour, and there was darkness over the whole land until the ninth hour, while the sun's light failed" (Luke 23:44-45).

Poussin's dramatic enactment of the moment of Christ's death richly illustrates the event as related by the gospels and also stresses its meaning for Christianity. The affirmation of faith by the centurion and mourners is as important as the details of the action. Poussin further underscores this theme of belief by contrasting the tragic gestures of those who observe Christ's death with the petty actions of those who do not, such as the gambling soldiers. This way of telling a story, so that actions and their significance are related to the viewer through the gestures and facial expressions of the figures, places Poussin squarely in the tradition of narrative painting that had thrived in Western Europe since the Renaissance.

Poussin painted *The Crucifixion* in Rome for a friend, the French abbot Jacques de Thou, who was a member of the French Parliament. We know from Poussin's own correspondence that he had been asked by de Thou to paint a picture of Christ on the cross sometime before May 14, 1644,[2] that Poussin had begun *The Crucifixion* by November 12, 1645,[3] and that on June 3, 1646 *The Crucifixion* was finished.[4]

The Crucifixion, then, took Poussin a little over two years to paint, not a long time given the scale (148.5 x 218.5 cm; 58 1/2 x 86 in) and the complexity of the composition. We know that Poussin was a slow, deliberate painter. Both eye-witness accounts of his procedure and surviving preparatory drawings suggest that no aspect of a painting was improvised. Several preparatory drawings for *The Crucifixion* survive, which allow a glimpse of the evolution of the design.[5] Three early drawings, in the Louvre, show that while the actors in the story are the same as in the finished work, their placement and gestures are different.

The latest surviving drawing, located in Leipzig, Germany, is a large sheet that shows the entire composition (17.8 x 25.2 cm). In this drawing Poussin has already arrived at several aspects of the design that make *The Crucifixion* unusual. He has, for example, turned the left cross around and changed the position of the centurion so they are seen from the back, thereby enriching the spatial character of the scene. He has also added the corpse emerging from its rocky tomb, a narrative detail drawn directly from biblical accounts, but infrequently depicted. The drawing also indicates that walls of Jerusalem seen in earlier drawings have been eliminated.

Poussin still made changes in the final painting. In the drawing the right-most figure in the group of dicing soldiers rests his left arm on his staff; in the painting he draws a dagger to fend off the emerging corpse, enhancing the drama of the action and tying the foreground figures together. In the drawing the corpse appears to be an old man; in the painting he appears as a younger, bearded figure.[6] Perhaps most dramatic is the change in background: the painting places the figures against bare hills at the center and left and a rocky cliff at the right. This setting intensifies the funereal mood of the scene and concentrates our attention on the central action.

The four surviving drawings for *The Crucifixion* reveal Poussin's drive to eliminate incidental detail, concentrate attention on the action of the figures, and convey to the viewer the drama and significance of Christ's death as related in the biblical accounts. The drawings do not prepare us for one significant feature of the painting, however: the sombre color scheme. And yet, the dark palette is entirely in keeping with Poussin's solemn conception of the subject. The result is one of the most detailed and moving depictions of the Crucifixion ever painted. We know that Poussin was consumed by the theme; when de Thou, evidently pleased by his painting, requested that Poussin paint him a pendant of the *Carrying of the Cross*, Poussin refused, saying,

"I have no longer the joy nor the health to undertake these sad subjects. *The Crucifixion* has made me ill; I took many pains with it; but the *Carrying of the Cross* would kill me. I cannot resist the serious and afflicting thoughts that must fill my mind in order to paint these sad and lugubrious subjects. Release me from it, please!"[7]

Conservation

Stephen Kornhauser,
Patricia Sherwin Garland

The summary of literary sources, the commission, and the evolution of *The Crucifixion* explains why Atheneum curators and conservators decided, in 1992, to undertake its conservation. (Fig. 2) The painting surprised and troubled visitors who saw it in the gallery, but not for the reasons that Poussin had intended. Most were disturbed by its dark, almost monochromatic appearance; many struggled to read the rich narrative details that had become almost invisible (Fig. 1). Although Poussin depicted the moment of Christ's death, when biblical accounts say "there was darkness over the whole land," the painting looks quite different from the way it did in June 1646. Our goal was to understand its present state and return *The Crucifixion*, as much as possible, to its original appearance.

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Fig. 2 – *The Crucifixion*, prior to treatment.

Fig. 3 – *The Crucifixion*, detail illustrating cupping paint and loss along edges of cracks.

Fig. 4 – *The Crucifixion*, photograph ca. 1940.

Fig. 5 – *The Crucifixion*, copy after Poussin, private collection, Switzerland.

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Careful examination of the painting revealed an irregular paint film that is extremely thin in some places and uncharacteristically thick in others. In some areas, especially in the shadows of figures, the paint film had fractured into many small islands of cupping (Fig. 3), where the paint curled up at the edges. During an earlier restoration, the sky, background, and parts of the figures had been painted over to disguise old damages. And prior to its arrival at the Atheneum in 1935, earlier cleaning attempts had damaged the paint film by dissolving original paint; abrading the top edges of the cupped paint; and exposing the tops of the threads of the woven canvas (Fig. 2).

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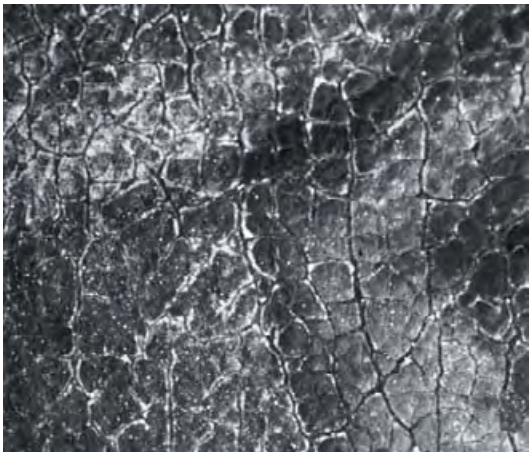

A disturbing fractured surface over the entire painting, the direct result of these restorations, competed for attention with the original design of the composition.

Earlier photographs of *The Crucifixion* (Fig. 4) from the 1930s indicate that the painting may have continued to darken even after its arrival at the Atheneum. It had become more transparent over time, rendering the dark ground more prominent. A faithful copy of the painting (Fig. 5), perhaps made during the 17th century,[8] reveals details and colors that no longer are visible in the original.

A technical study of the painting was undertaken, in an effort to further understand its present state as well as Poussin's process. X-radiography (Fig. 6) revealed that the disturbing pattern on the surface was in part caused by a diamond weave fabric chosen by the artist for the commission. The pattern was amplified and the painting stiffened by an early glue lining.[9] It also revealed thin areas of a dense pigment, perhaps a lead white that are now barely perceptible to the naked eye. The x-rays also showed how the artist painted his figures: first applying a fluid layer of paint to indicate the form, then a denser, more precise layer of highlights, usually containing white.[10]

Infrared reflectography (Fig. 7) indicated that Poussin made few changes in the design directly on the canvas. The folds of St. John's cloak, for instance, have been altered. Other extraneous marks visible with infrared illumination are difficult to interpret as true *pentimenti* and are more likely the result of Poussin's deliberate method of work.

Pigment samples proved revealing. Lead tin yellow and ochre, consistent with 17th century artists' materials, were discovered. The ultramarine of the Virgin's mantle and red iron oxide in St. John's robe are typical of Poussin's choice of materials and use of color. Although the ground appears to be a homogeneous red-brown layer, it is actually composed of a mix of red iron oxide and clay.

Cross sections in key areas were taken to assess the condition of the work and to understand further the artist's working method. While some of the samples were so brittle that they disintegrated, several were successfully mounted and analyzed, showing a thick, granular ground, a thin paint film,

and a continuous, thin, black film above the paint layer. (Fig. 8)[11] This finding impacts the visual properties of the painting. A dark surface can obscure the entire painting. A thin paint film over a thick, dark ground causes the paint film to appear translucent, or even transparent.

The picture was taken to the J. Paul Getty Museum for further study. Scientists at the Getty Conservation Institute analyzed the composition of the pigment samples using gas chromatography. They discovered that a resin of the *Araucariaceae* family, such as Manila Copal, was part of the paint film. The chromatogram also revealed the presence of an oleo resin, possibly from a tree in the balsam, pine, or spruce families. The presence of these resins is unusual in 17th century paintings. However, during the 19th century, a well-known German scientist and restorer, Max von Pettenkofer, suggested rubbing Copaiba Balsam onto a painting's surface as a way of improving its appearance. Max Dörner, whose 1934 book *Materials of the Artist* also promoted the use of Copaiba Balsam, adding a cautionary note: the treatment, he urged, must not be continued too long, "otherwise the paint at the edges of the cracks will stand up, owing to the expansion of the color layers."[12] We now know that, although Copaiva Balsam does re-saturate a paint surface, the improvement is short-lived. Eventually the resin darkens, leaving the painting more illegible than before treatment. Even worse, in time the resin fuses with the paint film and becomes impossible to remove without loss of original pigment.

Conservators and scientists now think that during the 19th century Copaiba Balsam was rubbed into the surface of *The Crucifixion*, and that it was allowed to penetrate the paint film. This treatment resulted in the cupping of the pigment still noticeable on the surface of the painting, and the overall darkening of the colors that is so striking an aspect of the painting's appearance today.

The Getty scientists also discovered that azelaic acid, a component of linseed oil present in all old master oil paintings, was absent from the paint film of *The Crucifixion*. Azelaic acid is water soluble, and is easily removed during cleaning. If it is missing from the paint film, it was probably leached out with a caustic solution. Such treatment would break down the linseed oil, further dissolving part of the paint film, leaving a much diminished, brittle layer of paint, which is in fact what has been observed in *The Crucifixion*.

After the technical study, a minimally invasive course of treatment was determined. First a synthetic varnish that had been applied in the 1970s, was removed with a mild solvent. Conservators then removed a layer of discolored natural resin varnish. During this stage, retouching in the figures from the 1970s campaign that obscured original passages was removed. In some cases, however, little of the original form remained, so some, older retouching was left. Removing the layers of varnish and old retouching improved the legibility of the painting: greater contrast between light and dark emerged; forms became more voluminous; and an illusion of depth returned.


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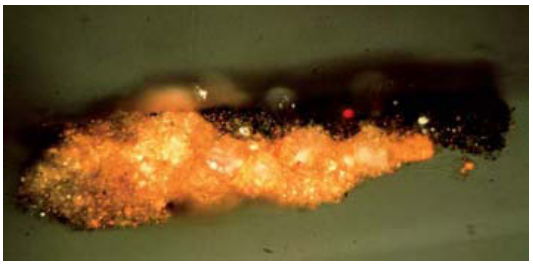
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Fig. 6 – X-radiograph, showing the diamond weave pattern of the canvas.

Fig. 7 – IR reflectogram revealing changes in the rendering of St. John's cloak.

Fig. 8 – Cross section taken from the upper left of the painting, above the centurian's head.

After the cleaning, several thin coats of a natural resin varnish was brushed into the surface. Minimal inpainting was executed in order to knit together fragments of the original that remained. The aim, given the extent of the damage and loss, was only to replicate the artist's original design, based on the evidence of what still existed. This laborious task was aided by reference to the copy of *The Crucifixion*, which provided a greater understanding of the most damaged areas of the original. (Fig. 5)

Conservation of *The Crucifixion* resulted in a painting that is still dark and in some ways com-

promised. Nothing will bring back those parts of the surface that changed as a result of the natural aging process, or that were damaged through past restorations. Nor can the darkening effect of the Copaiba Balsam treatment be reversed. Yet, through careful analysis and conservative choices, the painting was reclaimed from its former murky state and an attempt was made to reconstruct its physical history.

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Notes

[1] The most important bibliography for *The Crucifixion* is the following: Poussin's *Correspondance* (Jouanny 1911, pp. 268, 322, 339); Blunt 1964; Blunt 1966, p. 55, no. 79; Blunt 1967, vol. 1, pp. 185-86, 213-15, 250, vol. 2, pl. 168; A. Lins, "Poussin's *Crucifixion* in the Wadsworth Atheneum," 1971, typescript in Atheneum files; Blunt 1979, pp. 65-68. See, most recently, Zafran 2012, pp. 52-55, no. 14.

[2] Jouanny 1911, p. 268.

[3] Jouanny 1911, p. 322.

[4] Jouanny 1911, p. 339.

[5] For analysis of the preparatory drawings, see especially Blunt 1964, pp. 450-454.

[6] This figure has been interpreted by Blunt as Adam, whose tomb was said to be on Golgotha; Blunt 1964, p. 454. Whether he is seen as an old man, as Adam is depicted in scenes of his death (as, for example, in Piero della Francesca's fresco in Arezzo), or as a young man, as in scenes from Genesis (as in Michelangelo's *Creation of Adam* on the Sistine Ceiling), does not affect the identification one way or the other.

[7] This passage is presumably taken from lost correspondence of Poussin and de Thou. It was included in the Comte de Brienne's "Discours sur les ouvrages des plus excellens peintres anciens et nouveaux" of 1693-95, and cited in Thuillier 1960, p. 219. The original reads, "Je n'ay plus assez de joye ni di santé pour m'engager dans ces sujets tristes. Le Crucifiement m'a rendu malade, j'y ai pris beaucoup de peine, mais le porte croix acheveroit de me tuer. Je ne pourrais pas résister aux pensées affligeantes et sérieuses dont il faut se remplir l'Espirit et le coeur pour réussir à ces sujets d'eux mesmes si tristes et si lugbres. Dispensez m'en donc s'il vous plait." In fact, Poussin must have begun the painting, as a drawing in the Musée des Beaux-Arts in Dijon close in style to the two Louvre fragments shows the theme; Blunt 1979, p. 70, fig. 76.

[8] The copy was reputed to have been painted by Jacques Stella (1657), and was in the collection of his niece, Claudine Bouzonnet-Stella (1697), *Masters of French Painting,* 1290-1920 at the Wadsworth Atheneum. London, D Giles Limited, 2012, p. 55.

[9] Poussin generally used canvases with simple weaves, but on occasion, he used more complex twill weaves; see Blunt 1960, pp. 333-348.

[10] Observed by Rees Jones in x-rays of other paintings by Poussin: see Rees Jones 1960, p. 307.

[11] Thickness of ground, paint film, and resinous material were: ground, 0.12 mm; paint film, 0.025 mm; resinous material, 0.003 mm.

[12] Dörner 1934, p. 400.

The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Rikke Foulke

Introduction

The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth, painted in 1650, is one of at least twelve paintings Nicolas Poussin painted on the subject. (Fig. 1) The work has been in the collection of the Fogg Museum at Harvard University since 1942 when Mrs. Samuel Sachs gave it to the museum in memory of her husband.[1] The original patron remains unknown, but documents confirm that it appeared in 1678 in the collection of a Monsieur Fromont de Veine.[2] The Cleveland Museum of Art, owner of the *Holy Family on the Steps,* requested the loan of the Fogg painting for an exhibition devoted to Poussin's versions of the Holy Family. The catalogue for the exhibition features special studies on the artist's materials and techniques.[3] With the Fogg painting as reference, research was carried out to contribute information to the understanding of Poussin's technique within this group of the Holy Families. After placing the Fogg *The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth* in context with the other works, examination with IR reflectography, transmitted IR, Fourier Transform-IR Microscopy (FT-IR), elemental analysis SEM/EDS, and x-radiography revealed information that contributes to our understanding of Poussin's painting technique.[4]

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Paintings Conservator, Pittsburgh, Pennsylvania, USA.

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Fig. 1 – Nicolas Poussin, *The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth*, (1650-51) 99 x 131.5 cm, Harvard Art Museums/ Fogg Museum, Gift of Mrs. Samuel Sachs in memory of her husband, 1942.168. Imaging Department © President and Fellows of Harvard College.

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Fig. 2 – Nicolas Poussin, *The Holy Family with St. Elizabeth and St. John the Baptist* (*The Holy Family with Eleven Figures*), (1651) 100.6 x 133 cm, Malibu, J. Paul Getty Museum and Pasadena, Norton Simon Museum.

Fig. 3 – Schematic plan of lines of perspective pointing toward single vanishing point.

The Holy Families

Poussin's earlier depictions of the Holy Family, which date from the late 1620s to the mid-1640s, exhibit fairly simple and vertically oriented compositions, as seen in examples in collections in Karlsruhe, Detroit, and Toledo, Ohio.[5] Poussin started painting the Holy Family again in the late 1640s. Later works are closely related by the introduction of attendant putti and figures such as the infant John the Baptist, Elizabeth and Anne. One owned jointly by the Getty and the Norton Simon Museum, *Holy Family with Putti* (*Holy Family with eleven figures*) from 1651 shares with the Fogg's *Holy Family* the stone font and architectural features directly behind the group. (Fig. 2) *Holy Family under a Group of Trees*, 1651, is located in the Louvre. The Dublin painting in the National Gallery of Ireland, *Holy Family with St. Anne, St. Elizabeth, and St. John the Baptist*, was painted in 1649, and the most famous of this series, *Holy Family on the Steps*, now in the Cleveland Museum of Art, was painted in 1648. Additional paintings from this group are found in collections of the Hermitage, St Petersburg, the Louvre, Paris, the Musée Condé in Chantilly, the Pushkin Museum in Moscow, and in Sarasota, Florida at the John and Mable Ringling Museum of Art.[6]

There are details unique to each canvas but many similarities unite this group of paintings. The presence of water and tub are significant in the Fogg's *Holy Family* and the allusion to the baptism is clearly represented by the Virgin who reaches as if about to wash infant Christ. Unique also to the Fogg's composition is the inclusion of the covered figure identified as *Synagoga*.[7]

Poussin unites these later Holy Families by a grand simplicity that goes beyond the theme alone. His horizontal compositions impart a sense of great calm and concentration to the formal design. The family is grouped in all paintings in a triangular format in the foreground; the base of the pyramid in the Fogg's *Holy Family* is broad and stable. Pilasters and trees or reflections of them in the water soften the bold formatting. Heads of figures converge around a vanishing point, but are broken up by elements such as trees or simple architectural features. For example, the Fogg's *Holy Family* exhibits orthogonals drawn from principal architectural features, which point towards a single vanishing point located at the proper left of the Virgin's shoulder. Poussin marks the single vanishing point with a physical pinprick that is visible on the painting surface and visible in the x-rays as a black dot.[8] (Fig. 3)

Interesting, but less obvious, the gazes of all figures in the composition appear to pass through the vanishing point. Aside from the single putto pouring water from the basin in the foreground, whose gesture and placement interact with the viewer, the eyes of the Virgin, Christ, Joseph, St. John the Baptist, and putti, no matter the direction of their heads, face in the direction of the vanishing point. The Virgin and Christ look at each other through this point. The putto on the far left tilts its head forward, but looks through the tops of his eyes keeping the Virgin's head and proper left shoulder in sight. *Synagoga* engages in the actions of the Holy Family by facing towards the same focus. Through this deliberate device Poussin reinforces the perspective system of the composition and the psychological and emotional unity of the figures.

Studio practice

The studio practice of Poussin was considered during the 17th century to be unusual and painstaking. A reconstruction of Poussin's working method is published in Anthony Blunt's comprehensive biography of the artist.[9] Although there is little agreement on the details in the various translations of Joachim von Sandrart's original Middle German text, it is still possible to reconstruct Poussin's preparation for a composition.[10] When he was planning some work, he carefully read all available texts on the subject. Then the artist made a couple of initial sketches of the composition on

paper. He made little wax figures in the nude, measuring about "half a hand's breadth in height", or about four and half inches, and fixed them in the proper attitudes, as he needed them to represent the image.[11] Then he added draperies of wet paper or thin taffeta to them in desired colors and arrangements for intended drapery. Another contemporary, Antoine Le Blond de la Tour, in his *Lettre du Sieur Le Blond de La Tour a un de ses amis, contenant quelques instructions touchant la peinture*, from 1669,[12] adds that Poussin fixed these figures onto a board with pegs, then encased the board in a box, open on one side and having shutters on the other three sides. He could then control direction and quantity of light in his miniature theater to replicate the effects of light for outdoor scenes and interiors. For example, the source of illumination originates from the left side of the composition in the case of the Fogg composition as well as the series of Holy Family works.

Poussin then made sketches based on the model, and more sketches from larger models and studies from nude life models, not missing any detail. Engravings by Agostino Veneziano after Baccio Bandinelli from 1531 and by Cornelis Cort from 1578 after Johannes Stradanus are examples dating to the 16th century which document the frequent practice of drawing from figurines.[13] Due to the time-intensive labor involved, it had generally fallen out of practice. Anthony Blunt concludes that it is consistent with Poussin's meticulous nature to practice this very careful method and continue with it long past its popularity.

A pen and ink drawing dating to 1649-50, in the collection of the British Museum and made on the same page on which the artist writes a letter, is considered the principal sketch for the Fogg's *Holy Family*.[14] (Fig. 4) The landscape of the painting is based on the study from 1649, now in Düsseldorf.[15] Unfortunately, a lack of more studies of the Fogg painting makes it difficult to reconstruct its development from figurines. Numerous sketches do exist for a composition of the *Baptism*, 1642, and offer a more complete account of the development of his idea from figurines. The reconstruction of figurines and staging from Blunt were based on this series. The works evolve from simple line drawings with heavy contrasts, to versions with a more thoughtful grouping of figures and a stronger sense of light and shadow to impart volume to figures and depth to the space. It is possible to see how, through his use of figurines and staging, Poussin clarifies rhythm, groupings and lighting, crops unnecessary elements, reinforces gestures and expressions, and organizes landscape and architecture. His meticulous efforts gave him an "instant sense of the overall effect of a painting" before he developed the idea further in oil.[16]

Structure

The original canvas was wax lined onto a second support, but it is possible to examine the weave texture in thinly pained areas, such as the in

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Fig. 4 – British Museum, Accession number 1937.1211.1.

Virgin's face. The support for the Fogg painting is a single seamless piece of Z-twill canvas. Texture of the twill is seen easily in raking light and in Poussin's application of paint, which catches the twill texture, particularly in flesh tones of putti. In the x-ray it is possible to count the threads: roughly 12 threads per centimeter in the warp and 18 threads per centimeter in the weft. The *Laboratoire de recherche des musées de France* (LRMF) published a survey in 1994 recording the types of canvas used in Poussin's paintings. This data was compared to the support of *Holy Family with the Infant Saint John the Baptist and Saint Elizabeth*. The survey concluded that there were distinct periods when he favored particular weaves and weights. He used both plain weave and twill canvases in the Holy Family series. According to the survey the weight of the Fogg's *Holy Family* is classified as a "fine" weave. The density and use of twill are consistent with the findings in the survey for Poussin's use of support during his "mature" period. [17] A comparison of supports in preparation for the

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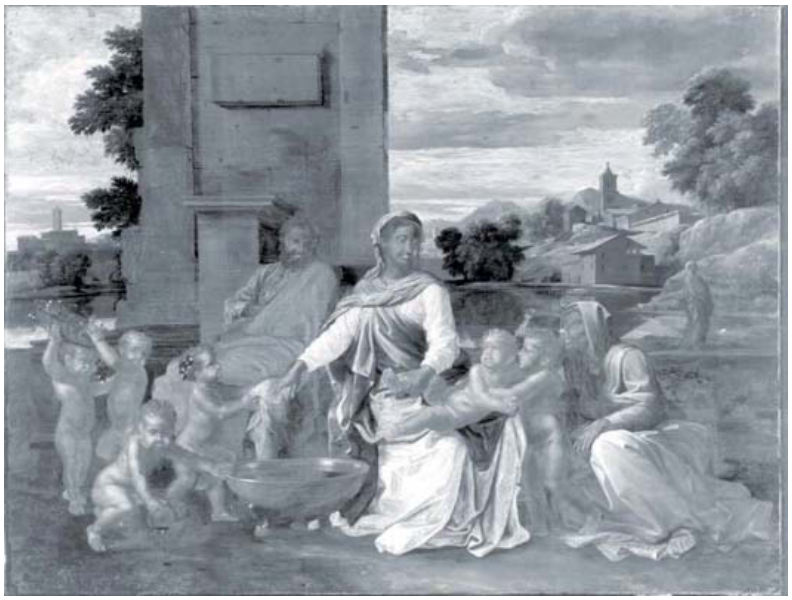

6

Fig. 5 – IR reflectogram; mosaic composed of eighty digital images captured with Inframetrics camera and assembled in Adobe Photoshop 5.0.

Fig. 6 – IR reflectogram of writing on reverse of canvas; mosaic composed of thirty-two digital images captured with Intrametrics camera and assembled in Adobe Photoshop 5.0.

1999 exhibit of the series at the Cleveland Museum of Art indicated that the canvases of the Fogg work and that of the Norton Simon/Getty *Holy Family with putti* (*Holy Family with eleven figures*) are nearly identical in thread count and irregularities in warp and weft and concluded that the two were painted within a short period.[18] A quantitative canvas weave analysis on these two works, such as that carried out recently on Poussin's Bacchanals for Cardinal Richelieu, may support the likelihood that the canvases for these works were also cut from the same bolt.[19]

The LRMF also studied Poussin's grounds and identified the presence of red ochres, earth oxides, carbon-containing blacks, white lead, and chalk in an oil binder. Findings from cross sections of the Fogg painting show the artist's use of a double-ground. A cross section was sampled from the bottom edge of the painting in the foreground. Polarized light microscopy and elemental analysis identified the following materials in the matrices of grounds: lead white, red and yellow earths, green earth, umber, calcium carbonate, calcite, quartz, bone black, and particles of plagioclase feldspar, antimony glass, and rutile. Ultramarine was also identified in the matrix of the second layer of ground, which is noteworthy due to its premium cost. The purpose of the first reddish ground was to reduce the rough canvas texture and to impart a warm tonality to the second grayish-brown layer. The second layer serves the purpose of providing a middle tone in building volumes left thinly painted. An unfortunate abrasion of paint during a previous conservation campaign unfortunately increases the effect of the second layer of ground, particularly in faces of figures. Cross section samples show two layers of fine particulate ground with roughly equal thickness. Compositions of the red and brown grounds are similar, but contain different proportions of earth pigments. Whether these two grounds and colors were applied across the entire canvas remains unclear. These findings are consistent with published data on grounds of Poussin and other 17th century French artists.[20] An additional pale gray layer seen in the cross section and through thinly painted areas of blue in the sky, consisting of lead white, calcite, earths, and a carbon based black in an oil medium, blocks-in the area of the sky. The large, vertical stone wall behind the figures dividing the sky in halves was painted without the pale gray layer. Poussin also blocked in additional layers underneath figures and drapery to emphasize highlight and shadow. Examination of the painting with a binocular microscope confirms the presence of underlying pale and dark tones seen through small losses in the paint film in the area of drapery.

IR reflectography

Underdrawing, made with dark variegated lines around contours of figures and architecture, is visible in IR reflectography. The Straus Center platinum silicide IR camera made by Inframetrics made it possible to examine underlying carbon-containing layers in this IR reflectographic mosaic. With a system developed at the Straus Center, eighty digital images were captured with the Inframetrics camera and assembled using digital imaging software. [21] (Fig. 5) In the reflectogram some interesting compositional changes are visible. For example, dark lines in the architectural element behind Joseph indicate that the stone wall was once more narrow. A second pilaster was added to the left of the wall and covers initial underdrawing depicting a thick tree trunk. The motif of a tree with branches coming from behind a stone or figures is found often in Poussin's works. The stone column supporting Joseph was once higher. A few dark lines seen in IR reflectography indicate that it may have changed heights more than once. Dark lines on Elizabeth's neck indicate that the neckline of her tunic was once more modest. The current version preserves a pleat in the contour identical to a neckline previously positioned roughly 1 cm above the current one. Other dark contours in the stone resemble urns and re-worked architectural profiles, but remain enigmatic despite exhaustive examination, image enhancement, discussion of the changes with other conservators, and comparison of this composition to other drawings and paintings.

The reverse of the canvas was also viewed and revealed an image of writing in a carbon-contain-

ing material in the upper left quadrant. A reflectogram was likewise captured and assembled. (Fig. 6) Despite image enhancement, it was not possible to fully decipher and determine the significance of the text. The discovery of writing on the back of a Poussin at the Virginia Museum of Fine Arts reads: "*Monsieur le duc de Crequi*," a name identified as the patron of the painting.[22] This finding encourages the re-examination of the back of the Fogg composition again with a new camera and updated software to better discern the writing.

IR transmittography

Evidence of Poussin's working method previously not visible in reflected IR was observed with transmitted IR. A transmittogram mosaic was composed from the eighty captured digital images. (Fig. 7) During examination with IR reflectography, internal reflection of IR within layers of nonabsorbent paint scatters the image. Scattering is reduced when IR is transmitted "simply because the radiation passes through each layer only once and in a direction generally perpendicular to the laminate."[23]

Sharpening of variegated contours in the underdrawing, particularly in the landscape, architecture, and in the drapery of the Virgin's skirt are more visible in the transmittogram. Straight edges of architecture in the background to the right are sharp as well as contours of architectural detail in the wall behind Joseph. Thick and heavy variegated lines in the lower half of the Virgin's skirts differ in character and handling to underdrawing in the greater part of the composition and emphasize Poussin's attention to drapery. Lighter and distinct folds in the proper right side visible in transmitted IR differ from folds seen in visible light. Contours of figures, such as the proper right shoulder of Joseph and the proper right arm of the Virgin exhibit a distinct variegated line of a wet medium. Contours of *putti* at the far left are also legible through this form of examination.

Reworking in the architecture is also visible in transmitted IR and suggests the presence of a large urn placed above the shorter pilaster to the left of Joseph, which would link the composition more closely to the Norton Simon work *Holy Family with Putti* (*Holy Family with eleven figures*) of 1651. Branches seen in the IR reflectogram are given detail in the transmitted IR study. Sketchy underdrawing now visible can be compared to sketches and underdrawing in other paintings. Poussin was known to have drawn extensively in sketchbooks that have not survived today.[24] By viewing more paintings in transmitted IR we can conceivably compare underdrawing among like paintings and sketches and ultimately understand better the artist's working methods and purpose of preparatory work. Architecture in the background was examined again with a binocular microscope once the dark lines were detected in the transmittogram and revealed an interesting handling of the paint. Sharp lines at contours of architecture were not reinforced, in favor of allowing the dark line or ground applied under the paint film show through. The resulting image depends highly on preparatory work of the artist.

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Fig. 7 – IR transmittogram; mosaic composed of eighty digital images captured with Inframetrics camera and assembled in Adobe Photoshop 5.0.

Pigment identification

Fourier Transform IR Microscopy/ Elemental Analysis/ Polarized Light Microscopy

A sample of the flesh color from Elizabeth's face was analyzed using FT-IR.[25] Results seen in the spectra show absorbance at 1513 wavenumbers from lead carboxylate, a product of lead white in aged oil. Peaks in the sample from the paint layer matched those for lead white in the Forbes pigment database. Absorbance for C-H stretch of the binding media was located at 2922 wavenumbers and absorbance of the C=O stretch was at 1738 in the spectrum. FT-IR coupled with microscopy and SEM/EDS also identify pigment particles easily seen with low-power magnification of black, yellow and red earth pigments, green earth and umber in the flesh tones.[26]

Nine samples from the paint layer were selected to represent the range of Poussin's palette in the *Holy Family*. The following pigments were identified using a combination of FT-IR, Elemental Analysis SEM/EDS, and Polarized Light Microscopy: ultramarine blue, lead white, calcite, quartz, bone black, lead tin yellow (type I), orange and yellow iron earths, green earth, umber, red lake, and vermilion.[27] Selected results of analysis of the yellow, red, blue, and flesh tone have been entered into the chart (below).

Selected Results of Pigment Analysis

The sample of blue taken from the sky is particularly interesting. Its spectrum contains a strong absorption band at 1012 wavenumbers, which identifies it as ultramarine blue. The spectrum also

Color	Sample	Area X-Y	SEM/EDS	Microscopy	FT-IR	Pigment I.D.
Red	Virgin's robe	73.4; 24.5 cm	Hg – major Pb/S* – major Al – major Ca – trace Si – trace K – trace	Vermilion, ultramarine blue, light pink lake	Protein peaks, aluminum-based carrier, oil	Vermilion and red lake, small amount ultramarine blue
Yellow	Elizabeth's robe	102.6; 25.2 cm	Pb – major Ca – major Sn – medium Si – trace	Calcite, small amount yellow ochre	Calcite	Lead tin yellow (type I), small amount yellow earth, calcite
Flesh mixture	Flesh from Elizabeth's face	98.4; 47.6 cm	N/A	Green earth, yellow and orange earths, lead white, ultramarine blue	N/A	Lead white, green, yellow and orange earths, ultramarine blue
Green Particle	Flesh from Elizabeth's face	98.4; 47.6 cm	N/A	N/A	Green earth	Green earth
Orange Particle	Flesh from Elizabeth's face	98.4; 46.6 cm	N/A	Yellow earth, umber, orange earth, unidentified opaque black	Umber, orange earth, lead white	Yellow and orange earths, umber, small amount unidentified opaque material
White Particle	Flesh from Elizabeth's face	98.4; 46.6 cm	N/A	N/A	Lead white, carboxylate	Lead white, carboxylate
Blue	Blue from sky	123.8; 66.2 cm	Si – major Pb/S – major Ca – medium Na – medium Al – major Fe – medium	Ultramarine blue (blue and colorless particles)	Blue and colorless particle of ultramarine (peak at 2343 identifies Afghani source)	Natural ultramarine blue from Badakhshan, Afghanistan

* Indicates the presence of sulfur and/or lead

matched the natural ultramarine standard from the Forbes pigment database. The small absorbance at 2343 wavenumbers, according to a study published in 1995, occurs only in natural ultramarine obtained from lapis lazuli from the Badakhshan mines in Afghanistan.[28] Elemental analysis and microscopy also confirmed the presence of aluminum, silica, and sodium, characteristic of ultramarine blue.

Elemental analysis and Polarized Light Microscopy identified vermilion in the sample taken from the Virgin's robe. Red lake in the robe was also observed by visual examination of the painting with a stereo binocular microscope and light pink particles were seen with PLM. Interesting too, is that elemental analysis shows a major peak for aluminum, which indicates that the carrier for the dye is aluminum-based. FT-IR shows an absorbance for aluminum hydrate and peaks for linseed oil and protein. The finding of a protein in the sample also suggests the use of an insect dye.

These findings are consistent with analyses of Poussin's palette carried out at the Cleveland Museum of Art, the Virginia Museum of Fine Arts, Metropolitan Museum of Art, and the National Galleries in Washington and London.[29]

With a binocular microscope it was possible to examine and survey the application of paint by the artist. Layers of ground, paint, light and opaque scumbles and overlying glazes are used to build figures, landscape, and architecture. Poussin layers the flesh tones of each figure, relying on the toned double ground to impart color to areas with little body paint. Ground is not only visible in Joseph's face, the Virgin's face, in flesh tones of the putti, but in thinly painted parts of the architecture, trees, and distant landscape. Used as a medium tone, it warms up cool dark shadows. Half tones have lower content of opaque white to create transitions between highlights and shadows. Bright vermilion red is added in shadows and highlights, creating the illusion of the reflective quality of skin. According to Félibien, Poussin makes clear efforts to characterize age, sex, and station and life of figures through the tones of their flesh. The ruddy complexion of a figure, for example, was a sign of fresh, firm skin belonging to a character with natural goodness. Poussin gives a thin, wizened appearance to Elizabeth by adding cool blues and greens, even in highlights, to her flesh, which consists of lead white and yellow earth. The ruddy, tanned complexion of Joseph, created by iron earth oxides, is an element of his occupation as a carpenter, and the very pale tonality of Christ refers to the infant's purity.[30]

Final transparent glazes and light, opaque scumbles in drapery and flesh appear to be missing from some areas, possibly through overcleaning in the previous conservation treatments. Traces of brilliant blue in transitional areas in the

Virgin's robe and distinct particles of red lake confirm that Poussin strengthened the paint layers with glazes. With the unfortunate loss of material in the area of Joseph's robes it is especially difficult to determine Poussin's intended color scheme for it. The unusual mottled handling of the white paint in his shirt differs dramatically from white garments on the Virgin and Elizabeth. Comparison with color schemes in other compositions is helpful. Poussin often painted garments in green, pink or violet, colors that are lacking in this work, but found, for instance, in the work on the right *Achilles with the Daughters of Lycomedes* from 1656 in the collection of the Virginia Museum of Fine Arts. Our current hope is to view, in a color reproduction or in person, an early copy made of the painting by an unidentified artist. This copy is in a private collection in Rome, *La quadreria della Cassa Depositi e Prestiti*.[31] In a small black and white reproduction it is possible to see details of buttons on Joseph's shirt. It is possible that this work would not have experienced the same cleaning treatments and indications of the original colors are still preserved today.

X-RADIOGRAPHY

X-radiography permits further examination of the painting's layered structure. Technical studies show that the artist made numerous changes, both dramatic and subtle. This x-radiograph is composed of sixteen films digitized and assembled with the VIPS software program developed at the National Gallery in London. (Fig. 8) The x-radiograph confirms the use of heavy metal pigments found with FT-IR. A mosaic of assembled images records subtle changes important to Poussin's working technique. Interesting in the sky is how the broad blue and white areas in the color image do not correspond as expected to contrasts in the x-ray. This indicates that the artist used complex layering and reworked his composition in this area. Lines drawn in a carbon-containing material discovered in IR correspond to whitish strokes in the x-ray and could indicate that Poussin used the opaque paint to white-out dark lines from a previous idea. In normal light opaque brushstrokes are also visible, but only after examination with x-ray and IR is the purpose of these strokes clear.

The headdress hides the profile of Elizabeth's head in visible light. The contour of her head in the x-radiograph suggests that Poussin first sketched an unadorned head before applying the drapery. The Virgin's arm reaching for Christ's foot in the x-radiograph also lacks the fullness of the final drapery. Other minute changes are in the landscape. One interesting change is found in the contour of the mountain that, in the actual painting, has a sharp, peculiar dip. X-radiography indicates changes that include an initial mountain sketched with a dip having a more sloping profile.[32]

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Fig. 8 – X-radiograph; mosaic composed of sixteen scanned films assembled with the VIPS software program developed at the National Gallery in London.

Conclusion

In summary, this research contributed to an understanding of Poussin's materials and techniques in the *Holy Family* series. Examination of the painting's canvas support, double-ground, and paint layers placed the Fogg's *Holy Family* in context with other related works. Findings from digital imaging were coupled with analytical results. FT-IR, elemental analysis, and polarized light microscopy confirmed that the artist used a double-ground to influence the appearance of the final paint layers and identified specific pigments in his grounds and paint layers. Studies with x-radiography, reflected –, and transmitted – IR proved to be powerful tools of research. Technical analysis was essential in understanding Poussin's scrutiny in refining his composition in the Fogg's *Holy Family* and observing practices in underdrawing that had not been seen previously. Success of IR transmittography revealed similarities between the Fogg's Holy Family and *Holy Family with St. Elizabeth and St. John the Baptist* (*Holy Family with Eleven Figures*) in the collection of the J. Paul Getty Museum and Norton Simon Museum. This study provided an opportunity to contribute results of Poussin's technical on the Fogg's *Holy Family* to the wider pool of information on the artist's technique and make it available to a broad audience of scholars.

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Notes

[1] Fogg Museum of Art accession number 1942.168.

[2] He may be the Fromont mentioned by Conrart, who was in 1652, 'Sécretaire des Commandements' to the Duc d'Orléans, in his *Memoires*. Mérot 1990, p. 302.

[3] (1999) *Cleveland Studies in the History of Art*, vol. 4.

[4] Due to expansion of the Fogg Art Museum, which re-opened in late 2014, the painting was not available for a more recent examination. More sophisticated analytical equipment available today may have provided more information on the IR reflectogram and transmittogram.

[5] Karlsruhe, Staatliche Kunsthalle, *The Holy Family with St. John the Baptist* (late 1620s), 101 x 75.5 cm. Toledo, Ohio, Museum of Art, *The Holy Family with St. John the Baptist* (ca. 1625 or ca. 1630), 169 x 127 cm. Detroit, Detroit Institute of Arts, *The Holy Family* (*The Roccatagliata Madonna*), (1641), 71 x 55.5 cm.

[6] Poussin painted the Holy Family series in both vertical and horizontal formats. The Fogg's version is more closely related to the works with horizontal format. Toldeo, Ohio, Museum of Art, *The Holy Family with St. John the Baptist* (ca. 1625-30), 169 x 127 cm; Cleveland, Ohio, *The Holy Family on the Steps* (1648), 72.5 x 111.5 cm; Malibu, J. Paul Getty Museum and Pasadena, California, *The Holy Family with St. Elizabeth and St. John the Baptist* (1651), 100,6 x 133 cm; Dublin, National Gallery of Ireland, *The Holy Family with St. Anne, St. Elizabeth, and St. John the Baptist* (1649), 79 x 106 cm; Cambridge, Mass., *The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth* (1650-51), 99 x 131.5 cm; Paris, Louvre, *The Holy Family under a Group of Trees* (ca. mid-1650s), 94 x 122 cm and *The Holy Family in a Landscape with St. John and St. Elizabeth, and St. Joseph* (1656), 68 x 51 cm; St. Petersburg, Hermitage Museum, *The Holy Family with St. John and St. Elizabeth* (1655), 172 x 133,5 cm and *The Holy Family in Egypt* (1655-57), 105 x 145,5 cm; Sarasota, Florida, John and Mable Ringling Museum of Art, *The Holy Family with Infant St. John the Baptist* (1655-56), 198.9 x 131 cm; Chantilly, Musée Condé, *The Holy Family with St. Elizabeth and St. John the Baptist*, n.d., 67 x 49 cm; Moscow, Pushkin Museum, *The Holy Family with St. Elizabeth and St. John the Baptist*, n.d,, 64 x 50.5 cm.

[7] Hibbard 1974, p. 71.

[8] Evidence that Poussin left visible marks in the final paint layer identifying the vanishing points of his compositions was first discovered by Carol Sawyer while examining and treating *Achilles Among the Daughters of Lycomedes* at the Virginia Museum of Fine Arts. This discovery was reported by Ms. Sawyer at the Symposium: *Poussin's Practice*, Royal Academy of Arts, London, March 24, 1995 in her paper, "Discoveries Concerning Poussin's Technique Made during the Examination and Treatment of *Achilles Among the Daughters of Lycomedes*." For more information on how Poussin used these vanishing points see Sawyer 1999, and the Carol Sawyer and Sheila McTighe essays in this issue.

[9] Blunt 1995.

[10] Some of the discrepancy arises in making a translation of Poussin's use of strings on the figures. One translation writes that the strings were used to sew miniature costumes together, and others write that strings were used to place figurines correctly within the perspective and horizon.

[11] Mérot 1990, p. 315, from Bellori.

[12] Thuillier 1960, pp. 145-147. For complete text of letter and its translation See Appendix I to Helen Glanville essay in this issue.

[13] Blunt 1995, p. 244. This method was practiced also by Tintoretto, Barocci, and El Greco, described also by Vasari in his *Lives of the Artists*.

[14] Poussin was writing to Paul Fréart de Chantelou (1609-1694) to address the commission of *The Conversion of Saint Paul*, a painting now lost. On the reverse of this drawing another landscape exists, very similar to the landscape in the left half of *The Holy Family*. The palace in the drawing is depicted under flame.

[15] This drawing ties *The Holy Family* to *Landscape with Orpheus and Eurydice* (1649-50), *Landscape with Pyramus and Thisbe* (1651), and *The Exposition of Moses* (1654), through composition, scale, and attention to architectural motifs such as the castle, other rounded buildings within the landscape, and a stone bridge with arches.

[16] Mérot 1990, p. 175. Interesting, too, is that Leonardo da Vinci warned that the danger of this method was a composition that would appear both uniform and contrived.

[17] Ravaud 1994.

[18] Steele 1999, p. 149.

[19] Erdmann 2013.

[20] Duval 1994.

[21] Adobe Photoshop 5.0.

[22] Charles III de Blanchefort, duc de Créqui,1624-1687, French ambassador to Rome in 1662-62 and 1664-65, Rosenberg 1994, p. 492.

[23] Kushel 1985, p. 2. The author recommends that transmitted IR be practiced as a routine procedure to examine paintings and artifacts. Portability and ease of handling the Inframetrics camera has made it more possible to capture images during examination in the IR, both transmitted and reflected.

[24] Blunt and Mérot quote from Felibien: "He was always studying, wherever he might be. When he walked in the streets he observed the actions of all those he met, and if he saw one which seemed to him of interest, he noted it in a book which he always carried with him for this purpose." Art historians state that no sketchbooks of Poussin survive today and speculate that the artist deliberately destroyed sketchbooks of landscapes and of the model, considering them as only a "means toward the creation" of a work and not worth holding onto. Blunt 1995, p. 224.

[25] FT-IR microspectroscopy was performed using a Spectra-Tech IR-Plan microscope attached to a Nicolet 510M spectrometer with an auxiliary MCT detector. Samples were mounted for analysis on a Spectra-Tech Micro Sample Plan fitted with a diamond window, and data were collected for 200 scans at a spectral resolution of 8 cm^{-1}. The resulting spectra were viewed in absorbance mode between 625 and 4000 wavenumbers, and for consistency, the CO_2 peak was removed and the spectra were baseline corrected. Spectra were searched against commercial and custom spectral libraries of artists' materials. The functional groups of the unknowns were identified and the spectral match evaluated.

[26] The pigment samples were mounted on a carbon planchet and coated with a thin precipitated layer of carbon. Elemental information of the pigment composition was determined using a Camera MBX electron microprobe and Wavelength Dispersive Spectrometers (WDS) with a Tracor-Northern TN 5502 EDS system (X-ray analysis system.) Beam voltage was 15 keV, and beam current 15 nanoamps.
For Polarized Light Microscopy the pigment samples were mounted and dispersed on microscope slides using Cargille Melt Mount 1.662 mounting medium and viewed with a Leitz Laborlux 12 Pol binocular polarized light microscope.

[27] Lead tin yellow type I is a lead-tin oxide, Pb_2SnO_4, and is the form more frequently encountered. Lead tin yellow type II may contain silicon and free-tin oxide. Lead tin yellow has been identified in paintings dating between 1300-1750 and has not been found in paintings in the second half of the 18th century.

[28] Derrick 1995, pp. 309-311. The spectrum for this sample with the peak at 2343 wavenumbers was considered to be a clear example of the Old World ultramarine and was entered into the database as a standard for comparison.

[29] Not found in the Fogg's *Holy Family*, but found in other Poussin compositions, are copper green and smalt. Minimal sampling reduced the possibility of finding the full range of Poussin's palette.

[30] Mérot 1990, p. 316 from Félibien, *Entretiens sur les vies et les ouvrages des plus excellents peintres anciens et modernes*, V, 9th and 10th Entretiens (Paris, 1688), pp. 3-5 and 193-196.

[31] No. 93 *Sacra Famiglia*, Inv. no. 175, da Nicolas Poussin, oil on canvas, 100 x 133 cm. The copy has the same dimensions as the original at Harvard University. Faldi 1956, p. 39. The catalog entry also identifies the Campidoglio col Palazzo Senatorio e la sua torre in the landscape in the left hand side of the composition.

[32] An intermediate profile of the mountain seen in the x-radiograph is very similar to the mountain in the landscape of *Achilles with the Daughters of Lycomedes* (1656), at the Virginia Museum of Fine Arts.

Some Preliminary Remarks on Nicolas Poussin's Painting Technique in *L'Orage*: Complementary X-ray Fluorescence and X-ray Diffraction Study

Kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Laurence de Viguerie, Philippe Walter, Helen Glanville

This work is dedicated to the memory of our dear colleague and friend Hélène Rousselière, who carried out the original XRF/XRD measurements.

1. L'Orage

André Félibien tells us in his *Entretiens*, that *L'Orage*[1] (Fig. 1) was painted for Poussin's friend and patron Pointel in 1650-51, together with its pendant *Un temps calme*,[2] which now hangs in the J. Paul Getty Museum in Los Angeles.[3] (Fig. 2) The challenge of painting a storm – what Félibien would term the "unpaintable"[4] because the effects were so momentary – had already been set by Leonardo in his *Trattato* which Poussin knew well having provided illustrations for it in the 1630s.[5] He had also penned a description of his other storm-ridden dramatic landscape – the *Pyramus and Thisbe* in the Städel Museum in Frankfurt painted for Cassiano Dal Pozzo in 1651, making clear that the painting was indeed a dramatic landscape, the macrocosm a mirror to the microcosm, the storm ridden natural world a metaphor for the effects of fortune on mankind, and emotions on man's soul.[6]

The painting was bought by the Musée des Beaux-Arts in Rouen as a work by Gaspard Dughet. It was published by Jacques Thuillier in 1976 as the work by Nicolas Poussin described by André Félibien.[7] Before acquisition by the museum in Rouen, the painting was examined techni-

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Fig. 1 – *L'Orage* (1650-51), oil on canvas, 99 x 132 cm, Musée des Beaux-Arts, Rouen, inv. no. 975.1. © Musée des Beaux-Arts, Rouen.

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Fig. 2 – *Un temps calme* (1650-51), oil on canvas, 97 x 131.5 cm, J. Paul Getty Museum, Los Angeles, inv. no. 97.PA.60.

Fig. 3 – *L'Orage*. XRF/XRD measurements were taken at the points indicated in red.

cally in what was then LMRN (now C2RMF), in order to provide further clues as to attribution (i.e. Gaspard Dughet or his brother-in-law, Nicolas Poussin), and to establish whether the figures and the landscape were painted by the same hand. No evidence of more than one hand at work was found, and the examination determined the materials and handling to be compatible with the work of Poussin.

The present investigation is a preliminary to a future technical comparison of this painting with its pendant in the J. Paul Getty Museum, as well as with what might be called its 'sister' paintings, *Pyramus and Thisbe* in the Städel Museum and *Man killed by a snake* in the National Gallery in London.

We performed the investigation using x-ray fluorescence and x-ray diffraction. Samples were taken from the edge of the painting in order to provide information as to the composition of the ground layers and build up of the paint layers, to aid in the interpretation of the XRF and XRD measurements.

2. Results

2.1 Preliminary non invasive investigation of the palette

X-ray fluorescence and x-ray diffraction measurements were performed by means of mobile equipment (Fig. 3). The pigments identified are listed in the Annex in the complete table of results. With only a limited period of time at one's disposal, particular attention was paid to areas of blue and blue/grey, and to a lesser degree to areas of green in the landscape.

Calcite, hydrocerussite and cerussite were found in almost all of the points analysed, present either in mixtures or in underlayers. Lead tin oxide (lead tin yellow Type I) was used alone in the drapery of the figures, or mixed with lapis lazuli (natural ultramarine) and green earth in the foliage/landscape. It should be noted that cassiterite (SnO_2) was also found as traces alongside the lead tin oxide. Its presence can be explained by the preparation process of lead tin yellow which consists in the mixture of three parts of lead oxide and one part of tin oxide (SnO_2), heated to high temperatures.[8]

Bone black could not be identified by XRD, but the association of phosphorous and calcium detected throughout XRF indicates that it has been used in the shadows of the buildings in preference to the cooler charcoal black (see 3.3). SEM analysis of sample 4 confirmed its presence in the dark green paint in *L'Orage* (Fig. 7). A similar inclusion of bone black has been found in a dark brown/green interstitial layer in a sample from the foliage, on the top edge of the Getty painting.[9] (Fig. 5) It would seem that this black which is warm in tonality, was deliberately chosen by Poussin for use in foliage in preference to the "blewish black"[10] of charcoal black, which found used in the dark clouds of the stormy sky of *L'Orage*, (Fig. 4a) or added in small quantity to the pigments making up the reddish ground, to give it a cooler tonality (Figs. 4a-b). What is often called a "Claude"[11] green, was the 17th century replacement for the copper based greens favoured in the previous century, the discolouration of which had been noted by artists of Poussin's generation, which entailed this change in practice. "Warm" greens do not number amongst artist pigments which are cool and bluish, so artists have always struggled in their depiction of the greens seen in the natural world. Green earths had already been put to use in fresco painting from earliest times: in an aqueous medium or used matt, they have an intense colour when of good quality (the celadonite green-earth from Verona for instance,)[12] and an increased use of high quality green earths in draperies as well as landscape is one characteristic of 17th century practice. Green earths are omni-present in the landscape, and the green mixture usually includes lead tin yellow and sometimes lapis (see Annex), as well as bone black as we have seen, in the darker shades. The use of green earths is certified here by the presence of crystalline phases of celadonite or glauconite detected by XRD. The absence of any copper based green pigment (or indeed blue) is to be noted. Recent analysis of works by Annibale

Carracci and Domenichino, suggests that this may be a trend.[13]

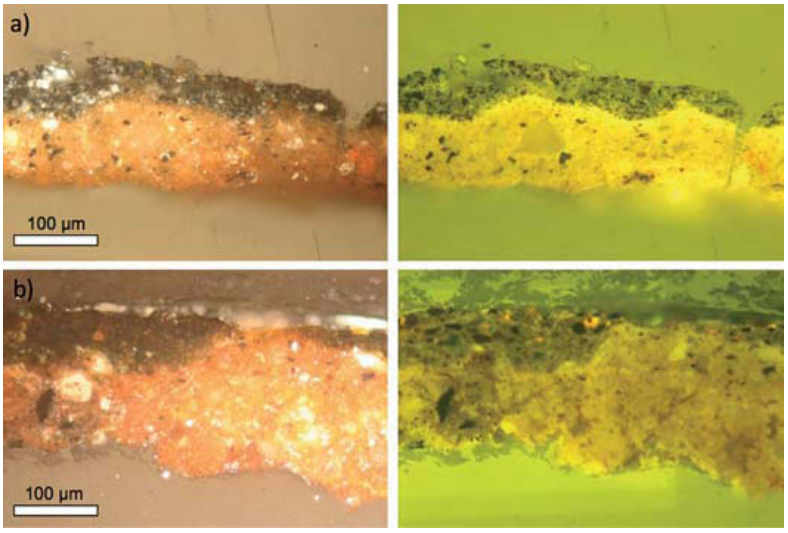
Also to be noted is Poussin's choice of a red earth in preference to the more strident vermilion, for the red drapery of the cowering figure in front of the oxen, a hue in the same key as the rest of the composition. All the hues are consonant with one another, there is no false note in the harmony, and this can be appreciated even in the deteriorated condition of the painting.

The presence of lapis lazuli in the sky (in the dark grey area), although it was not detected in XRD, was established visually from the surface of the painting where large particles were visible under magnification. Its presence was also confirmed with SEM both in the mixed green and in the dark paint mixture of the sky (See cross sections 2 and 4, Figs. 4a-b). It is interesting to note that one finds this same pigment – lapis lazuli – used in all the figures tested, whether the small flame like figure clad in pale blue in the background, the figure to the right in the mid-ground, as well as in the pure blue of the drapery of the central figuring in the cart (Fig. 14). It is equally present in all elements of the landscape – earth, water and sky; mixed with lead tin yellow and earth colours in the greens of the foliage, in the grey paint of the sky and the mountains, as well as a constituent of the water both in shade and light, in the watering hole in the foreground. It is a pigment the worth of which was far in excess of its monetary value, symbolising the divine spark which unifies all elements in creation (see Glanville essay in this issue).

2.2 Information from the samples

Optical examination and SEM-EDX analysis of cross sections give information about the nature and composition of underlayers as well as of the paint surface. Spot analysis by SEM as well as elemental mapping was carried out to investigate the stratigraphy of the paint-layers, and help in the interpretation of XRF results. Two samples were analysed, both from the left-hand edge of the painting; one from the dark cloud (sample 2, Fig. 4a), and one from the dark green foliage further down (sample 4, Fig. 4b).

Two layers of ground are present, both largely consisting of clays, although the top layer contains some lead. The top layer is difficult to distinguish in visible reflected light under the microscope, but clearly distinguishable both in UV light and in the SEM elemental map for lead (see Pb map in Fig. 6) which shows that there is none present in the initial layer in contact with the canvas. This is characteristic practice at the time when more than one layer of ground is present.[14] This distinction between the layers is also found in *Un temps calme* although the greater quantity of lead in the form of lead white in the top ground layer makes the top layer clearly distinguishable in terms of hue (it is paler, pinkish, see Fig. 5). It also would make it denser and less absorbent (in terms of the oil medium of the layers above it), as well as more reflectant of the light traversing the paint layers above it.



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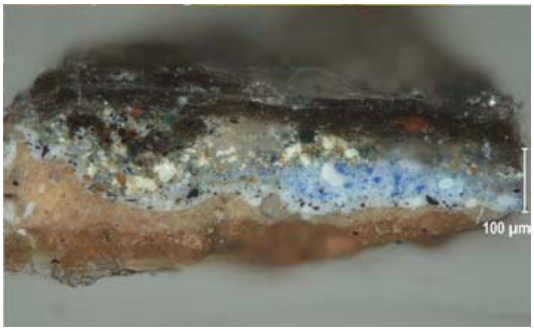

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Fig. 4 – Cross sections from *L'Orage*:
(a) sample 2, dark grey cloud;
(b) sample 4, green foliage.
On the left, visible microscopy; on the right, UV fluorescence.

Fig. 5 – Cross section from the top edge, green foliage of the Getty's *Un temps calme*. © Getty Conservation Institute, with thanks to Alan Phenix.
The dark interstitial layer is rich in lead, in addition to containing bone black and a green earth.

Both these facts are responsible in part for the present appearance of the two paintings. The surface paint in *L'Orage* appearing to have 'sunk' into the reddish, more absorbent ground, so that the details and foliage in the foreground – painted largely using earth colours – are less legible or lost. The fact that the top layer of ground in *L'Orage* is more rich in earth colours and contains less lead white than the equivalent layer in its pendant, also makes it more susceptible to the action of solvents used during cleaning.[15] The difference in 'grounds' in the two paintings, and its influence on the "effect" of the paintings, was already noted in Clovis Whitfield's 1977 article on the two pendants.[16] The difference in the "mode" or key of the two paintings can thus be imputed in part to Poussin's choice of grounds; a comparison of the prints made not long after execution of the paintings will give a better idea of the original effect and tonal construction.[17] When Charles Le Brun gave his opening lecture at the Académie Royale de Peinture et Sculpture in November 1667, he was at pains to explain why he was not choosing to speak about an Old Master, but rather about a painting by Poussin (*La Manne* in the Louvre); the paintings of the old Masters he maintained, had not retained their original effects with the passage of time, whilst he had seen the paintings of Poussin as they left the easel, and had spent much time talking with the painter, so he felt that as a result, he could correctly interpret the painting.[18]

Several features visible in the paint layers in the cross sections are of interest:

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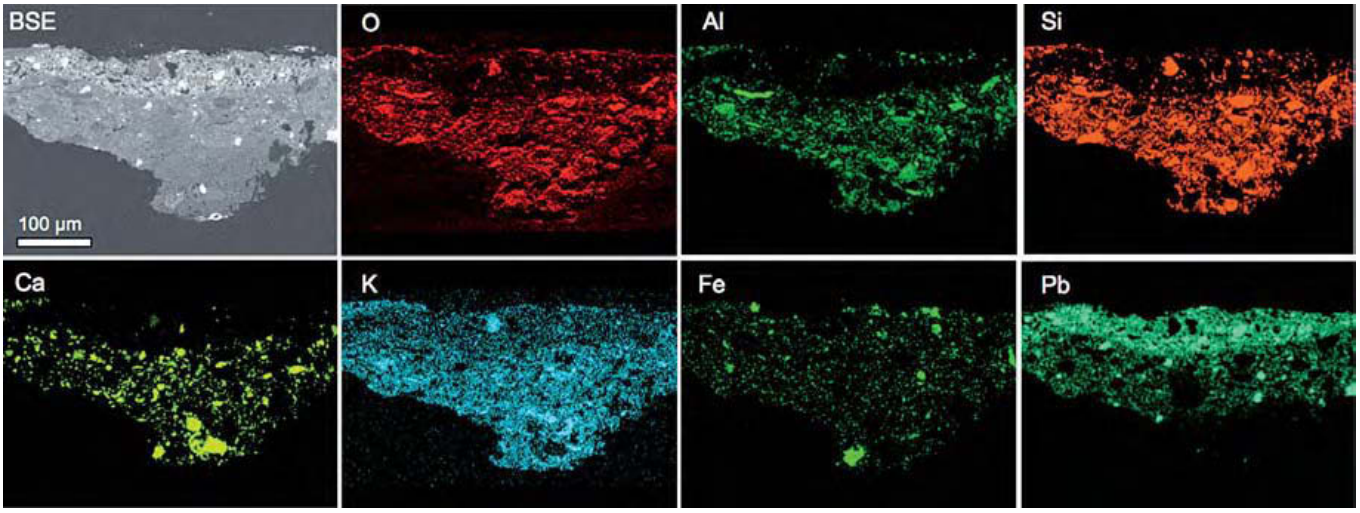

Fig. 6 – SEM-Backscattered electron image and elemental maps of cross section sample 2.

Fig. 7 – SEM-Backscattered electron image and elemental maps of cross section sample 4.

Fig. 8 – Area 1: detail of the building on the left. Visible light photograph (left), x-radiograph (centre), IR reflectogram -900 nm (right).
The red line indicates the line along which XRF measurements were taken.

Fig. 9 – XRF analysis along the line of measurement area 1: evolution of the signal as a function of the distance in mm to the first spot measurement.

Fig. 10 – Photograph of area 2. XRF analysis along the line of measurement zone 1: evolution of the signal as a function of the distance in mm to the first spot measurement.

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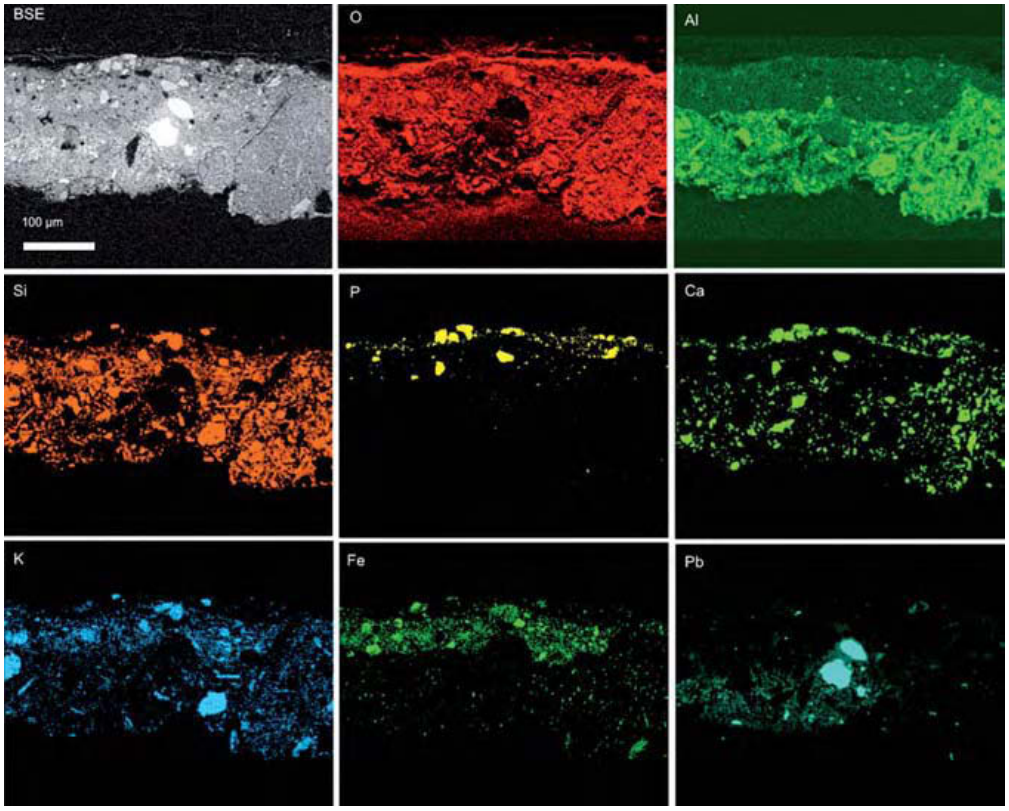
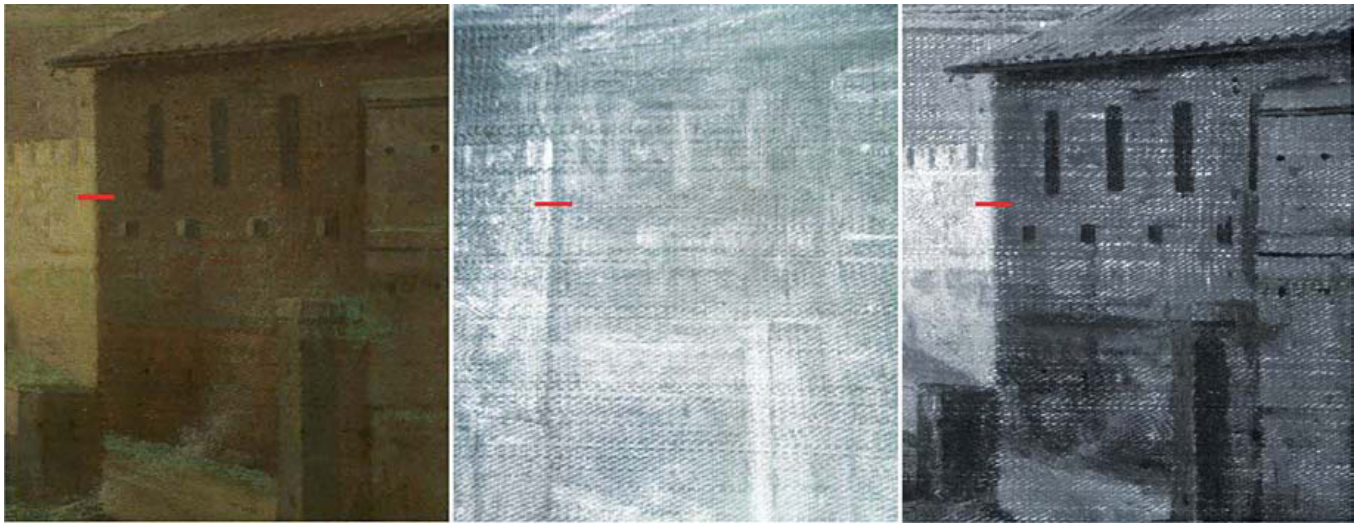


– SEM confirmed visual identification of a charcoal black in the paint layer corresponding to the dark cloud (sample 2, Fig. 4a), whilst a warmer animal bone black was used in the green mixture of the foliage. It is interesting that Canini[19] expresses this same preference as is relayed to us through Richard Symonds: "In the scuri scuri [the very darks] betweene the legs of the gruppo [group] where the Mores head is, he usd negro d'osso [bone black] always alayd [allied] with Lacca & Terra verde [lake and green earth] I askd him if negro Carbone [charcoal black] might not serve, he rep. Che tira troppo alla Turchina [that it vies too much to blue]."[20]
– The inclusion of a lake pigment in the mixed ("Claude") green is indicated by the high peak for aluminium in the top green layer of sample 4 (Fig. 4b), and confirmed by particles fluorescing in UV when observed under the microscope.
– The UV photograph of the cross sections also seems to indicate the presence of an interstitial layer of oil laid onto the ground before painting, which would have made the ground less absorbent; more clearly visible in sample 2 than sample 4 (see Figs. 4a and 6; 4b and 7)

2.3 *Treatment of light and shadow in the buildings*

We decided to concentrate on the handling of light and shade in the buildings in the background, dramatically lit against the stormy sky: all the points analysed in XRD-XRF showed the same range of pigments. These spot measurements cannot help in an understanding of how Poussin created his effects of light and shade on the walls and



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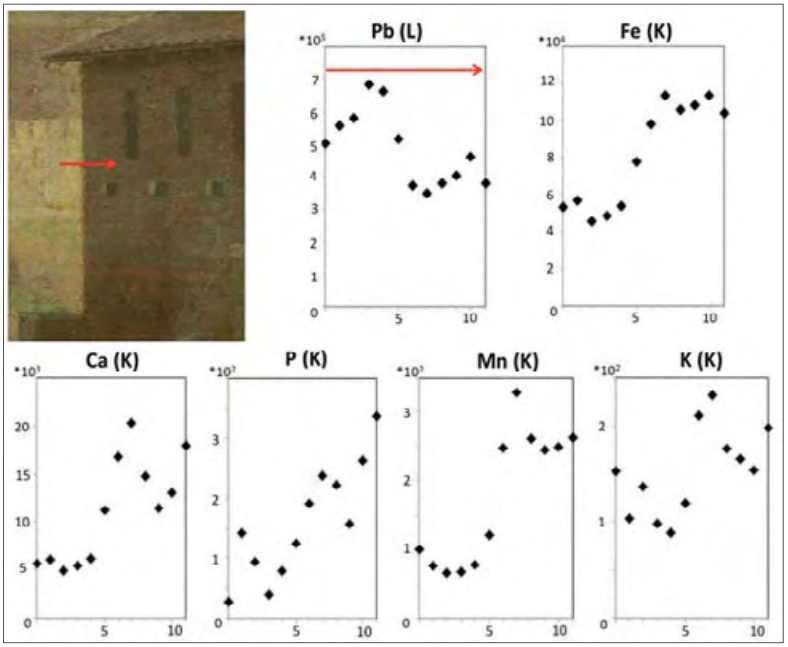
façades of the buildings, effects which replicate and are caused by the baleful lighting in the painting. We therefore attempted to better understand the material make-up of these effects by studying the evolution of particular elements (Pb, Ca, Fe, Mn …), carrying out XRF measurements along a line from light to shadow, studying the handling of shadows in terms of elemental composition, in the walls and windows in three different areas. We used the x-ray and IR images to help us in the interpretation of the results.

Broadly speaking, the shadows in different areas were not created using any one single method.

Three lines were studied, the first one being on walls from light to dark shadows (Fig. 8). The evolution of the elements along the line of measurement is indicated in Fig. 9. The variation in the presence of lead clearly follows that visible in the x-radiograph: the thick lead white containing stroke emphasizing the sharp edge of contrast between strongest highlight and deepest shadow. The resolution of the x-radiograph detail is not good enough to be able to judge from it whether the stroke is laid on later to emphasize the broad line of shadow scored into the underlying paint, or the shadow has been scored through this thicker white paint. In the area of deepest shadow corresponding to the reserve (broad dark line in the x-radiograph – the broadness suggesting the butt end of a brush as the tool used to score and remove the paint), there is a sharp fall in the Pb count, before returning to an average level for the rest of the wall.

The increase in iron, calcium, and potassium,[21] coincides with the decrease in lead, indicating the presence of earth pigments in the wall which is in shadow. It is interesting to note that the ratio of Mn/Fe in the darkest shadows is around 2% in the three areas studied; in the lighter areas, this ratio is around 1%. This suggests that different earths were used in lighter and in darker shadows. Phosphorus (K line) was also detected, in particular at the very beginning of the wall in shadow, indicating the presence of bone black in the paint, which may explain why the evolution of Ca does not follow that of Fe.



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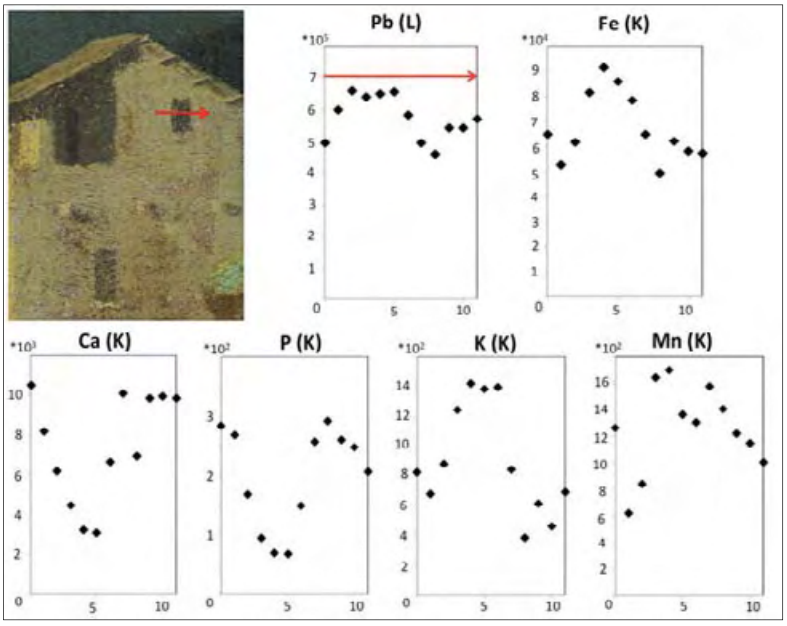

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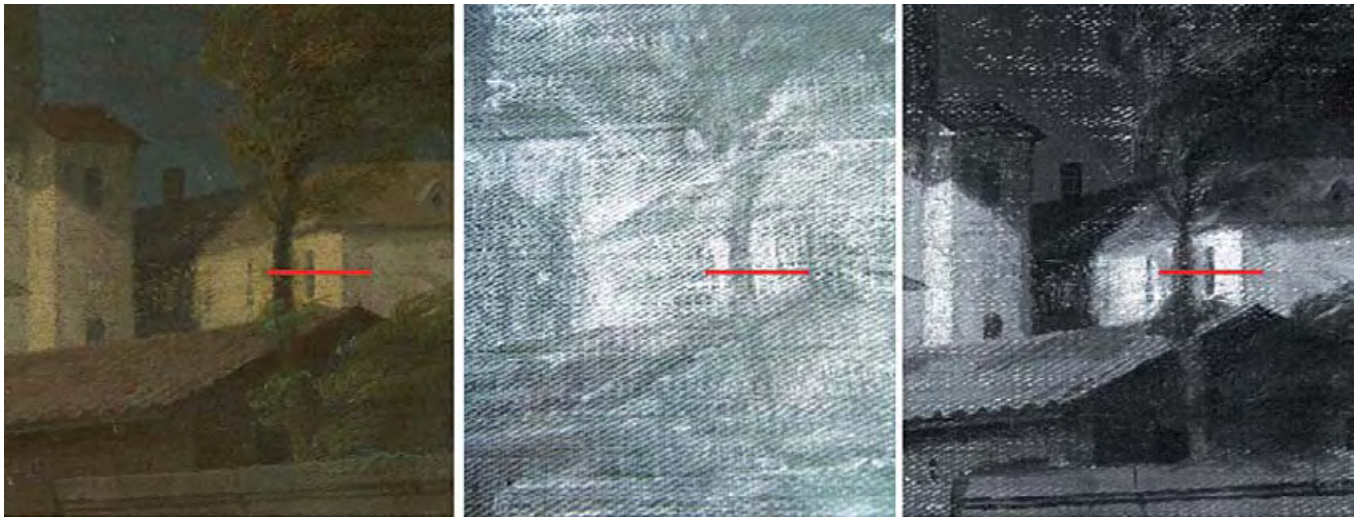

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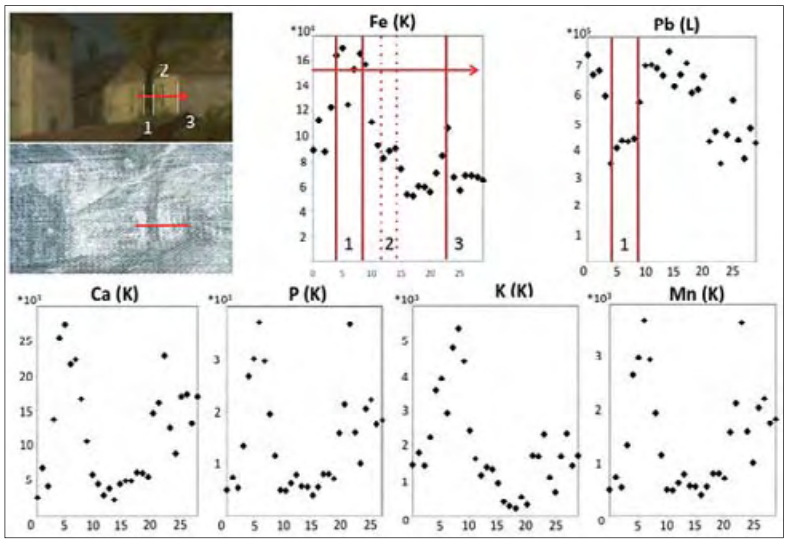

Fig. 11 – Area 3: detail of buildings on the right. Visible light photograph (left), X-radiograph (centre), IR reflectogram -900 nm (right).
The red line indicates the line along which XRF measurements were taken.

Fig. 12 – XRF analysis along the line of measurements in area 3: evolution of the signal as a function of the distance in mm to the first spot measurement.
The tree (1), the window (2) and the start of the 2nd wall (3) are indicated on the iron (Fe, K line), in correlation with the image.
The radiograph of this area is also reproduced for a better interpretation of lead (Pb, L line).

It is also interesting to note that the dark windows in this building appear very dark in IR (and are therefore carbon containing), but also more x-ray opaque than the surrounding wall in the x-radiograph. There are several possibilities to explain the presence of both carbon containing black and a lead based compound:

– for instance that they are present in a mixture as a monochrome blocking-in to indicate the position of the windows, this could be a mixture used for the tonal sketch, rather like the *sauce* used for the *ébauche* in later academic paintings, which was dark but would at the same time have had to 'dry' rapidly.
– or they can be in the dark paint used for the shadow of the window. This was found in the uppermost dark layer of cloud in sample 2 of the painting (Fig. 4a), and in the interstitial dark brown layer in the sample from the Getty painting, which is also rich in lead although it appears dark brown in cross section.[22] (Fig. 5)

These are only hypotheses, and need to be further explored.

These results of the above XRF line can be compared with those from the line across the window of the house furthest removed in the background. (Fig. 10) Unfortunately for this area we do not have a comparative x-radiograph image, which makes the interpretation of the lines more difficult.

The lead (L line) increases where the window begins, as does the iron. This suggests that lead white is here present together with earth pigments to depict the shadow of the window. This is similar to what was found in the x-radiograph of area 1. (see Fig. 8)

The evolution of calcium is also interesting, inversely proportional to that of iron, but correlated to that of phosphorus. The quantities present are not large, but the global evolution suggests a dip in correlation to the position of the window: bone black (Ca and P) was probably included in the mixture for the walls, but not in the dark paint used for the windows which was made up of earths (peaks for Fe, K and Mn) and judging by the colour and its opacity in IR,[23] also some carbon containing black.

Fig. 11 shows the third area we studied, and the variation in elements along the line analysed in XRF can be seen in Fig. 12. This is more complicated to interpret because of the greater number of points analysed (30 points). The x-radiograph is here indispensable if we are to understand the elemental variations, and particularly that of lead.

The tree was painted within a reserve: as can be seen in the x-radiograph, two highly x-ray opaque areas lie either side of the tree trunk. These areas correspond to points with high lead content with a dip corresponding to the trunk of the tree. This 'dip' is correlated to peaks for iron, manganese, potassium, calcium and phosphorus indicating the usage here again of earth pigments combined with bone black, but in this instance for the tree trunk. Again, as in Fig. 8, the quality of the x-radiographic image is not high enough to be able to establish whether the thick white either side of the trunk was scored through for the trunk or added either side to reinforce the contrast. However, this use of the brush (or another tool) to both add material and remove it, is very much part of Poussin's technique – the same he uses for example when painting the fingers of the hand of the cowering figure draped in blue, scoring the flesh colour to delin-

eate the fingers, (see Fig. 14) working as he would when creating his figurines in wax or clay, adding and removing to effect.[24]

As was noted above, (Fig. 8) here too the light areas in the painting do not always correspond to areas which are x-ray opaque in the x-radiograph, as one would have expected. For instance the top of the building on the left of the detail in visible light in Fig. 11 is in shadow, with the lower section being lit. The x-radiograph of the same area shows the upper portion in shadow to be more x-ray opaque than the lower section, rather than the inverse. That this is not an isolated anomaly can be seen in Fig. 13 which juxtaposes a detail from the leftmost buildings in *Le temps calme* with an x-radiograph detail of the same area. Again, it is the eaves in shadow and the shaded wall which are the most x-ray opaque. This suggests that the darker colour used for the shaded areas is a mixture of dark pigments but in a lead rich matrix (similar to what was found in the top layer from the sample of the dark grey cloud perhaps, see Figs. 4a and 13).

In the x-radiograph, the window is not visible as a reserve, nor is it marked by a change in the evolution of lead; the elemental variations indicate the use of earth pigments for the painting of the window (and not bone black as Ca and P contents are both very low). The window was added at a later stage of the composition of the work, once the walls had been painted. As with the window in area 1, (Fig. 8) and the window in *Le temps calme* (Fig. 13) it appears dark in IR which suggests the admixture of a carbon containing black. There is no clear distinction in the x-radiograph between the wall which is lit and that in shadow, (Fig. 11) and the image suggests that originally Poussin had used a chimney stack in the lower roof to profile the angle of the wall, and this is no longer part of the present composition. Similar not so much *pentiments,* as adjustments and evolutions in the painting on the road to perfection, can equally be seen even in the small x-ray detail from the Getty painting, (Fig. 13) where the present building replaces a tree (that can be seen in reserve), as well as a small cupola also in reserve belonging to an abandoned town-scape.

That is the cadences of light and dark and geometric lines shapes (trees and buildings) are not all established at a preparatory stage; the process of refinement and perfecting continues as the painter paints and repaints[25] until every element is as it should be, part of the whole. Nothing is overlooked.[26]

Conclusions

One of the most interesting results is Poussin's use of carbon black (identified as charcoal black by its morphology in the cross sections) and bone black to different ends, which is in complete agreement with what Richard Symonds relays as Canini's practice.[27] Charcoal black – the "blewish black" – is used characteristically in the underlayer to the blue sky in *Le temps Calme* and also for the dark storm clouds in *L'Orage*. It is a conscious choice to have used bone black – a warmer black as Symonds points out – in the greenery and landscape. The windows seem to have been painted using a mixture similar to that used for the sky; windows – like eyes – are openings onto the celestial. It is too early in the study of Poussin's use of materials to be able to state categorically that Poussin is here too making a symbolic link with his use of materials, rather in the way that he has linked figures and all parts of the created world with his use of lapis lazuli. It is not only Padre Lana Terzi[28] who refers to the inclusion of lapis – symbol for the divine – in all paint mixtures, we find the physical aspect of this also described by Richard Symonds in Canini's practice.[29]

Another intriguing aspect which requires further investigation – even bearing in mind that the opacity/transparency levels in x-radiographic

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Fig. 13 – Details from the x-radiograph of left side of *Un temps calme* © Getty Conservation Institute (with thanks to Yvonne Szafran) and from the visible light photograph. The sunlit wall and roof appear less x-ray opaque than the wall and eaves in the shade: this suggests that the blue-grey almost violet shadow has been painted using a mixture rich in lead white, not so the bright sunlit wall and roof.

images are a relative phenomenon – is the reversal of light and dark, from visible light to radiographic image.

Various avenues for further research have been opened by these initial investigations, so as to better understand how the effects of the painting have been achieved. For instance more needs to be done to characterise the earth colours which feature so prominently in the palette of this painting; to cast light on anomalies encountered in the x-radiographs further characterisation of what might be different types of lead white used as well as analysis of the medium/media, (at present from sampling but we hope before long with in-situ non-destructive analysis.) Complementary analytical methods together with reconstructions would help to understand the nature of the mixtures found, and the effects achieved by their use.

Acknowledgements

The authors thank David Montero for the SEM analysis and imaging with instruments facilitated by the IMPC (Institut des Matériaux de Paris Centre FR2482) financially supported by the C'Nano projects of the Region Ile-de-France. Alan Phenix, Laura Rivers and Yvonne Szafran at the Getty Conservation Institute are also to be thanked, as well as Chris Titmus and Spike Bucklow at the Hamilton Kerr Institute, for their precious help. Helen Glanville wishes to thank CHARISMA for giving her the opportunity to consult the archives and technical dossier of the painting in C2RMF.

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Fig. 14 – *L'Orage*. Top: Detail of the cowering figures on the ox-cart. Below: x-ray image of the same area. The hand (circled in red) was painted over the blue cloak, and the outline of the fingers scored through the flesh paint.

Appendix
Analytical methods and materials

XRF/XRD measurements

X-ray fluorescence and x-ray diffraction measurements were performed directly on the painting by means of mobile equipment. These techniques are particularly suitable for the study of works of art as they are totally non-invasive. XRF gives information on the elemental composition (qualitatively and/or semi-quantitatively) of the artworks, and on the superimposition of layers. It is the analytical technique that is most frequently employed in the scientific examination of works of art and other Cultural Heritage material because it can be implemented relatively easily without specific geometrical requirements. However, XRF analyses cannot detect light elements (hydrogen, carbon, oxygen). X-ray diffraction allows for the identification of the crystalline phases in pigments and degradation products, as well as providing information as to the size of the crystals. However, it is not appropriate for the identification of amorphous materials such as smalt, or hybrid pigments such as copper resinates, acetates or lake pigments.

Two pieces of equipment were used that have been fully described elsewhere.[30] The portable XRD/XRF system was built with an air-cooled iMOXS x-ray tube (IFG-Gmbh, Berlin) with a copper anode (wavelength of 1.542 Å) and a maximum power of 30 W. For the experiments, a voltage of 40 kV is used with a current of 700 μA. The source is equipped with a polycapillary semi-lens and a 0.5 mm vertical slit that provides a 4x0.5 mm^2 pseudo-parallel x-ray beam. By working in reflection mode, with an angle of about 10° between the incoming x-rays and the surface of the object, the beam impinging on the painting has an area of 4x3 mm^2. A 15x30 cm^2 photostimulable Phosphor plate (or imaging plate) is used to record the diffractograms over a period of approx. 20 minutes, before being scanned with a DenOptix Gendex system. The software FIT2D[31] allows the observation of the diffraction patterns and their transformation into standard 2σ XRD diagrams; the Bruker-AXS EVA software is used to identify the crystalline phases from the diagrams. A silicon drift detector (Peltier-cooled SDD from Amptek, resolution of 150 eV FWHM at 5.9 keV) with an active area of 7 mm^2, is used to detect the XRF signal.

A second XRF system has been used, equipped with a Moxtek tube with a palladium anode and a Silicon Drift Detector from Amptek with an active area of 25 mm^2. The voltage used during the experiments is 30 kV and the current 50 μA, the acquisition time is of 5 minutes. The XRF spectra were processed by the dedicated software PyMca.

The two prototypes allow complementary measurements: the XRF system has a smaller beam impact on the surface (ca. 1 mm in diameter) and, with its Pd anode, is more adapted to analyze materials containing Cu compared to the XRD-XRF system. It also allows measuring points along a line, thanks to a motorised displacement system.

Annex

Measurements results - Main elements and pigments identified

N°	Colour - Origin	XRF Main Elements	XRD Main Compounds
1	Blue from the top of tiny back-ground figure	Fe, Pb, Ca, K, Ti, Mn	Hydrocerussite, cerussite, lazurite, calcite, quartz
2	Blue from the bottom of the same	Fe, Pb, Ca, K, Ti, Mn	Hydrocerussite, cerussite, lazurite, calcite, quartz
3	Yellow from tiny second back-ground figure on the left	Fe, Pb, Ca, K, Mn, (Sn)	Hydrocerussite, cerussite, lead tin oxide type I, quartz
4	Shadow of left hand blue figure	Fe, Pb, Ca, K, Mn	Hydrocerussite, cerussite (calcite, lazurite)
5	Shadow of right-hand yellow figure	Fe, Pb, Ca, K, Mn	Hydrocerussite, cerussite (calcite, lazurite)
6	Wall to the right	Fe, Pb, Ca, K, Mn	Hydrocerussite, cerussite (calcite, lazurite)
7	Shadow to the left	Fe, Pb, Ca, K, Mn	Hydrocerussite, cerussite (calcite, lazurite)
8	Under crenellations – reddish tone	Fe, Pb, Ca, K, Mn	Hydrocerussite, cerussite, calcite
9	As above, a little to the right	Fe, Pb, Ti, Ca, K, Mn	Hydrocerussite, cerussite, calcite
10	Drapery mid-ground figure on the right	Fe, Pb, Ca, K, Mn, (Sn)	Lazurite, hydrocerussite, cerussite (quartz, calcite)
11	Foliage to the right of this figure	Fe, Pb, Ca, K, Mn, (Sn)	Celadonite/glauconite, calcite, lead tin oxide type I
12	Lower part of this same figure	Fe, Ca, Pb, K, Mn, (Sn)	Lazurite, hydrocerussite, cerussite (quartz, calcite)
13	Yellowish-green foliage to the right of the same	Fe, Pb, Ca, K, Mn, Sn	Lead tin oxide, cerussite, calcite (lazurite, cassiterite)
14	Blue drapery around central figure on cart (Fig. 14)	Fe, Pb, Ca, K, Mn, Sn	Cerussite, hydrocerussite, lazurite
15	Yellow drapery of the same (Fig. 14)	Fe, Sn, Pb, Ca, K, Mn	Lead tin oxide type I, cerussite, hydro-cerussite
16	Green foliage next to green	Fe, Pb, Ca, K, Mn, (Sn)	Celadonite or glauconite, calcite, lead tin oxide type I, quartz
17	Red drapery of left-hand figure	Fe, Pb, Ca, K, Mn	Hydrocerussite, cerussite, quartz (calcite)
18	Water to the right, quite light	Fe, Sn, Pb, Ca, K, Mn	Lead tin oxide type I, lazurite (calcite, hydrocerussite, cerussite)
19	To the left, darker water	Fe, Pb, Ca, K, Mn, (Sn)	Lazurite, lead tin oxide type I, calcite (cerussite, hydrocerussite)
20	Sky, just above the mountain	Pb, Fe, Ca, (K, Mn, Sn)	Hydrocerussite, cerussite, lazurite
21	Mountain, a little below the above	Fe, Pb, Ca, (K, Mn, Sn)	Hydrocerussite, cerussite, lazurite
22	Mountain, below, highlight	Pb, Fe, Ca, Sn, (Cr, K, Mn)	Hydrocerussite, cerussite, lazurite, lead tin oxide type I
23	To the left of the above	Pb, Fe, Ca, Sn, (Cr, K, Mn)	Hydrocerussite, cerussite, lazurite
24	Left-most mountain – top (sunlit)	Fe, Pb, Ca, (Sn, K, Mn)	Hydrocerussite, cerussite (lead tin oxide type I, lazurite)
25	Sky to the left of the above	Fe, Pb, Ca, Ti, (K, Mn)	Hydrocerussite, cerussite

Samples investigation

2 samples were taken from the edges of the work in order to provide information on the preparation layers and to better interpret the XRF/XRD results. The samples were embedded in resin as cross sections, and then examined and analysed with conventional laboratory-based instruments (optical microscopy and scanning electron microscopy, associated with EDX analysis) for a systematic study of the spatial distribution of the identified materials over the different paint layers. The painting was not in restoration at the time, so although every possible care was taken to avoid areas of restoration this was difficult particularly as edges of paintings are almost without fail heavily retouched.

Imaging and microanalysis was performed on a SU-70 Hitachi SEM-FEG and a X-Max Oxford EDX detector.

Notes

[1] Thuillier 1976, McTighe 1996, Allen 1988.
[2] Félibien, *Entretien VIII*: "Pour le sieur Pointel deux païsages, l'un representant un orage, & l'autre un temps calme & serain." Félibien, 1685, p. 303, see also Thuillier 1976, p. 353.
[3] Whitfield 1977.
[4] Félibien 1679, pp. 57-59, and Thuillier 1976, p. 345.
[5] See Bialostocki 1954, pp. 130-136.
[6] Letter to his friend the painter Jacques Stella, see Thuillier 1976, p. 345.
[7] See note 2.
[8] Kühn 1993; Hradil 2007.
[9] Grateful thanks to Alan Phenix at GCI for his analysis of the cross section, and allowing us to reproduce it; we have only highlighted those elements which are comparable or of interest in terms of what we found in the samples from the Rouen painting.
[10] Beal 1984, p. 226.
[11] Named after Claude Lorrain, as typical of the greens found in his paintings it consists of a complex green mixture made up of earth pigments, calcite, usually with the admixture of some black, a blue pigment and either an opaque yellow or a lake but not always etc.
[12] Grissom 1986, p. 149.
[13] Moioli 2015.
[14] See for instance Martin 2008.
[15] Glanville 1996.
[16] Whitfield 1977, p. 4.
[17] See Fig. 3, Thuillier 1976, p. 348.
[18] See Glanville essay in this issue.
[19] Gian Angelo Canini, a contemporary of Poussin and also part of Cassiano dal Pozzo's circle, was a pupil of Domenichino and would have first met Poussin when he too worked in Domenichino's studio in his early years in Rome.
[20] Beal 1984, p. 249.
[21] Titanium and silicon were also present as traces elements, with the same evolution.
[22] Grateful thanks to Alan Phenix at GCI for his analysis of the cross section; we have only highlighted those elements which are comparable or of interest in terms of what we found in the samples from the Rouen painting.
[23] Not shown here.
[24] See McTighe, Glanville, Villis, Foulke in this issue.
[25] Le Blond de la Tour describing Poussin at work, see Thuillier 1960, p. 211 and Appendix 1 to Glanville essay in this issue.
[26] Poussin is reputed to have pronounced on the subject: "Je n'ai rien negligé."
[27] See above, and note 21.
[28] "Ma prima faccio una tinta di azzurro oltremarino, pigliando del meno perfetto, con un poco di biacca, della quale mi servo per unire con quasi tutte le altre tinte …" Lana Terzi 1977, p. 151. (see Bensi, Glanville in this issue).
[29] Referring to the painting of a «wench» in Canini's *Anthony and Cleopatra* "Her garment though a light greene has Cenneri [ultramarine ashes] in it. Cenneri in all their flesh and almost in all their garments." Beal 1984, p. 254.
[30] Glanville 2014a; Gianoncelli 2008.
[31] Hammersley 1989.

Discoveries Concerning Poussin's Technique Made during the Examination and Treatment of *Achilles among the Daughters of Lycomedes*[1]

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

Carol Woods Sawyer

Introduction

Achilles among the Daughters of Lycomedes,[2] owned by the Virginia Museum of Fine Arts (VMFA), is one of Nicolas Poussin's late works, painted in 1656 for Charles III de Blanchefort, the Duc de Créqui, French Ambassador to Rome (Fig. 1). The subject depicts the popular Greek legend of Ulysses's discovery of Achilles disguised as a female in the company of the daughters of King Lycomedes on the island of Skyros. Achilles mother, Thetis, who knew her son was fated to die at the siege of Troy, disguised him as a female in an attempt to save him from entering the Trojan War. Ulysses and Diomedes thwarted her efforts by tricking Achilles into revealing his true identity. They presented the King's daughters with a chest containing finery and women's jewelry along with arms and armour, items only of interest to a warrior. Achilles, the only "maiden" to be fascinated by the weapons, discarded his disguise to don the helmet and take the sword, and willingly joined the Greeks in battle. The Museum of Fine Arts in Boston (MFA) owns a version of the same subject that was painted around 1650.

VMFA acquired the painting in 1957 from Wildenstein and Company in New York. Little was known about the painting's whereabouts for most of the nineteenth century up through the mid-twentieth century.[3] However, scholars were well aware of the painting's existence from a contemporary engraving executed by Pietro del Po (1610-1692), and through early documents that refer to the second version of the *Achilles* composition.[4]

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Fig. 1 – Nicolas Poussin, *Achilles among the Daughters of Lycomedes* (or *Achilles on Skyros*), 1656; oil on canvas, 100.33 x 133.35 cm. Virginia Museum of Fine Arts, Richmond, Arthur G. and Margaret B. Glasgow Fund, 57.2.

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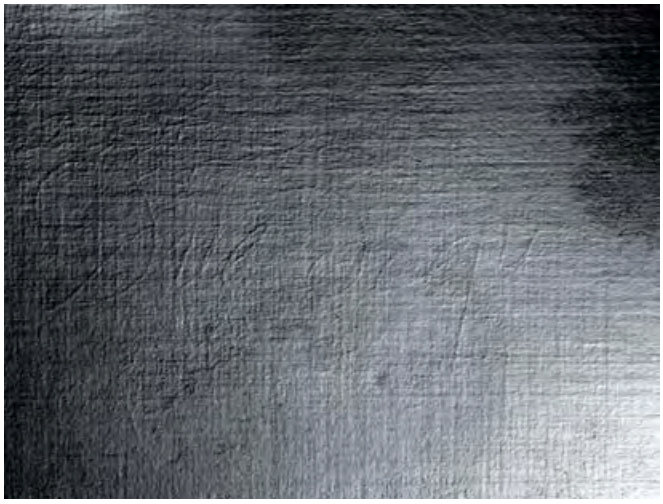

Fig. 2 – Detail of inscription on right side of painting captured using Reflectance Transformation Imaging (RTI). RTI image reversed for ease of reading.

Fig. 3 – Detail of inscription on left side of painting captured using Reflectance Transformation Imaging (RTI). RTI image reversed for ease of reading.

Fig. 4 – Tracing of inscription in VMFA's *Achilles*.

During this period the painting was referred to as the "lost Achilles."

Before acquiring the painting VMFA asked Walter Friedländer to assess the painting and offer an expert opinion regarding its quality. Friedländer identified the painting as the "lost Achilles" and accepted it as not only an authentic work by Poussin but also as an "impressive" example of his mature style.[5] Some scholars concurred with Friedländer,[6] but others had doubts about the painting's authenticity because of its condition, and its "reputation" suffered as a result.[7]

The primary condition problem stemmed from an area of abrasion in the central figural group caused by overcleaning in the past. This area, which includes the faces, chests, and arms of two of the seated female figures, contained crude overpaint that was visually distracting and not in keeping with Poussin's hand, and, for some, may have influenced the overall reading of the painting. Another significant area of damage was located in Achilles's helmet. This part of the composition had clearly been restored, and the repair did not match the corresponding area in the Pietro del Po engraving. Other than these damages the painting was in very good condition.

In anticipation of the Poussin retrospectives to be held at the Grand Palais (Paris) and the Royal Academy of Arts (London) in 1994 and 1995, the VMFA decided to conduct a thorough technical examination and conservation treatment of the painting. In concert with this effort, Poussin scholars were invited to VMFA to reevaluate the painting in light of the conservation findings.[8] Ultimately, VMFA's *Achilles* was included in both exhibitions[9] and is now universally accepted as an original work.[10]

Technical Examination and Analysis

Technical examination of the painting included visual, stereoscopic, x-radiographic and IR reflectographic examination, as well as limited pigment and cross section analysis.[11] This research provided a great deal of comparative material that was used to determine if VMFA's *Achilles* was similar to other paintings by the artist. The canvas type and

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weave,[12] ground materials,[13] pigments, glazes and layering structure in the ground and paint film,[14] including a "cool" gray underlayer between the "warm" ground and blue sky,[15] the use of ultramarine glazes and ultramarine and lead white mixtures in blue drapery,[16] and a monochrome underlayer in the flesh tones[17] were present in, or consistent with, other works by the artist.[18] Unique characteristics in the x-radiograph, associated with Poussin's working method, were also found in other x-radiographs of paintings executed in his early, middle, and late period.[19]

One significant finding of the conservation treatment was discovered early on in the examination process. Close inspection of the surface revealed that the paint layer contained a raised crackle pattern in the form of letters that together create a partially legible handwritten inscription (Figs. 2 and 3).[20] The inscription is not visible on the back of the canvas due to the presence of a secondary lining support. However, the inscription is visible in the paint film in reverse. In order for cracks and planer deformations to have developed in the paint layer over time, a certain degree of pressure had to have been applied to the back of the original canvas. The inscription may have been made using a rigid marking tool such as a piece of charcoal or chalk.

By tracing the crackle pattern present on the surface it was possible to determine the legible portion of the inscription (Fig. 4): *Mo(n?) sieu(r?) (l?) [as in le] Duc*. The remaining letters are difficult to read. However, given the name of the patron of the painting, and the fact that the words Monsieur and Duc are decipherable, it is reasonable to suggest that the remaining letters spell "*de Créqui*."[21]

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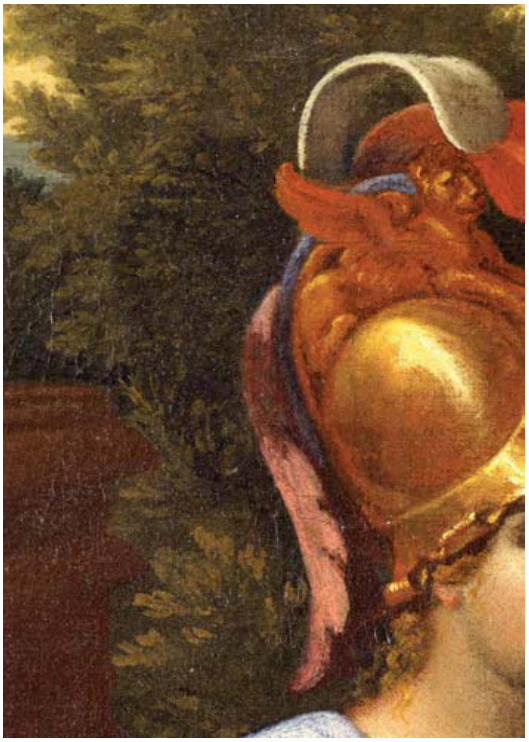

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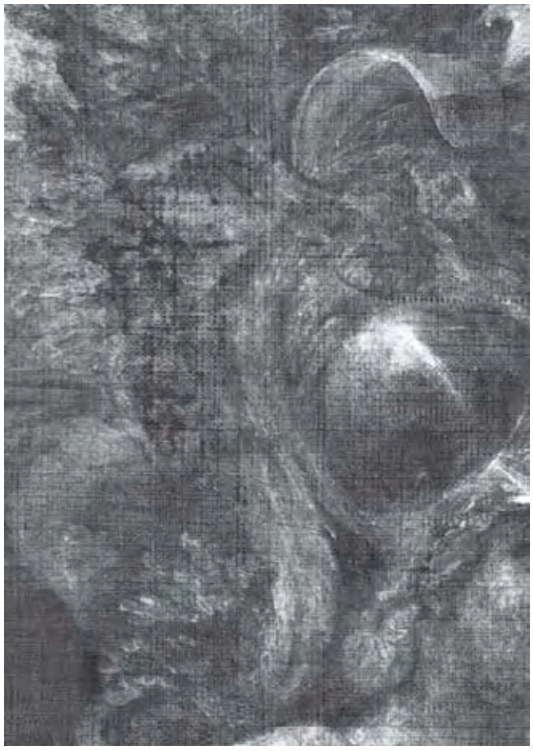

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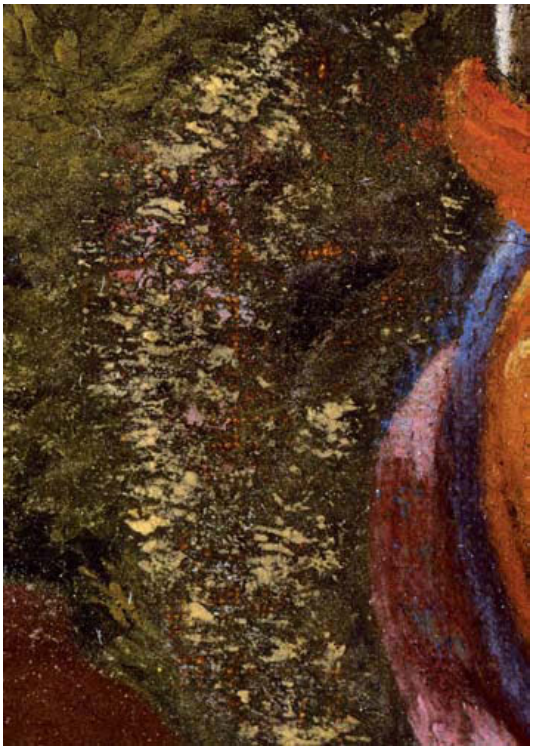

Fig. 5 – Before treatment detail of old repair behind Achilles's helmet.

Fig. 6 – Pietro del Po, 1610–1692. *Achilles among the Daughters of Lycomedes,* after Nicolas Poussin; engraving, 36.6 cm x 50.4 cm. Bibliothèque Nationale de France, Paris, Département DCO, Cabinet des Estampes, SA-45-FOL.

Fig. 7 – Detail of abrasion in paint layers behind Achilles's helmet as seen in x-radiograph.

Fig. 8 – Close-up during treatment detail of pink paint layer and fill material behind Achilles's helmet.

Cross section and pigment analysis were conducted to assess the damaged and repaired area behind Achilles's helmet. The repair depicted foliage, duplicating trees in the background, and consisted of multiple small fills, overpaint, and retouching that had become dark and discolored (Fig. 5). In addition, three of the feathers on the back of the helmet, present in the Pietro del Po engraving (Fig. 6), were missing in the area of repair.

Subsequent cleaning of the area behind the helmet revealed that the paint layers were severely abraded, a condition issue that was evident in the x-radiograph as well (Fig. 7).[22] Removal of the varnish, retouching, and overpaint uncovered patches of an original pink paint layer beneath a dark green paint layer and old fill material (Fig. 8). An evaluation of two cross sections taken from the area prior to cleaning revealed that the green paint layer was in intimate contact with the pink paint layer and that it contained bone black, lead-tin yellow and lead-antimonate yellow. The pink paint layer contained madder lake and lead white. All are pigments that Poussin is known to have used. Based on this information, and the fact that the damage followed the curved outline and shape of a feather, it was evident that more feathers were present at one time, and that these additional feathers may have been similar in color to the remaining pink plume on the back-side of Achilles's headdress.[23]

How or why this area behind the helmet was abraded is unclear, but the nature of the damage is so localized that it appears intentional (Fig. 7). One hypothesis, based on the pigment and cross section analysis (Figs. 9 and 10),[24] is that Poussin made the first alteration, painting greenery over his initial feather design, and that a subsequent alteration was executed by a restorer to hide this pentimento after it had become more visible and distracting with the passage of time. An alternative hypothesis is that Poussin was not involved, and that one or more restorers executed the alterations after the painting was completed.[25]

X-radiographic analysis revealed that the artist made extensive modifications during the evolution of the composition. These changes indicate that Poussin was not satisfied with the initial color and configuration of several compositional elements as well as their placement. The most significant modifications took place in the fabric draped over the pedestal on the right side of the composition, the water basin on the left side, and the jewelry chest in the center.[26]

At an early stage, instead of the red and green fabrics on the pedestal, there was a single piece of blue fabric similar to the single piece of yellow drapery on the basin in MFA's *Achilles*. The general shape of this preliminary blue drapery was determined by tracing the outside edges of the blue paint layer that is visible under high magnification in cracks and slightly abraded areas in the paint film (Fig. 11). The blue paint layer was present under all of the green fabric (ending at the fabric edges) and under the top half of the red fabric. The outline formed by the tracing revealed that the shape of the blue fabric was not unlike the yellow fabric in MFA's *Achilles* (Fig. 12), only depicted in reverse (Fig. 13).

As in MFA's *Achilles,* the water basin in VMFA's *Achilles* initially stood alone, without a pedestal in front of it. This is revealed in the deep shadows of the pedestal where the reddish brown brushstrokes of the water basin can be seen beneath the gray paint layer (Fig. 14). In the x-radiograph (Figs. 15

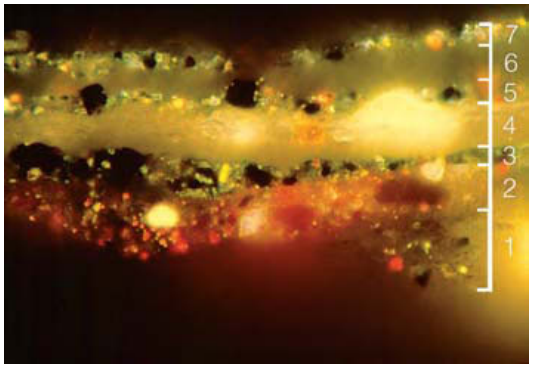

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Fig. 9 – Cross section of area behind Achilles's helmet taken in visible light (mag. 1250X with Cargille type DF immersion oil). Layers 1-7 (bottom to top): 1-blue layer; 2-pink layer; 3-dark green layer; 4-brown ground layer; 5-dark pigmented layer; 6-whiter ground layer; 7-dark pigmented layer. Original ground layer missing in photomicrograph.

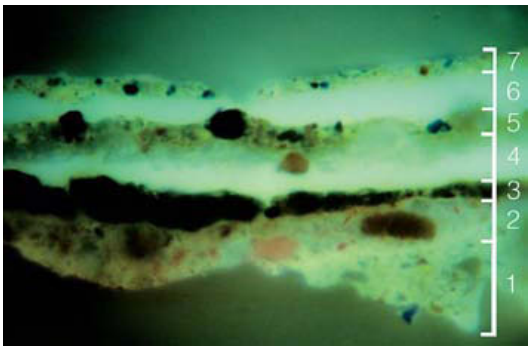

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Fig. 10 – Cross section of area behind Achilles's helmet taken in reflected UV light (mag. 1250X with Cargille type DF immersion oil). Layers 1-7 (bottom to top): 1-blue layer; 2-pink layer; 3-dark green layer; 4-brown ground layer; 5-dark pigmented layer; 6-whiter ground layer; 7-dark pigmented layer. Original ground layer missing in photomicrograph.

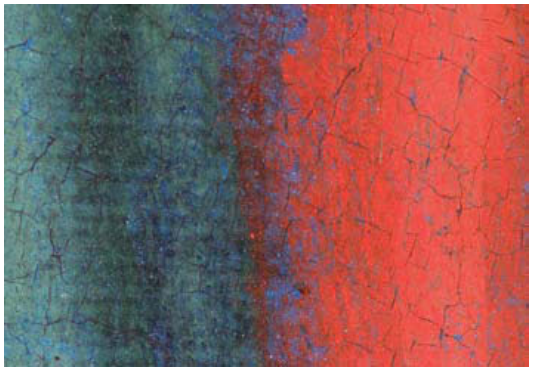
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Fig. 11 – Detail of blue paint layer beneath red fabric and green fabric on pedestal.


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Fig. 13 – Tracing of the outline of blue paint layer beneath existing red and green paint layers.


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Fig. 12 – Nicolas Poussin, *Discovery of Achilles on Skyros*, ca. 1649-50; oil on canvas, 97.5 x 131.1 cm. Museum of Fine Arts, Boston, Juliana Cheney Edwards Collection, 46.463.

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Fig. 14 – Detail of reddish brown paint layer beneath gray paint layer of pedestal on left.

Fig. 15 – X-radiograph of VMFA's *Achilles*.

Fig. 16 – Detail of x-radiograph of VMFA's *Achilles* indicating changes made by the artist: a) white outline defines earlier shape of water basin b) red outline defines final shape of water basin c) radio-opaque brushstrokes of water basin continue under pedestal.

Fig. 17 – Nicolas Poussin, *Achilles among the Daughters of Lycomedes*; pen and bistre wash over traces of black chalk, 16 x 20.2 cm. The State Hermitage Museum, St Petersburg, Inv. OR-5140.

and 16) radio-opaque brushstrokes, delineating the contours of the water basin, continue through the pedestal toward the left edge of the canvas. In addition, the basin's original contours were curved and it was more shallow, aligning more closely with Achilles's elbow.

In the central portion of the composition, there were several modifications made to the jewelry chest. The chest appears to have been narrower at one point, closer in dimension to the smaller chest depicted in MFA's *Achilles* (Fig. 12) and the square chest depicted in Poussin's preliminary drawing related to VMFA's *Achilles* (Fig. 17). Close inspection of the brown paint layer in the existing chest reveals that the brushstrokes abruptly change in texture, color, and thickness, forming a vertical line from the top of the chest to the bottom. This line, circa 9.7 cm from the left side of the chest, represents what appears to have been the left edge of the smaller preliminary chest (Fig. 18). The jewelry chest also had a red piece of fabric draped over the front instead of the current light blue fabric.[27] Traces of this underlying red paint layer are visible below the upper brown paint layer.

The modifications made by Poussin on the left side of the composition, including the design changes and the addition of the pedestal, as well as the modifications related to the color scheme in the center and on the right, resulted in a more balanced composition both visually and chromatically. These changes also help to further distinguish VMFA's *Achilles* from MFA's *Achilles*, producing a more refined and elegant composition.

Stereoscopic examination revealed a subtle method used by Poussin to create some of the highlights in flesh tones in VMFA's *Achilles*; this same method can be found in other works. The fingers of the two seated females (center and right) contain "cool" light green highlights, which are comprised of a green pigment mixed with lead

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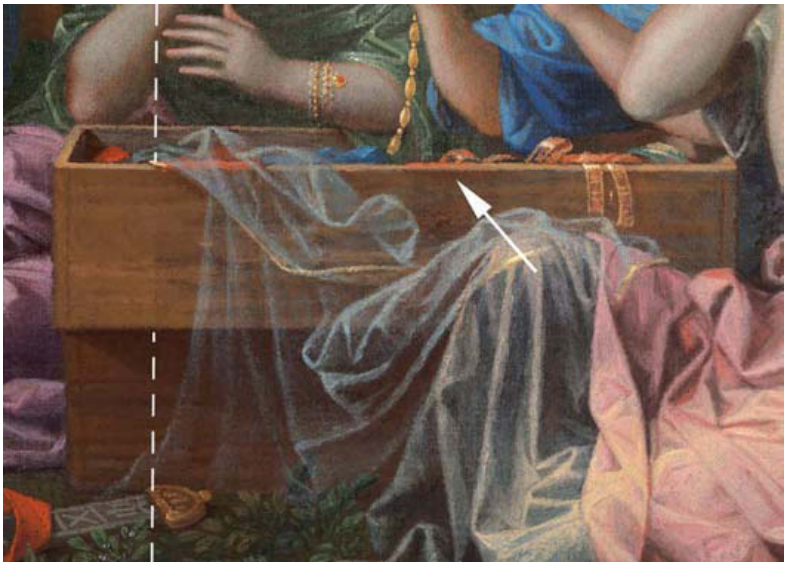

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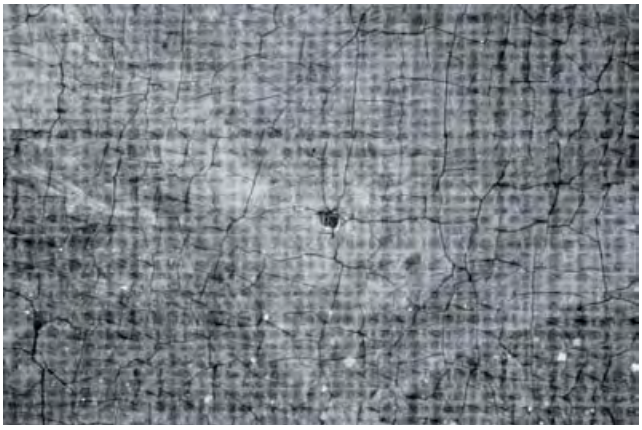

white. This same technique and pigment mixture was found in the highlight of the Christ Child's thumb in *The Holy Family on the Steps*[28] (1648, The Cleveland Museum of Art, Cleveland) and in Mary's forefinger in *The Holy Family with the Infant St. John the Baptist* (1655, John and Mable Ringling Museum, Sarasota).[29] The bright green pigment particles are visible only under high magnification, and it appears that the same green pigment was used in each of these paintings.

A less subtle method used by Poussin to create highlights in flesh tones in VMFA's *Achilles,* as well as other works, is evident from visual inspection and involves the use of a "hot" orange red color. In VMFA's *Achilles* this "hot" orange red color is used to develop facial features in Ulysses, Diomedes and the nursemaid and defines the lips, ears, cheeks and eyelids of these figures as well as the toes of Achilles's and Diomedes's feet. This same color is used in a similar manner in many paintings including *The Holy Family on the Steps* (1648), *The Holy Family with Nine Figures* (1650-51, Fogg Art Museum, Cambridge), *The Finding of Moses* (1651, National Gallery, London), and *The Holy Family with Eleven Figures* (1651, Norton Simon Art Foundation, Pasadena).[30]

Of all the technical findings documented during the course of the treatment of VMFA's *Achilles*, by far the most interesting is a small indentation in the paint film located on the horizon line in the middle of the composition. This physical impres-

Fig. 18 – Detail of chest indicating changes made by the artist: a) arrow points to red fabric beneath brown paint layer b) dotted lines indicate where brushstrokes stop, forming a line that appears to correspond to the left side of a smaller version of the chest.

Fig. 19 – Detail of background landscape in VMFA's *Achilles*. Arrow points to vanishing point in center of photograph.

Fig. 20 – Close-up detail of vanishing point in VMFA's *Achilles*. Actual size of vanishing point in paint layer is 1 mm.

Fig. 21 – Close-up detail of vanishing point in VMFA's *Achilles* as seen in x-radiograph.

Fig. 22 – Orthogonals drawn along the contours of the architecture and compositional elements in VMFA's *Achilles*. Orthogonals converge at vanishing point.

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sion was made with a pointed instrument after the last layer of paint was applied and while it was still soft. Although very small, approximately 1 mm in diameter, the indentation is visible to the naked eye in the trees along the shore of the lake (Figs. 19 and 20). In the x-radiograph the indentation appears as a dark radio-transparent dot in the paint structure, partially surrounded by a radio-opaque white ridge of paint (Fig. 21). The ridge around the indentation corresponds to thicker paint that was pushed aside as the pointed instrument was pressed into the soft paint layers. This indentation is significant because it coincides with the single vanishing point of the composition.

The mark on the vanishing point was discovered by overlaying pieces of string on the x-radiograph along lines defined by different compositional elements that relate to the perspective. This process revealed the general location of the vanishing point, and when examined the indentation was discovered. All of the compositional elements in the foreground and background are organized along orthogonals[31] that converge at this point (Fig. 22).

The fact that the vanishing point is visible in the uppermost paint layer is of particular interest. This mark would have provided the artist with a critical reference point for checking the foreshortening and accuracy of the perspective throughout the process of creating the final image. This could have been accomplished by the use of a string attached to a pointed instrument inserted at the vanishing point.[32] Because the depth of field is an important aspect of the VMFA composition, and because Poussin added to and modified many of the compositional elements, including several objects with linear features, it is easy to understand why it would have been helpful to keep the vanishing point within view.

Given the mark on the vanishing point in VMFA's *Achilles*, it was natural to speculate as to whether there were similar marks in other paintings by Poussin, particularly in those compositions where the artist clearly attempted to distinguish the background from the foreground. The first painting examined to test this idea was *The Holy Family on the Steps* (1648) (Fig. 23). The examination[33] revealed that the painting contained an indentation in the paint film located in the blue fabric, on the edge of the top step, just to the left of the red fabric on Mary's foot (Figs. 24 and 25).[34] Just as in VMFA's *Achilles*, this point marks the cen-


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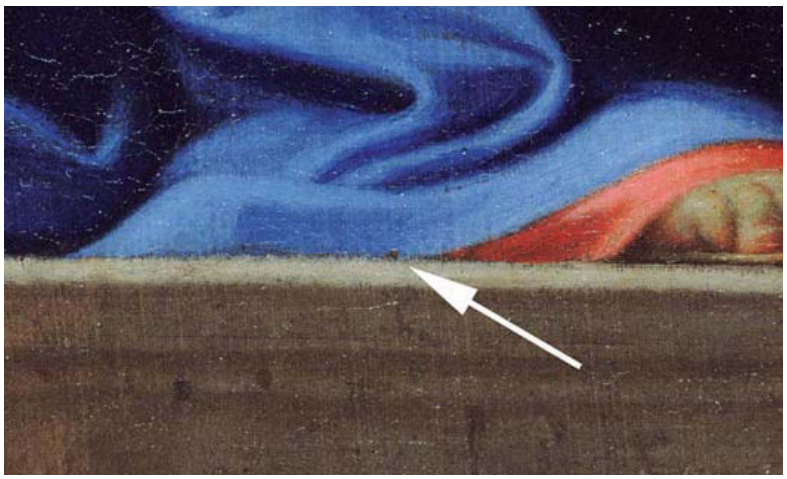
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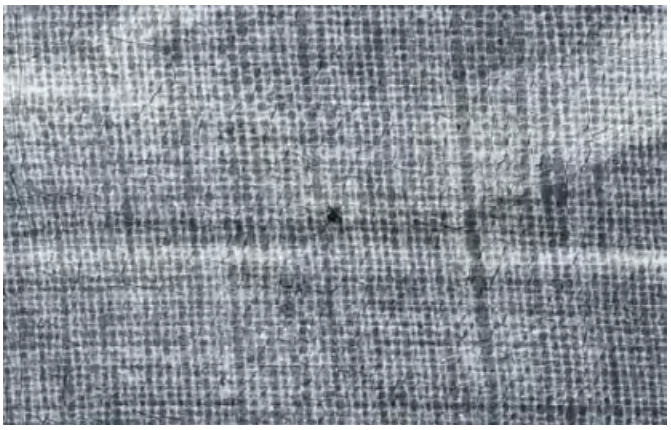
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Fig. 23 – Nicolas Poussin, *The Holy Family on the Steps*, 1648; oil on canvas, 73.3 x 105.8 cm. The Cleveland Museum of Art, Cleveland, Leonard C. Hanna, Jr. Fund, 1981.18.

Fig. 24 – Detail of Figure 23. Arrow points to vanishing point in blue robe in center of photograph.

Fig. 25 – Close-up detail of vanishing point in *The Holy Family on the Steps*. Actual size of vanishing point in paint layer is 1 mm.

Fig. 26 – Close-up detail of vanishing point in *The Holy Family on the Steps* as seen in x-radiograph.

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tral vanishing point of the Cleveland composition. The indentation is also clearly visible in the x-radiograph of the painting (Fig. 26), and all of the orthogonals, including the inscribed lines in the architecture on the upper right of the picture, converge at this point.[35]

Subsequently, other paintings by Poussin were examined, and, indeed, several were found to contain marks located at the central vanishing point. These paintings range in date between 1638 and 1664 and include *The Finding of Moses* (1638, Musée du Louvre, Paris), *Landscape with a Man Killed by a Snake* (1648, National Gallery of Art, London), *The Judgment of Solomon* (1649, Musée du Louvre, Paris), *The Ecstasy of St. Paul* (1649-50, Musée du Louvre, Paris), *Landscape with Orpheus and Eurydice* (1650, Musée du Louvre, Paris), *Landscape with a Calm* (1650-51, J. Paul Getty Museum, Los Angeles), *Christ and the Woman Taken in Adultery* (1653, Musée du Louvre, Paris), *The Death of Sapphira* (1652, Musée du Louvre, Paris), and *Summer*, also known as *Ruth and Boaz* (1660-64, Musée du Louvre, Paris).[36]

The marks on the vanishing points in these nine compositions are subtle, more so in some than in others, yet still visible to the naked eye. The marks measure approximately 1-2 mm in diameter. Two of the best examples are found in *The Death of Sapphira* and *Landscape with Orpheus and Eurydice*. In *The Death of Sapphira* (Fig. 27) the incised mark is located between the two tiny figures standing in the far background behind the man in blue leaning over (Figs. 28-30). In *Landscape with Orpheus and Eurydice* (Fig. 31) the incised mark is located in the starling at the base of the bridge, just below the niche between the two left arches (Figs. 32-34)

It is well known that at some point in the evolution of his working methods, Poussin began to try to capture in two dimensions the subtleties of light and shadow and depth of field associated with three-dimensional space.[37] Part of this process involved a perspectival projection[38] where the illusion of three-dimensional space is created in two dimensions. The single point linear perspective method for creating a perspectival projection, developed by Brunelleschi and perfected by Alberti and others, was widely practiced during Poussin's time. The examination of the paintings discussed in this paper strongly indicates that not only did Poussin use this method extensively but that he also applied it with great care.[39] A more

Fig. 27 – Nicolas Poussin, *The Death of Sapphira*, 1652; oil on canvas, 122 x 199 cm. Musée du Louvre, Paris, Inv. 7286.

Fig. 28 – Detail of Figure 27 showing Charity through alms-giving. Arrow points to vanishing point in center of photograph, below arm of tiny figure in white.

Fig. 29 – Close-up detail of vanishing point in *The Death of Sapphira*.

Fig. 30 – Close-up detail of vanishing point in *The Death of Sapphira* as seen in x-radiograph.

comprehensive analysis of Poussin's works could reveal more about the process he used to render three-dimensional space on a two-dimensional plane and the extent to which he used physical impressions[40] either in the ground or in the paint film in this process.

Conclusion

The technical examination of VMFA's *Achilles* opened many avenues of research. When considered in the context of what is known about other paintings by the artist, the findings from this research have helped to provide great clarity regarding the authenticity of the painting.[41] Even though it has gone unnoticed since it was first placed in the paint film, the mark on the vanishing point can now also be counted as a contributing factor to the positive attribution of the painting.

Acknowledgments

This project could not have been completed without the assistance of many individuals. Katharine Lee Reid, former Director of the Virginia Museum of Fine Arts, offered invaluable support, encouragement, and provided critical funding that made it possible to examine paintings in other collections. Susan Reed helped with conservation photography and administrative work; Travis Fullerton and David Stover provided photographic images and digital tracings; Maggie Albee and Suzanne Freeman expeditiously retrieved interlibrary loans; Rosalie West offered advice and helped with editing; and Howell Perkins patiently assisted with reproduction requests. I am grateful to Christopher McGlinchey for his interest and help with cross section and pigment analysis; Dr. Ashok Roy for sharing his technical findings related to Poussin's grounds and pigments; Pierre Rosenberg for facilitating the research at the Laboratoire de Recherche des Musées de France (LRMF) and for his interest in the analysis and treatment of *Achilles*; Elisabeth Martin, Elisabeth Ravaud, and Patrick Le Chanu of LRMF for allowing me to study x-radiographic images and technical files; and to the late Sir Denis Mahon for his enthusiastic support of this research. I also wish to express my appreciation to several institutions for allowing me to photograph details in paintings on exhibit at the Royal Academy of Arts: the Musée


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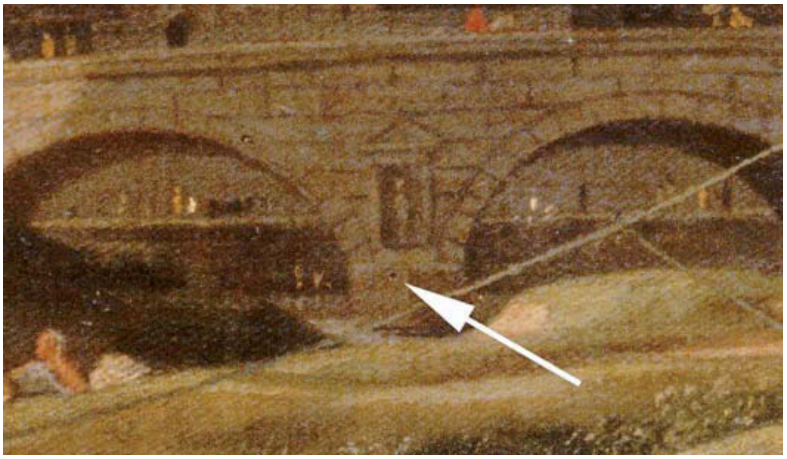
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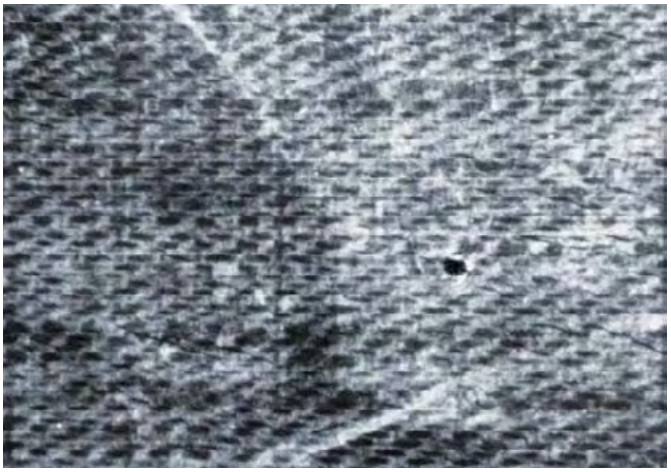
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Fig. 31 – Nicolas Poussin, *Landscape with Orpheus and Eurydice*, 1650; oil on canvas, 124 x 200 cm. Musée du Louvre, Paris, Inv. 7307.

Fig. 32 – Detail of Figure 31 showing the bridge. Arrow points to vanishing point in center of photograph, in triangular starling at base of bridge.

Fig. 33 – Close-up detail of vanishing point in *Landscape with Orpheus and Eurydice*.

Fig. 34 – Close-up detail of vanishing point in *Landscape with Orpheus and Eurydice* as seen in x-radiograph.

du Louvre, National Gallery, Cleveland Museum of Art, and Sudeley Castle. Finally, many thanks go to David Porter, my husband and reader, for his helpful suggestions and thoughtful editing.

Photography Credits

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Notes

[1] This paper, *Discoveries Concerning Poussin's Technique Made during the Examination and Treatment of Achilles among the Daughters of Lycomedes*, was first presented at the Royal Academy of Arts' symposium, *Poussin's Practice*, held on March 24, 1995, in conjunction with the Academy's exhibition *Nicolas Poussin: 1594-1665*.

[2] Also known as *Achilles on Skyros*.

[3] For a complete provenance of the painting, see Rosenberg 1994, p. 491.

[4] VMFA's *Achilles* was described in Bellori 1672, p. 446, see Friedländer 1926-27; and recorded in Félibien 1725, p. 65. It was also documented in the estate inventory of the Duc de Créqui executed at his death in 1687, see Blunt 1966, p. 89.

[5] VMFA received the following handwritten correspondence from Friedländer on the back of a Wildenstein photograph of VMFA's *Achilles*: "This (second) version of 'Achilles among the daughters of Lycomedes discovered by Odysseus & Diomedes' by Nicolas Poussin was known to me for a long time-though only in the engraving by Pietro del Po which I have reproduced on p. 260 of my book on N. Poussin (1914). However, the painting itself had disappeared and only now has been rediscovered. This is a very important 'trouvaille' because the composition is one of the most ~~important~~ impressive of the relatively few examples of Poussin's grandiose 'old age style.' I consider the painting reproduced on the reverse to be the original work by Poussin 1656. New York. February 1957 Walter Friedlaender." (Underlining and strikethrough are in the original) VMFA Curatorial Department file.

[6] Scholars accepting the painting as authentic, following its purchase, included Blunt 1960 (2nd edition), pp. 136-137 and Blunt 1966, p. 89; Wild 1980, vol. 1 p. 167 and vol. 2 p. 179; and D. Mahon, conversation with Mahon, 1993.

[7] Scholars with concerns regarding the painting included J. Thuillier, "il apparait difficile de décider s'il s'agit d'une copie ancienne ou plutot d'un original considérablement repeint," Thuillier 1974, cat. no. 199, p. 109; P. Rosenberg, "Achilles Discovered among the Daughters of Lycomedes (original? painting has not been reexamined) Richmond," Rosenberg 1982, p. 371; and C. Wright, "Either the picture is the original painted for the Duc de Créqui in 1656, overpainted to conceal damages; or it is a good old copy which has suffered. Poussin's 'brushwork' (or lack of it) is notoriously difficult to recognize in his last years when he had abandoned his freer manner. A good copyist can usually imitate the somewhat dead surface of many of his late compositions," Wright 1985, p. 244.

[8] This effort was led by Katharine Lee Reid, former Director of the Virginia Museum of Fine Arts.

[9] *Nicolas Poussin: 1594-1665*, Galeries Nationales du Grand Palais, Paris, 27 September 1994-2 January, 1995; Royal Academy of Arts, London, 19 January-9 April, 1995.

[10] P. Rosenberg reversed his opinion regarding the painting as well, "Nous avions pensé (1984) que le tabeau de Richmond n'était qu'une copie ancienne, considérablement et maladroitement repeinte; sa toute récente restauration nous a amené à l'accepter sans aucune restriction parmi les originaux de Poussin." Rosenberg 1994, p. 492.

[11] The analysis of pigment and cross section samples was performed by Christopher McGlinchey, currently the Sally and Michael Gordon Conservation Scientist (Museum of Modern Art, New York).

[12] The painting was executed on a fine weight tabby weave linen canvas support with 17 warp to 17 weft per sq. cm. *Self Portrait* (1650, Musée du Louvre, Paris) and *Apollo in Love with Daphne* (1664, Musée du Louvre, Paris) have supports with the same thread counts, see Hours 1960, pp. 34 and 38. Similar supports have been documented by M. Steele and E. Ravaud, see Steele 1999, pp. 148-149 and 160; and Ravaud 1994, p. 34.

[13] Dr. Ashok Roy, Director of Collections (National Gallery, London), found that single brown grounds were used in *The Finding of Moses* (1651, National Gallery, London), *The Adoration of the Golden Calf* (1633-34, National Gallery, London), and *A Bacchanal* (1632-33, National Gallery, London). A. Roy, *Paintings by Poussin in The National Gallery, London*, unpublished report (May 5, 1994), National Gallery of Art (NGA) Painting Conservation Department file, courtesy of the late Ross Merrill, NGA, Washington DC, May 19, 1994. In addition, Alain Duval documents Poussin's use of brown grounds, see Duval 1994, pp. 35-41. For additional information on Poussin's grounds and pigments, see Steele 1999, pp. 149-159.

[14] C. McGlinchey reported that the pigments, chemical composition of the ground, and the layer structure in *Achilles* were all consistent with Poussin's late painting technique. He also noted that Poussin typically used lead white and charcoal black in a gray underlayer in the sky, and ultramarine and lead white in the upper layer of the sky. Pigments found in selected areas of interest include red earth (+ fine silica) and charcoal in the ground; ultramarine (low grade) and lead white in the sky; madder lake, lead white, smalt, and a small amount of charcoal in the purple midtones of the nursemaid's tunic (with a thin layer of smalt applied on top of a mixture of madder lake and lead white); smalt, madder lake, and some lead white, charcoal and red earths [+ silicates] in a dark blue shadow of the nursemaid's tunic (with an abundant layer of smalt applied on top of a mixture of the other pigments); and smalt, lead white, and a lead-based yellow in the water on the horizon. C. McGlinchey, *Technical Examination Results*, 1993, July 20. Unpublished report, VMFA Painting Conservation Department file.

[15] The same pigments and the same layering structure are present in the sky of *The Finding of Moses* (1638, Musée du Louvre, Paris) and *Christ and the Woman Taken in Adultery* (1653, Musée du Louvre, Paris). Elisabeth Martin, Head of Painting Studies (LRMF, Paris), Notes on file. This same information was published in Delbourgo 1960, pp. 49 and 51 (dates

given for *The Finding of Moses*, 1645-47, inv. 7271).

[16] The blue robe of *Achilles* contains ultramarine glazes over black, black underpainting left visible, and what appears to be a mixture of black with ultramarine (and a tiny amount of lead white) in the darker shadows; ultramarine mixed with lead white in the highlights; pure ultramarine glazes over ultramarine mixed with lead white in the midtones; as well as some yellow orange highlights. A. Roy reported ultramarine glazes over black in the dark shadows of blue drapery in *The Adoration of the Golden Calf* (1633-34), *The Adoration of the Shepherds* (1633-34, National Gallery, London), and *The Finding of Moses* (1651) and a mixture of ultramarine and lead white in blue drapery in *The Finding of Moses* (1651) and *The Annunciation* (1657, National Gallery, London). A. Roy, *Paintings by Poussin* unpublished report, (May 5, 1994). Ultramarine glazes and blue and white pigment mixtures are present in Mary's blue robe in *The Holy Family with the Infant St. John the Baptist* (1655, John and Mable Ringling Museum, Sarasota). Sawyer, Technical notes on file, VMFA Painting Conservation Department.

[17] The opaque monochrome underlayers in the flesh tones of VMFA's *Achilles* are present in many other paintings by the artist, and readily visible in his last unfinished work, *Apollo in Love with Daphne* (1664). *The Holy Family with the Infant St. John the Baptist* (1655) contains gray undermodelling in the faces of Mary and Joseph. Sawyer, Technical notes on file, VMFA Painting Conservation Department. Helen Glanville describes gray undermodelling in Venus's hip and Mercury's neck, see Glanville 1986, pp. 25 and 27.

[18] Gray undermodelling in the flesh tones and similar pigments were found in the *The Holy Family* (1641-42, Detroit Institute of Arts, Detroit), *The Holy Family with Ten Figures* (1649, National Gallery of Ireland, Dublin) and *The Holy Family with Nine Figures* (1650-51, Fogg Art Museum, Cambridge). Technical examinations conducted in 1999 by Sawyer and Steele for the exhibition *A Painting in Focus: Nicolas Poussin's "Holy Family on the Steps,"* Cleveland Museum of Art. Notes on file, VMFA Painting Conservation Department.

[19] These characteristics include a radio-transparent ground; radio-transparent areas in the trees left in reserve; mask-like faces with dark eye sockets (due to the contrast between the radio-transparency in the eye cavity and radio-opacity in the eyebrows, eyelids, cheekbones, and brow); and dark (black) radio-transparent outlines in the heads, arms, shoulders, legs, and hands of the figures. The x-radiographic image reveals the way Poussin applied paint to create volume and form. The impression of volume in facial features and flesh tones was achieved by using radio transparent pigments along the outlines of the figures, or by relying on radio-transparent underlayers (allowing the dark ground to show through), while applying lead white in limited amounts and of varying thickness in the midtones and highlights. These characteristics are also present in other x-radiographs including *The Inspiration of the Poet* (1629-30, Musée du Louvre, Paris), *The Rape of the Sabines* (1637-38, Musée du Louvre, Paris), *The Arcadian Shepherds* (1638-40, Musée du Louvre, Paris), *The Death of Sapphira* (1652, Musée du Louvre, Paris), and *Apollo in Love with Daphne* (1664), see Hours 1960. H. Glanville describes "dark patches representing Venus's eyes in the x-radiograph," see Glanville 1986, pp. 24-25. Similar x-radiographic characteristics are documented in Le Chanu 1994.

[20] The photographs of the raised crackle pattern in the paint film, shown in Figs. 2 and 3, were captured using Reflectance Transformation Imaging (RTI). RTI "is a computational photographic method that captures a subject's surface shape and color and enables the interactive re-lighting of the subject from any direction. RTI also permits the mathematical enhancement of the subject's surface shape and color attributes." "RTI images are created from information derived from multiple digital photographs of a subject shot from a stationary camera position. In each photograph, light is projected from a different known, or knowable, direction. This process produces a series of images of the same subject with varying highlights and shadows. Lighting information from the images is mathematically synthesized to generate a mathematical model of the surface, enabling a user to re-light the RTI image interactively and examine its surface on a [computer] screen." http://culturalheritageimaging.org/Technologies/RTI.

[21] While it is not possible to determine that the inscription was actually made by Poussin (no study of his handwriting has been undertaken), it is worth mentioning that another inscription, purportedly to be in Poussin's "own scrawl," and spelling the name of the patron "Sacchetti," was reported on the reverse of an original unlined canvas of a very early work, *The Battle of Gideon against the Midianites* (1625-26) in the Pinacoteca, Vatican Museums, Rome, see Levy 1981, p. 97. Bellori in *Le Vite* (1672) reported that Poussin marked his canvases: "He [Poussin] never discussed the price of his paintings either with this gentleman [Cardinal Massimi] or with any other of his friends, but when he delivered their paintings he marked the back of the canvas, and payment in full was immediately sent round to his home." Mérot 1990, p. 315. Although Bellori describes markings that are associated with the price, the artist's practice may have included inscribing the patron's name on the reverse of the canvas.

[22] The area in the x-radiograph contains radio-transparent patches. This indicates that the abrasion extended through the paint film to the canvas threads.

[23] The shape of the repair duplicated the form and outline of the feathers in the helmet of Achilles represented in Pietro del Po's seventeenth-century engraving of VMFA's *Achilles*.

[24] The cross sections taken from this area contained the following (bottom to top): a blue layer (smalt, lead white, and charcoal), a pink layer (madder lake and lead white), a dark green layer (bone or ivory black, lead-tin yellow and lead antimonate yellow), a brown ground layer, a dark paint layer (mostly iron earths + silicates), another whiter ground layer (nearly pure calcium carbonate), and another dark paint layer (mostly iron earths + silicates). See Figs. 9 and 10, McGlinchey, *Technical Examination Results*, 1993. The degree of abrasion in the paint layer, seen in the x-radiograph (Fig. 7), could explain the necessity for applying a ground material prior to overpainting and/or retouching.

[25] These alternative hypotheses were suggested by McGlinchey. He cautioned, however, that it was diffcult to make conclusions based on two cross sections from the area. With respect to the first hypothesis McGlinchey added "it is quite possible that in the Virginia picture there was a first attempt at more closely mimicking the plume from the Boston picture." He also stated that Poussin's use of iron earths in the upper layer, versus yellow and black in the lower layer, could be attributed to "a dissatisfaction with the earlier materials." McGlinchey summarized, "in either event, these paired grounds and overpaints are repeated attempts at hiding part of the plume with foliage." McGlinchey, *Technical Examination Results*, 1993.

The cleaning confirmed that the pink layer and dark green paint layer were original. If Poussin reworked the area then it is likely that the del Po engraving was executed before this modification (assuming, of course, that the engraver was faithful to the original design). Perhaps Poussin's motive for changing the area behind the helmet was a desire to reduce the visual weight of compositional elements on the left side of the painting by simplifying the design of the helmet (see engraving). The artist adjusted the color and shapes of other elements to improve the overall balance of the painting, and may have replaced three large colorful feathers with greenery for the same reason. Achilles's helmet, sword and shield are very important "props" in this story of discovery, and as such required thoughtful handling. Or, perhaps the motive for the change was based on an owner's request to "tone down" the helmet. Whatever the explanation, the painting is, arguably, a more refined and balanced composition without the additional plumage.

The other areas in the composition that were reworked by the artist have not been abraded; the artist simply painted over his earlier designs. If the feathers contained textural brushwork or impasto, it may have been necessary to scrape down the paint layer prior to overpainting.

Taking everything into consideration, including the information revealed by the cleaning, I believe the second hypothesis, referred to as the alternative hypothesis in the text, is the most likely. The dark green paint layer that is in intimate contact with the pink paint layer in the cross section could represent an area where brushstrokes overlap along the edges between foliage and feathers.

[26] Minor modifications were made in the position of the fingers on the left hand of the seated female in the center; the profile

of the mountain behind Ulysses and Diomedes; and the background behind the nursemaid, where additional flowers and leaves were painted out in the landscape.

[27] The light blue fabric appears translucent in some areas because the paint film has become more transparent over time.

[28] In contrast to the Cleveland picture, the same "white" highlight in *The Holy Family on the Steps* by a follower of Poussin (1648, NGA, Washington, D.C.) does not contain any green pigment particles. Apparently, the copyist replicated the "appearance," that which is visible to the naked eye, but not the method.

[29] A similar "cool" highlight was found in *The Holy Family with Nine Figures* (1650-51). Technical examination conducted in 1999 by Sawyer and Steele for the exhibition *A Painting in Focus: Nicolas Poussin's "Holy Family on the Steps*," Cleveland Museum of Art. Notes on file, VMFA Painting Conservation Department.

[30] This strong orange red color is frequently used in compositional areas in shadow and in figures with ruddy complexions.

[31] With single point linear perspective, parallel lines in three-dimensional space that are perpendicular to the picture plane converge at the vanishing point. These lines are called orthogonals.

[32] The presence of an indented vanishing point has been documented in 17th century Dutch painting. Vermeer's working method, as described by Jørgen Wadum, involved the use of a visible vanishing point created by the placement of a pin in the paint and ground layers attached to a string. He suggests that a string would have allowed the artist to check the accuracy of the orthogonals related to the perspective, see Wadum 1995, pp. 150-151. I independently came to the same conclusion regarding Poussin's use of a pin or pointed instrument attached to a string and discussed this idea with visiting scholars in 1994 during the reevaluation of VMFA's *Achilles*.

[33] The painting was examined before the Curatorial/Conservation Colloquy VI, Nicolas Poussin's *Holy Family on the Steps*, held at the National Gallery of Art in Washington, D.C., May 23-24, 1994. The colloquy was hosted by the Center for the Advanced Study in the Visual Arts.

[34] *The Holy Family on the Steps* by a follower of Poussin (1648) was also examined before the colloquy at the NGA. During the course of the comparison of the two paintings it was noted that there is a mark in the Washington copy located to the left of Mary's foot in her red robe, close to the location of the mark in the original painting. The association between this mark and the vanishing point of the composition was alluded to by Howard Hibbard in his treatise on *The Holy Family on the Steps* in which he states, "the vanishing point of the entire composition is just left of the Virgin's foot, uniquely prominent." Hibbard's treatise is based on the Washington copy, which he (along with many other scholars) believed was original, see Hibbard 1974, pp. 58-59.

[35] For a thorough discussion regarding the technical evaluation of *The Holy Family on the Steps* (1648, The Cleveland Museum of Art, Cleveland) and *The Holy Family on the Steps* by a follower of Poussin (1648), including technical data related to other Holy Family compositions by Poussin, see Sawyer 1999 and Steele 1999.

[36] The presentation of this paper at the Royal Academy of Arts symposium included color slides of the vanishing points in the paint layers of each of these paintings, as well as color slides of their locations in corresponding x-radiographs.
The Rape of the Sabines (1637-38) was also examined. However, there was no evidence of an indentation or mark in the area of the vanishing point due to the presence of what appears to be a fill material from a previous restoration. Avigdor Arikha, in his analysis of the *The Rape of the Sabines*, identified the area containing the vanishing point by demonstrating that incised lines in the imprimatura layer, corresponding to the orthogonals, converge at a point located in the helmet of the Roman rider just left of center, see Arikha 1983, pp. 25-32.
A mark located at the central vanishing point was discovered in *The Holy Family with Nine Figures* (1650-51) also known as *The Holy Family with the Bathtub*. This discovery and other technical findings related to the painting were shared with Rikke Foulke, former Painting Conservation Intern, Fogg Art Museum. Technical examination conducted in 1999 by Sawyer and Steele for the exhibition *A Painting in Focus: Nicolas Poussin's "Holy Family on the Steps*," Cleveland Museum of Art. Notes on file, VMFA Painting Conservation Department.

[37] "If we look at the pictures Poussin painted after 1630, however, it is clear that he has fully mastered Alberti's principles and has succeeded in applying them without losing anything..." Mérot 1990, p. 193.

[38] A perspectival projection is "the way of making a picture on a flat surface in such a manner that the various objects represented in it appear to have the same sizes, shapes, and positions, *relatively to each other*, that the actual objects as located in actual space would have if seen by the beholder from a single determined point of view." Ivins 1964, p. 32.

[39] Using the terminology "aspect" and "prospect" originating from a letter written by Poussin to Sublet de Noyers (1642, undated), Martin Kemp in his assessment of the perspectival framework for *The Holy Family on the Steps* states that Poussin "used his mastery of 'aspect' to convey the *impression* of 'prospect' " [italics added for emphasis]. As interpreted by Blunt, the meaning of the term "aspect" refers to Poussin's view of the wrong way of viewing things "which consists of the simple process of receiving the rays of light in the eye." Blunt interprets the meaning of the term "prospect" to refer to Poussin's view of the right way of viewing things, which involves a mathematical process that "takes into account the measurement of distance and angle of vision which affect the view of a spectator." The results from the examinations of the paintings discussed in this paper suggest that Poussin was a master of both "aspect" as well as "prospect." Kemp's assertion was based on his erroneous conclusion that the perspectival framework of *The Holy Family on the Steps* lacked precision. As discussed in Sawyer and Steele, *The Holy Family on the Steps* by a follower of Poussin (1648) is the composition that lacks precision, not the original *Holy Family on the Steps* (1648). Kemp 1990, p. 127; Blunt 1995, p. 225; Sawyer 1999, pp. 123 and 131.

[40] For a discussion of the use of incisions in other works by Poussin, see Sawyer 1999, pp. 123-124; Arikha 1983, pp. 31-32; Le Chanu 1994, pp. 45-47; and Rees Jones 1960, pp. 307-308.

[41] The technical findings and discoveries made during the examination of VMFA's *Achilles* were shared with numerous scholars visiting the Painting Conservation studio at VMFA in 1993 and 1994. The information related to the various pentimenti, the discovery of an incised vanishing point, and my thoughts regarding the significance and meaning of these findings were shared with R. Verdi and published in his catalogue raisonné. Verdi 1995, p. 302. A photograph of the tracing of the inscription (Fig. 4) was shown to P. Rosenberg during his studio visit in 1993. This photograph was published in Rosenberg 1994, p. 492, (Fig. 225c).

Characteristics of the Canvases Used by Nicolas Poussin

kermes

NICOLAS POUSSIN. TECHNIQUE, PRACTICE, CONSERVATION

In the current table you will find the characteristics of the canvases used by Poussin, complementing the information previously published in the table at the end of a contribution on the subject in the first issue of *Technè*.[1] That table summarized the results of radiographic inspection of 37 paintings in the Louvre. However, for six of these paintings the weave-type and thread-count were not provided, while for two paintings (*Time and Truth* and *The Holy Family with Saints John, Elisabeth and Joseph Praying*), although they had been transferred, it was possible to determine the thread-count of the original canvas through the imprint left by the threads of the original canvas which had been filled by the lead white of the new preparatory layers. Furthermore, in one instance (*The Israelites Gathering Manna in the Desert*) although the painting had not been transferred onto a new canvas, it was not possible to carry out a thread-count, and only the weave-type (twill) was provided.

This 1994 investigation on the canvases used by Poussin was preceded by another important contribution, that of Madeleine Hours in preparation for the Louvre Poussin exhibition in 1960, of which Anthony Blunt was the curator. On this occasion the exhibition included a number of didactic panels with the results of technical investigations which included thread-counts, and these were summarised in the exhibition catalogue. The same radiographic study was published in issue no. 5 of the *Bulletin du Laboratoire du Musée du Louvre*.[2] From this latter publication we have drawn the information for *Midas Washing Himself in the Source of the River Pactolus* (Musée Fesch, Ajaccio) and for *The Inspiration of the Poet*. This latter painting was inserted into the 1994 publication among the number of those paintings which had been transferred, for which it was impossible to gain information on the original canvas – verification of the radiographic image suggests that this is not a transfer.

It is very interesting to compare information provided in 1964 and 1994 – there are some important differences in the thread-count, as well as in the recognition of weave-types. Human error needs to be factored in before any definitive statements are made on the basis of visual results (and this is as true of our table as of any past results) but we now have the potential to check these with automated systems provided by software, which will also allow us to go further in terms of linking the supports of different paintings – interesting in terms of studio practice and chronology of works, in addition of course to authentication, although it should be said too little is known about Poussin's studio practice to be able to be definitive on this score.

The contents of the table published here derives from several different sources: a small proportion from publications, while the greater part derives from unpublished reports or from the direct study of x-radiographs kept in the archives of museums and other institutions. In this latter case the 'reading' of the x-radiographic material was generously performed by colleagues, some of whom are also contributors/authors in this issue, and we thank them all.

A considerable number of the x-radiographs or technical reports consulted, are archived in the National Gallery Archives (Conservation Dossiers) and in the Collection of the Technology Department of the Courtauld Institute of Art in London, into which converged the material from the x-radiographic campaigns commissioned in the 1960s by Anthony Blunt.

When the thread-count contains decimal numbers, these derive from taking the average number, performed at least twice, on a 5 cm width and far from the painting's edges, as requested for new counts, in order to minimize excessive fluctuations. For only six painting (the three paintings in the Cleveland Museum of Art and the three Richelieu *Bacchanals*) counts were obtained automatically through computer application performed on the digital acquisition of the x-ray images. In these instances the mean values are calculated not over 5 cm but over the entire length of the canvas. For the *Bacchanals*, minimum and maximum are referred to, while for the Cleveland paintings averages and standard deviations are supplied.

Complex weave-types are indicated in the table as 'damask'. More precisely, 'diamond weave' characterises *The Realm of Flora* in the Dresden Staatliche Gemäldegalerie, *The Crucifixion* in the Wadsworth Atheneum, Hartford and *The Holy Family* in the State Hermitage Museum, St. Petersburg, while the type of canvas used for *Moses Exposed on the Waters* in the Ashmolean Museum, Oxford can be characterised as 'basket weave.'

Putting together the information from this table and that published in *Technè* in 1994, almost half of Poussin's painted *oeuvre* is covered, and this material needs to be studied attentively (and added to or corrected) in the future, in particular taking into consideration the Roman context of most of Poussin's activity. At first sight, one of the most striking features concerns the undifferentiated employment of tabby or twill canvases for pen-

dants (for instance the two landscapes with *The Body of Phocion Carried out of Athens*, and *The Ashes of Phocion*), or for paintings pertaining to the same series (the Dal Pozzo *Sacraments*). In direct contrast, we have the recent confirmation that the canvas of the National Gallery *Triumph of Silenus*,[3] which many art historians do not consider to be of the qualitative standard of an original work by Poussin, was cut from the same bolt of cloth as the two other *Bacchanals* now generally accepted as originals. Of some interest is also the fact that the only example of Poussin's use to date of a 'basket weave' canvas should be for the subject of *Moses Exposed on the Waters* (exposed in a woven reed basket). All this and more will provide fruitful data we hope for future studies and investigations.

Again, we should like to thank all those who made the realisation of this table possible.

Notes

[1] Ravaud 1994, pp. 33-34.
[2] Ravaud 1960.
[3] Erdmann 2013.

Poussin – table of weave types and thread counts

TITLE/SUBJECT	COLLECTION/MUSEUM	INV. #	EXECUTION DATE	DIMENSIONS HEIGHT-WIDTH [CM]	WEAVE TYPE	THREADS/CM^2	*
The Death of the Virgin	Church of St. Pancras, Sterrebeek	-	ante 1624	202 x 137	tabby	13 x 15	a
The Abandonment of Moses	Staatliche Gemäldegalerie, Dresden	Gal.-Nr. 720	ca. 1624	145.5 x 197	tabby	6 x 7	l
Resting Venus and Cupid	Staatliche Gemäldegalerie, Dresden	Gal.-Nr. 721	ca. 1624	73.3 x 98.8	tabby	structure not visible	l
Midas and Bacchus	Alte Pinakothek, München	BStGS 528	ca. 1625	98.5 x 153	tabby	8.1 x 8.7	b
Bacchanal (*Bacchus and Ariadne*)	Museo del Prado, Madrid	P-2312	1625-26	122 x 169	tabby	7 x 6	c
Nymphs and a Satyr (Amor Vincit Omnia)	Cleveland Museum of Art, Cleveland	W37/1926.26	1625-27	97 x 127.5	tabby	8.5±0.5 (warp) x 7.7±0.7 (weft)	d
Virgin and Child in a Garland of Flowers	Brighton Museums, Brighton	PM090001	1625-27	57.5 x 48.5	tabby	18.8 x 14.6	e
Bacchanal of Putti	Galleria Nazionale di Arte Antica in Palazzo Barberini, Rome	2592	ca. 1626	74.5 x 85.5	tabby	18 x 20	f
Bacchanal of Putti	Galleria Nazionale di Arte Antica in Palazzo Barberini, Rome	2593	ca. 1626	56 x 76.5	tabby	18 x 20	f
Venus and Mercury	Dulwich Picture Gallery, London	DPG481	1626-27	80 x 87.6	tabby	9 x 9.5	e
Midas Washing Himself in the Source of the River Pactolus	Musée Fesch, Ajaccio	MFA 852.1.361	1626-28	58 x 82	tabby	9 x 12	g
The Return of the Holy Family to Nazareth	Cleveland Museum of Art, Cleveland	W77/1953.156	1627	134 x 99	tabby	4.8±0.4 (weft) x 6.3±0.3 (warp)	h
Nymph and Satyrs	National Gallery, London	NG91	ca. 1627	66.4 x 50.3	tabby	9 x 9	i
Moses Sweetening the Bitter Waters of Marah	The Baltimore Museum of Art, Baltimore	1958.7	1627-28	152.4 x 209.6	tabby	12 x 12	j
The Shepherds of Arcadia (Et in Arcadia Ego)	Devonshire Collection, Chatsworth	-	1627-28	101 x 82	tabby	11 x 9	e
The Nurture of Bacchus	National Gallery, London	NG39	ca. 1628	80.9 x 97.7	tabby	10.5 x 9.6	i

continue

TITLE/SUBJECT	COLLECTION/MUSEUM	INV. #	EXECUTION DATE	DIMENSIONS HEIGHT-WIDTH [CM]	WEAVE TYPE	THREADS/CM^2	*
Lamentation over the Dead Christ	Alte Pinakothek, München	BStGS 625	ca. 1628	102.7 x 146.1	tabby	9.3 x 8.9	b
Apollo and Daphne	Alte Pinakothek, München	BStGS 2334	ca. 1628	97.4 x 131.1	tabby	6.6 x 6.8	b
Rinaldo and Armida	Dulwich Picture Gallery, London	DPG238	1628-30	82.2 x 109.2	tabby	7.5 x 11.6	e
The Return of the Holy Family from Egypt	Dulwich Picture Gallery, London	DPG240	1628-30	117.8 x 99.4	tabby	8.5 x 7.1	e
The Inspiration of the Poet	Paris, Louvre	R.F. 1774	1629-30	183 x 213	tabby	7 x 9	k
The Triumph of David (David the Victor)	Museo del Prado, Madrid	P-2311	1630	100 x130	tabby	7-8 x 6-7	c
The Realm of Flora	Staatliche Gemäldegalerie, Dresden	Gal.-Nr. 719	1630-31	132 x 181.4	damask	19-20 x 16-17	l
Saint John Baptizing in the River Jordan	J. Paul Getty Museum, Los Angeles	71.PA.58	1630s	95.6 x 121.3	tabby	8.3 x 10.6	m
The Assumption of the Virgin	National Gallery of Art, Washington	1963.5.1	1630-32	134.4 x 98.1	tabby	7-8 x 7-8	n
The Triumph of David	Dulwich Picture Gallery, London	DPG 236	1631-33	118.3 x 148.5	twill	11 x 22	o
The Adoration of the Magi	Staatliche Gemäldegalerie, Dresden	Gal.-Nr. 717	1633	160 x 182	tabby	19 (weft); warp not visible	l
The Crossing of the Red Sea	National Gallery of Victoria, Melbourne	1843-4	1632-33	155.6 x 215.3	twill	20 x 12	p
A Bacchanalian Revel before a Herm of Pan	National Gallery, London	NG62	1632-33	98 x 142.8	tabby	14 x 12	i
The Adoration of the Shepherds	National Gallery, London	NG6277	1633-34	97.2 x 74	tabby	18.1 x 18.4	i
The Adoration of the Golden Calf	National Gallery, London	NG5597	1633-34	153.4 x 211.8	tabby	10 x 7	e
Dance to the Music of Time	Wallace Collection, London	P108	1634-36	82.4 x 104	tabby	18.5 x 26.5	e
Dance in Honour of Priapus	Museu de Arte, São Paulo	46 P	1634-38	166.5 x 373	tabby	8 x 10	q
Saint Cecilia	Museo del Prado, Madrid	P-2317	1635	117.7 x 89	tabby	8-10 x 9-10	c
The Triumph of Bacchus	Nelson-Atkins Museum of Art, Kansas City	31.94	1635-36	128.3 x 151.8	tabby	8.7-10.0 (weft) x 6.3-7.1 (warp)	r
Landscape with a Sleeping Nymph (Attributed to Poussin)	Museo del Prado, Madrid	P-2319	1635-40	50 x 68	twill	10-11 x 16-17	c
The Triumph of Pan	National Gallery, London	NG6477	1636	135.9 x 146	tabby	6.4-7.3 (warp) x 8.6-9.9 (weft)	r
The Nurture of Jupiter	Dulwich Picture Gallery, London	DPG234	1636-37	96.5 x 121	tabby	17 x 23	e
Pan and Syrinx	Staatliche Gemäldegalerie, Dresden	Gal.-Nr. 718	1637	107.5 x 82.5	tabby	18 x 18	l

continue

TITLE/SUBJECT	COLLECTION/MUSEUM	INV. #	EXECUTION DATE	DIMENSIONS HEIGHT-WIDTH [CM]	WEAVE TYPE	THREADS/CM^2	*
Landscape with a Man Scooping Water from a Stream	National Gallery, London	NG6390	ca. 1637	63 x 77.7	tabby	13.7 x 13.5	i
The Triumph of Silenus	National Gallery, London	NG42	ca. 1637	142.9 x 120.5	tabby	6.0-7.3 (warp) x 7.9-10.1 (weft)	r
The Destruction of the Temple in Jerusalem	Kunsthistorisches Museum, Wien	GG 1556	1638	148 x 199	tabby	10 x 7	s
Landscape with Travellers Resting	National Gallery, London	NG6391	1638-39	63 x 77.8	tabby	14.6 x 14.3	i
Extreme Unction	Fitzwilliam Museum, Cambridge	PD.11-2012	1638-40	95.5 x 121.5	twill	10.4 x 17.6	i
Eucharist	Duke of Rutland (on loan to Fitzwilliam Museum, Cambridge)	-	1638-40	95.5 x 121	twill	20 x 11	i
Ordination	Duke of Rutland (on loan to Fitzwilliam Museum, Cambridge)	-	1638-40	95.5 x 121	tabby	18.2 x 22.4	i
Marriage	Duke of Rutland (on loan to Fitzwilliam Museum, Cambridge)	-	1638-40	95.5 x 121	tabby	10.2 x 9.8	i
Confirmation	Duke of Rutland (on loan to Fitzwilliam Museum, Cambridge)	-	1638-40	95.5 x 121	twill	12.6 x 10.2	e
The Crucifixion	Wadsworth Atheneum, Hartford (Connecticut)	1935.422	1645-46	148.5 x 218.5	damask		t
Landscape with Ruins (*Landscape with an Ancient Tomb and two Figures*)	Museo del Prado, Madrid	P-2308	1642-47	72 x 98	tabby	10-11 x 13	c
The Holy Family on the Steps	Cleveland Museum of Art, Cleveland (Ohio)	W140/1981.18	1648	72.3 x 105.8	tabby	17.7±1.0 (warp) x 17.7±1.3 (weft)	u
The Body of Phocion Carried out of Athens	Earl of Plymouth (on loan to the National Museum Wales, Cardiff)	(L) 480	1648	117.5 x 178	tabby	15.6 x 11.1	v
Landscape with the Ashes of Phocion	Earl of Derby (on loan to the Liverpool Galleries)	WAG 10350	1648	116 x 176	twill	10 x 20	e
Landscape with Travellers Resting (*Roman Road*)	Dulwich Picture Gallery, London	DPG203	1648	79 x 99.7	tabby	8.7 x 10	e
Landscape with Man Killed by Snake	National Gallery, London	NG5763	ca. 1648	118.2 x 197.8	twill	11 x 16	i
Landscape with a Man Washing his Feet at a Fountain	National Gallery, London	NG40	ca. 1648	74 x 100.3	tabby	22 x 16.5	i
Landscape with Buildings (*Landscape with Three Men*)	Museo del Prado, Madrid	P-2310	1648-50	120 x 187	twill	13 x 12-13	c
The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth	Fogg Museum at Harvard University, Cambridge MA	1942.168	1650	99.9 x 132.5	twill	12 (warp) x 18 (weft)	w

continue

TITLE/SUBJECT	COLLECTION/MUSEUM	INV. #	EXECUTION DATE	DIMENSIONS HEIGHT-WIDTH [CM]	WEAVE TYPE	THREADS/CM^2	*
L'Orage	Musée des Beaux-Arts, Rouen	975.1	1650-51	99 x 132	twill	10.4 x 20	x
Le Calme	J. Paul Getty Museum, Los Angeles	97.PA.60	1650-51	97 x 131	twill	9.6 x 14.7	m
Pyramus and Thisbe	Städel Museum, Frankfurt	1849	1651	191 x 274	tabby	7 x 7	y
The Finding of Moses	National Gallery, London	NG6519	1651	115.7 x 175.3	twill	12.7 x 14.5	i
The Holy Family with the Infant St. John the Baptist and St. Elizabeth	Jointly owned by the Norton Simon Art Foundation, Pasadena, and the J. Paul Getty Museum, Los Angeles	81.PA.43	ca. 1651	100.6 x 132.4	twill	9.9 x 18.6	m
Cephalus and Aurora	National Gallery, London	NG65	ca. 1651	96.9 x 131.3	twill	13.3 x 19.4	i
Moses Exposed on the Waters	Ashmolean Museum, Oxford	A791	1654	149.5 x 204.5	damask	16.4 x 16.5	e
The Holy Family	The State Hermitage Museum, St. Petersburg	GE 121	1655	172 x 133.5	damask		z
Achilles among the Daughters of Lycomedes	Virginia Museum of Fine Arts, Richmond	Arthur and Margaret Glasgow Fund, 57.2	1656	100.3 x 133.3	tabby	17 (warp) x 17 (weft)	aa
Adoration of the Shepherds	Staatsgalerie im neuen Schloss Schleißheim, München	BStGS 617	1656-57	97.2 x 131.2	tabby	20.8 x 21.1	b
The Infant Bacchus Entrusted to the Nymphs of Nysa; The Death of Echo and Narcissus	Fogg Museum at Harvard University, Cambridge MA	1942.167	1657	121.2 x 179.3	twill	10-11 x 20-21	w
The Flight into Egypt	Musée des Beaux-Arts, Lyon	R.F. 2008-1	1657-58	146 x 216	tabby	17 x 17	bb
The Annunciation	National Gallery, London	NG5472	1657	104.3 x 103.1	tabby	12 x 12.2	i
Eliezer and Rebecca at the Well	Fitzwilliam Museum, Cambridge	PD.38-1984	1660-65	96.5 x 138	tabby	11 x 9	cc

*

a - Postec 2003.
b - Katharina Geffken, intern, Conservation Department of the Doerner Institut/Bayerische Staatsgemäldesammlungen, München.
c - Ana González Mozo, Museo del Prado, Madrid.
d - Thread count report. Nymphs and a Satyr (Amor Vincit Omnia), Nicolas Poussin, 1625-1627 (W37/1926.26), Cleveland Museum of Art. Kindly provided by Marcia Steele, Cleveland Museum of Art.
e - Courtesy of the x-radiograph Collection of the Technology Department, Courtauld Institute of Art. Many thanks to Aviva Burnstock. Thread count by Helen Glanville.
f - Chiara Merucci, Soprintendenza SPSAE e Polo Museale della Città di Roma, Rome.
g - Madeleine Hours, in Blunt 1960, p. 338.
h - Thread count report. The Return of the Holy Family to Nazareth, Nicolas Poussin, 1627, (W77/1953.156), Cleveland Museum of Art. Kindly provided by Marcia Steele, Cleveland Museum of Art.
i - National Gallery Conservation Dossiers (many thanks to Ceri Brough for her help). Thread count by Helen Glanville.
j - Rosenthal 1984, n. 12, p. 27.
k - Blunt 1960, p. 342; Hours 1960, p. 17.
l - Ute Christina Koch, Wissenschaftliche Mitarbeiterin, Gemäldegalerie Alte Meister, Dresden.
m - Laura Rivers, Conservation Department, J. Paul Getty Museum, Los Angeles.
n - Ann Hoenigswald, National Gallery of Art, Washington.
o - Aviva Burnstock, Courtauld Institute of Art, London.
p - Carl Villis, National Gallery of Victoria, Melbourne.
q - Ravaud 2009.
r - Erdmann 2013.
s - Beatrice De Ruggieri, Emmebi Diagnosticia Artistica, Rome.
t - Jean Cadogan, Trinity College, Connecticut.
u - Thread count report. The Holy Family on the Steps, Nicolas Poussin, 1648, (W140/1981.18), Cleveland Museum of Art. Kindly provided by Marcia Steele, Cleveland Museum of Art.
v - Rose Miller, National Museum of Wales, Cardiff.
w - Kate Smith, Harvard Art Museums.
x - Laura Rivers, Conservation Department, J. Paul Getty Museum, Los Angeles, with the kind permission of Virginie Thenoz and Catherine Regnault, Musée des Beaux-Arts, Rouen.
y - Measured from digital acquisitions of x-radiographs rescaled to real size.
z - Helen Glanville, visual inspection of the picture surface.
aa - Carol Woods Sawyer, Virginia Museum of Fine Arts.
bb - Ravaud 2010.
cc - Helen Glanville.

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Abstracts

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Poussin's Practice: A New Plea for Poussin as a Painter

Sheila McTighe

Discoveries made by technical examinations of Poussin's work demand that we integrate this information into a larger view of the artist's practice as a painter, one that takes into account both the *peintre* and the *philosophe*.

Le scoperte derivate dalle indagini tecniche sull'opera di Poussin devono essere integrate in una visione più ampia della prassi dell'artista come pittore, che tenga conto sia del pittore *che del* filosofo.

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Nicolas Poussin: Creation and Perception

Helen Glanville

This essay looks at the process of creation in Poussin in the context of the contemporary figures that influenced him in his thinking as much as in his artistic practice (Giambattista Marino, Zaccolini), and the way in which the philosophy and cultural context of the circle of Cassiano Dal Pozzo in which he moved found material expression in his paintings. André Félibien and Charles Le Brun who knew him well, are seen to reflect this understanding of the philosophies on which Poussin's œuvre is built, which are not those of the subsequent generation which saw him rather as an intellectual painter with little interest in the material aspects of his art, and not a learned poet who used paint and colour as his means of expression.

Questo saggio esamina il processo creativo di Poussin nel contesto delle figure contemporanee che lo influenzarono tanto nel pensiero quanto nella pratica artistica (Giambattista Marino, Zaccolini), e il modo in cui la filosofia e il contesto culturale della cerchia di Cassiano Dal Pozzo in cui si mosse ha trovato espressione materiale nei suoi dipinti. André Félibien e Charles Le Brun, che lo conobbero bene, riflettono questa stessa comprensione delle filosofie su cui è costruita l'opera di Poussin, diverse da quelle della generazione successiva, che lo ha visto piuttosto come un pittore intellettuale con poco interesse per gli aspetti materiali della sua arte, e non come un poeta dotto che ha usato la pittura e il colore come mezzo di espressione.

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Supporti e preparazioni: aspetti delle scelte esecutive di Poussin a confronto con le tecniche pittoriche dell'ambiente romano (1620-70)

Paolo Bensi

Taken into consideration are certain technical aspects of Poussin's technique, and in particular the supports he chooses, both wood and canvas, as well as the preparatory layers present in his paintings. The results of scientific analyses are compared with the technical characteristics of paintings executed in Rome by both foreign and Italian artists in the period under consideration, that is roughly from 1620-70. When it has proved possible, comparisons have also been made with letters written by Poussin or technical sources of the period, such as Richard Symonds' notes, or Bellori's *Lives*, and texts written by artists and critics in other artistic centres (Lana, Baldinucci, Volpato). Certain elements which are considered of particular interest in Poussin's production, such as the use of cypress wood and particular types of fabrics and of silk, are highlighted, as well as the potential role of suppliers of artist materials.

Vengono presi in considerazione alcuni aspetti della tecnica esecutiva di Poussin, in particolare i supporti utilizzati dall'artista, tavole e tele, e gli strati di preparazione presenti nei suoi dipinti. I risultati delle analisi scientifiche eseguite sulle opere dell'artista francese vengono messi a confronto con le caratteristiche tecniche dei dipinti eseguiti a Roma da artisti italiani e stranieri nel periodo preso in considerazione 1620-70 circa. Quando possibile sono stati effettuati dei confronti con le indicazioni che emergono dall'epistolario del pittore e da testi tecnici coevi di ambiente romano, come le annotazioni del manoscritto di Richard Symonds o le Vite *di Bellori, oppure elaborati da artisti e critici di altri centri artistici (Lana, Baldinucci, Volpato). Vengono posti in evidenza alcuni aspetti giudicati interessanti della produzione di Poussin, come l'impiego di legno di cipresso, il ricorso a tele particolari e a tessuti di seta, il ruolo che può essere stato svolto dai fornitori di materiali pittorici.*

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Qualche osservazione sui *Baccanali di putti* della Galleria Nazionale d'Arte Antica in Palazzo Barberini

Chiara Merucci, Claudio Seccaroni

The two *Bacchanals with Putti* in the Galleria Nazionale di Arte Antica in Palazzo Barberini were investigated by IR reflectography, thus providing additional elements to the scarce technical information gathered during the restoration conducted in the 1980s. It was possible to characterize the canvas, erroneously described in previous publications, the underdrawing and other aspects of Poussin's painting practice used in these two works so early in his career and atypical if compared to the most famous *Bacchanals* and *Landscapes* realized during his first period in Rome.

I due Baccanali di putti *della Galleria Nazionale di Arte Antica in Palazzo Barberini sono stati indagati mediante riflettografia IR, integrando così le scarse informazioni tecniche raccolte durante il restauro condotto negli anni '80. È stato così possibile caratterizzare la tela, erroneamente descritta in precedenti pubblicazioni, l'underdrawing e altri aspetti della prassi pittorica del pittore in queste due opere così precoci nella sua carriera e atipiche rispetto ai più noti* Baccanali e Paesaggi *realizzati durante il suo primo soggiorno romano.*

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Transmitted Light Infrared Imaging of Two Paintings by Poussin at the Cleveland Museum of Art

Marcia Steele

Transmitted light infrared imaging was used to compare two paintings by Poussin at the Cleveland Museum of Art. The difference in the appearance of the flesh tones is striking; in one painting they appear dark and in the other much lighter. This imaging technique, in conjunction with x-rays and microscopic examination, reveals the more sophisticated paint handling in *The Holy Family on the Steps* (1648) as opposed to the earlier painting *Nymphs and a Satyr* (1625-27).

La tecnica di ripresa nell'infrarosso in luce trasmessa è stata impiegata per confrontare due dipinti di Poussin nel the Cleveland Museum of Art. La differenza di aspetto degli incarnati è impressionante; in un dipinto essi appaiono scuri e nell'altro molto più chiari. Questa tecnica diagnostica per immagini, abbinata alla radiografia e all'esame al microscopio, rivela una condotta pittorica più sofisticata nella Sacra Famiglia sui gradini *(1648) rispetto all'assai anteriore* Ninfe e satiro *(1625-27).*

The Cleveland Museum of Art-Painting Conservation. Transmitted IR Photography Setup

David Piurek

The article provides an accurate description of the procedure and materials required for the execution of transmitted IR photography.

L'articolo fornisce un'accurata descrizione della procedura e dei materiali necessari all'esecuzione di riprese fotografiche nell'infrarosso in luce trasmessa.

Technical Examination and Conservation of *The Triumph of David* by Nicolas Poussin

Sophia Plender, Aviva Burnstock

In 2004 *The Triumph of David* by Nicolas Poussin in the Dulwich Picture Gallery, London, underwent an in depth technical examination in addition to its conservation treatment. X-radiography and IR reflectography provided information as to the development with frequent reworking of the composition, while the study of cross sections using a combination of light microscopy supplemented by elemental analysis using SEM-EDX provided the full characterisation of the palette and stratigraphy.

Nel 2004 il Trionfo di David *di Nicolas Poussin nella Dulwich Picture Gallery di Londra è stato sottoposto a un'approfondita serie di indagini tecniche in occasione del suo restauro. La radiografia e la riflettografia IR hanno fornito informazioni sull'elaborazione della composizione, con frequenti cambiamenti, mentre lo studio delle sezioni stratigrafiche mediante l'impiego combinato della microscopia ottica e dell'analisi elementale SEM-EDX ha fornito una completa caratterizzazione della tavolozza e della stratigrafia.*

The Crossing of the Red Sea in the National Gallery of Victoria, Melbourne

Laurie Benson, Carl Villis

The National Gallery of Victoria's *The Crossing of the Red Sea* by Nicolas Poussin underwent major technical examination and conservation treatment in 2011-12. The painting had suffered considerable abrasion and paint loss in preceding centuries, with considerable damage to the sky and landscape. The recent rediscovery of a high quality 17th century replica enabled the partial reconstruction of critical details which had been lost to the painting, and helped answer certain questions regarding changes in the appearance of the original.

Il Passaggio del Mar Rosso *di Nicolas Poussin è stato sottoposto nel 2011-12 a un'importante intervento conservativo ed indagini scientifiche. Nei secoli precedenti il dipinto aveva infatti subito rilevanti abrasioni e cadute della pellicola pittorica, di considerevole entità soprattutto in corrispondenza del cielo e del paesaggio. La recente scoperta di una replica seicentesca di elevata qualità ha consentito la parziale ricostruzione di dettagli critici che erano stati irrimediabilmente perduti e aiutato a risolvere alcuni dubbi relativi ai mutamenti di aspetto intervenuti nell'originale.*

Poussin's Materials and Techniques for *The Triumph of Bacchus* at the Nelson-Atkins Museum of Art

John Twilley, Nicole Myers, Mary Schafer

The Triumph of Bacchus at the Nelson-Atkins Museum of Art is one of the three *Bacchanals* painted by Nicolas Poussin for Cardinal Richelieu. Though the autograph status of this painting was strongly debated in the 20th century, its quality and authenticity were almost unanimously recognized in the 1980s. Nevertheless, attribution doubts still lingered in the scholarship. The automated canvas weave comparisons of the support of this painting with those of *The Triumph of Pan* and *The Triumph of Silenus*, both in the National Gallery, London, by the Thread Count Automation Project showed that these three canvases derive from the same bolt. Furthermore, new research on the Nelson-Atkins' *Bacchus* has revealed important aspects of its condition, compositional changes by the artist, and details of his palette and working methods, setting the stage for a long-sought comparison of the three paintings.

Il Trionfo di Bacco *del Nelson-Atkins Museum of Art è uno dei tre* Baccanali *dipinti da Nicolas Poussin per il cardinale Richelieu. Sebbene l'autografia di questo dipinti sia stata fortemente dibattuta nel corso del XX secolo, le effettive qualità e l'autenticità sono state quasi unanimemente riconosciute negli anni '80. Ciononostante, persistono presso la critica ancora alcuni dubbi in merito all'attribuzione. Il confronto automatizzato della tessitura del supporto di questo dipinto con quelli del* Trionfo di Pan *e del* Trionfo di Sileno*, entrambi nella National Gallery di Londra, effettuato dal Thread Count Automation Project, ha dimostrato che sono stati ricavati tutti e tre dal medesimo telo. Infine, nuove ricerche sul* Bacco *del Nelson-Atkins Museum hanno rivelato importanti aspetti in merito alle condizioni del dipinto, ai mutamenti effettuati dall'artista e particolari concernenti la tavolozza e il metodo lavorativo, gettando le basi per il lungamente atteso confronto dei tre dipinti.*

The Crucifixion by Nicolas Poussin in the Wadsworth Atheneum Museum of Art, Hartford, Connecticut

Jean Cadogan, Stephen Kornhauser, Patricia Sherwin Garland

The Crucifixion by French artist Nicolas Poussin depicts the central episode in the life of Christ about which key beliefs of Christianity have been formed. Although the artist depicted the moment of Christ's death, when biblical accounts say "there was darkness over the whole land," the painting looks quite different from the way it did in June 1646, when it was completed. The painting surprised and troubled visitors who saw it, but not for the reasons that Poussin had intended. Most were disturbed by its dark, almost monochromatic appearance; many struggled to read the rich narrative details that had become almost invisible. Atheneum curators and conservators decided, in 1992, to undertake a technical study and conservation. The goal was to understand its present state and if possible return the *Crucifixion*, as much as possible, to its original appearance.

La Crocifissione *dell'artista francese Nicolas Poussin rappresenta l'episodio centrale della vita di Cristo, su cui si sono formate le credenze fondamentali del cristianesimo. Sebbene l'artista abbia raffigurato il momento della morte di Cristo, quando i racconti biblici dicono "si fece buio su tutta la terra", il*

dipinto appare molto diverso da come doveva essere nel giugno 1646, quando è stato completato. Ha sorpreso e posto in difficoltà visitatori, ma non per ragioni legate all'intenzione di Poussin. La maggior parte è disturbata dalla sua apparenza scura, quasi monocroma; molti faticano infatti a leggerne i ricchi dettagli narrativi, divenuti quasi invisibili. I curatori e i conservatori del Wadsworth Atheneum hanno deciso nel 1992 di intraprendere uno studio tecnico e il restauro. Lo scopo era quello di comprendere il presente stato e di restituire alla Crocifissione*, per quanto possibile, il suo aspetto originario.*

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The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth

Rikke Foulke

The paper discusses the technical examination of Nicolas Poussin's *The Holy Family with the Infant Saint John the Baptist and Saint Elizabeth* in the collection of Harvard University Fogg Museum. Examinations of the painting support, ground, underdrawing, paint layer and pigment identification were conducted. Scientific analyses of materials and techniques included Fourier Transform-IR Microscopy (FT-IR), IR reflectography, IR transmittography, elemental analysis SEM/EDS, polarized light microscopy, and x-radiography. Research on the painting was carried out for the exhibition *A Painting in Focus: Nicolas Poussin's "Holy Family on the Steps"* in late 1999-2000. Introductions to Poussin's other Holy Family compositions and to the artist's use of figurines in his studio give context to the planning of the Fogg composition.

L'articolo discute i risultati derivati dall'esame tecnico della Sacra Famiglia con san Giovanni Battista e santa Elisabetta *di Nicolas Poussin nelle collezioni dell'Harvard University Fogg Museum. Sono stati analizzati il supporto, gli strati preparatori, l'underdrawing, gli strati cromatici ed è stata eseguita l'identificazione dei pigmenti. Le analisi scientifiche dei materiali e della tecnica esecutiva hanno compreso la microspettrometria infrarossa con trasformata di Fourier, la riflettografia IR, le riprese IR in trasmissione, l'analisi elementale mediante microscopio elettronico a scansione con microanalisi EDS, la microscopia ottica con luce polarizzata e la radiografia. Le ricerche sono state condotte preliminarmente alla mostra* A Painting in Focus: Nicolas Poussin's "Holy Family on the Steps"*, tenutasi presso il Cleveland Museum of Art, Cleveland dal 14 novembre 1999 al 23 gennaio 2000. Lo studio comparato di altre composizioni di Poussin rappresentanti la* Sacra Famiglia *e le riflessioni sull'impiego, da parte dell'artista, di figurine nel suo studio forniscono adeguato contesto per inquadrare la messa a punto della composizione Fogg.*

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Some Preliminary Remarks on Nicolas Poussin's Painting Technique in *L'Orage*: Complementary X-Ray Fluorescence and X-ray Diffraction Study

Laurence de Viguerie, Philippe Walter, Helen Glanville

This exploratory investigation of Poussin's palette and handling of paint in *L'Orage* (the *Storm*) in the Musée des Beaux-Arts in Rouen using complementary x-ray fluorescence and x-ray diffraction, was carried out so as to be able in the future to compare the technical aspects of this painting with those of its pendant – *Un temps calme* in the J. Paul Getty Museum, Los Angeles – as well as with what might be called its 'sister' paintings, *Pyramus and Thisbe* in the Städel Museum, Frankfurt and *Man killed by a snake* in the National Gallery in London. Two samples were taken from the edge of the painting in order to provide information as to the composition of the ground layers and build up of the paint layers, and to aid in the interpretation of the XRF and XRD measurements. We focused our attention on the handling of the materials used to create the dramatic effects of light and shadow in the buildings, so crucial to the general effect of the painting on the beholder, and to its meaning.

L'indagine conoscitiva sulla tavolozza e sulle caratteristiche esecutive de L'Orage *(*Il temporale*) di Poussin nel Musée des Beaux-Arts di Rouen, impiegando in maniera complementare la fluorescenza x e la diffrazione x portatili, è stata condotta al fine di un futuro confronto delle caratteristiche tecniche di quest'opera con quelle del suo* pendant, Le Calme *(*La calma*) nel J. Paul Getty Museum di Los Angeles e di quella che potrebbe essere definita come la coppia gemella di queste due opere,* Piramo e Tisbe *dello Städel Museum di Francoforte e l'*Uomo ucciso da un serpente *della National Gallery di Londra. Sono stati prelevati due campioni dal bordo del dipinto, per avere informazioni sulla composizione degli strati preparatori e sulla successione degli strati cromatici, nonché per facilitare l'interpretazione dei dati XRF e XRD. L'attenzione è stata focalizzata sull'impiego dei materiali utilizzati per creare gli effetti drammatici di luce e ombra sugli edifici, così importanti per l'impatto generale sull'osservatore e sui contenuti dell'opera.*

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Discoveries Concerning Poussin's Technique Made during the Examination and Treatment of *Achilles Among the Daughters of Lycomedes*

Carol Woods Sawyer

This paper presents the key findings from the examination and technical analysis of Nicolas Poussin's *Achilles among the Daughters of Lycomedes* owned by the Virginia Museum of Fine Arts (VMFA). Some of these findings provide insight into certain aspects of Poussin's working methods. Of particular interest is a small but visible indentation found in the paint film marking the location of the central vanishing point of the composition. This discovery led to the examination of other works by the artist where similar marks were found, illuminating an aspect of Poussin's working method that was not known before it was discovered in VMFA's *Achilles*.

L'articolo presenta i principali risultati derivati dall'esame e dall'analisi tecnica di Achille tra le figlie di Licomede *di Nicolas Poussin, del Virginia Museum of Fine Arts (VMFA). Alcuni di questi risultati forniscono informazioni in alcuni aspetti dei metodi di lavoro di Poussin. Di particolare interesse è una piccola ma ben visibile impronta sugli strati pittorici che demarca la posizione del punto di fuga centrale della composizione. Questa scoperta ha portato a indagare altre opere dell'artista, dove sono stati trovati segni simili, gettando luce su un aspetto del metodo di lavoro di Poussin ignoto prima che fosse scoperto nell'*Achille *del VMFA.*

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I METODI DI RESTAURO DEI MONUMENTI ARCHITETTONICI DI LEGNO IN RUSSIA

Le costruzioni fatte con i tronchi di legno rappresentano un capitolo a parte, originale ed irripetibile, per il patrimonio culturale russo. Questo tipo di costruzione fu praticato in maniera massiccia nel corso di tanti secoli, fino al Settecento e all'Ottocento, quando per l'edificazione nelle città si passò rapidamente all'uso della pietra. Gli edifici antichi di legno si sono conservati prevalentemente nelle aree rurali.

Attualmente nelle regioni nordiche della Russia sono presenti circa 130 chiese in legno, costruite nelle forme tradizionali in uso fino a tutto il XVIII secolo, e non meno di un centinaio di chiese appartenenti al XIX-inizio secolo. Inoltre sono presenti circa 300 cappelle del secolo XVIII e dei primi del secolo, e una grande quantità di abitazioni e fabbricati di uso domestico appartenenti alla fine dell'Ottocento o ai primi del Novecento.

Questi beni quindi sono presenti in quantità notevole, e la loro conservazione rappresenta un problema di non poco conto. Nel restauro ci si trova ad affrontare problemi di diversa natura: legislativa, tecnologica, relativa alle risorse umane, ecc. Noi ci soffermeremo sulle questioni riguardanti i metodi di restauro, i diversi approcci da applicare, le soluzioni di progettazione e la loro realizzazione.

I primi tentativi di restauro dei monumenti di architettura di legno in Russia risalgono ai primi del Novecento, quando veniva attuata in maniera massiccia la ricostruzione delle antiche chiese di legno. I ricercatori e gli architetti, che erano contrari a questa prassi, sostenevano che il valore autentico di tali monumenti era racchiuso appunto nel loro stato originale da ripristinare, ma il restauro dei primi del Novecento si distingue per l'approccio molto liberale nel trattare l'autenticità.

Fig. 1 – Chiesa dell'Assunzione della Vergine nella città di Kondopoga, 1774. La foto è di P. Stepanov.

Dopo la Rivoluzione d'Ottobre c'è stata una lunga pausa nel restauro di questi monumenti, che ripartì in maniera notevole solo dopo la Seconda Guerra Mondiale. In quel periodo, nel restauro dominava la tendenza di eliminare gli strati degli ultimi interventi per ottenere una determinata integrità artistica.

I lavori più significativi di restauro nel periodo postbellico riguardarono i seguenti monumenti: Chiesa dell'Assunzione della Vergine a Kondopoga (1774), Cattedrale dell'Assunzione di Kem' (1711-1717), complesso dell'Antico Cimitero di Kizhi (XVIII-XIX), Chiesa dei Santi Pietro e Paolo a Lychnyy Ostrov (1620, XVIII), Chiesa della Madre di Dio del villaggio di Kholm (XVI-XVIII),

Fig. 2 – Chiesa di Santa Barbara nel villaggio Yandomozero, XVII-XVIII secolo. La foto è di P. Stepanov.

Fig. 3 – Chiesa di Giovanni il Teologo nel villaggio Bogoslov, 1687. La foto è di A. Bodé.

Fig. 4 – Chiesa di San Nicola nel villaggio di Nizhnij Pochinok, 1717. La foto è di V. Skopin.

Chiesa della Deposizione della Tonaca di Borodava (1485), Chiesa della Trasfigurazione del Salvatore nel villaggio di Spas-Vezhi (1713) e altri.

Per la maggior parte di questi monumenti tra la fine dell'Ottocento e i primi del Novecento fu effettuato il rivestimento delle pareti e la posa delle coperture metalliche. Poi, per restituire a questi monumenti le loro sembianze originali, furono eliminati in maniera risoluta i rivestimenti e furono ripristinate le coperture in legno. In quella fase furono ricostruiti in maniera poco fedele i terrazzini d'ingresso, i portici e gli elementi decorativi, ma al termine del restauro i monumenti acquisirono un aspetto molto espressivo e stilisticamente integro. Le ricostruzioni effettuate in quel periodo si distinguono per un ottimo gusto artistico e l'eliminazione degli strati recenti ha permesso di riportare alla luce e mostrare la bellezza delle costruzioni tradizionali russe in legno.

La maggior parte degli interventi di restauro avvenne durante il trasferimento del monumento nelle zone destinate ad ospitarli sotto forma di museo a cielo aperto. Questo è il caso dei seguenti monumenti: Chiesa della Natività della Madre di Dio di Peredki (1539), Chiesa della Risurrezione di Kusheretskoe (1669), Chiesa di San Giorgio di Vershina (1672).

Il restauro delle abitazioni e dei fabbricati di uso domestico di per sé è meno complicato. La maggior parte di questi monumenti è raggruppata nei musei.

Si tratta di strutture del tardo periodo, costruttivamente non complesse, restaurate tutte con il criterio della restituzione dell'aspetto originale in maniera fedele. Le parti mancanti furono tutte ricostruite fedelmente grazie all'abbondanza di esempi analoghi autentici.

Nel periodo del dopoguerra non tutti i monumenti furono restaurati però con questo criterio, e diversi, quelli rimasti al loro posto e non trasferiti nei musei, presentano la stratificazione di tutti gli interventi, compreso le aggiunte più recenti.

La Chiesa di Giovanni il Teologo nel villaggio Bogoslov sul fiume Ishnya (1687) è pervenuta ai giorni nostri con la parte superiore ricostruita, con dei rivestimenti, con il campanile costruito di recente. Il progetto di restauro presentava delle alternative: eliminare il campanile ripristinando il terrazzino d'ingresso originale, oppure eliminare il rivestimento senza ricostruire il portico conservando il recente campanile. Questo esempio quindi

Fig. 5 – Chiesa dell'Ascensione proveniente dal villaggio Kushereka (1669) nel museo "Malye Korely ". La foto è di A. Bodé.

Fig. 6 – Chiesa di Giovanni Crisostomo nel villaggio Saunino, 1665. La foto è di A. Bodé.

Fig. 7 – Chiesa di Sant'Elia del camposanto di Il'insko-Vodlozerskiy, XVIII-XIX secoli. La foto è di A. Bodé.

rispecchia la frammentarietà e la non completezza nell'approccio applicato.

La Chiesa di San Nicola nel villaggio di Nizhnij Pochinok (1717) fu ricostruita nella parte superiore. Le indagini non permisero di determinare come fera il suo aspetto in origine. Durante il restauro sui muri perimetrali in tronchi d'albero furono mantenute sia le forme della parte superiore realizzate nel periodo recente che la copertura metallica.

Nel restauro in questi ultimi decenni sono stati praticati i più svariati approcci: il restauro integrale, con la conservazione di tutti gli strati, compreso quelli più recenti, e il restauro con l'esecuzione dei lavori ex novo, che prevede di riportare alla luce gli elementi originali e di conservare le aggiunte più recenti.

Con il restauro integrale ancor oggi spesso si pratica l'eliminazione di parti del monumento cospicue. Per la Chiesa di San Giovanni il Precursore nel villaggio di Shirkovo (1694) fu eliminato il campanile del XIX secolo.

Il restauro della Chiesa della Natività della Madre di Dio e del Campanile nel villaggio di Gimreka (1695) fu eseguito con l'eliminazione del rivestimento. Diversi dettagli e gli elementi del decoro furono ricostruiti in base alle tracce e agli esempi analoghi. Il monumento ha perso la sua autenticità, ma ha acquisito un'immagine espressiva ed integra.

Il restauro della Chiesa di San Demetrio di Tessalonica nel villaggio di Verkhnyaya Uftyuga ha restituito invece l'autenticità al monumento (1784), che nel corso della sua esistenza subì poche modifiche, restò immune all'applicazione del rivestimento e conservò molti elementi originali. Grazie a questo monumento nella prassi di restauro per la prima volta fu attuato il ripristino delle tecniche antiche di carpenteria e falegnameria.

La Chiesa della Deposizione della Tonaca di Borodava (1485) fu trasferita nel territorio del Monastero dell'Assunzione di San Cirillo (Kirillo-Belozerskiy), e poi ricostruita e restaurata più volte. Durante il restauro del 2009-2010, in base alle tracce rinvenute, sono stati ripristi-

Fig. 8 – Chiesa di Sant'Elia nel villaggio Tsypino, 1755. La foto è di A. Bodé.

Fig. 9 – Chiesa di San Nicola nel villaggio Lyavlya, 1584. La foto è di A. Bodé.

Fig. 10 – Chiesa di San Nicola nel villaggio Soginitsy, 1696. La foto è di P. Stepanov

nati diversi tipi di copertura senza chiodi. Questo tipo di restauro però è stato molto dibattuto, e ritengo che una soluzione del genere doveva rimanere solo come un'ipotesi, senza essere attuata su un monumento così unico come questo.

L'aspetto originale fu restituito alla Chiesa di San Giorgio del villaggio Semenovskiy (1685), trasferita al demanio artistico "Kolomenskoe" di Mosca. Tutti i monumenti trasferiti in museo sono stati restaurati con la restituzione dell'aspetto originale.

Di seguito ricorderemo una serie di monumenti restaurati con la conservazione dell'immagine creatasi durante l'ultima fase costruttiva.

La Chiesa di San Giorgio del villaggio Yuksovichi (1495) fu ricostruita nei secoli XVII e XIX. Il restauro prevedeva la conservazione di tutte le modifiche apportate nel corso del tempo, con tutta la stratificazione. All'interno però si sono conservati gli elementi antichi autentici: i muri di tronchi d'alberi, pali e colonne intagliate.

Il complesso del camposanto di Il'insko-Vodlozerskiy comprende la chiesa, il campanile e lo steccato con il portone. La Chiesa di Sant'Elia (1798) comprende quattro periodi costruttivi. Durante il restauro sono stati mantenuti gli strati anche dei periodi recenti, che comprendono i rivestimenti dei muri e la copertura metallica delle cupole. Una grande porzione dell'edificio coperta dai rivestimenti non armonizza bene tuttavia con lo steccato di tronchi d'alberi.

L'esempio recente dell'approccio storico è il restauro della Chiesa di Sant'Elia nel villaggio Tsypino (1755). L'edificio fu ricostruito notevolmente nel XIX secolo, ma nel 1980 fu elaborato il progetto di restauro che prevedeva il ripristino dell'aspetto originale. Nel 2000

al progetto sono state apportate delle correzioni che prevedevano di praticare una certa frammentarietà. Durante il restauro infine si è optato per una nuova soluzione progettuale, ossia quella di conservare con precisione l'aspetto esteriore creatosi per l'inizio del secolo.

Adottando questa soluzione, cioè di conservare tutta la stratificazione con l'immagine esterna più recente del monumento, all'interno rimangono sempre i muri di travi rotonde scoperte, con i segni delle modifiche fatte. Quindi, possiamo concludere dicendo che ricostruire l'aspetto originale di un monumento in maniera autentica ed esaustiva oppure proporre un'immagine recente come qualcosa di armonico non è proprio possibile.

Esaminiamo infine pochi esempi dove convive la soluzione di riportare alla luce ciò che è stato nascosto nel corso del tempo con la conservazione delle ultime aggiunte.

La Chiesa di San Nicola nel villaggio Lyavlya (1584) rappresenta un antico tempio cuspidale. Nell'Ottocento fu eliminato il portico, fu fatto il rivestimento, fu rinnovata la copertura, fu aggiunto il vestibolo (nartece) e i muri principali perimetrali in tronchi d'albero furono abbassati di 2, 5 m. Durante il restauro i muri antichi furono liberati dal rivestimento e l'altezza delle travi fu mantenuta invariabile. Fu ripristinato il rivestimento iniziale con tegole di legno della cuspide, della cupola e sulle ali annesse dei tetti semicilindrici con la sommità appuntita che forma sulla facciata un frontone a chiglia, nonché fu conservato il vestibolo aggiunto nei tempi recenti. La Chiesa di San Nicola, da restaurata, praticamente non presenta delle ricostruzioni che non siano fatte in maniera autentica.

Anche la Chiesa di San Nicola nel villaggio Soginitsy (1696) durante la sua esistenza ha subito diverse modifiche. La chiesa e il campanile sono stati costruiti in periodi diversi. Durante il restauro ai muri principali perimetrali in tronchi d'albero è stato restituito il loro aspetto originale, mentre per il campanile sono state mantenute tutte le ultime aggiunte.

Anche la Chiesa di San Nicola del villaggio Nenoksa (1762) fu ricostruita diverse volte. Alla fine degli anni 90 del secolo scorso il progetto di restauro di questo monumento contemplava ben cinque soluzioni diverse, e dal punto di vista metodologico questo offriva diversi spunti per la riflessione. Alla fine fu scelta la soluzione che prevedeva il ripristino solo delle forme autentiche, senza cercare di ricostruire le parti oramai perdute basandosi solo sulle analogie esistenti. I muri principali in tronchi d'albero sono stati restaurati con la restituzione dell'aspetto originale. Il vestibolo è conservato secondo le forme del XIX secolo.

La Chiesa della Caldelora a Zaostrov'ye (1688) è pervenuta ai giorni nostri dopo diverse modifiche e con tante parti perdute. Si tratta di una costruzione unica, che ricalca le forme dei templi in pietra, ma non ci sono abbastanza elementi per poter restituire a questo monumento l'aspetto originale. Sui muri ci sono i segni non sufficientemente decifrabili della presenza di un portico e non è chiaro se una volta esisteva il terrazzino d'ingresso. L'ultimo rivestimento inoltre ha permesso di mantenere il monumento in buono stato. Il progetto ha previsto quindi la soluzione di restauro frammentario. Sui muri principali in tronchi d'albero è stata mantenuta la recente copertura metallica. Il ripristino dei tetti dell'altare e del vestibolo è stato effettuato in base alle tracce presenti. Nei muri le finestre originali si trovano accanto a quelli aggiunti in seguito. Il progetto ha previsto la minimizzazione degli interventi di ricostruzione e rimozione.

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Nel restauro di monumenti architettonici di legno in Russia dunque si usano diversi metodi, con prevalenza della tendenza al ripristino dell'immagine originale del bene. I risultati che si ottengono, come abbiamo visto, sono i più svariati. Il numero elevato degli elementi rimossi oppure delle parti ricostruite diminuisce l'autenticità del monumento. Il difetto del restauro che tende a conservare tutti gli strati, anche quelli più recenti, invece consiste nel non scoprire la storia costruttiva di un edificio, con tutte le fasi del primo periodo di vita del monumento, che risultano più interessanti dal punto di vista architettonico e artistico.

I monumenti in legno solitamente comprendono le parti che appartengono a diversi periodi storici e la stratificazione quindi risulta molto variopinta. Non è possibile ricostruire le parti perdute in maniera autentica. L'integrità artistica del monumento restaurato si riesce ad ottenere solo sacrificando la sua autenticità.

I buoni risultati per il restauro dei monumenti di legno offre un approccio differenziato quando diverse parti dell'edificio conservano l'immagine appartenente a periodi storici diversi. Nel riportare alla luce i muri antichi principali in tronchi d'albero si mette in mostra il valore artistico dell'architettura tradizionale del legno. Nel conservare le coperture, le ali e i terrazzini d'ingresso recenti si sottolinea l'antichità delle parti principali. Un metodo del genere permette di rivelare al massimo la storia costruttiva di un fabbricato e di conservare nel contempo le parti autentiche aggiunte di recente.

Andrej Bodé

Traduzione: *Valentina Eberle*

Деревянные постройки в традиционном бревенчатом исполнении составляют едва ли не самую оригинальную часть культурного наследия России. В статье рассматриваются вопросы методики реставрации памятников деревянного зодчества. Анализируются примеры реставраций второй половины XX в. и недавнего времени, которые показывают достоинства и недостатки различных реставрационных подходов. Для максимального сохранения подлинности реставрируемого объекта требуется минимум воссозданий и удалений. Автор полагает, что на большинстве памятников деревянного зодчества оптимального баланса между воссозданием первоначальных элементов и удалением позднейших наслоений можно достичь при аналитическом подходе, дифференцированно подходя к каждой разновременной части здания. Это позволяет максимально полно раскрыть историю здания и вместе с тем сохранить подлинные позднейшие его части и детали.

Associazione Restauratori d'Italia

IL TESORO SOTTRATTO DI ROMA

Grazie all'accordo siglato da Roma Capitale i nostri reperti formeranno nuovi studiosi negli Usa. In Italia, chi dovrebbe promuovere le politiche culturali considera la formazione e il restauro un lusso. Il costo zero e l'umiliazione degli specialisti italiani.

Un novembre all'insegna delle copiose piogge ha regalato ai romani anche un insolito dinamismo in campo archeologico. In un crescendo di proposte, infatti, si è infatti registrato l'intervento del Ministro Franceschini con l'ipotesi di "restituire al Colosseo la sua arena", seguito dal presidente dell'As Roma Pallotta che ha avanzato l'idea, scarsamente presa sul serio dagli addetti ai lavori, di trasformare la millenaria area del Circo Massimo in un campo da calcetto. Infine, è stata poi la volta del sindaco Marino che, passando dall'astrazione ai fatti, ha presentato ufficialmente un protocollo d'intesa siglato con il Gruppo Enel, destinato a fare molto discutere e che ha destato subito qualche sospetto già dal titolo in inglese. "The hidden treasure of Rome" ("Il tesoro nascosto di Roma") è un programma interamente finanziato dall'Enel che prevede il trasferimento di un notevole numero di reperti archeologici inediti (circa 100.000), scavati e custoditi a Roma, da dislocare presso Università estere, in particolare negli Stati Uniti, per essere studiati da ricercatori internazionali. All'Università del Missouri, ad esempio, è già stato affidato un lotto di 249 reperti provenienti dalle casse dei Musei Capitolini.

L'ARI, Associazione Restauratori d'Italia, ha subito espresso il più vivo allarme per un progetto che presenta fin troppi aspetti oscuri e può costituire un pericoloso precedente di cedimento delle competenze italiane in materia di tutela, ma in subbuglio è l'intero mondo dei beni culturali. In attesa di conoscere alcuni importanti aspetti di questa operazione, come il costo sostenuto dal Gruppo Enel, la destinazione dei reperti, i tempi di restituzione dei prestiti e le autorizzazioni che si sono rese necessarie, sono d'obbligo alcune riflessioni sull'impatto del programma in un settore già in crisi sotto molteplici aspetti.

Le maggiori perplessità risiedono nel fatto, senza precedenti nella storia della Tutela italiana, che una considerevole fetta del patrimonio culturale sia sottratto alle capacità degli specialisti formati negli Istituti e nelle Università italiane per essere "de localizzato", al pari di un qualsiasi macchinario industriale, con la motivazione della convenienza del "costo zero" per la pubblica amministrazione e di una presunta superiorità tecnologica dei laboratori esteri, ancora tutta da dimostrare. Come se un reperto archeologico fosse un oggetto qualsiasi, privo di significato immateriale e subordinato perciò alle logiche dettate dal mercato, come se in Italia non esistessero centri di eccellenza e ricercatori competenti per studiare i nostri reperti, come se i soldi che il Gruppo Enel ha stanziato non provenissero da privati cittadini, come se a pagare il prezzo del progetto non fossero le migliaia di professionisti altamente qualificati e specializzati la cui dignità è messa perfino in discussione; e, infine, come se le Istituzioni preposte alla salvaguardia dei beni culturali non cedessero di fatto una quota di sovranità su un settore che rappresenta l'eccellenza dei saperi e la più avanzata formazione scientifica dei professionisti italiani, riconosciuta da sempre in campo internazionale, dove restauratori, archeologi, storici dell'arte operano con faticosa tenacia e sacrificio personale per riuscire a mantenere elevata la qualità del loro operare, della conoscenza e della prassi degli interventi di conservazione. L'impressione è perciò che il progetto sfugga completamente alla comprensione di queste fragilità e s'inserisca invece a pieno titolo nel contesto di disimpegno delle politiche culturali che si sono manifestate concretamente in questi ultimi anni con effetti deleteri, basti pensare ad esempio alla progressiva estromissione nelle gare d'appalto delle competenze del Restauro superspecialistico a vantaggio di un'imprenditoria edile assai meno qualificata, in una visione che punta progressivamente a considerare il patrimonio storico e artistico, in particolare l'archeologia, come qualcosa di alieno e non un Bene comune capace di suscitare bellezza, inducendo ad amare la propria terra e a desiderare di prendersi cura di quanto ereditato.

"Il tesoro nascosto di Roma" assesta perciò un ulteriore colpo nel processo di de-costruzione del settore già in atto, aggravando anche l'immagine internazionale dell'Italia in ambito culturale, se il "New York Time" può sostenere in un editoriale apparso nel settembre scorso (prima ancora dell'annuncio da parte del sindaco) che l'Italia non può permettersi il lusso di studiare, restaurare e catalogare, facendo slittare il nostro Paese nella categoria dei luoghi in via di sviluppo. Salvo poi sostenere che i nostri reperti servirebbero a "coinvolgere gli studenti con materie prime cui potrebbero altrimenti non avere accesso". Saranno perciò le inesperte mani degli studenti a trattare i nostri preziosi reperti per "studiarli, restaurarli e catalogarli"? E con quali cautele, controlli, saperi?

Infine, sono questi i "costosi test che non avremmo mai potuto permetterci da questa parte dell'Oceano"? E come se non bastasse, proprio a ridosso dello scandalo sul malaffare che ha coinvolto l'amministrazione capitolina, è giunta un'altra nuvola carica di pioggia. La Sovraintendenza comunale ha pubblicato sul suo sito un bando pubblico per la ricerca di volontari da impiegare nello svolgimento di atti-

vità gratuite nell'ambito della valorizzazione, bando che attesta che dopo il "costo zero" è possibile anche aprire la "stagione dei saldi", chiamando a raccolta i volontari per supportare le necessità dei musei della Capitale, creando dunque la premessa per disporre di professionalità altamente qualificate da dislocare in sotto-mansioni cui corrispondere retribuzioni pari al solo rimborso spese spettante al volontario. Sono questi gli effetti impazziti di una visione che predica l'azzeramento dei costi a qualsiasi costo, anche al prezzo di mortificare in modo fatale quei saperi preziosi appresi nelle aule degli Istituti formatori, nelle Università e poi direttamente sul campo, nei cantieri di restauro, di scavo archeologico e nei musei.

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Consiglio Direttivo ARI

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SUPSI

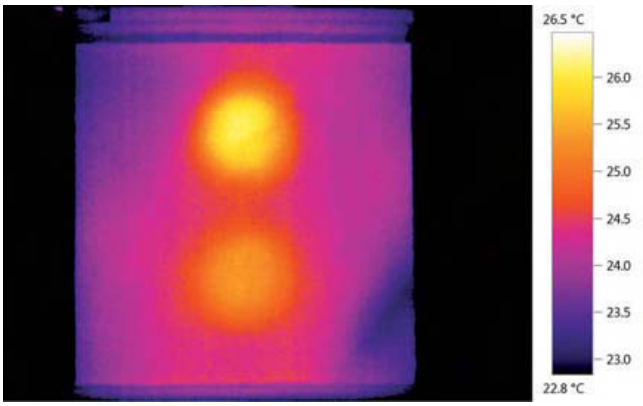
STUDIO COMPARATIVO DI METODI DIAGNOSTICI PER LA VALUTAZIONE DEI DISTACCHI DEGLI INTONACI E DEL LORO TRATTAMENTO

I conservatori-restauratori che operano sui dipinti murali sono spesso messi a confronto con la difficile valutazione del fenomeno di degrado dovuto ai distacchi d'intonaco e con l'altrettanto difficile valutazione dell'efficacia dell'intervento di *grouting* (iniezione di malta liquida nella sede del distacco).

Negli ultimi decenni, per aiutare i restauratori ad affrontare questi aspetti, sono stati impiegati diversi metodi strumentali mutuati da altri settori (l'edilizia, l'ingegneria, il campo sanitario), ma spesso applicati a livello sperimentale e sporadico, non sempre con una verifica della loro applicabilità *in situ* e quindi della loro affidabilità.

Durante la tesi di *Master in Conservazione e restauro SUPSI* svolta durante l'anno accademico 2012-2013 ("Studio comparativo di alcuni metodi diagnostici per la valutazione dei distacchi degli intonaci e del loro trattamento", relatrice professoressa Francesca Piqué, correlatori Maria Rosa Lanfranchi e Albert Jornet) sono state affrontate le problematiche correlate ai distacchi d'intonaco, testando e paragonando alcuni metodi analitici , al fine di integrare e supportare il metodo autoptico tradizionale (*Knocking test*) e la successiva interpretazione dei dati da parte del restauratore.

Il lavoro ha avuto come obiettivo quello di determinare quali fossero gli strumenti in grado di fornire la migliore interpretazione del fenomeno, ovvero quella più accurata e di semplice comprensione. Altri aspetti considerati hanno incluso la valutazione della riproducibilità delle analisi, sia in termini di accessibilità da parte del restauratore (dal punto di vista delle collaborazioni con enti e dal punto di vista economico) sia di funzionalità (ovvero di applicabilità reale).



È stato scelto di analizzare le tecniche di: termografia, *Laser Speckle Interferometry*, indagine con frequenze ultrasoniche, soniche (successivamente sostituita da indagini acustiche) e radar.

La ricerca è stata organizzata in tre differenti fasi.

Nella prima fase è stata svolta un'approfondita ricerca bibliografica, al fine di determinare lo "stato dell'arte" sulla tematica e selezionare un numero limitato di strumentazioni da analizzare, comprendendone i principi di funzionamento e definendone i limiti ed i van-

Fig. 1 – Modelli di laboratorio che riproducono i distacchi d'intonaco tra gli strati.

Fig. 2 – Esempio dei risultati sui modelli di laboratorio osservati tramite termografia attiva. Le aree a temperatura maggiore (identificate dai colori più caldi) definiscono l'estensione e la forma dei distacchi simulati.

Fig. 3 – Indagini con strumentazione Speckle Laser del tramezzo dipinto da Bernardino Luini, Chiesa di Santa Maria degli Angeli, Lugano, svolte in collaborazione con il Getty Conservation Institute.

Fig. 4 – Indagini con strumentazione ultrasonica, Chiesa di San Nazario, Dino. Posizionamento delle sonde a contatto della superficie. Collaborazione con Boviar© S.r.l. di Milano.

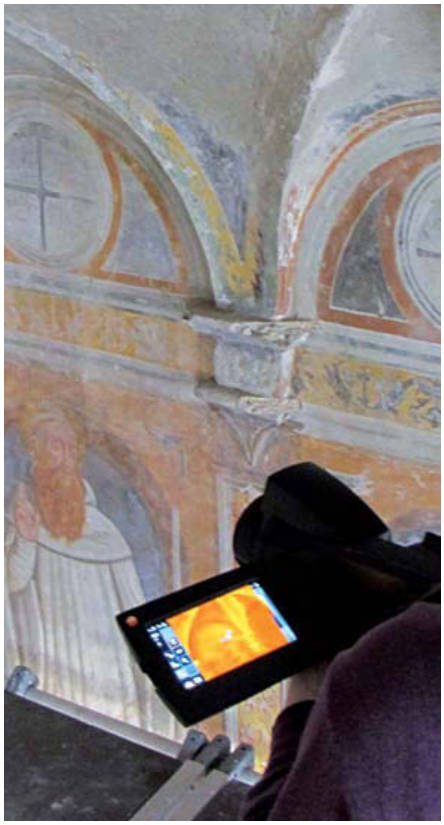


Fig. 5 – Indagini tramite termografia passiva, Chiesa di San Nazario, Dino. Collaborazione con il Politecnico di Milano.

taggi applicativi.

Durante la seconda fase della ricerca le strumentazioni sono state sottoposte a prove in laboratorio. Per avere un parametro di confronto standard sono stati realizzati 12 modelli, riproducendo la più semplice stratigrafia generale di un intonaco storico (supporto-arriccio-intonaco). Nei vari livelli sono state ricreate diverse casistiche di distacco, variandone posizione ed ampiezza.

Lo scopo di questa fase è stato sia quello di avere un primo approccio con le tecniche scelte, sia di valutare il loro funzionamento, determinando quali strumenti riuscissero a fornire un'interpretazione del fenomeno più corretta e più vicina alla realtà. Infatti il vantaggio di effettuare delle prove su ricostruzioni è stato quello di poter lavorare su distacchi con dimensioni e localizzazioni note, a differenza dei casi reali in cui il restauratore deve indagare una situazione non conosciuta.

Sono stati condotti diversi test sulle strumentazioni per valutare come venisse interpretato il fenomeno di degrado e per comprendere quale aiuto potesse ricevere un restauratore con il loro utilizzo durante e dopo l'intervento di *grouting*.

Durante la terza fase, le strumentazioni selezionate in laboratorio sono state trasportate presso diversi casi studio, per valutare la loro applicabilità nella situazione reale di un cantiere.

Sono state realizzate preliminarmente delle mappature con il rilevamento dei distacchi tramite il metodo classico sensoriale, così da confrontare i risultati analitici con la percezione del restauratore.

I casi studio e le tecniche selezionate sono stati:

- la chiesa di Santa Maria degli Angeli a Lugano (*Laser Speckle Interferometry* e termografia attiva);
- la chiesa di Santa Maria in Selva a Locarno (*Laser Speckle Interferometry*);
- la chiesa di San Nazario a Dino (termografia passiva e tecnica ultrasonica).

In generale si è potuto osservare come i metodi diagnostici strumentali siano stati in grado di identificare la presenza dei distacchi d'intonaco, ma non tutti siano riusciti a caratterizzarne con precisione la forma e l'estensione.

Le tecniche non a contatto (termografia e *Laser Speckle Interferometry*) sono state generalmente preferite nell'applicazione *in situ*, in quanto hanno il grande vantaggio di non richiedere un'interazione meccanica con la superficie, problema che invece si riscontra per tutte le tecniche che richiedono sonde a contatto (radar, indagini soniche/acustiche ed ultrasoniche).

Per la definizione dell'estensione dei distacchi è risultata efficace la tecnica termografica, come indagine globale di ampie aree a distanza.

La tecnica radar, invece, è potenzialmente utile come indagine di zone puntuali definite preliminarmente dal restauratore. Questa ha dimostrato però dei limiti tecnici a

causa della scarsa definizione e dettaglio dei risultati, dovuti alla risoluzione della strumentazione e alla necessità di avere uno scorrimento diretto dell'antenna sulla superficie.

La tecnica *Laser Speckle Interferometry* ha mostrato buone potenzialità, ma necessita di miglioramenti tecnici del software e di limitare la dispersione delle onde sonore in ambienti ampi.

Le indagini acustiche, infine, si sono dimostrate troppo invasive e sensibili per essere efficaci nell'ambiente di cantiere.

La tecnica più utile per la valutazione dell'intervento di *grouting* durante la sua esecuzione è indubbiamente la termografia, in quanto non interferisce con le operazioni del restauratore ed è l'unica che permette di visualizzare in modo dinamico il movimento della malta fluida al di sotto della superficie dell'intonaco.

Una tecnica utile, invece, per la valutazione a breve e a lungo termine dell'intervento, è la tecnica ultrasonica, che valuta la densità e la continuità dei materiali, ma necessita di ulteriori sperimentazioni specifiche.

In conclusione le strumentazioni si sono dimostrate valide per effettuare misure relative nel tempo, ossia permettono al restauratore di paragonare i risultati oggettivi ottenuti con le medesime analisi e riprodotte nelle stesse condizioni, anche a distanza di anni. Questo migliora la documentazione prodotta sia per quanto riguarda le indagini preliminari, sia riguardo all'intervento di restauro. Entrambi questi elementi sono fondamentali per il monitoraggio e la manutenzione nel tempo del bene culturale, fornendo dati con un'oggettività maggiore rispetto al metodo autoptico.

Sarà compito del restauratore definire quale tecnica sia la più applicabile nel proprio caso studio, in termini di informazioni che vuole ottenere, accessibilità alle superfici ed economia di cantiere.

Come prima occasione di valutazione sistematica, il lavoro di ricerca ha potuto porre delle basi per paragonare differenti metodi e la loro utilità nell'ambito degli intonaci storici, rappresentando un punto di partenza per studi più approfonditi e specifici.

Elisa Anna Figus
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Associazione Italiana dei Conservatori e Restauratori degli Archivi e delle Biblioteche

AICRAB

DIGITAL HUMANITIES ALLA BIBLIOTECA CAPITOLARE DI VERCELLI

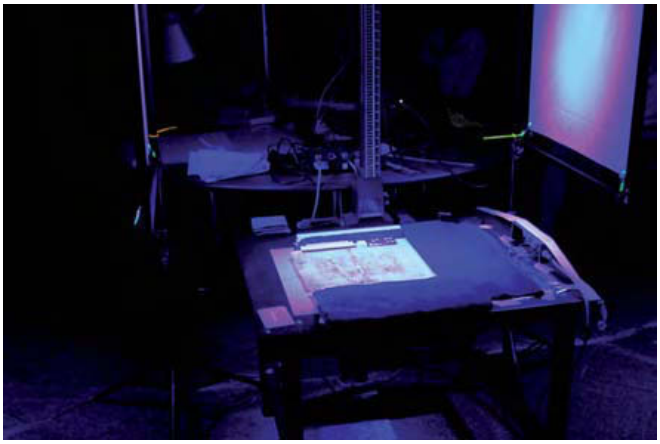
Biblioteca Capitolare-Vercelli
(6-19 luglio 2014)

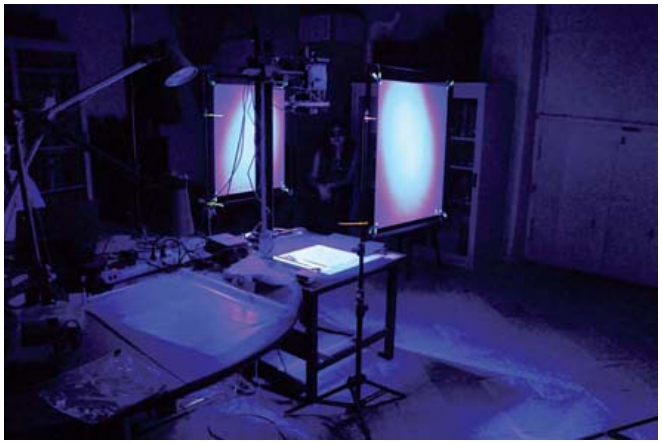
"L'anno del Signore 1908, addì 1 aprile, alle ore undici, ottenuto il necessario consenso di S. E. Mons. Arcivescovo e del Rev.mo Capitolo Eusebiano alla ricognizione della preziosissima reliquia dell'Evangeliario detto di S. Eusebio, sono convenuti nella sala maggiore dell'Archivio Capitolare di Vercelli S. E. Ill.ma e Rev.ma Mons. Teodoro Valfré dei Conti di Bonzo, arcivescovo; Mons. Giovanni Mercati della Biblioteca Vaticana, prelato domestico di Sua Santità, delegato della S. Sede alla visita degli archivi ecclesiastici principali d'Italia; i Rev.mi Canonici Eusebio Raggi Arciprete e Guglielmo Conti Prevosto, delegati dal Rev.mo Capitolo; il Rev.mo Canonico Teologo Luigi Sincero prefetto degli Archivi, Canonico Penit. Romualdo Pasté vicearchivista". In tal modo inizia la lettera di ricognizione stilata per l'apertura del cofanetto contenente il *Liber Evangeliorum Vercellensis*.

Date le sue pessime condizioni, ampiamente descritte nel testo del documento, si decide di sottoporre immediatamente il manoscritto a restauro, presso il laboratorio della Biblioteca Apostolica Vaticana. I danni subiti dal codice sono imputabili al suo uso per funzioni liturgiche, alla sua età e al suo uso come reliquia da contatto: oggetto di devozione per i fedeli, venerato dal clero e utilizzato per i giuramenti fin dall'Alto Medioevo.

Il restauro è avvenuto durante la prefettura di Franz Ehrle, più volte ricordato nei manuali di restauro librario per aver organizzato la Conferenza Internazionale di S. Gallo

Fig. 1 – Primo piano della Mega-Vision EV Camera, posizionata all'interno della sala capitolare della Biblioteca e pronta per la campagna fotografica. Sullo sfondo una delle due lampade a led.





Figg. 2 e 3 – Due momenti delle riprese ultraviolette del Liber Evangeliorum Vercellensis.

nel 1898, dove fu concretizzata la prassi di riprodurre fotograficamente i manoscritti a rischio, pratica seguita anche per l'Evangeliario vercellese.

Questo manoscritto, meglio conosciuto con il nome di "Codice A" della Biblioteca Capitolare di Vercelli, è il testimone più antico dei quattro vangeli canonici, con testo latino detto "europeo", anteriore alla *Vulgata* di San Girolamo del 382 d.C. Vergato in splendida onciale tardoantica, con abbreviazioni molto rare secondo l'uso più antico, è impaginato su due colonne di 24 righe ciascuna, con titoli su ogni pagina e uso di inchiostro rosso all'inizio e alla fine di ogni vangelo. La sua stesura si deve, secondo la tradizione, a S. Eusebio, protovescovo del Piemonte e di Vercelli (283-371 d.C.).

Nel 1908, prima del restauro, il manoscritto viene definitivamente separato dalla sua preziosa legatura in lamina d'argento sbalzata, datata alla metà del X secolo.

Oggi, i 154 bifogli sono conservati in cartellette di cartoncino telato, riposti in quattro cassette di legno di ciliegio, a seguito di un nuovo intervento di manutenzione avvenuto nel 1996 dallo stesso laboratorio vaticano, consistito solamente nella sostituzione delle cassette e delle cartellette.

La storia millenaria di questo libro ha avuto una svolta nel mese di luglio 2014 quando, nella sala capitolare della Biblioteca, il team americano del Lazarus Project ha sottoposto ogni singolo bifoglio a riproduzioni basate sulla tecnologia della ripresa multispettrale: scatti con raggi ultravioletti e infrarossi, a differenti tempi di esposizione, per catturare immagini ad alta definizione da rielaborare, successivamente, con un software dedicato.

Come affermano i responsabili Gregory Heyworth e Ken Boydston, rispettivamente docente del Dipartimento di inglese dell'Università del Mississippi e amministratore delegato della MegaVision di Santa Barbara CA, "esistono cinque strumentazioni simili al mondo, ma solamente questa è trasportabile e quindi non limita il suo utilizzo all'interno di una Biblioteca o di un dipartimento abbastanza ricco da potersi permettere l'acquisto e la manutenzione della stessa". Ma non è tutto, infatti "una caratteristica che la differenzia dalle altre, sta nel fatto che sfrutta, tra il range molto ampio di scatti possibili, la tecnica della luce trasmessa". In altre parole, ogni singolo foglio viene ripreso oltre che con le lampade da stativo, anche con una luce speciale posta al di sotto del piano di appoggio del foglio di pergamena, dando così la possibilità di illuminare per trasparenza la stessa e catturare una serie di immagini trasmesse. In questo modo in fase di rielaborazione dati è possibile sovrapporre una serie di immagini differenti, in modo da ricostruire dettagliatamente il foglio pergamenaceo originale.

Questa tecnologia, tuttavia, sarebbe inutile senza il sostegno di tecnici specializzati nella rielaborazione digitale di immagini. I responsabili, Roger Easton e Keith Knox, provenienti dal RIT (Rochester Institute of Technology) e dall'Airforce Research Lab di Maui nelle Hawaii, dirigono il team che è stato decisivo per il progetto vercellese: senza di loro non sarebbe stato possibile rielaborare i dati ottenuti, che renderanno visibile circa il 90% della scrittura ormai in gran parte danneggiata dai secoli, restituendo agli studiosi un testimone fondamentale, non solo della Cristianità, ma anche della cultura universale.

Il secondo step del progetto sarà quello di creare un software open source, che permetterà di sfogliare virtualmente il manoscritto a diversi livelli di lettura: esaminare le immagini delle singole pagine che lo compongono e la versione rielaborata digitalmente, con l'ausilio di strumenti di navigazione e filtri per l'elaborazione grafica; comparare l'immagine con l'edizione diplomatica del manoscritto; confrontare il testo dell'edizione diplomatica e quello dell'edizione critica; effettuare ricerche testuali complesse sul testo del manoscritto, sia a livello paleografico sia a livello filologico-letterario.

Tutto ciò sarà reso possibile dalla multidisciplinarietà che anima il personale della Fondazione Museo del Tesoro del Duomo e Archivio Capitolare e della sinergia che si crea di volta in volta con i protagonisti dei vari progetti.

Timoty Leonardi

OPD – Opificio delle Pietre Dure e Laboratori di Restauro di Firenze

AVANZAMENTI CIRCA IL RESTAURO DELL'*ADORAZIONE DEI MAGI* DI LEONARDO DA VINCI

Come è noto e come è già stato annunciato anche in questa sede, l'*Adorazione dei Magi* di Leonardo da Vinci della Galleria degli Uffizi di Firenze è stata consegnata alle cure dell'Opificio delle Pietre Dure nel novembre 2011: inizialmente per una campagna diagnostica che ne valutasse lo stato di conservazione e le principali problematiche. In seguito ai risultati emersi da questa campagna di indagini, dal luglio 2012, è stato presa la decisione, in pieno accordo con la Soprintendenza Speciale per il Patrimonio Storico, Artistico ed Etnoantropologico e per il Polo Museale della città di Firenze, di sottoporre l'opera ad un intervento di restauro. Dopo due anni e mezzo, periodo durante il quale, oltre ad un continuo monitoraggio, l'operazione della pulitura è andata considerevolmente avanti, ci sembra giusto aggiornare il pubblico degli addetti ai lavori circa gli avanzamenti del restauro dell'*Adorazione dei Magi* di Leonardo, con alcune immagini ed alcune considerazioni anche di carattere generale.

Possiamo affermare che le problematiche e i risultati sperati, frutto delle indagini diagnostiche svolte sull'opera e delle osservazioni autoptiche dei restauratori, anticipati e proposti fin dal momento della scelta di dare inizio al restauro, si sono col tempo pienamente realizzati, facendo tuttavia emergere anche interessanti novità. In realtà ora vediamo chiaramente e in maniera inconfutabile che l'intervento di pulitura, tramite un leggero, graduale e differenziato assottigliamento dei vari materiali sovrapposti nei secoli dai vari manutentori e restauratori delle Gallerie fiorentine sulla superficie, era assolutamente doveroso e tecnicamente possibile. Come appare in maniera così evidente la superficie pittorica, anche se appena abbozzata, risulta ora libera dal pericoloso effetto di strappo dei materiali accumulatisi sopra, e le parti disegnate e ombreggiate da Leonardo emergono finalmente leggibili in maniera chiara, rendendo possibile una più approfondita lettura dei loro valori espressivi.

Per esempio, le alterazioni di questi materiali sovrapposti, non originali ed oggi anche fortemente alterati, sulla bellissima figura di anziano, in primo piano, all'estrema sinistra del dipinto (Isaia, secondo la lettura iconografica di Antonio Natali), appiattita

Fig. 1 – Leonardo da Vinci, Adorazione dei Magi, *Galleria degli Uffizi, Firenze. Foto prima del restauro.*

Fig. 2 – Particolare delle figure di lavoratori sulla scalinata del tempio, stato del settembre 2014.

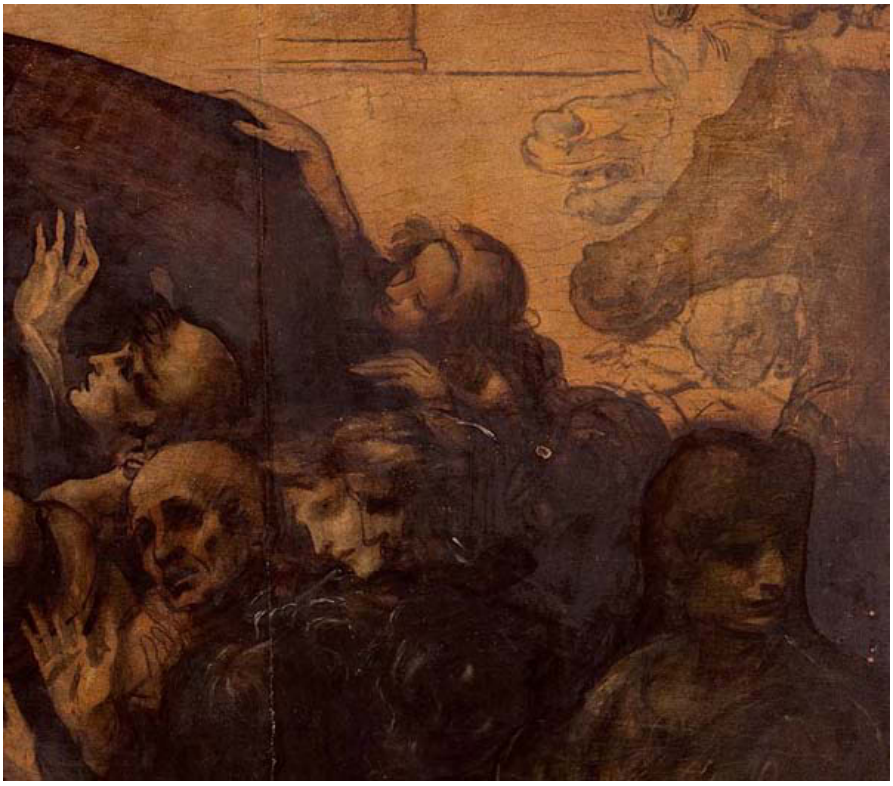


Fig. 3 – Particolare della lotta di cavalli, stato del settembre 2014.

Fig. 4 – Particolare del gruppo a destra del dipinto, stato del settembre 2014.

dallo sbiancamento, sono scomparse con un leggerissimo trattamento di pulitura e la potenza dei volumi e dell'espressione sono immediatamente riemerse. Ma è soprattutto nella parte alta che la nuova lettura dell'opera si afferma prepotente, rivelando un accenno sottilissimo del colore del cielo e rendendo percepibili a occhio nudo anziché solo in riflettografia infrarossa le figure dei lavoratori che sono intenti alla ricostruzione del tempio, elemento iconologico di grande importanza; così come appaiono in tutta la loro forza e potenza, ma anche nella loro incompiutezza e nelle incertezza relative ad uno stadio di lavoro ancora in corso, le figure di uomini e cavalli impegnati in una zuffa sulla destra della fascia alta del dipinto.

La forte disomogeneità dei livelli di avanzamento del lavoro, allo stadio in cui Leonardo lasciò l'opera non compiuta, caratterizzata da zone con tracce di velatura di colore, coesistenti con aree solo abbozzate e zone in cui la trasparenza dell'imprimitura mostra l'*underdrawing* e l'*undermodelling*, situazione già evidenziata dalle prime indagini diagnostiche, è forse all'origine della patinatura stesa diffusamente sulla superficie in epoca imprecisata, nel passato. Attraverso questo intervento si era voluto certo occultare queste disomogeneità che inducevano ad una difficoltà di visione, con l'intento, forse, di conferire all'insieme l'effetto di un voluto monocromo piuttosto che quello di un non finito.

L'attuale, delicato intervento di pulitura, tuttora in corso, ha consentito anche di comprendere sempre più il modo di lavorare di Leonardo, confermando l'interpretazione già avanzata[1] circa le varie fasi e materiali, ma arricchendola di nuovi elementi, esempi ed anche di interessanti problemi interpretativi. Significativa, in particolare, la decisione di Leonardo di affrontare il disegno preparatorio a mano libera, secondo un processo mentale che consente una elaborazione della composizione in continuo divenire, al di sopra di una, invece, rigorosissima impostazione prospettica degli elementi architettonici e di partizione geometrica dello spazio totale del piano di lavoro. Il gruppo di teste sul lato sinistro mostra con evidenza i vari possibili livelli durante il processo di costruzione delle immagini.

All'estremità destra, invece, appaiono varie posizioni di una testa di cavallo, per la quale, evidentemente, il pittore non aveva ancora compiuto la scelta definitiva.

Dal punto di vista dei risultati della pulitura, come si rileva ovunque, ad una osservazione tecnica accurata e, in particolare, sotto illuminazione UV, molta materia aggiunta, in termini di vernici e patinature, è stata ancora lasciata, in base alla impostazione teorica e tecnica della pulitura propria dell'Opificio, sia come livello di sicurezza, sia come "patina" della storia trascorsa. Il principio che ci guida, come è bene noto, è che la pulitura non deve porsi l'obiettivo di far tornare il dipinto come era, una indimostrabile e pericolosissima pretesa dato che nessuno sa esattamente come esso apparisse e può con-

Fig. 5 – Leonardo da Vinci, Adorazione dei Magi*, Galleria degli Uffizi, Firenze. Foto durante il restauro, stato del settembre 2014*

GRUPPO DI LAVORO OPD

Direzione dei Lavori
Marco Ciatti e Cecilia Frosinini

Restauro della pellicola pittorica
Roberto Bellucci e Patrizia Riitano

Restauro del supporto ligneo
Andrea Santacesaria, con Ciro Castelli e Mauro Parri

Analisi scientifiche
Laboratorio scientifico dell'OPD, coordinatore Carlo Galliano Lalli, con Giancarlo Lanterna, Isetta Tosini

PER LA SOPRINTENDENZA SPECIALE PER IL PATRIMONIO STORICO, ARTISTICO ED ETNOANTROPOLOGICO E PER IL POLO MUSEALE DELLA CITTÀ DI FIRENZE

Cristina Acidini
soprintendente
Antonio Natali
direttore della Galleria degli Uffizi

Il restauro è realizzato grazie al generoso contributo degli Amici degli Uffizi, associazione presieduta da Maria Vittoria Rimbotti

durre a danni irreparabili, ma quelli più ragionevoli di consentire una corretta lettura dei suoi significati e valori espressivi, sia pur con i segni del passaggio del tempo. Alla fine, il dipinto di Leonardo dovrà apparire un dipinto non finito, antico, ma per quello che è: in buone condizioni sia materiche sia di leggibilità. A tale scopo, unitamente con il massimo rispetto della sua autenticità materica e formale, vanno tutti gli sforzi del team dell'Opificio al lavoro (restauratori, esperti scientifici, storici dell'arte) che, con un confronto continuo con la Direzione della Galleria degli Uffizi, con gli studiosi dell'opera di Leonardo e con il fondamentale sostegno degli Amici degli Uffizi, vede ormai prossima la conclusione di questa prima fase dell'intervento. I risultati ottenuti sono però di tale interesse e novità che, in ossequio al nostro principio di totale trasparenza, abbiamo ritenuto opportuno presentarli a tutti gli interessati.

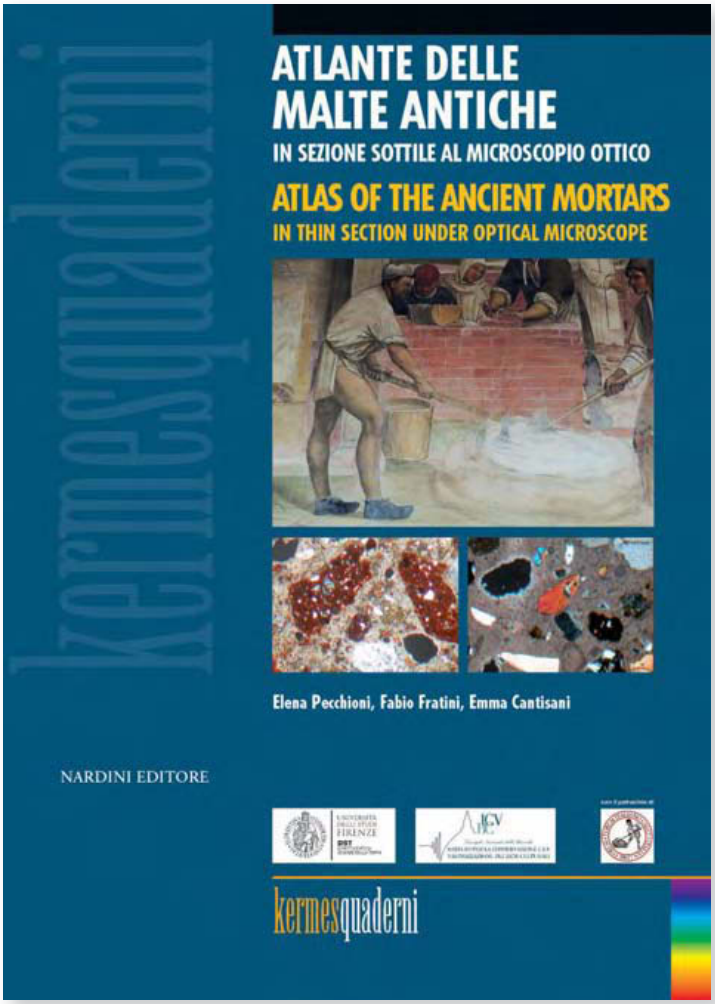
Marco Ciatti, Cecilia Frosinini

Note

[1] Si veda quanto pubblicato finora in: M. Ciatti, in "Kermes", 85, 2012, pp. 21-23; R. Bellucci, M. Ciatti, C. Frosinini, P. Riitano, *Un nuovo avvicinamento sistematico al restauro dell' "Adorazione dei Magi" di Leonardo da Vinci*, in "OPD Restauro", XXIV, 2012(2013), pp. 45-56; C. Frosinini, *L' "Adorazione dei Magi" di Leonardo da Vinci e le prime indagini diagnostiche presso l'Opificio delle Pietre Dure: oltre il visibile*, in *Leonardo da Vinci and optics*, a cura di F. Fiorani e A. Nova, Venezia 2013, pp. 333-351; R. Bellucci, M. Ciatti, C. Frosinini, P. Riitano, *Leonardo's 'Adoration of the Magi' at the Uffizi: preliminary technical studies at the OPD*, in *Leonardo da Vinci's technical practice*, ed. by M. Menu, Paris 2014, pp. 32-39.
Gli avanzamenti del restauro sono stati inoltre presentati in alcune conferenze internazionali, tra cui: Cecilia Frosinini, *The Adoration of the Magi - The Fertile Mind of Leonardo da Vinci*, New York University, 3 dicembre 2013 (2013-2014 NYU Kress Lecturer in Paintings Conservation); Cecilia Frosinini, *The Adoration of the Magi like you've never seen it before*, The Metropolitan Museum of Art, 9 dicembre 2014.

Scopo di questo atlante è quello di illustrare, attraverso un panorama di immagini in sezione sottile petrografica al microscopio ottico polarizzatore in luce trasmessa, varie tipologie di malte che si differenziano per tipo di legante (aereo, idraulico, ecc.) e per caratteristiche tessiturali e granulometriche non sempre di facile identificazione.

Purpose of this atlas is to illustrate, through a panorama of images of thin sections observed under optical microscope in transmitted light, several typologies of mortars which differ in type of binder (air hardening, hydraulic, etc.), textural characteristics and grain size.



Elena Pecchioni, Fabio Fratini, Emma Cantisani

ATLANTE DELLE MALTE ANTICHE

IN SEZIONE SOTTILE AL MICROSCOPIO OTTICO

ATLAS OF THE ANCIENT MORTARS

IN THIN SECTION UNDER OPTICAL MICROSCOPE

Formato cm 21x29,7, brossura,
100 sezioni sottili a colori, pagine 80, € 25

Mnemosyne – Istituto per la Salvaguardia del Patrimonio Storico

Il maggiore impegno di Mnemosyne:
RIPRENDERE LE PROPOSTE DI GIOVANI URBANI PER LA CURA DEI CONTESTI AMBIENTALI e condizione per la duratura conservazione anche delle singole opere d'arte

I contributi dell'Istituto Mnemosyne di Brescia alla Rubrica "Cultura dei beni culturali" di *Kermes* iniziarono nel 2007. Fu nel n. 64 (Gennaio-Marzo 2007) che fu pubblicato il Bando per la prima edizione del Premio "Giovanni Urbani"[1] per Tesi di Laurea dedicate alla ricerca e alla sperimentazione dei processi della conservazione programmata. Nuovo processo di salvaguardia proposto dall'ICR nel 1976 con il "Piano pilota per la conservazione programmata dei beni culturali in Umbria".

Come documentato dalle note pubblicate sui successivi numeri di *Kermes*, l'Istituto Mnemosyne ha continuato a riproporre le indicazioni di Giovanni Urbani sviluppando – assieme alla conduzione degli Incontri "Le parole della salvaguardia dell'arte"[2] – la promozione dei Seminari del Progetto "Ecologia per l'arte"[3] e l'edizione di opere che documentano l'azione svolta per recuperare e dare attualità alle sue "proposte disperse"[4].

Ma non solo riflessioni e scritti ha sviluppato l'Istituto Mnemosyne.

Tra il 2013 e il 2014, come documentato in *Kermes* 90 e 92, ha condotto (per conto della Diocesi di Brescia e grazie ad uno specifico contributo della Fondazione Cariplo) la ricerca-documentazione denominata "Piano di gestione per la prevenzione e la conservazione del patrimonio storico-architettonico del sistema delle Parrocchie del centro storico di Brescia".

In questo 2015 (mentre sta avviando un nuovo "Piano" per rinnovare, per conto della Congrega Apostolica di Brescia la ricerca-documentazione già realizzata per conto della Diocesi), l'Istituto Mnemosyne sta curando, in *Kermes*, il Dossier *La cura dei territori storici* con il quale persegue l'obiettivo di sviluppare al meglio la principale e più innovante proposta di Giovanni Urbani: soprattutto la cura delle condizioni ambientali consente di favorire la durabilità delle risorse d'arte che, di ogni territorio, manifestano l'intrinseca musealità.

Note

[1] Al primo Bando del 2007, seguirono quelli del 2009 e del 2011.

[2] Gli incontri dedicati a "Le parole della salvaguardia" sono stati programmati nel 2006 e nel 2008:
– 2006. *Conoscere per conservare.* 1. La salvaguardia nei progetti europei di ricerca; 2. Il controllo dei fattori di degrado; 3. Ricerca storica e ricerca scientifica per la salute dell'arte; 4. Quale salvaguardia per i territori storici?
– 2008. *Non solo Restauro: anzitutto Prevenzione e Manutenzione.* 1. Il recupero di Palazzo Pirelli a Milano; 2. Associazioni, editori e riviste per la salvaguardia del patrimonio storico; 3. L'esperienza delle Fabbricerie per la manutenzione degli antichi edifici ecclesiastici; 4. Quali materiali per la manutenzione?

[3] I Seminari programmati e condotti dall'Istituto Mnemosyne, sono:
– 2007. Quale ricerca storica e scientifica per la durabilità del patrimonio storico del Museo Italia?
– 2008. Dalla riduzione delle cause di degrado alla promozione delle condizioni della durabilità dei materiali di storia e d'arte: ricerche e sperimentazione.
– 2009 (con *Kermes*). In memoria di Giovanni Urbani: esperienze di conservazione preventiva (Firenze).
– 2010. Ambienti per la durabilità dei materiali di storia e d'arte (Ferrara).
– 2011. La complessità dei processi di conservazione (Firenze).
– 2012. Non solo "ri-restauri per la durabilità dell'arte (Ferrara).
– 2013. Dai processi di restauro ai processi della durabilità (Firenze)

[4] I volumi pubblicati da Mnemosyne sono:
– *I fattori ambientali che incrementano il degrado dei materiali di storia e d'arte della Valle del Garza*, Brescia, Mnemosyne, 2005.
– *Codici per la conservazione del patrimonio storico*, Firenze, Nardini Editore, 2006.
– *Non solo "ri-restauri" per la durabilità dell'arte*, ebook, Firenze, Nardini Editore, 2012.
– *Dopo Giovanni Urbani. Quale cultura per la durabilità del patrimonio dei territori storici?*, ebook, Firenze, Nardini Editore, 2014.
Con Nardini Editore, per pubblicare le Tesi prescelte dal "Premio Giovanni Urbani", l'Istituto Mnemosyne ha avviato la collana "Cultura e scienza della durabilità dei materiali di storia e d'arte".

CAMPAGNA DI DOCUMENTAZIONE DELLO STATO DI CONSERVAZIONE DELL'OPERA *LA BELLA PRINCIPESSA* ATTRIBUITA A LEONARDO DA VINCI

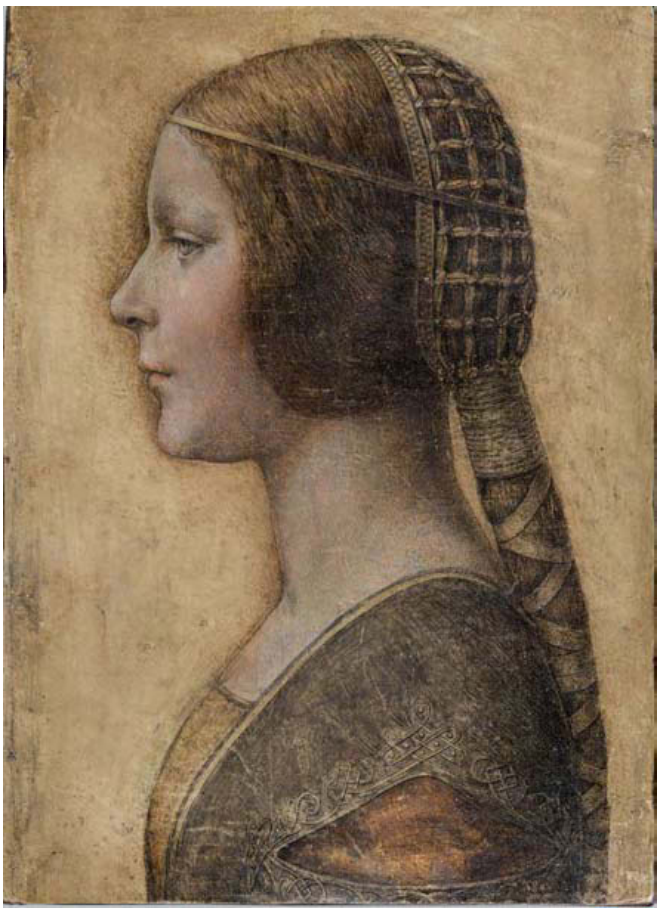
CCR – Centro Conservazione e Restauro "La Venaria Reale"

Centro Conservazione e Restauro
La Venaria Reale

Il CCR ha collaborato alla campagna diagnostica per documentare lo stato di conservazione del disegno su pergamena noto come "Bella Principessa" attribuito a Leonardo da Vinci, di proprietà privata ed eccezionalmente esposto al pubblico in anteprima mondiale al Palazzo Ducale di Urbino dal 6 dicembre 2014 al 18 gennaio 2015. L'opera è stata eseguita con pastelli colorati e inchiostro su un foglio di pergamena facente parte del codice *Commentarii rerum gestarum Francisci Sfortiae*, conosciuto anche come Sforziade di Varsavia. La pergamena, dopo essere stata rimossa dal manoscritto, fu collocata per mezzo di un adesivo su un supporto in legno di quercia.

La campagna di analisi con tecniche non invasive per immagine (fluorescenza UV e riflettografia UV in falso colore, infrarosso, infrarosso falso colore) è stata eseguita per documentare la tecnica esecutiva e i materiali costitutivi e registrare efficacemente lo stato di fatto dell'opera in previsione dell'esposizione temporanea in altri luoghi di conservazione. Le indagini finalizzate a monitorare le condizioni conservative del disegno, in vista del trasferimento a Urbino, hanno rappresentato una preziosa opportunità per il Centro per proseguire con la sperimentazione della tecnica RTI (Reflectance Transformation Imaging), già testata sull'*Autoritratto* di Leonardo della Biblioteca Reale di Torino in occasione della sua esposizione in mostra alla Reggia di Venaria nel 2011, del quale ad esempio sono state riconosciute e misurate le tracce lasciate dalle vergelle durante il processo produttivo della carta.

La procedura RTI costituisce infatti uno strumento scientificamente validato per l'analisi e il monitoraggio non invasivo delle caratteristiche morfologiche superficiali e cromatiche dell'opera d'arte, tramite comparazione matematica delle normali alla superficie e restituzione della cromia su file RAW certificato e non modificabile. Selezionando la direzione dell'illuminazione (dal piano d'opera allo zenith) e applicando guadagni e filtri si ottengono iperradenze e particolari della morfologia del supporto o della stesura della pellicola pittorica. Il confronto con la radenza tradizionale permette di dare una lettura più aderente alla consistenza materica della superficie



La Bella Principessa, *fotografia in luce visibile.*

La Bella Principessa, *fotografia in fluorescenza UV.*

La Bella Principessa, *fotografia in riflettografia IR (1150 nm).*

La Bella Principessa, *elaborazione grafica della scansione laser.*

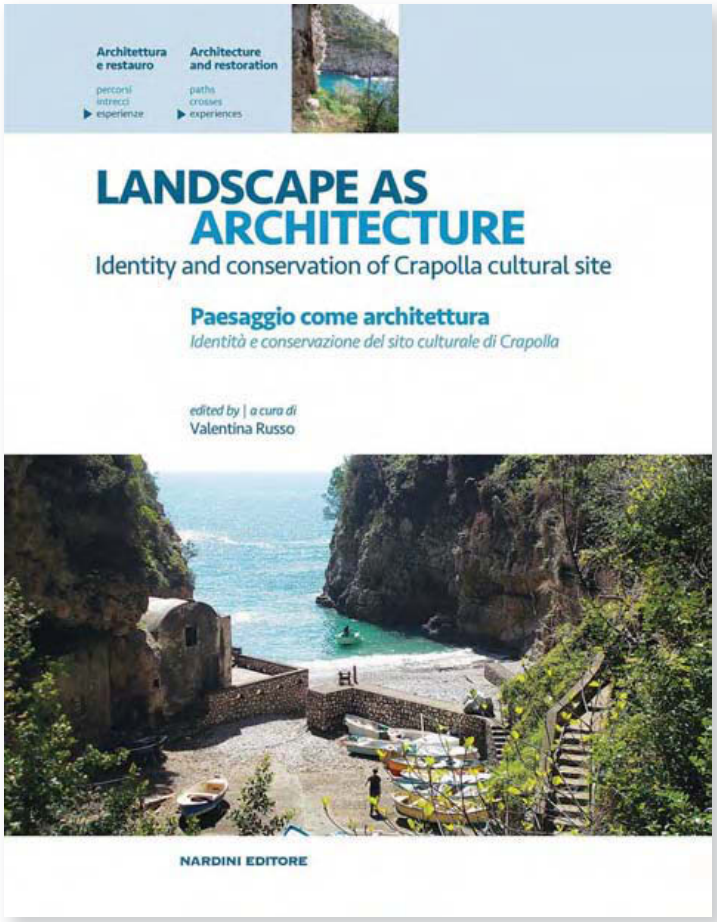
indagata. L'RTI consente inoltre l'integrazione delle tecniche multispettrali per immagine: differentemente dal caso dell'*Autoritratto* conservato a Torino, sulla Bella Principessa è stato eseguito anche un rilievo RTI in infrarosso, con la finalità di ottimizzare le informazioni derivanti dalla banda visibile e trarre considerazioni sul supporto in relazione alla prima fase di underdrawing.

Allo scopo di documentare ulteriormente lo stato di fatto dell'opera, è stata eseguita una scansione laser a medio raggio e una fotogrammetria tridimensionale del supporto pergamenaceo e di quello ligneo: attraverso la prima tecnica è possibile ottenere un modello tridimensionale referenziato metricamente, con il rilievo della volumetria ad altissima definizione. Con la seconda tecnica, oltre all'acquisizione delle volumetrie, si è ottenuto il dato d'immagine correttamente bilanciato dal punto di vista espositivo e cromatico. Questi rilievi hanno consentito di segnare un "punto zero" attraverso cui operare confronti metrici di ulteriori scansioni dell'opera in seguito alle variazioni del luogo di conservazione, come nel caso di esposizioni o mostre, durante i quali il supporto pergamenaceo o quello ligneo potrebbero subire variazioni tensionali/strutturali legate alla variazione dei parametri di temperatura e umidità relativa o a stress meccanici.

Sulla base della campagna conoscitiva effettuata, il Centro ha inoltre supportato le attività legate all'esposizione della Bella Principessa nel Palazzo Ducale di Urbino con la redazione di una scheda tecnica di rilevamento utile al monitoraggio dello stato di conservazione e un condition report sullo stato di fatto dell'opera preliminare e funzionale alla movimentazione.

Starting from the urgent problems and complex challenges for the conservation of stratified landscapes, places of the synthesis between human activity and nature, the volume presents the results of a research project ...

A partire dalle cogenti problematiche e sfide complesse connesse alla conservazione dei paesaggi stratificati, luoghi di sintesi tra azione umana e natura, il volume presenta i risultati di un percorso di ricerca ...



***edited by/a cura di* Valentina Russo**

LANDSCAPE AS ARCHITECTURE

Identity and conservation of Crapolla cultural site

Paesaggio come architettura

Identità e conservazione del sito culturale di Crapolla

Formato cm 21x27, brossura,
oltre 600 immagini in b/n e a colori, pagine 424, € 40

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TACCUINO IGIIC

Sostenibilità della conservazione, ma oltre le mode ...

Il termine Sostenibilità è diventato soggetto di moda e di culto. Quanti precursori si sono oramai persi e, a volte, vengono riportati alle cronache da qualche vetero romantico o distratto naif fuori tempo. Fra questi come non pensare al termine Reversibilità, così come a Compatibilità, Manutenzione, Minimo Intervento e via così. Oggi come oggi non si può fare a meno di pensare che ogni azione sia da fare secondo un concetto di Sostenibilità.
Molti sono anche gli incontri e i congressi in cui si trova questo concetto e non solo in forma di approccio, come accade nei congressi dell'IGIIC, dove la sezione di Sostenibilità è stata prevista in tempi non sospetti, già da qualche anno. Oramai ci sono incontri e congressi specifici sulla sostenibilità del restauro. Il gioco, a questo punto, si fa morboso, ci si arrovella e arrabatta attorno alle definizioni, ai pilastri principali della Sostenibilità, come per esempio quelli citati più comunemente: economia, sociale e ambiente. Ci si sforza ed interroga per trovare la via per dare al restauro quel supporto di Sostenibilità che gli permetta di entrare a pieno titolo nei luoghi dorati dei finanziamenti nazionali o internazionali.
Tutto questo movimento, mi sembra, abbia perso la definizione dei valori del contesto e la domanda, per me che opero da anni nel settore della conservazione, nasce spontanea e cioè, ma allora fino ad oggi ho lavorato per conservare parti di un patrimonio comune che, per vari motivi, non ha raggiunto i valori richiesti di una Sostenibilità e, quindi, ho lavorato per nulla!
È evidente che la definizione dei valori rappresenta il punto di riferimento. Se il valore del salvataggio di una testimonianza culturale, sia materiale e sia immateriale, può misurarsi solo con l'impiego di un abaco, tanto per dare dignità superiore e storica a quello che da piccoli chiamavamo comunemente pallottoliere, allora penso che a nulla serve preoccuparsi di quanto sta succedendo in alcuni paesi iconoclasti, alla fine essi si tolgono dai piedi solo cose costose e di poco conto.
Ecco dove, da sempre, sta la mia difficoltà a parlare di Sostenibilità nel settore della conservazione, semplicemente dal fatto che ritengo che il valore della memoria di una nazione e di una cultura sia un patrimonio inestinguibile che persino le evoluzioni genetiche si portano dietro, a retaggio di quella origine pseudo animale che spesso neghiamo. Il problema, se si vuole usare un termine con accezioni negative e molto usato, sta nel fatto che la Cultura, e usa la C maiuscola perché così la intendo, sta nel fatto che essa non compare mai come valore principale, in nessuno degli scritti degli ultimi meeting fatti, dai grandi delle varie nazioni, nella volontà di definire i valori con cui migliorare la vita sulla Terra. Lo dimostra il fatto che anche nelle politiche europee la cultura è un sotto prodotto dell'ambiente, priorità d'investimento 6c (tutelare e promuovere il patrimonio naturale e culturale), e non ha una dignità sua propria, come se non dovessimo pensare a salvaguardare un concetto culturale europeo già fortemente influenzato dalle americanate e da altre cose che stanno per arrivare.
Non parliamo poi del valore che viene dato alla materia e alla sua conservazione. La grande scommessa, anche scientifica, che rappresenta la conservazione è da sola capace di muovere spazi di ricerca e di sviluppo che solo pochi comprendo appieno. Capire come sistemi multimaterici, con interfacce non sempre omogenee, abbiano superato i tempi, nonostante calamità o azioni a loro, per fortuna solo teoricamente, contrarie, non sembra faccia parte di un valore aggiunto, anzi sia il lato B del disco del progresso. Peccato che ad oggi nessuno sia più in grado di fare un battuto a cocciopesto capace di isolare le abitazioni dall'umidità di risalita, cosa invece assai comune in epoca romana.
È evidente che, quindi, mi sento schiacciato da questo insieme di InSostenibilità che hanno come scopo solo la salvaguardia del nostro patrimonio e, per di più, utilizzando una scienza applicata come quella della conservazione, tutte azioni contro il progresso. A parte le considerazioni e il tono ironico, resta il concetto di una lacuna culturale che è manifesta proprio nel settore della conservazione del patrimonio culturale e nella sua collocazione all'interno dei processi economici attuali.
È lungi da me l'intenzione di sminuire alcuni dei concetti espressi in questo senso a livello internazionale, ma, restando nel mio piccolo, sento carente quel supporto alle iniziative tese a produrre qualità nel settore del restauro e della conservazione. Forse è una visione un po' snob, ma è pur vero che è altrettanto stiracchiato questo rincorrere le mode e le terminologie che esse portano con sé.
Nel frattempo, grazie alla disponibilità e al volontariato che da sempre caratterizza il Gruppo Italiano dell'IIC, noi cerchiamo di mantenere attaccate al piano operativo le nostre attività di diffusione e confronto nel settore della conservazione del patrimonio mirando sempre più a guardare a quel vuoto di discussione che sembra diffuso in merito alla pratica applicata del restauro, pur restando sempre attenti alle interferenze culturali, ma con quell'icona di riferimento che è rappresentata dall'oggetto o dagli oggetti da conservare.
Il nuovo incontro assembleare e congressuale – *Lo Stato dell'Arte 13*, 22-24 ottobre 2015 – ha trovato, quest'anno, l'interesse e la volontà di ospitarci nella scuola di restauro della Venaria Reale. Un evento e un interesse che rafforza quell'interesse che da tempo stiamo riscontrando da parte degli Istituti di formazione, siano essi Università o Accademie. È questo il giusto punto di riscontro per comprendere come effettivamente il Gruppo raccoglie attorno a sé coloro interessati a confrontarsi sulle evoluzioni della pratica della conservazione con l'evidente scopo di migliorare le proprie conoscenze a favore di quella qualità di intervento che deve far parte dell'approccio etico del nostro operare, perché senza confronto non vi è crescita.
Il congresso/assemblea, giunto oramai alla sua XIII edizione, spiazza un po' quella migrazione continua nelle varie parti del territorio, dato che segue di un anno il congresso di Milano, ma è anche vero che le dinamiche messe in modo dall'evento Expo, per altro evidenziato nella scorsa edizione con la sezione "grandi eventi" all'interno dei temi congressuali, favoriscono questa scelta anche in funzione della concentrazione di attività che questo genere di occasioni generano, nel bene e nel male.
Partecipare al congresso/assemblea sarà quindi un modo per ritrovarsi e anche per mantenere questo ruolo di appartenenza del gruppo a quelle che sono le aspettative dei suoi soci e, inoltre, sarà anche il momento per condividere alcune delle iniziative che sono intraprese e trovare quegli spazi ulteriori di incontro e confronto. La presenza al congresso è di sicuro importante, ma ricordo a tutti che il momento dell'assemblea è di per sé fondamentale per far si che l'IGIIC sia sempre di più la casa di ogni iscritto.

Lorenzo Appolonia
Presidente IG-IIC

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Licia Vlad Borrelli
La fucina di Vulcano. I metalli nel mondo antico: storia, tecnologia, conservazione
Viella
Roma, 2014
ISBN 978-88-6728-278-4
pp. 172, brossura, €19,00

La straordinaria operosità di Licia Vlad Borrelli ci regala un altro gioiello. Nitidamente spartito in tre sezioni, il libro non esagerato di pagine ma ricchissimo di contenuti presenta nella prima le informazioni storiche: riferimenti letterari, testimonianze figurative, fonti (in bibliografia, troverete al proposito quaranta titoli), miniere (in greco, *métallon* significa appunto miniera, e il termine è connesso, ricorda la Vlad, con *metalláo*, "cercare", anche se l'etimologia data da Plinio è differente). Segue la sezione sui minerali, in numero di undici, dal rame allo zinco, farcita di notizie storiche e tecniche. Termina la sezione sulla conservazione, nella quale vengono presentati i restauri più significativi, tutti relativamente recenti, ognuno dei quali sicuramente dotato di elementi aperti alle discussioni. La linea interpretativa dell'autrice è tesa ad una qualità di studi che veda approfonditi ed utilizzati contestualmente gli elementi tecnici e storici, dovendo lamentare da un lato che i primi siano stati troppo spesso trascurati, nei confronti dei secondi, per atteggiamento "sufficiente" di studiosi e insufficienza di consapevolezza teorica, conoscenze ed esperienze; ma anche ammonendo che non abbia a verificarsi "quel pericoloso scavalcamento – in effetti una abdicazione -, alla quale potrebbero condurre le trionfanti certezze di un nuovo positivismo" (p. 119). Quanto alle metodologie di teoria del restauro, vorrei osservare però che nello spazio dedicato alla Minerva di Arezzo (pp. 120-121), richiamato giustamente dall'autrice il "corrente criterio deontologico che impone il rispetto dei restauri cosiddetti storici", non si fa esplicitamente parola della vera questione che rimane ancora adesso a provocare robuste perplessità sulle scelte effettuate a suo tempo dalla direzione del Laboratorio di Restauro della Soprintendenza Archeologica. Non mi riferisco allo smontaggio e alla sostituzione del sistema storico di rinforzo strutturale studiato da Francesco Carradori nel suo restauro del 1785, soluzione che evidentemente non conosceva oggi alternative, quanto alla rimozione non soltanto dell'intero braccio destro ma perfino "dell'innocua metà anteriore del Serpentello sull'elmo della Minerva" aggiunta appunto da Carradori; convinto come sono che le "Entrestaurierungen", i derestauri, si rivelino una "pratica, [che] se applicata estesamente, innesca processi dotati di conseguenze incalcolabili … una china pericolosa, in cui i costi appaiono sempre infinitamente più alti dei benefici" ("Aperto per Restauri", in "Giornale dell'Arte", n. 289, aprile 2009). Il libro termina con l'esame del restauro del Bronzo di Lussino, condotto dalle autorità croate insieme con l'Opificio; laddove le sinergie internazionali "Rappresentano…la più innovativa e feconda conquista degli ultimi anni, traguardo di una scienza che non tollera confini".

Giorgio Bonsanti

Giuseppina Perusini
Simon Horsin-Déon e il restauro in Francia alla metà del XIX secolo
Edifir
Firenze, 2013
ISBN 978-88-7970-599-8
317 pp., brossura, €20,00

Anni fa Ségolène Bergeon intitolò un libro sul restauro dei dipinti *Science et patience, ou La restauration des peintures*: munita di questi requisiti, e di passione, senza la quale non si può intraprendere nessuna impresa intellettuale, Giuseppina Perusini ha compiuto le sue ricerche per consegnarci quest'opera, estremamente utile per chi si occupa di storia della conservazione delle opere d'arte, l'ultima (per ora) tessera di un mosaico di studi di dimensione europea. Per ricostruire la personalità di Simon Horsin-Déon, figura di restauratore ignota in Italia ma oggetto di scarsa attenzione anche in Francia, ha esplorato gli archivi parigini e provinciali, a partire da Sens, dove Déon era nato nel 1812. Il risultato è il vivo ritratto di un uomo impegnato su più fronti, restauratore ma anche connoisseur, collezionista, mercante, consulente per case d'asta, saggista polemico. Va detto che un primo grande merito del testo è quello di concentrarsi sugli anni Quaranta-Cinquanta dell'Ottocento, superando le colonne d'Ercole del 1815, data alla quale si arrestano anche gli studi più recenti sulla storia della conservazione in Francia.
Una parte rilevante del testo è dedicata al trattato *De la conservation et de la restauration des tableaux*, pubblicato da Horsin-Déon nel 1851, tradotto per la prima volta in italiano e commentato dalla Perusini. L'opera ha una struttura dispersiva, in cui i dati sul restauro sono mescolati a considerazioni sulle tecniche esecuti-

ve e a biografie di artisti francesi, impostate su toni agiografici.
Viene innanzitutto affrontato il tema della foderatura dei quadri su tela e del trasporto del colore da tavola a tela, operazioni di cui Déon rivendica la paternità francese (Picault, Haquin), mentre è noto come interventi del genere fossero praticati sa Napoli e a Roma dall'inizio del Settecento. Vengono elogiati gli interventi di distacco dei dipinti murali, oggetto di critiche in Italia già nel 1825 da parte di Cicognara. La tematica gli fornisce lo spunto per un attacco alla gestione dei restauri nel nostro paese, tacciato di arretratezza nel campo delle foderature, dei trasporti di colore e delle parchettature. Non è chiaro in che modo si sia formato tale opinione, dato che i suoi contatti con l'Italia erano consistiti in un giovanile soggiorno romano nel 1828, in viaggi in Liguria negli anni Quaranta e a Roma nel 1844 per la vendita della collezione Fesch: è possibile che le sue impressioni riguardino l'ambiente romano.
Ci troviamo comunque di fronte, come in altri scritti di Horsin-Déon, ad un'esaltazione nazionalistica dell'operato dei restauratori francesi.
Nel capitolo dedicato alle preparazioni l'autore si dedica ad osservazioni sui procedimenti esecutivi attribuendo agli artisti italiani la scelta di supporti lignei come il cedro e la quercia, una notizia errata di cui non si riesce a capire la fonte. Vengono elogiate le preparazioni chiare, tipiche del primo Ottocento francese, mentre a quelle scure vengono imputati gravi difetti, un atteggiamento critico che suscitò l'approvazione da parte di Pietro Selvatico nel 1856.
Nella seconda parte viene proposta una classificazione dei restauratori in tre categorie: restauratori veri e propri (*peintres-restaurateurs*); operatori di livello inferiore, chiamati in Italia restauratori "dei quadri di fabbrica"; praticoni che intervenivano in modo grossolano su opere di bassa qualità.
Le operazioni di restauro vere e proprie iniziano con la descrizione dell'asportazione delle vernici e dei ritocchi: le prime potevano essere rimosse sfregando con le dita – metodo ancora consigliato dal pittore napoletano Morelli alla fine dell'Ottocento – oppure con miscele di alcol ed essenza di trementina. Nel caso di vernici oleose o proteiche si passa a metodi più drastici, basati su sostanze alcaline – diffuse d'altronde in Italia almeno sino alla Seconda Guerra Mondiale – su acqua ed olio caldi; più blande e con un certo carattere di novità risultano le applicazioni di impacchi di cotone imbevuti di alcol. Lo sporco viene rimosso con le sostanze alcaline contenute nella miscela di sapone nero e ceneri setacciate, la 'lisciva' già citata alla fine del Seicento da Volpato.
Si accenna allo sbiancamento delle vernici, originato, secondo Déon, da attacchi di muffe: dodici anni dopo a Monaco di Baviera Pettenkofer confuterà tale ipotesi, individuando cause di natura fisica, a cui cercherà di porre rimedio con il celebre quanto criticato metodo della rigenerazione alcolica e della 'nutrizione' dei dipinti con balsamo di copaive, oggetto del convegno del 2001 dedicato al restauratore Giuseppe Valentinis, coordinato dalla Perusini. Interessante è la descrizione dei diversi tipi di crettature che possono rinvenirsi nei dipinti, un argomento che meriterebbe ancora oggi di essere maggiormente approfondito.
Il ritocco pittorico deve essere eseguito imitando l'effetto delle stesure originali con pennellate minuziose, servendosi di colori ad olio con essenza di trementina: le tempere medievali dovranno però essere ritoccate con pigmenti mescolati a miele o gomme. I materiali coloranti giudicati adatti per il ritocco comprendono anche la biacca, il bitume (oggetto di accese discussioni per la sua tendenza a scurirsi e a crettarsi) e

il blu minerale (blu di Prussia con sali di alluminio e bario) - questi ultimi due esclusi più avanti da Secco Suardo; si nota l'assenza dei verdi. Nelle lacune occorre intervenire con il sistema del puntinato, oggetto di forti critiche da parte di altri operatori ottocenteschi.
Il capitolo è particolarmente interessante perché viene descritta l'esecuzione dei "quadri di fabbrica", con un atteggiamento ambiguo, dato che viene esplicitamente enunciato come il ritocco pittorico possa trasformare un dipinto mediocre in un'opera di un grande maestro, operazione da una parte definita un esercizio "pericoloso", dall'altra oggetto di una schietta ammirazione nel caso degli operatori più abili. Non si tratta di falsi ex-novo ma siamo comunque di fronte ad una spregiudicata imitazione, che comprende l'uso di vernici antichizzanti e l'incisione di finte craquelures con aghi. Comunque patine in grado di restituire ai dipinti il "tono antico" sono consigliate anche da Forni e Secco Suardo.
La Perusini dedica un capitolo alla fortuna critica del manuale, con particolare attenzione alla sua ricezione in Italia. Forni e Secco Suardo sono accumunati dalle critiche all'atteggiamento e ai metodi del collega francese (l'uso dell'olio nei ritocchi, ad esempio) e nella difesa dell'operato dei restauratori italiani, anche se Forni utilizza diversi brani del trattato senza citarne l'autore; Secco Suardo denuncia invece apertamente il rilievo che Déon dà ai "restauratori di quadri di fabbrica", che vengono definiti sostanzialmente dei falsari.
Un contributo veramente significativo del volume sono le parti dedicate a due episodi in cui il restauratore ebbe un ruolo significativo, ossia il concorso del 1848 e le polemiche sugli interventi ai dipinti del Louvre degli anni Cinquanta.
Già alla fine del Settecento si era avuto in Francia un tentativo, non andato in porto, di istituire mediante un concorso il ruolo di restauratore statale. Il progetto fu ripreso nel 1848 e portato avanti dal conservatore delle pitture Frédéric Villot sino al compimento nel 1850, con un complesso iter, ricostruito brillantemente dall'autrice grazie anche a documenti inediti, che prevedeva il raggiungimento delle qualifiche di esperto in foderature e trasporti, pulitura e ritocco.
L'operato dei candidati veniva valutato anche alla luce di quelle che oggi potremmo chiamare 'prove di invecchiamento artificiale', applicate sia alle foderature – i dipinti dovevano essere sottoposti alternativamente a calore e umidità per sei mesi – sia ai ritocchi – le opere dovevano essere tenute sia al buio che esposte alla luce solare. Quasi sicuramente questa attenzione all'azione dei fattori ambientali era dovuta all'influsso delle ricerche degli scienziati francesi (Guyton de Morveau, Chaptal, Thénard) applicate al restauro già dai primi anni dell'Ottocento, come annota giustamente l'autrice, che trova riscontro in Italia nelle ricerche del chimico pisano Giuseppe Branchi nei primi quarant'anni dell'Ottocento. I vincitori dell'estenuante concorso conseguirono nel 1850 solo una idoneità che non garantiva affatto un posto fisso presso il Louvre e neppure la sicurezza di essere chiamati ad effettuare interventi conservativi sulle pitture pubbliche: la vicenda ha forti punti di contatto con recenti vicende concorsuali nel campo dei beni culturali in Italia.
Horsin-Déon partecipò alle prove, fu nominato membro del *Jury* dei concorrenti, che doveva esprimere un giudizio provvisorio sulle diverse fasi, ed eletto presidente dell'associazione dei partecipanti, indizi questi della stima che godeva presso i colleghi. Tuttavia il suo ruolo di portavoce non gli impedì criticare in modo acceso l'operato di Villot, di fatto il giudice supremo del concorso, e questo non fu gradito da alcuni dei concorrenti. Alla fine fu inserito nell'elenco degli idonei ma non venne mai chiamato ad operare nelle collezioni statali.
Anche in Italia furono fatti alcuni tentativi, all'inizio del secolo di regolamentare l'accesso ai ruoli di restauratori di collezioni statali, di portata ristretta; in particolare è stato recentemente descritto da Mariolina Olivari il concorso svolto a Brera nel 1813 (*Qualche informazione sui restauratori agli inizi di Brera: la successione ad Appiani*, in *Studi in onore di Maria Grazia Albertini Ottolenghi*, a cura di M. Rossi, A. Rovetta, F. Tedeschi, Milano, Vita e Pensiero, 2013, pp. 195-199).
L'altra vicenda in cui il restauratore venne coinvolto fu la *querelle* sulle puliture dei dipinti del Louvre: opportunamente l'autrice premette un'efficace sintesi dello svolgimento di una vicenda analoga, relativa alle puliture nella National Gallery di Londra (1846-1853), non ancora abbastanza nota in Italia. Le critiche agli interventi mosse per mezzo della stampa suscitarono un notevole interesse da parte dell'opinione pubblica, convincendo il governo inglese ad istituire una commissione, che raccolse i pareri di numerosi esperti, anche stranieri. Il rapporto finale conteneva raccomandazioni sulla conservazione dei dipinti, sul controllo delle puliture e sulla collaborazione con gli scienziati, quest'ultima già avviata, come si è detto, in Francia e in Italia, a Pisa, ma anche a Napoli e più tardi, ad opera del Selvatico, nel corso dei restauri della cappella Scrovegni a Padova.
Le polemiche in Francia si avviarono nel 1851, attraverso campagne di stampa rivolte contro l'operato di Villot, inviso a molti anche per il suo comportamento arrogante, che fu costretto a dimettersi nel 1860. È interessante notare come Déon ritenne in quell'occasione di intervenire, sia pur coperto dall'anonimato e nonostante i pessimi rapporti personali con il conservatore, avendo compreso che veniva messo in discussione il concetto stesso di restauro. Il suo intervento fu l'unico proveniente dalla categoria dei restauratori, sottolineando, in sintonia con Villot, la necessità di rimuovere le patine dovute alle ripetute verniciature scurite, quelle che i critici delle puliture consideravano invece un aspetto fondamentale della ricezione delle opere, secondo "il gusto consacrato dai secoli".
La Perusini molto opportunamente

istituisce un confronto tra le vicende inglesi e francesi e propone articolate riflessioni sull'influenza dell'evoluzione della cultura visiva nelle diverse epoche sulle strategie del restauro e sul giudizio sugli interventi conservativi precedenti.
Il suo testo ci fa rivivere le vicende e soprattutto l'approccio culturale di un'epoca fondamentale per la costruzione del restauro moderno, aprendo pagine di storia ignote agli stessi ricercatori francesi: esso si propone come una lettura molto stimolante per gli studenti come per gli studiosi.

Paolo Bensi

Christoph Schölzel
Gemäldegalerie Dresden: Bewahrung und Restaurierung der Kunstwerke von den Anfängen der Galerie bis 1876
Verlag Gunter Oettel
Görlitz, 2012
ISBN 978-3-938583-80-7
pp. 456, €60,00

Anche se la pubblicazione di questo libro non è recentissima, abbiamo comunque ritenuto obbligatorio darne notizia sulla nostra rivista in considerazione dello straordinario valore del libro, sia per i contenuti offerti che per il modello presentato. L'autore è restauratore presso la Gemäldegalerie (Galleria dei Dipinti) di Dresda, e gioverà allora in primo luogo ricordare che si tratta di una collezione fra le più importanti in esistenza, per la storia secolare che l'accompagna e la coerenza progettuale nelle acquisizioni scelta e mantenuta nel tempo. In particolare, le campagne settecentesche di acquisti dei due Federico Augusto, il Secondo e il Terzo, costituirono i nuclei sostanziali delle pitture che ancor oggi (tranne alcune poche per quanto lamentevoli perdite di guerra) stanno a caratterizzare Dresda fra le grandi raccolte internazionali. Nel Museo troverete ancor oggi la massima parte dei cento quadri che poco prima della metà del Settecento lasciarono la Galleria Estense di Modena per raggiungere la capitale sassone, a cominciare dalle quattro grandi pale del Correggio;

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come anche altri dipinti di provenienza emiliana pervenuti indipendentemente, come da Piacenza la Madonna Sistina di Raffaello o da Bologna l'Annunciazione di Francesco Cossa. È da tenere anche presente che l'architettura del Museo costruito alla metà del secolo XIX, così come lo vediamo ancor oggi, è dovuta al noto architetto Gottfried Semper (autore in Dresda anche della famosa Opera, ricostruita modernamente in ogni suo dettaglio dopo la distruzione bellica) [1]. I rapporti con l'Italia della "Firenze sull'Elba", fra XVIII e XIX secolo, furono comprensibilmente continui e strettissimi, e possiamo eleggere a simboleggiarli il soggiorno del restauratore romano Pietro Palmaroli, fra 1826 e 1827. Palmaroli fu chiamato apprezzabilmente a Dresda principalmente per il restauro della Madonna Sistina, ma in quel breve periodo pose mano ad una cinquantina di quadri della Galleria. L'iniziativa del principe Federico Augusto (non c'era molta fantasia per i nomi, in quella Corte) era stata corroborata da una famosa, bellissima lettera del direttore degli Uffizi, Antonio Ramirez Montalvo (1823), indirizzatagli in risposta alle sue domande di consigli e indicazioni (la trovate, p. es. , nel libro di Giuseppina Perusini sul Manuale di Christian Koester).

Ma riprendiamo con ordine. Il lavoro pluriennale di Schölzel, svolto in parte anche nell'ambito di una tesi di dottorato condotta con il grande studioso Ulrich Schiessl, purtroppo prematuramente scomparso qualche anno addietro, è consistito in uno scavo metodico ed assiduo degli archivi locali; potendo e sapendo però mettere in connessione le notizie storiche e storico-artistiche, ed è questo il plusvalore della ricerca, con gli argomenti relativi specificamente alle questioni di conservazione e restauro. Il libro, di grande formato, si presenta così nitidamente spartito in due parti. Una prima, di cinque capitoli; ognuno dei quali contiene nell'ordine la storia delle collezioni e della loro presentazioni negli edifici che le albergavano, sia per quanto riguarda la loro materiale confezione che per ogni altra circostanza relativa; seguiti da altri paragrafi dedicati alle tecniche e metodologie di restauro: puliture, vernici, foderature, stuccature e ritocchi, misure generali di conservazione. La seconda parte si concentra su alcuni "case studies" particolarmente significativi, a cominciare ovviamente dalla Madonna Sistina; ma menzioneremo anche almeno, fra gli altri dipinti, il superbo trittichetto di Jan van Eyck, di cui viene ricordata l'antica provenienza italiana. La ricchezza delle collezioni è tale, che alcuni fra i massimi capolavori trovano nel libro soltanto brevi menzioni, dall'Annunciazione del Cossa sopra ricordata, al San Sebastiano di Antonello, a quell'incredibile dipinto che è il Giove e Ganimede di Rembrandt. Seguono alcune appendici di documenti o tabelle, di grande utilità nel riassumere e presentare le conoscenze accumulate da Schölzel nel corso dei suoi studi. I capitoli centrali per noi Italiani, naturalmente, sono quelli (terzo e quarto) che si riferiscono ai preliminari e poi alla effettiva chiamata a Dresda di Palmaroli, con la sua attività di restauro compiuta nella città. Alcune delle osservazioni da lui redatte nell'occasione confluirono dopo la sua morte (1828) nella terza edizione del Saggio analitico chimico sopra i colori… di Lorenzo Marcucci (1833; 1° ed. 1813). Ricordiamo che Palmaroli eseguiva i restauri pittorici con attenzione sicuramente precocissima a due condizioni fondamentali che sono divenute imprescindibili oggi, la reversibilità (le sue stuccature risultavano solubili in acqua) e la riconoscibilità, con dei ritocchi a puntinato (studiati da noi da Giuseppina Perusini e Simona Rinaldi) che purtroppo non ci sono giunti, travolti dai restauri successivi. Lo stesso Schölzel si domanda le ragioni dell'aperta ostilità con cui quei ritocchi venivano attaccati da Christian Koester; evidentemente, a parte questioni di bassa lega, come la gelosia nei confronti del restauratore italiano, il principio teorico della riconoscibilità nei Paesi tedeschi si faceva strada ancora con difficoltà. Del resto, ci sarebbe voluto un lungo cammino perché si affermasse anche da noi, sì che l'opzione di Palmaroli in tal senso risulta in ogni caso straordinariamente precorritrice.

In conclusione, questo libro, risultato di un lavoro impressionante per costanza d'impegno ed eccellenza di risultati, può essere tranquillamente definito un capolavoro. In una sperabile seconda edizione, sarà possibile correggere alcuni errori nella restituzione delle parole italiane, sia nei nomi (a cominciare dal mio in bibliografia…) che nelle trascrizioni documentali (lo scritto alle pp. 49-50 onestamente ne è pieno: avverto però che gli errori potrebbero esistere già nella trascrizione antica). Naturalmente, occorre avvertire che il libro è in lingua tedesca, il che ovviamente non lo renderà popolarissimo nel nostro Paese; ma è da augurarsi che se lo procurino almeno le Istituzioni pubbliche, perché negli scritti di storia del restauro (e, aggiungo, della museologia) rimarrà indiscutibilmente una pietra miliare. Potremmo nel caso augurarci che un'Istituzione che ne avesse i mezzi (che so, il Getty di Los Angeles o una Stiftung tedesca), ne finanziasse una traduzione inglese; questa soluzione assicurerebbe al volume una circolazione sicuramente assai più vasta in ambito internazionale, com'esso assolutamente merita.

Giorgio Bonsanti

Note

[1] Gottfried Semper fu padre del grande storico dell'arte Hans, professore ad Innsbruck, autore di una straordinaria monografia su Carpi (Carpi, Ein Fürstensitz der Renaissance, Una residenza principesca del Rinascimento, 1882), da lui scoperta durante una sosta del treno verso il Sud; come anche di una delle prime monografie su Donatello (1870), e di studi fondamentali sull'arte del Quattrocento nel Tirolo del Sud confluiti nella raccolta di scritti Michael Pacher und die Seine, 1911.

la recensione

Science and Art.
The Painted Surface
Edited by Antonio Sgamellotti,
Brunetto G. Brunetti
and Costanza Miliani
The Royal Society of Chemistry
Cambridge, 2014
ISBN 978-1-84973-818-7
pp. XXIV + 620, copertina rigida,
€49,99

È stato su sollecitazione della Royal Society of Chemistry (prima sede nella Burlington House di Piccadilly che ospita anche la Royal Academy) che due scienziati nella Conservazione notissimi internazionalmente e la studiosa formatasi con loro presso l'Università di Perugia (oggi valida garante di continuità), hanno confezionato un volume da considerare la punta avanzata in campo mondiale, quanto alla conoscenza e divulgazione degli argomenti in questione. Consistono, quest'ultimi, in tutti quelli che si riferiscono in primo luogo alla caratterizzazione dei materiali costitutivi delle superfici dipinte, e successivamente e di conseguenza, alle tecniche esecutive. Rimangono un poco più marginali in quest'occasione, direi abbastanza inevitabilmente, gli aspetti relativi alle materiali operazioni di restauro (non era questo l'argomento), così come le questioni relative alle ricadute di carattere storico-artistico delle indagini stesse sulle opere d'arte, dipinti a supporto mobile o fisso che siano. In realtà, il rapporto indagini-restauro rimane un punto critico di tal genere di ricerche: la loro finalizzazione, la loro efficacia reale sulla conservazione dell'opera che rappresenta il caso specifico, in definitiva i risultati materiali cui possono dare adito. Ovviamente al momento di impostare il piano di indagini, invasive e no, è impossibile prevederne gli esiti particolari (anche se è bene comunque partire avendo in mente delle domande quanto alle quali andare cercando le risposte); di qui l'impressione di alcuni che in generale si registri oggi un'esagerazione nelle indagini forse addirittura a scapito delle operazioni conservative. Ma è da dire che quest'ultime non possono tradursi in intervento materiale se non appunto a seguito della disponibilità delle indagini, e dei contributi fondamentali ed ineliminabili ch'esse offrono; inoltre è da considerare che la ricerca, ed è questa una sua caratteristica, ha valore di per sé e in quanto tale; anche se sul momento non se ne coglie la funzionalità specifica nei confronti di un restauro particolare, le conoscenze

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maturate e le esperienze compiute si renderanno utili nella prossima occasione. Comunque, coloro che vorrebbero vedere emergere con maggiore evidenza la finalizzazione delle indagini allo scopo di una più completa conoscenza dell'opera d'arte, leggeranno qui con interesse il contributo di studiosi polacchi e italiani sul Giudizio Finale di Hans Memling oggi a Danzica; perché nessuno è mai riuscito a recuperarlo da quando già nel 1473 i pirati anseatici lo predarono dalla nave che, al largo delle coste inglesi, lo trasportava verso la sua destinazione ultima, nella Badia Fiesolana; che, giova avvertire il traduttore (tutto il libro è in inglese), non è un luogo ma un edificio. Alla recentissima Mostra su Memling nelle Scuderie del Quirinale il Trittico non è giunto in prestito; le autorità polacche, rifiutandolo, avranno pensato che non si sa mai … Non è dunque escluso, a seguito delle indagini (in questo caso, i pentimenti e le rilavorazioni rivelati dalla riflettografia infrarossa multispettrale), che l'opera possa essere stata iniziata nella bottega di Rogier van der Weyden e poi condotta avanti e terminata dal suo possibile allievo da poco arrivato nei Paesi Bassi dalla Germania. Comunque, i ventisette studi, alcuni dei quali indirizzati a dipinti murali in Paesi lontani, e quindi realizzati con tecniche per noi insolite; e altri, come prevedibile, applicati ad opere d'arte contemporanea, risultano decisamente la punta di diamante della ricerca internazionale in tal senso. E qui, davvero, Sgamellotti, Brunetti e Miliani hanno compiuto un lavoro eccezionale, che conferma, possiamo pure riconoscerlo in tutta semplicità, che gli studiosi italiani hanno saputo acquistarsi internazionalmente una fama di affidabilità professionale che ci piacerebbe potesse estendersi a tutto il resto delle attività del nostro Paese.

Giorgio Bonsanti

Elena Pecchioni, Fabio Fratini, Emma Cantisani
Atlante delle malte antiche in sezione sottile al microscopio ottico
Atlas of the ancient mortars in thin section under optical microscope
Nardini Editore, Firenze, 2014
ISSN 2036-1122
ISBN 978-88-404-4366-9
80 pp., brossura, €25,00

Già nel 2008 veniva pubblicato per i tipi di Pàtron Editore il volume *Le malte antiche e moderne tra tradizione e innovazione*, un testo che negli anni recenti ha rappresentato un contributo bibliografico e manualistico significativo per gli studiosi di malte, calcestruzzi e intonaci, esperti di archeometria, ricercatori e studenti universitari in Scienze per i Beni Culturali e scienze applicate alla caratterizzazione dei materiali delle costruzioni. A distanza di alcuni anni, la valenza di tale opera è misurabile nella diffusione che questo testo ha avuto nelle bibliografie di studio di svariati corsi di laurea, nonché nelle numerose citazioni in articoli e pubblicazioni quale manuale di riferimento per l'analisi di malte antiche e moderne, condotta con rigore scientifico e terminologie chiare e condivise.
Gli stessi autori di allora – Elena Pecchioni, Fabio Fratini, Emma Cantisani – si sono oggi cimentati in un'operazione forse ancor più meritevole del già pregevole volume del 2008, pubblicando un atlante bilingue nell'ambito della collana *Quaderni di Kermes* di Nardini Editore.
Come dichiarato dagli autori nella prefazione, lo scopo di questo atlante è illustrare varie tipologie di malte antiche attraverso casistiche di varia epoca e provenienza, mediante l'uso di immagini in sezione sottile petrografica al microscopio ottico polarizzatore in luce trasmessa, corredate di testo descrittivo che evidenzia i caratteri peculiari di composizione, manifattura e alterazione.
La struttura dell'atlante consente al lettore di apprendere come riconoscere e caratterizzare una malta antica e classificarla in relazione a: natura del legante (calce aerea calcica, magnesiaca, con componenti idraulicizzanti, leganti idraulici, leganti gessosi); presenza di grumi quale risultato di un non perfetto e completo spegnimento delle zolle di calce viva; residui carboniosi del combustibile impiegato nella fornace durante il processo di produzione del legante; tipologia (granuli mono/policristallini, a varietà composizionale), granulometria, forma e contorno dell'aggregato; rapporto legante/aggregato; porosità, quest'ultima comprensiva anche delle casistiche di porosità da alterazione, nell'ambito più ampio degli effetti di processi secondari e di deterioramento che si riscontrano negli impasti di malta una volta messi in opera e nell'esercizio delle loro funzioni architettoniche e strutturali. Il lettore non tarderà ad apprezzare gli aspetti di forza di questo agevole volume.
Le immagini, particolarmente didattiche per la scelta vincente delle aree riprese, sono il risultato di un'attenta selezione dagli ampi archivi di sezioni sottili disponibili presso l'Istituto per la Conservazione e la Valorizzazione dei Beni Culturali del Consiglio Nazionale delle Ricerche, sede di Sesto Fiorentino, e del Dipartimento di Scienze della Terra dell'Università di Firenze. L'estrema nitidezza delle figure rende per altro giustizia alla manifattura delle sezioni sottili, molte delle quali prodotte da Gherardo Saviozzi, della cui abilità in molti abbiamo beneficiato in questi anni di ricerche e collaborazioni.
Scorrendo il volume, si scoprono interessanti casistiche di fabbriche costruttive di notevole importanza architettonica quali la brunelleschiana Cupola del Duomo di Firenze, il Duomo di Prato, il campanile del Duomo di Pietrasanta e Palazzo Te a Mantova.
Altrettanto ben rappresentate sono le strutture archeologiche, con esempi da Pompei e città italiche e mediterranee dell'Impero Romano, quali Fiesole, Narni con il Ponte di Augusto, Bulla Regia in Tunisia, i ponti romanici della Provenza, ma anche esempi più antichi, uno su tutti il Tempio di Ramesse II ad Antinopoli. Una varietà tipologica e geografica questa che rende particolarmente unico il campione presentato in questo atlante, arricchito anche da evidenze e testi-

monianze della tecnologia della calce e delle malte da opere murarie che, meno note, ingiustamente potrebbero essere considerate non interessanti o meritevoli di essere prese quali esempi dimostrativi. In tal senso, la scelta degli autori di rappresentare forme di edilizia "minore" ricorda al lettore, se mai ce ne fosse bisogno, il ruolo delle malte nelle diverse e più svariate forme di edilizia, dalla più semplice alla più complessa, e come la conservazione del "patrimonio diffuso" passi attraverso la conoscenza dei materiali, indipendentemente se questi siano di pregio o di valenza storico-artistica o architettonica.
Degno di menzione è anche l'apparato testuale che precede l'atlante, inclusivo di una sintetica ma quanto mai importante specifica sulla preparazione dei campioni.
Sufficientemente esaustiva è anche la sezione bibliografica che raccoglie i principali contributi della letteratura recente, nonché atlanti e manuali. Tra questi ultimi vengono correttamente riportati i capisaldi della petrografia applicata, quali Adam et al. (1984), Mackenzie & Guilford (1985) e Mackenzie et al. (1990), con i quali questo atlante si allinea sia nella struttura di presentazione che nell'intento didattico. Ed è proprio nella didattica, nonché nella pratica professionale e di ricerca scientifica, che l'*Atlante delle malte antiche* si propone come strumento nuovo, di confronto e di apprendimento, oltre che di esempio per una corretta descrizione delle caratteristiche tessiturali e granulometriche comunemente riscontrate in sezione sottile, ma anche di quelle di non facile identificazione.
Alla diffusione e fortuna di questo volume contribuirà certamente la lungimirante scelta di affiancare il testo italiano con la traduzione inglese, quale valore aggiunto all'estrema competenza ed esperienza professionale e accademica degli amici e colleghi autori di questo atlante, ben noti nella comunità scientifica per la loro autorevolezza nel campo dello studio e della conservazione delle malte antiche e moderne.

Deodato Tapete

La cultura del restauro. Modelli di ricezione per la museologia e la storia dell'arte
A cura di Maria Beatrice Failla, Susanne Adina Meyer, Chiara Piva, Stefania Ventra
Campisano Editore
Roma, 2013
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Osservando una tempistica particolarmente apprezzabile, le tre ispiratrici e realizzatrici del grande Convegno di Roma (aprile 2013), coadiuvate da un'altra giovane studiosa, Stefania Ventra, hanno saputo offrire al mondo degli studi il volume degli Atti, caratterizzato dalle pagine numerosissime e da una straordinaria varietà di temi. Il Convegno nasceva alla conclusione di un lungo percorso condotto in alcune fra le nostre Università, nell'ambito dei progetti PRIN. Gli scritti introduttivi e conclusivi, di Michela di Macco e Orietta Rossi Pinelli, come anche le tre introduzioni alle singole sezioni dovute alle studiose di cui si è detto, avevano la finalità di "leggere la storia del restauro, della conservazione, della tutela come percorso strettamente connesso alla storia dell'arte e della critica d'arte, alla storia delle istituzioni museali" (p. 9), nella convinzione che "in ogni periodo il restauro sia stato inteso come atto critico nelle sue diverse modalità storicamente date" (di Macco p. 13). Se volessimo burocratizzare il tutto, ma si fa per capirci ancor meglio, diremmo che il Convegno e l'attuale volume degli Atti rappresentino forte e chiara l'identità del settore disciplinare L-Art/04, intitolato alla "Museologia e critica artistica e del restauro"; un'area degli studi da non considerare accessoria, ma che anzi "entra a far parte a pieno diritto della storia dell'arte *tout court*. Difficilmente potremmo definire come marginale una disciplina che si rivela di tanta utilità nello schiudere spazi conoscitivi ai quali altrimenti non avremmo accesso; l'inserimento della storia del restauro nella storia dell'arte, non ancillare né subordinato, comporta per quest'ultima un arricchimento importante. Non si dovrà dunque per il futuro immaginare una storia dell'arte che si adorni di un ristretto numero di discipline accessorie (critica, museologia, restauro), ma che anzi acquisti contenuti e significati nella dialettica interna con queste" (mi sono permesso di citare dal mio "Aperto per Restauri" nel "Giornale dell'Arte", n. 332, giugno 2013). In questa sede, comprensibilmente, mi prefiggo sostanzialmente non più che una semplice segnalazione dell'importanza di questo volume, destinato a diventare storico; una recensione vera e propria necessiterebbe di altri spazi e altri tempi di confezione. Non è certo possibile menzionare qui singolarmente, e magari discutere e integrare, i singoli interventi (magari, parlando della Patina, oltre al bell'articolo di Manfred Koller si poteva ricordare il fascicolo monografico dei *Quaderni di Kermes* dedicato a questo argomento nel 2005). Dirò soltanto che i contributi pubblicati qui, comprensivi anche di quelli presentati al Convegno come poster, risultano straordinariamente informativi e stimolanti, e dichiarano quanto grande sia il numero di studiosi di valore, a vari livelli e in varie articolazioni della professione e delle competenze, che costituiscono oggi lo zoccolo duro della "critica del restauro". L'auspicio, al termine, è che il progetto dell'Archivio dei Restauratori Italiani che fa capo all'Associazione Secco Suardo (v. "Aperto per Restauri" in "Giornale dell'Arte", n. 307, marzo 2011) possa riprendere nuova lena, e confermarsi il punto di raccolta nazionale di memorie e documenti che il nostro Paese merita, per le sue tradizioni ma soprattutto per la sua capacità di produrre innovazione di studi e di pensieri, come dimostrato dal Convegno e dal volume in questione.

Giorgio Bonsanti

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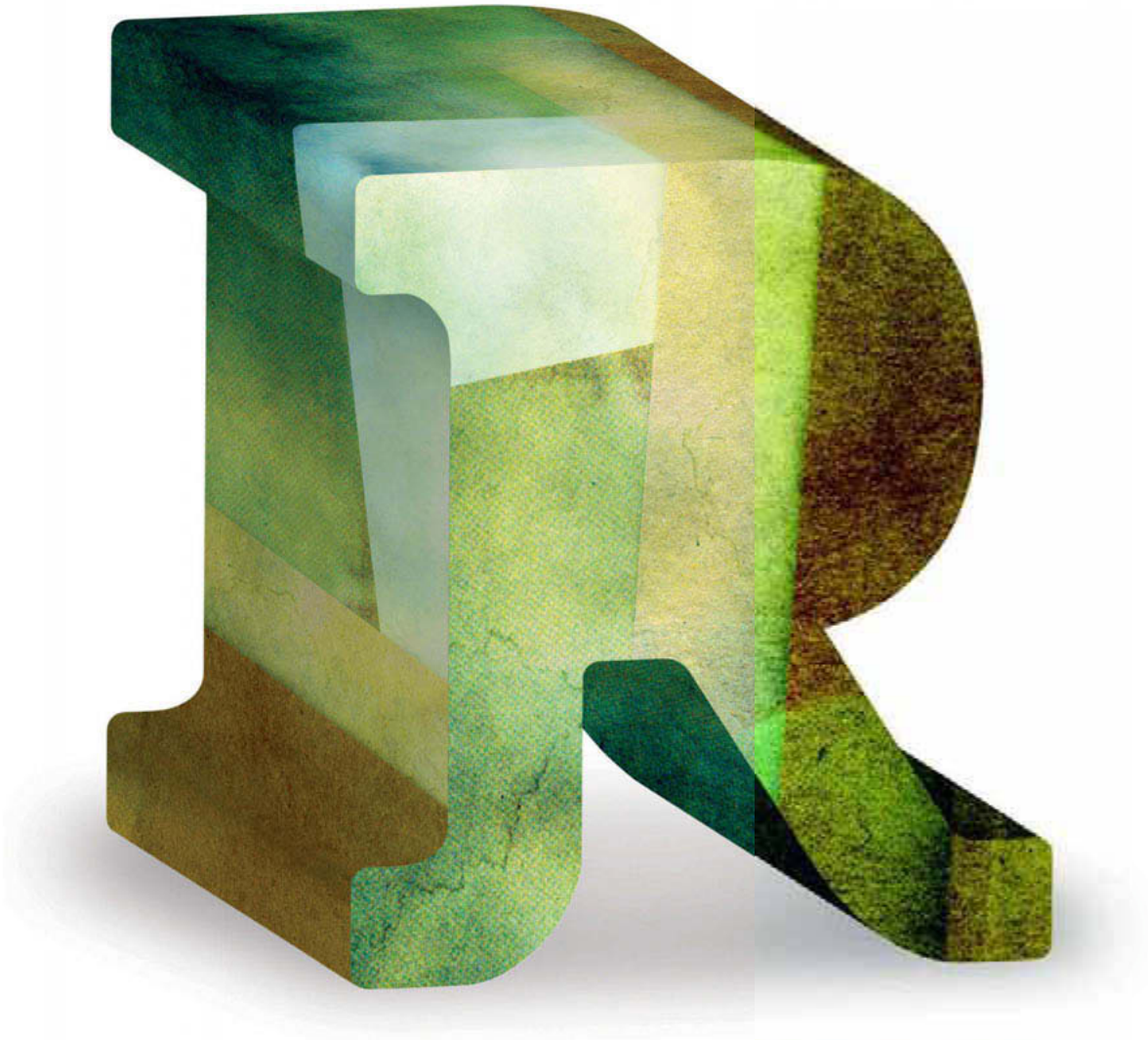

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