INSTITUT ROYAL DU PATRIMOINE ARTISTIQUE

KONINKLIJK INSTITUUT VOOR HET KUNSTPATRIMONIUM

BULLETIN

XXIV – 1992

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PETER PAUL RUBENS'S ELEVATION OF THE CROSS

STUDY, EXAMINATION AND TREATMENT

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TEN GELEIDE

Dertig jaar na de *Kruisafneming*, heeft het Koninklijk Instituut voor het Kunstpatrimonium opnieuw de eer en het voorrecht genoten de behandeling van de tweede triptiek van Pieter Paul Rubens, de *Kruisoprichting*, die zich in de kathedraal van Antwerpen bevindt, toevertrouwd te krijgen.

Wij hebben besloten een volledig boekdeel aan dit belangrijk werk te wijden. Het is inderdaad noodzakelijk het maximum van de ingewonnen informaties ter beschikking te stellen van de navorsers en van al diegenen die geboeid zijn door het werk van deze uitzonderlijke schilder. Daar wij deelgenomen hebben aan de Nederlandstalige en Franstalige uitgave van het Ministerie van de Vlaamse Gemeenschap - Bestuur Monumenten en Landschappen, bleek het gerechtvaardigd deze nieuwe uitgave, met recente opzoekingen, in het Engels te realiseren. Zodoende wordt deze begrijpelijk voor nieuwe lezers. Wij hebben ons ook de bijzondere moeite gedaan om veel meer fotografische kleuren-documenten te bieden dan gewoonlijk.

Wij hopen dat deze verzameling van informaties zal bijdragen tot de studie van het werk van Rubens. Zo hopen wij ook dat het eenieder zal toestaan deel te nemen aan de bewondering en het genoegen die wij ondervonden tijdens het onderzoek en de behandeling van deze meesterlijke triptiek.

L.M.-K.

EDITORIAL

Trente ans après la *Descente de Croix,* l'Institut royal du Patrimoine artistique a eu à nouveau l'honneur et le privilège de se voir confier le traitement du second triptyque de Pierre Paul Rubens conservé à la cathédrale d'Anvers, l'*Erection de la Croix.*

Nous avons décidé de consacrer un tome entier à cet important travail. Il est en effet indispensable de mettre le maximum des données recueillies à la disposition des chercheurs et de tous ceux qui se passionnent pour l'oeuvre de ce peintre exceptionnel. Comme nous avions participé aux éditions néerlandaise et française du Ministerie van de Vlaamse Gemeenschap - Bestuur Monumenten en Landschappen, il nous a semblé justifié de réaliser cette nouvelle édition, qui détaille les recherches récentes, en anglais, afin de la rendre accessible à de nouveaux lecteurs. Nous avons aussi consenti un effort particulier en présentant un nombre beaucoup plus important que d'habitude de documents photographiques en couleur.

Nous espérons que ce recueil d'informations contribuera à l'étude de l'oeuvre de Rubens et permettra à tous de partager l'admiration et le plaisir que nous avons éprouvés au cours de l'examen et du traitement de ce triptyque magistral.

L.M.-K.

ORIGINS AND PRELIMINARY STAGES OF THE PROJECT

LILIANE MASSCHELEIN-KLEINER

In 1975, the Church Council of the Cathedral of Our Lady in Antwerp, concerned about the preservation of the triptych of the *Elevation of the Cross* by Peter Paul Rubens, contacted the Koninklijke Commissie voor Monumenten en Landschappen. The Royal Institute for Cultural Heritage (IRPA), on being consulted, found that although there was no imminent danger, a close watch needed to be kept on the deterioration of the varnish.

In January 1978 the triptych was transferred from the transept to the side-chapel of St. Joseph for a more thorough examination.

On May 9 and 10, 1978, Ms. Rika De Backer-Van Ocken, Minister of the Flemish Community, brought together in Antwerp an International Commission which was asked to give an opinion as to the state of preservation of the triptych and the urgency of treatment. Chaired by Professor Roger-A. d'Hulst, Head of the Nationaal Centrum voor de Plastische Kunsten van de 16de en de 17de Eeuw, the Commission included seven foreign members : Ms. Anneliese Mayer-Meintschel, Head of the Gemäldegalerie Alte Meister of the Staatliche Kunstsammlungen in Dresden, Messrs. Thomas Brachert, Chief Restorer at the Germanisches Nationalmuseum in Nuremberg, Jacques Foucart, Curator of the Département des Peintures of the Musée du Louvre in Paris, David Freedberg, Professor at the Courtauld Institute of Arts, University of London, Willibald Sauerländer, Head of the Zentralinstitut für Kunstgeschichte in Munich, Jan Gerrit Van Gelder, Professor Emeritus at the Rijksuniversiteit Utrecht and Hubert von Sonnenburg, Head of the Doerner-Institut at the Bayerische Staatsgemäldesammlungen in Munich. There were also eight Belgian members : Ms. Elisabeth Dhanens, Honorary Inspector at the Provinciale Dienst voor het Kunstpatrimonium van Oost-Vlaanderen in Ghent and Ms. Gertrude Gepts, Chief Curator of the Koninklijk Museum voor Schone Kunsten in Antwerp ; Messrs. Frans Baudouin, Curator of the Kunsthistorische Musea of the City of Antwerp, René Lefève and Roger H. Marijnissen, Works Managers at IRPA, Henri Pauwels, Head of Department at the Musées royaux des Beaux-Arts de Belgique in Brussels, René Sneyers, Director of IRPA and Jan Karel Steppe, Professor at the Katholieke Universiteit Leuven. The scientific secretary was Carl Van de Velde, Head of research at the Nationaal Fonds voor Wetenschappelijk Onderzoek at the Rubenianum in Antwerp. Several members of IRPA, the Nationaal Centrum voor de Plastische Kunsten van de 16de en de 17de Eeuw, the Bestuur voor Monumenten en Landschappen

and the Cathedral Church Council also attended the meetings.

IRPA then presented the results of its examinations, together with a proposal for consolidation of the supports, the consolidation of the paint layers and the removal of the varnish. The Commission emphasised the necessity for carrying out the treatment in the cathedral itself ; to that end, the tutelary minister would be requested to accelerate the installation of air conditioning in the building. The Commission unanimously approved the treatment proposed by IRPA for the supports, namely the replacement of the heavy wooden beam at the back of the central panel by an aluminium angle-bar and the removal of the metal dovetails between the horizontal and vertical boards of the wings. The Commission was more circumspect regarding removing the varnish. IRPA then proposed trying a cleaning test on the upper part of the reverse side of the wings, on the cherubim.

A second meeting was convened for December 10 and 11, 1979, to assess the result of the cleaning test. The Commission also agreed on replacing all the wooden reinforcing elements by aluminium angle-bars on the reverse side of the central panel. It was decided to begin the consolidation of the paint layers, but the decision to remove the varnish was postponed, following a controversy initiated by Mr. R. Marijnissen, who expressed the fear that cleaning might reveal a difference in quality between the central panel and the wings. For practical reasons, it was decided that in future the work would be followed solely by the Belgian members of the Commission.

This restricted Commission was convened by its Chairman, Professor R.-A. d'Hulst, and met on April 8, 1980, December 14, 1981, June 29, 1983 and September 18, 1984.

During that time, consolidation of the central panel was completed, the metal dovetail plates of the wings were replaced by wooden inlays, the loose joins adjusted and the crack in the left wing was glued. In the spring of 1983, by which time the first phase of the restoration of the cathedral had been finished, it was possible to set up a workshop in the western part of the north aisle. The stained glass windows were temporarily replaced by plain glass and a window was placed in the partition to enable the public to follow the work (Fig. 2). The consolidation of the paint layers took place in 1984.

At the Commission meeting on September 18, 1984, the new Head of IRPA, Ms. Liliane Masschelein-Kleiner, proposed entrusting the restoration of the triptych to Ms. Nicole Goetghebeur and Ms. Regine Guislain-Wittermann, but no decision was taken at this stage.

With the Reform of the Institutions of the State, it had become necessary to finalise the terms of the IRPA work in respect of cultural property depending on the Flemish Community. The Koninklijke Commissie voor Monumenten en Landschappen, which is responsible for giving opinions on movable and immovable cultural property to the Minister, at its meeting on October 11, 1984, chaired by Mr. H. Craeybeckx, decided to take over the restricted Commission as a Sub-Commission. The members of the new Sub-Commission (Fig. 1) were confirmed in their mission, but the administrative secretariat was provided by the Bestuur voor Monumenten en Landschappen, headed by Mr. Edgar Goedleven. The administrative secretary was first Ms. Ann Bergmans, followed by Ms. Madeleine Manderyck.

On April 11, 1985 the Commission authorized IRPA to carry out cleaning tests on larger areas (30 cm by 40) to decide whether it was desirable to remove the varnish and,

1. The Rubens Commission in the workshop set up in the Antwerp cathedral.

if so, to what extent.

On June 26, 1985, Ms. M. d'Hooge, Section Head at the Province of Antwerp, was invited to attend the Commission meeting. The Province offered to act as Master of the Work, which would facilitate the obtaining of finance from the Flemish Community. To speed up the work, the Flemish Community said it was prepared to advance the funds. That proposal became official on November 13, 1986. The Church Council gave its agreement and Mr. Jean Gol, Minister of Justice and Ecclesiastical Matters, accorded his authorization. The Koninklijke Commissie voor Monumenten en Landschappen confirmed that the work would be done in the cathedral and decided that it would be entrusted to the Royal Institute for Cultural Heritage and in particular to the two previously recommended restorers, Ms. Nicole Goetghebeur and Ms. Regine Guislain-Wittermann. As the cleaning tests proved satisfactory, the Commission gave its consent to a light reduction of the varnish.

Professor Hubert von Sonnenburg who, in the meantime, had become Chief Curator at the Alte Pinakothek of the Bayerische Staatsgemäldesammlungen in Munich, would be consulted regularly to give an opinion on the progress of the work.

On March 10, 1987, the panels, supported by a metal brace, were erected side by side, so as to enable a comparative treatment of the three parts of the triptych. This work, as well as the construction of the two scaffoldings, was executed free of charge by the Antwerp firm Tony Gram and C. Verstraete-Vanhecke.

2. The workshop as seen from the nave of the cathedral during a Monuments Day.

The Flemish Community Minister of Culture, Mr. Patrick Dewael, agreed to include the financing of the restoration in the programme for 1987 ; a grant of five million francs was allocated, with sixty percent provided by the Flemish Community, thirty percent by the Province of Antwerp and ten percent by the church Council of the cathedral. The amount was to be paid to the Province. The latter was instructed to ensure payment to IRPA, designated as the sole competent executant for the work.

The agreement between the Province of Antwerp and IRPA was signed on June 23, 1987. It was anticipated that the work could not be completed before 1991. For the two restorers it meant reconciling the treatment in situ of this enormous triptych with their other obligations to IRPA. It was therefore decided that they would devote three days a week to the project, but only during the months in which the temperature in the cathedral was above 15°C, i.e. from May to November. This would both guarantee the action of the solvents and consolidants and ensure normal working conditions.

THE ELEVATION OF THE CROSS IN RUBENS'S WORK

FRANS BAUDOUIN

In order to ascertain the place which the *Elevation of the Cross* occupies in Rubens's work, it is first of all necessary to take account of when the artist painted the great triptych.

However, it is impossible to be absolutely certain when he was approached to do this work by the church wardens of the St. Walburgis church for which it was intended. The church archives, which might have provided us with a definite answer to this question, have not survived. A late eighteenth century copy of a number of account items relating to the triptych, although incomplete, suggests that Rubens was very probably commissioned to paint the work in 1609. This means it was shortly after his return from Italy at the end of 1608, at a time when he had not yet established his reputation in Antwerp.

However, the first entry in the above-mentioned copy dates from 17 May 1610 [1]. On that day a collection of money was held by the parish priest and church wardens of the St. Walburgis church, for the construction of the high altar and the painting that was to adorn it. It is not known whether there was just this one collection, or whether others had been made previously. It is nevertheless highly probable that the collection of the money needed for this project was preceded by many other activities, for example, discussions about the work to be commissioned, both with the designer of the altar (who has unfortunately remained anonymous), and with the painter who was called upon to execute the altarpiece ; submitting and discussing the designs ; contracting out the construction of the altar to the subcontractors, who designed the lower half in stone and the upper half in wood [2] ; and finally, ordering the wooden panels on which the scenes were

[1] The late 18th century copy of extracts from the lost original church accounts has been published in M. ROOSES, *L'œuvre de P.P. Rubens*, II, Antwerp, 1888, p. 79-81. Other important publications about the *Elevation of the Cross* : M. ROOSES, *Rubens' leven en werken*, Amsterdam-Antwerp-Ghent, 1903, p. 127-135 ; G. GLÜCK, *Rubens' Kreuzaufrichtungsaltar*, in P. CLEMEN (ed.), *Belgische Kunstdenkmäler*, II, Munich, 1923, p. 161-182, reprinted in G. GLÜCK, *Rubens, Van Dyck und ihr Kreis*, Vienna, 1933, p. 56-81 ; J.R. MARTIN, *Rubens : The Antwerp Altarpieces, The Raising of the Cross, The Descent from the Cross* (*Norton Critical Studies in Art History*), New York, 1969; J.S. HELD, *The Oil Sketches of Peter Paul Rubens. A Critical Catalogue*, 2 vols., Princeton, N.J., 1980, No. 349, fig. 393; R. D'HULST e. a., *De Kruisoprichting van Pieter Paul Rubens* , Brussels, 1992; IDEM, *Pierre Paul Rubens. L'Erection de la Croix*, Brussels, 1992.

[2] That the lower part of the altar was in stone, whereas the upper part was in wood, appears from the documents concerning the demolition of the original altar in 1733 (STADSARCHIEF VAN ANTWERPEN, K. 275, *Burchtkerk St. Walburgis (1539-1794)*, various papers).

to be painted from the panel maker. In Rubens's day the panels were ordered and paid for directly by the clients, after which they were presented to the artist commissioned to do the work [3].

Another account entry, dating from at most a few weeks after the church collection concerned, shows that all the preparations had been made to permit work to begin painting the triptych immediately *in situ* in the church. Taking all the preparations into account, it is clear that the work could not have commenced if Rubens and all those involved in the project had not been contacted some considerable time in advance, at least at some time during 1609. The entry referred to above, most probably dating from the beginning of June 1610, mentions a payment to the "mates" (= workmen) of the Admiral of the Scheldt, who helped to hang up a canvas sail loaned to the church by the Admiral ; this served to conceal the choir from the gaze of visitors while Rubens was painting the triptych, so that he could work undisturbed. From this it can also be deduced that the high altar had already been erected in the choir before June 1610, and that the side panels were probably attached to it [4]. Thus, the work had progressed to such an extent that the preparatory stage had been completed and the artist could start immediately on the definitive execution.

Apparently an official agreement about the commission was still lacking. This contract was allegedly concluded about mid-June 1610. On that occasion a meal was organized in the "Klein Zeeland" inn. During this gathering, "which included the parish priest, Cornelis van der Geest and the church wardens", it was agreed with Rubens that he would paint the high altar.

There must have been a special reason for mentioning an "outsider" by name in the agreement, in addition to the parish priest and church wardens. Cornelis van der Geest was a prosperous merchant and great art lover, who lived very close to the St. Walburgis church [5]. The explanation for his presence can be found in the inscription at the bottom of a large engraving made many years later by Jan Witdoeck in 1638 which reproduces the *Elevation of the Cross* in a form adapted to engraving. The text concerned is a dedication to Cornelis van der Geest by Rubens in which he explicitly states that the for-

[3] A striking example of this working method is provided by archival sources concerning the triptych Rubens painted in 1618 for the Fishmongers in Mechlin (Mechelen), *The Miraculous Draught of Fishes*, in the church of Onze-Lieve-Vrouw-over-de-Dyle in that city : the panels existed already a few years before Rubens was asked to paint the triptych (ROOSES, *L'œuvre...*, II, p. 24-25). No other altar triptych has been painted by him afterwards, except the *Saint Ildefonso-triptych* (ca. 1630-1632), in the Kunsthistorisches Museum in Vienna, but there must have been a particular reason explaining the use of painted wings (see F. BAUDOUIN, in A. BALIS e. a., *De Vlaamse schilderkunst in het Kunsthistorisches Museum te Wenen*, Antwerp-Zurich, 1987, p. 162).

[4] On a painting by Peter Neefs I and Frans Francken III representing the *Interior of the Church of St. Walburgis in Antwerp* (Madrid, Prado), the altar is still to be seen without the side panels of the triptych and before angels had been put up on both sides of the aedicula on top of the altar (D'HULST e. a., *op. cit.*, p. 78, fig. 54). For other paintings on which the altar is visible : F. BAUDOUIN, *Vier afbeeldingen van het interieur der verdwenen Sint-Walburgiskerk te Antwerpen*, in *Bulletin van de Koninklijke Musea voor Schone Kunsten van België / des Musées royaux des Beaux-Arts de Belgique*, 1985-1988, 1-3, p. 181-194.

[5] J.S. HELD, *Artis Pictoriae Amator : An Antwerp Art Patron and his Collection*, in *Rubens and his Circle*, Princeton, N.J., 1982, p. 35-64.

mer was "the main designer and most zealous promoter" of the triptych [6]. Apparently the initiative for painting the work came from him, and it was also paid for by him to a large extent.

On 17 June 1610, shortly after the party in the "Klein Zeeland" inn, Rubens received an advance of 1000 guilders (of the total of 2600 guilders which had been agreed upon). From this we can deduce that he had actually started on the execution of the work in the church.

Most probably, the triptych was completed *at the latest* by 12 March 1611, because on that date Jan Le Grand, a merchant from Dunkirk living in Antwerp at the time, in a letter to a colleague in Sint-Winnoksbergen, mentioned the painting in the "Borchtkerck" as one of Rubens's works which were held "in great esteem" in Antwerp at that time [7].

Between 2 August 1611 and 1 October 1613, Rubens received four more instalments for the work, representing together the complete balance of the clients' obligations towards him.

A comparison of the dimensions of the panels of other triptychs painted earlier, for example, by Marten De Vos, Abraham Francken and Otto Venius [8], with those of Rubens's *Elevation of the Cross* reveals that the latter altarpiece is considerably larger. This was quite deliberate, for the following reasons.

In the context of growing popularity for the Counter-Reformation in the Southern Netherlands, the clergy insisted, as Saint Charles Borromeo had already argued in 1572, that everything possible be done to attract the attention of believers to the high altar as soon as they entered the church. The tabernacle was placed on this altar, with the clear

[6] The inscription underneath mentions that the engraving was made "Ex tabula Walburgensis Ecclesiae cuius ipse [= Cornelis van der Geest] praecipuus Author et promotor fuit." (Cf. M. ROBELS, *Die Rubens-Stecher*, in [exhib. cat.] *Peter Paul Rubens, 1577-1640, Katalog II : Maler mit dem Grabstichel. Rubens und die Druckgrafik*, Cologne, 1977, p. 71-72, fig. 77 ; [exhib. cat.] E. MAI and H. VLIEGHE (ed.), *Von Bruegel bis Rubens*, Cologne, 1992, p. 609-610, No. 201.2 (entry by P. HUVENNE, with bibliography). The sketch by Rubens which served as a model for the engraving by Witdoeck is in the Art Gallery of Ontario, Toronto (J.S. HELD, *The Oil Sketches..., op. cit.*, No. 352, ill. 346 ; a colour reproduction in D'HULST e. a., *op. cit.*, p. 94, fig. 74).

[7] "Hy [= Rubens] heeft hier diversche stucken gemaeckt die in groote extime gehouden worden als namentlyck opt Stadthuys, tot Sinte Michiels Preeckheren ende de *Borghtkerck*, die fray syn" (A. MONBALLIEU, *P.P. Rubens en het "Nachtmael" voor Sint-Winnoxbergen (1611), een niet uitgevoerd schilderij van de meester*, in *Koninklijk Museum voor Schone Kunsten Antwerpen, Jaarboek* 1965, p. 196). This author suggests that in March 1611 "at least one part" of the *Elevation of the Cross* could be seen. For this he refers to L. VAN PUYVELDE, *Rubens*, Brussels-Paris, 1952, p. 102-103, who, however, convincingly argues in support of the opinion that the triptych was already finished before March 1611. The fact that Rubens received in 1613 a last instalment does not mean that the triptych was only finished that year. It often happened that, for important commissions, the painter had to wait several years after he completed his work before receiving the last instalment. Cf. also F. BAUDOUIN, *Pietro Pauolo Rubens*, Antwerp, 1977, p. 68 and p. 76-79.

[8] The difference is striking when we compare the dimensions of earlier triptychs, for instance : Marten de Vos, the *St. George-Triptych* of the "Oude Voetboog", central panel 347 x 280 cm, wings each 345 x 124 cm (Antwerp, Kon. Museum voor Schone Kunsten, cat. Nos. 72-76) ; Ambrosius Francken, *Triptych of the Holy Eucharist*, central panel 275 x 240 cm, wings each 255 x 115 cm (*ibidem*, cat. Nos. 136-140) ; Otto Venius, *Triptych of the Meerseniers*, central panel 269 x 164 cm (Mainz, Mittelrheinisches Landesmuseum), wings each 269 x 162 cm (Antwerp, Kon. Museum voor Schone Kunsten, cat. Nos. 479-482). Cf. F. BAUDOUIN and P. HUVENNE, *Schilderkunst na de val van Antwerpen (1585)*, in *Openbaar Kunstbezit in Vlaanderen*, 23, 1985, No. 4, where other triptychs dating from the late 16th and early 17th century are also reproduced.

intention of focusing attention on the Holy Eucharist [9]. Therefore the high altar had to impress the congregation with its size and beauty, and the altarpiece which adorned it should also contribute to that effect by its large dimensions and imposing design.

However, there was another more specific reason why the triptych had to be so large, and this was related to the space in which it was to be positioned. In this case artistic reasons coincided with religious considerations. The high altar had to be erected in a long choir which was at the same time considerably elevated, only accessible from the nave of the church by a flight of no fewer than nineteen steps (Fig. 4) [10]. Therefore the altar obviously also had to be striking by virtue of its monumental size. The scene that was depicted on it had to be clearly visible both from below and from a long way off at the back of the church. This obliged the artist to choose a design which could be clearly "readable". Rubens certainly met these requirements in every respect. With regard to the dimensions, the central panel measures 460 x 340 cm, while the two side panels are 460 x 150 cm each [11]. Moreover, in the composition itself he has also succeeded in achieving a great degree of clarity.

The subject chosen for the inside of the triptych, the elevation of the Cross, gave Rubens the possibility of depicting a single scene running across the three panels. The subject also fully complied with one of the demands of the spiritual authorities, viz., that the central panel should show only the figure of Christ, or a subject from the New Testament, and not, for example, an episode from the lives of the saints. While his predecessors (and also some contemporaries), in accordance with a tradition dating back at least to the fifteenth century, were accustomed to depict numerous episodes relating to the central theme [12] – as it were, filling up the background of the painting with these -, Rubens concentrated entirely on the one subject he wished to portray. He deliberately avoided any other elements. Although each of the three panels constitutes a certain unity of content and form, the viewer clearly experiences the scene represented over the complete front of the open triptych as a single interrelated composition. The different *simultaneous* activities carried out by the figures on the side panels and the various feelings expressed by them form an integral part of the subject of the central panel. *Together* they represent the elevation of Christ's Cross. Undoubtedly this concentration on a unique theme was a striking innovation in Flemish art.

[9] G. KREBS, *Tabernakel*, in M. BUCHBERGER (ed.), *Kirchliches Handlexikon*, II, Munich, 1912, col. 2287-2288; A. BLUNT, *Artistic Theory in Italy, 1450-1600*, Oxford, 1956, p. 128. In 1614 , Pius V's *Rituale Romanum* stipulated that the consecrated Host should be kept, as was already customary in Rome and several other places, in a tabernacle on the high altar or on a side altar (T. MAGNUSSON, *Rome in the Age of Bernini*, I, Stockholm, 1982, p. 109).

[10] P. GÉNARD, *Verhandeling over de Ste Walburgiskerk*, in *Verzameling Graf- en Gedenkschriften van de Provincie Antwerpen*, II. *Antwerpen, Parochiekerken*, Antwerp, 1863, p. LIX-LXXXV, to be completed by J. VAN ACKERE, *Antwerpen, van Romeins veer tot wereldhaven*, Antwerp, 1975, p. 25 (mentioning more recent publications).

[11] See note 8.

[12] For this profusion of motifs, see e.g. the central panel of Ambrosius Francken's *Martyrdom of Crispinus and Crispinianus*, in the Koninklijk Museum voor Schone Kunsten, Antwerp, No. 145, with an excellent colour reproduction in [exhib. cat.] *Van Bruegel tot Rubens*, Antwerp, 1992, p. 63.

459.5 x 339.6 – 150 cm

3. P.P. Rubens (1577-1640), Triptych of the *Elevation of the Cross,* 1610-1611. Antwerp, Cathedral of Our Lady.

intention of focusing attention on the Holy Eucharist [9]. Therefore the high altar had to impress the congregation with its size and beauty, and the altarpiece which adorned it should also contribute to that effect by its large dimensions and imposing design.

However, there was another more specific reason why the triptych had to be so large, and this was related to the space in which it was to be positioned. In this case artistic reasons coincided with religious considerations. The high altar had to be erected in a long choir which was at the same time considerably elevated, only accessible from the nave of the church by a flight of no fewer than nineteen steps (Fig. 4) [10]. Therefore the altar obviously also had to be striking by virtue of its monumental size. The scene that was depicted on it had to be clearly visible both from below and from a long way off at the back of the church. This obliged the artist to choose a design which could be clearly "readable". Rubens certainly met these requirements in every respect. With regard to the dimensions, the central panel measures 460 x 340 cm, while the two side panels are 460 x 150 cm each [11]. Moreover, in the composition itself he has also succeeded in achieving a great degree of clarity.

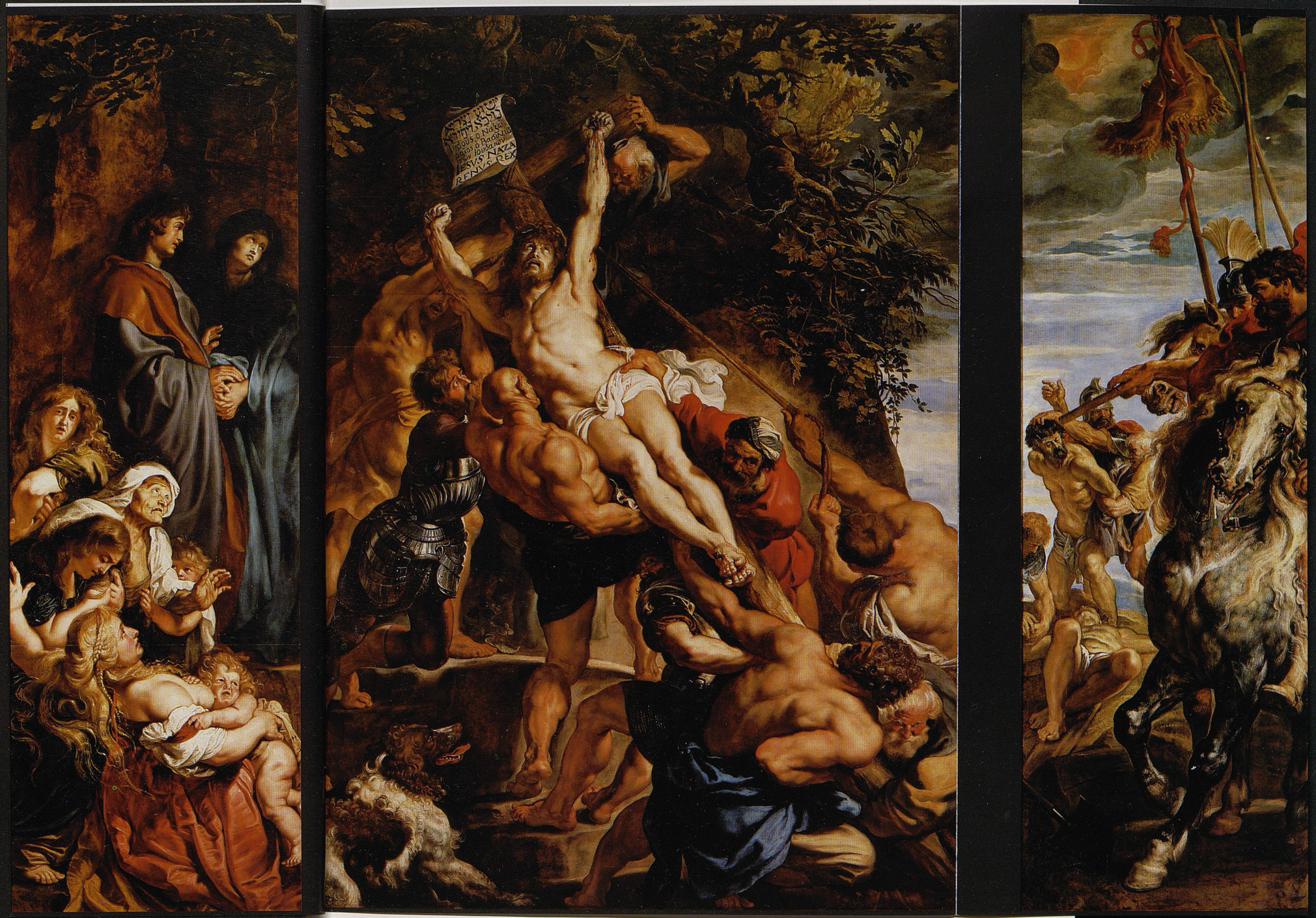
The subject chosen for the inside of the triptych, the elevation of the Cross, gave Rubens the possibility of depicting a single scene running across the three panels. The subject also fully complied with one of the demands of the spiritual authorities, viz., that the central panel should show only the figure of Christ, or a subject from the New Testament, and not, for example, an episode from the lives of the saints. While his predecessors (and also some contemporaries), in accordance with a tradition dating back at least to the fifteenth century, were accustomed to depict numerous episodes relating to the central theme [12] – as it were, filling up the background of the painting with these -, Rubens concentrated entirely on the one subject he wished to portray. He deliberately avoided any other elements. Although each of the three panels constitutes a certain unity of content and form, the viewer clearly experiences the scene represented over the complete front of the open triptych as a single interrelated composition. The different *simultaneous* activities carried out by the figures on the side panels and the various feelings expressed by them form an integral part of the subject of the central panel. *Together* they represent the elevation of Christ's Cross. Undoubtedly this concentration on a unique theme was a striking innovation in Flemish art.

[9] G. KREBS, *Tabernakel*, in M. BUCHBERGER (ed.), *Kirchliches Handlexikon*, II, Munich, 1912, col. 2287-2288; A. BLUNT, *Artistic Theory in Italy, 1450-1600*, Oxford, 1956, p. 128. In 1614 , Pius V's *Rituale Romanum* stipulated that the consecrated Host should be kept, as was already customary in Rome and several other places, in a tabernacle on the high altar or on a side altar (T. MAGNUSSON, *Rome in the Age of Bernini*, I, Stockholm, 1982, p. 109).

[10] P. GÉNARD, *Verhandeling over de Ste Walburgiskerk*, in *Verzameling Graf- en Gedenkschriften van de Provincie Antwerpen*, II. *Antwerpen, Parochiekerken*, Antwerp, 1863, p. LIX-LXXXV, to be completed by J. VAN ACKERE, *Antwerpen, van Romeins veer tot wereldhaven*, Antwerp, 1975, p. 25 (mentioning more recent publications).

[11] See note 8.

[12] For this profusion of motifs, see e.g. the central panel of Ambrosius Francken's *Martyrdom of Crispinus and Crispinianus*, in the Koninklijk Museum voor Schone Kunsten, Antwerp, No. 145, with an excellent colour reproduction in [exhib. cat.] *Van Bruegel tot Rubens*, Antwerp, 1992, p. 63.



459.5 x 339.6 – 150 cm

3. P.P. Rubens (1577-1640), Triptych of the *Elevation of the Cross,* 1610-1611. Antwerp, Cathedral of Our Lady.

Four, larger than lifesize figures are depicted in pairs on the reverse sides of the wings. These appear as living beings dressed in real garments but at the same time they have a sculptural character. On the left wing, we have Saint Amandus and Saint Walburgis ; on the right wing, Saint Catherine of Alexandria and next to her, facing the viewer, Saint Eligius. The figures are strongly outlined against a dark background. Two angels float above, one of which, situated exactly above the heads of the male saints, holds a bishop's mitre, a reference to the saints' function in the Church. The choice of these four saints is closely related to the worship of the parish of St. Walburgis. It should be noted that the strongly outlined forms of these figures are characterized by an intense power which at that time had not yet appeared in Western European art north of the Alps. The surprising presence which Rubens gave these figures in this way bears witness to the indisputable mastery which he had already achieved while still in his early thirties.

That he actually succeeded in achieving a clearly identifiable representation, both by means of the impressive size of the panels of the triptych and by the strong synthesis of the composition and the sculptural and monumental quality of the figures, as already been stressed by J.F.M. Michel in his book *Histoire de Rubens*, which was published in Brussels in 1771. He described the impression which the triptych in the St. Walburgis church made on him as follows: "... for the painter has made his work appear with the same perfection and force from a distance as from immediately below, despite the fact that it stands upon the high altar of the choir, to which one must ascend by nineteen steps. The painter has succeeded in giving his colours and finishing touches such vigour and harmony, by means of heavier applications in some parts [i.e. heavier impasto], that the effect of perfection and the strength of the colouring are as clearly visible at the back of the church as they are from the raised level of the choir." [13]

In this context we should also be aware that the triptych, undoubtedly the largest ever to be painted in the Low Countries, was positioned on an imposing high altar, the most monumental erected in Antwerp up to that time. Documents in the archives reveal that the lower part, serving as a sort of pedestal, was executed in marble, with the upper part, as well as the top, made completely of wood. This altar was demolished in 1733, and replaced by a new portico altar constructed completely of marble, to the designs of the well-known Antwerp sculptor Guillielmus-Ignatius Kerrickx (1682-1745) [14]. We can clearly see how the first original altar looked in a painting by Anton Ghering dating from 1664, which represents the interior of the St. Walburgis church in that year (Fig. 4) [15]. This painting is located in the former cloister of the church of St. Paul in Antwerp.

[13] " ... car le Peintre fait paroître son ouvrage, tant de loin, que du bas vers le haut, dans la même perfection & force, nonobstant qu'il se trouve dans l'autel du grand choeur, auquel il faut monter par 19 escaliers, le Peintre a çu donner tant de vigueur & d'harmonie à ses couleurs et dernières touches, par des applications plus matérielles en quelques parties, que l'effet de perfection & la vigueur du coloris paroissent au fond de l'Eglise, comme sur le haut du choeur" (J.M.F. MICHEL, *Histoire de la vie de Rubens*, Brussels, 1771, p. 76).

[14] G. GEPTS-BUYSAERT, *Guillielmus Ignatius Kerrickx, Antwerps beeldhouwer, 1682-1745*, in *Gentse Bijdragen tot de Kunstgeschiedenis*, XIV, 1953, p. 293-296.

[15] See BAUDOUIN, *Vier afbeeldingen...*, *op. cit.* n. 4, p. 190-193 and fig. 6.

459.5 x 339.6 – 150 cm

3. P.P. Rubens (1577-1640), Triptych of the *Elevation of the Cross*, 1610-1611. Antwerp, Cathedral of Our Lady.

Anton Ghering's painting allows us to see how the wings of the triptych were joined to the central panel, to which they appeared to be attached by hinges. Above the cornice of the actual altar, in the centre, was a small construction with, as it were in a niche, a painting depicting God the Father in half-length [16]. On each side of this painting, there was a large angel with a flowing robe, painted on a panel cut to the shape of the figure. One of these panels was recently rediscovered, and is now in the Flint Institute of Arts, Michigan (Fig. 5) [17]. A pelican in gilt wood adorned the top of the pediment, symbolically summarizing the significance of what is represented on the triptych : the death of Christ for the salvation of mankind. Apart from its extremely impressive dimensions and the fact that the upper part of the altar was given a sense of movement through the presence of the baroque angels in flowing garments, it did not represent any new development in the architecture of altars in Antwerp. In fact, altars of this type had already been erected in the cathedral, and possibly also in other churches. Indeed, there were others which were even more "progressive" in style, with pillars crowned by capitals on either side of the central panel, so that they started to adopt the structure of portico altars [18].

The rather "outdated" type of altar in which the *Elevation of the Cross* was placed allows us to assume that Rubens was not or hardly involved in its conception. This was in contrast with his later, larger commissions for churches, for which he designed not only the altarpieces but also the constructions on which they were to be placed. However, as mentioned above, the angels with their large wings and elegantly draped garments were a new element, an attempt to imbue the structure with more baroque liveliness. Another important figure is that of God the Father in the centre at the top. It is to Him that Christ looks up from the central panel below, as the Cross to which He is being nailed is erected. Thus, as in other altar constructions which Rubens himself later designed in a more pronounced baroque style, there was already a clear relationship between the theme depicted on the altarpiece and the figures above it. In this respect, a further development is here already distinctly announced [19].

On the other hand, the high altar in the St. Walburgis church also represents the end of an era, as, together with the *Descent from the Cross* (1611-1614), it is certainly one of the last great triptychs to be painted in Europe. Rubens's two great altarpieces, which are now each other's counterpart in the Cathedral of Our Lady in Antwerp, represent both the zenith and the swansong of the evolution of the painted triptych through the centuries since its origins in the 12th century [20]. With the introduction in the Netherlands of the large portico altar, which had already assumed monumental dimensions in Italy

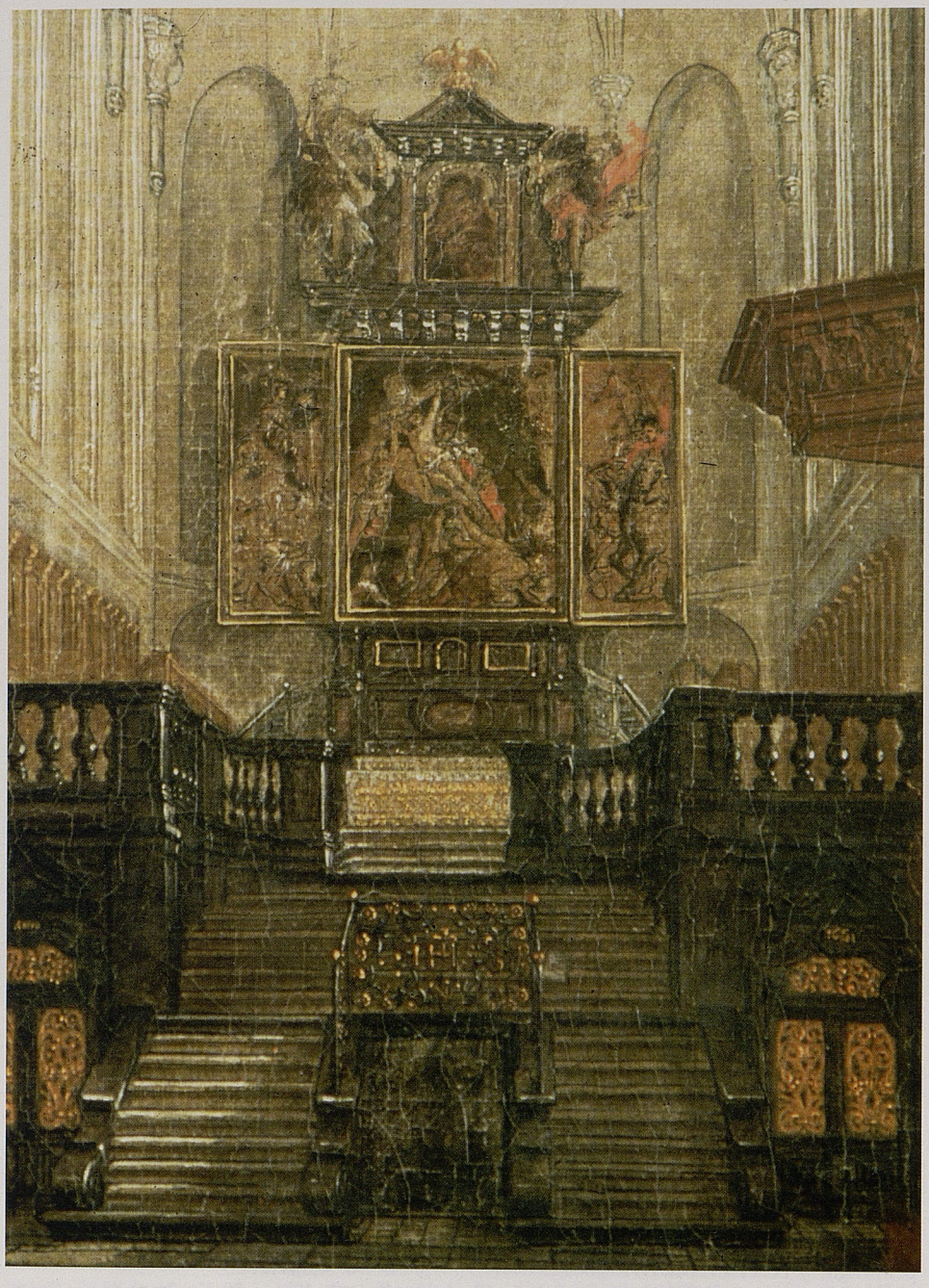
[16] An engraving by Ignace Joseph van den Berghe (1752-1824), representing God the Father, is reproduced in J.R. MARTIN, *The Angel from Rubens' Raising of the Cross*, in *Rubens and his World. Studies... opgedragen aan R.A. d'Hulst*, Antwerp, 1985, p. 141-142, pl. 2 ; a colour reproduction in D'HULST e. a., *op.cit.*, p. 64, fig. 40.

[17] See MARTIN, *The Angel...*

[18] F. BAUDOUIN, *Altars and Altarpieces before 1620*, in J.R. MARTIN (ed.), *Rubens before 1620*, Princeton, N.J., 1972, p. 75-79. See about this type of altars, called in German *"Aedikula-Retabel"*, J. BRAUN, *Altarretabel (kath.)*, in O. SCHMITT (ed.), *Reallexikon zur deutschen Kunstgeschichte*, I, Stuttgart, 1937, col. 544-547.

[19] See especially K. FREMANTLE, *The Baroque Town Hall of Amsterdam*, Utrecht, 1959, p. 123-133.

[20] About the origin of the altar triptych in the early 12th century in and around Rome, see the interesting remarks in H. BELTING, *Bild und Kult. Eine Geschichte des Bildes vor dem Zeitalter der Kunst*, Munich, 1990, p. 363-368, 395, 412, 430-431, 497-500.



4. A. Ghering (? - 1668), *Interior of the church of St. Walburgis*, 1664, detail. Antwerp, cloister of St. Paul's Church.

much earlier – see, for example, the portico altar adorned by Titian's *Assumption of the Virgin* (1516-1518) in the Church of Sta Maria dei Frari, in Venice [21] – the triptych form was abandoned. Certainly, attaching side panels in this strikingly tall new type of altar with the heavy pillars which served as a support, led to numerous insuperable problems. Henceforth, artists restricted themselves to painting only a single altarpiece, characterized by a pronounced height, which accorded with the structure of the portico altar. An example of this is Rubens's *Assumption of the Virgin* completed in 1626, which adorns the high altar in the same church [22].

Let us focus our attention once again on the triptych itself. Rubens's *Elevation of the Cross* is of exceptional importance for art history in the Netherlands in at least two respects. First, from the iconographic point of view, because the subject was represented here for the first time in a completely coherent and harmonious way in a spirit which fully accorded with the Counter-Reformation ; secondly, because the triptych can be considered as the most important monumental work of art of this period, introducing the new baroque style north of the Alps.

As regards the iconographic aspect, it should be noted that the subject of the elevation of the Cross was not used in art before the end of the 16th century, neither in fresco, nor on panel nor on canvas, in Italy, the Netherlands or anywhere else in Europe. In series of paintings representing the Passion of Christ, the *Carrying of the Cross* is usually followed directly by the representation of *Christ on the Cross*, in some cases with the two figures of the thieves crucified on either side.

In exceptional cases a scene was inserted in the 15th century representing Christ being nailed to the Cross. One early unusual and rather unique example of such a *Kreuz-Annagelung Christi* (as this subject is sometimes called in German), can be seen in the fresco by Fra Angelico – or, as is now thought, probably by one of his assistants – in cell 36 of the San Marco Monastery in Florence [23]. In this fresco the Cross has already been erected, Christ is placed with His back to it in the centre, and He stands with His arms stretched out on the top rung of a short ladder. Behind the Cross, a ladder is placed against the crosspiece on either side, and an executioner is nailing Christ's hands to the wood.

However, in most cases He is depicted stretched out on the Cross. His hands and feet are nailed while the Cross is still lying on the ground. This sort of representation can be found for example on a panel in Turin depicting numerous scenes from the Passion, which was painted by Hans Memling in about 1478 [24]. Another version of the same sub-

[21] The altar is visible in G. LORENZETTI, *Venezia e su Estuario*, Venice, 1927, fig. LXIV (in front of p. 515) ; it is only partly visible in H. TIETZE, *Titian. The Paintings and the Drawings*, London, 1950, fig. 35.

[22] FREMANTLE, *op. cit.*, fig. 146 (the engraving by Lommelin) ; P. HUVENNE, *Rubens' "De Hemelvaart van Maria" in de Onze-Lieve-Vrouwe kathedraal van Antwerpen*, Tielt, 1991, p. 4 (the painting), p. 12 (the engraving of the altar designed by Rubens, including the painting).

[23] F. SCHOTMÜLLER, *Fra Angelico da Fiesole* (*Klassiker der Kunst*, 18), Stuttgart-Berlin-Leipzig, 2nd ed., 1924, p. 140 right ; J. POPE HENNESSY, *Fra Angelico*, London, 1974, p. 208, No. 36, fig. 35.

[24] M.J. FRIEDLÄNDER, *Early Netherlandish Painting*, VIa, Leiden-Brussels, 1971, p. 50, No. 34, pl. 86-87 ; C. ARU and E. DE GÉRADON, *La Galerie Sabauda de Turin* (*Les Primitifs flamands*, I. *Corpus de la peinture des anciens Pays-Bas au quinzième siècle*, 2), Antwerp, 1952, p. 14-20, pl. XXXVII.

204.5 x 144.8 cm

5. One of the two angels painted by Rubens for the upper part of the main altar in the church of St. Walburgis. Flint, Michigan, Flint Institute of Arts.

ject in the National Gallery in London, which originally formed part of a Passion triptych by Gerard David, is better known. The side panels are now displayed as separate panels in the Royal Museum of Fine Arts in Antwerp [25].

Nor is the elevation of the Cross commonly used as a subject in miniature paintings. One well-known exception is the small miniature on parchment which forms part of the so-called *Stein Triptych*, composed of no fewer than sixty four scenes from the life of Christ, painted by the Ghent miniaturist, Simon Bening (1483/84-1561). The triptych is

[25] M.J. Friedländer, *Early Netherlandish Painting*, VIb, Leiden-Brussels, p. 83-84 and 100, No. 162, pl. 170 ; H.J. Van Miegroet, *Gerard David*, Antwerp, 1980, p. 47, fig. 23 and p. 277, No. 4.

6. H. Wierix (1553-1619) after B. Passeri (c. 1540-1590), *Elevation of the Cross*, No. 128 in the *Evangelicae Historiae Imagines*, a book of engravings compiled by G. Nadal (Natalis), Antwerp, 1593.

now in the Walters Art Gallery in Baltimore [26]. It should be noted that on this miniature, Christ's Cross is elevated by means of spears pushed against the back, while the

[26] S. RINGBOM, *Icon to Narrative. The Rise of the Dramatic Close-up in Fifteenth Century Devotional Painting* (*Acta Academiae Aboensis*, Ser. A. *Humaniora*, 31.2), Abo, 1965, p. 205-209, fig. 195.

crosspiece is balanced by ropes attached to it [27].

It was not until the last decade of the 16th century that we find another representation comparable to Rubens's *Elevation of the Cross*, although it should be immediately added that this did not contain the strong expressive force and powerful dynamism of the Antwerp triptych. This is a print by Hieronymus Wierix (1553-1619), after a design by the Roman painter and engraver, Bernardino Passeri (c. 1540-1590), No. 128 of a very well-known and often reprinted book of plates with scenes from the life of Jesus, entitled *Evangelicae Historiae Imagines*, compiled by the Spanish Jesuit, Geronimo Nadal (Natalis) (Fig. 6). Originally it was intended to publish this work in Rome, but eventually it was published in Antwerp in 1593, though only after Nadal's death in 1580, and following a great many trials and tribulations [28]. The work was intended as an aid for novices in the Jesuit order, and any other people who wished to adopt this method of meditation. By looking at the illustrations and considering the points of attention indicated under A, B, C etc., the viewer was encouraged to think about Christ's life in the most concrete visual terms possible, so intently and with so much empathy that the viewer would feel strongly involved with His suffering. In the same way that Saint Ignatius of Loyola tried to do this in his *Spiritual Exercises*, it was an attempt to facilitate repentance, prayer and the imitation of Christ. In fact, the use of prints for this purpose was in keeping with the views of the Council of Trent, which fully recognized the value of the image as a didactic instrument for instilling the doctrine of the Catholic faith, though admittedly, as we know, on the condition that apocryphal, excessively sensual, fantastic or confusing elements were omitted.

An examination of the book of illustrations reveals that when Bernardino Passeri drew the designs for the prints, which certainly must have been before the death of Father Nadal in 1580, he was frequently inspired by paintings and prints by Italian masters, usually his contemporaries. Yet in many cases the subjects he borrowed from them were placed in a new context, and subsequently also modified slightly, probably in accordance with Father Nadal's didactic requirements. Print No. 128 was adapted in this way, and can be considered as a sort of simplified paraphrase of the elevation of the cross of the thief, as it is depicted on Tintoretto's *Crocifissione* in the Scuola di San Rocco in Venice, to the left of Christ on the Cross (Fig. 7) [29]. On the engraving, the subject is represented in reverse, with the exception of the figure of the young man who is pulling on the rope to raise the cross. Although his pose is different, and he no longer holds a rope,

[27] This motif derives from a small woodcut belonging to a set of 40 blocks by Albrecht Altdorfer (ca. 1480-1538) representing together *The Fall and Redemption of Man* (1515) ; No. 29 : *Erection of the Cross* (F.W.H. Hollstein, *German Engravings and Woodcuts ca. 1400-1700*, I, Amsterdam, 1954, p. 240, fig. p. 241). For his *Raising of the Cross* in the Alte Pinakothek in Munich, Rembrandt also borrowed from the same woodcut by Altdorfer (C. Brown, J. Kelch and P. Van Thiel, [exhib. cat.] *Rembrandt. De Meester en zijn werkplaats. Schilderijen*, Amsterdam-Zwolle, 1991-1992, p. 158). See also note 30.

[28] M. Mauquoy-Hendrickx, *Les Estampes des Wierix conservées au Cabinet des Estampes de la Bibliothèque Royale Albert Ier. Catalogue raisonné*, 3.1, Brussels, 1982, p. 491-496, No. 2096, fig. 318 ; about the history of Nadal's book, see p. 491-496.

[29] P. Palluchini and P. Rossi, *Tintoretto. Le Opere sacre e profane*, I, Milan, 1982, p. 69 and 189, No. 283 ; II, fig. XXII and p. 371-375.

but a stick with a hook with which the crosspiece of the cross is pushed up [30], it is evident that he served as a model for the corresponding figure in Wierix's print after Passeri.

The fact that Rubens was familiar with and had used Nadal's book of prints of evangelical scenes has already been shown by David Freedberg [31]. He had already borrowed the above-mentioned athletic figure of the young man raising the Cross from this book in his first *Elevation of the Cross*, which he painted for the church of Santa Croce in Rome in 1601-1602, and which is known to us only through a copy in Grasse (Fig. 8) [32]. However, in that work he placed the executioner's assistant closer to the Cross, in such a way that he could raise it with two hands outstretched. In the same way, Rubens again introduced this man in the centrepiece of his altarpiece for the St. Walburgis church, accentuating his torso and muscular arms even more strongly [33]. The other executioners at the bottom seem to be based more on Tintoretto's *Crocifissione* than on Wierix's print after Passeri, although these figures are not borrowed in a "literal" fashion. In any case, a comparison of the preliminary sketch for the central panel of the *Elevation of the Cross* in the Louvre (Fig. 9) [34] with the print in Nadal's book of illustrations dating from 1593 clearly shows that Rubens based his work on the latter.

In fact, it is likely that the church Council of the St. Walburgis church in Antwerp which commissioned the work was also familiar with this publication, which had been reprinted a few years earlier, in 1607 [35]. Perhaps this positively influenced their choice of the elevation of the Cross, until then a very unusual subject for a high altar. Certainly this represented the introduction of a completely new theme in painting, a theme which undoubtedly reflected the spirituality of the Counter-Reformation and was further elaborated by Rubens straightaway, in terms of both content and form, to a stage of development which had up to that time not existed either in Antwerp, or anywhere in Europe. In this work he was certainly very innovative. In this context we should draw attention, first of all, to the link between the figure of God the Father, which used to be above the cornice of the portico altar, and that of Christ, whose upward gaze was directed at His Father. In his excellent analysis of the triptych, H.G. Evers writes : "The fact that Christ rises silently above his surroundings, with a sigh of relief, not crying out, so that within

[30] It seems likely that Passeri also took over this motif from Altdorfer's woodcut, on which the cross is raised by means of lances, on both ends of the cross-bars. See note 27.

[31] In relation with Rubens' paintings of the *Assumption* and the *Coronation of the Virgin*, cf. D. Freedberg, *The Life of Christ after the Passion* (*Corpus Rubenianum Ludwig Burchard*, VII), London, 1984, p. 139, 191 and 195. J.B. Knipping (*Iconography of the Counter Reformation in the Netherlands*, II, Nieuwkoop-Leiden, 1974, p. 419 ; the original edition in Dutch dates from 1940) mentioned already the print in Nadal's book, but wrote erroneously that this was engraved by Wierix "after Pissaro" (for : Passeri). Knipping also mentioned Altdorfer's print.

[32] H.G. Evers, *Die Kreuzaufrichtung von Rubens im Hospital in Grasse*, in Idem, *Rubens und sein Werk. Neue Forschungen*, Brussels, 1943, p. 97-104 ; J. Müller Hofstede, *Rubens in Rom 1601-1602. Die Altargemälde für Sta. Croce in Gerusalemme*, in *Jahrbuch der Berliner Museen*, III, 1, 1970, p. 61-110 ; H. Vlieghe, *Saints*, II (*Corpus Rubenianum Ludwig Burchard*, VIII), Brussels, 1973, No. 112, fig. 35 ; M. Jaffé, *Rubens in Italy*, Oxford, 1977, p. 96, fig. 187. The painting is at present, together with the two other ones, in the Cathedral in Grasse.

[33] In the Ashmolean Museum in Oxford there is a preparatory drawing of the upper torso of this man, seen partly from behind (Chr. White, *Peter Paul Rubens, Man and Artist*, New Haven-London, 1987, p. 92, fig. 105).

[34] See the colour plate in d'Hulst e.a., *op. cit.*, p. 68, fig. 45.

[35] In fact, the *Evangelicae... imagines* were not published in 1607 as a separate book, but formed part of a reissue of Nadal's (Natalis') *Adnotationes et meditationes in Evangelica* (first edition : Antwerp, 1597).

7. Tintoretto (1518-1594), *Crucifixion*, c. 1565, detail : the elevation of the cross of one of the thieves. Venice, Scuola di San Rocco.

(© Scuola Grande Arciconfraternità di S. Rocco, Venezia No. V1)

the heavy weight of his suffering we perceive suddenly something of the weightlessness of the Ascension, and the fact that God the Father is above awaiting him, suggests the significance that this lattice-work of figures had in the choir of the church of St. Walbur-

ga for two hundred years." [36] In this way, Rubens gave the subject of the elevation of the Cross a dimension which may not be immediately apparent to us now that the work above it with the figure of the Father is no longer there : Christ's victory over Death. For the believers who attended mass in the St. Walburgis church, the ivory coloured body, the unmistakable main theme in the centre of the composition, had another meaning – it made a reference to the *Corpus Christi* of the Eucharist [37]. The correspondence between the white host which was raised above the altar during mass, and the luminous body of Christ on the painting above it, really could not have been visualized in a more poignant way. It immediately becomes clear that although Rubens based the conception of his triptych on Tintoretto's masterwork in the Scuola di San Rocco in Venice, and on the above-mentioned print in Nadal's book of illustrations, he ultimately left both of these far behind him, elaborating a more cohesive and meaningful composition. His representation places the subject in the context of the exaltation of the Holy Eucharist which was also a strong feature of the Counter-Reformation.

In connection with the iconography of the triptych, it should also be noted that Mary is not depicted as having fainted – as is often the case in the paintings of the Italian masters of the Renaissance, who show her at the foot of the Cross – but standing up, as she was described in the medieval hymn *Stabat Mater Dolorosa* [38]. Saint John is next to her. The fact that he wishes to support her in her grief is shown discreetly, but at the same time expressively, by the gesture of his right hand which he places on her folded hands (Fig. 11).

In a stylistic respect, Rubens's *Elevation of the Cross* also serves as a milestone in the history of art in the Netherlands. Before discussing this in greater detail, it should be noted that certain stylistic features of this triptych could already be found in works painted by the artist during the last years of his stay in Italy. The continuity which is revealed in this way is probably most striking on the reverse sides of the wings. It is evident that the figure of Saint Amandus on the left panel can be traced back to Rubens's figure of Saint Gregorius, found on a painting on slate which was located on the wall to the left of the

[36] "Das Christus emporschwebt, aufatmend, nicht aufschreiend, so dass innerhalb der lastenden Schwere plötzlich etwas von der Schwerlosigkeit einer Himmelfahrt entsteht, dass über ihm Gottvater ihm erwartet, damit ist der Sinn angedeutet, den dieses Gitterwerk an Gestalten zwei hundert Jahre lang im Chor der Kirche gehabt hat" (H.G. EVERS, *Peter Paul Rubens*, Munich, 1942, p. 127).

[37] Attention has also been drawn to this Eucharistic significance in N. VERHAEGEN, *La Descente de Croix de Rubens. Etude préalable au traitement. Iconographie*, in *Bulletin de l'IRPA/van het KIK*, V, 1962, p. 24.

[38] E. MÂLE, *L'Art religieux de la fin du XVIe siècle, du XVIIe siècle et du XVIIIe siècle*, Paris, 2nd ed., 1951, p. 8. For the study of the iconography of the triptych, notice should also be made of some remarks in T.L. GLEN, *Rubens and the Counter Reformation. Studies in his Religious Paintings between 1609 and 1620*, Diss. Princeton, N.J., Sept. 1975, New York-London, 1977. For instance on p. 44 and on p. 193-194, notes 72 and 73 : the Hebrew characters of the *titulus* above Jesus' head are real ; the text is in Aramean (or Chaldean), the dialect used at the time in Palestine ; p. 45 : the bushes on the rocky escarpment are scrubby oak trees (symbol of the Tree of the New Faith, referring to Christ's sacrifice) intermingled with a grape vine (Eucharistic reference : "I am the true Vine"), a torny rose branch (symbol of martyrdom) and delicate ferns (symbols of humility and sincerity) ; p. 39 : the gestures and expressions of the mourning figures on the left wing may recall Christ's words to the onlookers just before His crucifixion, as described by Luke 23, 28-29. In addition, it should also be noticed that the dark moon covering already partly the sun refers to the darkness which, according to Mark (15, 33), Matthew (27, 45) and especially Luke (23, 44-45), was falling over the land just before Christ expired.

224 x 180 cm

8. P.P. Rubens (copy), *Elevation of the Cross*, 1600-1601. Grasse, Cathedral of Notre-Dame-du-Puy.

Central panel : 68 x 51 cm. Wings : 67 x 25 cm each

9. P.P. Rubens, sketch for the *Elevation of the Cross*, c. 1610. Paris, Musée du Louvre.

choir of Sta Maria in Vallicella in Rome (Fig. 10) [39]. On the other hand, the tall figure of Saint Catherine of Alexandria is highly reminiscent of the figure of Saint Domitilla on the painting to the right in the same choir [40]. These figures have very similar forms, with a strong element of plasticity. This sculptural aspect is related in particular to the sculpture of classical antiquity which Rubens had zealously studied during his lengthy second period in Rome, and which had undoubtedly influenced him. The putti floating above the saints on the wings in Antwerp are almost identical to those fluttering over the heads of the saints like butterflies on his panels in the Church of the Oratory in Rome. There is absolutely no break in the style which he mastered in Italy and which he merely continued to use and develop when he returned to Antwerp.

The relationship with his earlier work can also be recognized on the front of the triptych. Again there are stylistic features which Rubens borrowed from the Italian masters, and which he had already incorporated in his own works of art while he was in Italy. It was stated above that as regards the composition of the *Elevation of the Cross* as a whole, he was influenced by Tintoretto. But he also borrowed elements from his great Venetian predecessor for certain details in the triptych. In this respect the most striking element is the monumental horse on the front of the right panel, which is reminiscent of motifs in Tintoretto's *Crocifissione*, although it should be noted that Rubens depicted it more forcefully and energetically [41]. In addition, both the clear light which imbues the bodies of the thieves with a vibrant transparency, and the characteristic bright blue of the sky, are features of the Venetian school of painting which Rubens adopted. The horseman's head is again reminiscent of a statue from classical Antiquity, the *Hercules Farnese*, which Rubens repeatedly copied in Rome and which is now in the Capodimonte Museum in Naples [42].

In addition to classical and Venetian elements, the influence of Michelangelo can be identified, particularly in the centre panel. The robust limbs of the executioner's servants, whose muscles are powerfully clenched as they join forces in exerting themselves to raise up the heavy Cross, are reminiscent of many of the great Florentine's paintings and statues. Their powerfully defined torsos, burnt brown in the sun, are outlined against the dark rock wall in the background, as though in relief. The noble body of Christ seems carved from ivory, and is also reminiscent of figures in the oeuvre of Michelangelo. In its immaculate beauty it is, so to speak, the antithesis of the *Schmerzens-*

[39] Altarpieces painted on slate occured in Rome already in the sixteenth century. A well-known example : Taddeo Zuccari, *The Conversion of Paul*, in S. Marcello al Corso. It is striking to observe the vigour and liveliness of the colours showing up against the dark slate background (J.A. GERE, *Taddeo Zuccari. His Development Studied in his Drawings*, London, 1969, p. 82 ; S.J. FREEDBERG, *Painting in Italy : 1500-1600* (*The Pelican History of Art*), Harmondsworth, Middlesex, 1970, p. 336, fig. 211.

[40] Colour reproductions of the two paintings on slate : WHITE, *op. cit.* (n.33), p. 49, fig. 70-71. It is interesting to notice that the slate panels there measure each 425 x 250 cm, which is certainly higher and wider than the usual dimensions of triptych wings in the Netherlands (cf. the wings of the Antwerp *Elevation of the Cross* : 460 x 150 cm). See also on p. 51, White's excellent remarks on Rubens' s use of antique sculpture for the figures of the Saints.

[41] For the derivation by Rubens of other horses from the same huge painting by Tintoretto, see e.g. F. BAUDOUIN, *Slotbeschouwingen*, in *Aspecten van vijftig jaar kunsthistorisch onderzoek, 1938-1988. Acta van het Colloquium Brussel, 3-4 november 1988*, Brussel, 1990, p. 123-126, fig. 4-11.

[42] Already observed by MARTIN, *Rubens : The Antwerp Altarpieces...*, p. 49, who also reproduces the sculpture, fig. 36 ; compare with Rubens's drawing in the Princes Gate Collection, Courtauld Institute Galleries, London, in D'HULST e.a., *op. cit.*, p. 86-87, fig. 68 and 69.

mann (The Man of Sorrows) of the late Middle Ages, as depicted, for example, by Grünewald in his moving Isenheimer Altar in Colmar [43]. Venetian influences as well as reminiscences from Michelangelo's art could already be seen in his large canvases for the Jesuit church in Mantua (1604-1605), such as, for example, *The Baptism of Christ in the Jordan*, which formed part of this series and is now in the Royal Museum of Fine Arts in Antwerp [44].

However, a third component with which Rubens was confronted during his second lengthy visit to Rome was also incorporated in the *Elevation of the Cross*. This was the influence of Caravaggio's work. Although he certainly did not borrow subjects directly from this great Italian painter, who was very controversial in his time, the realism with which the mourning women at the front of the left panel are represented, and the striking contrast between the bright light illuminating them and the dark shadows of their garments, are reminiscent of some of the essential characteristics of Caravaggio's œuvre [45]. Moreover, the fact that Rubens admired this artist's work is clear from his attempts to persuade the Duke of Mantua to acquire the moving painting, *The Death of Mary*, by this master, as it was considered too naturalistic to be placed in a church in Rome. It is now in the Louvre [46]. Later, when he had already been back in Antwerp for eight years, Rubens, together with Jan Brueghel I (the Velvet), Hendrik van Balen and others, purchased another of Caravaggio's masterworks, *The Madonna of the Rosary*, which is now in Vienna, for the church of St. Paul in Antwerp [47].

In addition to the influences and stylistic characteristics which could already be discerned in works from his Italian period, and which were also present in the works that Rubens completed during the first two or three years after his return to Antwerp, there is a new element in the *Elevation of the Cross* – a powerful dynamism which had not yet been expressed with such power in Rubens's art up to that time, and which gave his art a new dimension. Although his composition reveals an extraordinary sense of synthesis and balance, the work seems to be full of movement. As John R. Martin remarked, the viewer is confronted with an incomplete act, movement which could develop further : "In the ... altar, with its forceful diagonal accent cutting obliquely through space, and its relentless emphasis on cruelty and pain, the observer is confronted with a still uncompleted action, an action that must continue in a *crescendo*" [48]. The dominant diagonal in-

[43] It seems likely that, in his noble and restraint depiction of Christ's martyrdom, Rubens was influenced by Neo-Stoicism (cf. F. BAUDOUIN, *Iconografie en stijlontwikkeling in de godsdienstige schilderkunst te Antwerpen in de zeventiende eeuw*, in *Antwerpen in de XVIIde eeuw*, Antwerpen, 1989, p. 342).

[44] Cf. e.g. WHITE, *op. cit.*, p. 32-33, fig. 47.

[45] Attention has been drawn to this by R. OLDENBOURG, *Die Nachwirkung Italiens auf Rubens und die Gründung seiner Werkstatt*, in *Jahrbuch der Kunsthistorischen Sammlungen des Allerhöchsten Kaiserhauses*, 34, 1918 , reprinted in W. VON BODE (ed.), *Peter Paul Rubens, Sammlung der von Rudolf Oldenbourg veröffentlichten Abhandlungen über den Meister*, Munich-Berlin, 1922, p. 63-68 ; also G. GLÜCK, *Rubens, Van Dyck und ihr Kreis*, Vienna, 1933, p. 76-79, and WHITE, *op. cit.*, p. 47 (Caravaggio's influence already on the portrait of the member of the Doria family on horseback), p. 95 : "undoubtedly influenced by his understanding of Caravaggio's art, Rubens achieved a very vivid realisation of the event by the clear definition of the role of each participant" (concerning the *Elevation of the Cross*).

[46] Cf. e.g. R. HINKS, *Caravaggio's Death of the Virgin* (*Carlton Lectures on Art*), Oxford-London, 1953, p. 4-7.

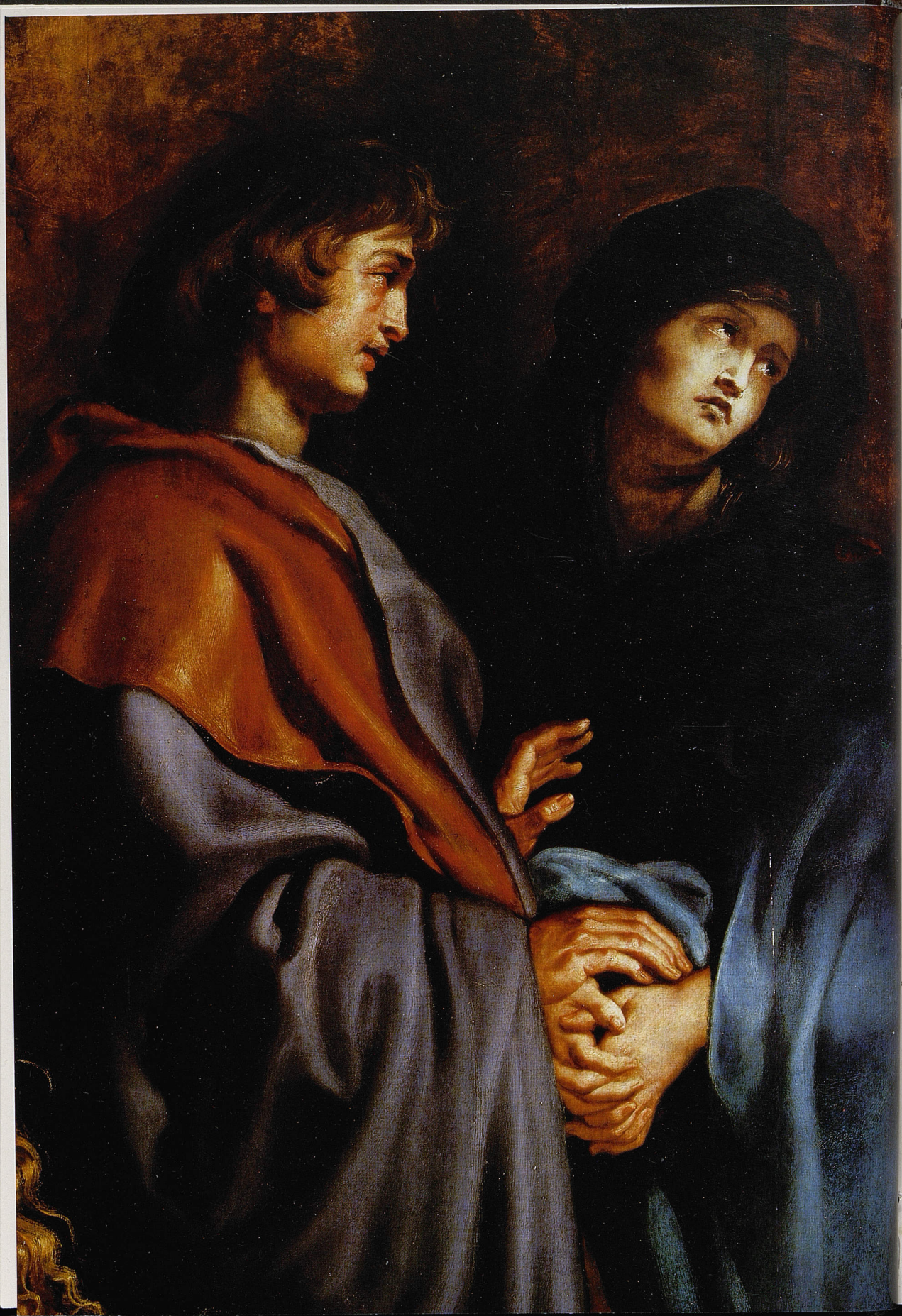
[47] Cf. e.g. J. MÜLLER HOFSTEDE, *Neue Ölskizzen von Rubens*, in *Städel Jahrbuch*, N.F. 2, 1969, p. 192-193 and 232-233, notes 21-23 ; and certainly W. PROHASKA, *Unterzuchungen zur "Rosenkranzmadonna" Caravaggios*, in *Jahrbuch der Kunsthistorischen Sammlungen in Wien*, 76, 1980, p. 114-116.

[48] MARTIN, *Rubens : The Antwerp Altarpieces...*, p. 48.

425 x 250 cm each

10. P.P. Rubens, *The "Madonna della Vallicella" Adored by Seraphim and Cherubim* ; left : *Saints Gregory, Maurus and Papianus* ; right : *Saints Domitilla, Nereus and Achilleus,* 1608, on slate. Rome, church of Sta Maria in Vallicella (Chiesa Nuova).

dicated by the half-raised Cross, the rotating bodies, the twisted positions of figures bending forwards and backwards, expressive gestures, violent contrasts between bright and dark areas, flashes of light glowing on the women's plaits and curls and on the manes of the rearing horse, together create the turbulence which characterized Rubens's art during the first years after his return to Antwerp : his youthful *Sturm und Drang* period, as R. Oldenbourg describes it. With the clashing of cymbals and sounding of the trumpet, he introduced a new and powerful style rich in colour and contrasts, full of life and movement : the High Baroque. He introduced it not only in Antwerp and in the Netherlands but throughout Europe, including Italy.



FORMER RESTORATIONS AND PRELIMINARY REPORTS FROM 1627 TO 1946

REGINE GUISLAIN-WITTERMANN and JACQUELINE FOLIE

During the over four hundred years of its existence, the triptych has undergone repeated examinations of its condition. Numerous projects have been drawn up for its restoration, only a few of which have in fact been carried out. Our knowledge of these projects derives from documents of very varying kinds, and of equally varying precision and reliability. The present report sets out to compare these documents with our own observations, in particular of traces of restoration work, and to present more general considerations stimulated by reading them. We refer here solely to published documents.

1627

Painted in situ in 1610-1611, the triptych underwent initial restoration as early as 1627. In this year Jan Baptist Bruno was paid 24 florins to clean the paintings (Rubens himself had received a total of 2,600 florins for the complete triptych) to allow Rubens to undertake some retouching work.

> "1627, October. Paid to Jean-Baptist Bruno for cleaning the painting on the High Altar, so that Mr Rubens can retouch it, as he promised and also did --- 24 florins" [1]

At this date, the triptych had been painted for only seventeen years. As such it was a "modern" painting, and still particularly sensitive to environmental conditions, and perhaps not completely dry in the thickly painted zones. Did the cleaning consist of a superficial brushing, or washing, or the elimination of deposits of candle soot ? Was the painting protected by a varnish, and indeed, did Rubens varnish his paintings ? We ourselves found nothing to prove that he did, and none of the fifty-six samples analysed by ourselves exhibited the presence of a varnish between two distinct stages of the original painting. Moreover, examinations of the artist's paintings have never yet proved with

[1] *Extraits du registre des comptes de l'église Ste.Walburge relatifs au tableau de Rubens, l'Erection de la croix, et des Archives du Serment des Arquebusiers concernant la Descente de croix par le même maître. 1610-1617*, Antwerp, 1840, *1610-1617*, p. 402 : "1627, October. Betaelt aen Jan Baptist Bruno voor de schilderije op den Hooghen Altaer te kuysschen en schoon te maeken, omdat Mr. Rubens die soude retoqueren gelijk hij belooft hadde en ook gedaen heeft,— fl. 24". Published by M. ROOSES, *L'œuvre de P.P. Rubens*, Antwerp, II, 1888, p. 80, n.4 ; English translation in J.R. MARTIN, *Rubens. The Antwerp Altarpieces. The Raising of the Cross / The Descent from the Cross* (*Critical Studies in Art History*), London, 1969, p. 55-56.

11. Detail showing the depth of expression achieved by Rubens in the figures.

12. Detail of the central panel : the dog is indeed part of the original composition, his body being painted directly on the ground layer.

certainty that the old varnishes which have been observed are indeed original. In the artist's writings, we find several passages mentioning the drying of the paint as such [2] but there is never any question of varnish.

Which parts are likely to have been retouched by Rubens in 1627 ? In principle, any of the *pentimenti* mentioned in the chapter *Materials and Techniques* below could have been executed at that time. The frequently advanced hypothesis that the dog was added at this occasion has been disproved by our examinations: whilst the head is indeed super-

[2] Notably in his letter to Carleton dated 26 May 1618 (Public Record Office, London) : "I cannot, however, affirm as precisely as I might wish, the exact day on which all these pictures will be dry. To tell the truth, it would seem to me better to have them all go together, considering that the first ones are freshly retouched. Still, with the aid of the sun, if it shines bright and without wind (which raises dust and is injurious to freshly painted pictures), they will be ready to be rolled after five or six days of fine weather". Original in Italian. Published in *The Letters of Peter Paul Rubens, Translated and Edited by* R.S. Magurn, Cambridge, Mass., 1955, p. 65.

posed on the dark background of the rock, the body is painted directly on top of the ground layer, with the limit visible to the naked eye (Fig. 12).

If the members of the St. Walburgis church Council called on the services of Jan Baptist Bruno in 1627, this means that Rubens himself no longer envisaged carrying out restoration work himself, as he had done in 1603 in Spain on two copies painted by Pietro Facchetti based on works by Raphael, taken by him to the Duke of Lerma as a present from the Duke of Gonzaga [3].

1733

The lunette containing the figure of God the Father, the cut-out panels of the angels flanking it and the three panels of the predella, which were parts of the original structure of the altar, were sold by auction to permit assembly of the altarpiece within a marble portico altar. It was the Antwerp sculptor Guillaume-Ignace Kerrickx, in charge of the construction of the new altar, who would then have added an arched part at the top of the panel :

> "Kerrickx covered with his own paint a part added at the top of the Rubens work, in order to transform the rectangular painting into an arched painting" [4].

We have found no trace of this addition, which must have been removed in the meantime, neither in remains of overpaint at the top of the original panel, nor otherwise. But as we had decided that it was preferable not to remove the central panel from its frame, we were unable to examine the state neither of the upper part nor of the upper edge of its support.

1781

Sir Joshua Reynolds, during a visit to St. Walburgis church, noted that the colour of the central panel and the left wing appeared to have suffered from their exposure to the sun, but that the danger had been removed as a screen was permanently fixed in front of the south window of the choir.

> "This part of the work [right wing], where the horses are represented, is by far the best in regard to colouring ; it has a freshness which the other two pictures want : but those appear to have suffered by the sun. This picture of the horsemen is situated on the south-east side, whereas the others, being east and south-east [north-east], are more exposed : however, at present, there is no longer danger, the fathers having taken the precaution to have a fixed window-blind, which the rays of the sun cannot penetrate." [5]

[3] Letters to Chieppio, Valladolid, 24 May and 17 July 1603. ARCHIVIO GONZAGUA, MANTOVA. Originals in Italian. Published in MAGURN, *op. cit.*

[4] J.F. MICHEL, *Histoire de la vie de P.P. Rubens, Chevalier, & Seigneur de Steen*, Brussels, 1771, p. 78 : "Kerrickx couvrit de sa peinture une partie ajoutée en haut de l'oeuvre de Rubens pour faire du tableau rectangulaire un tableau cintré." Cf. ROOSES, *op. cit.*, p. 75.

[5] Sir J. REYNOLDS, *A Journey to Flanders and Holland* [1781], in *The Works of Sir Joshua Reynolds, Knt.*, London, II, 1797, p. 22-26. Cf. MARTIN, *op. cit.*, p. 72.

The lack of freshness of the colours of the central panel and the left wing which Reynolds observed were probably due to no more than a yellowing or an opacification of the varnish under the effect of the sun, as we ourselves observed that these two panels are at least as well preserved as the right wing, in terms of pigments and colorants, the ground layer, and the wooden support. The preventive measure in the form of the window blind against the sun appears to have been effective.

1794

The *Elevation of the Cross* was selected by the French commissioners, with a number of other paintings, to be taken away to Paris. Transport was by boat and cart, first of all the central panel, followed later by the wings. The detailed report of the state of the paintings upon arrival in Paris, prepared by Jean-Baptiste P. Le Brun, mentions cracks, raised paint and losses. These problems were probably caused by precarious transportation conditions (jolting in the carts) and poor fillings and repaintings applied during earlier restoration work of which we have no records.

> "The third plank from the top has warped the most, and its upper part is split over two thirds of the painting. The lower part of the biceps is very cracked. The bottom of the attachment of the same arm is similarly cracked and, at this level, is split from one end to the other, with an opening of one to two *lignes* [1 *ligne* = 2,2558 mm]. The whole of the pectoral area is refilled with old putty and the upper part of the sides is severely split and lifting in several places. On the outer surface, close to the toe, [there are] two blows of 3 to 5 *lignes*. In the other knee-cap certain areas [are] refilled and repainted. 3 crushed flakes have fallen from the man dressed in red. On the fist of the man pulling the cord and crossing the hair, [there is] a blister 12 inches long and 4 to 5 *lignes* high. In the drapery on the shoulder, [there is] an area of flaking of 4 to 5 inches. The head of the man supporting Christ from below has been much too cleaned. Behind his deltoid muscle, close to the shoulder blade, [there is] a raised area 3 inches long and 1 inch high. In the shaded areas of his back, [there are] several areas of flaking and, at the bottom, close to the arm, an 8 inch wide and 3 *lignes* high area of the green drapery is blistered. 4 areas, 3 inches in diameter are raised or have flaked at the bottom of the knee of the right leg. A narrowing area [of paint] 6 inches long is lifting from the hip of the soldier wearing a cuirass standing under the cross. An area of 6 inches is blistered and a flake has fallen below the shoulder blade. A small flake on the 4 inches square vertebra, the rest ready to fall. 8 other locations, of which 3 [are] on the back and 5 on the top of the shoulder are also raised. A 3 foot long split is to be found 8 inches from the bottom of this painting, which in general has been too cleaned in several places. Numerous other small repaintings or flaking of minor importance have not been detailed ---" [6].

[6] Arch. Musées Nationaux, Paris (AMN), P. 4, 4 Vendémiaire an II (25 September 1794) : "La 3me planche du haut a le plus travaillé et à sa partie supérieure fendue aux deux tiers du tableau, le dessous du bisepce est trés gersé, Le dessous de L'attachement du même bras, est de même et à cette hauteur est fendue d'un bout à L'autre et ouvert d'une et deux lignes, rebordé d'ancien mastique, tout le pectoral, et la partie superieure des cotes fortement gersée et leve dans quelques places : Sur le vasse [la face] externe, près de L'orteil, 2 coups de 3 à 5 lignes dans L'autre rotule quelques places remastiquées et repeintes, 3 écailles enfoncées et tombées dans l'homme vétu de rouge : sur le poing de L'homme qui tire la corde et traversant les cheveux, une boursouflure de 12 pouces de long sur 4 à 5 lignes de hauteur dans la Draperie sur L'épaule un soulèvement de 4 à 5 pouces. L'homme qui soutient le Christ en dessous a eu la tête beaucoup trop netoyée, derrière son Deltoïde près L'omoplatte une partie levée de 3 pouces de long sur un pouce de haut : Dans les ombres de son dos, plusieurs places écaillées du fini, et dans le bas prés le bras 8 pouces de long sur 3 lignes de hauteur sont boursouflées sur sa draperie verte, 4 places de 3 pouces en rond se soulevent où sont ecaillées au bas de ses genoux de la jambe

13. Before the recent restoration, old putty and discoloured retouchings emphasized join 6 which J.-B. Le Brun had seen open in 1794 and the severely damaged paint layer on Christ's chest (photography under oblique light).

The blisters cited above must have been consolidated, as we have found no losses in the indicated places, except in a few areas, such as the green garment of the bald-headed executioner holding up Christ. On the other hand, Le Brun's report already mentions the join which traverses Christ's shoulder (join 6, Fig. 13) : having been filled in earlier with putty, it had opened up again. As for the losses mentioned in the above report, the fillings and retouchings which we observed cannot therefore predate the triptych's stay in Paris. J.-B. Le Brun notes that the bald-headed executioner's head has been

droite une partie de 6 pouces de long allant en diminuant se lève à la hanche du soldat cuirassé qui est sous la croix une espace de 6 pouces bouresouflée et une écaille de tombée au dessous de l'omoplatte et sur le vertebre de 4 pouces en quarré une petite écaille – le reste pret à tomber, 8 autres places dont 3 sur le dos, et 5 sur le haut de L'épaule lève encore ; une félure de 3 pieds est à 8 pouces du bas de ce tableau qui généralement a été trop nétoyé dans plusieurs places, nombre d'autres petits repeints ou écailles très peu importantes n'ont pas été détaillées ---." Published by G. Émile-Mâle, *Le séjour à Paris de 1794 à 1815 de célèbres tableaux de Rubens. Quelques documents inédits*, in *Bulletin de l'IRPA/van het KIK*, VII, 1964, p. 159.

overcleaned, along with several other places in the painting. This could point to selective cleaning, aimed at highlighting certain details. However, only the arm of the soldier propped up against the cross seemed to us to have been cleaned more than the rest.

1798

The Board of Administrators of the Musée Central des Arts decided, at its 1 June 1798 session (13 Prairial An VI), to entrust Messrs. Röser and Michau with the cleaning and varnishing of the *Elevation of the Cross* [7]. The minutes of the meeting do not provide any precise details as to the materials to be used, or the degree of cleaning to be obtained. A memoir by the restorer Michau mentions only :

> "to have removed the superficial dirt, varnished and placed some putty, duly coloured" [8]

When unpacking the paintings upon their return to Antwerp in 1815, the authorities however attributed the new flaking to the application of fish glue by the French in order to give a lustre. Indeed, we observed a greyish layer underneath the varnish in certain areas, resistant to solvents, but fragile to rubbing which might correspond to this layer. It is also possible that, during the 1798 cleaning, the balance between those zones which appeared overcleaned to Le Brun and the rest of the painting was reestablished.

From now on, successive commissions were to occupy themselves with everything relating to the good condition of the triptych : whether or not to carry out restoration work, choice of restorer, proposals for products and procedures, preventive conservation and safety measures. Initially, this task fell to the "Commission for Surveying Paintings Recovered from France", consisting essentially of artists. The overabundance and verbosity of the 19th century documents force us to limit ourselves in this essay to the most significant passages.

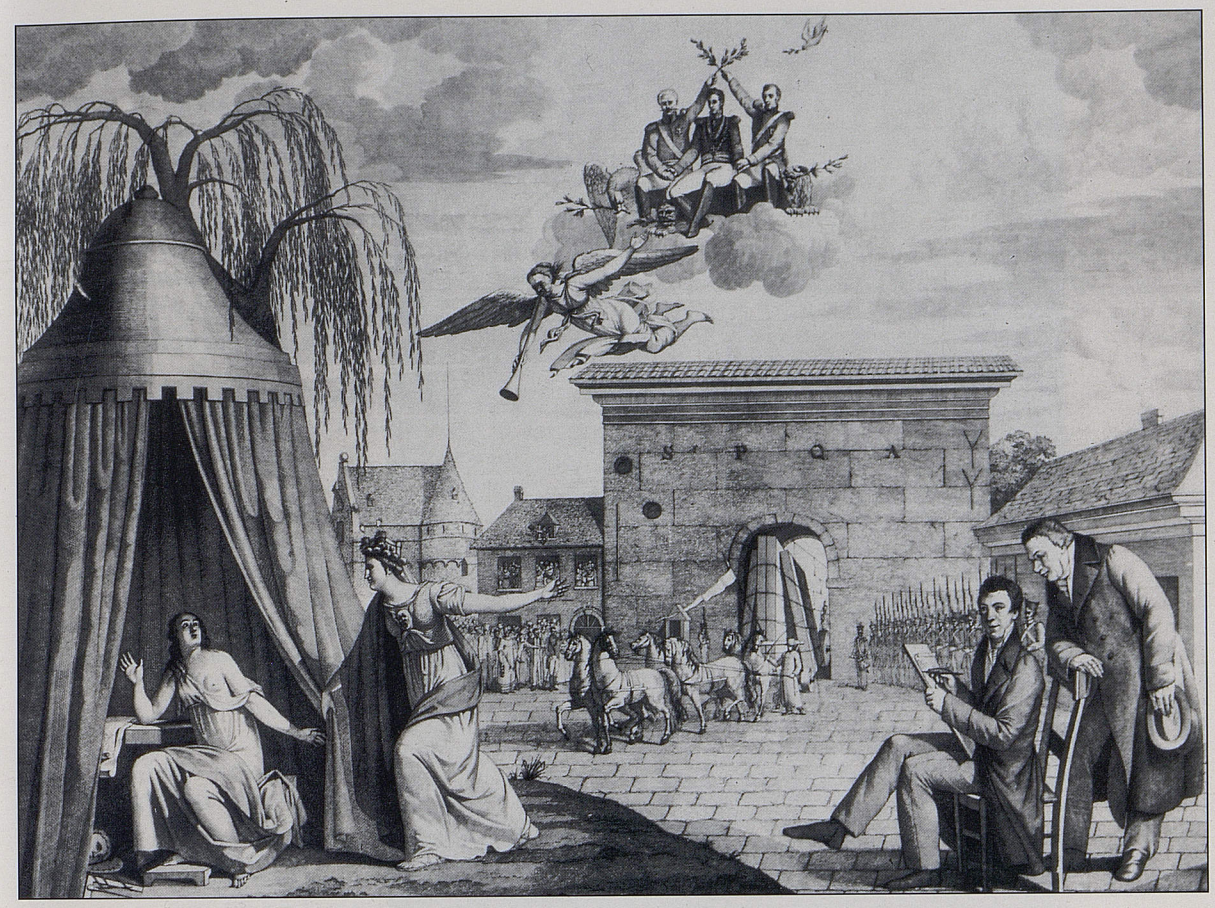
1815

The works of art were returned to Antwerp, under military escort, in packing cases hung in specially designed carts, and with the cases themselves protected by tarpaulins (Fig. 14). Despite all these precautions, the *Proces verbal de la Commission pour le Déballage et la Réception des Tableaux récupérés sur la France et appartenants à la ville d'Anvers* [9] points to the presence of numerous cracks and traces of mould on the *Elevation of the Cross*, mentioning also that the three panels of the triptych had each been divided into two parts and placed in four different cases.

[7] PARIS, AMN, *Procès-verbaux de l'Administration du Musée central des Arts*, registre 3, fol. 270, 13 prairial An VI (1st June 1798). Cf. ÉMILE-MÂLE, *op. cit.*, p. 162, n.3.

[8] PARIS, AMN, *Comptabilité an VII, Mémoires des restaurations faites par Michau du 1er Germinal au 30 prairial an VI* (21 March to 18 June 1798) : "avoir oté la première crasse, verni et mis quelques mastics au ton." Cf. ÉMILE-MÂLE, *op. cit.*, p. 162, n. 5.

[9] H. VLIEGHE, *Het verslag over de toestand van de in 1815 uit Frankrijk naar Antwerpen teruggekeerde schilderijen*, in *Koninklijk Museum voor Schone Kunsten Antwerpen. Jaarboek* 1971, p. 277-280.



14. A.G. Van Prooyen (1796-1854), engraving after a drawing by J.J. Verellen (1788-1856) : the triumphal return to Antwerp on 5th December 1815 of the paintings removed from Belgium in 1794. The cart passing the St. George Gate carries Rubens's large panels.
(© Kathedraalarchief van Antwerpen)

"Session of 15 December 1815.
8°, Case No. 15 --- 3° Two parts of the Elevation of the Cross painting on wood by Rubens, from the Church of St. Walburga.

Session of 16 December 1815.
--- 4° That the part of the side panel of the Elevation of the Cross, representing the Roman judges, has two splits on the left, which, however, do not traverse the panel, and that slight damage is to be found in the ensign. 5° That the piece of the other wing of the same picture is in good condition." [10]

[10] *Proces verbal de la Commission pour le Déballage et la Réception des Tableaux récupérés sur la France et appartenants à la ville d'Anvers* : "Séance du 15 Decembre 1815. 8° Caisse No. 15. --- 3° Deux pièces du tableau *L'Elevation de la*

15. Before our intervention, the right arm of the bald executioner still showed a network of flaking paint, as observed in 1841.

Item 4 of the minutes refers to the upper third of the right wing, separated at the intersection of the vertical and horizontal planks. The "two splits" are in fact two joins which must then have been partially open. We do not know the nature of the "slight damage" noticed in the ensign. Item 5 refers to the lower third of the left wing, also separated into two parts along the joint between the vertical and horizontal planks.

Croix sur bois par Rubens, de l'Eglise de Ste Walburge.

Séance du 16 Décembre 1815. --- 4° Que la partie du volet de l'Elevation de la croix, répresentant les Juges romains, a deux fentes à gauche qui cependant ne traversent pas le panneau, et qu'un leger dommage se trouve dans l'enseigne. 5° Que la piece de l'autre volet du même tableau est en bon état."

"Case No. 4. A large painting on wood by Rubens, from St. Walburgis church, representing the Elevation of the Cross, this picture, according to declaration, was received in Paris by the delegates having : 1° a split, filled and retouched, crossing Christ's neck. 2° Another split, also filled in and retouched, passing through the hand of the executioner pulling the cord. 3° The reception commissioners have noted a third split at the bottom of the painting, ending close to the dog, and a splinter of wood on the left side of the painting." [11]

As the join mentioned in item No. 1 (join No. 6) was at that time closed, it cannot be the one which was opened to separate the panel into two by the delegates in charge of recovering the painting and transportation from Paris to Antwerp. We initially thought of this join, because it is particularly apparent on the front side and the four oak battens reinforcing it on the reverse are placed symmetrically against it.

"For reasons of safety, the delegates decided to pack the upper part, which was held to the painting only by wooden battens fixed on the reverse side, in another case. This part is to be found in case No. 14." [12]

Therefore it was during the preparation of the painting for transport that the five vertical elements reinforcing the reverse of the panel were cut at the height of join 4, the effective separation line of the panel [13].

"Session of 18 December 1815.
--- Case No. 14 --- On subsequently examining the part belonging to the painting The Elevation of the Cross, unwrapped from the same case, the Commission noticed two slight splits, of little importance, which do not traverse the piece." [14]

This can only refer to joins 1 and 2, which show differences in level at the left and right side respectively.

"We continued with unpacking case No. 17, from which we withdraw 1° the side panel of the painting the Elevation of the Cross, St John and the Virgin, The Commission found, running down the length of this side panel, a split passing through the drapery and the head of the Virgin, and a light network of cracks on St John's chest, 2° the side panel representing the crucifixion of the thieves, on which we noticed a minor split passing through the left leg of the thief still

[11] *Ibidem* : "La Caisse No. 4. Un grand tableau sur bois par Rubens, de l'eglise de St. Walburge, répresentant L'élevation de la croix, ce tableau selon la déclaration a été reçu a Paris par Messieurs les délégués ayant 1° Une fente bouchée et retouchée traversant le col du Christ. 2° Une autre également bouchée et retouchée passant par la main du bourreau tirant la corde. 3° Messieurs les Commissaires pour la réception ont remarqué une troisième fente au bas du tableau s'arrétant près du chien et un éclat du bois sur le coté gauche du tableau."

[12] *Ibidem* : "Par mésure de sureté, Messieurs les delegués sont convenus d'emballer dans une autre caisse la partie supérieure qui ne tenait au tableau que par les barres de bois fixées sur le revers ; cette partie se trouve dans la Caisse No. 14."

[13] See below J. Vynckier's observations p. 84.

[14] *Ibidem* : "Séance du 18 Decembre 1815. --- Caisse No. 14. --- Examinant ensuite la partie appartenant au tableau l'élévation de la croix, déballée de la même Caisse, la Commission a remarqué deux legeres fentes de peu de conséquence qui ne traversent pas la pièce."

standing. The reverse of these wings is decorated with a grisaille : on the first one can see St Catherine and on the other St Eloi." [15]

Item 1 relates to the upper two-thirds of the left wing. The "split" mentioned in its right side no doubt corresponds to the long crack which we observed running from the top to the bottom of this part of the wing. Item No. 2 relates to the lower two-thirds of the right wing, which appeared then to be in good condition, as well as the reverse sides of the wings.

1815-1816

After P. van Regemorter had been entrusted with the task of cleaning and restoring the triptych, he proceeded with the necessary tests [16] which were judged by the Commission.

"--- The Commission, examining first of all the tests made on the flaking parts, saw that the artist has successfully employed two different compositions : glue diluted in water, and a mixture of turpentine and wax. The Commission, convinced that the latter is preferable, decided that the artist must use only the latter mixture. Going on to examine the tests made for removal of the glue and the varnish covering the paintings, the Commission noted that the artist had perfectly succeeded in reproducing the original freshness of the colour. It also recognized that the means employed to remove the traces of blanching which has attacked certain paintings is neither dangerous nor difficult, but that it is urgent to begin this operation as soon as possible." [17]

The two consolidation procedures proposed by the restorer were described and commented on by Mr van Bree, a member of the Commission, in a detailed report dated 3 January 1816.

"First method. One takes strong glue and dilutes it in warm water. This glue is introduced onto the flaking paint with a slight rubbing of the finger. Then, using a hot iron, the flakes are flattened and fixed onto the panel, whilst the glue hardens and cools.
--- to introduce it (the glue), it must be diluted in water, which will necessarily take refuge in the

[15] *Ibidem* : "On a continué par le déballage de la Caisse No. 17, d'où on a retiré 1° le volet du tableau l'Elévation de la croix, St Jean & la vierge, La Commission a trouvé sur la longueur de ce volet une fente passant par la draperie & la tête de la vierge & une légère froissure sur la poitrine du St Jean, 2° le volet representant le Crucifiement des Larrons, sur lequel on a rémarqué une fente tres peu conséquente passant par la jambe droite du larron encore de bout, le revers de ces volets est orné d'une grisaille : sur le premier on voit Ste Catherine & sur l'autre St Eloi."

[16] Provinciaal Archief van Antwerpen (PAA), No. 94065. Published by V. van Grimbergen, *Documents historiques concernant les oeuvres d'art enlevées à Anvers sous la République française et restituées en 1815*, in *L'Escaut*, XV, 31877, No. 210, p. 1 (Cf. J. Van den Nieuwenhuizen, *La Descente de Croix de Rubens. Etude préalable au traitement. Histoire matérielle*, in *Bulletin de l'IRPA/van het KIK*, V, 1962, No. 37, p. 53).

[17] Letter from G. Herreyns, Chairman of the Commission, to the Governor of the Province of Antwerp, 30 December 1815, about the meeting of 29 December (PAA, No. 94.065) : "— La Commission examinant d'abord les épreuves faites sur les parties écaillées, a vu que l'artiste a employé avec succès deux composés divers, de la colle détrempée dans de l'eau et un mélange de térébenthine avec de la cire ; la Commission convaincue que ce dernier est préférable, a délibéré que l'artiste sera tenu de l'employer uniquement. Examinant ensuite les essais faits pour enlever la colle et le vernis dont les tableaux sont enduits, la Commission a vu que l'artiste a parfaitement réussi en réproduisant la fraicheur primitive des couleurs. Elle a également reconnu que les moyens employés pour effacer les traces de chanci dont quelques tableaux sont attaqués, n'est ni dangereux ni difficile, mais qu'il est urgent de commencer cette opération au plutot." Published by van Grimbergen, *op. cit.*, No. 211, p. 2-3 and Van den Nieuwenhuizen, *op.cit.*, No. 38, p. 54.

wood on which it is applied. Should we not fear that the same water, as has already happened, will reappear and detach the colours ?
--- Second method. One takes white wax and an equal amount of Venetian turpentine, melts them together in a bain-marie. First of all small pouches filled with hot sand are placed on the raised areas to dry them and to slightly soften the flakes. Once the area is deemed to be sufficiently warm, the entire flaking surface is filled with as much of this mixture of wax and turpentine as it can contain, which easily penetrates into the smallest crevices, holding a hot iron above this area to prevent the turpentine mixed with the wax from cooling too soon. This composition, which penetrates into the wood, is at the same time an emollient, which means that, with a slight rubbing of a soft body, one can successfully integrate and consolidate the flaking. ---[18]

The problems raised by the restoration were submitted to an expert, pharmacist F.M. Verbert, in the form of five questions :

"1°. Which is the better way of the two for fixing and flattening the raised colours or the flaking parts, that of glue mixed in water, or that of a mixture of equal parts of Venetian turpentine and white wax ? 2° Is there a safer or better way of achieving the same end ? 3° Is the cold and wet season an obstacle to beginning work on restoring these paintings immediately, and, in both cases, for what reasons ? 4° What effect could alcohol or spirit of wine have on the colours, if it is necessary to use it to remove the bad varnish which cannot be removed just by dry rubbing. And could one advantageously use another substance for this operation ? 5° As the varnish protects the painting from the vicissitudes of the atmosphere, which could influence the colours, would it be dangerous to leave the painting uncovered, as possible emanations from close to the place where the paintings are deposited could affect the colours ?" [19]

In his reply of 16 January 1816, Verbert does not recommend alternative materials, neither for consolidation nor cleaning, but for the first operation he expresses a preference for wax-turpentine as being one of the "materials least liable to change", adding

[18] PAA, No. 94.065 : " Premier Moyen. On prend de la colle forte que l'on délaie dans de l'eau chaude : on introduit par un léger frottement du doigt cette colle sous les écailles, ensuite au moyen d'un fer chaud on applanit, et fixe ces écailles sur le paneau pendant que la colle se fige et se refroidit. --- pour l'introduire [la colle] on a besoin de la delayer dans de l'eau qui va necessairement se refugier dans le bois sur lequel il [elle] est appliqué[e]. Ne doit-on pas craindre que cette même eau comme elle avoit deja faite ne reparaisse et ne detache les couleurs.
--- Second Moyen. On prend de la cire blanche et autant du therbentine de Venize que l'on fait fondre ensemble au bain marie, on pôse d'abord sur les parties soulevées, des petits matelas remplis d'un sable bien chaud pour secher les parties du paneau et pour ammolir insensiblement les écailles. Aussitot que l'on croit que l'endroit est assez chaud, on rempli toute la surface écaillée, et autant qu'elle peut contenir de ce melange de cire et therbentine qui pénètre facilement dans les plus petites crèvasses moyenant de tenir au dessus de cet endroit un fer chaud pour empecher que la therbentine mêlée avec de la cire ne se froidite pas trop tot. Cette composition qui pénètre dans le bois est en meme temps un amoliant qui permet que par le moindre frottement d'un corps doux on parvient à unir et fixer ces écailles. ---". Published by VAN GRIMBERGEN, No. 211, p. 1 and VAN DEN NIEUWENHUIZEN, No. 39, p. 56.

[19] PAA, No. 94.065. "1° Quel est le meilleur moyen des deux pour fixer et applatir les soulèvements des couleurs ou parties écaillées, celui de la colle fondue dans l'eau, ou celui d'un mélange fondu de parties égales de térébenthine de Venise et de cire blanche ? 2° Pourroit on trouver un moyen plus sur ou plus avantageux pour atteindre le même but ? 3° la saison froide et humide est elle un obstacle à commencer de suite la restauration de ces tableaux, et dans le cas affirmatif ou négatif pour quelles raisons ? 4° Quelle pourroit être l'action de l'alcool ou esprit de vin sur les couleurs si l'on devoit avoir récours a son emploi pour enléver le mauvais vernis qu'on ne pourroit faire disparaitre par le seul frottement a sec et pourroit on employer avec avantage une autre matière a cette opération ? 5° Comme le vernis garantit la peinture des vicissitudes de l'atmosphére qui pourroient influencer sur les couleurs, seroit il dangereux de laisser la peinture a découvert parceque des émanations qui pourroient avoir lieu prés de l'endroit ou les tableaux sont déposés pourroient avoir quelques effets sur les couleurs ? " Published by VAN DEN NIEUWENHUIZEN, No. 41, p. 58.

that cold and humidity do not present any problems for the restoration, and that alcohol does not have any mordant or dissolving effect on the paint matter, but rather is ideal for removal of the dirtied layers of varnish. Finally he states that no harm would be done by exposing the unvarnished paintings to air and light.

With regard to cleaning, P. van Regemorter removed the crazed varnish, first of all on the unraised parts, and then on the others after consolidation :

> "Operation completely successful by rubbing with the fingers in such a manner that the colours are presented in their full splendour." [20]

The documents available to us make no mention of the regluing of the joins, but the fact that the panels are then provided with new frames leads us to assume that this regluing had already taken place. 1816 is therefore the earliest date we can posit for the application of metallic dovetails and the iron nails reinforcing the horizontal intersection joint and the fissure in the left wing. With regard to the retouching, the governor of the province, in a letter to G. Herreyns dated 28 January 1816, expressed the concern – in itself remarkable for its time – to reduce intervention to a minimum :

> "It is right now necessary to proceed with repainting ---. Nonetheless, this should be applied with the greatest parsimony." [21]

In any event, we are unaware of the extent of this retouching work, nor do we know what materials were used. The damages mentioned in the December 1815 report had indeed been retouched at the time of our restoration. These retouchings could possibly date from the 1816 restoration.

Indeed, the complete treatment lasted scarcely two months, as the triptych was accessible to the public in the Minderbroederkerk from 15 February 1816 onwards (for 3 francs "to the benefit of the poor") [22]. On 31 May 1816, the triptych was permanently transferred to the cathedral, as the St. Walburgis church was then secularized.

1819

In a letter dated 14 June 1819, G. Herreyns asked the cathedral authorities to have the Rubens paintings varnished in order to protect them from dust, candle smoke and even simple contact with the air [23]. We have no document allowing us to affirm that the cathedral authorities followed this recommendation. The Commission chairman's initiative reinforces nevertheless the assumption that the triptych had not been varnished prior to being transferred to the cathedral, following the advice of F.M. Verbert, whose report of 16 January 1816 judged that no harm was done by exposing the paintings without a varnish.

[20] Letter from G. Herreyns to the Governor of the Province of Antwerp, 8 January 1816 (PAA, No. 94.065) : "opération qui a complètement réussi par le frottement des doigts de maniere que les couleurs se représentent dans tout leur eclat." Published by VAN GRIMBERGEN, p. 2-3 and VAN DEN NIEUWENHUIZEN, No. 40, p. 57

[21] *Ibidem* : "Il est nécessaire actuellement de s'occuper des repeintes ---. Il faudra néanmoins en user avec la plus grande parcimonie."

[22] PAA, *Privilegiekamer*, No. 128, fol. 192 v°. Published by J.F. and J.B. VAN DER STRAELEN, *Kronijk van Antwerpen*, VIII, *1803-1817*, Antwerp, 1936, p. 231 and VAN DEN NIEUWENHUIZEN, No. 44, p. 59.

[23] KATHEDRAALARCHIEF VAN ANTWERPEN (KAA), *Rubens* file. Cf. VAN DEN NIEUWENHUIZEN, No. 49, p. 62.

1824

The Supervisory Commission concluded unanimously that it was necessary to clean the Rubens paintings, prescribing the composition of the solvent to be used :

> "--- a mixture of 2/3 parts pure blanched oil and 1/3 part turpentine, removed with bread after treatment." [24]

The work was again entrusted to P. van Regemorter, who began on 1 September and was paid on 31 December.

> "1824, December 31. To M. Van Regemorter, for the cleaning of the paintings : 73.71 Dutch florins." [25]

At this stage the triptych appears to have been in good condition and to have required treatment solely for aesthetic reasons.

1830

During the Dutch bombardment of Antwerp in October 1830, the Rubens paintings were placed in a shelter where they were to remain for two years [26].

1837 – 1849

It is certainly this stay in poor conditions which provoked the serious deteriorations noted on the two large triptychs between 1837 and 1849. We select here the most important observations of the experts consulted prior to the 1850 restoration.

First, a certain Mortemare, "restaurateur du Musée de France", noted on 18 January 1837 :

> "--- two paintings where the sickness is too advanced ; not only are these paintings flaking over the whole surface, but the most affected parts are principally the figures." [27]

Next, on 28 May 1838, the *Elevation of the Cross* was cited, along with the *Flagellation* in the Church of St. Paul, as one of the two Rubens paintings whose condition gave rise to serious concern [28].

In their report of 13 February 1841, G. Wappers and F. Berckmans, members of the Province of Antwerp Commission for Monuments, who had been given the task of examining the two large Rubens triptychs, wrote :

> "We first of all examined the Elevation of the Cross, and we noticed that this picture was scattered with several large patches about two hands wide, where the colour was cracked and split,

[24] Letter from G. Herreyns and J.A. Snyers to the Council of the church, 5 July 1824 (KAA, *Rubens* file): "--- een mengeling van 2/3 deelen zuyver gebleekte olye op 1/3 deel terpentijn, welke na de behandeling afgebrood word." Cf. VAN DEN NIEUWENHUIZEN, No. 50, p. 62.

[25] KAA, *Grootboek van de kerk (1816-1824)*, p. 163 : "1824, xber 31. Aen M. Van Regemorter, voor het schoonmaecken der schilderijen, 73,71 Neerl. Fl." Cf. VAN DEN NIEUWENHUIZEN, No. 50, p. 62-63.

[26] P. LAMBOTTE, art. *Verboeckhoven (Joseph-Eugène)*, in *Biographie nationale*, XXVI, Brussels, 1936-1938, col. 591.

[27] *Rapport sur l'état des tableaux les plus remarquables du musée d'Anvers et de quelques églises de cette ville* (ARCHIEF VAN DE ACADEMIE VOOR SCHONE KUNSTEN TE ANTWERPEN (AAA), box *Toezichtscommissie*): "--- deux tableaux dont la maladie est trop avancée ; non seulement ces tableaux se détâchent sur toute la surface mais les parties les plus malades sont principalement les figures." Published by VAN DEN NIEUWENHUIZEN, No. 53, p. 64.

[28] STADSARCHIEF VAN ANTWERPEN (SAA), *Modern Archief*, 201_2, 2°. Cf. VAN DEN NIEUWENHUIZEN, No. 55, p. 65.

and others where the colour was completely detached from the panel. This was visible by the "lifting" of the colour, in areas of about 1 inch.
We noticed in particular that the paint on Christ's chest is very cracked and has badly deteriorated ; and that the colour of Christ's throat is on the point of falling as well as that of the arm of a figure at the bottom and of another figure [Fig. 13 and 15]. One of these arms is even beginning to peal. As a result, we do not hesitate to state that this painting is in a very poor state." [29]

On 24 September 1842, the Commission of Enquiry was able to examine the two triptychs in good conditions, on scaffolds. It also observed raising and flaking paint. It attributed this damage to many factors including the varnishing in Paris, the removal of this varnish in Antwerp, the transportation of the panels, the opening and closing of the wings, the draughts on the front side, and the lack of aeration to the back. It concluded that restoration was urgently needed [30]. However, intervention was impossible due to lack of financial resources [31].

On 12 December 1845, restorer Paul Kiewert wrote to the Cathedral Council stating that restoration of the two triptychs was impossible without a transfer onto canvas, accompanying his report with lithographs indicating the different types of damage observed (Fig. 16) [32].

On 2 April 1846, G. Wappers and F.A. Verschaeren, after examining the paintings with the help of a scaffold, reported that the indications given in P. Kiewert's lithography were exact, but not sufficiently rigorous as to their extent [33].

Fortunately, P. Kiewert's proposal rapidly elicited categorical opposition from the experts whose advice had been solicited : H. Héris at a date later than 12 December 1845, N. de Keyser on 24 April 1846, A. Maillard on 27 June 1846, and G. Wappers and N. de Keyser on 26 July 1846 [34]. A. Maillard in particular vigorously criticised the proposal to transfer the painting onto canvas, proposing moderate and more appropriate methods :

"--- The Elevation of the Cross is in much worse condition than the Descent, fortunately the damages are outside the attractive parts. --- I have heard that there has been talk of transferring these paintings onto canvas. This is not achievable without a great risk : right now, only small parts are missing, but the result would be that large parts would be missing which would be im-

[29] KAA, *Rubens* file : "Nous avons d'abord examiné l'élévation de la Croix et nous avons remarqué que ce tableau était parsemé de grandes taches de la largeur d'environ deux mains, où la couleur était gercée et fendillée et d'autres dont la couleur était entièrement détachée du panneau, ce qui était visible par le rebordement de la couleur, par parcelles de la grandeur d'environ un pouce.
Nous avons particulièrement remarqué que la couleur de la poitrine du Christ est très fendillée et accuse une grande dégradation ; que la couleur de la gorge du Christ est sur le point de tomber ainsi que celle du bras d'une figure du bas et d'une autre figure ; l'un de ces bras commence même à se peler. En conséquence, nous n'hésitons pas à dire que ce tableau se trouve dans un très mauvais état." Published by VAN DEN NIEUWENHUIZEN, *Historiek van de restauratie van Rubens' Kruisoprichting en Kruisafdoening in de kathedraal*, in *Antwerpen*, III, 1957, p. 64 ; W. AERTS and J. VAN DEN NIEUWENHUIZEN, *L'histoire de L'érection de la croix après la Révolution Française*, in *L'Erection de la Croix. Pierre Paul Rubens*, Brussels, 1992, p. 109-110.

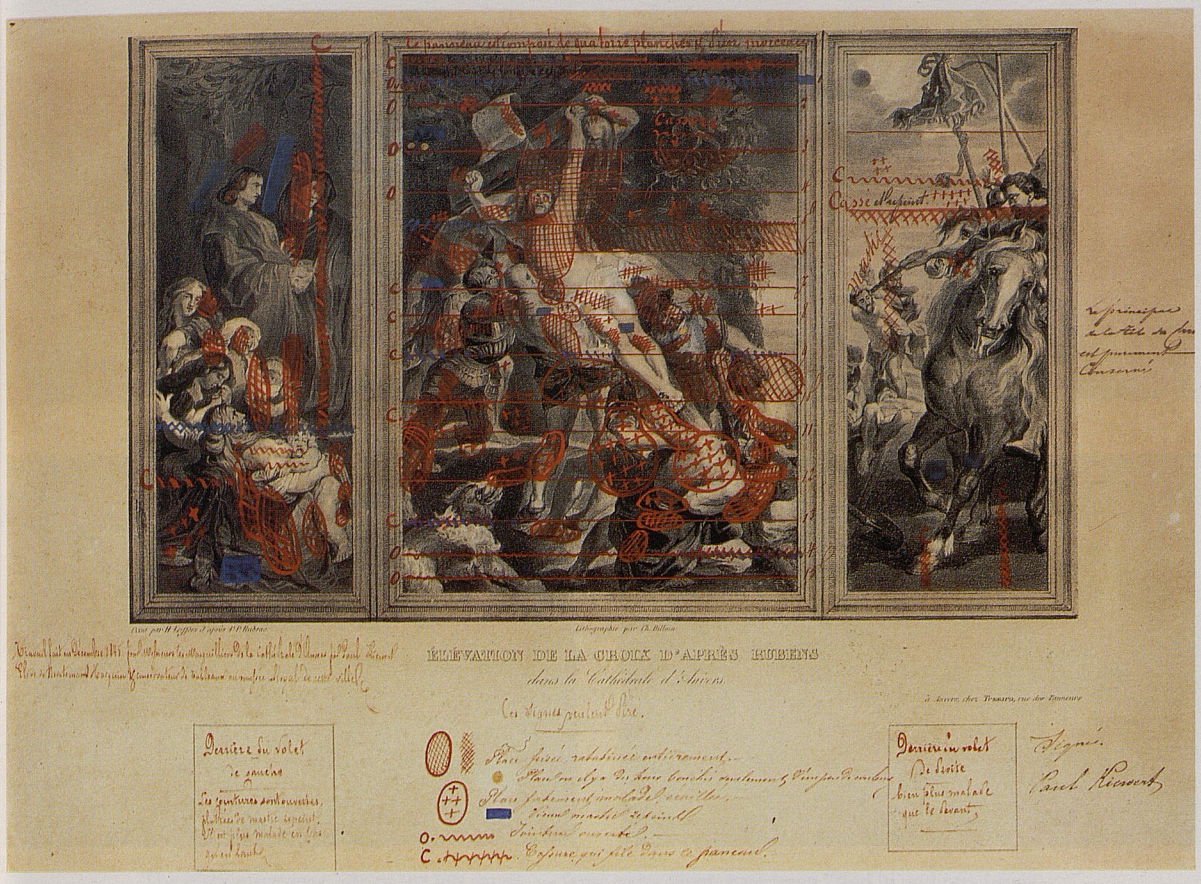
[30] KAA, *Rubens* file and PAA, No. 10.479, published by VAN DEN NIEUWENHUIZEN, 1962, No. 57, p. 65-66.

[31] Letter from the Governor to the Council of the church, 6 November 1843, KAA, *Rubens* file and letter from the Council to the City Administration, 10 June 1844, SAA, *Modern Archief*, 201_2, 2° (cf. VAN DEN NIEUWENHUIZEN, 1962, No. 57, p. 66).

[32] KAA, *Rubens* file (cf. VAN DEN NIEUWENHUIZEN, 1957, p. 65, and 1962, No. 58, p. 66 ; AERTS-VAN DEN NIEUWENHUIZEN, 1992, p. 111).

[33] KAA, *Rubens* file (cf. VAN DEN NIEUWENHUIZEN, 1962, No. 58, p. 66).

[34] KAA, *Rubens* file (cf. VAN DEN NIEUWENHUIZEN, 1962, No. 59, 60, 61, p. 66-68).



16. Lithograph by Ch. Billoin (1813-1869) on which the restorer Paul Kiewert indicated the various damages he observed in December 1845.

possible to restore. It is also certain, if this is done, that all the heavy touches would be ironed into cavities, and that through the heat of the ironing, the colour is frequently burned or singed, as one sees every day. --- The four wings must be sawn in order to put them onto canvas, which also represents a major risk." [35]

[35] Letter to the church Council, 27 June 1846. KAA, *Rubens* file : "--- De Kruisrechting is veel slechter als de Afdoening, gelukkiglijk zijn de blottinge buyten de schoone deelen. --- Ik heb vernomen dat er spraek is geweest om deeze schilderijen op doek te brengen. Dit is niet bestaenbaer, zonder een groot gevaer te lijden, want nu mankeeren daer maer kleine deelen en dan zouden er dikwijls groote deelen mankeeren, het geen onmogelijk zoude zijn om bij te restaureren. En is ook zeker, zoo het gedaen word, dat alle de zwaere toetsen in putten gestreken worden en door de heete van het strijken dikwijls het couleur verbrant of verzengelt is, gelijk men dagelijks ziet. --- de vier deuren moeten gezaegt worden voor de zelve op doek te brengen, het gene nog een groot gevaer is." Published by VAN DEN NIEUWENHUIZEN, 1962, No. 60, p. 67 ; AERTS-VAN DEN NIEUWENHUIZEN, 1992, p. 111.

a

c

17. Damages observed before our treatment : a) needle holes from previous consolidations (central panel) ; b) crushed paint layer due to a bad consolidation (central panel) ; c) brownish stains (central panel) ; d) dust and dirt hiding the modelling (right wing, reverse side).

From the experts' report of 26 July 1846, we would emphasize the rare discernment of N. de Keyser, approving Maillard's attitude

> "which does not expose the paintings to the dangers of recently invented methods, for which we have as yet no guarantee of stability." [36]

[36] Meeting of 26 July 1846. KAA, *Rubens* file : "qui n'expose pas les tableaux aux dangers des méthodes nouvellement inventées, dont on n'a pas encore pu avoir des gages de stabilité." Published by AERTS-VAN DEN NIEUWENHUIZEN, *ibidem.*

A commission consisting of seven painters from the Classe des Beaux-Arts (N. de Keyser, F. de Braekeleer, L. Gallait, H. Leys, Fr. J. Navez, R. Verboeckhoven and G. Wappers) and two members of the Classe des Sciences (J.S. Stas and A. Quetelet) examined the Rubens paintings on 26 March 1847, noting in its report of 7 April that the wooden supports were in good condition, that there was no need to transfer the paintings onto canvas but that it was particularly important to change their position in order to protect them against draughts and other noxious atmospheric agents [37].

A new examination took place in the restoration workshop set up at the bottom of the south tower, where the paintings were transferred in March 1849. This examination differed little from the earlier ones, but we can note certain interesting details :

> "--- Despite the strong wooden battens applied previously on the reverse, slight openings are visible, rendering the surface of the painting uneven. Most of these splits have been filled in with putty. The colour is falling off in several places, the flaking and blistering are much more serious and more difficult to restore [than those of the other Rubens in the Cathedral]; they can be observed over a fairly wide area, and the figures at the foot of the Cross have suffered most. The particular preparation of the panel has contributed to cracking the colours and to forming fissures, and a multitude of small brown stains. This misfortune exists principally on Christ's chest, on the naked back of a man, at the bottom of the painting ---." [38]

The figures at the foot of the Cross are indeed in a less well preserved zone, with surface irregularities due to poorly consolidated flaking paint, with cracking at the edges of cupped paint, numerous needle holes, etc. (Fig. 17). Prior to our intervention, a large number of small brownish stains could be found at several places on the triptych which had a particularly disturbing effect on the flesh-coloured parts of Christ's body.

> "The Virgin and St. John. --- a horizontal split crosses the figure of the woman in the foreground, and another one cuts perpendicular across the figure of the Virgin. These have been filled and repainted.
> ---
> The bishop (reverse side of the left wing). --- large parts which have been filled in and repainted have become completely detached, certain fairly large flakes have raised the colour, but in areas of little importance.
> ---
> In the brief description of the present state of these masterpieces, we have had to take account of the layers of superimposed and deteriorated varnish and which, mixing with the dust, render certain parts of the painting almost invisible today. They hide the original colour under a grey layer, and it is probable that we shall later find other parts in poor condition, or suffering." [39]

[37] *Rapport de la Commission chargée de l'examen des moyens de conservation des grands tableaux de Rubens*, in *Bulletin de l'Académie royale des Sciences, des Lettres et des Beaux-Arts de Belgique*, I, 1847, p. 385-387. Cf. VAN DEN NIEUWENHUIZEN, 1962, No. 62, p. 70.

[38] Report of the Commission of Enquiry published by M. ROOSES, *L'œuvre de Pierre Paul Rubens*, Antwerp, II, 1888, p. 82, note 1 : "--- Malgré les fortes traverses de bois qui ont été appliquées autrefois sur le revers, de légères ouvertures s'y manifestent et rendent la surface de la peinture inégale ; la plupart des fentes sont bouchées et mastiquées ; les couleurs tombent en plusieurs endroits ; les écaillures et les boursouflures sont beaucoup plus graves et plus difficiles à restaurer [que celles des autres Rubens de la cathédrale] ; on les observe sur une assez grande étendue, et les figures au pied de la croix en ont surtout beaucoup souffert. La préparation particulière du panneau a contribué à gercer les couleurs et à former des fissures, et une multitude de petites taches brunâtres. Ce mal existe principalement sur la poitrine du Christ, au dos nu d'un homme, au bas du tableau ---.

[39] *Ibidem* : "La Vierge et St. Jean. --- Une fente horizontale traverse la figure de la femme placée sur le devant,

Two restorers, I. van Regemorter and E. Le Roy, were appointed by ministerial decree of 17 August 1849 [40]. The cleaning work began in September, controversy ensuing rapidly with the restorers' competence called into question, in particular by the Cathedral Council. A supervisory committee consisting of the directors of the Academies of Fine Arts and two restorers nonetheless came out in favour of the initial method advocated for the cleaning, that of a partial removal of the varnish [41].

1850

On 6 October, the members of the Monuments Commission expressed their satisfaction with the restoration work, which must then have been completed, in a letter to the minister :

> "--- The colour which was becoming detached in certain areas has been perfectly refixed and the cleaning carried out with sufficient tact and lightness for these paintings to have preserved, as a whole, all their harmony. As for the retouching, in itself a minor job, this has been executed with considerable skill." [42]

Note how much their view of the approach taken to cleaning was already remarkably close to our own conception of a controlled lightening of the varnish.

The triptych was to remain in the workshop until the completion of restoration work on the *Descent from the Cross* in summer 1856.

1856

At the end of April, the reverse side of the central panel was covered with a layer of pitch, as had already been done on the *Descent from the Cross* [43]. The many brackets consolidating the majority of joins must have been applied previously, as they are also covered by this same layer (Fig. 21). As to the way the brackets were applied, we can base our assumptions on the proposal made by the Monuments Commission for consolidating the panel of the *Assumption*, which in turn takes for its model the central panel of the *Descent from the Cross* :

> "--- Our delegates are of the opinion that, for the present operation, the consolidation, the painting should be maintained in its vertical position so that, while gluing on the buttons, the

et une autre coupe perpendiculairement la figure de la Vierge ; elles ont été mastiquées et repeintes. --- L'Evêque (Revers du volet gauche). --- de grandes parties mastiquées et repeintes se sont détachées complètement, quelques écaillures assez fortes ont soulevé la couleur, mais dans les endroits peu importants. --- Dans la description succincte de l'état actuel de ces chefs-d'oeuvre, nous avons dû tenir compte des vernis superposés et décomposés, lesquels s'étant mêlés à la poussière rendent plusieurs passages presque invisibles aujourd'hui ; ils cachent la couleur primitive sous une couche grise, et il est probable que nous découvrirons plus tard encore quelques autres parties délabrées, ou en souffrance."

[40] VAN DEN NIEUWENHUIZEN, 1957, p. 66-68.

[41] VAN DEN NIEUWENHUIZEN, *ibidem*, p. 67.

[42] "--- La couleur qui se détachait dans certaines parties, a été parfaitement refixée et le nettoiement opéré avec assez de tact et de légèreté pour que ces tableaux aient conservé, dans leur ensemble, toute leur harmonie. Quant aux retouches, qui, en elles-mêmes, étaient peu de chose, elles sont exécutées avec beaucoup d'adresse." AERTS-VAN DEN NIEUWENHUIZEN, 1992, p. 117.

[43] VAN DEN NIEUWENHUIZEN, 1957, p. 69. As for the *Descent from the Cross*, the covering layer on the reverse side is wood pitch (I. ELSKENS, *La Descente de Croix de Rubens. Examen préalable au traitement. L'enduit au goudron de bois*, in *Bulletin de l'IRPA / van het KIK*, V, 1962, p. 154-161). See also below, p. 84.

planks will tighten under their own weight. The buttons to be replaced on the joins will have to have their grain running parallel to that of the panels. They will also have to be made according to the unequal thickness of the planks, which in this way will not require planing, which would severely weaken the painting. This complicated task should be undertaken only under the direction of Mr Etienne Leroy, who had to execute an identical task for the Descent from the Cross, and which was completely successful." [44]

The Supervisory Committee decided to have the paintings varnished on that occasion [45]. Towards the end of June, the two triptychs were finally back in the transept, after more than seven yeves in the restorers' workshop (Fig. 18) [46].

It was probably also following the arguments rising at the time of these major interventions that the Minister of the Interior consulted the Academy in 1860 on the principle itself of the restoration of paintings :

"Should the restoration of old paintings be encouraged, recommended or solely authorized ? By which characteristics can we recognize that the restoration of a painting has become essential ? Within what limits should this be circumscribed ? Which system of restoration should we give preference to ?" [47]

In its response, the Commission appointed to this effect approved the government

"--- to consider the restoration of paintings as a serious matter, to which it is impossible to give too much attention. However it is not possible to state in general whether restoration is essential, within what limits, and what processes should be used. This has to be decided on a case-by-case basis." [48]

1874

On 6 January, a delegation from the Monuments Commission examined the two paintings in great detail, concluding that they

"are in the same and perfect state as on the day after they were restored --- and one can state that there are few paintings from the 17th century as completely and marvellously preserved." [49]

[44] Draft of a letter dated 14 August 1874 to the Minister of Interior (COMMISSION ROYALE DES MONUMENTS ET DES SITES, No. 1634) : " --- Nos délégués sont d'avis que pour la présente opération, la consolidation du tableau, celui-ci devra être maintenu dans sa position verticale de façon à ce que, en collant les taquets, les planches se resserrent d'elles-mêmes par leur propre poids. Les taquets qu'on replacera aussi sur les joints devront avoir leur fil parallèle à celui des panneaux. Ils devront aussi être confectionnés d'après l'épaisseur inégale des planches qu'il sera ainsi inutile de raboter, ce qui ébranlerait fortement la peinture. Il conviendrait de [ne] faire procéder à ce travail compliqué que sous la direction de M. Etienne Leroy, qui a dû exécuter un travail identique pour la Descente de Croix et qui y a complètement réussi." Published by VAN DEN NIEUWENHUIZEN, 1962, No. 73, p. 76.

[45] Letter to the Cathedral Council, 28 April 1856 (KAA, *Rubens* file).

[46] PAA, No. 10.479 (cf. VAN DEN NIEUWENHUIZEN, 1962, No. 76, p. 76).

[47] "La restauration des anciens tableaux, doit-elle être encouragée, recommandée ou seulement autorisée? A quels caractères reconnaît-on que la restauration d'un tableau est devenue indispensable ? Dans quelles limites y a-t-il lieu de la circonscrire ? A quel système de restauration convient-il de donner la préférence ?" E. FÉTIS, *Rapport sur les travaux de la Classe des Beaux-Arts depuis sa création en 1845 jusqu'à 1872*, in *Histoire des sciences, des lettres et des beaux-arts en Belgique*, Brussels, I, 1879, p. 110.

[48] *Ibidem* : "--- de considérer la restauration des tableaux comme une chose grave, à laquelle on ne saurait donner trop d'attention. Quant à dire si la restauration est indispensable, dans quelles limites et par quels procédés elle doit être exécutée, cela ne se peut pas d'une manière générale. Il faut décider de chaque cas particulier."

[49] KAA, *Rubens* file : "se trouvent dans le même et parfait état qu'au lendemain du jour où elles ont été restaurés --- et l'on peut affirmer qu'il y a peu de peintures du dix-septième siècle aussi complètement et merveilleusement conservées." Published by VAN DEN NIEUWENHUIZEN, 1962, No. 79, p. 77.

1898-1899

A fine coating of dust and a slight dullness, observed as early as 1874, mainly on the joins and the refixed parts, led to a cleaning limited to

> "--- a simple washing using filtered rain water" [50]

and entrusted to L. Maillard. On 15 March 1899, after a test on the right panel, the Monuments Commission decided to have the whole triptych cleaned after consolidation of the raised parts [51].

1914-1918

The paintings, placed in safe keeping in the cellars of the Museum of Fine Arts at the beginning of the war, were rehung in the cathedral as early as 1917 in order to prevent further damage from humidity. However, they received only superficial cleaning [52].

1940-1945

The main paintings in the cathedral were first placed for safety in a shelter under the southern tower. In February 1941 they were moved to a new shelter constructed in the northern transept [53].

1946

The *Elevation of the Cross* was withdrawn from the shelter on 6 June. In his report of his examination, L. van Puyvelde, Director-General for the Protection of the Cultural Heritage noted :

> "--- Central panel: on the right part, on the tree, the varnish has become resinous. Left wing : half-way up, the join has slightly widened : as a result, some colour fragments from the old restoration have fallen away on both sides. Right side : two-thirds of the way up a horizontal join has widened ; as a result, fillings from an earlier repair have fallen out." [54]

This evidently refers to the two intersecting horizontal joints between the vertical and horizontal planks, which have unceasingly posed problems. In August, L. van Puyvelde had the triptych entirely revarnished by A. van Poeck. The report by Professor J. Muls informs us that :

> "—The Elevation of the Cross had received a fresh layer of Copal varnish. This is a product of hard resin warmed in oil, which is also used to paint wooden floors or linoleum. Whenever such an oil varnish layer hardens, it can no longer be removed without affecting the paint layer itself.

[50] "un simple lavage à l'eau de pluie filtrée --- " *Bulletin des Commissions royales d'Art et d'Archéologie*, XXXVII, 1898, p. 139-140 (cf. VAN DEN NIEUWENHUIZEN, 1962, No. 84, p. 80).

[51] VAN DEN NIEUWENHUIZEN, 1957, p. 70 ; AERTS-VAN DEN NIEUWENHUIZEN, 1992, p. 120-121.

[52] VAN DEN NIEUWENHUIZEN, *ibidem* and AERTS-VAN DEN NIEUWENHUIZEN, 1992, p. 121.

[53] *Ibidem.*

[54] KAA, file *Veiligheidsmaatregelen 1938-1948* : "--- Middenpaneel : op het gedeelte rechts, aan den boom, is de vernis geresinifieerd. Linkerluik : op 1/2 van de hoogte is de voeg eenigszins verwijderd ; daardoor zijn aan beide zijden enkele verfschilfers van een oude herstelling afgevallen. Rechterzijde : op 2/3 van de hoogte is een horizontale voeg ruimer geworden ; daardoor zijn stopsels van een vroegere herstelling afgesprongen." Published by VAN DEN NIEUWENHUIZEN, 1957, p. 70 and AERTS-VAN DEN NIEUWENHUIZEN, 1992, p. 121.

18. Former display of the *Elevation of the Cross* in the north transept of the cathedral of Antwerp (photography c. 1900). (© Antwerp, Provinciaal Museum voor Fotografie)

> For this reason, we also cover with mastic varnish or with wax, as these layers can be removed without any danger." [55]

Our analyses have identified this varnish as a mixture of linseed oil and terpenoid resins [56]. Happily, our cleaning tests showed that this varnish had remained easily soluble, enabling us to lighten it in a controlled manner during the latest restoration.

[55] Undated copy handed over to the Dean of the Cathedral, 26 July 1948. KAA, file *Veiligheidsmaatregelen 1938-1948*: "--- *De Kruisoprichting* een versche laag had gekregen van Copal-vernis. Dat is een product van hardhars in olie gestookt, dat ook gebruikt wordt om planken vloeren of linoleums te bestrijken. Wanneer zoo'n olievernislaag verhardt, kan zij niet meer worden verwijderd zonder de verflagen zelf aan te tasten. Daarom wordt steeds met mastiekvernis of was gedekt, daar deze lagen zonder eenig gevaar kunnen weggenomen worden." (cf. VAN DEN NIEUWENHUIZEN, 1962, No. 94, p. 85). Published by VAN DEN NIEUWENHUIZEN, 1957, p. 71.

[56] See below, p. 95-96.

The following chapters on the most recent restoration, which began in 1978 with preliminary examination and treatment of the supports and continued with the restoration of the paintings from 1987 to 1991, constitute, in their turn, another link in the chain of documents setting out the history of the *Elevation of the Cross.*

MATERIALS AND TECHNIQUES

Jozef Vynckier, Jean-Albert Glatigny, Leopold Kockaert,
Luc Maes, Marina Van Bos and Jan Wouters

THE STRUCTURE OF THE SUPPORTS

The *Elevation of the Cross* triptych is painted on oak planks cut from quartered trunks. The structure of the panels is shown in the diagram in Figure 19.

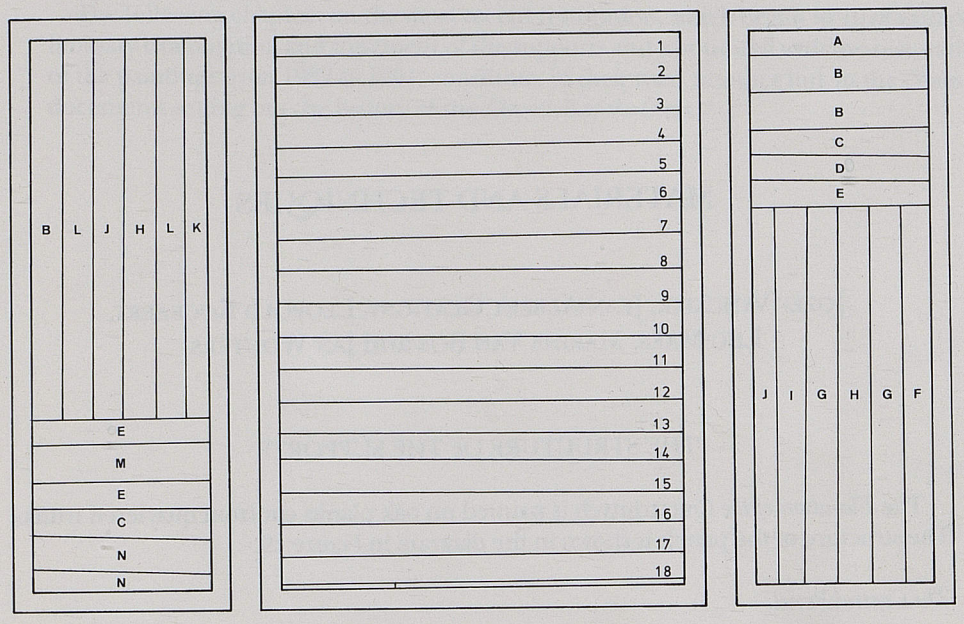
The Central Panel

Measured inside the frame, the panel is 459.5 cm high on the front side and 455.8 cm on the reverse, 339.6 cm wide on the front side and 335.9 cm on the reverse.

It is composed of 19 horizontal planks, assembled with open butt joins and cylindrical pins (5 per join : diameter of the slots = approx. 1 cm). The width of the boards varies from 20.5 to 29.5 cm. There are two exceptions : the top plank, measured inside the frame on the reverse side, is only approximately 14 cm wide and the part of the bottom element visible on the reverse measures only approximately 4 cm to the left and 2.5 cm to the right ; a vertical join cuts the latter 96 cm from the left edge, on the front side, with the result that this element is composed of two parts. X-radiographs show that elements 18 and 19 have been assembled using 9 pins instead of 5 and that these are finer (diameter : approx. 0.7 cm). Everything leads us to believe that the bottom element, No. 19, does not belong to the original construction of the panel. The lower edge of plank 18 is bevelled, but this bevel is a lot narrower than that of the top edge of the panel. Element 19 is also characterised by its thinness (approx. 1.5 cm), which explains the absence of bevel on its lower part, which slots into in the framework. Soundings showed the thickness of the other planks to vary between 1.7 and 2.3 cm. On the reverse of the panel, these elements are of different levels (Fig. 21). In addition, the two vertical sides as well as the upper side of the central panel are evenly thinned, to permit insertion into the framework.

The Wings

The planks comprising the wings, painted on both sides, together measure 459.5 cm high and 150 cm wide inside the frame. The left wing is formed, up to a height of 143.5



19. Diagram of the construction of the panels, front side. In the central panel, the figures designate both each of the planks and the join immediately below. In the wings, the planks originating from the same tree carry the same letter.

cm, by 6 horizontal planks surmounted by 6 vertical planks. The right wing, on the contrary, is constituted, up to a height of 313.5 cm, by 6 vertical elements surmounted by 6 horizontal elements. The separation joints between the two groups of planks consist of a groove and a V-shaped tongue (*joint en épi*), the groove being cut into the edge of the vertical planks (Fig. 20).

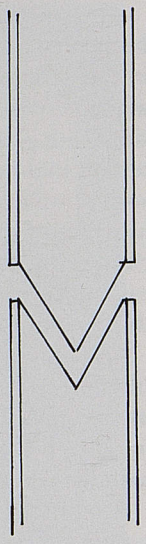
The assembling of the wings presents thus an anomaly : it is obvious that a construction consisting of both vertical and horizontal planks cannot remain stable for long. This apparently illogical construction leads us to suppose that the panelmaker did not have available boards of Baltic oak [1] of a sufficient length, i.e. approximately 462 cm, in order to assemble the wing panels out of vertical planks only. Indeed, the longest boards used (343 cm) are part of the central panel.

The panels of the wings are flat on the front side, but slightly convex on the reverse. Their thickness varies from 1 cm along the edges to 2 cm at the centre of the panels. The width of the boards varies from 15.7 to 32.3 cm. These elements are assembled with

[1] See below p. 61-63.

open butt joins and cylindrical pins, 5 for each of the vertical joins, and 3 for each of the horizontal joins. Along the vertical join closest to the central panel, the X-radiographs reveal the presence of smaller pins, 3 in the right wing and a good dozen in the left wing, the latter appearing to have been used to consolidate an ancient crack situated close to the join.

J.V.



20. Diagram of the joint connecting the horizontal and vertical planks of the wings.

THE CONSTRUCTION OF THE PANELS

The Dimensions and Arrangement of the Planks

In Rubens's time, the foot was the standard measure of length, but its value varied from one city to another, and it could be divided into 10, 11 or 12 inches. The Antwerp foot was 28.68 cm long and was divided into 11 inches [2]. The central panel of the *Elevation of the Cross* measures 459.5 cm in height by 339.6 cm in width. This means that a 16 ft. high and 12 ft. wide panel was ordered from Hans van Haecht for the central part of the triptych, which also determined the size of the wings.

The 18 original planks constituting the central panel are placed horizontally. This is surprising given the traditional method of constructing panels. Generally, the planks are placed in the direction of the longer dimension of the panel, so as to reduce the number of joins. The central panel originally contained 17 joins. If the joiner had been able to place these same planks vertically, he would only have had to fit 12 joins, which would have reduced his work by one third. The fitting and gluing of joins are long and delicate operations. Also each narrow join provides an additional area of weakness, and craftsmen do not multiply their number without good reason.

[2] H. DOURSTHER, *Dictionnaire des poids et mesures*, Amsterdam, 1865, p. 403.

The structure of the wings is even more unusual, with a combination of vertical and horizontal members. In constructing each wing, Hans van Haecht assembled the planks in the traditional fashion, in the direction of the longer side of the panel. As the planks available were only two thirds the length of the panel, he constructed the remaining third with planks disposed horizontally. It is most likely for economy of time and raw materials, that he did not align the planks solely in the horizontal direction. It is also reasons of solidity which led him to juxtapose the two directions of the wood grain at the junction of the two sections of the wings. The non-adhered *joints en épi* ('barley-ear') connecting the two parts have V-shaped grooves (Fig. 20). The juxtaposition of the vertical and horizontal grain at this joint facilitates the inevitable movement of the wood, thereby ensuring greater rigidity.

One question remains open with regard to the assembly of the wings within their frames. Why were the horizontal members placed in the lower part in the left wing, but in the upper part in the right wing ? In order to limit the pressure on the structure and to make it less obvious to the viewer, the junction between the horizontal and vertical members should logically have been placed in the upper part of the wings.

The most evident reason for all the anomalies observed in the construction of the support of both the *Elevation of the Cross* and the *Descent from the Cross*, relates to a problem concerning the supply of wood. R. Lefève, who has examined six large paintings by Rubens, arrived at the same conclusion [3]. An analysis of the dimensions of these panels suggests that the maximum lengths of wood available were between 3.10 m and 3.50 m, i.e. 11 or 12 Antwerp feet.

It has been discovered that the oak used came from the Baltic area, but that it passed through Holland, which is why it was for a long time known as "Holland wood". The city of Bruges's archives mention payment for wood from Gdansk, of 10 feet in length [4]. In the 18th century, the Parisian joiner J.A. Roubo pointed out that Holland wood 'is sold either by the handful volume or by the rows in a stack : in lengths of 6, 7, 8 or 12 feet' [5]. Given that the Paris foot was then equal to 32.484 cm, the greatest length for 12 feet was 3.89 m.

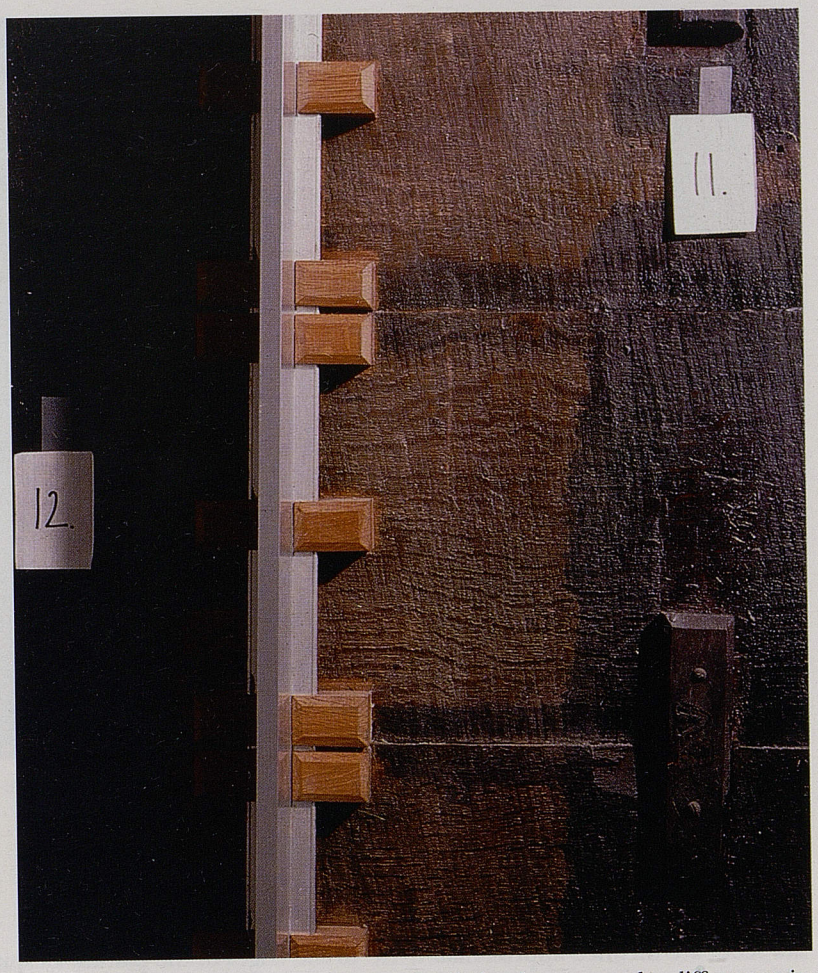
A study of tool marks [6] observed on a large number of panels, altarpieces and sculptures in this wood in the 15th and 16th centuries, has shown that they were made by cleavage. The cut of wood was obtained by cleaving the trunks into quarters along the medullary rays immediately after the tree was cut down. Only wood between the top of the roots and the beginning of the branches, was used. This ensured the quality of the wood, eliminating misshapen or knotty parts. Ongoing experiments with oak are showing that it is technically complicated to cleave planks of a great length. Moreover, only a small proportion of oak trees are able to provide this type of plank.

[3] R. Lefève, *La Descente de Croix de Rubens. Etude préalable au traitement. Le support*, in *Bulletin de l'IRPA/van het KIK*, V, 1962, p. 128-145. See also H. Verougstraete-Marcq and R. Van Schoute, *Cadres et supports dans la peinture flamande aux 15e et 16e siècles*, Heure-le-Romain, 1989.

[4] J.-P. Sosson, *Les travaux publics de la ville de Bruges, XIVe-XVe siècles. Les matériaux. Les hommes* (Crédit communal de Belgique, Collection Histoire Pro Civitate, 8vo Series, No. 48), Brussels, 1977, p. 102-112.

[5] J.A. Roubo, *L'art du menuisier*, Part 1, Paris, 1769, p. 29 ("se vend à la poignée ou bien au rang de la pile. Ces longueurs sont de 6, 7, 9 ou 12 pieds").

[6] J.-A. Glatigny, *Des marques énigmatiques*, in *Anrtwerpse retabels, 15de-16de eeuw*, II. *Essays*, Antwerp, 1993, p. 142-143.

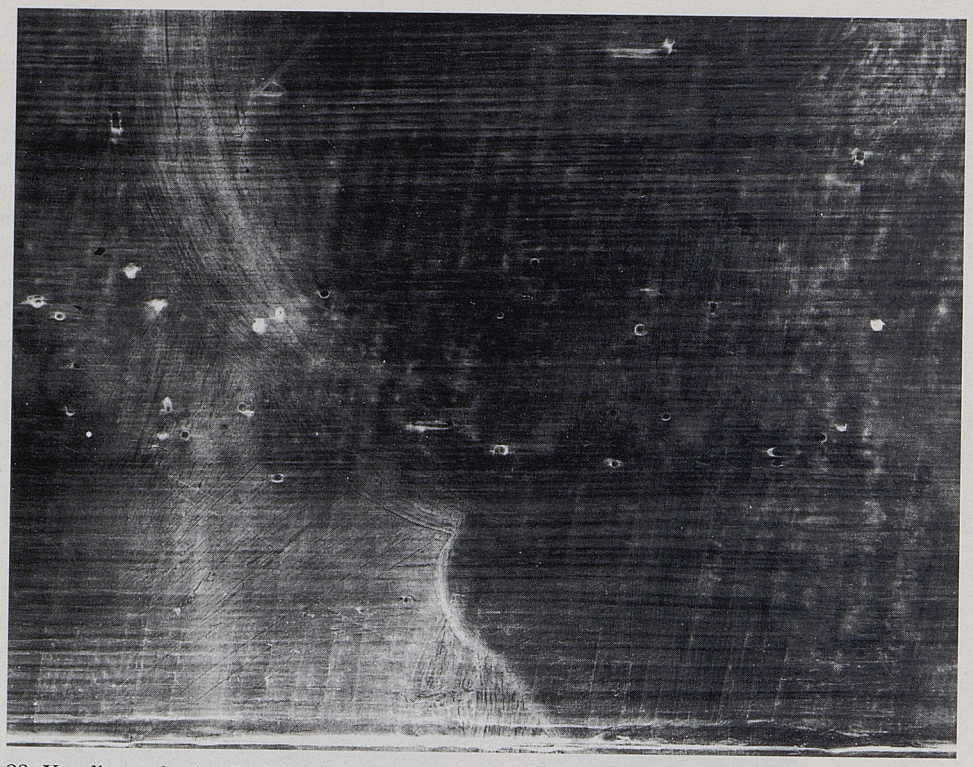


21. Reverse side of the central panel after treatment, detail showing saw-marks, differences in thickness of the planks and layer of pitch.

It is interesting to note that in none of the six large panels which Rubens painted over a thirteen-year period (1613-1625) did the joiner use planks longer than 3.50 m. It appears that in Antwerp, quarter-sawn oak from the Baltic was never more than 12 feet in length.

Stages of Construction

An examination of the reverse of the central panel shows us how the planks were cut. Each of them carries traces of saw-marks (Fig. 21). The marks left in the wood from the



22. X-radiograph, detail of the central panel (ear of the executioner pulling the rope) : lunate (growth anomaly of the tree) revealed by the holes left by wood-eating insects.

saw teeth are inclined approximately 70° to the edges of the planks. Despite a slight oscillation, these cuts are regular and consistent over the whole length. This is the "signature" of the sawyers who cut the quarters into planks. These craftsmen, who worked in pairs, used a large saw, the blade held within a wooden frame. The wood was always sawn perfectly vertically, and where several planks were cut from the same piece of wood, their profiles were rectangular and their surfaces parallel. In the central panel of the *Elevation of the Cross*, the planks have a trapezoidal cross-section, being thicker on the bark side than the heartwood side. This leads to the deduction that these planks are derived from cleaved elements.

J. Vynckier's dendrochronological examination of the wings has shown that several planks come from the same trees. We note the presence of pairs of planks of the same length. These would have originated from single planks, sawn in half down the middle in order to obtain twice the number of boards.

X-radiographs of the central panel (Fig. 52) reveal certain zones where the ground layer (?) is much thicker. These are places where the tears in the wood fibres due to

cleaving remain apparent despite the surface planing. The joiner preferred, at this stage in his work, to keep the panel as thick as possible. The X-radiographs also show certain places along the joins that have been levelled by the ground layer (Fig. 36a).

The arrangement of the individual planks closely follows a method observed for the construction of other large works. During assembly, Hans van Haecht took care to distribute correctly the areas of weakness. Each plank has a thinner and a thicker edge, as they come from quartered logs (Fig. 21). Gluing together two thick edges gives a solid reinforcing element: these two planks were placed at the centre of the panel. As two thin edges glued together offer little resistance, the joiner was forced to adhere a thin edge to a thick edge for the remainder of the panel.

The planks are of unequal width. Hans van Haecht therefore placed the widest ones at the centre and the narrowest at the outside, in an attempt to balance the weakness of the edges of the panel with the reinforcement of the frame. Planks taken from cleaved blocks are obviously broader at the bottom of the tree. As a result, their width is not constant. By alternating their natural position, he achieved approximately parallel joins without loss of wood.

In one of the planks, X-radiographs reveal the presence of lunate, rendered visible by the holes left by wood-eating insects (Fig. 22). A lunate is a growth anomaly of the tree following on a hard frost. Certain annual growth rings remain as sap-wood inside the heartwood. It is difficult to detect lunate during the early years following the cutting of the wood. During these years, this zone remains full of carbohydrate, its colouring stays light, and beetles find it an ideal place in which to live and breed.

J.-A.G.

DENDROCHRONOLOGICAL DATING OF THE WINGS

On the occasion of the treatment of the *Elevation of the Cross*, we undertook a dendrochronological examination of the two wing panels which, unlike the central panel, were removed from their frames. Each wing consists of six horizontal and six vertical oak planks. All 24 wood members were examined in this way. Their maximum width varies from 21.5 to 32.3 cm. In each case the wood is from the heart of the tree : we never observed traces of sapwood.

It was possible to measure the widths of the annual growth rings on the two ends of the horizontal planks, but only on the accessible end of the vertical planks. Comparison of the dendrochronological curves obtained shows that the 24 elements examined came from 14 different trees (designated by letters A to N on the diagram Fig. 19). Planks from the same tree were used both on the left and the right wing, which confirms that these two wings were assembled at the same time and in the same workshop.

Dendro-chronological curve of tree	Number of measured annual rings		Date of youngest ring present	Probable felling date and geographical origin of tree
	Heart-wood	Sapwood		
H	303	0	1574	1589 (-2 ; +x), Baltic
D	164	0	1577	1592 (-2 ; +x), Baltic
A	179	0	1582	1597 (-2 ; +x), Baltic
L	187	0	1584	1599 (-2 ; +x), Baltic
J	210	0	1586	1601 (-2 ; +x), Baltic
G	169	0	1587	1602 (-2 ; +x), Baltic
F	170	0	1587	1602 (-2 ; +x), Baltic
B	254	0	1590	1605 (-2 ; +x), Baltic
N	161	0	1591	1606 (-2 ; +x), Baltic
C	196	0	1591	1606 (-2 ; +x), Baltic
E	138	0	1593	1608 (-2 ; +x), Baltic
M	235	0	1596	1611 (-2 ; +x), Baltic

The curves related to trees I and K could not be dated

For dating the curves, we tried Fletcher's [7] and Hollstein's [8] dated reference curves. The curve corresponding to tree I has only 82 annual rings and could not be dated. The curve relating to tree K could not be dated either because the accessible edge of the only plank originating from K had been badly damaged by woodworm. The other curves were dated using Fletcher's REF.1 reference curve, which is moreover the case for most paintings on wood from the former Low Countries. According to Dr P. Klein of the University of Hamburg, this reference curve must be brought forward by four years [9]. Along with other researchers, he has also shown that this curve relates to imported oak of Baltic origin, where the number of sapwood rings averages around 15 (minimum 9, maximum 36, ranging in 50% of cases between 13 and 19) [10]. These comments were taken into account in preparing the table. It is evident that only the dates given in the penultimate column can be considered to be absolutely certain. Those in the last column are obtained by assuming an average of 15 sapwood rings. The notation (-2) assumes the presence of only 13 sapwood rings. The notation (+x) tells us that the sapwood is missing and that it is not impossible that the panelmaker, when cutting off the

[7] J.M. Fletcher, in *Journal of Archaeological Science*, 4, 1977, p. 335-352.
[8] E. Hollstein, *Mitteleuropaïsche Eichenchronologie* (*Trierer Grabungen und Forschungen*, XI), Mainz, 1980.
[9] Personal communication.
[10] P. Klein, D. Eckstein, T. Wazny, J. Bauch, *New Findings for the Dendrochronological Dating of Panel Paintings for the 15th to the 17th Century*, in *ICOM Committee for Conservation, 8th Triennial Meeting, Sidney, Australia, 6-11 September 1987, Preprints*, Los Angeles, 1987, p. 51-54. The authors of this communication also mention that wood imports were interrupted towards the middle of the 17th century.

sapwood, also removed some heartwood. Moreover, x represents here not a constant figure, but an unknown number of years, depending on the number of heartwood rings removed.

This table reveals that the wings of the *Elevation of the Cross* are constructed from Baltic oak and that the date of their fabrication should be calculated based on the curve of tree M, which has the youngest annual ring observed. From a statistical viewpoint, assuming 15 sapwood rings, this tree was cut down either around 1611 in the supposition that no heartwood has been cut away with the sapwood, or shortly after 1611 if some heartwood has been removed. However, archives relating to the painting of the triptych allow F. Baudouin [11] to deduce that the supports, both of the central panel and of the wings, were already assembled at the beginning of June 1610. As a result, in the supposition that no mistake was made during the counting and measuring of the annual rings and that only the sapwood was cut away, the probable felling period of tree M coincides with the execution of the triptych by Rubens. Other similar cases where the likely felling date of the tree coincides with the subsequent painting have been identified elsewhere in the first half of the 17th century, for example Rubens' sketches for the *Life of Marie de Medicis* [12] as well as five signed and dated Rembrandt works [13]. In any case, it seems that the seasoning of the wood used for the supports of the *Elevation of the Cross* was reduced to a minimum.

J.V.

COMPOSITION AND STRUCTURE OF THE PAINT LAYERS

In order to study the stratigraphy of the paint layers and to measure the thickness of the old varnish before and after cleaning, ninety-three samples, spread over the five panels constituting the *Elevation of the Cross* were examined microscopically. Most of these samples were also analysed by microchemistry and with the electron microprobe.

THE GROUND LAYER

The five panels are prepared with the traditional ground, mixture of chalk (coccoliths) and a protein reacting as animal glue. The thickness of this layer appears to be at least 300 microns and its colour varies from whitish to grey-beige, obviously according to the degree of impregnation, either original or subsequent (varnish, fixatives, etc.). No

[11] F. BAUDOUIN, *L'Erection de la croix de Pierre Paul Rubens*, in *L'Erection de la Croix. Pierre Paul Rubens*, Brussels, 1992, p. 43-96.

[12] See J. BAUCH, D. ECKSTEIN and G. BRAUNER, *Dendrochronologische Untersuchungen an Eichenholztafeln von Rubens' Gemälden*, in *Jahrbuch der Berliner Museen*, XXX, 1978, p. 209-211. Nonetheless, the dates corresponding to the youngest preserved rings, should be advanced by 6 years.

[13] See P. KLEIN, *Ages Determinations Based on Dendrochronology*, in *Scientific Examination of Easel Paintings* (*Pact*, 13) ed. by R. VAN SCHOUTE and H. VEROUGSTRAETE-MARCQ, Strasbourg, 1986, p. 225-237; see also D. ECKSTEIN, T. WAZNY, J. BAUCH and P. KLEIN, *New Evidence for the Dendrochronological Dating of Netherlandish Paintings*, in *Nature*, 320, 1986, p. 465-466.

isolating layer was observed, but it is very likely that some fat medium has been brushed on the chalk ground in order to lower its porosity.

THE PRIMING OR "IMPRIMITURA"

A light grey *imprimitura* is present almost on the whole triptych. It is composed of lead white and charcoal. Chalk was positively identified in only one case, but appeared to be present in many others. The medium is a mixture of oil and protein. Only in a few samples does this priming contain other pigments such as earths ; but most of these cases concern doubtful or non-original areas.

THE UNDERDRAWING

Only one sample (flesh tone on the central panel) contains a blackish layer likely to be drawing. It reacts as an oily layer containing some charcoal. It lies on the grey ground tone.

THE COLOURED LAYERS

The panels are identified here as follows : I = central panel, II = left wing, IIbis = left wing, reverse side, III = right wing, IIIbis = right wing, reverse side. Cross-sections are illustrated on Figure 23.

The following types of paint layer stratigraphy were observed in the *Elevation of the Cross*.

Blue

Clothes and Draperies

1° (II) On grey or pink ground tone : azurite with a little ultramarine and lead white (cross-section/slide No.18).

2° (I, II) Ultramarine, indigo (I : and lead white), with or without a glaze of indigo and ultramarine (Nos. 3, 4, 19).

3° (IIbis) Brocade on ochre tinted ground : azurite and lead white, glazed with a mixture of ultramarine, indigo and traces of black (No. 32).

4° (IIIbis) Azurite with ultramarine, followed by a glaze of indigo probably containing some ultramarine.

Sky

1° (I, III) One layer of lead white and ultramarine (Nos. 1, 37).

2° (I, IIIbis, underpaint close to angels) : azurite and lead white, containing traces of charcoal (No. 2).

Green

Clothes
1° (II) On the grey *imprimitura* : a mixture of lead white, lead-tin yellow, azurite, with traces of red and yellow ochres and charcoal (No. 21).
2° (I) A glaze, probably of copper resinate on a mixture of lead white and charcoal, with a few grains of red earth and azurite (No. 8).
3° (IIIbis) On the *imprimitura* : azurite with traces of brown or red earths (No. 43).

Foliage
1° (I, II) Light green. On *imprimitura* or pinkish sky : a mixture of lead-tin yellow, lead white, azurite and possibly traces of ochre and charcoal (No. 6).
2° (I) Lead white and copper green on a pink undertone.
3° (I) Dark green : azurite, lead-tin yellow, traces of charcoal and earths ; possibly with a few grains of smalt (Nos. 5, 20).

Yellow

Clothes
1° (I) Directly on the *imprimitura* : lead-tin yellow with lead white, probably followed by a brown glaze containing a few grains of earth and black (No. 9).
2° (II) On the *imprimitura* : lead white and lead-tin yellow, covered by a layer of lead white with traces of yellow ochre and what appears to be a yellow lake. Possibly glazed with a brown lake (No. 22).
3° (II) Overlapping a red drapery : lead-tin yellow followed by an organic brown containing a few particles of earth (glaze ?) (No. 23).
4° (II) Pinkish yellow : on grey ground tone : lead white with yellow and red ochres, traces of charcoal (No. 24).

Blond hair
(II) Lead white with a non identified yellow dye (No. 25).

Foliage
(I) Lead-tin yellow and white lead, with organic brown glaze containing scarce particles of earths and charcoal (No. 7).

Red and Pink

Clothes
1° (I) On the grey *imprimitura* : vermilion (cinnabar) with traces of lake or red earth, followed by pure red lake. This sequence may be repeated (IIIbis) or receive a final highlight mainly of vermilion (No. 10).

2° (II) Similar structure but double layer of covering red : red lake with vermilion on the *imprimitura*, followed by vermilion with red lake and probably a little lead white and red earth (No. 29).
3° (IIbis) Dark red : on the *imprimitura*, first ochre and lead white with very little red lake and charcoal, then red lake with red earth and traces of white. Finally, a third layer similar to the first one (No. 33).
4° (III, IIIbis) On the beige or grey *imprimitura* : red lake with a few grains of red earth and vermilion. In the highlights a layer of vermilion and little red earth is present (Nos. 38, 46).

Pink background
(I) A ground layer of lead white, charcoal and red earth is covered by a thin, glazing layer, rich in medium and containing a few grains of red earth (No. 16).

Brown and Grey

Clothes
1° (II) A mixture of red and brown earths with charcoal is covered by an organic brown containing traces of charcoal. The layer of vermilion with red lake underneath may be an underpaint resulting from a *pentimento* (No. 28).
2° (IIbis) Painted brocade : brown on beige ; on the grey *imprimitura*, lead white and ochre, followed by oil containing a little yellow ochre. Next a transparent brown layer, probably a brown dye with scarce grains of charcoal.
Basic colour of the brocade. On the *imprimitura*, lead-tin yellow with traces of charcoal, glazed with an organic brown.
3° (IIbis) Brownish grey gown, shadow : brown glaze with a few particles of charcoal, covered by a blackish layer of charcoal (No. 36).
4° (IIIbis) On the *imprimitura* : an ivory coloured mixture of lead white and charcoal, followed by lead white with traces of earth and charcoal ; on top, dark grey, possibly a glaze.

Dark hair
1° (I) On the *imprimitura* : probably organic brown with red earth, red lake and scarce particles of vermilion and charcoal (No. 13).
2° (II) A mixture similar to the former, but without red lake (Nos. 26, 27)
3° (III) Red and brown earths, charcoal, lead white and traces of azurite (No. 42).

Background and sky
1° (I, IIbis) Organic brown (bituminous ?), red and brown earths, charcoal with or without traces of azurite ; on the grey ground tone (Nos. 16, 17, 35).
2° (IIIbis) First brown earth with lead white and a little charcoal on the *imprimitura*, then lead white, charcoal and scarce grains of brown earth (No. 48).
3° (IIIbis) One layer, presumably in two parts : ochre and umber with charcoal and a small amount of lead white (No. 52).

4° (IIIbis). A first brown layer on the *imprimitura* or on a yellowish tone (pentimenti of flesh tone of angel ?) is composed of brown earth, charcoal and lead white. It is overpainted with azurite containing traces of charcoal. The second grey-brown covering this blue is similar to the first one (Nos. 50, 51).

White and whitish grey (architecture)
(IIIbis) Directly on the *imprimitura* : lead white with possibly some chalk and traces of smalt (azurite ?).

Flesh Tones

Light and medium
1° (II, IIIbis) Directly on the *imprimitura* : lead white with a little red earth and traces of vermilion ; next a thin transparent light brown layer, probably a glaze rather than an old varnish layer (Nos. 30, 47).
2° (IIbis) Underneath lead white with yellow and red ochres, a small amount of umber and charcoal, glazed with an oily mixture containing a few grains of yellow and brown ochre, and traces of charcoal (No. 34).
3° (III) On the grey *imprimitura* : lead-tin yellow with traces of azurite and yellow ochre (No. 39).
4° (III) On the *imprimitura* : one or two layers of lead white with red lake, yellow and red ochres with scarce grains of vermilion, azurite and charcoal. The greyish organic brown on top seems to be a glaze (No. 40).

Dark
1° (I) On the grey *imprimitura* : lead white, red ochre, charcoal and traces of vermilion and azurite, with in some cases also a little red lake. Certain parts could also be covered by a transparent brown layer (Nos. 11, 12).
2° (II) Lead white with vermilion and some red ochre, followed by a glaze of red lake (No. 31).

23. Cross-sections.

The structure and composition of the paint samples are given here for each panel separately, the lowest layer numbered as 1. Consequently, the layer's numbers do not always correspond to the same level in different samples. Asterisks identify the thin sections. ▶

1. Sky near the right edge (light blue)

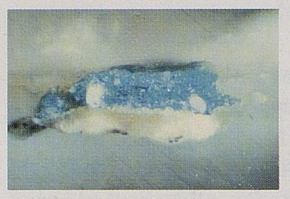
4. grey without particles (varnish) (10 µ)
3. lead white, ultramarine ; oil-protein (25 to 30 µ)
2. lead white, charcoal ; oil-protein *(imprimitura)* (40 µ)
1. ivory toned chalk ground (≥ 100 µ).

2. Sky near the right edge, upper part (greenish)

4. light grey without particles (varnish ?) (5 µ)
3. lead white, azurite and traces of charcoal
2. lead white, little charcoal, traces of red earth ; (20 to 30 µ) oil-protein *(imprimitura).*
1. yellowish chalk ground (≥ 100 µ).

3. Drapery of the executioner on the foreground, shadow (deep blue)

5. grey without particles (varnish ?)
4. indigo, a little ultramarine (20 to 30 µ)
3. white lead, indigo and ultramarine ; oil base
2. white lead, charcoal ; oil base *(imprimitura)* (15 to 25 µ)
1. beige chalk ground (≥ 250 µ).

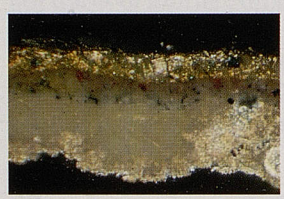


4. Same drapery, light (light blue)

5. grey, varnish (10 µ)
4. grey without particles, fluorescent (varnish ?) (10 µ)
3. lead white, indigo, traces of ultramarine ; oil with little protein (50 to 70 µ)
2. lead white ; oil base *(imprimitura)* (10 to 15 µ)
1. beige chalk ground (≥ 60 µ)

5. Foliage near upper right edge (deep green)

4. grey (varnish or glaze) (10 to 20 µ)
3. azurite, lead white, brownish red earth, lead-tin yellow (?), traces of charcoal ; oil base (40 to 70 µ)
2. lead white, charcoal ; oil with proteins *(imprimitura)* (40 to 60 µ)
1. chalk ground, light grey to beige.



6. Foliage, close to upper edge (green on pink sky)

4. lead white, lead–tin yellow, copper green (?), little azurite, traces of charcoal and smalt (?) ; oil base (30 to 60 µ)
3. lead white, vermilion, red lake, traces of charcoal ; oil base
2. lead white with charcoal *(imprimitura)* (20 to 40 µ)
1. ivory toned to beige chalk ground (≥ 150 µ).

7. Foliage, upper right area (yellowish)

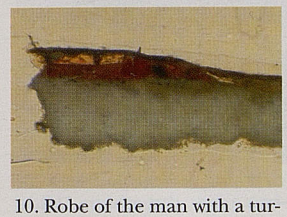
6. grey-brown fluorescent varnish (10 to 15 µ)
5. organic brown with traces of charcoal (glaze ?) (5 µ)
4. lead-tin yellow, lead white ; oil with a little protein (50 to 70 µ)
3. organic brown with charcoal (10 to 15 µ)
2. lead-tin yellow, lead white ; oil base with a little protein (20 to 60 µ)
1. white lead with charcoal, oil with protein *(imprimitura)* (25 to 40 µ)

8. Drapery of the bald executioner in the centre (brownish green)*

5. varnish
4. copper resinate (25 to 30 µ)
3. lead white, charcoal, little red earth (and lake ?), traces of azurite ; oil base (100 µ)
2. lead white and charcoal ; oil base *(imprimitura)* (20 to 30 µ)
1. beige chalk ground (≥ 80 µ).

9. Sleeve of the old man on the lower right edge (yellow)

4. grey, fluorescent varnish
3. brownish grey with traces of earths and black (glaze ?) (5 to 10 µ)
2. white lead and lead-tin yellow ; oil with protein (50 to 60 µ)
1. lead white with charcoal *(imprimitura)* (≥ 40 µ).



10. Robe of the man with a turban, shadow (deep red)*

6. brown, a few grains of fine red and black ; oil base (overpaint) (5 to 20 µ)
5. blackish brown (varnish ?) (5 to 10 µ)
4. red lake, traces of vermilion (15 to 20 µ)
3. vermilion (cinnabar ?), traces of red earth ; oil base (20 µ)
2. lead white with charcoal ; oil base *(imprimitura)* (10 to 20 µ)
1. ivory coloured chalk ground (≥ 100 µ).

11. Left leg of the man bent under the cross (flesh tint)

4. fluorescent greyish brown (varnish ?) (5 µ)
3. lead white, red ochre, traces of vermilion, azurite and charcoal ; oil-proteins (20 to 40 µ)
2. lead white, traces of charcoal ; oil base *(imprimitura)* (15 to 30 µ)
1. ivory coloured ground layer (≥ 125 µ).

12. Same leg, shadow (flesh tint)* (after staining)

5. fluorescent brownish grey without particles (varnish ?) (5 to 10 µ)
4. red and yellow ochre, black, vermilion and azurite ; oil base (20 to 25 µ)
3. oil with charcoal (drawing ?) (15 to 20 µ)
2. lead white, traces of black ; oil base *(imprimitura)* (10 to 15 µ)
1. ivory toned ground layer (≥ 150 µ).

13. Hair of the executioner in the foreground (reddish brown)

6. fluorescent grey varnish
5. grey, traces of black (varnish ?) (20 to 25 µ)
4. fluorescent greyish brown without particles (varnish ?)
3. red and brown earths, charcoal, red lake and cinnabar ? oil (15 to 20 µ)
2. lead white with charcoal ; oil base *(imprimitura)* (10 to 15 µ)
1. chalk ground (≥ 150 µ).

14. Right leg of the same executioner, shadow (flesh tint) (no analysis)*

4. grey to brown (varnish ?) (5 µ)
3. lead white, charcoal, red ochre (?), traces of red lake (20 to 40 µ)
2. lead white, traces of black *(imprimitura)* (15 to 30 µ)
1. whitish grey ground (≥ 125 µ).

15. Dark hair of the dog (brown) (no analysis)*

4. fluorescent brownish grey without particles (varnish ?) (15 to 25 µ)
3. lead white, charcoal, earth (?), traces of red lake ((30 to 40 µ)
2. lead white and charcoal *(imprimitura)* (15 to 20 µ)
1. ivory toned ground (≥ 150 µ).

16. Background, left centre

5. grey (varnish ?)
4. organic brown with earths (50 µ)
3. brown earth, charcoal, traces of azurite or calcite ? ; oil base (50 µ)
2. lead white, charcoal ; oil base *(imprimitura)* (20 to 30 µ)
1. light grey ground layer (≥ 150 µ).

17. Background at the upper edge, on the left*

4. grey with traces of red (glaze ?) (20 µ)
3. lead white, charcoal, a little brown earth and azurite ; oil base (20 to 50 µ)
2. lead white, charcoal (with chalk ?) ; oil base *(imprimitura)* (15 to 30 µ)
1. ivory toned chalk ground (≥ 150 µ).

LEFT WING (Front Side)

18. Gown of Mary Magdalen, lower left (blue)

3. grey varnish (5 to 25 µ)
2. azurite, traces of ultramarine and lead white ; oil (10 to 15 µ)
1. pink underpaint (?) : lead white, red earth and charcoal ; oil base (≥ 70 µ).

19. Mantle of the Virgin, near right edge, shadow (deep blue)

4. three thin layers of varnish (total thickness 5 to 10 µ)
3. ultramarine, indigo (?) and lead white ; oil base
2. lead white and charcoal ; oil with proteins *(imprimitura)* (30 to 40 µ)
1. ground layer : chalk and animal glue (≥100 µ).

20. Foliage, upper right corner (deep green)

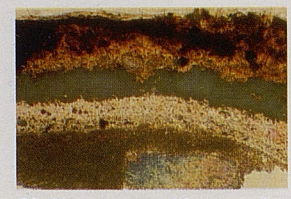
4. grey varnish (15 to 25 µ)
3. lead white, yellow ochre, lead-tin yellow, traces of azurite and charcoal ; oil base (15 to 30 µ)
2. lead white, charcoal ; protein and oil *(imprimitura)* (15 to 50 µ)
1. beige chalk ground (≥ 100 µ).

21. Gown of the Holy Woman on the left (green)

4. oil with little red earth, ultramarine (?) and black (overpaint ?) (5 to 10 µ)
3. lead white, lead-tin yellow, azurite, a little yellow and red ochre,traces of charcoal ; oil base (150 µ)
2. lead white and charcoal ; oil with protein *(imprimitura)* (10 to 20 µ)
1. ivory toned chalk and glue ground (≥ 150 µ).

22. Gown of the woman with a child, underneath, light (yellow)

6. grey varnish (5 to 10 µ)
5. dark brown (glaze ?) (5 µ)
4. lead white, yellow dye (?), traces of yellow ochre and red lake ; oil base (5 to 30 µ)
3. white lead and lead-tin yellow ; oil base (15 to 50 µ)
2. grey *imprimitura* (10 to 15 µ)
1. chalk ground (≥ 130 µ).



23. Same gown, with overpaint (brown on yellow)*

7. varnish (5 to 15 µ)
6. brown earth, charcoal, organic brown (?) ; oily (overpaint)
5. brown glaze (75 to 100 µ)
4. lead-tin yellow, lead white (?) ; oil base (50 to 75 µ)
3. red lake, vermilion ; oil base (red mantle ?) (15 to 40 µ)
2. beige to grey *imprimitura* (20 to 25 µ)
1. beige chalk ground (≥ 150 µ).

24. Gown of Mary Magdalen, light (pinkish yellow)

5. varnish
4. greyish brown glaze or varnish (25 to 30 µ)
3. lead white, red and yellow ochre, traces of black ; oil with proteins (40 to 50 µ)
2. grey *imprimitura* (20 to 30 µ)
1. ivory toned chalk ground (≥ 50 µ).

25. Hair of the woman with a child, light (yellow) (incomplete)

3. grey varnish (5 to 10 µ)
2. yellow lake (?) with lead white ; oil and proteins (20 to 30 µ)
1. lead white, possibly traces of yellow lake ; oil and proteins (≥ 150 µ).

26. Hair of the woman with a child, shadow (brown) (incomplete)*

4. greyish brown varnish (10 to 20 µ)
3. organic brown, traces of charcoal (20 to 40 µ)
2. organic brown (?), charcoal, little lead white ; oil (20 to 40 µ)
1. lead white, charcoal, red earth ; oily (flesh tint ?) (30 to 40 µ).

27. Hair of the upper left Holy Woman (deep brown)*

5. grey without particles : protein (10 µ)
4. lead white, brown and red earth, charcoal ; oil base (30 to 40 µ)
3. brown dye, charcoal, traces of red earth ; oil (25 to 40 µ)
2. lead white with charcoal ; oil and proteins – *imprimitura* (15 to 20 µ)
1. chalk and glue ground (≥ 50 µ).

28. Mantle of St. John, lining, shadow (deep brown)

5. varnish
4. organic brown (?), traces of charcoal (20 to 40 µ)
3. brown earth with charcoal ; oil (20 to 50 µ)
2. red lake, little vermilion ; oily (15 to 20 µ)
1. grey to beige *imprimitura* : lead white with charcoal and traces of umber ; oil base (20 to 25 µ).

29. Gown of the woman with a child, overpaint (dark brownish red)*

6. grey varnish
5. dark red lake (madder ?) ; oil (30 to 40 µ)
4. vermilion, red lake, lead white, traces of red earth (?) ; oily (50 to 100 µ)
3. red lake, vermilion ; oil (50 to 75 µ)
2. grey *imprimitura* (15 to 25 µ)
1. light brown chalk ground (≥ 60 µ).

30. Right arm of Mary Magdalen (flesh tone)

4. brown glaze or varnish (5 µ)
3. lead white, red earth, traces of cinnabar ; oil with proteins
2. lead white and charcoal ; protein with oil – *imprimitura* (25 to 50 µ)
1. beige chalk ground (≥ 150 µ).

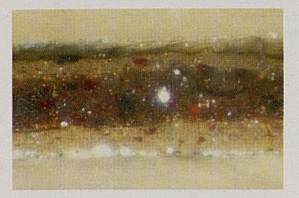
31. Finger of the upper left Holy Woman (flesh tint)

5. organic blackish brown (background) (10 to 15 µ)
4. red lake, partially discoloured (?) ; oil (20 to 30 µ)
3. vermilion, little red earth ; oil base (15 to 25 µ)
2. lead white and charcoal ; protein-oil – *imprimitura* (20 µ)
1. ivory toned chalk ground (≥ 50 µ).

LEFT WING (Reverse Side)

32. Cope of St. Amandus (greenish brocade)

7. varnish
6. oil with Prussian blue (?) (retouching) (10 to 15 µ)
5. charcoal, ultramarine and indigo (?) ; oil
4. lead white and azurite ; oil base (30 to 50 µ)
3. lead white with ochre (?) ; oil base (20 to 30 µ)
2. lead white with charcoal – *imprimitura* (20 to 30 µ)
1. chalk ground in two parts, separated by a thin brown layer (cracked ?) (≥ 100 µ).



33. Drapery of the right angel (deep red)*

6. brownish grey varnish (20 to 30 µ)
5. lead white, ochre, charcoal and red lake (light) (25 to 30 µ)
4. red lake with few grains of red earth ; oil (70 to 80 µ)
3. lead white, ochre, red lake, charcoal ; oil (30 to 50 µ)
2. lead white with charcoal ; oil base *(imprimitura)* (10 to 15 µ)
1. chalk and glue ground (≥ 100 µ).

34. Left shoulder of the left angel (flesh tone)

5. grey varnish (15 to 20 µ)
4. red lake, traces of lead white and charcoal ; oil base (25 to 40 µ)
3. lead white, ochre and charcoal ; oil base (30 to 40 µ)
2. lead white, charcoal ; oil base – *imprimitura* (20 to 25 µ)
1. chalk ground (≥ 60 µ).

35. Background at the extreme left (added part)

4. grey varnish (20 to 40 µ)
3. red and brown earth, charcoal and lead white ; oil (20 to 40 µ)
2. lead white, chalk, little earth and traces of charcoal ; oil base *(imprimitura)* (20 to 30 µ)
1. chalk and glue with lead white (≥ 150 µ).

36. Robe of St. Walburgis (dark grey)

5. grey varnish (10 to 15 µ)
4. charcoal ; oil (15 to 30 µ)
3. organic brown with traces of charcoal ; oil base (15 to 20 µ)
2. lead white and charcoal ; oil base *(imprimitura)* (15 to 20 µ)
1. chalk and glue ground in two layers (≥ 75 µ).

37. Sky above the soldier on the left (whitish blue)

3. lead white, ultrammarine ; oil and proteins
2. lead white, charcoal ; oil and proteins *(imprimitura)* (25 to 50 µ)
1. chalk and glue ground (≥ 200 µ).

38. Pennant, light on red (incomplete)

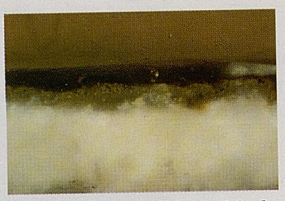
4. organic brown, traces of black (varnish ?) (10 to 15 µ)
3. vermilion (cinnabar ?), red earth ; oily
2. red lake, a few grains of red earth ; oily (50 to 75 µ)
1. lead white, a little brown earth and chalk ; oily (50 to 80 µ).

39. Face of the standing thief (flesh tone)

4. protein (10 to 15 µ)
3. lead-tin yellow, traces of azurite and ochre ; oil base
2. lead white, charcoal ; oil base with proteins *(imprimitura)* (25 to 40 µ)
1. chalk and glue (≥ 150 µ).

40. Knee of the thief lying on his back (flesh tone)

4. grey varnish (?) (5 to 10 µ)
3. (split in two parts) lead white, red lake, traces of cinnabar, azurite, red and yellow earths ; oil with proteins (50 µ)
2. lead white, charcoal ; oil base with proteins *(imprimitura)* (10 to 20 µ)
1. chalk and glue ground (≥ 100 µ).



41. Left eye of the horse (blackish brown)

4. varnish (?) (15 to 20 µ)
3. charcoal with lead white ; oil (5 to 10 µ)
2. lead white, umber ; oil base *(imprimitura)* (10 to 15 µ)
1. ground layer (≥ 150 µ).

42. Hair of the standing thief

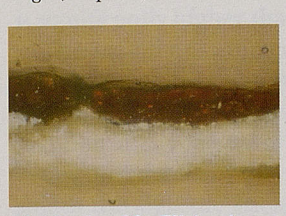
4. grey varnish (?) (10 to 15 µ)
3. brown and red earth, charcoal, lead white, traces of azurite ; oil base (50 to 80 µ)
2. lead white, traces of charcoal ; oil base *(imprimitura)* (5 to 20 µ)
1. chalk and glue (≥ 200 µ).

43. Belt of St. Catherine (green) (incomplete)

3. protein (animal glue ?) (10 to 20 µ)
2. azurite with few reddish brown grains ; oil base with proteins (50 to 75 µ)
1. lead white and charcoal ; oil with proteins *(imprimitura ?)* (30 to 60 µ).

44. Mantle of St. Eligius on left edge (deep red)

5. animal glue ? (10 to 15 µ)
4. red lake, oily (10 µ)
3. vermilion, red earth with some red lake (?) ; oily (30 to 40 µ)
2. few black grains in whitish *imprimitura* (?) (20 µ)
1. ivory toned to beige chalk–glue ground (≥ 125 µ).



45. Mantle of St. Eligius, lower section (deep red)

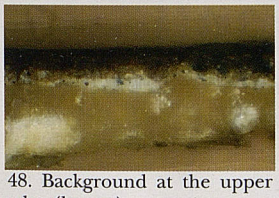
4. brown fluorescent varnish (10 to 15 µ)
3. red lake, few grains of red earth and vermilion ; oily (40 to 60 µ)
2. *imprimitura* (20 µ)
1. beige chalk ground (≥ 125 µ).

46. Mantle of St. Eligius, lower section (light red)

8. one or two layers brown with pink spots, oily
7. probably discoloured lake (10 to 25 µ)
6. vermilion with red earth (lead white ?) ; oil base (10 µ)
5. red lake ; oily (5 to 15 µ)
4. red earth ; oil base (5 to 10 µ)
3. red lake ; oily (5 to 15 µ)
2. red earth, traces of red lake ; oil base (10 to 20 µ)
1. ivory toned to grey chalk ground (≥ 200 µ)

47. Left hand of St. Catherine (flesh tone)

5. varnish (5 to 15 µ)
4. brown glaze or varnish (5 to 10 µ)
3. lead white, few grains of vermilion and red earth (?) ; oil and proteins (40 to 60 µ)
2. lead white, a little charcoal ; oil base with proteins *(imprimitura)* (10 to 15 µ)
1. ivory toned to beige ground layer (≥ 50 µ).



48. Background at the upper edge (brown)

5. dark fluorescent grey (varnish ?) (15 to 20 µ)
4. charcoal in lead white, few grains of ochre (?) ; oil base
3. lead white, charcoal, brown earth (40 to 50 µ)
2. lead white and charcoal *(imprimitura)* (10 to 15 µ)
1. beige chalk ground (≥ 125 µ).

49. Background at the upper right corner, on non-original paint area (brown)*

4. grey without grains (protein)
3. red and brown earths, charcoal, a little lead white ; oily (20 to 25 µ)
2. lead white ; oily (5 to 10 µ)
1. chalk ground (≥ 100 µ)

50. Background between the angels (brown on underpaint)

7. one or two layers of grey fluorescent varnish (10 to 25 µ)
6. brown earth in oily medium (5 to 15 µ)
5. azurite in lead white ; oil base (20 to 100 µ)
4. charcoal, red to brown earth, little white lead ; oily (20 to 50 µ)
3. lead white, yellow to brown ochre, traces of charcoal ; oil base } (25 to 50 µ)
2. lead white, charcoal ; oil with proteins *(imprimitura)* }
1. ivory toned or grey chalk ground (≥ 125 µ).

51. Background under the right angel (brown on blue underpaint)

structure and composition similar to these of the preceeding sample, except for layer 3, which is not present here.

52. Background near the wing of the right angel (grey)

4. grey, fluorescent (varnish ?) (5 to 10 µ)
3. one or two layers of lead white, charcoal and few grains of ochre and umber (?); oil base (60 to 70 µ)
2. lead white, charcoal ; oil and proteins *(imprimitura)* (15 to 30 µ)
1. ivory toned to grey chalk ground (≥ 150 µ).

REMARKS AND CONCLUSION

Although Rubens's medium may be described as oily in a general sense, its composition changes considerably from one colour to another. Two types can be distinguished :

1° The deep colours, glazes and pseudo-glazes, always laid on thinly, contain an oily medium, possibly oil diluted with some turpentine or other essential oils, as stated by de Mayerne.

2° The light tones, which are generally thick, such as flesh tints of women and angels and the impasted highlights, are painted with fat emulsions composed of oil and a pro-

tein. In some impasto both components appear to be mixed in equal proportions.

The binding medium of the *imprimitura* appears to vary between oil and tempera and in most cases an emulsion is indicated.

Flesh tones, particularly the darker ones, often appear to be covered with a thin layer of brown glaze containing a few pigment particles. However, it was not always possible to distinguish with certainty these pseudo-glazes from old varnish.

Some yellows probably contain a vegetal dye (yellow lake), but owing to the lack of sample they could not be identified.

Red lakes are probably fixed on aluminium hydroxide. This is suggested by the presence of aluminium which was detected by the electron microprobe. In most cases Rubens's vermilion-coloured pigment might be either vermilion made by the dry process, or cinnabar. Both pigments are identical microscopically and chemically. The black pigment on these paintings is always charcoal, and in many cases microscopy could identify particles of wood charcoal.

The red and brown earth pigments are described as "ochre" when their iron content is significantly higher than the other elements present.

The hypothesis concerning the original presence of three dimensional columns on the reverse sides of the wings is given greater weight by sample analysis. The areas close to the edges do not show the same stratigraphy or composition, thus suggesting a repainting after removal of the columns.

On the reverse of the right wing, around the angel on the right side, an underpaint shines through the background (Fig. 65). Examination of cross-sections confirms the changes in composition, showing a blue underpaint which might correspond to the painted sketch at the Dulwich Gallery in London (Fig. 66). The mantle of Saint John on the left wing is painted on a red layer, corresponding probably to a first project, in the Louvre Museum (Fig. 9). These changes in composition appear to be original.

The reverse sides of the wings are painted roughly and more impetuously than the other parts raising the possibility that Rubens did not paint these panels himself. However, this hypothesis is contradicted by analysis of other samples, showing that the constructions and mixtures on the central panel are also found on the other panels.

The painting technique of this triptych can be outlined as follows. A whitish to grey *imprimitura* was brushed thinly over an ivory coloured chalk ground. A painted design, possibly wiped away afterwards, may then have been applied to indicate the main elements of the composition. In the darker tones, the *imprimitura* was covered with a translucent layer of oil, whereas in the medium and lighter tones it is almost completely hidden by opaque paint layers. Modelling towards the highlights was achieved by adding white to the paint and impasto achieved by means of fat emulsions. Similarly, mid tones are rendered by the addition of lighter pigments, but often shaded with deep glazing colours applied over the still fresh paint.

The diverse and subtle blendings of pigments contribute as much to the rich and bright colouring as does the comprehensiveness of Rubens's pallet, which contained all the pigments known in his time.

L.K.

Over the last years, gas chromatography combined with mass-spectrometry has achieved extremely high levels in sensitivity and accuracy. This makes it the method of choice for the analysis of microsamples as required in the study of paint media (ref. 1, 2).

EXPERIMENTAL

Oils and Resins

Prior to the analysis, the oils, which are long chain triglycerides, are broken down into the composing fatty acids. These are then further derivatised into methylesters in order to obtain compounds sufficiently volatile to be analysed by means of gas chromatography (3,4).

Resins, which have a very complex composition are analysed mainly as the methylesters of the terpenoid acids (5,6).

Derivatisation

The sample is introduced in a glass tube and 0.4 ml of a 1 M solution of sodium methanolate in methanol is added. The tube is sealed and kept at 100°C during 45'. After cooling down to room temperature, the tube is opened and 0.4 ml of a 10 % solution of sulfuric acid in methanol is added. The tube is sealed again and kept at 120°C for 45'. The solution is then neutralized at room temperature with barium carbonate and centrifugated. The filtrate is diluted with 1 ml water and extracted with 1 ml chloroform. The organic layer is washed with water and dried over magnesium sulfate. After centrifugation the solution is concentrated to ± 0.2 ml.

GC – MS Analysis

The experimental conditions for the GC-MS analysis of the obtained methylesters are:

- Column: DB-5, length: 30 m; I.D.: 0.25 mm
- Temperature programming: 3' at 100°C; from 100°C to 290°C at 4°/min; 22' at 290°C
- Injector temperature: 250°C, splitless injection
- Iontrap room of the mass-spectrometer: 240°C
- Carrier gas: helium, rate: 50cc/min
- Equipment: Finnigan ITS-40

Proteins

Proteins are hydrolysed into their component amino acids. Subsequent silylation of both the amino groups and the carboxylic acids results in sufficient volatility (7).

Derivatisation

The sample, together with 0.2 ml 6N hydrochloric acid, is introduced in a glass tube which is sealed and kept at 110°C for 24 hours.

The solution is then evaporated to dryness. 80 µl of N,O-bis trimethylsilylacetamide and 200 µl of acetonitrile is added. The tube is sealed and kept at 110°C for 2 hours. The reaction can be followed by the yellowing of the solution.

GC – MS Analysis

Experimental conditions for the GC-MS analysis of the trimethylsilyl derivatives of the amino acids are:

- Column: DB-5, length: 30 m, I.D.: 0.25 mm
- Temperature programming: 2' at 90°C; from 90°C to 220°C at 2°/min; 3' at 220°C
- Injector temperature: 250°C, splitless injection
- Iontrap-room of the mass-spectrometer: 240°C

RESULTS AND DISCUSSION

Before analysing a sample, depending on the results of the microchemical tests, a choice was made whether to derivatise for oil identification or for protein identification. As the sample size was rather small, it was not possible to follow both derivatisation paths.

Central Panel

Dark brown background at the upper edge, on the left (cross-section No.17)
The resulting chromatogram shows the peaks typical for the presence of drying oil : the methylesters of palmitic and stearic acid and the dicarboxylic acid azelaic acid. The ratio of palmitic to stearic acid equals 2.3 which suggests the use of walnut oil.

Yellow-grey sleeve of the old man on the lower right edge (No. 9)
The resulting chromatogram shows the presence of oil with a palmitic/stearic ratio of 2.4 (walnut oil).
In the diterpenoid region of the chromatogram, Δ 5-methyldehydroabietate and the oxidized derivative compound methyl 7-oxodehydroabietate are identified.
As discussed in the review of Mills and White (5), dehydroabietic acid is the most stable compound of the diterpenoids and its presence in paint samples indicates the original presence of a pine resin.
Small amounts of dehydroabietate in paint samples have also been detected in Rubens's *Samson and Delilah* (8).

Foliage, upper right area (No. 7)
The resulting chromatogram confirms the use of walnut oil (palmitic/stearic acid ratio = 2.6).

Left Wing (Front Side)

Light yellow hair of the woman with a child (No. 25)
The analysis reveals the use of oil with a palmitic/stearic acid ratio of 2 which is in the overlapping region for linseed oil and walnut oil. Hence it is not possible to make a justified attribution to either oil.
Trace amounts of a pine resin are identified.

Light yellow gown of the woman with a child, underneath (No. 22)
After derivatisation for protein identification, different amino acids including alanine, leucine, proline and serine were detected but only in very small quantities. Calculation of the relative amounts was therefore not possible and hence the protein could not be identified.

Left Wing (Reverse Side)

Grey background at the extreme left (No. 35)
Once again the combination of walnut oil (palmitic/stearic acid ratio = 2.8) and pine resin was found for this sample.

Right Wing (Front Side)

Light grey head of the horse (No. 43)
The resulting chromatogram reveals the use of walnut oil (palmitic/stearic acid ratio = 2.3) in combination with pine resin.

Light blue sky above the soldier on the left (No. 37)
The combination of walnut oil (palmitic/stearic acid ratio = 2.6) and pine resin was identified.

Brown hair of the standing thief (No. 42)
The resulting chromatogram indicates the presence of walnut oil (palmitic/stearic acid ratio = 2.5) and trace amounts of pine resin.
After selective scanning for mass 191, which corresponds to the base peak in the mass spectra of hopanes, it was possible to identify nor-hopane which suggests the presence of bitumen (4,9).

Ivory-coloured reins (no cross-section)
No amino acids could be identified in the resulting chromatogram.

Whether or not this indicates the absence of proteins in the analysed sample or the fact that the quantity of proteins in the sample is too low to be detected by this method is not clear.
When analysing protein containing samples, R. White suggests a sample size tree times bigger than that used for oil identification (10).

Right Wing (Reverse Side)

Green belt of Saint Catherine (No. 45)
The chromatogram shows only the presence of palmitic and stearic acid. The third component typical for drying oils, azelaic acid is not present (11). It is well known that a small amount of azelaic acid next to larger amounts of palmitic acid indicates the admixture of egg-fats to the drying oil medium.
However, in this case, this could not be confirmed as the palmitic/stearic acid ratio of 1.8 is much too low to be representative for egg-yolk.

CONCLUSION

The binding medium used by Rubens in the *Elevation of the Cross* is very likely to be walnut oil.
The origin of the pine resin is not clear. Whether this results from resin added to the oil or from a varnish remains an unsolved question.
The difficulties in protein identification were caused by the small sample sizes. Samples were taken mainly for microchemical analysis and stratigraphic evaluations. Afterwards separation of the ground layer and the coloured layers was not possible anymore, so the combined layers were analysed. This can hinder the interpretation of analysis-results.
For future work, sampling will be more precise in order to overcome these problems.

M.V.B.

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ORGANIC LAKES

Red lakes are present in different areas of the painting. Their dyes were investigated with the aid of high performance liquid chromatography, with the following results :

1. traces of dcII, 100% carminic acid, traces of flavokermesic and kermesic acids ;
2. traces of dcII, 95.9% carminic acid, 4.1% flavokermesic and kermesic acids ;
3. 1.0% dcII, 99% carminic acid, traces of flavokermesic and kermesic acids.

These compositions point towards the use of a scale-insect for the preparation of the lake. The source would thus be animal, instead of vegetal (for example madder, – *Rubia tinctorum*).

Once it was known that a scale-insect had been used, we proceeded to the identification of the actual species. This was done with the help of calculations of relative ratios of specific dye components, such as dcII, carminic acid and flavokermesic and kermesic acids [14]. DcII stands for a yellow dye component, the exact chemical structure of which is unknown. However, the calculation of its relative presence is important for species determinations.

The criteria used for such determinations were defined on the basis of experiments on the scale-insects themselves and on dyed textiles. For the time being, it is not established to what extent these criteria can be applied to the analysis of lakes from paintings. Moreover, the amount of dcII could be calculated in only one sample from the *Elevation of the Cross.*

The combination of analytical [15] and historical [16] data leads us to suppose that Rubens used American cochineal (*Dactylopius coccus* (Costa), for the preparation of his red lakes for this painting. This dye, indigenous to Central and South America, was imported into Europe from the second quarter of the sixteenth century on. The port of Antwerp was one of the first locations for commercial import, starting around 1540.

J.W.

[14] J. WOUTERS and A. VERHECKEN, *The Scale Insect Dyes (Homoptera : Coccoidea). Species Recognition by HPLC and Diode-Array Analysis of Dyestuffs*, in *Annales de la Société Entomologique de France*, 25, 1989, 4, p. 393-410 ; J. WOUTERS and A. VERHECKEN, *The Coccid Insect Dyes. HPLC and Computerised Diode-Array Analysis of Dyes Yarns*, in *Studies in Conservation*, 34, 1989, p. 189-200.

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CONDITION BEFORE TREATMENT

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and Marina Van Bos

THE SUPPORTS

The Central Panel

The planks making up the central panel are in good condition, despite a few old wormholes of minor importance. The panel has remained flat, except at the level of joins 4 and 6, where raking light reveals a depression and undulations in the planks (Fig. 24). These joins have been separated, then reglued and retouched. The X-radiograph (Fig. 52) shows that part of join 6 has been reinforced with iron nails. Joins 1 and 2 are partially open. Join 18 evidently originates from the time when the bottom element was added to the support. Certain splits, possibly mobile, but which appear to be stable, run the length of the vertical edges.

The panel was reinforced from the reverse by an impressive series of vertical elements, probably not original (Fig. 25) :

a. an oak beam, approximately in the centre (cross-section: approx 22.5 x 9.5 cm) ;
b. two pine poles (diameter approx 10 cm) on either side of the central beam ;
c. a squared oak supporting batten adjacent to the left side of the frame ;
d. a squared oak supporting batten adjacent to the right side of the frame ;

(these five elements mounted from the bottom of the support up to approximately join 4)

e. four small squared oak battens extending the central beam and the c and d elements (above) to the top edge ;
f. four small squared oak battens running from the middle of plank 4 to the top of plank 8.

These reinforcing elements were held in place by iron braces fixed with screws. The presence of screw holes in plank 1 (to the left) and 2 (to the right) in the axis of the pine poles, shows that these poles originally extended as far as the upper edge of the panel. The e and f battens appear to have been applied at the same time, as they were fixed with identical iron braces. As the e battens covered a number of braces of the central beam and of the c and d elements, we can deduce that the e and f battens were applied only after the central beam and the c and d elements.

The timber used was either unhewn (poles) or recycled (squared battens, central beam). The work was not carried out very carefully, in particular as regards contacts with the panel, which, in most cases, were limited to a few projecting points. Only the f battens were in continuous contact with the support, which is either naturally flat or planed in places. These squared battens consolidated joins 4 and 6, along which there was and still is a considerable difference in level on the front of the panel. These reinforcements were very likely essential following the separation of the panel into two in 1815 [1]. As the oldest consolidation elements (a, b, c and d) appear to have been shortened to the height of join 4, we are led to believe that the 1815 separation line coincided with this join.

Twelve of the eighteen central panel joins have been reinforced throughout the whole length by oak buttons (small rectangular blocks) glued against the grain and fixed by pairs of iron screws, on well-planed surfaces. The oak buttons of join 18 are shorter ; three of them rest directly on the lower member of the frame.

The vertical reinforcing elements were in good condition, with the exception of the central beam, which was almost one third worm-eaten. The oak buttons are also well preserved.

In 1856, the back of the panel was given a layer of pitch of varying thickness [2]. This protective coating was applied neither on nor under the various reinforcing elements but was laid on the iron braces and oak buttons (Fig. 21). In the X-radiograph, this layer appears as a whitish veil, of a greater or lesser density depending on its thickness (Fig. 52).

The Wings

The woodwork of the wings is in a satisfactory state of conservation, despite a few worm-eaten areas. In general, the joins are more visible in the paint layer on the reverse than on the front. The horizontal joint between the vertical and horizontal planks strongly marks both sides of each wing (Fig. 26). On the left wing, this joint was in poor condition, with a gap of approximately 1 cm along the entire length. It had been reinforced, during earlier restoration, by five brass dovetail keys set into and screwed to the reverse of the panel (Fig. 36). In addition, there was an irregular crack, probably caused by an accident, running through the entire length of the second vertical plank from the side closest to the central panel ; starting at the bottom about 5.5 cm from the first vertical join, it took an oblique course towards this join, then ran upwardly parallel to it ending at the top, about 0.8 cm from the same join where it was open for approximately 70 cm. The X-radiograph reveals traces of six groups of four nails distributed in pairs on both sides of the crack, perpendicular to it. These probably relate to the earliest repair of the crack which seems to have been consolidated at a later date with small sized dowels. The X-radiograph also reveals the beginning of another crack close to the first, running upwardly 85 cm from the bottom, which has been reinforced by seven metal nails.

[1] See above, p. 41.
[2] See above, p. 50-51.

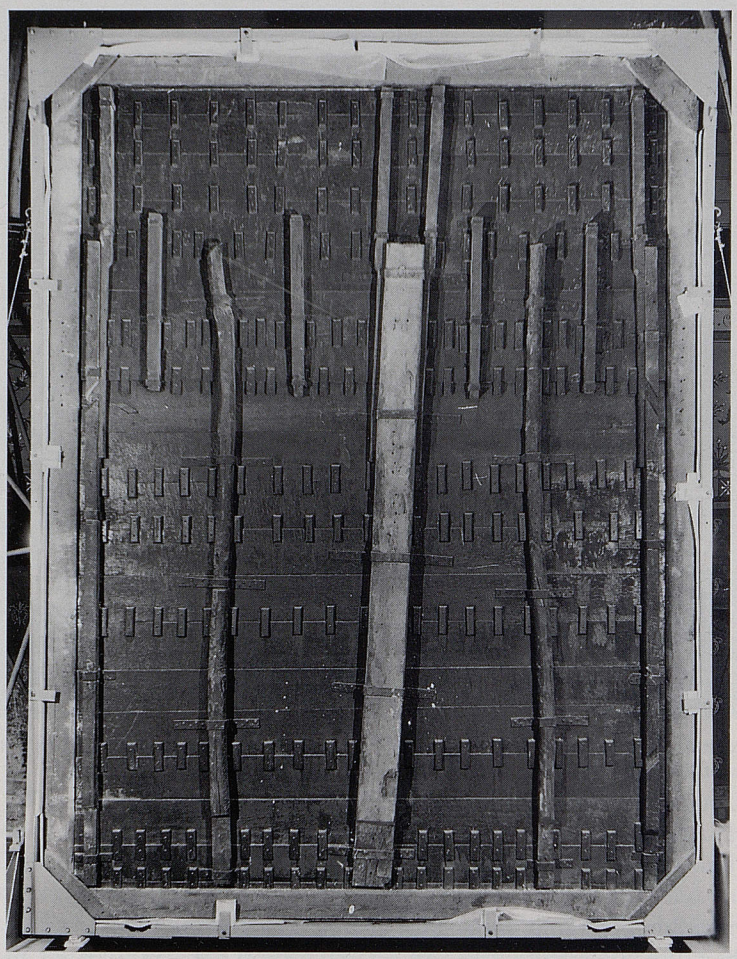
24. Oblique lighting reveals the variations in level between the planks making up the central panel, in particular joins 4 (separation line of the panel in 1815) and 6.

The right wing, in addition to a split in the joint between the vertical and horizontal planks, carried a split in the upper half of the vertical join nearest the central panel. In the upper part of the second vertical plank, approximately 3 cm from the first join, there was another split which continued for 26 cm.

The Frames

The frames, which conceal the extreme edges of the paint layer of the triptych, are modern and date from 1816. They consist of wooden members and planks screwed onto them. They are 491.5 cm in height and 371.5 cm in width for the central panel and 181.5 cm in width for the wings.

The frames of the wings are made from pieces of fir and lime wood, mitre-jointed together. The frame of the central panel consists of two parts : first, a solid, crudely worked load-bearing framework consisting of fir members into which the rebate is cut ; and second, on the front, large decorative mouldings which are mitre-jointed, screwed to the frame, and hold the panel in place within the rebate. The corners of the central frame are supported by wooden braces screwed on the back.



25. Reverse side of the central panel before treatment.

The frames are gilded on the front ; on the reverse, only the mouldings are gilded, whilst the flat surfaces are painted in black.

The frames are in a satisfactory condition. The back of the central frame has formerly been attacked by woodworm, in particular the right vertical and the upper horizontal members. However, this does not endanger the solidity of the structure. The brace of the upper right corner is badly worm-eaten.

The frame for the central panel allows the panel a certain amount of movement, as we have observed a friction zone, about 1 cm wide, in the pitch layer on the reverse side of the panel, all along the upper edge. The frames of the wings, on the other hand, do not allow any movement of the panels.

J.V.

The Protection Layer on the Reverse Side of the Central Panel

The black-brown protection layer on the backside of the central panel was analysed in the same way as discussed above.

Δ 5-methyldehydroabietate, methyldehydroabietate and methyl-7-oxodehydroabietate were identified.

It was also possible to detect norabietatriene, 1,2,3,4-tetrahydroretene and retene. These compounds are formed during the process of wood tar production : as the wood is distilled destructively, the methyldehydroabietate is dehydrogenated and decarboxylated resulting in the formation of the components just mentioned (1).

The presence of these compounds is indicative for wood pitch as was already identified on the reverse of Rubens's *Descent from the Cross* (2).

M.V.B.

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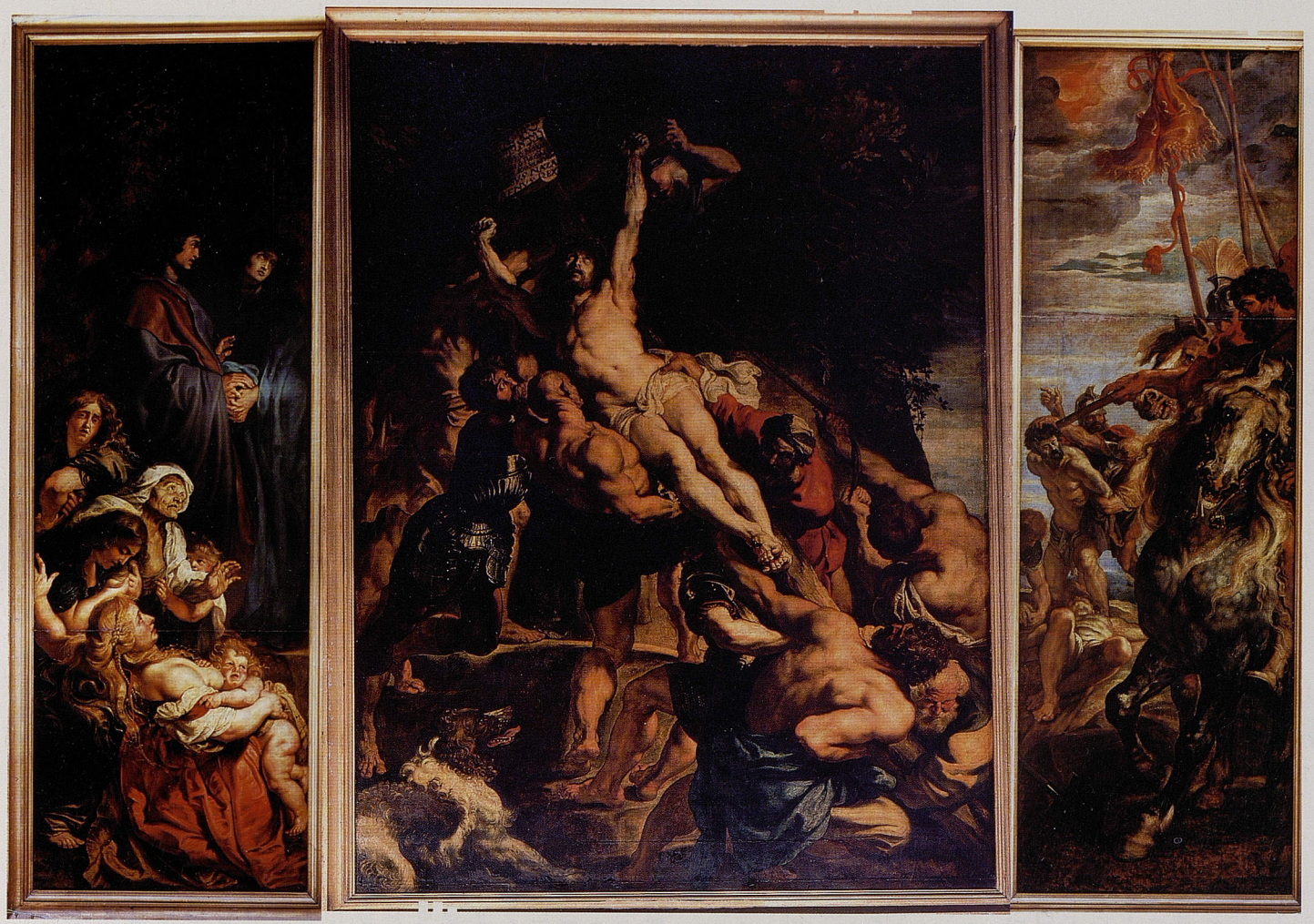
THE PAINT LAYER

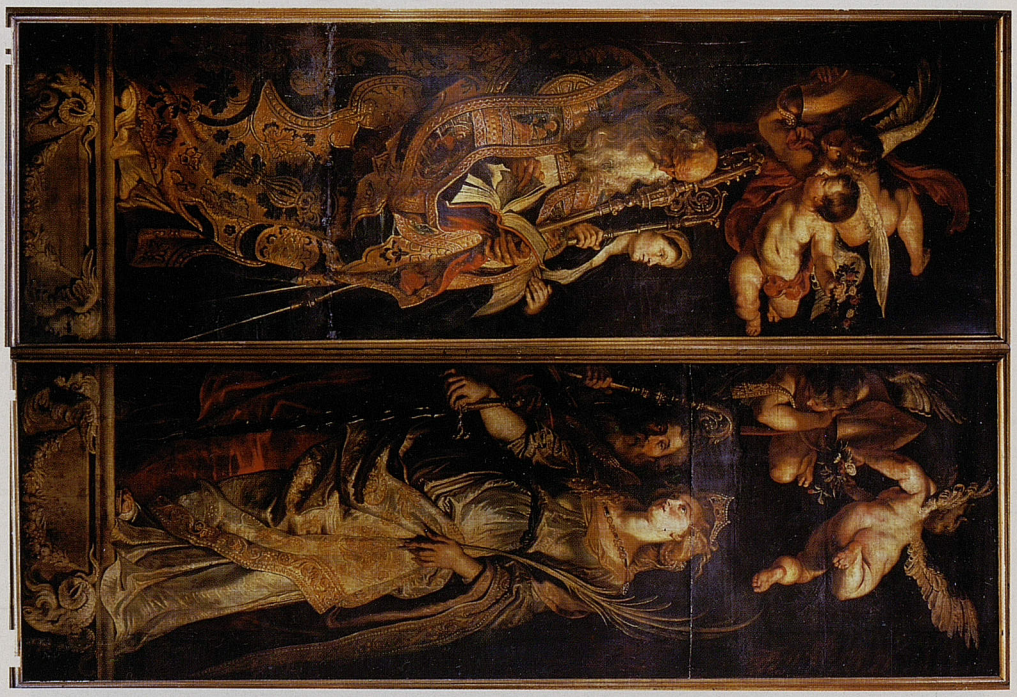
The paint and ground layers are generally in a good state of preservation. Losses are few and small, and are very local. The adhesion of the paint to the support is fairly good, but the cupping, the dust and yellowing varnish prevented the painting being viewed to full advantage (Fig. 26 and 32).

The central panel presents a very pronounced network of cracks. In the impasto of the light flesh-coloured areas, there are wide cracks, with raised edges, caused by the hardness of the paint, which contains lead white (Fig. 27). These zones had been consolidated several times, as shown by needle holes, cracks and crushed areas. In the dark colours of the clothing and the shaded areas, on the other hand, the network of cracks is very fine and the cupped surface of the paint layer provoked a dispersion of the light, reducing the effect of depth in the pictorial image. Another type of cracking, following the grain of the wooden support, is limited to certain planks. This is influenced either by the nature of the wood which is more reactive, or by differences in the thickness of the ground layer, or by the bond between this layer and the support (Fig. 28). The raised areas of the ground and paint layers, which were hard and brittle, were insecure in certain places (Fig. 29).

Drying cracks, provoked either by the nature or by excess of the medium, are visible in the yellow areas, as in the foliage (Fig. 30) which is painted with an impasto technique. They are also present in the head of the turbaned figure, where light colours are superposed on a dark background. These cracks are due to poor formulation of the binding medium-pigment mixture.



26. The *Elevation of the Cross* before treatment.



27. X-radiograph : crushed area and needle holes in the chest of Christ resulting from a bad consolidation.

The losses are limited to the zones which have suffered repeated lifting and subsequent consolidation : the back of the executioner in the right foreground, the shadows of his blue garment, the dark green clothes of the man holding up the Cross, the armour of the soldier under the Cross. These losses, which have been filled with putty and retouched, often overlapping onto original areas, were difficult to locate prior to cleaning. Retouching and fillings covered the whole length of three of the joins and part of the length of another four (Fig. 13). The wearing of the edges of the cracks, due to successive cleaning, created a network of lines and white dots on the suits of armour and around losses. Wear in the glaze could be observed in the blue and green of the clothing and in the rock in the background.

Overpaint sometimes extended well beyond the area of the losses, as in the torso of the executioner dressed in yellow to the left and the blue garment in the foreground. Overpaint also covered the worn original paint in the shadows of the same blue garment and the soldier's coat of mail. The same soldier's face was overpainted with a strong red

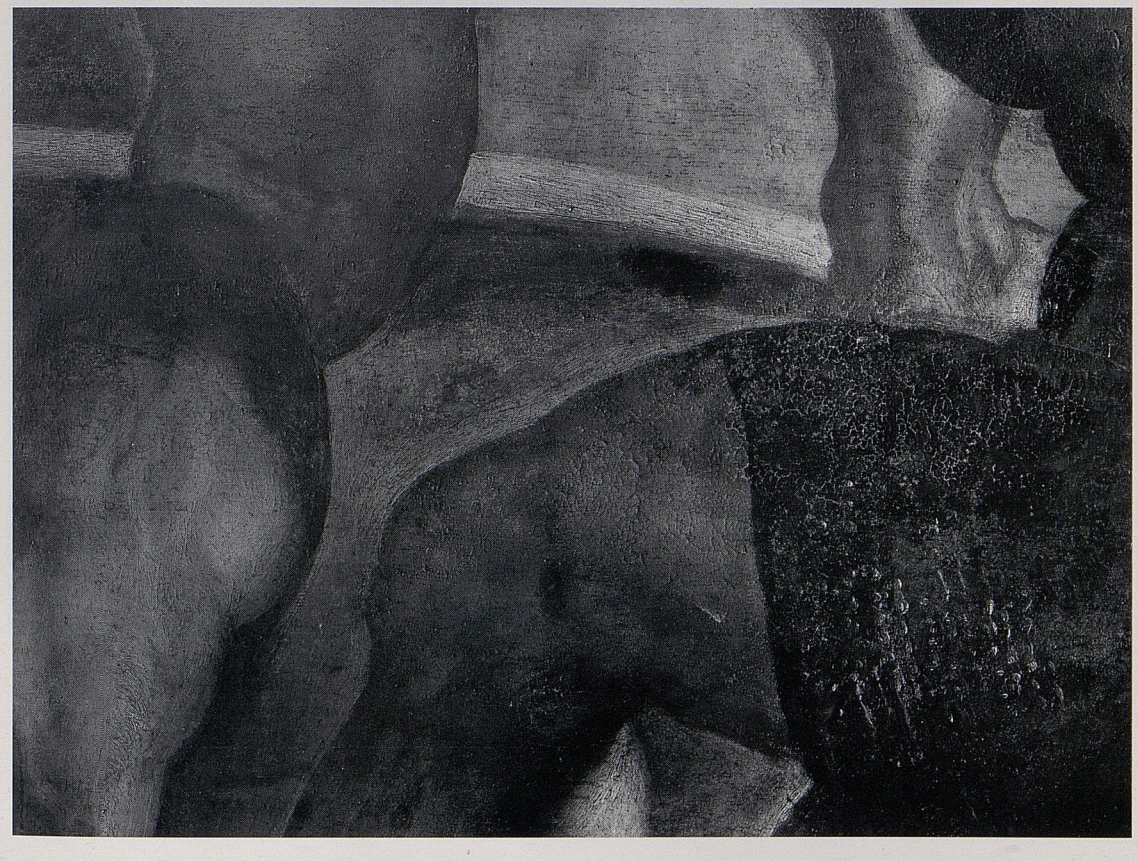
colour ; light accents in his armour were retouched in black and the luminous ground around the executioner's left naked leg was overpainted in grey, for no apparent reason (Fig. 54).

The later paint on the batten added to the bottom of the panel has been fairly well integrated into the original paint.

The wings are also in very good condition, even if the joints between the vertical and horizontal planks are the most extensively damaged of the whole triptych. Flaking was less frequent, as the paint layer is smoother on the faces of the wings than on the central panel. On the front of the left wing, the losses are limited to a few small circular holes in the Virgin's mantle, and the long vertical crack to the right. On the front side of the right wing, a loss runs alongside the horizontal joint to the left, across the sky, where this joint had been planed level during an earlier restoration (Fig. 39).

On the back of the left wing, the joint between the vertical and horizontal planks and the site of the metallic dovetails, filled with putty and retouched, was very noticeable on account of the surface irregularities (Fig. 33 and 36). On the back of the right wing, the retouched losses in the dark background around the cherubs, along the horizontal joint and those in a circular hole at the centre, remained well integrated.

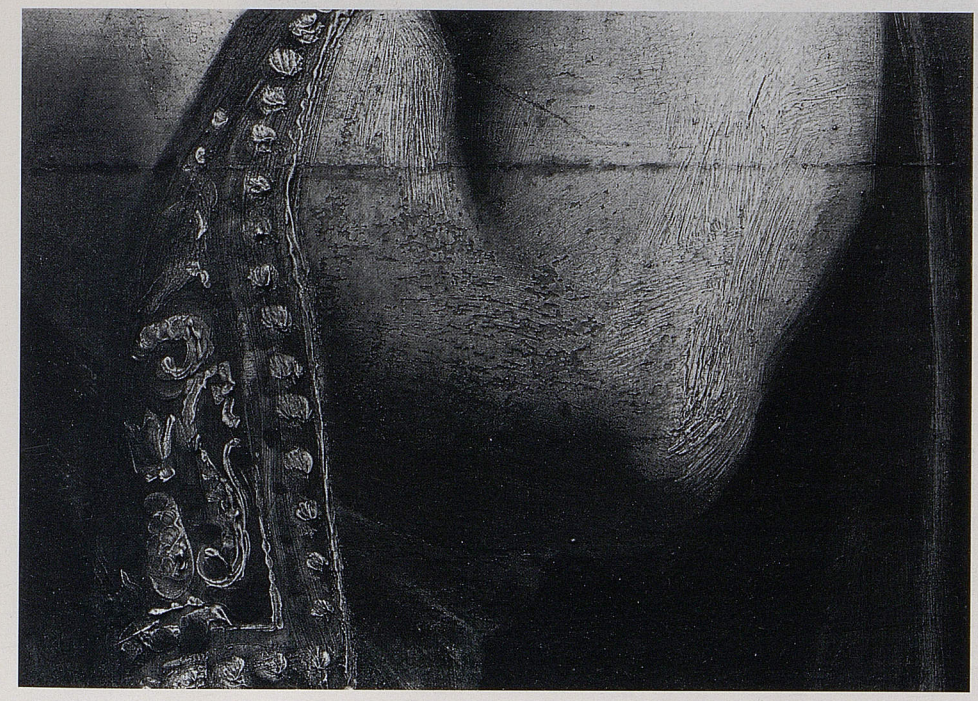
28. Cupping of the paint layer, cracks following the grain of the wood with accumulation of dirt, oxidized varnish, darkened retouching.



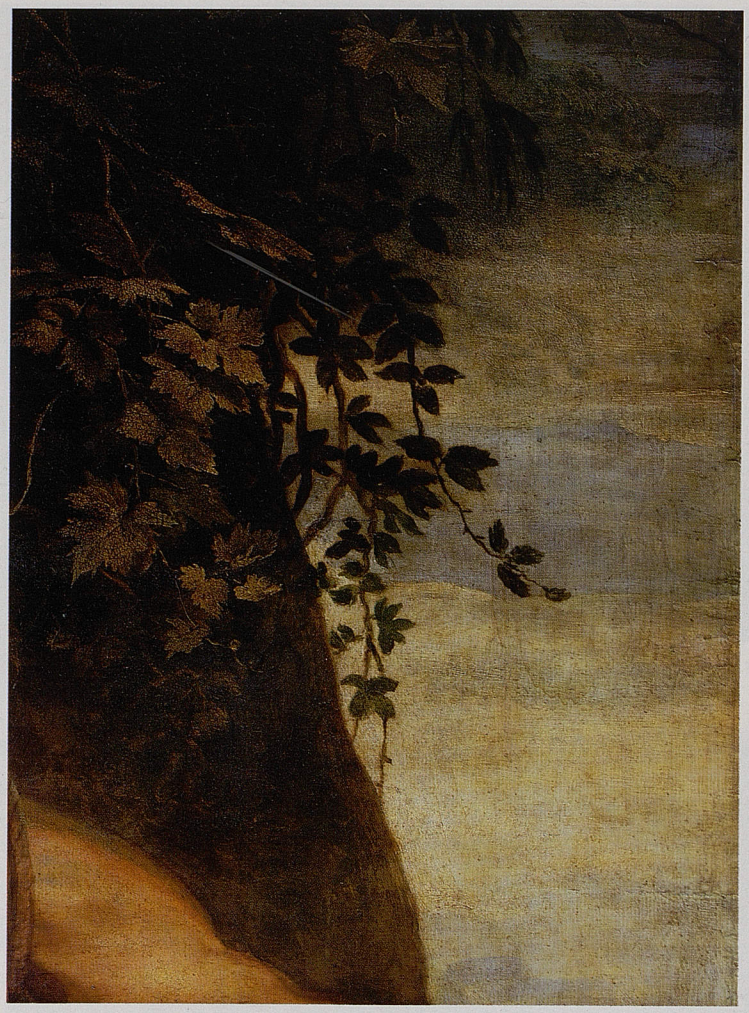
29. Raised cracks in the impasto of the hair of a woman (left wing) under raking light.

Two vertical strips of paint (22 cm width) run alongside the outer edges of the wings (Fig. 34). The difference in the surface structure of the paint and the colours as well as the absence of cracks indicate that these strips were added at a later date. We can reasonably suppose that these strips cover a larger unpainted edge originally concealed by a vertical element of the altar before its modification in 1733-1737. This hypothesis is confirmed by the fact that the composition is off-centre, as can be seen from the position of the cartouches (Fig. 68).

30. Drying cracks and drip due to excess of the medium (central panel).



31. Flaking of the uppermost paint layer in the arm of one of the angels (reverse side of the right wing).



32. Yellowed varnish veiled the impression of distance (central panel).

Flaking of the paint layer revealing the ground layer was visible in Saint Catherine's robe and in the light coloured tones of her face and the cherubs. In the sky and the ground on the front side of the right wing and in the breast-plate of the horse, the paint layer has worn away to reveal the beige-coloured ground. On the reverse side, the red colours of the drapery of the cherubs to the left and of Saint Eloi's cope to the right have been extensively overpainted. Further overpainting has changed the colour of the yellow robe at the bottom of the left wing and the Virgin's robe. In the sky of the right wing,

33. Damage to the paint layer due to the application of screws attaching metal dovetails (reverse side of the left wing).

the highlights have been covered by dark overpaint, as if to dull their brightness. The centurion's beard and neck are masked under a layer of retouching which extends well beyond them. A black, bituminous substance has been used to repair the worns areas of the horse's eyes, hooves and harness. This damage, local in nature and affecting only small areas, is of minor importance in relation to the enormous size of the triptych.

The thick varnish, consisting of three layers of a mixture of linseed oil and terpenic resins showed pronounced yellowing which impaired the original effect of the colours, in particular in the blues and whites. To this yellowing was added the effect of speckling, particularly unpleasant in the light coloured areas, caused by dust adhering to thicker

34. The large strip of paint applied along the outer edge of the reverse sides of the wings, probably in the 18th century, is clearly visible as a dark and non-cracked area.

parts of the old varnish. The optical quality of this varnish was severely reduced, not only by its colour, but by glossy and mat patches which made the picture difficult to see from certain angles and by micro-cracks which refracted light, leading to a loss of transparency and robbing the composition as a whole of its three-dimensionality and depth in its shadows. Solubility tests showed that the varnish had remained soluble, despite the presence of linseed oil.

N.G. and R.G.-W.

RESTORATION

NICOLE GOETGHEBEUR, REGINE GUISLAIN-WITTERMANN
and LILIANE MASSCHELEIN-KLEINER

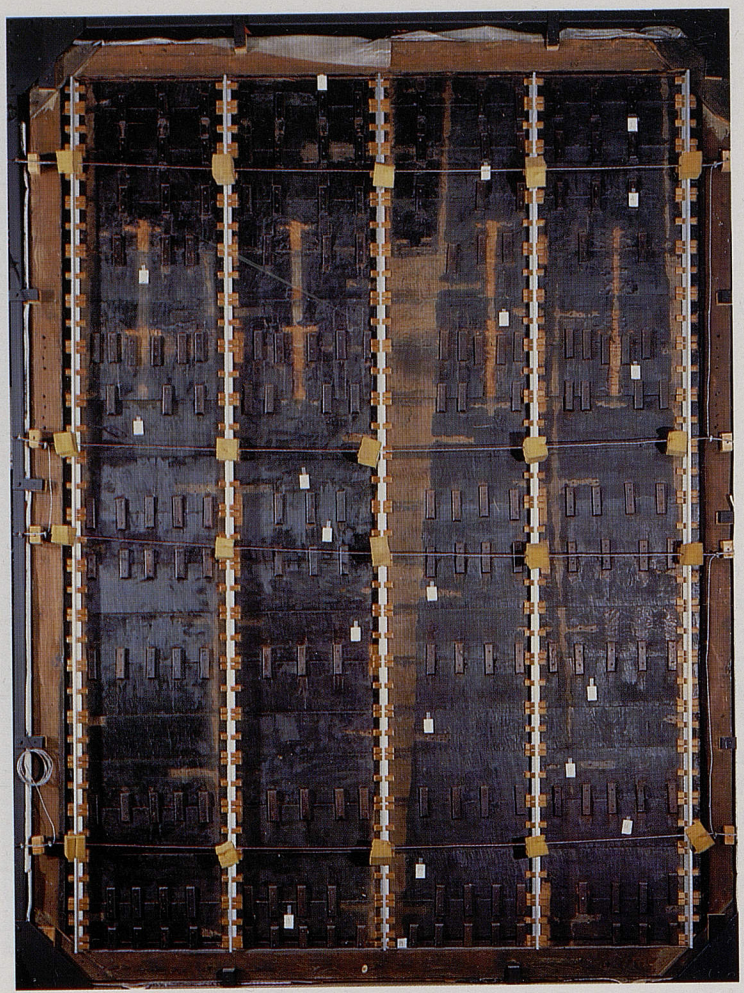
THE SUPPORTS

The Central Panel

The supporting timbers on the reverse, made up of disparate elements, weighed down the panel more than they reinforced it. Despite this, the equilibrium of the whole assembly seemed to be satisfactory. However, our main concern was to provide adequate support during manipulation. It was therefore decided to replace these elements with a lighter and more effective long-term system of consolidation.

The treatment of the support was carried out with the panel held vertically in a metal framework. The same framework had been used for the restoration of the central panel of the *Descent from the Cross* in 1962-1963. It was readjusted for this and subsequent operations. It was mounted on a trolley fitted with an axis that allowed the painting to be laid horizontally. Five T-profile aluminium bars were placed vertically against the back of the panel (Fig. 35). These were slotted into pairs of small oak buttons [1]. The T-bars were 1 cm shorter than the height of the panel, to permit the free movement of the wood. The oak buttons, each measuring 4.5 x 3 cm, the thickness adjusted to the irregular nature of the back of the painting, were glued on to hold the aluminium bars, first of all at the top, then at the bottom and centre of the panel. Prior to this, the pitch layer had been removed from the surface of the wood, and the wood degreased where the oak buttons were to be fixed. A polyvinyl acetate glue in emulsion form (KEIMFIX) was used. In this way, 56 pairs of oak buttons were attached per aluminium bar. A 0.5 mm space was left between the oak buttons and the aluminium bar, to permit movement. Placing this "cradle" required us to remove three of the old wood buttons that were screwed into the painting. Adjusting the thickness of each new oak button to the distance between the panel and the aluminium bar, without removing wood from the original support, required a high degree of precision.

[1] R.H. MARIJNISSEN and J. GROSEMANS, *Twee specifieke paneelproblemen. De Johannes de Doper van het Lam Gods en Rubens' Kruisoprichting*, in *Bulletin de l'IRPA/van het KIK*, XIX, 1982/83, p. 120-125.



35. The reverse side of the central panel during treatment, after substitution of aluminium bars for the heavy reinforcing wooden elements.

The pitch layer applied on the back to insulate the panel from climatic variations appeared to be too thin and irregular. To rectify this, a layer of paraffin wax was added.

Although the panel displays various planar deformations, such as differences in level between certain wood members and convex warping in some of the planks, we decided not to intervene as the joins are well-adhered.

The Wings

In the right wing, it was only necessary to repair the horizontal joints between the planks running against the grain, and an old vertical crack, which had been badly reglued.

The two parts of each panel were originally assembled by a groove and a V-shaped tongue (*joints en épi*, 'barley-ear') without glue or additional elements, and held in place by their own weight (Fig. 20). In the left wing, the original joint was reconstructed. The panels were freed from the harmful plates, and remains of glue and other dirt were removed from the joint surfaces. This required the removal of the wings from their framework and opening of the joints. A support system, consisting of an aluminium framework made of two sliding elements replaced the frames during this treatment. Oak fragments were meticulously inserted into the cavities left by the metal plates and along the edges of the joints, in order to minimize the visible line in the painting [2]. The vertical split in the left wing was also repaired in this way, in order to give parallel surfaces for gluing.

The Frames

The various paint layers of the frames were consolidated with wax and retouched with pigments bound with Paraloid B72. The surface was then polished with wax.

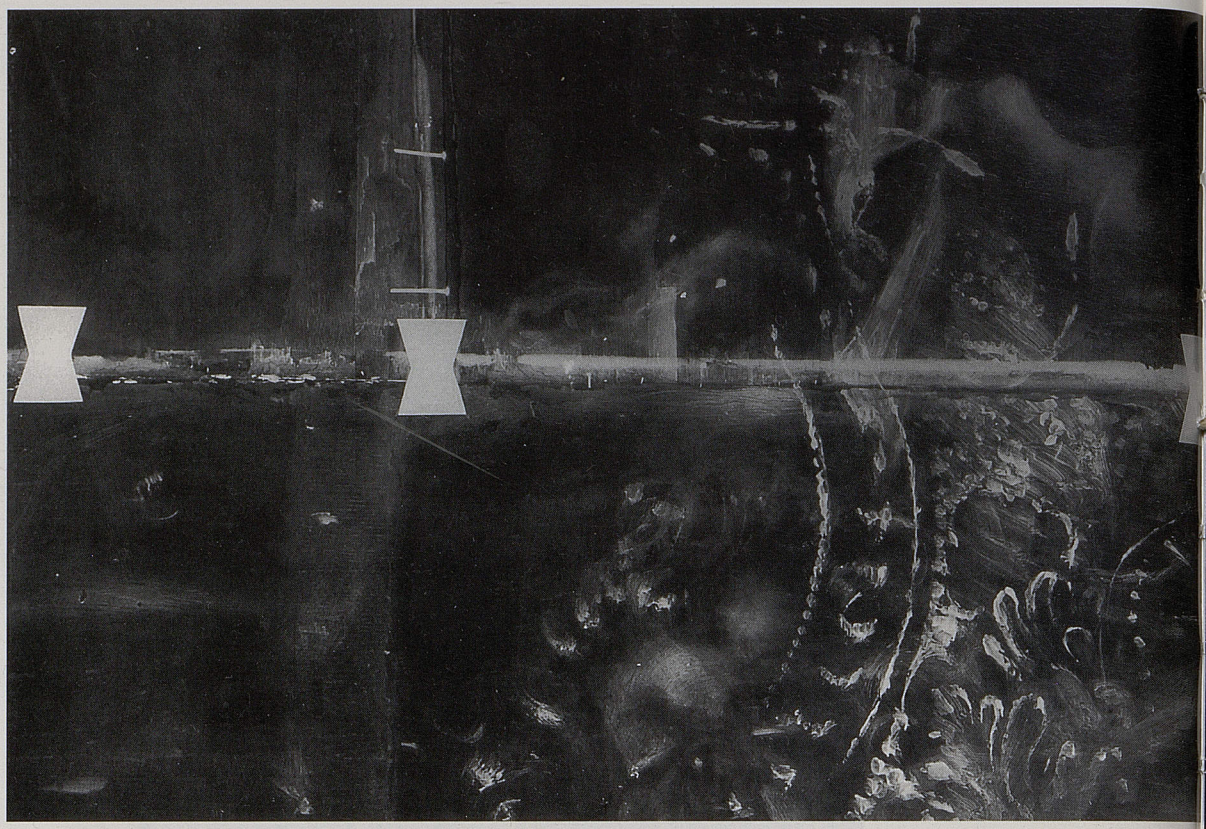
THE PAINT LAYER

Consolidation

Once the support of the central panel had been reinforced by means of aluminium bars, it was possible to place the panel horizontally and commence consolidation of the paint layer. Access to the centre of the panel was facilitated by use of a metal bridge (Fig. 37). The deformations of the paint layer, small scale cupping in the darks and wider cupping in the thicker parts of the flesh tones, were very hard, even where partially detached. The same problem had been encountered when restoring the *Descent from the Cross*. For this reason, we adopted the same fixing technique using acid glue, in the form of animal glue dissolved in a 7% acetic acid solution. The glue is non-putrescent, liquid when cold, and penetrates well. This makes it possible to soften the ground layer sufficiently to smooth down the raised cupping and reestablish contact with the support. This traditional technique, applied successfully on Flemish 15th and 16th century paintings, is used less and less frequently due to the danger of dissolving the ground and damaging the varnish. However, in the case of the two Rubens triptychs where the cupping was very hard, this technique made it possible to consolidate the raised parts.

[2] *Ibidem*, p. 124 and fig. 3-4.

a



36. Restoration of the joint separating the two parts of the left wing, reverse side : a) X-radiograph detail before restoration, showing metal dovetails ; b) after their removal, pieces of wood were inserted into the cavities ;

b

c

c) after filling with chalk-glue putty ; d) after retouching and varnishing.

d

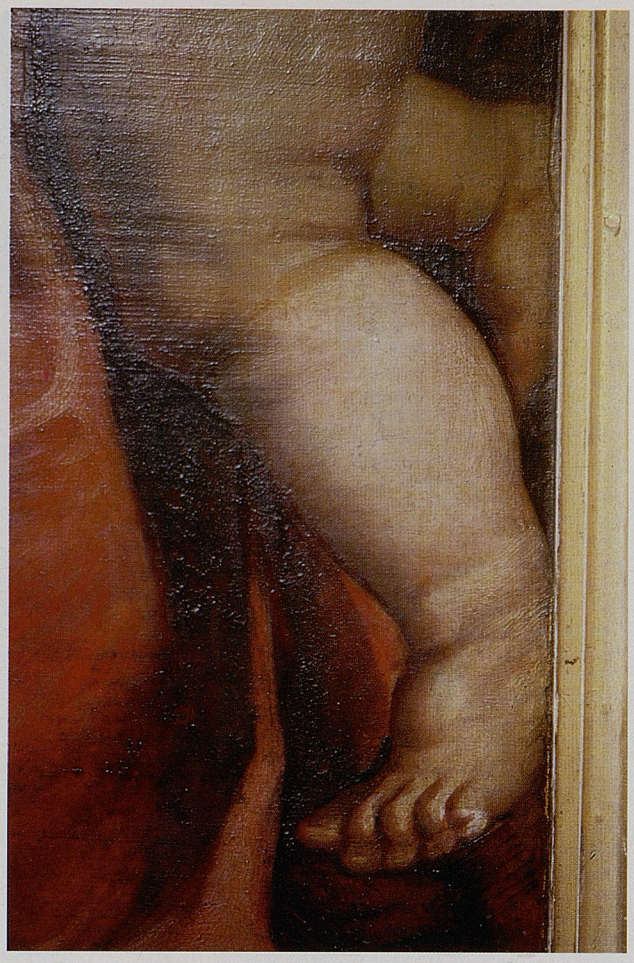
37. Consolidation of the paint layer on the central panel with animal glue.

The condition of the wings was notably better than that of the central panel, and consolidation was only necessary along the joints between the vertical and horizontal planks.

Cleaning (Fig. 38 to 45)

Before taking a final decision on cleaning the triptych, the solubility of the varnish was tested, as well as the optimal level of cleaning at various points on the painting. The initial tests, confined to small rectangular windows, showed that the varnish was still easily soluble. The second series of tests followed the painted forms : on the left wing the child's leg (Fig. 38) and a part of its mother's red robe ; and on the right wing a part of the thief on the cross and the soldier crucifying him. For these second tests, the varnish was thinned. From a few small areas of approximately two square centimetres, the varnish was completely removed, as a guide to controlling the degree of varnish removal during cleaning.

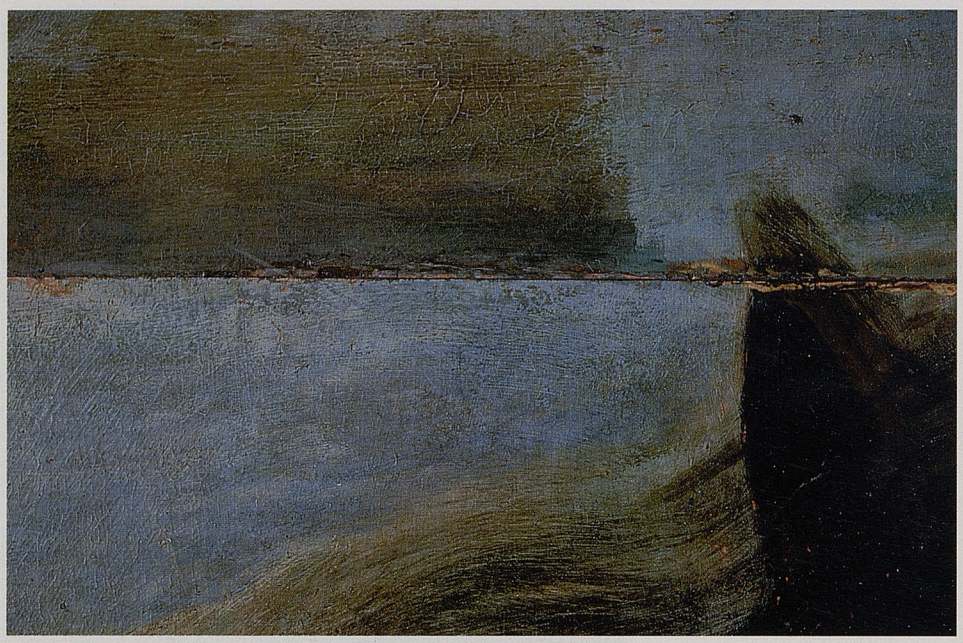
We proposed to the Commission that a partial cleaning or *allègement* of the varnish be undertaken, so as to recover the true range of colours. This would bring back the appearance of the painting closer to the painter's original intentions, whilst preserving the



38. Cleaning test following the painted forms, with two degrees of cleaning : varnish completely removed from a small square area in the toes, varnish only thinned over the leg.

oldest varnish as a fine protective layer. By this method, certain well-integrated overpaint and retouching could be maintained. The Commission accepted the proposal.

Cleaning was spread over three years. In the first year, work proceeded on the front side of the left wing and the upper half of the central panel, stopping at the diagonal formed by Christ's body. This was followed in the second year by the front of the right wing and the remainder of the central panel. The dominant light coloured body of Christ was cleaned last. Finally, the third year was devoted to the reverse sides of the wings.



39. During removal of dark overpaint in the sky of the right wing.

The cleaning tests, carried out in collaboration with the laboratory, were aimed at selecting solvents which would make it possible to reduce the varnish layer gradually. It was important that the solvent mixture should not swell all the various coats of varnish and would allow us to work in two stages. This meant that the mixture had to be volatile, but without too high a rate of evaporation. A mixture of isopropanol/iso-octane was selected, in varying proportions : 3:1, 1:1 or 1:3. First, with the most active mixture, the thickest layer of brown varnish was thinned ; second, the thicker stains and accumulations of varnish in the hollows of the paint layer were reduced before they had totally rehardened (impasto, cupping between the cracks). Certain older retouchings, revealed by the cleaning, were removed locally with more active solvents (toluene : dimethylformamide 75:25). These included retouchings along the join in the sky on the right wing (Fig. 39), retouching along the join in the executioner's blue garment in the foreground of the central panel and dark-coloured overpaint covering the light coloured parts, the highlights and various isolated spots.

In order to retain control of the level of cleaning, and hence the overall appearance of the painting, we proceeded gradually, following the planes of the composition of the painting : first the sky, then the floor, then the figure groups, whilst avoiding spectacular contrasts between cleaned and uncleaned zones. In this way, the painting remained harmonious at all times and gradually recovered its spacial structure and a range of colours close to those originally created by Rubens, despite the fact that a light coat of old varnish remains.

Retouching

The deep losses requiring filling were limited to the partially filled spaces left by the joints of the wings, in particular the dovetail plates at the back of the left wing and in the sky of the right wing (Fig. 46). These were filled with a mixture of chalk and animal glue. A water-colour base tone was then applied. After this had been isolated with dammar varnish, the base tones were adjusted with pigments in Paraloid B72 resin. Integration was achieved in an illusionist fashion, the inpainting invisible at normal viewing distance. The zones requiring retouching without filling (worn areas of the paint layer, glaze or patina) were reintegrated using translucent layers of pigment in Paraloid B72.

40. The metallic character of the armour as revealed by cleaning.

41. During cleaning : the red dress on the left wing has recovered colour, transparency and depth in the cleaned area.

Checking the colour match of the retouching by rubbing in a light film of dammar varnish also made it possible to achieve a uniform gloss ; subsequently, the painting required only a thin final varnish of dammar resin (Fig. 47).

Working Conditions

The temporary workshop installed in the cathedral was extended by the width of a nave aisle, which permitted the panels to be treated in one evenly lit space. The wings were placed vertically on large trolleys and kept in place with tensioning ropes. The three panels, on their trolleys, could therefore be placed side by side, perpendicular to the windows, the stained glass of which had been replaced by white glass. The working and lighting conditions were not perfect, but adequate. Gaining an overall view of the triptych was rendered difficult by the reflection caused by the large nave windows.

Two mobile sets of scaffolding adapted to the dimensions of the trolleys were made available to us (Fig. 48). A binocular microscope attached to the scaffolding with a moveable bar served to examine and remove the overpaint (Fig. 50). A window in the screen allowed the public to see the painting in the process of restoration (Fig. 2).

42. During cleaning : the whiteness and volume of Saint Catherine's heavy cloak re-emerges from under the dark and thick varnish.

We were forced to interrupt work every winter. Below 15°C, the solvents evaporated too slowly, and were less effective. Also, remaining nearly motionless in the cold became very uncomfortable for the restorers.

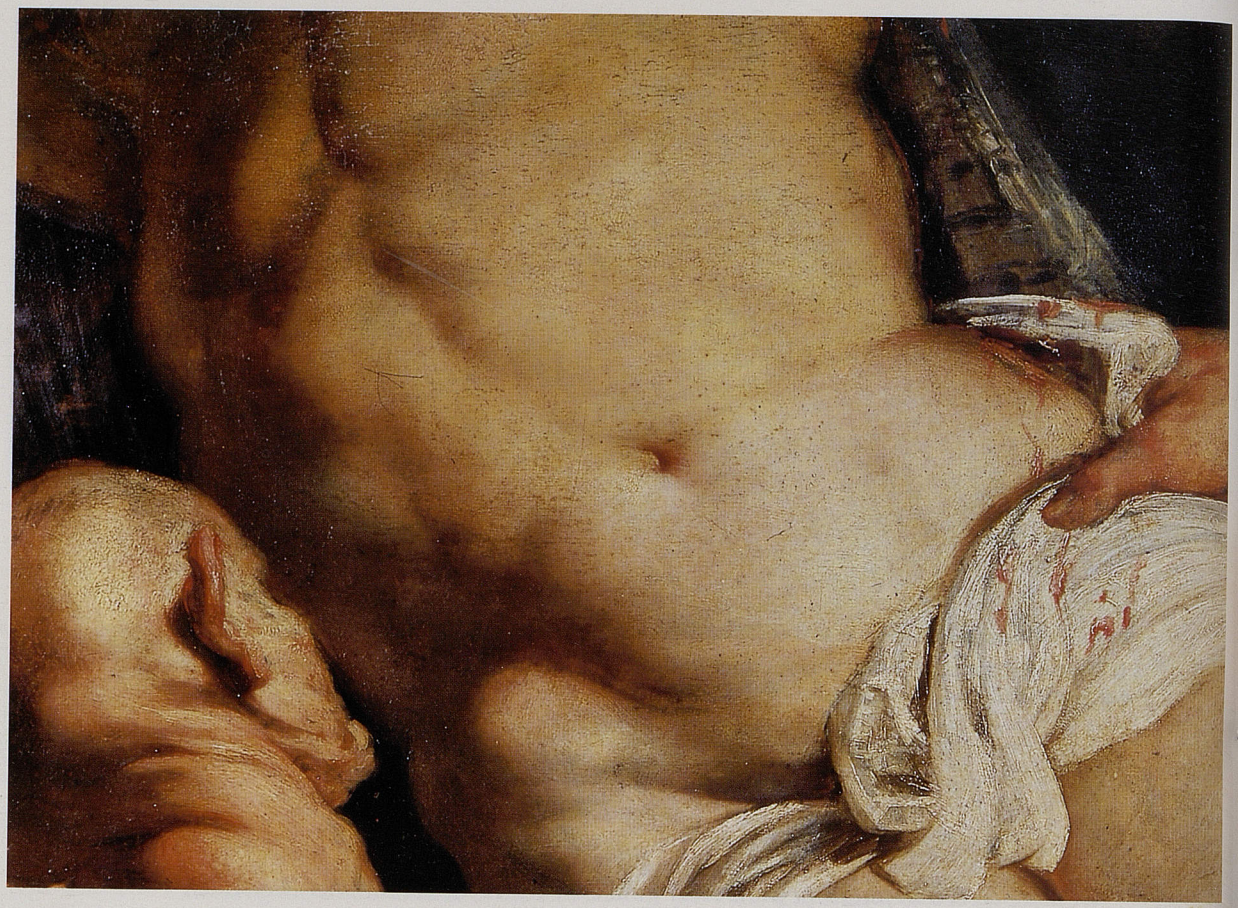
N.G. and R.G.-W.

Choice of Solvents

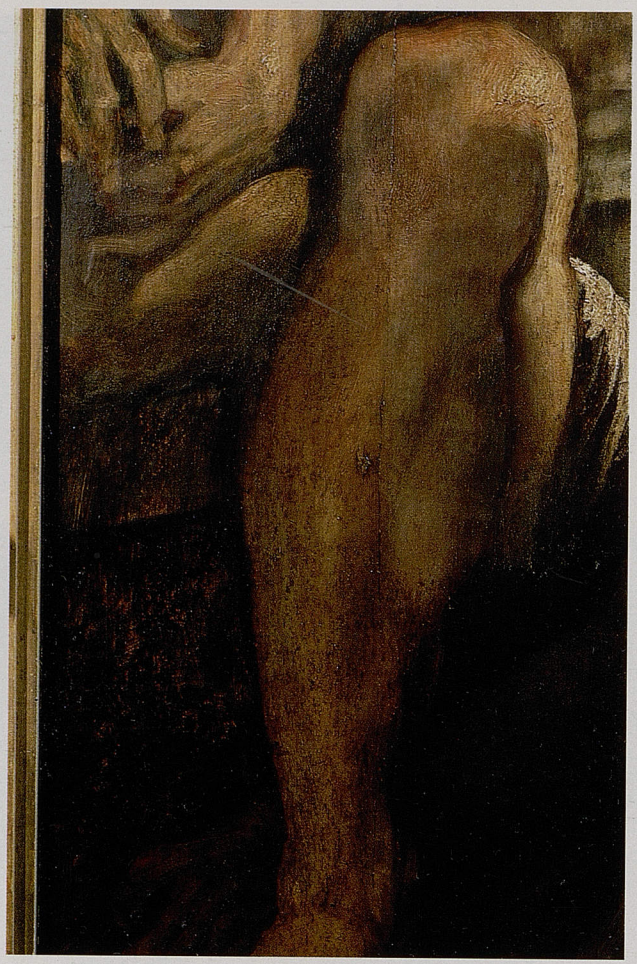
Our first cleaning tests on the *Elevation of the Cross* date back to 1978, and it was only in 1987 that we were able to begin on this important stage of the restoration. In the meantime, we had continued our research into the action of solvents on paint layers [3]. More specifically, we were looking to minimize the risk of damaging the painting by precisely monitoring the action of the solvents both during restoration and in the longer term.

We classified the solvents by three criteria. The first was their ability to penetrate the paint layers. This can be evaluated in terms of viscosity and surface tension. The second

[3] L. Masschelein-Kleiner and J. Deneyer, *Contribution à l'étude des solvants utilisés en conservation*, in *ICOM Committee for Conservation, 6th Triennial Meeting, Ottawa, 1981. Preprints* 81/20/2.



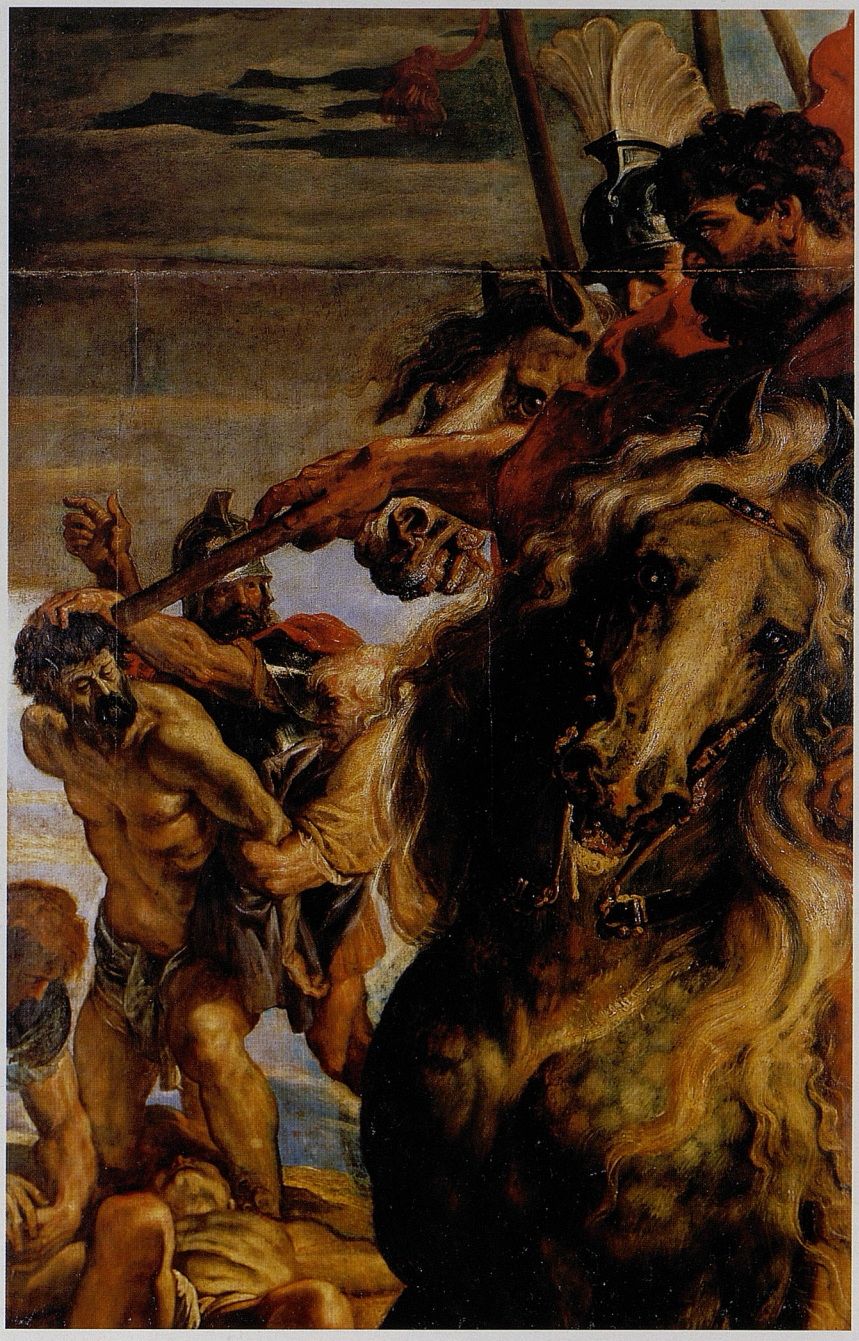
43. During cleaning : the soft nuances of the modelling of Christ's body and the broad brush strokes of the loin cloth reappearing from under the veil of yellowed and stained varnish.



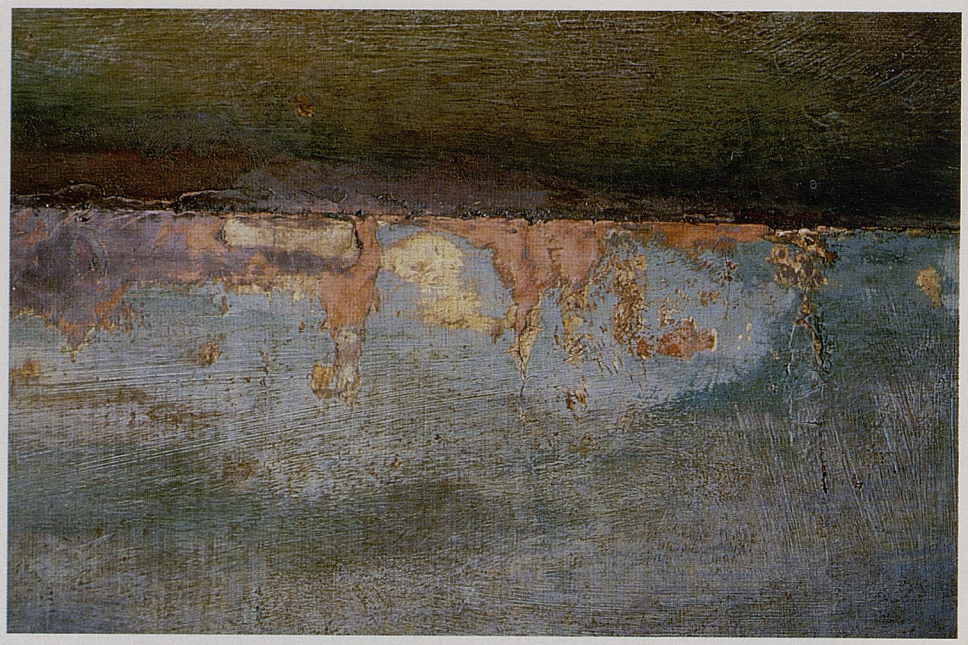
44. During the removal of brownish stains on the varnish, the leg of one of the thieves recovers its shape and roundness.

criterion was the time they were retained in the paint layers. We measured this duration experimentally on small samples, using solvents commonly employed in conservation. The third criterion related to potential inter-molecular interactions not only between the solvents and the matter to be removed, but also between different solvents (when mixtures are used), and between the solvents and the original paint, which should obviously be avoided.

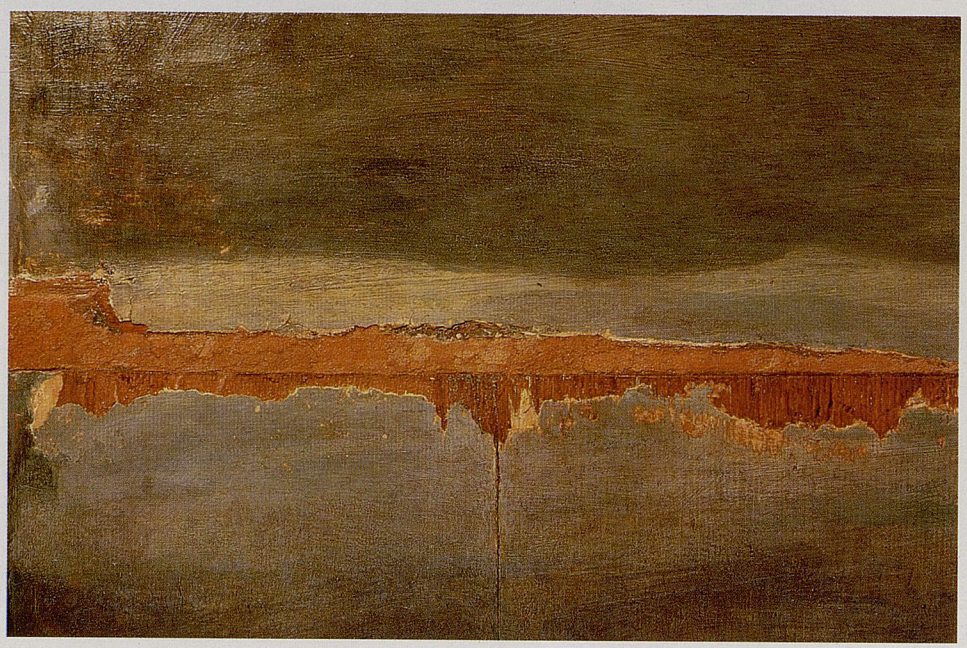
The solubility tests always begin with the weakest solvents, with the aim of selecting the solvent or mixture of solvents which is both effective and presents the least danger to



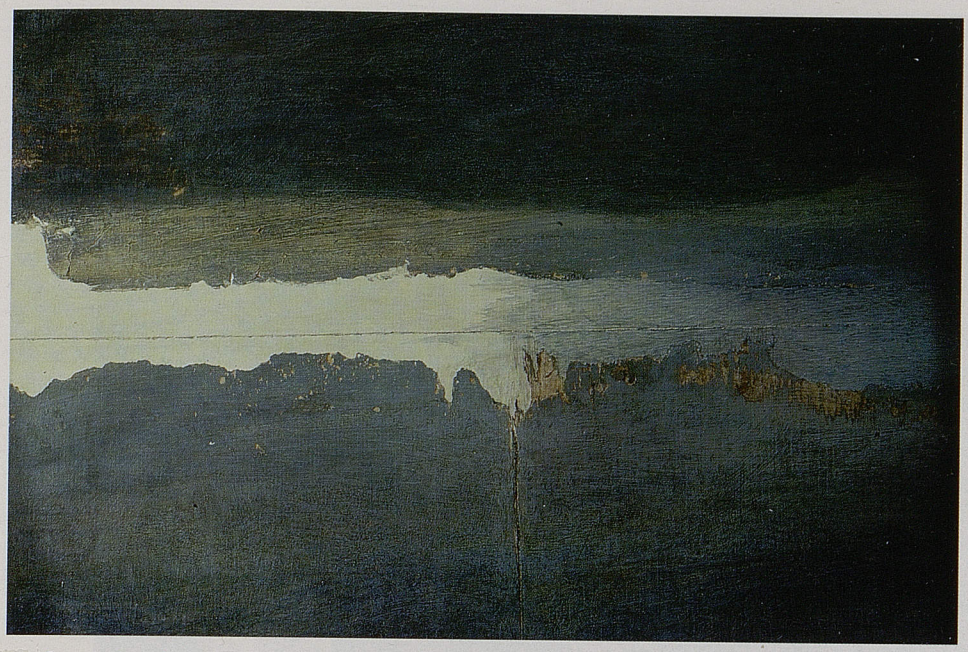
45. During cleaning : the figures regain their volume in a newly revealed deep space.



46. Retouching of the joint in the sky of the right wing : a) after a partial cleaning showing up old coloured putty and overpaint



b) after removal of overpaint and putty



c) after toning the losses

d) after retouching

47. Brush application of a light film of dammar varnish.

the work and the restorer [4].

The results of our research led us to repeat our 1978 tests using more volatile solvents, which could be retained for shorter periods and in smaller quantities in the porous layers of the paint.

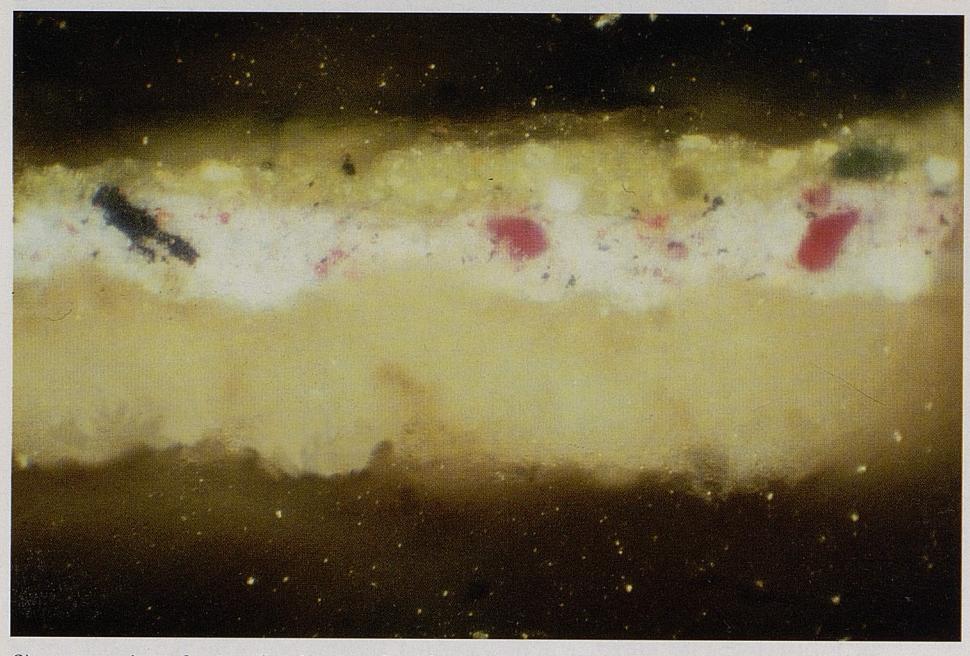
In fact the old mastic resin varnish, despite considerable deterioration of its optical and mechanical properties, had retained a remarkable degree of solubility in what we qualified as "average" solvents [5]. This category of solvents is characterized by average

[4] L. Masschelein-Kleiner, *Les solvants* (*Cours de conservation*, 2), Brussels, Royal Institute for Cultural Heritage, 2nd ed., 1991 ; Idem, *Remarques sur l'utilisation des solvants en conservation*, in *Bulletin de l'IRPA/van het KIK*, XIX, 1982/83, p. 95-104 ; Idem, *Oplosmiddelen en de gevaren voor kunstwerk en restauratoren* (*CL Informatie*, 13), Amsterdam, Centraal Laboratorium voor Onderzoek van Voorwerpen van Kunst en Wetenschap, 1993.

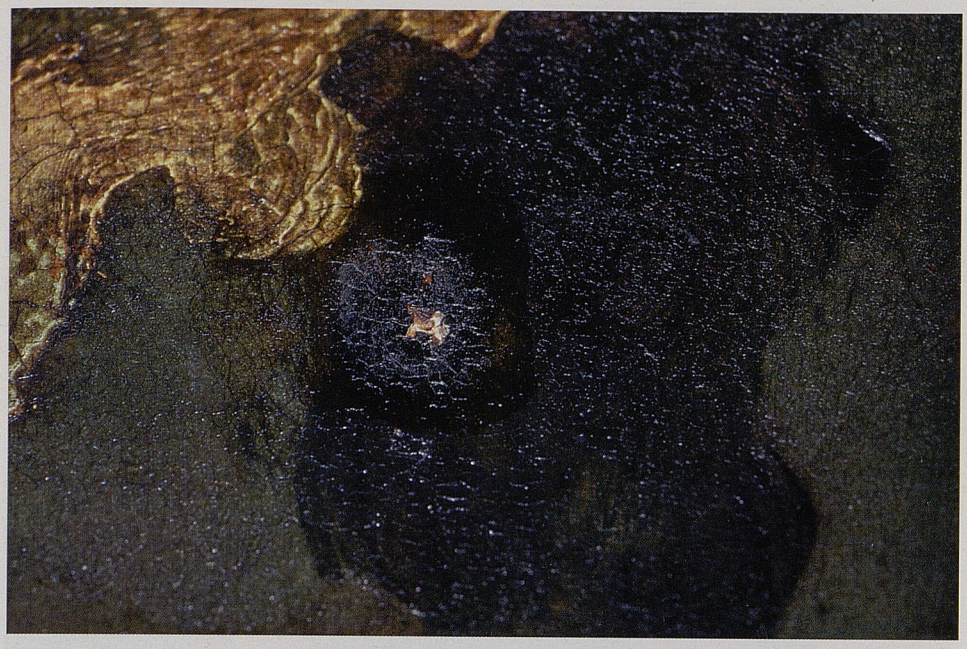
[5] Idem, *Oplosmiddelen* ...

48. Partial view of the workshop in the cathedral, showing one of the two mobile sets of scaffolding with restorer Nicole Goetghebeur.

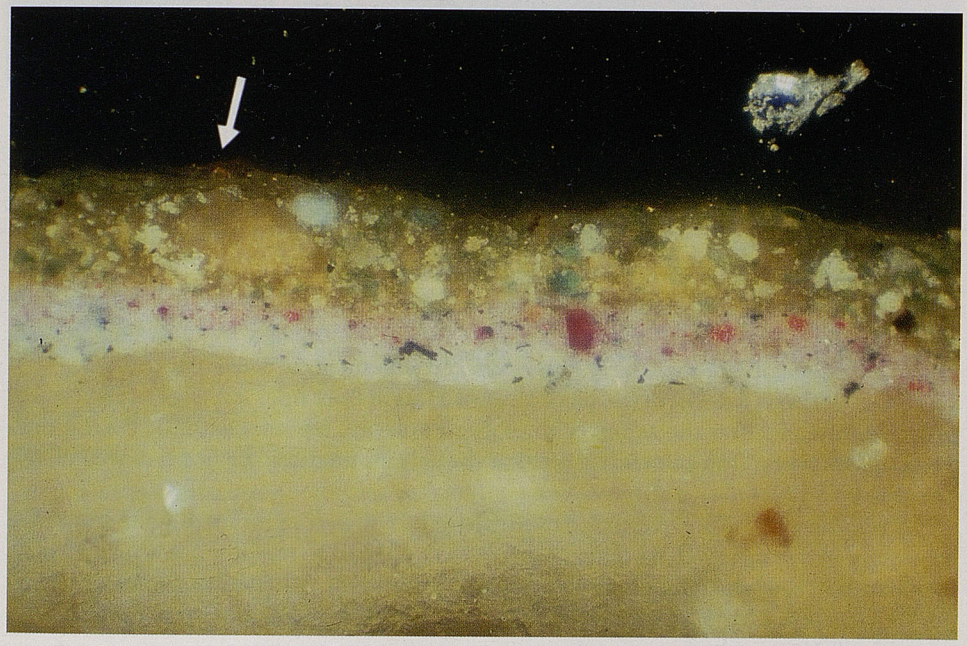
49. Cleaning test on a dark green leaf on the upper right edge of the central panel : 1) before testing



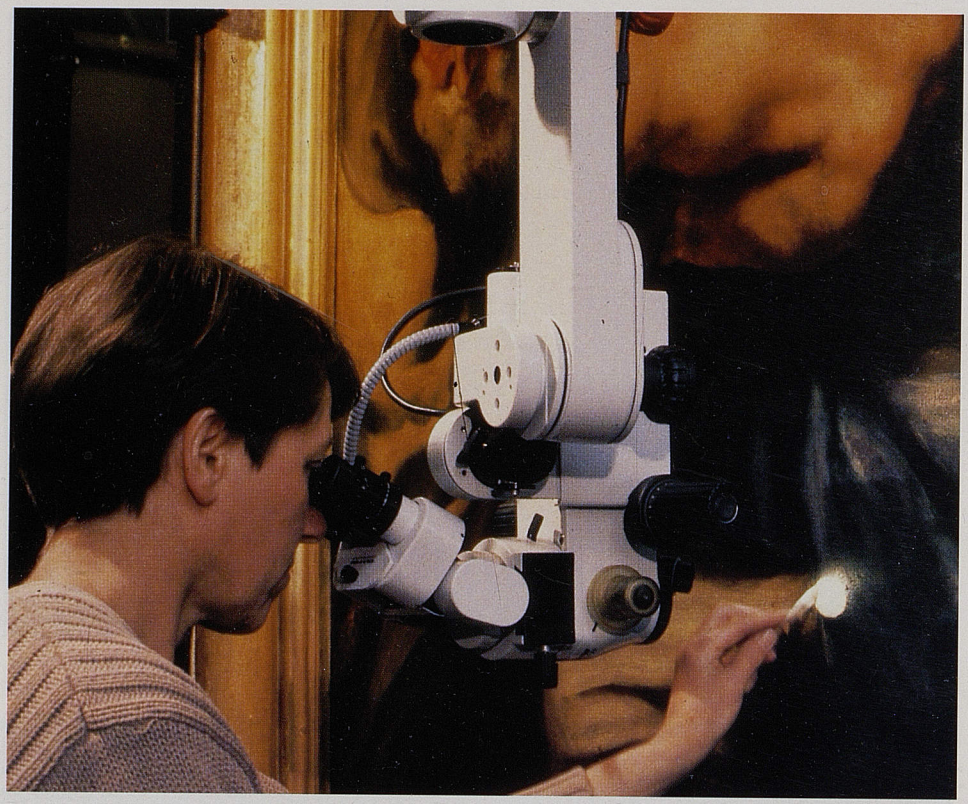
2) cross-section of a sample taken on the edge of the loss. The varnish is not present on the whole surface of the green area, but is clearly visible in the centre (a partial dissolution may occur during the preparation of the cross-section)



3) the same detail after the use of the solvent



4) after the solvent test, the cross-section still shows remnants of the varnish on the left *(arrow)*



50. Restorer Regine Guislain-Wittermann working with the binocular microscope.

penetrability and a retention of less than 3% after 4 hours' drying.

Isopropanol (propan-2-ol), a volatile alcohol with low penetration, diluted in isooctane (2,2,4-trimethylpentane), a very volatile saturated hydrocarbon, but with a very low toxicity level, provoked sufficient swelling to enable the removal of a thin layer of varnish. As the treated surface dries very quickly, it is literally possible to "peal" the varnish down to the desired level. Varnish removal can be modulated by changing the isopropanol/isooctane ratios : the restorers worked with mixes of 3:1, 1:1 and 1:3.

Figure 49 shows a detail of the paint layer of a leaf at the upper left edge of the central panel before and after the action of the solvent mixture, together with the corresponding cross-sections. One can clearly see that the solvent mixture has not removed all the varnish.

To remove disfiguring overpaint, more active mixtures containing toluene instead of isooctane were employed. In other cases we were obliged to use ethanol, which is more penetrating than isopropanol. In rare instances, particularly stubborn retouchings had to be removed with a more active mixture composed of toluene and dimethyl-formamide (3:1).

L. M.-K.

PAINTING TECHNIQUE

NICOLE GOETGHEBEUR, REGINE GUISLAIN-WITTERMANN
and LILIANE MASSCHELEIN-KLEINER

We had the unique privilege, during the restoration work, of examining the triptych in all its details, and even, where necessary, under the binocular microscope. We report here on our observations, supplemented by laboratory examinations.

We have attempted to answer three fundamental questions : How did Rubens paint the triptych ? What materials did he use ? How did he use them ?

Rubens painted the panels in their frames. This is shown by the presence of *"barbes"* (raised lips of ground around edges of paint layer) and unpainted edges. Near the upper edge of the central panel, we observed an unusual phenomenon (Fig. 51) : striations in the vertical direction impressed into the ground and fresh paint layer ; we cannot explain satisfactorily this damage, which might have been an accident while the painting was still soft.

The ground layer itself confronts us with an enigma. The wear and the losses in the paint layer reveal a yellowish coloured base. However, the cross-sections of all the samples taken show, with a few rare exceptions, an ivory-coloured chalk-glue ground layer, of the type traditionally used on Flemish panels, covered with a thin grey layer consisting of lead white, to which have been added grains of carbon of irregular thickness and dispersion. At times there is a little ochre and chalk. The presence of this thin layer above the ground comes as no surprise : numerous authors have observed it – designated variously as *imprimitura, impression* or "priming" – in various of Rubens's paintings. It is also omnipresent in the samples taken from the *Descent from the Cross.* It is particularly visible in his sketches [1]. We follow here R.L. Feller, who refers to this layer as an *imprimitura* in the case of Rubens's paintings. Indeed, the two other terms are generally used for layers providing a thicker covering.

[1] H. VON SONNENBURG, *Rubens' Bildaufbau und Technik*, I. *Bildträger, Grundierung und Vorskizzierung*, in *Maltechnik Restauro*, 85, 1979, p. 77-100 ; J. PLESTERS, *Samson and Delilah : Rubens and the Art and Craft of Painting on Panel*, in *National Gallery Technical Bulletin*, 7, 1983, p. 30-49 ; P. COREMANS and J. THISSEN, *La Descente de Croix de Rubens. Etude préalable au traitement. Composition et structure des couches originales*, in *Bulletin de l'IRPA/van het KIK*, V, 1962, p. 119-127 ; R.D. BUCK, *Rubens's The Gerbier Family : Examination and Treatment*, in *Studies in the History of Art, National Gallery of Art*, 1973, p. 32-53 ; R.L. FELLER, *Rubens's The Gerbier Family : Technical Examination of the Pigments and Paint Layers, ibidem*, p. 54-74 ; H. VEROUGSTRAETE-MARCQ, *L'imprimatura et la manière striée. Quelques exemples dans la peinture flamande du 15e au 17e siècle*, in *Le dessin sous-jacent dans la peinture. Colloque VI. Infrarouge et autres techniques d'examen*, Louvain-la-Neuve, 1985, p. 21-27.

51. Upper edge of the central panel showing unexplained striations.

The problem is that most authors describe Rubens's usual *imprimitura* as being of a grey or bluish-beige colour, often striped. However, we are unable to see this tone or structure in the *Elevation of the Cross*, neither through the transparent paint layers nor through the worn areas of the painting. At just one place on the central panel, on the right thigh of the bald-headed executioner, a large brush stroke visible on the X-radiograph could be a sign of this typical *imprimitura*, as it corresponds neither to the saw-lines of the planks nor to the painted motifs (Fig. 53). Also towards the middle of the right wing, we find two V-shaped brush strokes possibly attributable to this *imprimitura* ; however, nothing permits us to affirm that these stripes are not situated in the underlying ground layer. It may be that the *imprimitura* is too thin (10 to 40µ) and too transparent to be easily detected.

An *imprimitura* is used normally for two reasons, one mechanical, the other optical. First of all it facilitates the adhesion of oily layers on top of an aqueous ground, by interposing an oil or emulsion-based layer, thereby diminishing the risk of absorption in the ground layer. And indeed L. Kockaert identifies an oil-protein emulsion binder in most samples [2]. Moreover, certain painters used a coloured priming to provide a base tone, which can either be left apparent, or be covered by more or less transparent or opaque paint layers. Rubens does not appear to have used these optical properties in the *Elevation of the Cross*. Perhaps, understandably, he simply wanted to "calm" the white of the

[2] See above p. 64 and 77 and Figure 23.

ground, which could become disturbing when working on such a large surface. Or this layer could have served to augment the covering power of the paint layer, by reducing the reflectiveness of the ground, which, despite everything, remains light coloured and plays an optical role underneath thin layers of paint.

Another source of surprise is the scarcity of detectable underdrawing. Indeed, we find it only on a very limited zone in the central panel. In part it is visible to the naked eye, and shows up clearly in the infra-red photographs and in one cross-section (No. 12). This black brush drawing broadly outlines the folds of the blue garment and the left leg of the executioner leaning against the cross (Fig. 55). Infra-red reflectography has not shown any further underdrawing.

Plesters observed the same phenomenon in *Samson and Delilah* in London's National Gallery [3]. She cites a number of explanations : as reported by Turquet de Mayerne, a contemporary doctor who described the materials and techniques of painters of his time, drawings were wiped clean before painting "... to avoid said black stone dirtying and staining the colours" [4], thereby leaving behind only traces which would be difficult to detect. An alternative solution is that there was no need to make a detailed drawing, as the preliminary work had been done by means of sketches. It is also possible that Rubens used a substance which is not infra-red detectable, such as sepia or red chalk, which he would have then integrated when painting.

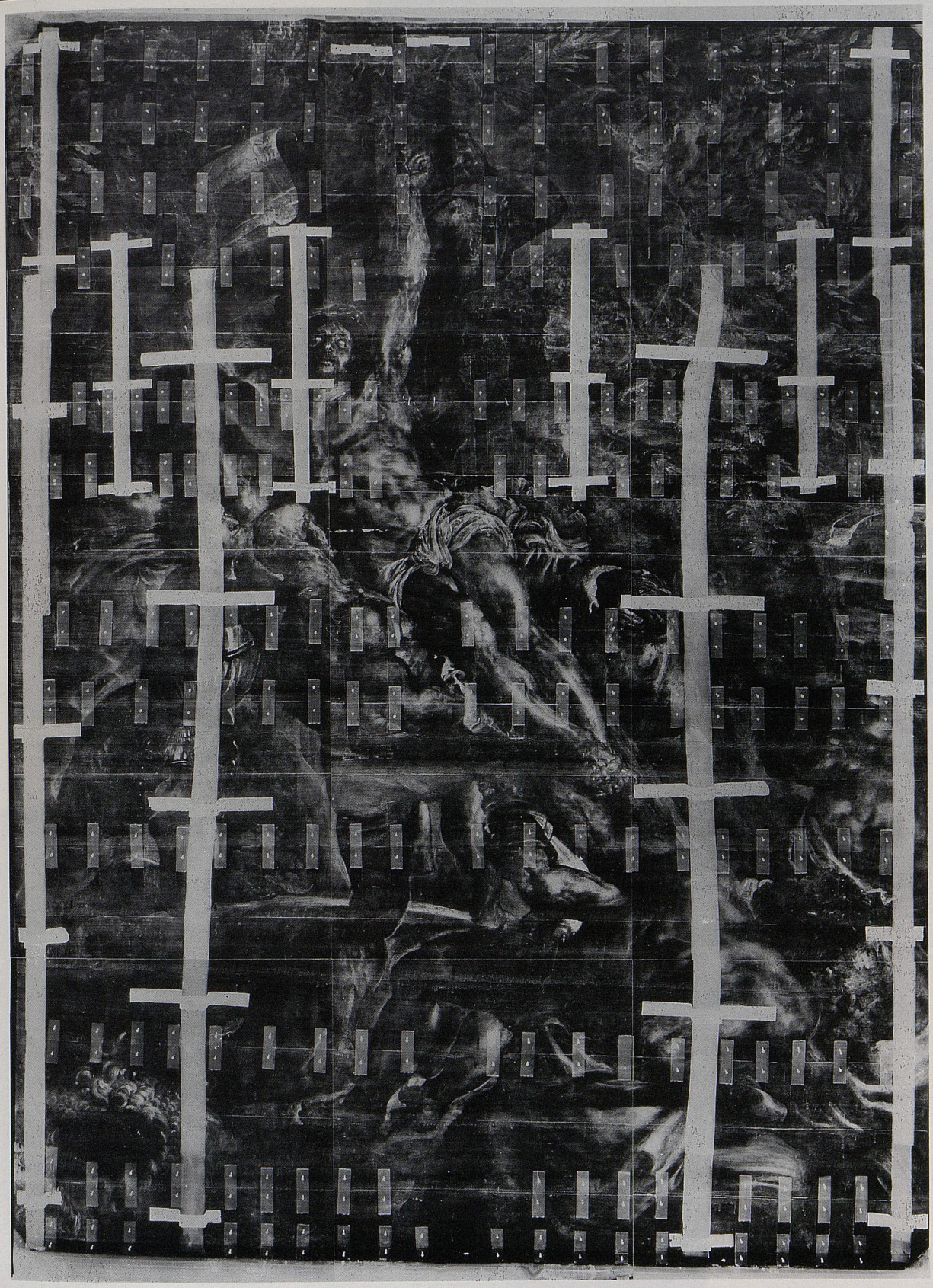
It seems unlikely that there was so little drawing for a picture as monumental as the *Elevation of the Cross*. Rubens certainly began his work with a general placing of the composition. This is proved by the sizeable reserves which are visible on the X-radiographs. On the central panel, these show in particular a very precise reserve for the cross (Fig. 57), the interior outline of Christ's legs and the legs of the executioner in the centre of the picture (Fig. 53). On the right wing, the flag poles have been reserved, and Rubens left these spaces blank when painting the sky (curiously, the blue tones used differ from one reserved sky area to the next).

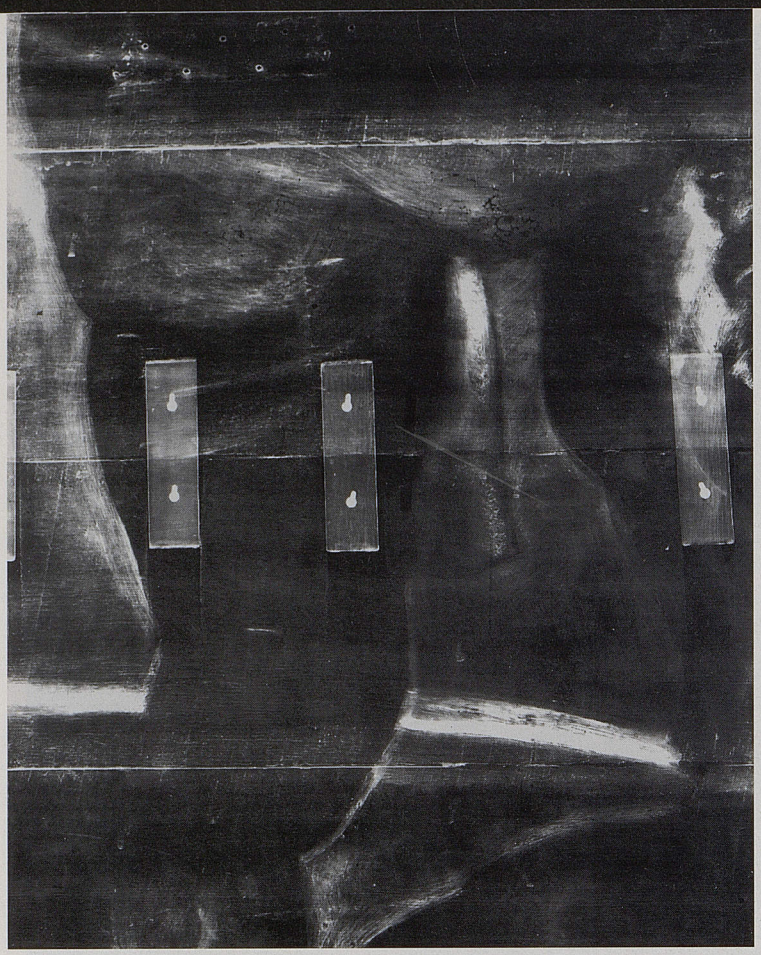
This sureness of execution nonetheless does not exclude *pentimenti*. There are many of them, as Rubens created as he painted, constantly perfecting his composition by removing details, isolating volumes and highlighting shapes. To this end, he extended the sky along the right edge of the central panel and increased the contrast of the rope strung from the rock by covering up the already painted leaves.

There are a number of changes around the figure of Christ. The loincloth (*perizonium*) originally extended further down the leg, covering the arm of the bald-headed executioner (Fig. 58). The drape, which was originally larger to the right, has been cut by the arm of the turbaned man and by a brown shadow delineating the thigh. The hand holding the rope (Fig. 60) has been displaced upwards in order to create a space against which it stands out better : the movement of the fingers has also been changed. The *titulus* and its Hebrew inscription have been partially repainted (Fig. 61), though it is impossible to make out whether the text has been altered. The left executioner's ochre-coloured garment also masks thick underlayers.

[3] PLESTERS, *op. cit.*, p. 38.
[4] C. VERSINI and M. FAIDUTTI, *Le manuscrit de Turquet de Mayerne*, Lyon, 1974, p. 124.

52. X-radiograph during treatment, taken from the front side of the triptych. Both painted sides of the wings are visible.





53. The X-radiograph shows reserved areas for the legs of the bald executioner, dense outlines, *pentimenti* in the drapery and large brush strokes from the *imprimitura* along the upper join.

On the left wing, the white veil and the flesh tones of the old woman's chest cover up locks of hair, and the folds in the veil have been altered (Fig. 62). Rubens has also modified the folds under the sleeve of the young woman in red and repositioned her ribbons. The ochre skirt of the blue-green robed woman to her left was originally more visible.

On the right panel, the horse's breast has been reduced in size in order to give more space to the sky (Fig. 63). The floating ribbons between the flag poles have been displaced (Fig. 64). At the centre of this panel, brush strokes in relief bear witness to another abandoned motif, not identified.

The backs of the wings, on their outer side, exhibit a vertical band which was originally unpainted (Fig. 34), having probably been covered by vertical elements of the altar [5].

In the upper corner of the right wing, an underpainting in relief clearly shows an arcade (Fig. 65) : this corresponds to the Dulwich sketch (Fig. 66). Rubens overpainted this arcade in order to isolate the shapes of the angels in the background. At the same time he discarded their floating drapery, highlighting their chubby flesh. Other drapery has also been covered by Saint Catherine's right arm (Fig. 81).

[5] See above, the contributions of F. Baudouin, p. 18 and L. Kockaert, p. 77.

54. Detail of the lower part of the central panel.

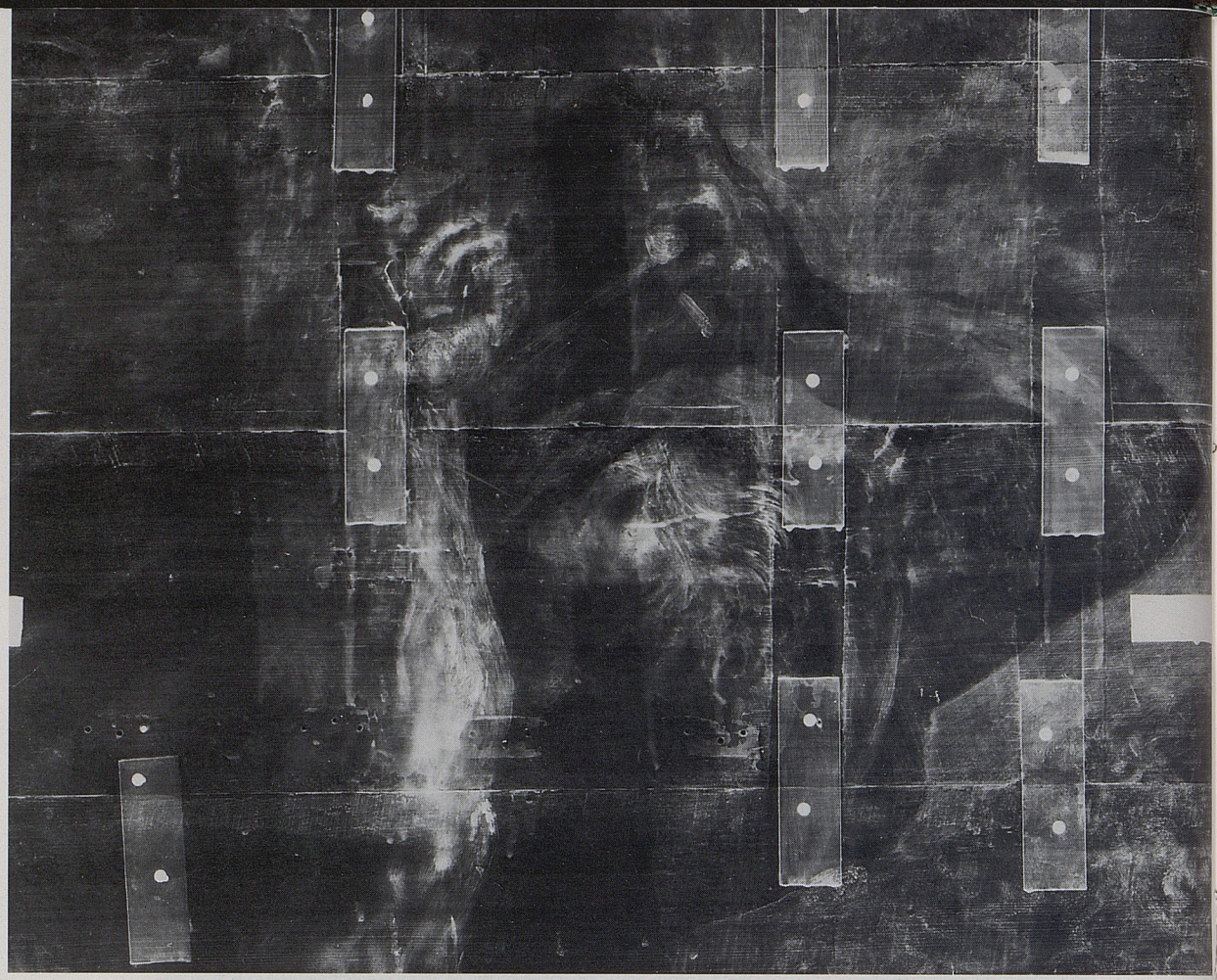
55. Infrared photograph of the executioner in the foreground showing changes in the underdrawing.

On the back of the left wing, Saint Amand's book has undergone numerous modifications. In the final version it opens out widely like a fan, nearly falling out of the saint's hands (Fig. 67).

At the centre of the cartouches on the backs of the two wings, a decorative element resembling a knot has been painted over (Fig. 68).

Unfortunately, most of the *pentimenti* have aged badly : where they are too thin, they have become transparent ; where they are too thick, they have provoked premature cracks in overlying layers.

56. Preparatory drawing for the same figure, chalk and ink on paper. Dutch private collection.



57. X-radiograph. Precise reserves for the cross and the raised arm of an executioner.

Rubens painted without hesitation : his technique and the materials he chose allowed him to paint quickly and without interruption. As already noted in other paintings by him, his palette contained all the pigments commonly used in his day [6] : azurite, verditer [7], ultramarine, indigo and smalt for the blues ; vermilion, red ochre and minium for the reds ; basic and neutral lead white and vegetal black. Like Plesters, Kockaert has observed that most greens are mixtures of blue and yellow, of blue and brown, or other combinations [8]. Rubens also used organic lakes, cochineal red, an unidentified yellow lake, copper resinate and frequently a bitumen-based brown lake. We will return to this subject in greater detail.

Unlike 15th and 16th century painters, Rubens mixed several pigments, including lake-pigments in the same paint layer, using up to five at a time. For example, two cross sections taken from green areas contain lead white, yellow ochre, lead-tin yellow, azurite and carbon black (cross-sections Nos. 5 and 20). In the flesh tones we find lead white,

[6] FELLER, *op. cit.*, p. 59.
[7] PLESTERS, *op. cit.*, p. 40.
[8] See above, p. 65.

red ochre, vermilion, azurite and carbon black (cross-section No. 11). The wide variety of these mixtures strongly suggests that Rubens made them up on the palette immediately before using them.

The painter chose two binding media : walnut oil (identified by M. Van Bos with the help of gas chromatography/mass spectroscopy) [9] and an oil-protein emulsion (identified by coloured reaction by L. Kockaert) [10].

The oil medium was used for scumbles, glazes and most red and brown tones. The presence of resinous substances from the *Pinus* species suggests that Rubens added some resins to his paint. The use of turpentine reported by Turquet de Mayerne [11] could not be confirmed : "Sir Rubens told us that, when working, one must mix the colours rapidly with aqua di ragia, (i.e. with the oil extracted from the soft, white resin obtained from the fir tree, it has a good smell, is distilled with water in the same way as white turpentine), which is better and less glossy than spike oil". De Mayerne indicates that this ragia is the white pitch derived from the *Picea*, adding : "On its own, this oil evaporates, one must therefore add a little litharge drying oil, made with linseed, nut or hemp oil, or if necessary with turpentine" [12]. The mono- and sesquiterpenoid components of turpentine were not found, but this is normal because they are readily oxidized and polymerized. Surprisingly, these unstable compounds were still found by Mills and White [13] in a varnish dated from the 18th century.

Analyses of Rubens's binders are still fairly rare. Mills and White identified linseed oil in five samples taken from *Samson and Delilah* (1609) in the National Gallery, London [14]. Two of the samples, one of white and the other of brown, also contain a resin. In the *Watering Place* (1615-1622), also in the National Gallery, they found linseed oil in the yellow, green and brown samples, and what was most probably nut oil in a white one.

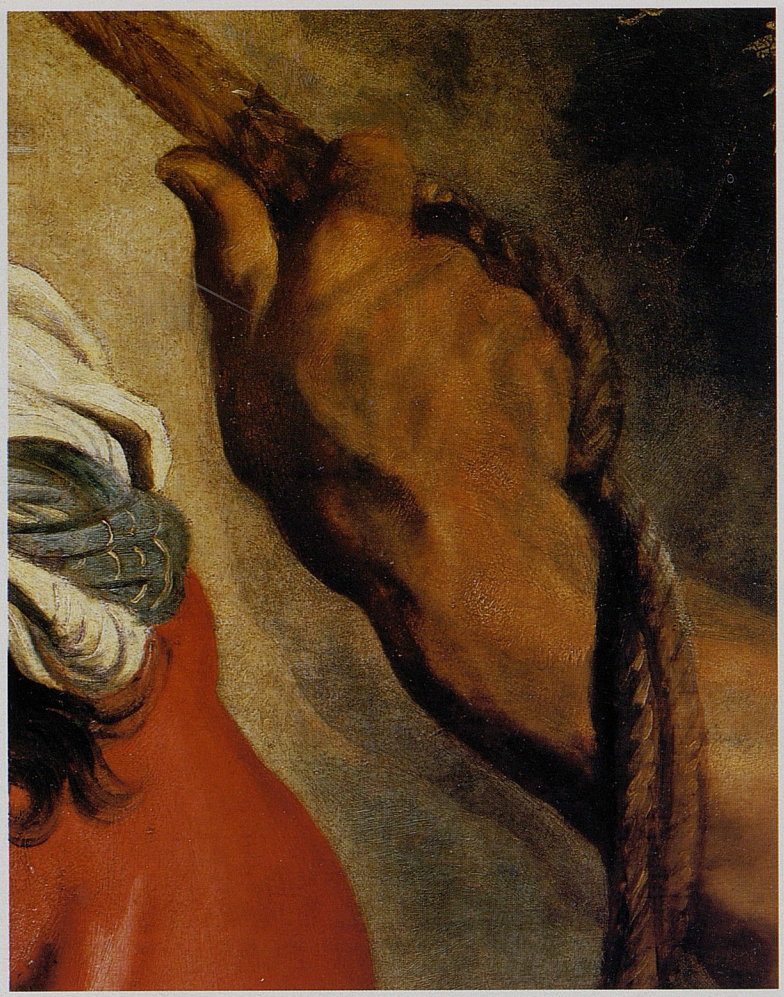
An oil-protein emulsion gives a paste with good covering power and a thixotropic quality, fluid when stirred with the brush, and solid at rest. Rubens used an oil-protein emulsion for the impasto of the highlights and flesh tones (Fig. 81), as well as for fine details such as hair, which have to remain firm without spreading (Fig. 79). Christ's face and body illustrate the many possibilities offered by this type of binder, which Rubens used with virtuosity. The very smooth flesh tints are undoubtedly obtained by prolonged modelling with the brush, which has the effect of fluidifying the thixotropic medium (Fig. 43). On the X-radiographs (Fig. 70), this gives a more blurred appearance which contrasts strikingly with the outlines of the loincloth applied at the end with broad, slashing brush strokes.

In Christ's face, Rubens has used an emulsion paste to mark the lights and to paint the white of the eyes and the teeth in a few strokes (Fig. 72). Touches of red around the eyes and in the nostrils accentuate the relief and the dramatic expression of the face.

[9] See above, p. 81.
[10] See above, p. 76-77.
[11] VERSINI-FAIDUTTI, *op. cit.*, p. 147.
[12] *Ibidem*, p. 122.
[13] S. MILLS and R. WHITE, *Natural Resins of Art and Archaeology. Their Sources, Chemistry and Identification*, in *Studies in Conservation*, 22, 1977, p. 12-31.
[14] S. MILLS and R. WHITE, *Analyses of Paint Media*, in *National Gallery Technical Bulletin*, 7, 1983, p. 65-67.

58. X-radiograph. *Pentimenti* in the loincloth of Christ.

59. These changes are still visible on the painting.



60. Change in the position of the hand and the rope.

Grey touches are also placed on the surface : Rubens did not exploit the *imprimitura.* Saint Catherine's hand, on the back of the right wing, also illustrates this technique (Fig. 73 and 81). The flesh tones are smooth and uniform on the edges, whilst the highlights in the centre show large brush strokes in relief.

In certain leaves in the central panel, we noticed long drips of a heavy and creamy substance (Fig. 74). Here Rubens has clearly added too much diluting agent to the emulsion. This has also modified the wetting properties of his paint, certain strokes of which have beaded on drying. He painted these leaves on an undercoating which was not yet sufficiently dry, provoking severe drying cracks.

Rubens frequently painted without superposition, which saved him from having to wait for drying (Fig. 69). Twenty-tree of the fifty-six cross-sections examined present a single paint layer. For example, in the armour of the soldier in the central panel, he first applied the grey tone and juxtaposed the black, and finally the white paint (Fig. 40). The light areas are enriched by the reflection of neighbouring colours such as the ochre of the flesh tones and the crimson of the garment.

It is interesting to compare the legs of the executioner in the centre of the central panel with their appearance on the X-radiograph (Fig. 53-54). Rubens painted, simultaneously and without superposition, the dark and light tones. The contour of the leg appears light in the X-radiograph, due to the presence of a dense pigment in the underpaint. This was later covered with a brown glaze to mark the volumes and to highlight the shapes. Finally, the highlights were placed rapidly using the thixotropic binder which retains the brush marks and does not spread.

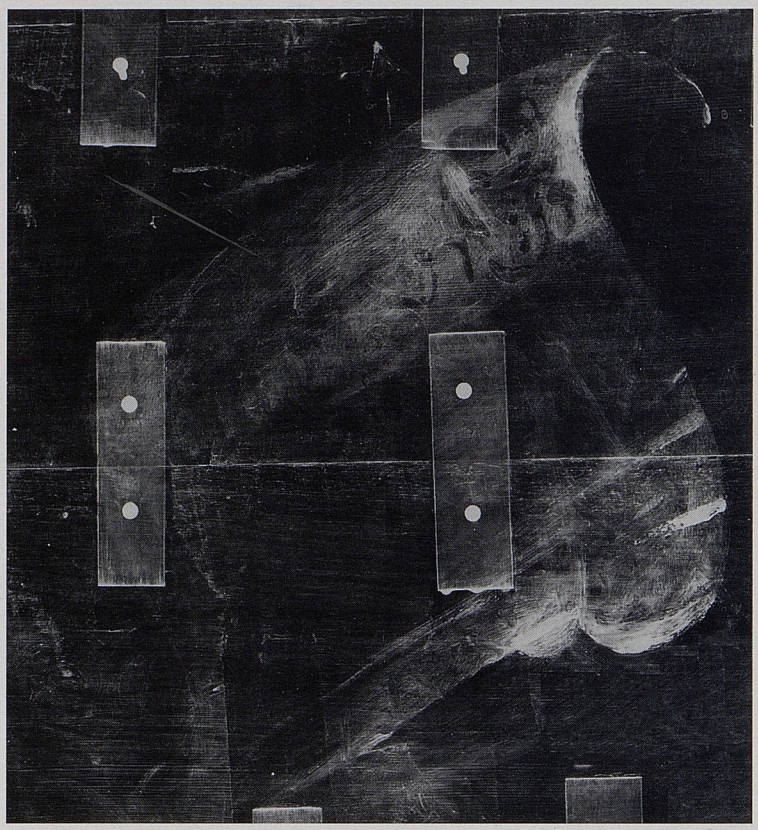
Rubens also displayed perfect command of the traditional transparency effects used by his predecessors. One example of this is the blue garment of the executioner under the cross, where the dark tones, painted with an ultramarine and indigo-based glaze, are superimposed over an opaque layer of lead white, ultramarine and indigo. Similarly, the red garment of the turbaned man presents a layer of vermilion and ochre overlaid with a red lake (Fig. 75). In addition, a layer of transparent copper resinate on a base containing lead white, yellow ochre, carbon black, azurite and possibly a yellow lake, was found on the greenish garment of the executioner in the middle of the central panel. The same technique was used in certain flesh tones, as detailed later.

Like Plesters [15], we note with surprise the frequent use of a translucent bituminous organic brown [16]. This is mixed with ochre, carbon particles and even with pigments such as azurite (cross-section No. 32). Contrary to what is normally observed with bituminous browns, very thin layers have dried without cracking. In Christ's face, transparent bituminous browns have been used to draw the eyebrows, the eyelids and to accentuate certain shadows (Fig. 72). In fact, Rubens used these browns frequently to shade the contours of the forms, to soften flesh tints and to mask lights which he judged too extensive, as in Christ's loin cloth and in the turbaned figure.

The different materials are rendered with great virtuosity. Rubens depicted velvet, satins, brocades, transparent veils, pearls, precious stones, metallic breastplates, hair, beards, dogs' fur, and horses' manes with remarkable accuracy in just a few brush strokes.

The depiction of the satin of Saint Catherine's robe reveals an exceptional gift for observation (Fig. 76). With striking accuracy, Rubens distributed the light and the shade to render the luminosity of the fabric and its heavy folds. He obtained these in an almost dry graphic style (Fig. 81) using a small number of intense white touches on a background modelled in a variety of grey tones.

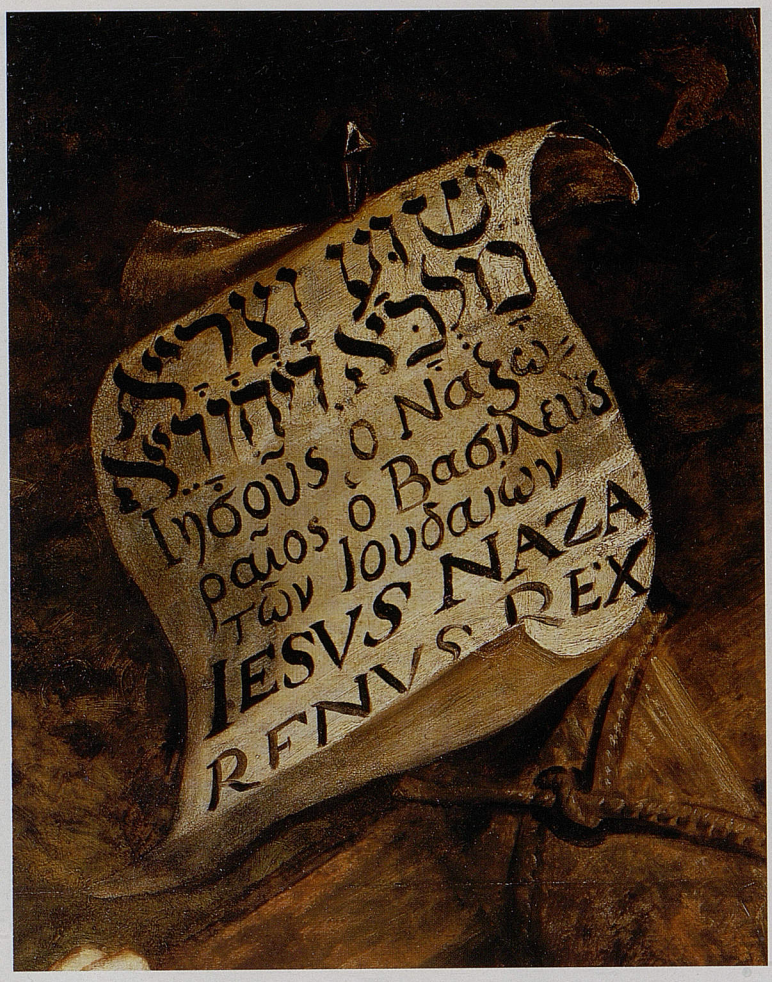
[15] PLESTERS, p. 43.
[16] See the contribution of M. Van Bos above, p. 87.



61. X-radiograph. Changes in the size and the hebraic characters of the *titulus*.

The jewel worn by the saint was also painted very simply, using transparent ochre and browns (Fig. 78). The dense highlights were then precisely applied. The reliefs of the embroidery were obtained in a similar fashion on an ochre base, finishing with thick highlights and a few shadows to accentuate volume.

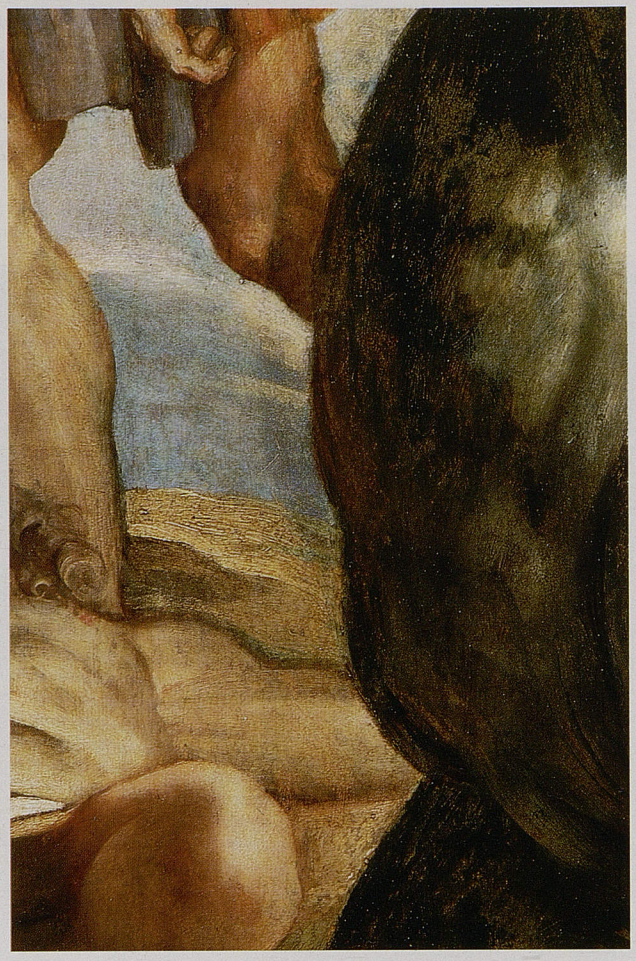
In the right wing, the ornamental feathers on the horse-man's helmet have been painted using a thin layer of nuanced grey allowing the brown background to show through. The feathers were then applied with thin white strokes. Rubens next painted wet in wet with strokes of blue and dark grey which mixed slightly with the underlying layer. Finally, thick highlights and strokes of a brown glaze accentuate volume. The flesh tones were produced with particular care : Christ's luminous body contrasts with the



tanned torsos of the executioners and their strained, reddened faces. Analysis has confirmed that Rubens went to considerable lengths to obtain the right tone (cf. L. Kockaert). The nine samples which we have examined all differ considerably. To his usual ochre and lead white, Rubens added reds (vermilion, earths or lakes), at times lead-tin yellow (double oxides) and even blue (azurite). In many cases he worked with a single opaque layer, but also used the transparency effects of red or brown glazes.

The variety of hair types is striking in its diversity, although the technique is always similar (Fig. 79). Rubens initially applied a carefully shaded background tone, which often allows the ivory ground to show through. He then marked the movement of the locks of hair with opaque strokes, either ochre or intense white, etched through the wet

62. Evidence of dark brush strokes underneath the paint of the veil and chest reveal the presence of long loose hair in a preliminary stage.



63. Rubens reduced the breast of the horse in order to enlarge the open space behind.

paint with the end of a brush. Thin strokes of light impasto were then rapidly and judiciously applied to accentuate the curls of hair. In many cases he deepened the shadows with strokes of a brown glaze.

Rubens's judicious choice of materials enabled him to diversify the consistency and covering power of his paint in a surprising fashion, from translucent scrumbles and glazes to unusually heavy impasto, in particular on the backs of the wings (Fig. 81). In this context, it appears evident to us that the four superb monumental figures on the back of these wings are indeed Rubens's work, contrary to certain previous assertions.

The extraordinary spontaneity, even exuberance, with which Rubens has painted this triptych, is founded on his experienced technique, simultaneously traditional and innovative. His materials differ little from those of his predecessors, but from them he drew an enormous diversity. His work proclaims an acute sense of observation, perfect draughtsmanship and talent as a colourist, underlaid by an exceptional creative genius.

64. Some of the floating ribbons have been concealed in the final paint layer by the flag poles and the sky *(right)*.

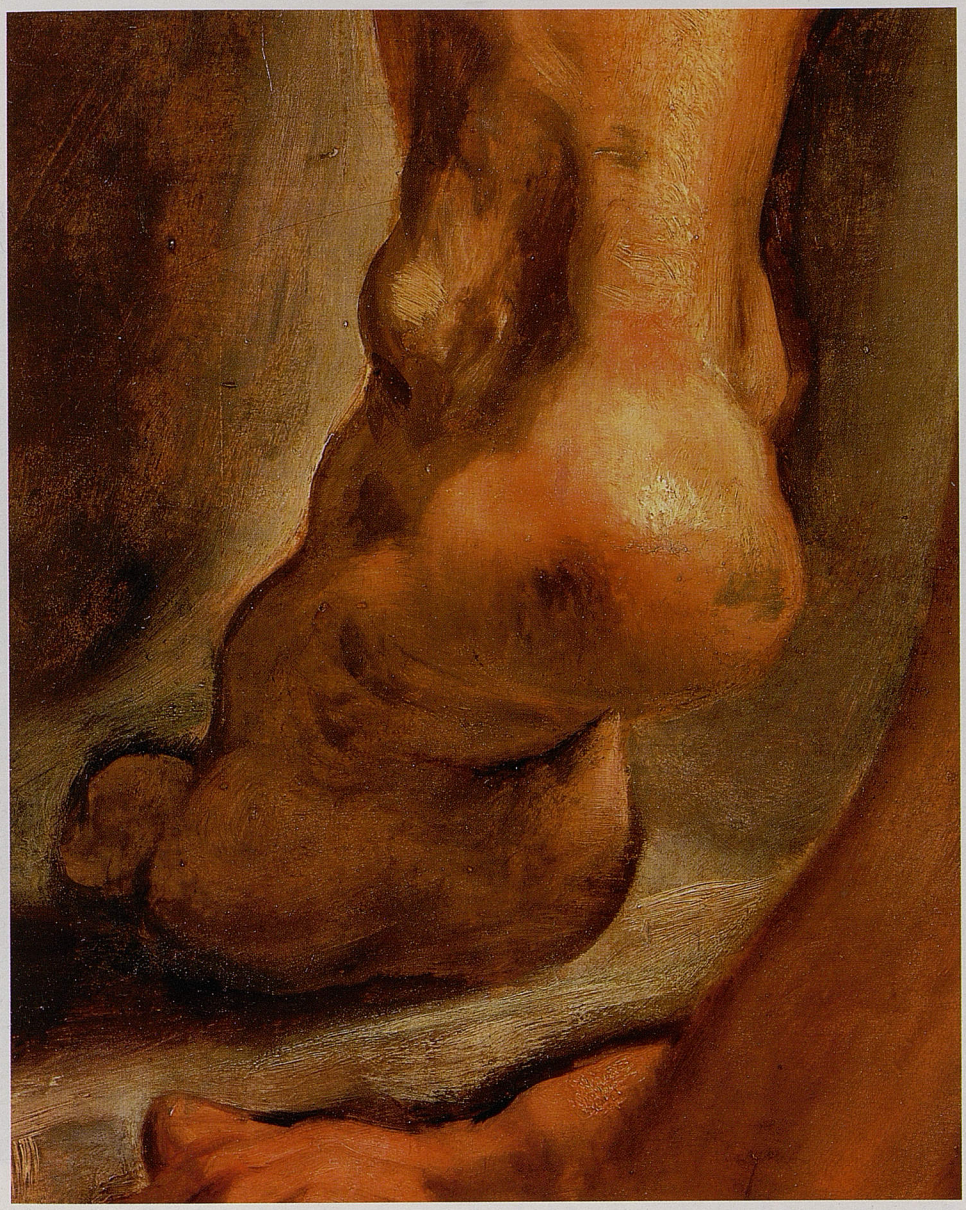
65. Photograph with reflected light clearly shows an underpainted arcade in the upper right corner of the reverse side of the right wing.

66.7 x 24.7 cm each

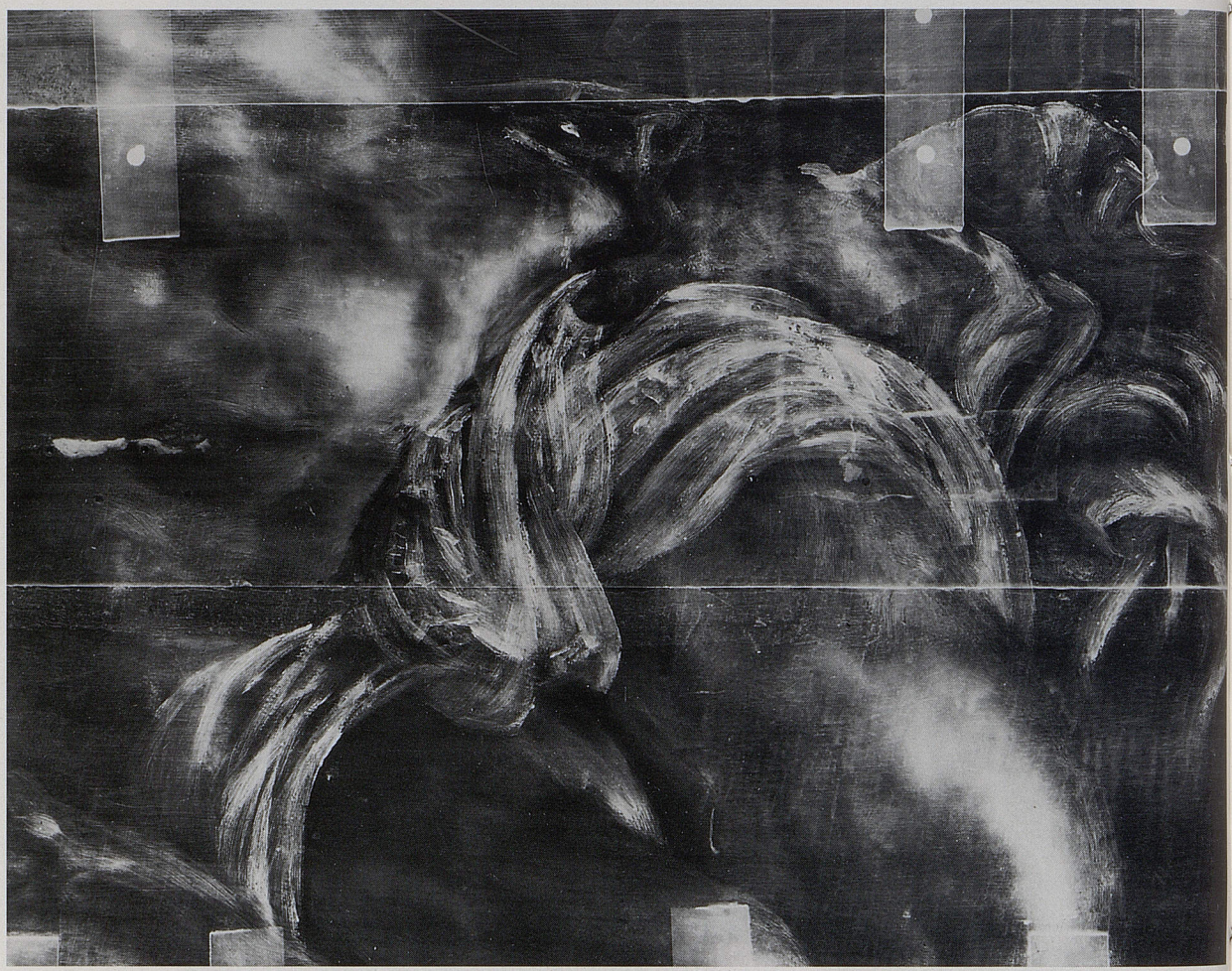
66. Arcades are present in the preliminary sketch belonging to the Dulwich College Picture Gallery, Dulwich.

67. Saint Amand's book was previously less open, as revealed by raking light.

68. Plinth under Saints Amand and Walburgis : a motif painted in the centre of the cartouche has been concealed in the final composition.



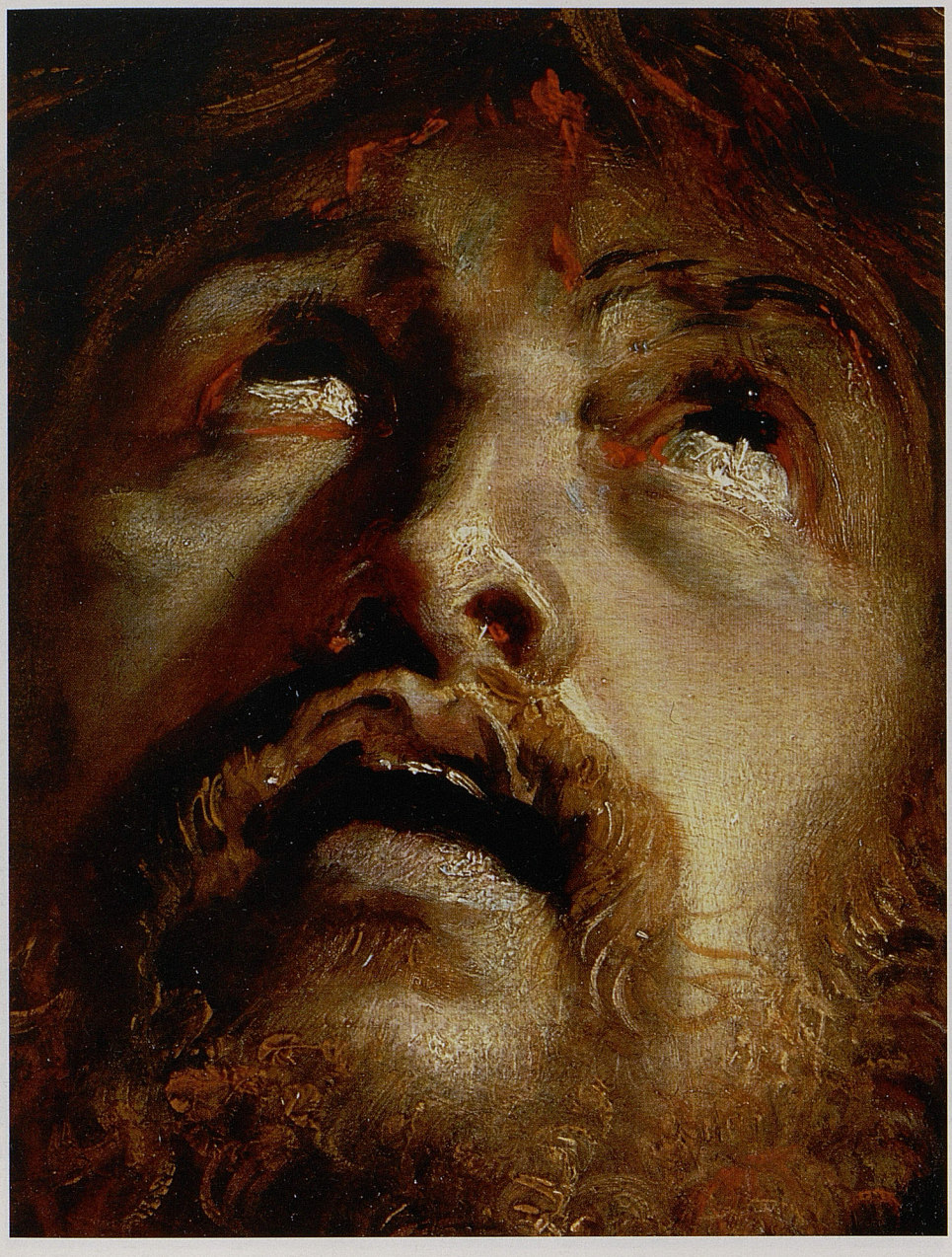
69. In a few rapid touches, Rubens captures light, volume and movement.

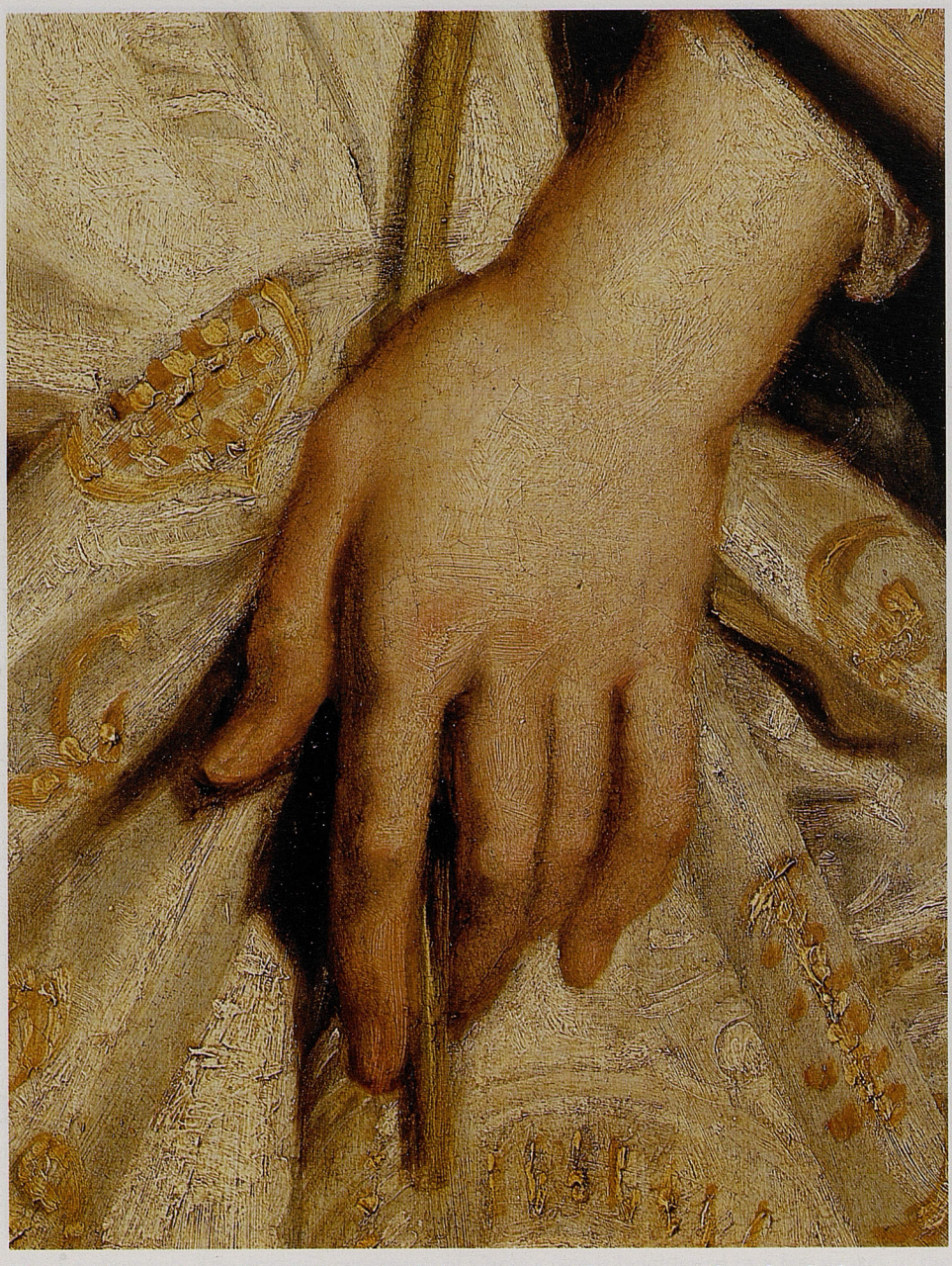


70. The X-radiograph shows the different usage of the same thixotropic medium : in the flesh, Rubens renders it fluid by the action of the brush, giving the paint a blended quality, whereas in the loincloth he applies it in one stage, without reworking, hence its graphic appearance.

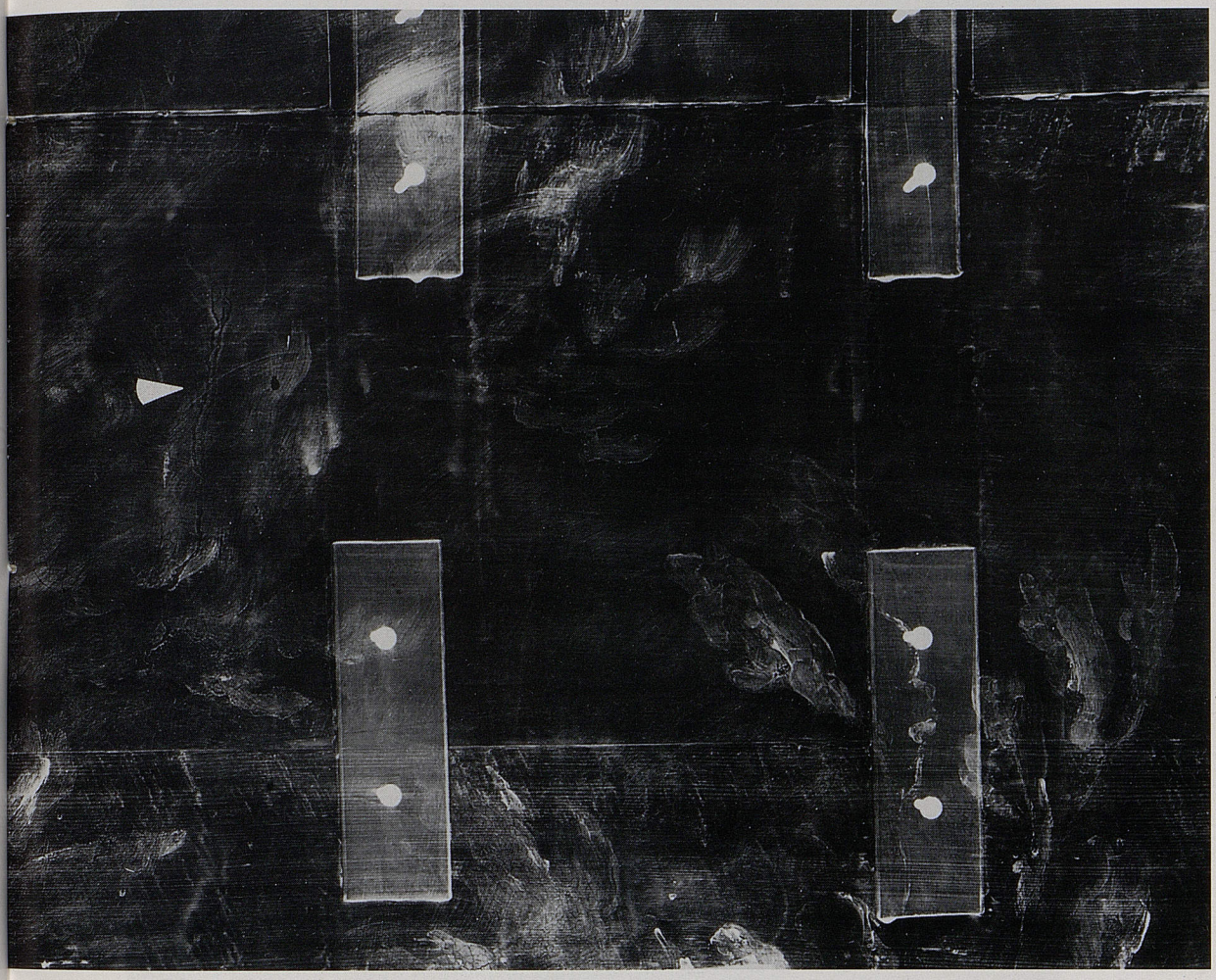
71. An X-radiographic detail of the loincloth showing clearly Rubens's rapidly applied brush strokes which have held their form during hardening of the thixotropic medium.

72. X-radiograph. The dramatic expression of Christ's face is heightened by a few strokes in the eyes and the mouth.





73. The thixotropic medium facilitates both the rendering of a very smooth surface in the contour of Saint Catherine's hand and the impasted highlights in the centre.



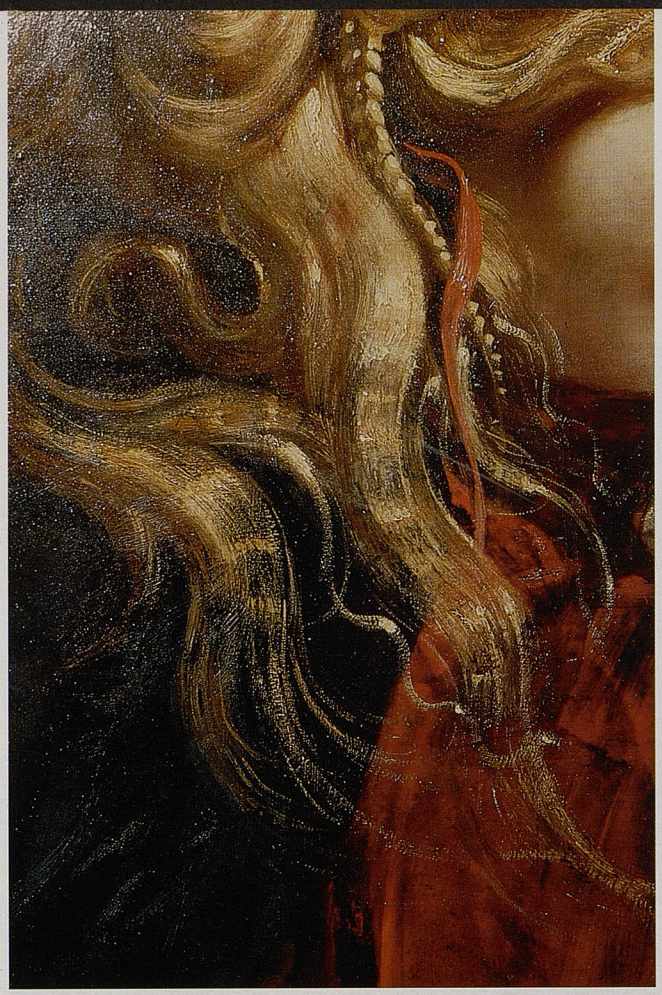
74. Long drips in the leaves of the central panel indicate the use of a heavy and creamy paste (X-radiograph).

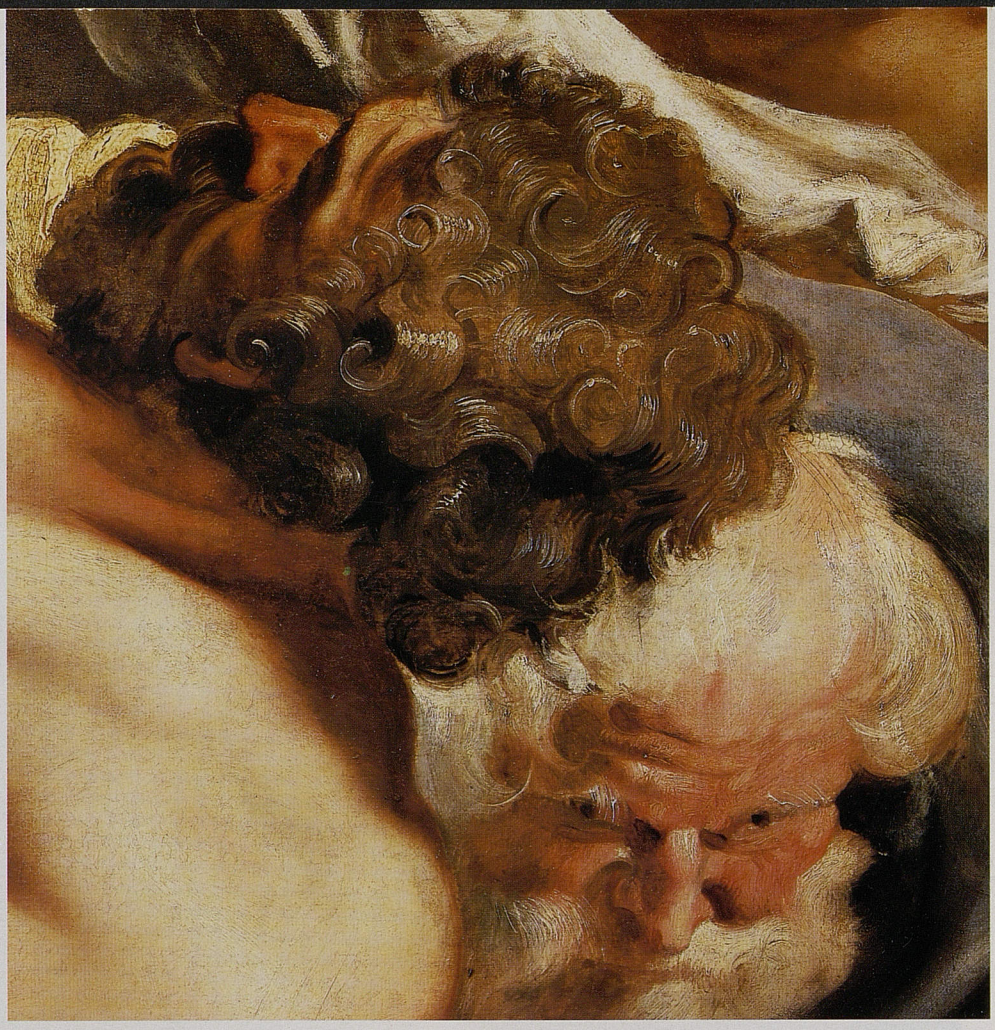
75. The red cloth was painted according to a classical technique, with a red glaze on an opaque underlayer (see cross-section No. 10).

76. The satin fabric of Saint Catherine's robe is rendered rapidly with a few highlights on a varied grey base.

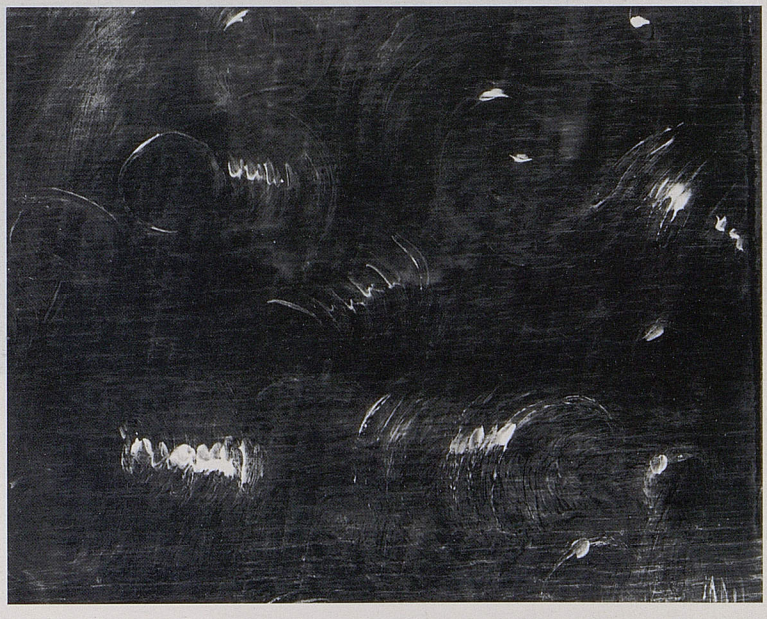
77. The laid and couching technique of the gold threads in Saint Amand's cope is rendered with remarkable realism.

78. With similar skill, Rubens renders the transparency of gems and the glittering of metal.





79. Rubens imaginatively differentiates between heads of hair from one figure to another.



80. Rubens is also a masterfully accomplished painter of animals.

81. Rubens's technique shows a wide range of painterly effects, from thin transparent glazes to thick empasto.

82. Above Christ's head, Rubens has left his finger-prints in the fresh paint, wether intentionally or not.

FROM THE ELEVATION OF THE CROSS TO THE DESCENT FROM THE CROSS

FRANS BAUDOUIN, LILIANE MASSCHELEIN-KLEINER, LEOPOLD KOCKAERT and MARINA VAN BOS

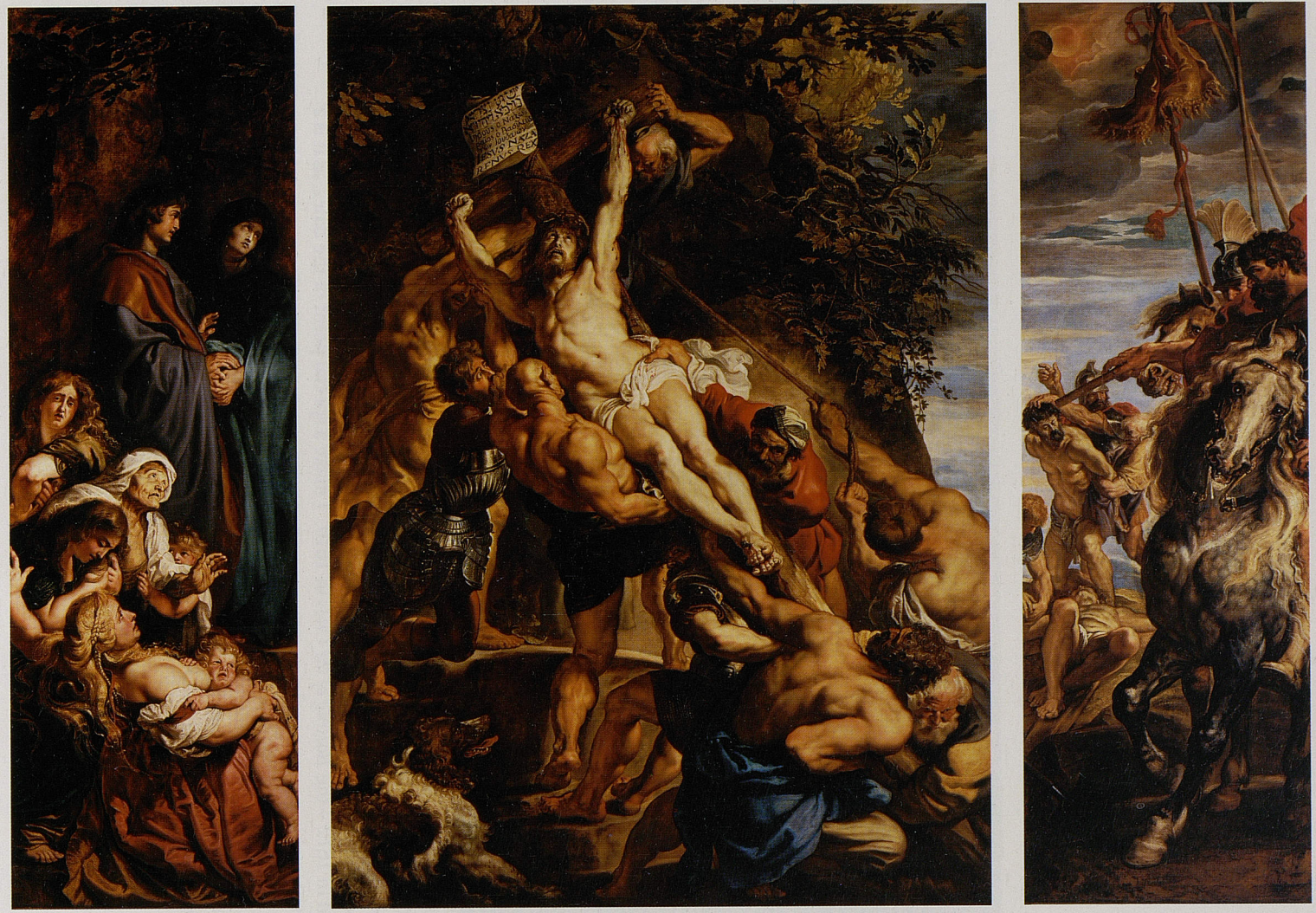
A COMPARISON OF STYLES

"It is three o' clock ; the high belfry has just struck the hour. The church is empty. The little noise made by the sacristan is hardly audible in the naves... Some German copiers have set up their easels in front of the *Descent from the Cross* ; there is no one in front of the *Raising of the Cross.* This fact alone explains well enough what is the world's opinion about these two works".

This is how painter and writer Eugène Fromentin begins his explanation of the difference in style between the two huge triptychs in Antwerp cathedral, in his book *Les Maîtres d'autrefois* [1]. This excellent text on Flemish and Dutch painting was first published in 1877, and over the years it has become a classic in the literature of art criticism. He goes on to say that "the two triptychs are greatly admired, almost without exception, and this is rare with Rubens, but the admiration is not equally divided between them. Fame has chosen the *Descent from the Cross.* The *Raising of the Cross* had had the power of moving more deeply the passionate or more convinced friends of Rubens. Nothing, in truth, can be slighter than the resemblance between these two works, conceived within two years of each other, inspired by the same effort of genius, and which nevertheless bear the impression of two very opposed tendencies. The *Descent from the Cross* was painted in 1612 – the *Raising of the Cross* in 1610. I make a special point of the dates, as it is a matter of importance ...".

Indeed, as we will see below, these dates are important because they mark the evolution of the artist's style which became apparent during the short lapse of time which separates the *Descent from the Cross* from the *Elevation of the Cross.*

[1] From *The Masters of Past Time* by Eugène Fromentin, translated by Andrew Boyle, London-New York, 1913, quoted by J.R. MARTIN, *Rubens : The Antwerp Altarpieces. The Raising of the Cross and The Descent from the Cross* (Norton Critical Studies in Art History), New York, 1969, p. 81.



83. P.P. Rubens, triptych of the *Elevation of the Cross*, 1610-1611. Antwerp, Cathedral of Our Lady.

84. P.P. Rubens, triptych of the *Descent from the Cross*, 1612-1614. Antwerp, Cathedral of Our Lady.

However, before examining this in further detail, we should be aware that there are essential differences between the two triptychs in terms of subject matter, which obviously also influenced the style of these works in different ways. First, it should be noted that while only a single subject is represented in the *Elevation of the Cross* (Fig. 83), spread across the entire surface of the open triptych, three distinct themes are depicted on each of the three panels of the *Descent.*

And yet it is possible to discern a relationship between the content of the subjects on the three panels of the *Descent from the Cross* (Fig. 84). Eighteenth century publications already pointed out that each of the three scenes was based on the name of the patron saint of the Arquebusiers' Guild, the body which commissioned Rubens to paint this triptych. This patron saint was Saint Christopher, whose name means "the bearer of Christ" in Greek. As Rubens did in fact depict "bearers of Christ" on the front of the panels of both triptychs, there is an inherent unity in the content of the whole work. The centre panel shows the holy women and the disciples, who are receiving Christ's dead body as it is carefully taken down from the Cross. On the left wing, Mary is the main figure : she is bearing Jesus in her womb during her visit to her cousin Elizabeth. On the right, we see Simeon, the High Priest, who holds in his arms the Child handed to him by Mary at the Presentation in the Temple : he too is a "bearer of Christ".

Nevertheless, despite this inherent unity of content, it is evident that three separate and clearly distinct scenes were depicted here, instead of just one, as in the *Elevation of the Cross.* From the outset it was clear that this would lead to stylistic differences.

At the same time, it should obviously be taken into account that the centre panels of the two triptychs depict two different episodes from the Passion. One of the triptychs depicts the events which occurred when the Cross was raised ; the second portrays the descent of Jesus's dead body and the sorrow felt by His followers as they respectfully take Him down from the Cross. It is obvious that this difference in subject matter could result in a difference in style, and this is clearly manifest here. Nevertheless, the significance of the subject *per se* should be seen to some extent in relative terms, for like some of his Italian and Spanish predecessors or contemporaries, Rubens could have opted for depicting the descent from the Cross with pathos or lachrymation. By contrast, he chose a more restrained representation, possibly following the tradition of the Early Netherlandish school, though at the same time the composition takes account of certain Italian examples. The *subject matter* itself is an important fact at the outset, but obviously it can be depicted in different ways : the *manner,* the spirit in which the subject is treated and which determines the form, is equally essential.

Continuing the analysis, and beginning by restricting ourselves further to a comparison of the centre panels of the two triptychs, a more pronounced coherence can be noted immediately as regards the composition in the *Descent from the Cross.* The figures are effectively grouped together, as if in an imaginary oval which, along a slight diagonal, extends from the bottom left to the top right and back down. The figure of Christ forms the centre of the composition developed within this schema. His left arm, shoulders and right upper arm form the diagonal, emphasized by the hanging white shroud,

[2] C. WHITE, *Peter Paul Rubens, Man and Artist,* New Haven-London, 1987, p. 98.

around which the other figures are grouped in a unified scene. There is a second diagonal in the central panel of the *Elevation of the Cross* – but set in the opposite direction. This suggests a sense of depth, just as the light blue sky to the right of the rocky background, and extending to the right wing, creates a feeling of space. This is completely lacking in the central panel of the *Descent from the Cross*, in which the composition of the figures is more suggestive of a relief outlined against a neutral dark background. It is only in the bottom left corner that we see a few wisps of sky which barely manage to indicate the last moments of a sunset, without giving much suggestion of depth. Like the body of Christ and the snow-white shroud, the faces of the figures surrounding Him are illuminated by a glow of light which seems to shine on them like a gentle caress. Apart from this, the figures are largely swallowed up by the darkness which continues to the sides of the panel. In this way the centre composition is isolated from the two side panels, which both have a bright background, in an efficient, but not over-emphatic way. The bright areas form a contrast with the dark background of the scene in the centre of the triptych.

However, despite the fact that each panel depicts a distinct scene, it is possible to identify a unity in the composition of the two wings and the central panel in the *Descent from the Cross*. For example, the diagonal which we saw in the central panel appears to be contrasted by a second diagonal in the right wing (though this runs in the opposite direction) starting at the bottom right under the sole of the foot of the kneeling figure of Saint Joseph, and ending on the left above the man shown in profile facing to the right (Nicolaas Rockox) on the left edge of the panel. While the figures seem to be grouped in this scene within a slightly triangular scheme in the bottom half of the panel, they were placed high up at the top of a flight of steps in the left wing. In this way a certain balance was achieved between the two wings, as well as a harmonious relationship with the central panel.

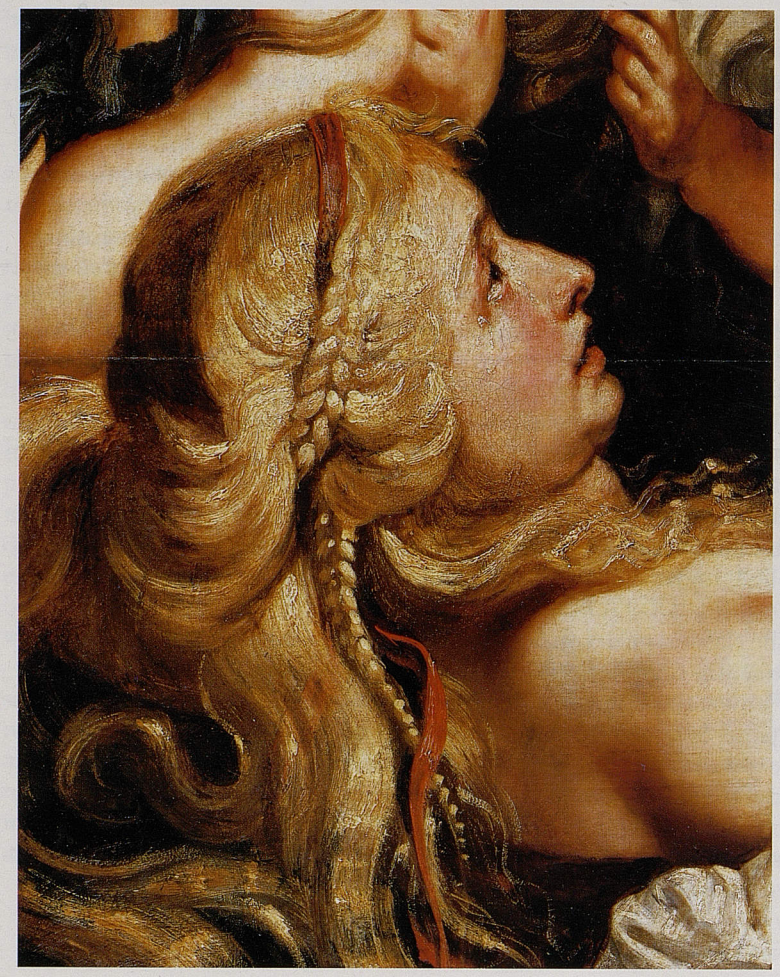
While the figures are placed against a neutral, virtually flat background in the central panel, as though they are shown in relief, there is a suggestion of space behind the figures on the wings. At the bottom of the left wing there is even a view of a landscape stretching to the horizon, seen under the arch of the staircase. It should be noted that the horizontal strokes of light appearing above this view, as well as the bright edges surrounding the clouds in the top half of the scene, are balanced in the composition of the right wing by the light under the vaulted arches of the temple, where Simeon is officiating.

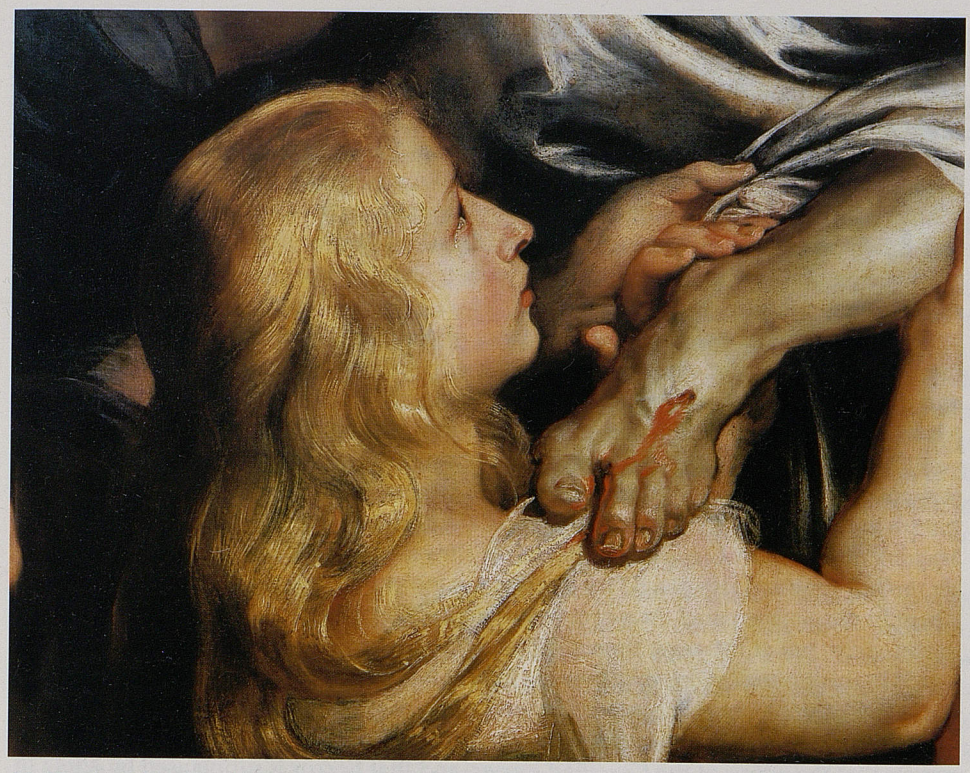
Furthermore, the classical pillars on both panels serve as a powerful support and (partial) frame for the centre composition within the triptych as a whole. C. White correctly describes this as "a pictorial buttress to the central scene" [2]. A clear interrelationship with the central panel is also achieved by the way in which the figures are grouped, "moving" to the right towards Elizabeth and Zachariah on the left wing, and, on the right wing, towards the top left, starting with the kneeling figure of Saint Joseph looking upwards in the bottom right of the composition.

Continuing the comparison between the two triptychs in their totality, while leaving aside for a moment the pillars and other architectural features, it becomes clear that in the composition of the *Descent from the Cross*, Rubens adopted a similar approach to that used in the *Elevation of the Cross*. For example, while the heads of Mary and Saint John ap-

pear at approximately the same level on the left wing as that of Christ in the central panel (in fact, slightly higher), this is also the case for Mary and the other figures standing on the steps outside the house of Elizabeth in the corresponding wing. The similarity of the composition of the two triptychs reveals itself most clearly if we reverse the right wing of the *Descent from the Cross* and then compare it with the left wing of the *Elevation* (Fig. 85). It immediately becomes clear how the figures are grouped in an analogous fashion within an imaginary triangle. Furthermore, parallels can also be found between the vertical line of the standing figures of Mary and John and the rock behind them in the left wing of the *Elevation of the Cross*, and the pillars and columns in the right wing of the *Descent*. Another element which clearly reveals the interrelationship between the two

85. Head of a woman on the left wing of the *Elevation of the Cross*.





86. Head of Mary Magdalen on the central panel of the *Descent from the Cross.*

large triptychs is the fact that Saint John, who is stretching out his arms to receive the body of Christ in the central panel of the *Descent from the Cross,* is the mirror image of the powerful, muscular executioner trying to erect the Cross – again using both arms – in the middle of the *Elevation of the Cross.* Only the position of the legs has been slightly changed, and the face of Saint John is now turned slightly towards the observer. He is clothed as well so that his powerful musculature is now indiscernible.

The two triptychs also have in common the central positioning of the body of Christ. Although the body itself is passive, it is depicted at a transitory moment, though in different ways : in the *Elevation of the Cross* it is nailed to the Cross, which is being pushed and hoisted up with tremendous effort, while in the *Descent* it is being carefully lowered from the Cross. However, there is a striking difference between the two representations as regards colour. In the *Elevation of the Cross* Jesus is still alive and is shown with open eyes, looking up towards heaven – there is a suggestion of ivory in the colour of His skin. In contrast, the body in the *Descent* has a greyish, almost bluish hue, the deathly pale coloration of a corpse.

However, there are other striking differences between the two altarpieces. The vehemence with which Rubens depicted this episode from the Passion is characteristic of the *Elevation of the Cross*, giving an impression that some of the violently gesticulating figures could almost break away from the painted surface, as they approach the observer. Examples are the woman leaning backwards, her fair hair hanging down, at the front of the left wing, the executioner with his back to the observer in the bottom right of the central panel, who is trying with all his strength to raise up the Cross with the other men, and finally the horse on the right, whose impatient hooves seem to suggest that the rider, a Roman centurion, has managed to restrain its forward movement and make it stand still but for only a moment.

In the *Descent from the Cross* there is no trace of this dynamic forward movement and of these unstable gestures and attitudes on the edge of the optical space of the painting and the space in front of it, where the observer stands. The three separate scenes in this triptych each seem to be situated in a defined space *behind* the painted surface. A quiet equilibrium is achieved here because the figures on the side panels are placed in the same plane as the figures in the central panel. For example, the kneeling figure of Saint Joseph at the front of the right wing occupies the same restricted shallow space as Mary Magdalene and Mary Cleophas on the left of the central panel. The figures on the steps on the left wing are also placed on the same plane as the group of figures surrounding Christ in the central panel. As we remarked above, there is a greater suggestion of depth in the wings, but at the same time it should be noted that the figures are only partly inserted in this space. Rather, they move *in front* of it, almost like silhouettes. Furthermore, the effect of depth in this space is also neutralized by the sturdy pillars and columns. Comparing this with the *Elevation of the Cross*, J.R. Martin correctly observes : "It is not merely that the agony of the Crucified is over, and that horror is supplanted by grief : in addition, the suppression of receding diagonals and the consolidation of the figures into a composition lying essentially on one plane give to this work the quality of discipline that may be properly called Classical" [3].

So far, we have been almost exclusively concerned with the composition of the two triptychs. Obviously the qualities of the drawing, the colours and the light and dark effects are equally important.

It is striking that in the *Elevation of the Cross* linear qualities play a dominating role, and are more manifest than in the *Descent*, in which more importance is attached to colouring as a means of expression. In the former triptych the outlines of the limbs and garments are clearly visible. They were drawn with a brush, which was also used to reveal the plasticity of the musculature and the curving lines of the torsos by emphasizing areas of shadow in a similar way to the parts in wash of a drawing in ink. As a result, every figure is strongly outlined in comparison with the others and with the background in which it is incorporated, appearing as a clearly individualised entity, which is nevertheless assimilated in the totality of the composition in a coherent fashion.

[3] MARTIN, *op. cit*, p. 48.

The plasticity of the musculature is less evident in the *Descent from the Cross*. With the exception of the left side of Christ's body, the contours and areas of shadow cannot for the most part be perceived so directly. In this case it is above all the different large areas of colour which immediately attract the eye. Undoubtedly these large areas are indicated by contours drawn in advance, which, however, did not remain visible, as they were wiped out when the outlined areas were "filled in" with colour. In some cases the figures wearing dark garments in the central panel are even difficult to distinguish from the dark background.

The above-mentioned coloured fields are in this work certainly more striking than the plastic qualities. They are spread across the three panels in a balanced way ; for example, there is the deep, saturated red of Saint John's garment in the centre, which is repeated in a virtually identical way on the left wing in Mary's outer cloak, and in the right wing in the bottom half of Simeon's robe. There is also Mary's dark blue garment in the central panel, which is repeated with subtle differences in the shade in the left wing in Mary's garment and the bodice of the serving girl next to her, and again in the figure of Mary in the right wing. (Incidentally, it should be noted that Mary plays an important role in each of the three scenes of Jesus's childhood and Passion.)

It is clear that Rubens's style in the *Elevation of the Cross*, is characterized by a stronger pictorial aspect : local colours dominate. However, in the central panel there are several other colours, such as the indeterminate violet of Mary Cleophas's robe at the bottom left and of the garment of the man on the right, standing on the ladder facing forward, the dull, almost olive green garment of Mary Magdalene in addition to a few reddish tones in various places, which are typical for Rubens's style during the early years in Antwerp after his return from Italy in 1608. These colour gradations are not exactly the same in the *Elevation of the Cross*, though they do appear in a number of other works dating from approximately the same period, such as, for example, *Samson and Delilah* in the National Gallery in London, the large *Adoration of the Magi* in the Prado in Madrid, *Lot and his Daughters* in Schwerin, and others.

These dull, rather undefined colours are not found in the side panels of the *Descent from the Cross*. On the contrary, this work radiates a bright, almost golden luminosity, manifesting a more powerful coloration. Perhaps this difference can be explained by the fact that the side panels were completed about eighteen months (in February/March 1614) after the central panel (in September 1612). During this rather short lapse of time, an evolution occurred in Rubens's palette and in his style in general. It should be noted that in the central panel of the *Elevation of the Cross*, this new stylistic phase is already announced, as here new characteristics appear together with "older" ones. Only in the wings is this new phase fully developed. Fromentin was certainly right when he observed that these dates are "a matter of importance".

Differences between the two large triptychs can be discerned not only in the composition, in the way the figures are grouped in an interrelated unity but also in the coloration and in the use of the brush. This can be observed most clearly by comparing the style of painting of the hair of the woman leaning backwards in the front left of the *Elevation of the Cross* with the elegant coiffure of Mary Magdalene in the central panel of the *Descent* (Fig. 86-87). The fair hair of the two women is equally luxuriant, but in the

Elevation of the Cross, Rubens depicted the loose braids of hair cascading in elegant tresses with a baroque flourish and in certain places added small, glowing highlights. Mary Magdalene's hair is equally elegant, but seems to have a more delicate structure. It is closer, more downy, and marked by a softer luminosity. In other words, it is painted with a more restrained use of the brush.

To summarise, it is right to advance that in contrast with the vehemence, the *Sturm und Drang* which characterized Rubens's art in Antwerp during the first few years after his return from Italy, of which the *Elevation of the Cross* was a good example, the quiet, balanced composition and the controlled gestures and expressions are the most striking characteristics of the *Descent from the Cross*. In the former work some of the figures at the front seem to move on the boundary of the painting and break free from the surface, while those in the latter work are all situated within the space of the painting in the same plane, which is not far from the edge of the panels.

However, though the two altarpieces are strikingly different in terms of style, they nevertheless share a number of common features : the structure of the composition by means of implied diagonals, the grouping of certain figures within a triangular schema of composition, and more generally, the harmonious "geometric" interaction of all the components in a coherent unity.

We have established that while the figures acquire a sculptural appearance in the *Elevation of the Cross* through an emphasis on line, unlike the figures in the *Descent*, where the forms are articulated through colour. The local coloration in the *Descent*, distributed across the whole surface of this triptych in large fields in a balanced way, to a large extent determines the controlled harmony which radiates from this work. The quiet brushwork also helps to contribute to the "classical" balance achieved in this painting, thus heralding a new stage in Rubens's artistic development. However, this was by no means the final stage in the exploration of his artistic possibilities. In fact, it was characteristic of Rubens that his style gradually continued to evolve right up to shortly before his death in 1640, almost thirty years after he completed the *Elevation of the Cross*.

F.B.

THE COLOURS

Peter Paul Rubens painted his *Elevation of the Cross* between 1610 and 1611 and his *Descent from the Cross* between 1612 and 1614. Identification of the pigments shows that there are hardly any differences in the palettes used. On the other hand, a comparison of the effects of the colours employed in the two triptychs reveals a refinement of Rubens's chromatic expression and a remarkable development in his command of colour.

Obviously, the colours which Rubens used translate, more than anything else, his artistic sensitivity – if not sensuality – but this does not exclude the desire to perfect his expression of these sensations. Certainly the painter was concerned to understand the

87. The left wing of the *Elevation of the Cross* compared with the right wing of the *Descent from the Cross* in mirror view.

visual effect of colours. He is purported to have written a work *De Lumine et Colore*, unfortunately no longer extant, on this subject [4]. We can hypothesize as to the contents of this treatise by studying C. Parkhurst's works on the theory of colour in the first decade of the 17th century. One and the same theory seems to have been in particular vogue at this time, at Antwerp (François d'Aguilon), Prague (Anselm de Boodt) and Paris (Louis Savot). According to this theory, every colour can be obtained by mixing the three "primary" colours, yellow, red and blue. The two-colour mixtures give the three "secondary" colours, orange, green and purple. White represents the maximum degree of lightness and black the maximum degree of darkness.

Rubens is said to have illustrated these principles in a painting, *Juno and Argus* dating from 1611 and currently hanging at the Wallraf-Richartz Museum in Cologne. Juno dominates the scene in a splendid red garment, Iris is clothed in a blue robe, whilst Juno's cloak and the chariot provide the yellow component. The three primary and three secondary colours are repeated, with lesser intensity, in the rainbow. The white is present in the highlights of the garments and the sky, whilst black forms the basis for the darkest shadows.

At the present time, visual perception is explained by the conjugated working of the eyes and the brain which affords an integrated interpretation of form, colour and motion.

The retina of human eyes contains two kinds of photosensitive receptors, the rods (about 120 million) which are more numerous at the periphery and the cones (about 6 million) which are concentrated at the centre called the *fovea centralis.*

Visual pigments are embedded in the membranes of the outer segment of these receptors. In the rods, the visual pigment, rhodopsin, consists of retinene 1, the aldehyde of vitamin A1 linked to a protein, the scotopsine. It absorbs the visible light with a maximum absorption at 500 nm.

Three slightly different pigments containing other proteins, the photopsines, have been found in the cones of the human retina, each cone containing only one pigment. The maximum absorptions are located in the short wave-lengths at about 450 (blue), the middle ones 540 (green) and the long ones 575 (orange) nm.

It is generally accepted that the rods are highly sensitive to light/dark contrasts and that the cones are responsible for the perception of colour.

The absorption of light promotes first the isomerisation and second, the decomposition of rhodopsin. This leads presumably to a change in the calcium conductance of the membranes. Ionic charges appear and promote the generation of a stimulus towards the brain.

The decomposed pigments are continuously resynthetized and a "membrane pump" returns the calcium to the interior of the membranes. Under steady illumination an equilibrium is reached between the decay and the reassembling of the pigment. The reaction balance influences the light/dark adaptation. As the level of illumination decreases, the concentration of visual pigments increases.

[4] H. VON SONNENBURG, *Rubens' Bildaufbau und Technik*, II. *Farbe und Auftragstechnik*, in *Maltechnik Restauro*, 85, 1979, p. 194 and 201, n. 23.

Thanks to their peculiar visual pigment, the three kinds of cones detect the blue, the green and the red (additive primaries). By combination, they will also differentiate other colours : yellow light stimulates red and green cones in an equivalent way. On the other hand, orange light excites the red cones one and a half times more than the green cones.

The message of the cones is sent to nerve cells, the ganglion cells. Those cells present some overlapping of their reception fields which means that the colour vision of each small area in the visual field of the eyes is influenced by the surrounding areas.

The painter can accentuate the static or dynamic character of the shapes by seeking chromatic interactions or oppositions. As Frans Baudouin points out, a new element appears in Rubens's painting following his return from Italy : "an enormous dynamism which had not yet manifested itself in Rubens's art and which gives it a new dimension" [5]. This powerful movement is obtained not only by the shapes but also by the contrast in the colours, as is demonstrated by an observation of the two triptychs.

Our analysis distinguishes between *simultaneous colour contrasts, successive contrasts, cold-warm contrasts* and *light-dark contrasts.*

Simultaneous contrast exists because the response to input at a given place on the retina depends on the illumination of its surrounding. This makes it possible to modify the saturation and luminosity of two juxtaposed colours. When two surfaces of the same colour, but with different saturation, are placed side by side, the more saturated one will make the other one appear "more white-washed".

On the right wing of his *Descent from the Cross*, Rubens juxtaposes two blues with differing saturation levels. This contrast has the effect of projecting towards us the kneeling figure of Saint Joseph in the foreground, giving the scene its special depth (Fig. 89). Similarly, two reds of different saturation are used in the left wing for the two parts of the Virgin's robe, the lighter very "unsaturated" area highlighting the roundness of her pregnancy (Fig. 88).

On the left wing of the *Elevation of the Cross*, the yellowish blue of the Virgin's mantle sets off the more violet blue of Saint John's garment. This same contrast is repeated in the *Descent from the Cross* between the Virgin's mantle and the violet-coloured robe of the holy Woman kneeling in the foreground.

The spatial proximity of the two complementary colours accentuates their saturation. The red-green contrast is present in the central panel of the *Descent from the Cross.* Mary Magdalene's green robe highlights the red saturation in Saint John's garment.

When the spectator looks for a longer time at a brightly coloured area, the corresponding visual pigments in the rods and the cones are decomposed. The retina preserves a remanent image which is inverted in terms of both colour and luminosity. This image will then influence the perception of the following image : this is the so-called *successive contrasts* phenomenon. If we concentrate our gaze on a red-coloured area for 10

[5] F. BAUDOUIN, *L'Erection de la Croix de Pierre Paul Rubens,* in *L'Erection de la Croix. Pierre Paul Rubens,* Brussels, 1992, p. 92.

88. Detail of the Visitation on the left wing of the *Descent from the Cross.*

to 30 seconds, the long-wave sensitive pigments in the cones react, and their sensitivity decreases. On the other hand, the cones containing the pigments sensitive to the short- and middle-wavelenghts colours, blue and green, remain inactive, at rest. They will react more strongly to light reflected from a white background which sends back light of all wavelengths. The eye will perceive a remanent greenish-blue "after-image". In the *Descent from the Cross*, the bright red of Saint John's garment accentuates the cadaverous colour of Christ's body. In the *Elevation of the Cross*, we also find a red area close to Christ's flesh, but not sufficiently striking to provoke a remanence effect.

The *cold-hot contrast* is better known. This a very subjective concept, but takes the form of very real reactions by our body. Red provokes vasoconstriction, changes in blood pressure, an acceleration of the pulse rate and the speed of breathing. Blue, on the other hand, has a calming effect on the circulatory and nervous systems. Obviously, we generally associate red and yellow with the incandescent colours of fire, whilst blue and green evoke the freshness and purity of water. Other senses, in particular hearing and taste, can also be excited by colours : we have noisy and discordant, silent and recollected colours ; we also have acid and "sugary" colours.

The left wing of the *Elevation of the Cross* is a good example of this type of contrast. The foreground is taken up by a noisy group of lamenting women and children. The warm colours of the young woman's hair and robe, her bright skin tints and those of her child predominate. This is in masterly contrast to the cold and recollected colours of the group consisting of the Virgin and Saint John. The dispersed areas of saturated blues and reds express movement, bustle and noise. Contrarily, Rubens goes on to use this same type of contrast to accentuate, in his *Descent from the Cross* the convergence of attention towards Christ's body. The red of Saint John's garment and the warm skin tints and hair of the two young women are in tragic opposition to the diagonal of cold colours forming the winding cloth, Christ's body and the Virgin's blue mantle. The colours boost the effect of concentration, recollection, silence.

89. The Presentation to the Temple on the right wing of the *Descent from the Cross.*

Finally, the *light-dark contrast* is undoubtedly the most easily perceived. It distributes the light on the picture, but also contributes powerfully to the spatial definition of volumes, shapes and planes. In the *Elevation of the Cross* Christ's body irradiates light, which bursts out throughout the whole triptych, magnifying the power and the athletic shape of the bare torsos, splashing the metal of the soldier's breast plate, lighting up the faces of the weeping women, the Virgin and Saint John, and giving a shimmering effect to the horse's trappings and eye reflections. In the *Descent from the Cross*, on the other hand, the light-dark contrast accentuates the dramatic concentration towards the bright stream of light which crosses the whole central panel. In both triptychs, the luminosity of the sky contributes to giving a sensation of space.

The cold-hot and light-dark contrasts are also used to create the sensation of distance. If one looks out over the countryside, the distant planes acquire a bluish tint due to the fact that the rays reflected by the distant objects lose their high wave length component (red, yellow) by absorption during their long journey through the air and mist. More generally, cold colours always appear more distant than warm colours. The red and yellow robe of the young mother in the left hand panel of the *Elevation of the Cross* literally projects the figure outside the picture, whilst the cold blue and mauve of the Virgin's and Saint John's garments accentuate the distance of the plane which they occupy in the composition. In the *Descent from the Cross*, the violet blue colour of Nicodemus's garment pushes him into the background compared with Saint John, who is dressed in red.

By way of conclusion, all these observations lead us to a sense of admiration and respect for Rubens's extraordinary genius as a colourist. Without possessing present day theoretical knowledge – still very partial – he demonstrates an extraordinary mastery and virtuosity in the use of chromatic contrasts. Only great artists are privileged to remain an inexhaustible source of enchantment for everyone seeking to understand the genesis and beauty of their work.

L. M.-K.

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THE PAINT LAYERS OF THE DESCENT FROM THE CROSS

A reexamination of several cross-sections from the *Descent from the Cross* raises several interesting points.

The oily *imprimitura* of the wings looks beige in colour and can only be distinguished from the chalk ground which it impregnates by the presence of a few white and black particles. This suggests that the *imprimitura* is rich in chalk and low in lead white. The *imprimitura* on the central panel is whiter than in the wings. This does not necessarily mean that Rubens did not paint the wings himself. Possibly he just wanted warmer and less brilliant colours in the wings.

In their earlier analysis, Coremans and Thissen [1] considered some paint layers as non-original, merely because they were situated on layers with the appearance of varnish. However, current research shows that such repainting is very common with Rubens and that these areas should be taken as *pentimenti* or accentuations rather than overpaint. Rubens's constructions are not always straightforward.

The fact that no brown glazes were identified in the earlier analysis of the flesh tones in the *Descent from the Cross* can be explained by the sampling being limited to the lighter areas.

The dye of the red glazes in the *Descent from the Cross* was described as madder by Coremans and Thissen. Evidently this label should be taken in the broader sense of "red lake", since no analytical work was performed.

Similarly, in the earlier research, the identification of indigo was only based on microscopic examination and microchemical tests so that indigo might be confused with Prussian blue. Our own determination of indigo is also based on microchemistry, but is confirmed by the microprobe. Prussian blue and indigo can be distinguished by the microprobe which can detect the iron content in Prussian blue.

For the black pigments, bone or ivory black were generally mentioned in the *Descent from the Cross*. We think these labels should be taken as synonyms for "charcoal". Indeed, the reexamination of some samples from the *Descent from the Cross* showed that they contain charred wood particles, as found in all the other Rubens' paintings we examined.

Concerning the earlier characterisation of green layers, the label "malachite" ought to be taken in the sense of "copper green" as there is not sufficient supporting analytical evidence. If some malachite was genuinely present in their samples, it probably did not exceed a few grains. Malachite is often present in the azurite as a natural component.

Taking the above remarks into account, the painting technique of both altarpieces corresponds reasonably well and also to the painting technique described extensively by H. von Sonnenburg [2]. In some cases, the stratigraphy is more complex in the *Elevation of*

[1] P. COREMANS and J. THISSEN, *La Descente de Croix de Rubens. Composition et structure des couches originales*, in *Bulletin de l'IRPA/van het KIK*, V, 1962, p. 119-127. See also A. and P. PHILIPPOT, *La Descente de Croix de Rubens. Technique picturale et traitement*, *Ibidem*, VI, 1963, p. 7-32.

[2] H. VON SONNENBURG, *Rubens' Bildaufbau und Technik*, in *Maltechnik-Restauro*, 85, 1979, p. 77-100 and 181-203.

the Cross, owing to the presence of several *pentimenti*. On the other hand, some typical constructions such as sky blues on a pinkish ground tone are found in both altarpieces. It is likely that Rubens used smalt more frequently in the *Descent from the Cross*, as it is often identified in its central panel.

The binding medium of the *Descent from the Cross* was found to be oily by Coremans and Thissen. Our recent analysis of the *Elevation of the Cross* reached a similar conclusion. However, recent staining tests show that the impasted light tones in both paintings, such as the flesh tones in women, contain a similar oil-protein emulsion.

Thus, the essence of Rubens's painting technique of both altarpieces can be typified as an intensely personal synthesis of both the Flemish tradition of the fifteenth century, with its modelling in glazing oily deep colours on a generally light coloured ground tone, and on the other hand the subtle blending of brilliant and diversified pigments in a typical *alla prima* technique, using fat emulsions in the always light toned impasto.

L.K.

THE BINDING MEDIA OF THE DESCENT FROM THE CROSS

As with Rubens's *Elevation of the Cross*, the binding media were analysed by gas chromatography combined with mass-spectrometry.

The experimental part is described in detail in the chapter *Materials and Techniques*.

RESULTS AND DISCUSSION

Central Panel

Dark red dress (P52/32)
The chromatogram shows the peaks typical for oils : the methylesters of azelaic, palmitic and stearic acid. The ratio of palmitic to stearic acid equals 4.2. This high P/S ratio can be interpreted as poppyseed oil or as a mixture of drying oil and egg-fat (1,2).
In the diterpenoid region of the chromatogram, Δ 5-methyldehydroabietate, methyldehydroabietate and methyl 7-oxodehydroabietate were identified. The presence of these compounds often indicates the original presence of pine resin (3).
Some hydrocarbons were identified as well, possibly residues of a consolidation material.

Light red dress (P52/33)
The chromatogram shows the typical oil components : methylazelate, palmitate and stearate.
The palmitic/stearic acid ratio of 3.4 suggests the use of walnut oil.
Some traces of pine resin were identified : Δ 5-methyldehydroabietate, methyldehydroabietate and methyl 7-oxodehydroabietate.

Light brown dress (P52/46)
Only the varnish layer is analysed. Identified compounds are : Δ 5-methyldehydroabietate and methyl-7-oxodehydroabietate indicating a pine resin.

Dark brown (P52/47)
The chromatogram shows the presence of palmitic and stearic acid and only a small proportion of azelaic acid relative to palmitic acid. This suggests that some egg-fats may have been added to the drying oil medium.
Identification of the oil on the palmitic/stearic acid ratio is not possible in these cases.
Once again pine resin is identified by the presence of Δ 5-methyl-dehydroabietate and methyl-7-oxodehydroabietate.

Dark brown (P52/ 48)
A combination of oil (palmitic/stearic acid ratio = 3, walnut oil) and pine resin was identified.
No hopane components could be identified in the chromatogram (4).

Dark brown (P52/53)
The presence of walnut oil (palmitic/stearic acid ratio = 3) in combination with pine resin was identified for this sample.

White sheet with underdrawing (P52/100)
Different amino acids were identified in the resulting chromatogram.
Hydroxyproline is present in considerable amounts, proline and glycine are present in equal amounts while the quantity of leucine is about one fifth of that of proline. This leads to the identification of animal glue (5).

Flesh tone of hand (P53/1)
Methylazelate, palmitate and stearate are identified with a palmitic/stearic acid ratio of 4.7.
As it is known that flesh tones are often painted using emulsions (6), the high P/S ratio might be explained by a mixture of egg-yolk and drying oil.

Dark blue (P53/8)
The resulting chromatogram shows the peaks indicative for oils with a palmitic/stearic acid ratio of 2.3.
Linseed oil and walnut oil overlap in the region 2.1 – 2.3 (2).

Hair (P53/12)
The chromatogram shows a small proportion of methylazelate next to larger amounts of methylpalmitate and methylstearate, possibly indicating a mixture of egg-yolk and drying oil.
Pine resin was also identified.

Right Wing

Whitish architecture (P52/95)
Different carboxylic acids were identified with 12, 14 and 20 carbon atoms, possibly indicating some wax (7).
Traces of pine resin were also detected.

Light grey (P53/74)
The resulting chromatogram confirms the use of walnut oil (palmitic/stearic acid ratio = 3.2).

Light brown (P53/76)
The chromatogram shows no peak corresponding to azelaic acid, while palmitic and stearic acid are present. This may indicat the presence of egg-yolk. Pine resin was also present.

Left Wing (Front Side)

Light yellow of the sky (P52/63)
For this sample, the presence of oil was found (palmitic/stearic acid ratio of 1.8 suggesting the use of linseed oil), together with pine resin and probably some wax (shown by the presence of C20 and C22 carboxylic acids).

Dark blue of the landscape on the background (P52/64)
Walnut oil (palmitic/stearic acid ratio = 3.5) was identified.

Brown, architecture (P52/66)
For this sample the proportion of azelate relative to palmitate was rather low, suggesting a combination of egg-yolk and drying oil.
Pine resin was also identified.

Dark blue sky (P52/96)
The resulting chromatogram shows only a small proportion of azelaic acid with larger amounts of palmitic acid and stearic acid : addition of egg-yolk to the drying oil medium ?
Pine resin was identified by the presence of methyldehydroabietate.
After derivatisation for protein identification, no amino acids could be detected.

Left Wing (Reverse Side)

Dark brown on the ground (P53/80)
The chromatogram reveals the presence of oil with a palmitic/stearic acid ratio of 4.

Flesh tone (P53/83)
As the proportion of azelaic acid relative to palmitic acid is low, these results suggest an admixture of egg-yolk and drying oil.

Dark brown on the ground (P55/96)
The chromatogram shows the presence of walnut oil (palmitic/stearic acid ratio of 3.6).

CONCLUSION

The samples analysed in this study were taken approximately thirty years ago thus long before the possibilties of modern analysis apparatus were known.

With the high sensitivity level of the GC-MS method, it is vital to take precautions against contamination of the samples. Even by touching glassware, fatty acids can very easily penetrate into the samples leading to misinterpretation of results.

With this reservation in mind some unanswered questions remain.

While the analysis results of Rubens's *Elevation of the Cross* generally suggests the use of walnut oil, no generalisations can be made on the interpretation of results for the *Descent from the Cross*. The palmitic/stearic acid ratios indicate linseed oil, walnut oil, poppyseed oil or a mixture of drying oil and egg-fats.

The animal glue found in one sample may originate from the ground layer as the samples often contained all the layers as required for stratigraphic studies.

The pine resin may be part of the binding medium or varnish layer.

M.V.B.

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