Centre for Conservation and Technical Studies
Fogg Art Museum
Harvard University

"MAN WITH A BEER KEG" ATTRIBUTED TO FRANS HALS
TECHNICAL EXAMINATION AND SOME ART HISTORICAL COMMENTARIES

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INDEX

ABSTRACT

The "Man with a Beer Keg" attributed to Frans Hals came to the Centre for Conservation and Technical Studies for technical examination, pigment analysis and restoration. A series of samples was taken and cross-sections were prepared. The pigments and the binding medium were identified and compared to the materials readily available in 17th century Holland. Black and white, infra-red and ultra-violet photographs as well as X-radiographs were taken and are discussed. The results of this study were compared to 17th c. materials and techniques and to the literature.

INTRODUCTION

The "Man with a Beer Keg" (oil on canvas 83cm x 66cm), painted around 1630 - 1633) appears in the literature in 1932.[1] It was discovered in London in 1930. It had been in private hands and was, at the time, celebrated as an example of an unsuspected and startling find of an old master. Its attribution to Frans Hals, however, has been questioned by scholars. The discussions so far have been conducted on the basis of art historical and stylistic rather than technical criteria.

The painting, which until then had been owned by an Irish family, was known as the "Smuggler". It was probably cleaned in 1935 [2] and after the removal of old varnish and dirt was considered to be in pristine condition. It was noted that the picture had a rich range of tints and that the luminous steely blue of the sky added a key note to the entire scheme. The picture is part of a comparatively small group among Hals' works. The landscapes in all of these paintings resemble those of Adriaen Brouwer, who studied in the early 20's with Hals. [3] The paintings consist of halflength portraits with moving and lively characters.[4] None of these genre paintings are dated. Valentiner puts these works around 1630 - 1635, a date upon which most scholars seem to agree.

The attribiution of the 'Man with a Beer Keg' to Frans Hals has been questioned. It is included in Slive's catalogue [5] but has been rejected by van Dantzig [6] and Grimm [7]. The latter attributes most of this group to a different hand. The anonymous genre painter is refered to as "the Master of the Fisher-children" (Meister der Fischerkinder), according to his most represented subject. Those paintings are, in his opinion, coherent in motive and similar in the way they

are painted.

Of the paintings attributed to Hals, 59 are on panel, three on copper and 157 on canvas.[8] In 77 of the paintings on canvas the measurement of 65 cm ($\pm$ 10%) was noticed by the author; this was probably a readily available (standard?) width of canvas. The above series of genre paintings fits well into this range of size.

FRANS HALS, HIS SCHOOL AND CIRCLE

Haarlem had been a home of painters since the beginning of the 15th century. Geertgen tot Sint Jans, Dirck Bouts, Jacob van Ruisdael, Herculas Seghers, Esaias van der Velde and his pupil Jan van Goyen all emerged from there.

Most of the historical data on Hals has been gathered by the Dutch historian Abraham Bredius, who based his works on research carried out in the archives and discovered very valuable documents of the time of Hals. According to the sources, the Hals family came originally from Mechelen in Flanders. It is from Arnold Houbraken that we gain a lively account of Hals' life although much has to be read with care as the information is not always factual. His work includes the descrip- tion of the lives of painters around that time. Most of Houbraken's account on Frans Hals originates from Vincent Laurens van der Vinne, one of the artist's pupils.

According to Houbraken, Hals' younger brother Dirck (who was espectially interested in painting genre scenes) one son from Hals' first marriage and three sons from his second marriage, his son-in-law Adriaen Brouwer, Philip Wouvermans, Vincent van der Vinne (he was a pupil around 1650) and Molenaer (Judith Leyster' husband), were at one point pupils of Frans Hals. Judith Leyster may be regarded as a follower of Hals' style for a brief period although she probably never was a pupil of the master [9,10]. Johannes Cornelis Vespronck and Pieter Fransz de Grebber are noted to have been influenced stylistically, and in a broader circle one should also include Jan de Bray as a follower of Hals. [11]

Frans Hals' first known painting dates from 1611 which makes it a

rather late start as an artist at the age of about thirty. Assuming his last work to be from 1664-66, this would mean a working period of fifty years or so. To determine the amount of surviving works is a difficult and confusing issue. The authenticity of many works is not clear as the paintings were tremendously popular in their time and often copied. Depending on which scholars one is consulting the range of authentic work will inevitably vary. The entries in catalogues on the artist range from 447 (Hoofstede de Groot) to 109 (Trivas). A range of 400% speaks for itself...

Major monographs and catalogues on Frans Hals:

1909 Moes who includes	275 paintings [12]
1910 Hofstede de Groot	447 [13]
1914 Bode	287 [14]
1923 W. R. Valentiner	290 [15]
1941 Trivas	109 [16]
1943 Gratama	120 [17]
1970 Slive	220 [18]
1972 Grimm	168 [19]
1974 Classici dell'Arte	344 [20]

An average work production per year would roughly be on the order of two to nine works. Judging from the sketchiness of so many of Hals' paintings, it appears that speed was an element throughout his career, and the low output of works per year does not correspond to what one might expect. We have to assume, and this can be proven too, that many paintings have been lost. Some etchings of works after Hals survive where the original no longer exists. More recently, works were lost during World War II. During the 1630's Frans Hals enjoyed an extraordinary popularity. During this decade, 70 paintings are known to have been executed, excluding the large company paintings. In the year 1635 alone he produced 25 works. This reflects, as Valentiner points out,

the popularity of portaiture in Holland around this time. Twenty-seven paintings are known from the 1620's, 44 paintings from the 1640's and 30 works from the 1650's.[21]

WRITINGS OF CAREL VAN MANDER

Around 1596, when Hals was 15 or 16 years old, he was noted as a pupil of Karel van Mander, the great historian, poet and painter and northern "Vasari". Although van Mander makes no remark of his gifted pupil, his biographer Gerbrandt Adriaensz. Breederoos mentions this in the second edition of the Schilderboek, which was published in Amsterdam in 1618. Therein Frans is noted as one of four of van Manders pupils and listed as portait painter of Haarlem.

Van Mander seems to have been a dogmatic teacher. It was perhaps because of this that Hals opposed his master (as every rebellious youth would have done) and expressed his freedom by not listening to advice given to him. Is this freedom not reflected in the way he handles the brush and expresses himself as an artist and individualist?

If the pupil is to work with fellow pupils under the same contract, van Mander advises them to take care of the master's palette and brushes, to clean and prepare the canvas or panels, to grind the colour finely and to keep it clean and not use too much smalt or ash (ultramarine ash?):

> I.48 Op winckel werckende met ander knechten staend'onder een Chaert om niet te crackeelen al waert ghy den besten wilt met den slechten helpen onderhouden Winckels gherechten hebt acht op Meesters pallet en Pinceelen op vaghen bereyden doecken panneelen fijn verwen wrijven op reyn houden passen niet te veel temperen smalten noch assen.

He mentions that the Italians are excellent in the drawing of figures, whereas the Flemings know how to draw landscapes well. The students are pushed to improve their reputation and show that the Flemings too, can draw the figure.(I.71,72)

On flesh tone much colour should be used according to the Italian manner. Not only white, red and brown, but all the colours from the palette, to avoid the grey fish tone. Impastoes should be used to catch the light. (XII)

He complains that the painters overload their pictures with paint, in such a way that one can feel and touch the paint without even looking. The paint is so unevenly and rough that one could mistake it for a relief cut in hard stone.

> XII.20 Op des edelheyt dees t'samen wel pasten en leyden hun verwen schoon net en blijde ginghen de penneelen so siet belasten als nu dat men schier blindelijck mach tasten en bevoelen al t'werck aen elcker sijde: want de verwen ligghen wel t'onsen tijde soo oneffen en rouw men mochtse meenen schier te zijn half rondt in gehouwen steenen.

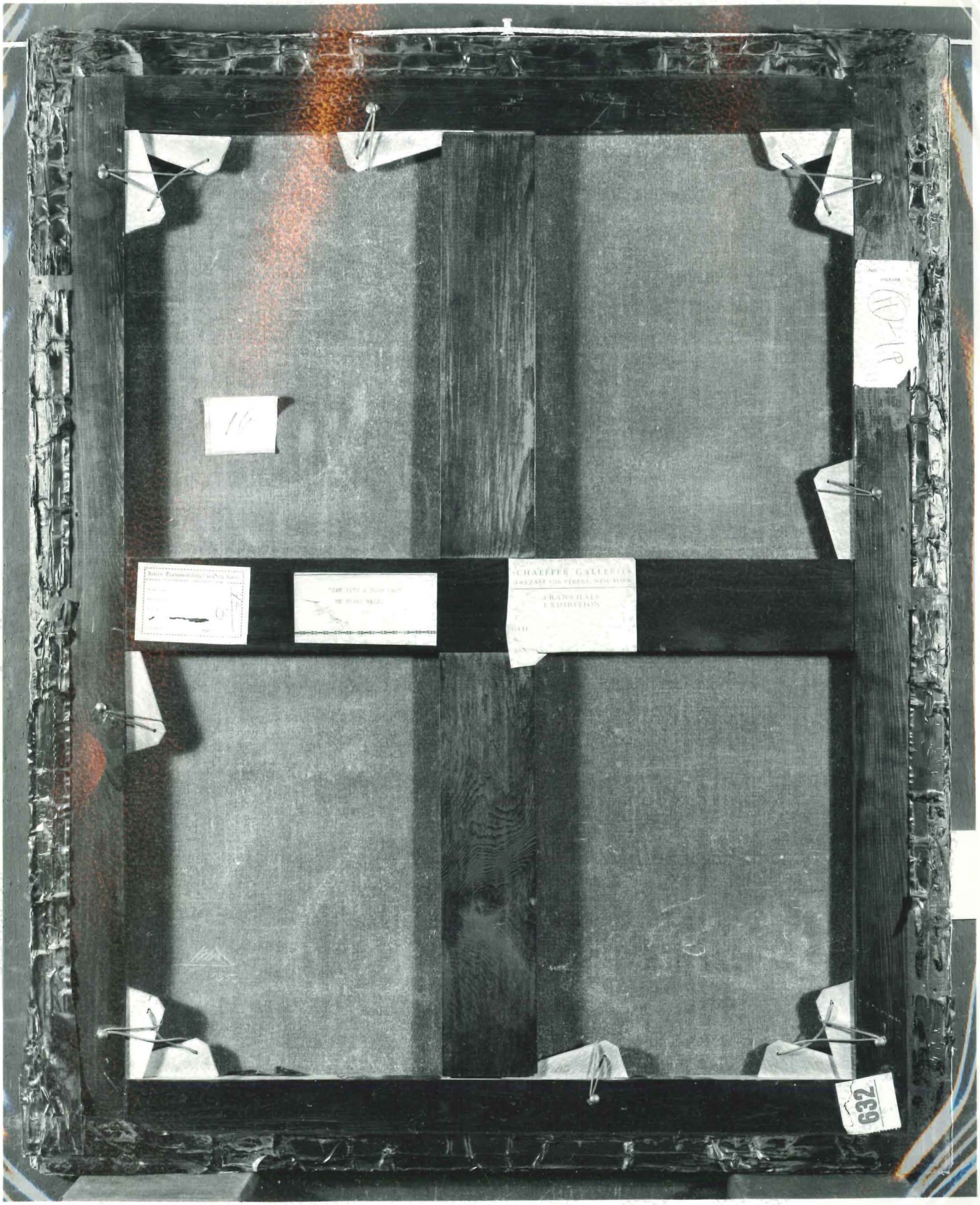
People should be painted according to whether they had been much outside in the fresh air. (such as peasants, shepards or sailors). Vermilion should be used, not too sparingly...

> XII.31 Aen Boeren Herders en aen die daer varen door wilde gloven met stormen bestreden daer salmen den ghelen oker niet sparen onder t'vermillioen want als of sy waren schier half ghebraden sien hun bloote leden ofmense sagh' ondeckt in sulcke steden daerse daeghlijcx bevrijdt zijn van der hitten daer trocke de carnaty meer ten witten.

He mentions that the Italian painters are more careful as the Flemings are. It is noted that the northern flesh tone resembles the colour of fish or of stone sclulpture. He advises to use many colours to paint flesh such as green, blue and yellow.

XII.35 Dus sijn d'Italianen al bedachter in't verwen als wy zijn hoe wy ons pooghen hun dinghen staeten veel poeslijcker en sachter als d'ons' en doen oock wy ghemeenlijck achter en vooren al even licht willen hooghen niet alleen siet ons dinghen uyt den drooghen maer als w'ons best vleesch te schilderen meenen soo isset al visch oft beelden van steenen.

XII.36 Dus moeten wy toesien dat ons wat milder de Pinceelen moghen zijn jonstich coene op dat oock t'wel verwen by ons verwilder: iae wy moeten bedencken hoe den Schilder wel soo veelderley verwen heft van doene om een troenge te schild'ren als men groene blaeuw gheel en van alles behoeft nootsakich om maken een Landtschap schoonen en vermakich.


632

TECHNICAL EXAMINATION OF THE "MAN WITH A BEER KEG"

A. VISUAL EXAMINATION

OIL ON CANVAS (RELINED)
83 cm x 66 cm (size of stretcher)

Stretcher

The stretcher is a mortise and tenon type. It is made with six members, including two cross-bars. All twelve keys are present. The present stretcher is not the original one. There are five paper labels stuck onto the stretcher:

1. Intern. Tentoonstellung van Oude Kunst/Rijksmuseum Amsterdam 1936/Hals, Frans/ Man met bierstroop/D. Katz(?)/Cat. No. 68/

2. "MAN WITH A BEER KEG"/ BY FRANS HALS/ Schaeffer (written with a pencil. The number 23 is written in red)

3. SCHAEFFER GALLERIES/ 61-63 EAST 57th STREET NEW YORK/ FRANS HALS/ EXHIBITION/ Nov.9 - 30th 1937/ No 16

4. No 149 (in red)/ Picture/ II - I P

5. The number 632

The stretcher itself bears a stamp on the top bar in the centre, reading

"DE WILD/ HOLLAND"

Support

The painting has been double lined; two canvases of the same or similar weave count have been used. The adhesion between the two lining canvases and the original seems satisfactory. The adhesive is a wax or wax-resin mixture and is very soft. The lining canvas, as seen from the back, is signed in monogram and dated "35" in the lower left corner, probably by the restorer who carried out the lining. The space between the stretcher and the support is very small. In some places the cross-bars are touching the reverse of the lining canvas. The original canvas seems to be of a medium coarse plain weave. A canvas strip has been added along the bottom edge. X-radiographs reveal a seam along the top edge, where a narrow strip of canvas (with a width ranging from 1.5 - 2.5cm) has been added. This addition appears to be original.

Ground and Paint Layers

The ground and paint layers are both in a good state of preservation. The ground is of a light creamy colour.

Damages and Losses

There are some areas of cleavage and also some small losses near the upper edge of the painting in the sky, in the upper left hand corner. There is some slight abrasion, noticeable especially in the darker colours, such as the sleeve and in the sitter's dress. There are stretcher marks around the edges.

Overpaint

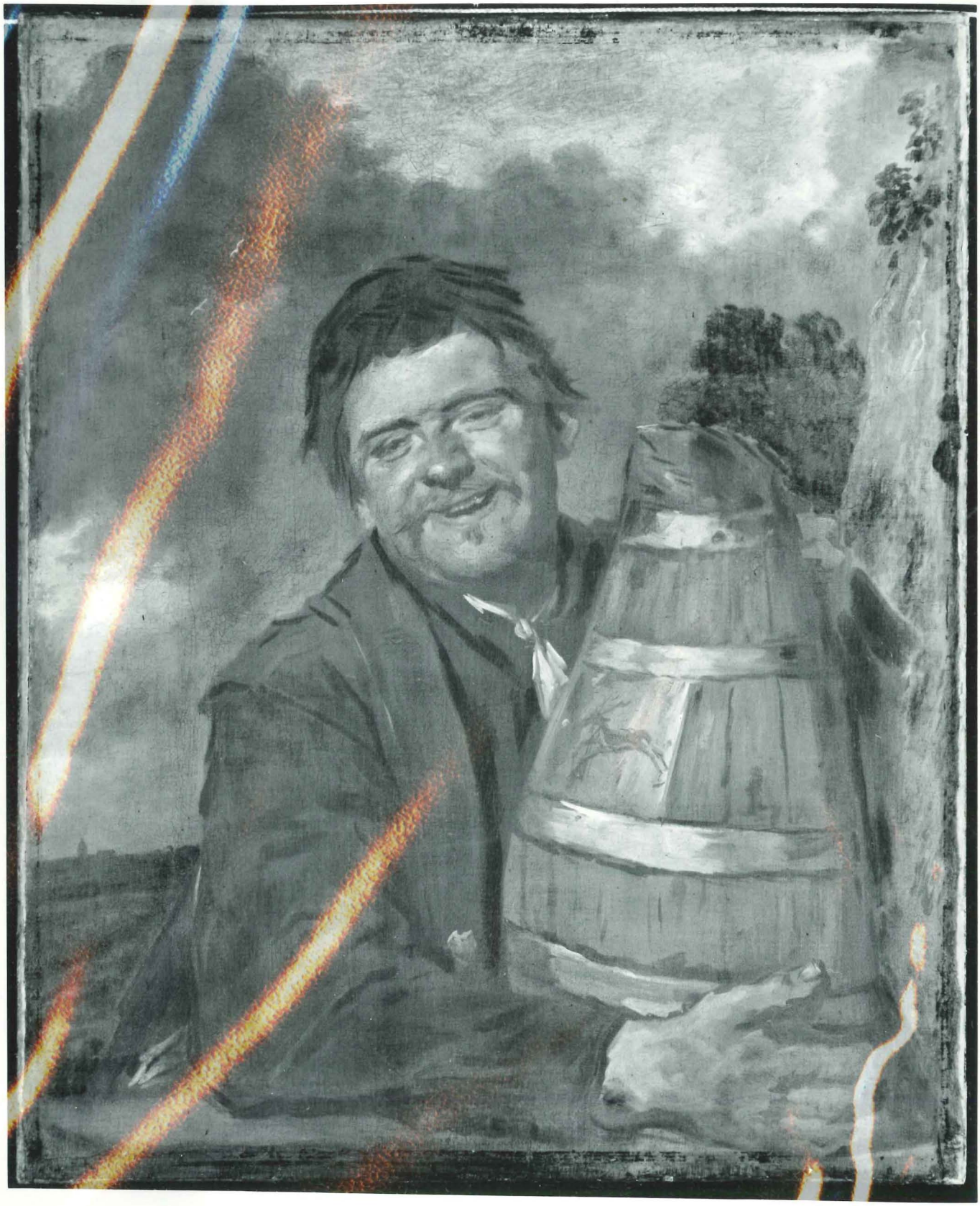
Areas in the sky and the clouds on the right have been overpainted, and appear darker and slightly orange in the clouds in

the top left corner. The sitter's left sleeve has been reinforced where the paint is very thin and somewhat abraded. There are some old retouchings along the bottom addition, especially in the left hand corner.

Surface Coating

The varnish has darkened considerably and is very thick.

(The surface coating and the overpaint were removed during the recent conservation treatment of the picture.)



B EXAMINATION IN ULTRA-VIOLET LIGHT

Areas of high uv absorbtion, noticeable on the photograph as darker areas, suggest overpaint. These can be seen along the edges of the picture. Probably they hide areas of abrasion from the frame. Reinforcements of lines appear in the hair, the man's right shoulder, around the colar, the front of the jacket and on his left sleeve. Darker appearing areas can be seen in the clouds. The trees and the foregrðund of the landscape both absorb uv-light, probably because of the presence of copper in the pigment. The craquelure is clearly visible.

C INFRA-RED PHOTOGRAPH

The infrared photograph does not reveil any underdrawing. Dark lines, emphasising folds in the sleeve, show clearly, probably because of the presence of an infrared-radiation absorbing pigment, such as carbon black. There are small dots noticeable in the man's hand and the lower part of the beer keg. These dots do not show in IR-reflectography examination, nor are they visible in normal light.

D EXAMINATION WITH INFRA-RED REFLECTOGRAPHY

Infra-red reflectography did not reveal any further information than those already visible in the IR-photograph.

E ANALYSIS OF PAINTING MATERIALS

Pigments

21 samples were taken from various locations around the edges or existing damages. Cross-sections were prepared for microscopic analysis and for pigment identification. The following pigments were identified:

BLACK	carbon black, bone black
BLUE	smalt, azurite
GREEN	"copper resinate" type glazes, mixtures of azurite and yellow ochre
RED	vermilion, red lake, red ochre, red lead
YELLOW	lead-tin yellow (type I)[22], yellow ochre
BROWN	ochres and umber
WHITE	calcium carbonate, lead white

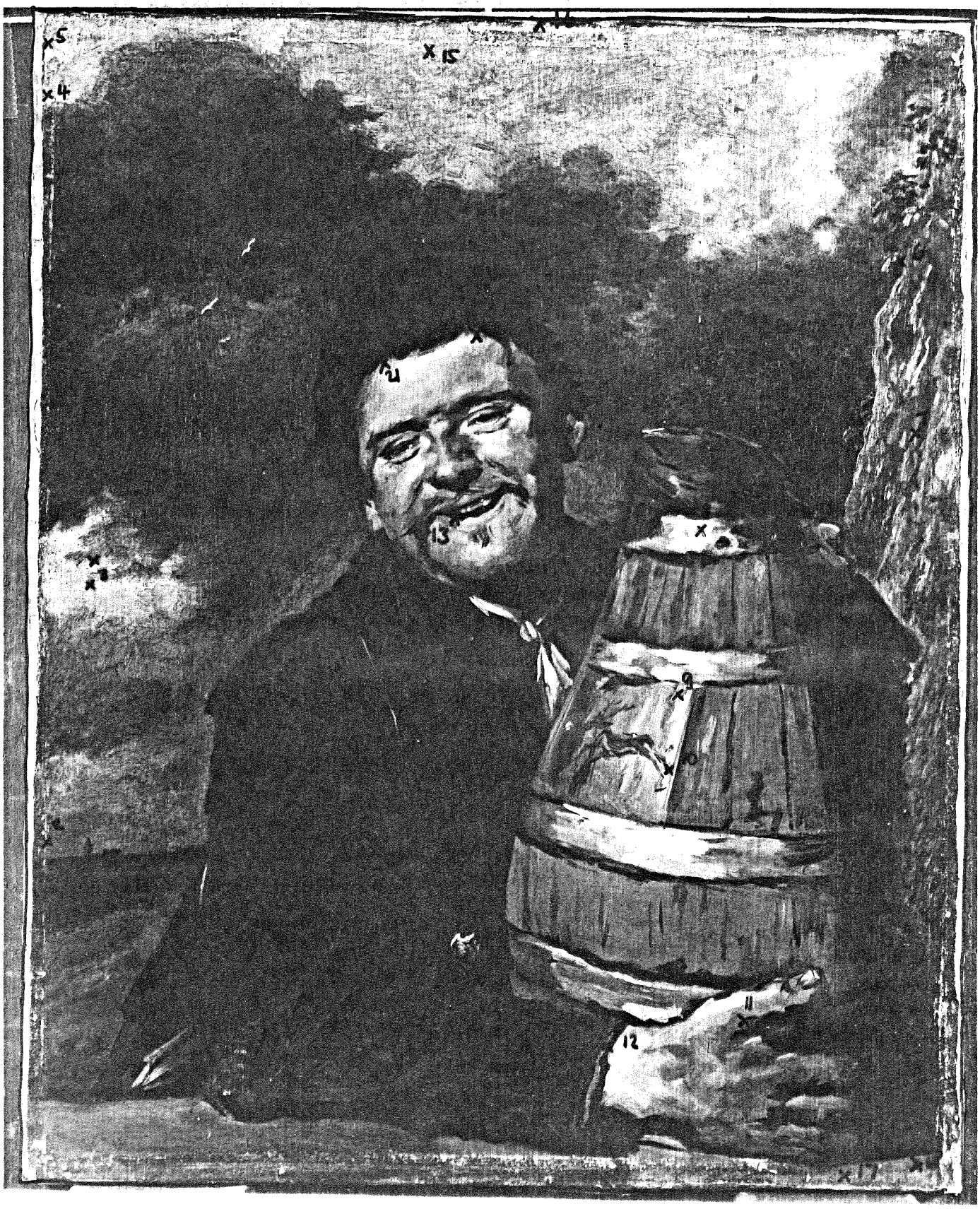
Location of Samples

1	Landscape	9.5 cm from the left	13,6 cm from the bottom
2	Sky	1,3 cm left	25 cm from the bottom
3	Pinkish cloud	4,2 cm left	44 cm bottom
4	Sky below join	at left edge	77,7 cm bottom
5	Sky above join	at left edge	81,4 cm bottom

7	Rock	3,6 cm right	54,5 cm bottom
8	Keg	19,7 cm righ	48,2 cm bottom
9	Keg	20,5 cm right	36 cm bottom
10	Keg	21 cm right	29,6 cm bottom
11	Hand	16 cm right	11,8 cm bottom
12	Sleeve	41 cm left	10 cm bottom
13	Lip	30,1 cm left	48,1 cm bottom
14	Hair	31,5 cm left	64,1 cm bottom
15	Sky below below join	28,1 cm left	4 cm top
16	Sky above join	42,5 cm left	0,2 cm top
17	Table	9 cm right	1 cm bottom
18	Table	3,3 cm right	2,3 cm bottom
19	Sleeve	15,7 cm left	9 cm bottom
20	Face	32,5 cm left	61 cm bottom
21	Face	24.4 cm left	59,3 cm bottom

location of sample.

TR



Binding Medium

The binding medium of one sample, analysized by gas chromatography, was found to be linseed oil.*[23]

* Sample analysed by Dr Rene de la Rie in the painting conservation laboratory at the Metropolitan Museum of Art, New York.

Table 1
pigment analysis and identification of samples

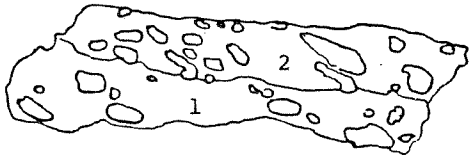
no	location	SEM/XRF	XRD	MICROSCOPE	PIGMENTS	REMARKS
1	landscape	Pb, Ca, Al Si, (Fe), Cu		white, blue, yellow /red ochre, black	lead white, smalt red ochre, chalk	
2	sky			white,blue, red, black	lead white, smalt chalk	
3	pink cloud	Pb, Al, Si, K, Ca, (Fe)		white, blue red	lead white,chalk, smalt, red ochre	
4	sky (below seam)	Pb, Si, K, Ca, Al (Fe), (Co)		White, blue, black	lead white,chalk, smalt ochre, black	size of smalt is large ca 50microns
5	sky (above seam)	Pb, Si, Ca, K, Co		white, blue	lead white, smalt	smaller size of smalt than in no 4. ration of Ca in ground higher smalt composition high in Si and K
6	tree	Pb, Si, Ca, Al, K, (Fe), (Cu), (Ti)		white blue,yellow	lead white, azurite, yellow ochre	
7	rock	Pb, Si, (Ca), (Fe), (K) (Ti)		white, blue yellow black, red	lead white, chalk smalt, yellow and red ochre black	size of smalt 50 microns
8	yellow in keg	Pb, Sn	type I	yellow,black, red	lead-tin yellow	
9	orange in keg	Pb, (Fe), (Si), (Al)		white, yellow and red, black	lead white, chalk yellow and red ochre red lake, black	
10	red in keg	Pb, Fe, Ca, (Al), (Si)		white, red, yellow black	lead white, chalk, yellow and red ochre vermillion red lead	main red pigment is red lead
11	hand	Pb, (Ca), (Fe), (Al), (Si)		white, yellow, red black	lead white, chalk yellow and red ochres	

table 1/ cont'd

no	LOCATION	SEM/XRF	XRD	MICROSCOPE	PIGMENTS	REMARKS
12	sleeve	Pb, (Ca), (Fe), (Al), (Si), red: Pb, Ca, Fe, (K), (Al), (Si), (Ag), (Hg) black: Pb, Ca, Fe, P, Al, Si	red lead	red, black white	red lead, red ochre, lead white bone black, vermilion	
13	lip	red: Pb, Al, (Si), (K), (Ca), (Fe) black: Ca, Pb, P, Al, K, (Fe)		red, black, white	red lead, yellow and red ochres, bone black lead white, chalk red lake	
14	hair	Pb, Ca, (Fe)		white, black, (blue), (yellow)	lead white, black, smalt? (yellow ochre)	
15	ground below seam	Pb, Ca, (Fe)		beige	lead white, chalk ochre	
16	ground above seam	Pb, Ca, (Fe)		beige	lead white, chalk, ochre	ratio of chalk higher than in no 15
17	brown along bottom	Pb, Fe, Si, Mn, (Al), (Ca), (Mg) overall: Pb, (Fe), (Si)			lead white, chalk umber, ochre	

display of cross-sections

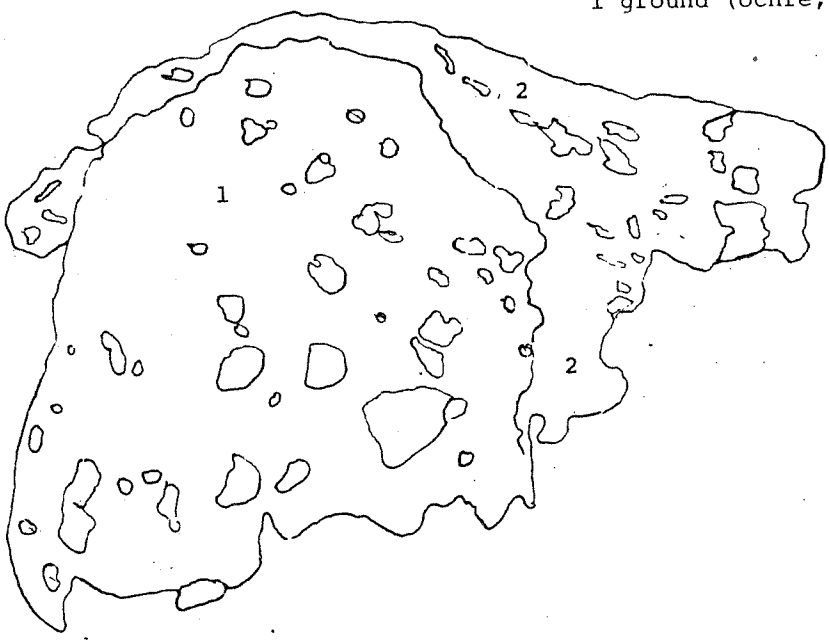
BLUE FROM SKY (No 2)



2 blue (smalt, lead white)
1 ground (lead white, ochres, black, $CaCO_3$)

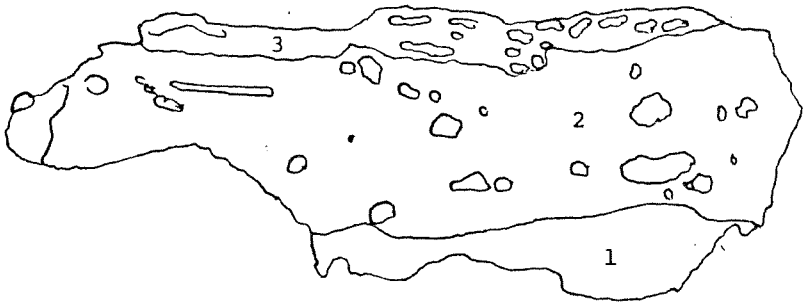
BLUE FROM THE SKY (No 4)

2 blue (smalt, lead white)
1 ground (ochre, $CaCO_3$, black)



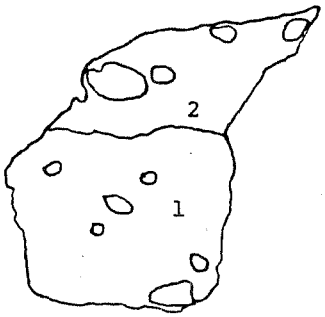
display of cross-sections cont'd

BLUE FROM THE SKY (No 5)



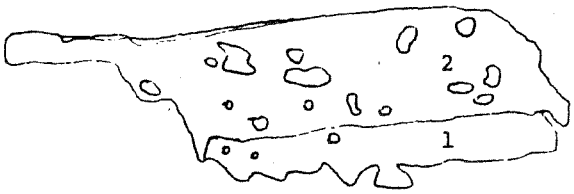
3 blue (smalt,small part., lead white)
2 ground(lead white, ochres, $CaCO_3$)
1 brown transp.layer probably sizing

GREEN FROM THE FOLIAGE (No 6)



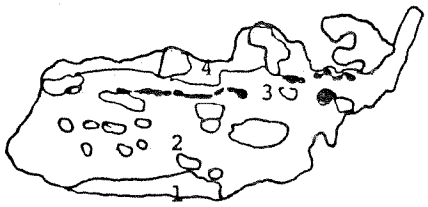
2 green transp. layer, possibly copper resinate type
1 ground, ochery colour (lead white, ochres, $CaCO_3$)

ORANGE FROM THE BEER KEG (No 9)



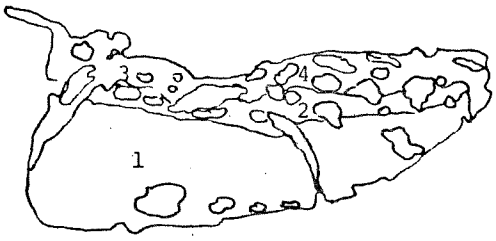
2 orange (lead white, yellow and red ochre, red lake, some black
1 ground (lead white, ochres, $CaCO_3$)

RED FROM SLEEVE (No 12)



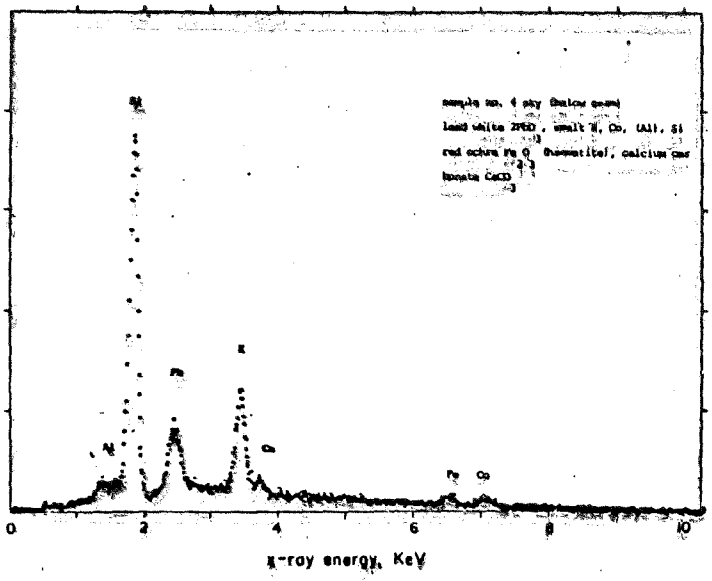
4 red (vermilion, lead white, red earth)
3 black
2 ground (ochre, calcium carbonate)
1 brown transp. layer, probably sizing

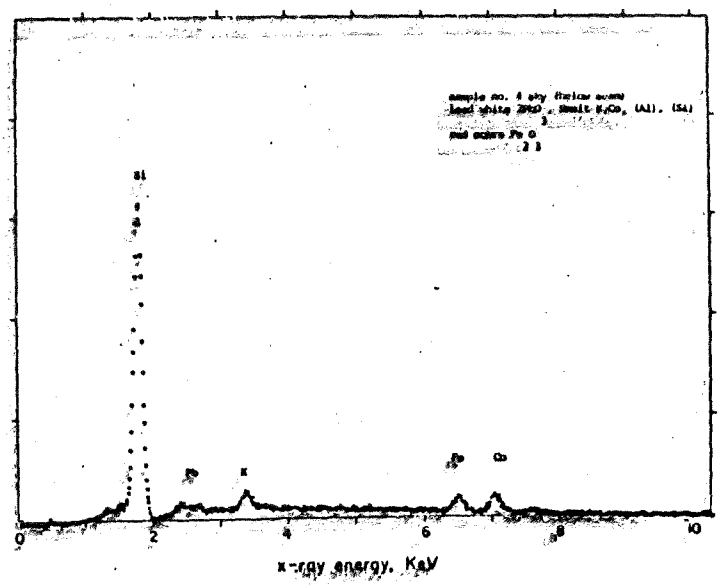
RED FROM THE LIP (No 13)

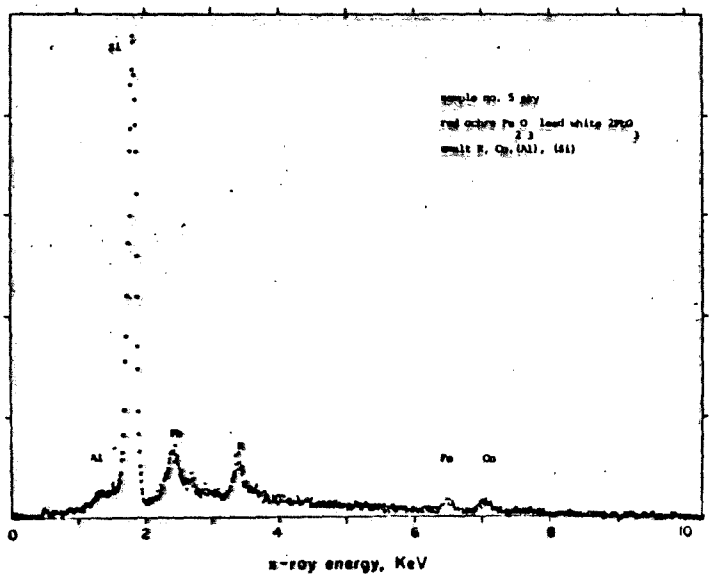


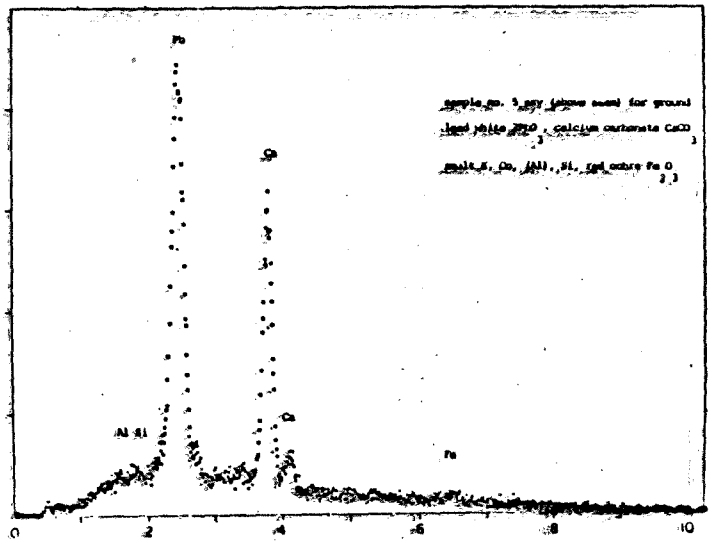
4 black
3 brown
2 red (lake, vermilion, possibly red lead, lead white)
1 ground (ochre, $CaCO_3$)

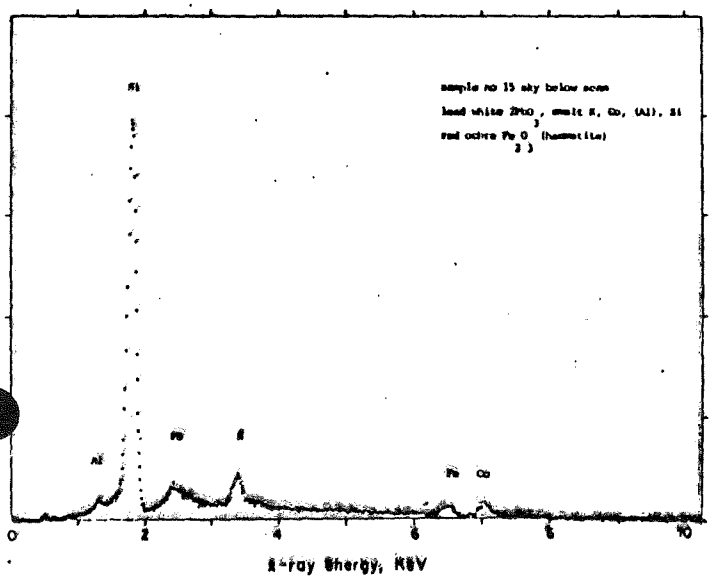
graphic display of the peaks in the X-ray spectrum

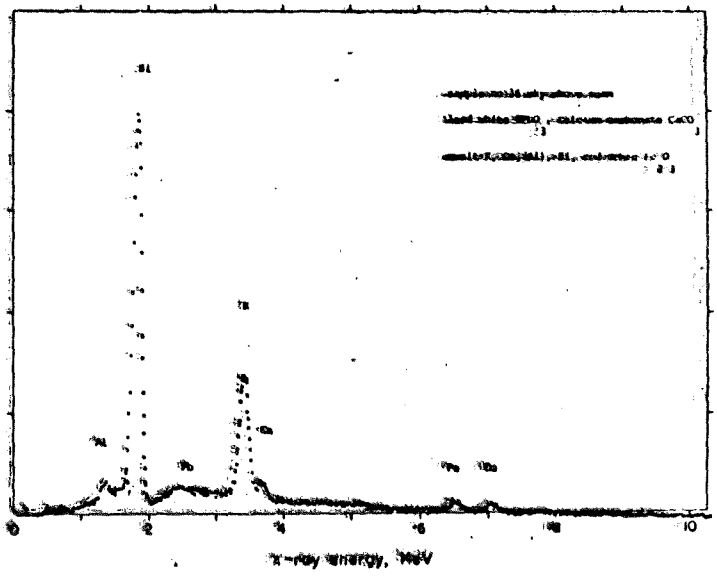


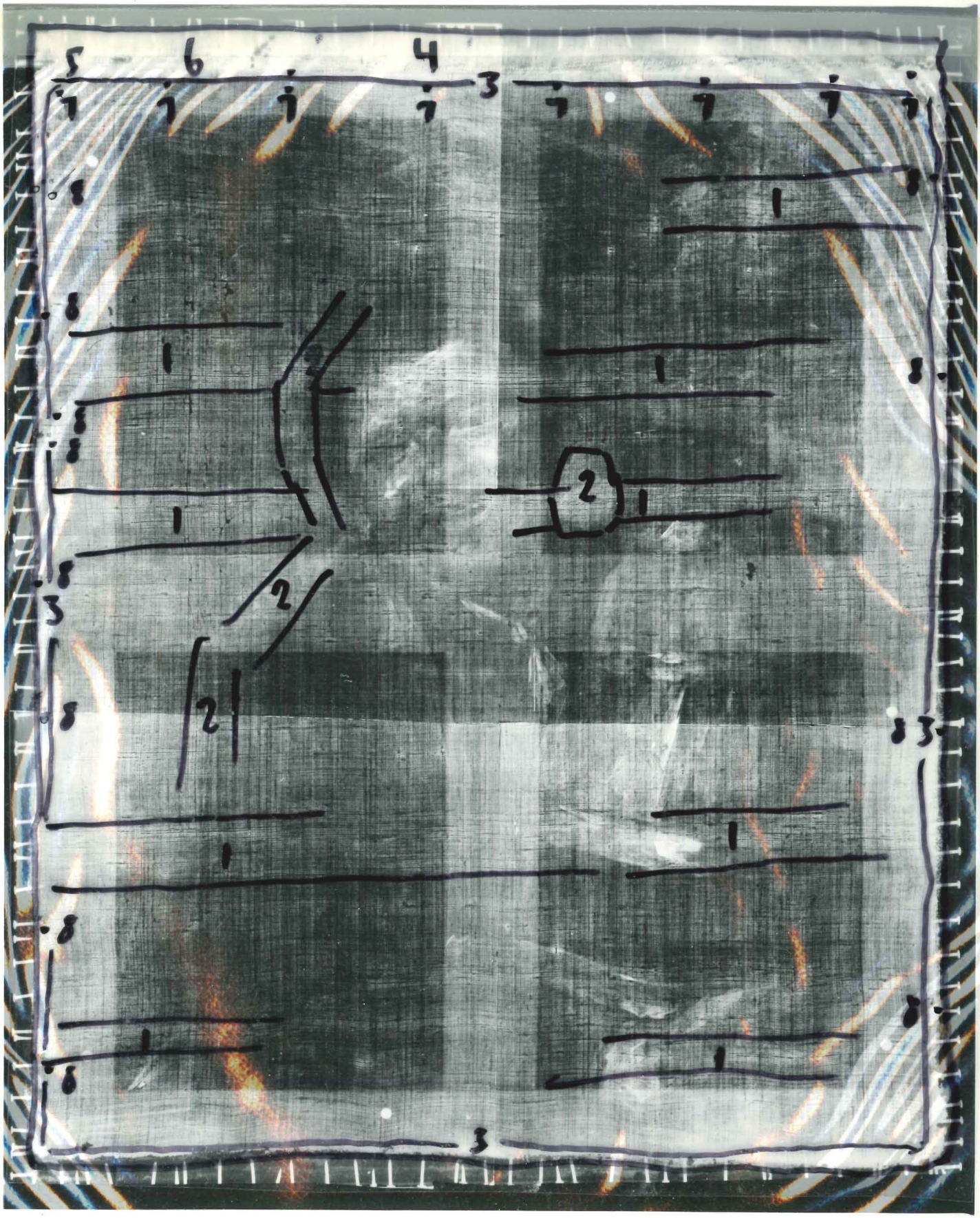












C INTERPRETATION OF THE X-RADIOGRAPH*

Support

The canvas structure is the most dominant feature in the X-radiographs. This suggests that the ground contains an X-ray absorbing pigment, such as lead white. The threads are fairly coarse and irregular, typical for a hand-woven cloth. The weave count is 15 threads/cm (warp) and 13 threads/cm (weft). Both selvedges seem to be present giving a clue to the original width of the textile. This might have been a standard size, as the width would be depend on the width of the loom used to produce the textile.[24,25]

Ground

The ground appears to have been applied very thinly, just filling the interstices of the canvas weave. Irregularities, visible as horizontal bands appear lighter in colour, indicating a thicker ground in those areas.(1) These irregularities might be due to the ground having been applied with a knife.[26] Another possibility might be that the ground was scraped unevenly with a pumice stone [27].

*The numbers in parentheses refer to individual X-radiographs in a marked composite set

Paint Layers

The presence of lead white in the ground somewhat blurs the legibility of the paint layers. No changes in the paint layers are apparent in the X-radiograph. The clouds, the highlight in the face and the hand and the highlights in the metal bands of the keg all show as lighter areas, the latter due to lead-tin yellow, which is another X-ray absorbing pigment appearing here in almost pure form. The hair, eyes and the dress appear darker. This is an indication that the artist had a very clear idea of the composition of the painting in mind. The background is blocked out for the hair and the dress of the figure. In the hair, for example, the sky just meets the hairline, with no great overlap.

The outline of the head was altered (2) where the sky overlaps the hair. There are further alterations (2) along the man's right shoulder and upper arm. This can be seen as a slightly lighter line of ca 1,5 cm width, which looks like a single brushline. It can be seen both visually and on the X-radiagraph.

The light horizontal line below the seam on the top edge of the painting remains still somewhat of a puzzle. This line can be seen clearly along the the edges of the painting (3). It has been suggested that these may be a rectangular outline for the painting at the very edges.

Addition (4)

There is also some question of the role of the additional strip of canvas along the top of the painting. It is quite clear that in the original stretching this top addition was not present, as the holes from the temporary stretcher (7) are set in the main canvas below the seam.[28]

Canvas Join (5)

Another unexplained feature shows in the X-radiograph. Loose diagonal stitches can be seen below the join. These are similar to the stitches along the bottom of the painting. It was observed that the diagonal stitches follow the general flow of the scalloped edge, whereas the join has no corresponding distortions. It is therefore unlikely that they belong to the same alteration [29].

Overlap of Ground (6)

The overlapping of the two grounds appears as a lighter horizontal band on the top of the X-radiograph. The strip was probably added and then the ground reapplied over the addition. The added strip contains a similar ground of lead white, ochres and calcium carbonate, but the relative amount of the latter seems to be greater than in the ground of the main canvas.

Holes (7) and (8)

Two different sets of holes are seen along the edges of the canvas. The white ones (7) are probably the original ones, originating from the temporary stretcher. The fact that they show up white in the X-ray means that they were filled (later) with ground containing lead white when the painting was completed and mounted on its permanent stretcher (now lost).

Mounting on Stretcher

The ground extends almost everywhere to the very edge of the canvas. This as well as the now covered holes in the canvas (8) suggest how the painting was originally mounted. During the working process the canvas was, with all likelihood, mounted on a temporary stretcher

where the canvas was suspended in a larger sized strainer and attached all way round with string, like a trampoline [30]. This method was used quite frequently in 17th-century Holland and is illustrated in a painting of an artist's studio by Molenaer. (Jan Miense Molenaer, "The Artist's Studio" 1631 Berlin Staatliche Museen no. 873)

D REMARKS

The top paint layer (i.e. the sky) covering the seam appears to be coherent in application; the brush marks can be seen as a continuous line reaching over the join. There is a slight break in the ground and paint layers. The paint structure has collapsed in small areas and has sunken into the intersticies of the join. The smalt found in the sky of the main canvas was compared with the smalt from the addition, shows a slight difference in composition of the pigment.[31]

Additional strips of linen were observed in Hals' painting "Portait of a Lady" (Art Institute of Chicago), published by Marigene Butler. She observes that the "support of linen appeared to have been cut down at sides and bottom where cut edges were visible 3/4 of an inch in from the stretcher edge. Additional strips of linen and tan gesso had been added to extend the sides, while at the bottom one could see that part of the original painting surface had been used as a tacking margin at one time." [32] It is not clear, however, whether the strips were added after alteration by the artist himself (or one of his workshop members) or later on.

PAINTING TECHNIQUE IN THE 17th CENTURY

The change of painting technique towards the end of 16th century was much influenced by an important external factor. It has to be remembered that much of the old painting tradition had been lost or destroyed during the Reformation towards the end of the 16th century. Much cultural heritage fell victim to the devastating iconoclasm. Many sculptures and paintings from churches were taken by religous fanatics and destroyed or vandalised. As Schiller notes, in Brabant and Flanders alone 400 churches were demolished in a period of four or five days...[33]. It was the treaty of Westphalia that brought back peace. Art at that point was entering a new era and striking changes in technique were to take place. The Italian influence at that time was great, as not much of the Northern painting tradition had survived. The following two new trends can be observed:

- use of canvas as a support, rather than the traditional panel [34]

- quicker pace of execution of the painting process.[35]

In the beginning of this change the artists seem to have been hesitant in their new working material and a fine smooth canvas was chosen probably because of its initial surface similarity to wooden supports. As soon as the 'new' support had been generally introduced, artists appreciated it greatly and a freer style could be explored. The surface texture of the cloth became an integral part of the painting. A canvas was less restrictive in the artist's choice of size and it was easy to join pieces of canvas together. A large painting need not be heavy and was more portable, which was a great advantage over the traditional oak panel.

The role of the ground also changed and its original function to even the support was to become less and less important. Traditionally, the ground on panel support was thicker than the paint layer. This trend can also be observed on paintings on canvas, where a thinner ground was used. The influence from the south (i.e. very thin grounds on paintings on canvas), and Venice in particular was somewhat late to take effect in the north.

The major change in technique during the 16th and 17th centuries was that the works were often done "alla prima" i.e. without prelimary sketch or drawing. Previously painters carefully prepared sketches or underdrawings which would have been used as a guide. Van Mander mentions in his Schilderboek the use of an underlayer which he calls 'dootverwe' or dead colour [36]. Eastlake interprets this as a grisaille, but Berger thinks this to be a lean colouring layer which is to receive the subsequent and final paint layers and glazes.

No preparatory drawings of Hals seem to have survived. Some oil sketches are attributed to him but are doubted by scholars. It is known, however, that the artist used studies for the heads (tronjes). Some oil sketches on paper did survive.[37]

PAINTING TECHNIQUE OF "THE MAN WITH A BEER KEG"

Studying the paint surface of the 'Man with a Beer Keg' with the naked eye and under the microscope quite a straightforward painting technique was observed. Generally two paint layers were found on top of the ground, as confirmed by cross-sections. The face represents an exception, insofar as an underlayer of a cooler colour was used here. Areas in the sky where the clouds meet the blue were painted wet-in-wet. There the brush work can be seen clearly as vigorous lines and squiggles. A dark underlayer can be seen near the clouds, probably in-

tended as a preparatory layer.

A possible work sequence was established by examination of the paint borders where layers overlap and from microscopical examination of the paint surface.

I	II	III	IV	V
ground	sketch(?)	hair	face	rock
	underlayer	keg	dress	outline on arm
		sky	tree	final glazes
		table	arm	
		landscape	hand	

Underdrawing and Underlayer

In the 'Man with a Beer Keg' no underdrawing can be seen by eye, nor was it detected by X-ray radiographs, infra-red photography, or infra-red reflectography. The fact that it could not be detected by these methods excludes a possible sketch in lead white or charcoal, which were conventionally used for this purpose. A drawing in ochre or chalk, however, would be very difficult to detect. Autoradiography has been successfully used in similar cases but the complicated procedure and limited access to such facilities ruled out this method in this case. [38]

Assuming there was some sort of sketch, the figure was probably done first. The sky was then applied, then the figure was painted in, which was corrected with 'background' colour in parts such as the shoulder and his upper right arm. In those areas the background slightly overlaps the dark of the shoulder and hair. The final strokes in the hair are on top of the corrections. The tree above the beer keg

was painted before the rock. The rock actually overlaps the sitter's left arm.

Hair

The hair was painted directly on the ground. It is not quite clear where the underlayer of the flesh tone of the face ends but there does not seem to be much of an overlap into the hair. The bare ground is in places visible due to use of a hard brush or even the back of the brush.

Keg

The wood in the beer keg was painted first. The artist used the bare ground in parts as a body colour, laied a cooler, greenish-grey wash over it (same colour as underlayer of the face) partially to suggest the form. The metal bands were then outlined sketchily in a dark brown-grey. Cool silver-grey colour was then applied, overlapping the outlines in some parts. The yellow highlights as well as the the yellow-grey shadow to the left of the two lower metal bands are on top of the metal coloured bands. The copper plate on the keg was then drawn, also overlapping the dark outline of the metal bands on the lower side. The red stag was painted in last.

Sky

The sky was painted wet-in-wet, often showing the brush marks.

Table

The table on the bottom side was painted before the elbow and arm of the figure.

Landscape

The landscape at the lower left side was painted first in a (bluish) body colour which was then glazed. Some of those glazes are missing or abraded.

Face

The face was painted on a slightly cooler, greenish-grey underlayer, overlapping the hair, which was painted first. This underlayer was used very beautifully to give form and depth to the shape of the face. It can be seen in the hairline, at the end of both eyes, the nose, the upper and lower lips, and the mouth. The pink highlight was painted on top. The dark grey eyebrows were painted last, as were the brownish, slightly transparent finer lines indicating wrinkles and shadows on the man's left cheek. The hair was painted above his right ear. The dark hair was worked into the flesh tone of his right cheek, which was at this time still wet. This gave a smooth transition for the shadow. The moustache is on top of the flesh and shadow on the right. The mouth was outlined first with a dark transparent brown. The flesh tone and the bright red of the lower lip was then applied. The black division line separating the lips was painted last. The transition from the flesh tone in the chin and the neck which is in the shadow, was again done wet-in-wet blurring the lines.

Dress

The clothing was painted very thinly in a brown colour, directly over the ground. Single brush-strokes (ca 1 - 1.5 cm in width) were applied to indicate light and shadow. The highlight appears just as a lighter wash. The extention of the sitter's jacket on the left side overlaps the landscape.

Arm

As mentioned above the arm lies on top of the table. The dark, broad outline along the lower side of the arm was painted on top.

Hand

The hand was painted on top of the keg. The hand was first outlinded with quite broad outlines of a dark brownish-grey colour, noticeable along the upper side of the hand and the thumb in the keg. (Same colour as the outline of the lowest metal band in the keg). The flesh tone was applied and the black outline drawn over the flesh tone. The thumb nail was then painted on the black outline.

GENERAL OBSERVATIONS

Summarizing, it can be said that the painting technique is uncomplicated. In the majority of the tested areas one or two paint layers appear over a warm ochre-coloured ground. The picture was painted rapidly. Areas are visible where the layer below (e.g. in the sky) or bordering the one in progress (e.g. in the face) were not allowed to dry [39].

Between the mouth of the keg and the tree above there is a slight gap, where the ground shows. This could be considered characteristic

of Hals, but may also be observed in other paintings of this period. A similar sort of line appears in the 'Banquet of the Officers of the St. Hadrian Civic Guard Company' at the Frans Halsmuseum in Haarlem. Slive dates the painting around 1627. The line appears between the hat in the upper right against the window. The second painting in which the line appears is a doubtful attribution to Hals, and Slive rejects the painting as a border-line case of an anonymous hand. In the "Fisher girl" (Cincinnati Art Museum) the line can be seen along both of the girl's arms and around her headdress. It has to be noted, however, that these two previous observations were drawn from photographic reproductions.

COMPARISON TO OTHER KNOWN WORKS BY FRANS HALS THAT HAVE BEEN TECHNICALLY EXAMINED

The layer structure and the pigments of the "Man with a Beer Keg" compare well with other works by Frans Hals. The painting here was compared to the "Portrait of Michiel de Wael", now at the Tafts Museum in Cincinnati, the "Portrait of a Man" and the "Portait of a Lady", now at the Art Institute Chicago, the National Gallery's (London) "Family Group in a Landscape" and finally to the painting of "St.Mark" (London?). These paintings were chosen, because analyses are available.

The following eight pigments were found in Hals' "St. Mark": lead white, ochre, vermilion, red lake, carbon black, soot black, indigo and azurite. The ground contains chalk and lead white. The media contains protein as well as a drying oil. The following pigments were found in the flesh tone: (yellow highlight on the front of the saint) yellow ochre, azurite and charcoal black. Red from the saint's cheek: lead white, vermilion, some red lake, some red ochre, and some charcoal black. Black from the dress: soot (bistre?), and red lake. Black layer from under the cuff: soot, some indigo and red lake. [40]

In a "Portrait of a Man", from 1644/45 [41] Hals has used a red-brown ground. The overall appereance of the painting is dark due to excessive use of binding media, which caused the pigments to sink to the bottom with the resulting formation of a glassy appearing layer. [42]

In the "Portrait of a Lady" (Art Institute Chicago, Max and Leola Epstein Coll.) the following six pigments were found [43] lead white, vermilion, azurite, crimson lake, yellow earth and a carbon black. The ground is of a cool pink colour containing lead white and iron oxide red. Most of the flesh tone is built up in two layers, on top of the

pink ground. The lower layer consists mainly of lead white with azurite and vermilion. The ratio of azurite is higher in areas of shadow, such as the jaw. The upper layer which is much thinner shows a greater variation of tones. A green-umber (yellow earth and carbon black in lead white) underlayer was found for the modeling of the mouth and lip. For the modeling of the forehead a green shadow tone was applied thinly on top of the flesh colours to suggest the shape, while the middle of the forehead is highlightened with a layer con- taining lead white and vermilion.

The ground in the National Gallery's Hals, "A Family Group in a Landscape",(no 2285) is of a fine beige texture, containing lead white, tinted with red-brown ochre in what appears to be an oil medium. [44]

Two facts are noteworthy. One is the identification of indigo, which is not very frequently found in the 17th century Dutch paintings. The other is the use of a cool greenish underlayer (dootverwe) for the flesh tone. This technique goes back to the early painting technique found in many Italian tempera paintings. It was used throughout the centuries, also for oil paintings. Van Mander notes that the "dootverwe" should be used to indicate where the colours should be laied, remarking that with the "dootverwe" the colours would last and not fade. To paint "alla prima" is the master's privilege, whereas the apprentice often would not get the desired effect at first attempt. There, van Mander advises, an underlayer with dead colour would be useful, as correction could be carried out easily. Berger concludes that due to the change of painting technique toward "alla prima" the dead colour was to become a general aid for the student and pupil, whereas the master would not need to refer to this technique. [45]

The presence of this underlayer below the flesh tone in the face

in the Portland picture might be a conclusive hallmark of Hals and/or his circle's working technique. It seems unusual, however, to find it still used in the 17th century. This is an important factor deserving some further investigation.

CONCLUSIONS

The examination and analysis of the painting showed all the expected materials (i.e. support, pigments and binding medium) used in Holland in the seventeenth century. Comparing the painting technique and the build-up of layers of the "Man with a Beer Keg" with published studies of Hals' paintings showed a close similarity. It has to be borne in mind, however, that Hals' circle probably followed the master's approach, style and painting technique. Corrections by Hals might be found in some of his pupil's paintings and it is often very difficult to distinguish the various hands involved in a painting. Many attributions of paintings to Frans Hals were done on stylistic criteria only, which is a very subjective and personal matter. Technical examination, on the other hand, are not always conclusive. Artists do not always work in a logical way and we are often tempted to interprete "irregularities" in technique or style.

The flatness of the keg might be explained as a possibly unfinished area. The fact that the keg and the hand show the same kind of preparatory outlines is remarkable and noteworthy. Nowhere else in the picture do those lines occur. It leaves the question open as to whether it is an unfinished painting by Frans Hals and/or the hand and keg had been worked up by a different hand, such as one of his pupils.

APPENDIX

INSTRUMENTATION ETC

Microscopical analysis:

Samples were mounted on microscope slides with Arochlor 5442, a standard mounting medium with a refractive index of 1.66. Examination of the samples was carried out in transmitted light on a polarizing microscope. Cross-sections were prepared by embedding the samples in an epoxy resin (Buehler Epo-kwic), cutting and polishing. The samples were then examinded under the above mentioned microscope, this time in reflected light, at magnifications of 100x - 200x.

Scanning Electron Microscope (SEM) and X-ray fluorescence (XRF)

Individual pigment particles were viewed under the SEM which was equipped with an energy dispersive X-ray spectrometer allowing identification of the elements occuring in the pigments. The elements in the particles were detected by their characteristic fluorescent X-rays. The specific peaks in the X-ray spectrum were recorded on a graph.

Powder X-ray diffracton (XRD)

Samples were mounted on a glass rod with collodion and mounted in a X-ray diffraction camera. They were exposed to CuKa X-rays at 35 kV and 10mA for 20-24 hours.

X-radiography

The X-radiograph was taken with an exposure of 40kV for 50 seconds.

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1) BORENIUS, Tanceret "A new Frans Hals" The Burlington Magazine, No 357, Vol LXI, Dec 1932, pp 245 f

2) Date incribed in the lining canvas

3) VALENTINER, W.R. Frans Hals. des Meisters Gemalede
28 Band, 2. Auflage, Klassiker Der Kunst, Deutsche Verlags Anstalt Stuttgart, Berlin und Leipzig 1923, pp 114 - 118 ; 131 - 135

4) The group includes the following twelve works on canvas, all which are of about the same size:

LAUGHING FISHERBOY
Westphalia, Fuerst zu Bentheim und Steinfurt
on canvas 82 x 60.2 cm, signed on jug FHF
1627-30 (Slive), 1633-35 (Valentiner)
Slive notes that the landscape is related to the works of Pieter Molyn, Salomon van Ruysdael and Jan van Goyen

FISHERGIRL
Cinncinati, Cincinnati Art Museum (no 1946.92)
on canvas 76,8 x 63 cm, signed in keg FH
Rejected by Slive as border-line cases together with the Malle Babbe now at the Metropolitan Museum of Art, New York and the Fishergirl at the Wallraf-Richartz Museum in Cologne.

FISHERBOY
Antwerp, Musee Royal des Beaux-Arts (cat.1958 no. 188
on canvas 74 x 61 cm, signed in lower right FH
1630 (Slive)

FISHERBOY
Dublin, National Gallery of Ireland (cat. 1971 no.193)
on canvas 72 x 58 cm, signed in lower left FH
1630 (Slive)

so-called MULATTO
Leipzig, Museum der Bildenden Kuenste (cat. 1924 no. 1017)
on canvas 75,5 x 63,5 cm, signed in lower right corner FH
1628-30 (Slive) the catalogue entry mentions a trace of a date, possibly 1627

MALLE BABBE
Berlin-Dahlem, Staatliche Museen (cat. 1966 no. 801 C)
on canvas 75 x 64 cm
1630-33 (Slive)

MALLE BABBE
New York, Metropolitan Museum (cat. 1954 no. 71.76)
on canvas 73 x 58,5 cm, signed in lower right FH
attributed by Slive to a gifted follower of Hals

LEFT-HANDED VIOLINIST
Lugano, Thyssen-Bornemisza Collection (cat. 1969 no. 123)
on canvas 83,5 x 67 cm
1627-30 (Slive)
In the 1969 catalogue of the Thyssen Collection it is noted, that the landscape might be by another hand possibly Pieter Molyn

PEECKELHAERING
Cassel, Hessisches Landesmuseum (cat. 1958 no. 216)
on canvas 75 x 61,5 cm, signed at the right of sitter' shoulder

f.hals f.
1628-30 (Slive)
This painting might have been in the possesion of Jan Steen

MERRY DRINKER
Amsterdam, Rijksmuseum (cat. 1960 no. 1091)
on canvas 81 x 66,5 cm, signed at right FH
1628-30 (Slive)

FISHERGIRL
formerly the Brooklyn Museum, New York
on canvas 80,6 x 66,7 cm, signed on barrel FH
around 1630 (Slive)
Seymour Slive makes in his catalogue reference to an old report from a restorer who observed that the original size of the painting was preserved. Strings with which the painting originally had been streched were still present. This is of some interest as the painting under discussion shows the same features although the strings are no longer present.

MAN WITH A BEER KEG
Portland ME, Museum of Art
on canvas 83 x 66 cm
1630-33 (Slive)

5) SLIVE, Seymour Frans Hals 3 vols, Phadion Press, London, 1970

6) The painting is classified as a fake in his book on Hals . He notes that it had been done in an oil-resin medium. The paint is observed to have fallen off the picture which, in his view is due to a quick drying and hardening binding medium. This evidence, however, has to be read with care. His understanding of Hals' painting technique is not convincing.

7) GRIMM, Claus "Frans Hals und seine 'Schule'" Münchner Jahrbuch der Bildenden Kunst, Dritte Folge, XXII, 1971, pp 147 - 178, esp pp 175 ff

8) Data compiled from Slive's catalogue

9) They were in fact on quite bad terms, as there had been an arguement regarding a pupil of Judith's who had 'defected' to Frans Hals. She was, as one can anticipate not very pleased. The pupils were under contract and generally living in the master's house. The contracts were required by the guilds.

10) Bredius, A "Een conflict tussen Frans Hals en Judith Leyster" Oud Holland, XXXV, 1917, pp 71ff

11) Hofstede de Groot A Catalogue Raisonne of the Works of the most eminent Dutch Painters of the 17th Century London, 1910, pp 9 - 133

12) Moes Frans Hals. Sa Vie et son Oeuvre, Brussels, 1909

13) Hofstede de Groot op. cit.

14) Bode, W. Frans Hals. His Life and Work, Berlin, 1914

15) Valentiner op. cit.

16) Trivas The Paintings of Frans Hals, London, 1941

17) Gratama Frans Hals door W.D. Gratama, 'Oceanus' Den Haag, 1943

18) Slive op. cit.

19) Grimm Frans Hals. Entwicklung, Werkanalyse, Gesamtkatalog Berlin, 1972

20) Classici del' Arte no 76 Frans Hals, Milan, 1974

21) Valentiner op. cit. Introduction of 1921 in the 1923 edition p XIII

22) Kühn, Herman "Lead-Tin Yellow", Studies in Conservation, 13, (1968), pp 7 - 33

23) MILLS, J.S.
"The Gas-Chromatographic Examination of Paint Media. Part 1 Fatty Acid Composition and Identification of Dried Oil Films"
Studies in Conservation, 11, (1966), pp 92 ff

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"The Gas-Chromatographic Examination of Paint Media. Some Examples of Medium Identification in Paintings by Fatty Acid Analysis"
Conservation and Restoration of Pictorial Art. IIC Congress Lisbon 1972 ed. by Brommelle and Smith. London 1976

24) The guilds set rules regarding the width of the looms. The length of the warp is mentioned (kettingen). The width was measured in ells (roughly a yard). Each of the textile manufacturing towns and cities, however, had ells of different lenght. 100 ells from Leiden were 102.5 ells from Brabant and the ell from Antwerp was smaller than the one from Leiden. (Amsterdam and Leiden, however, had the same one). The width had to have a certain amount of threads per warp, ranging from 1000, 1200, 1400 to 1600.

25) POSTHUMUS, N.W De Geschiedenis van de Leidsche Lakenindustrie

Part 2 De Niewe Tijd (zestiende tot achttiende eeuw)
Martinus Nijhoff, S'Gravenhage, 1939

26) van de GRAAF, J.A Het de Mayerne Manuscript als Bron voor de Schildertechniek van de Barok, Utrecht, 1958

27) The scraping of ground layers is mentioned in treatises and was also practised to even out irregularities in the support. After a layer was thinned in this manner other layers would be applied. de Mayerne Ms. op. cit in Berger p. 103

28) A further indication is the absence of scalopping above the seam. Distortion of canvas occur in the 'bare' state before the ground is applied. The sizing and following application of ground fixes the scalopping in place. The sizing and/or ground on the strip must have been applied when the rest of the canvas was in a relaxed i.e. unstretched position. Generally, canvases were sawn together by joining the selvedged edges.

29) An explanation might be that the canvas was initially loosely stitched on the cut sides (i.e. the top and the bottom sides of the painting) to prevent the individual threads from fraying. Or perhaps, there was originally a second additional strip of canvas along the bottom, (similar to the top one) which was later removed leaving only the stitches.

30) De Mayerne describes how to mount the canvas on a (temporary) stretcher with a string or by attaching a strip of linnen before the ground is applied. De Mayerne MS p 141
Couches autour de la fiscelle, & le tendes bien fortes sur vn chassis, apres prenes du blanc ou gris, ou ochre ou quelque couleur que vous voudres destrempe, qui ait corps, comme le blanc de croye, destrempes vostre couleur auec de la colle

(size) [sic] & en frottes le derriere de vostre tableau auec vne broisse. Laisses seicher, cela tirera, & rendra vostre toile egualle, aussi longtemps que la couleur y sera. Si est besoing vous pourres y passer la couleur par 2 ou 3 fois, tant plus espaisse sera la couleur, tant plus elle aura de soustien, & tirera la toile dauantage.

MS p. 147 Artifice pour rauiner tableaus a destrempe, & les rendre equivalents a ceuxqui sont a huyle.
T. de Mayerne Inuenit. 1632.
... Apres seront ourles auec vne fisselle ou fortifies auec vn ruban cousu a l'entour, puis tendus sur vn chassis auec fisselle, & par le derriere auec vne grosse broisse... (323)

De Mayerne describes here how to mount the canvas before the sizing of the ground.

31) The relative amount of Si and K in the smalt ist higher in the sample taken in the addition above the join. (sample no 5)

32) BUTLER, Marigene "Portrait of a Lady by Frans Hals", Museum Studies 5,The Art Institute of Chicago, 1970, pp 7 - 21

33) SCHILLER, J.C.F. von Geschichte des Abfalls der Niederlande IV Band Bildersturm

34) although to my knowlege panel still remains the main support for Northern paintings in the 16th and 17th c.

35) Berger op. cit p XXXIV

36) MANDER, Karel van Den Grondt Der Edel Vry Schilderkunst transl. by Rudolf Hoecker, Nijhoff, 1915

37) Such as the study of the head of Stephanus Geraerdts. The painting itself is now in Antwerp and the preparatory drawing is listed in Valentiner's cataloque to be in the collectin of H.E ten Cate in Almelo.

38) AINSWORTH, Maryan Wynn Art and autoradiography: insight into the genesis of paintings by Rembrandt, Van Dyck and Vermeer Metropolitan Museum of Art, New York, 1982

39) Butler op. cit. In paintings clearly attributed to Frans Hals the speedy way of working with the brush an this wet-in-wet technique has been remarked upon.

40) GRIMM, Claus "St. Markus von Frans Hals" Maltechnik/Restauro, 1974 pp 21 - 31

41) BRACHTERT, Thomas and GRIMM, Claus "Ein Herrenbildnis des Frans Hals", Maltechnik/Restauro, 3, (1975) pp 148 - 151

42) Carel van Mander in his "Den Grondt Der Edel Vry Schilder-Const" in chapter xii.43 makes a reference to the use of smalt as a pigment:

> De smalten behoeven wel in te schieten hierom eenighe prickelen met naelden dicht hun penneelen om sulcx te ghenieten sommige bliessen cladtpapier en lieten die daer op ligghen waer mede sy haelden d'oly daer uyt en eenigh, ander maelden met Heulsaeds oly ander van ghelijcken ghebruycken Oly ghemaeckt met practijken.

Van Mander suggests to use smalt in a quick drying binding medium. He notes that some painters use needles to roughen the paint

surface. (probably the ground is ment here). It is suggested to remove the excessive binding medium with a blotting paper, which is layed on top

Smalt in an oil medium does behave awkwardly. From own expirience with this pigment, it was noted that it was difficult to achieve a smooth pigment paste upon grinding the smalt in linseed oil. The pigment did not stay suspended but sank in the medium instead.

43) Butler op. cit.

44) PLESTERS, Joyce "The Ground in Pictures", Museum, 21, 1968, p 262

45) Van Mander op. cit. XII.4

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1

F. Hals
Man w/ a Beer Mug
Portland ME
after treatment July 89

2

F. Hals
Man w/ a Beer Mug
Portland ME
Detail after treatment July 89

3

F. Hals TL 2P755
Portland

Macrograph 'dust worm'

4

F. Hals TL 2P755
Portland ME

Macrograph 'dust worm'

5

F. Hals
Man w/ a Beer Mug
Portland ME

detail
after treatment
July 89

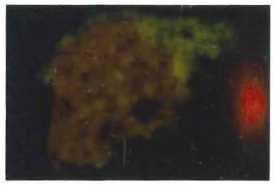
6

F. Hals

No. 8 (×20)
Landscape

7

F. Hals



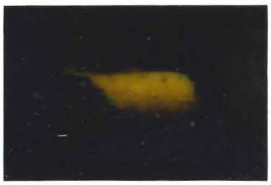
No 4 (×20)
Sky

8 F. Hals. 6.

No. 6. (×20)
Hat

9

F. Hals



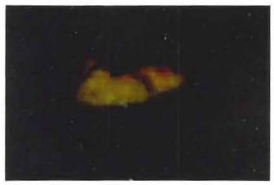
No. 9 (×20)
Orange in keg

10

No. 12 (×20)
Sleeve

11

F. HALS
Man with a Beer Keg.



Sample No 13 (×20)
Lip, cross-section

12 F. Hals

No. 20 ×20
Face (cheek) & mouth

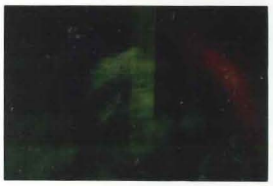
13

HALS, Frans TL 2P755
Man with a Beer Keg
Portland Museum Maine

x-ray

14

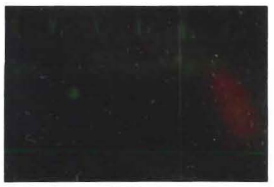
HALS, Frans TL 2P755
Man with a Beer Keg
Portland Museum Maine



x-ray det. of head

15

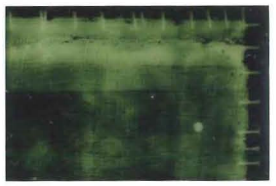
FRANS HALS
Man w/ a Beer Keg
Portland Mus. of Art



Detail face + shirt

16

Frans Hals TL 2P755
Man with a Beer Keg
Portland Museum Maine



x-ray upper right original canvas + painting strokes, + thick outline

17

Frans Hals
Man with a Beer Keg
Portland Museum Maine

Det. showing orig. stretching hole along left
×2 No 1

18

Frans Hals
Man with a Beer Keg
Portland Museum of Art

Det. showing stretching hole along left
×1 No 2

19

Frans Hals
Man with a Beer Keg
Portland Museum Maine

Det. showing orig. stretching hole part. filled in bp left corner ×1 No 3

20

Frans Hals
Man with a Beer Keg
Portland Museum of Art, Maine

Det of sky, across seam on bp showing consistent bp layer + craquelure of surface
×1
1/04