KNOW WHAT YOU SEE

The examination of paintings
by photo-optical techniques

Renaissance Society at the
University of Chicago
October 6 – November 7, 1970

Illinois Arts Council
1970 – 1971

Fair at Warmond, by Jan Steen
Private Collection

KNOW WHAT YOU SEE

An exhibition organized by Louis Pomerantz for The Renaissance Society at the University of Chicago, October 1970.

The Renaissance Society, founded in 1915, has brought the University of Chicago and the city, distinguished and original art of various periods.

The exhibition will be circulated by the Illinois Arts Council, an agency of the state, established in 1965 to bring "arts to the people." It was made possible by grants from the Council and from Ciba Corporation.

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Mrs. James R. Anderson, El Paso, Texas; Thomas G. Harris, Chicago; The Art Institute of Chicago, The Brooklyn Museum, Phyllis Kind Gallery, Chicago, the Estate of Mrs. Florence E. Dickerman, and to the many wonderful anonymous lenders.

I am deeply indebted to the following colleagues for their enthusiastic support and cooperation in supplying technical documents: Mrs. Susanne P. Sack, Brooklyn, New York; Charles C. Bridgman, Rochester, New York; Alfred Jakstas, Chicago; Linton Godown, Chicago; Sheldon Keck, Coopertown, New York; Nathan Stolow, Ottawa, Canada; Dr Herbert Pollack, Chicago; Madame Madeleine Hours, Paris, France, I am very grateful for the assistance of the many individual staff members of The Art Institute of Chicago, The Brooklyn Museum, The National Gallery of Art, Washington, D. C., and the Louvre Museum.

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My sincere thanks to the Illinois Arts Council, Mr. S. Leonard Pas, Jr., Director, and Mr. Don Baum, Director of Exhibitions, for their co-sponsorship of the exhibition. Through their support and planning, the exhibition will tour Illinois for the next year. My sincere thanks to the Renaissance Society and the University of Chicago for their enthusiastic reception and support. I know that Martyl Langsdorf, President of The Renaissance Society and Karin Rosenberg, Director of Exhibitions, join me wholeheartedly in these expressions of gratitude. Credit for the idea of such an exhibition goes to Martyl Langsdorf. To them I must express my own thanks for their help and enthusiasm and Mrs. Rosenberg's creative labors in preparation of the catalog. To their respective husbands and to my wife I express gratitude for the understanding they have shown.

In writing the text for the exhibition I have borrowed freely from the published works listed in the bibliography. However, responsibility for the statements made is mine alone.

Introduction

The exhibition "Know What You See" pays homage to an ideal shared by the artist, the scholar and the conservator: the revelation and preservation of the genuine in art. Hopefully, it will serve to remind us that reaching for this goal requires an open and inquiring mind.

The uninitiated should note that by carefully selecting case histories, the exhibition reflects only positive results, when in reality negative results are all too common. He should also bear in mind that equipment and techniques, no matter how sophisticated, only provide information, not answers. Often the information is unclear and requires interpretation. The validity of the results depends upon the accuracy of the interpretation. The techniques demonstrated in the show complement esthetic and historical criteria in the study and appreciation of paintings.

For those who view an exhibition of this kind for the first time, be forewarned: you may never again look at paintings in quite the same way. You may become aware of many reasons why a work of art possibly misrepresents the artist. You may understand more fully the many things that affect the appearance of paintings. You may begin to appreciate the limitations of the unaided, untrained eye, compared to the enlightened vision made possible with the aid of science and specialized photo-optical techniques. You may begin to question what you see, and in questioning reach out more often to touch the truth, to "know what you see."

No doubt there will be those who feel unhappy about such an exhibition, fearing the information revealed will cloud more minds than it will clear; will undermine public confidence in authority; will dangerously over-simplify things too complicated for the general public to grasp; and will spoil the simple joy of seeing.

To those who entertain such fears I admit some risk exists. But will our ideals be further advanced by maintaining walls of silence and islands of ignorance, or by building bridges and sharing knowledge?

By combining forces and pooling knowledge, the art historian and conservator can enhance the chances for success in separating facts from fancy. Hopefully, by preserving the integrity and natural continuity of art history, we can continue to learn from and build upon the past.

Louis Pomerantz
Conservator

Checklist of the Exhibition

Gerard David (Flemish, 1450/60-1523)

* *Madonna and Child*
Oil on wood panel, 6 7/8 x 5 1/4
Collection Thomas G. Harris, Chicago

Comparisons between genuine and false

1. Detail, Madonna's head before cleaning: The genuine cracks are crisp and form an all-over network. (Scale 8:1)
2. Unknown artist, fake 17th century Italian (?). The absence of age cracks in the face and the isolated cracks, obviously made by scoring the surface with a stylus, indicate a painting of modern origin. (Scale 8:1)
3. Detail, upper right section, genuine painting, before cleaning: At far right the grime and varnish have been removed; although the age cracks are still there, they are much less visible now. The overpainted white veil was removed in the cleaning process. (Scale 3:1)
4. Detail, upper half, fake painting: Most likely, an old, extensively damaged painting was used as a base for this modern fake. (Scale approximately 3:1)
5. Detail, age cracks in genuine painting, before cleaning: The white paint is seen as filling cracks, proof of a later addition. (Scale approximately 50:1)
6. Detail, fake 17th century painting: Outer edges of fake cracks are raised and rounded by the pressure of the stylus against the soft wax. (Scale approximately 50:1)

(Photographs by Linton Godown, Chicago)

Edgar Degas (French, 1834-1917)

* *Study of Dancer*
Pastel on paper, 12 1/4 x 9
Private collection

1. Page from *Vente Edgar Degas,* Volume II, *Catalogue des pastels et dessins par Edgar Degas et provinence de son atelier,* 3e Vente, Avril 1919. The value of photographic documentation cannot be overemphasized. Thanks to the photograph in the Degas estate sale catalogue, curator Harold Joachim was able to recognize it as a work of Degas which had been reworked.
2. Detail, (right side of page 129) Degas sale, 228-2e
3. Before treatment: Completely reworked to resemble a finished drawing.
4. Half-cleaned state: It was possible to remove the extensive layers of pastel pigment covering the original drawing with complete safety since the original pastel had been treated with a fixative before the forger reworked it.
5. After completion of cleaning: The drawing now matches the appearance of the photograph in the sale catalogue and is once again an authentic Degas pastel drawing.

*All artists' names and titles of works are as given by owners. All dimensions are in inches with height preceding width. Numbers in bold face indicate color transparencies and, unless otherwise specified, regular face indicates black and white photographs. Original works will be shown only at the Renaissance Society and will be replaced with color transparencies for the traveling portion of the exhibition. Photographs by Louis Pomerantz unless otherwise indicated. Asterisk marks works treated by Louis Pomerantz.

Edgar Degas, *Study of Dancer,* before treatment.

Edgar Degas, *Study of Dancer,* after treatment.

Felice Ficherelli (Italian, 1605-1669)
Judith, c. 1650
Oil on canvas, 38 3/4 x 39 3/4
Art Institute of Chicago, Charles H. and Mary F. S. Worcester Collection

1. Test cleaned areas reveal changes in composition indicated during preliminary examination.
2. Detail of heads, test cleaned.
3. Half-cleaned, revealing figure formerly overpainted.
4. Before treatment, ultraviolet photograph. The fluorescence pattern indicates the presence of repaint in the right-hand section.
5. Before treatment, infrared photograph: This reveals the figure of a woman below the discolored varnish.

(Treatment and photographs by Alfred Jakstas, Art Institute of Chicago)

Jean-Honoré Fragonard, (French, 1732-1806)
Portrait of Mlle. Marie-Catherine Colombe
Oil on canvas, 22 1/8 x 18 1/8
The Brooklyn Museum, lent by the estate of Mrs. Florence E. Dickerman.

Anonymous forger, (20th Century)
Copy of Fragonard Portrait of Mlle. Marie-Catherine Colombe
Oil on canvas, 22 7/8 x 20 3/4
The Brooklyn Museum, lent by the estate of Mrs. Florence E. Dickerman.

On the left, the original; on the right, the fake. Examination confirmed the contemporary nature of the fake. The paint film showed no signs of age cracks or drying cracks and reacted readily to very mild solvents which an old paint film would have resisted. The ground and paint film was composed of zinc-white, not yet used in Fragonard's life time. The canvas showed no natural signs of aging and the stretcher was stained to look old.

1. Radiograph of original painting. This shows the form of the design clearly indicating the use of white lead, proper for the period. Age cracks, damages, and irregular canvas weave are visible, common to the 18th century.
2. Radiograph of fake. This reveals only very faint traces of the painting's design; no cracks, no retouches and a very fine and evenly woven canvas.

(Photographs and radiographs by Mrs. Susanne Sack, The Brooklyn Museum.)

P. L. Harris (American, 19th Century)
* *Three Patten Daughters,* 1864
Oil on canvas, 41 3/4 x 34 1/8
Collection of Mrs. James R. Anderson, El Paso, Texas, daughter of the late Frank H. Philbrick

1. Partially cleaned, normal photograph
2. Same state, infrared photograph
3. Signature on rear, infrared photograph

This group portrait painting was wax-lined and cleaned in 1961. A preliminary examination revealed the presence of another painting below the visible design. Some of these forms are seen in the present painting as *pentimenti.*

Damiano Mazza (Italian, late 16th Century)
Allegory
Oil on canvas, 51 3/6 x 61 1/8
Art Institute of Chicago, Charles H. and Mary F. S. Worcester Collection

1. Before treatment: Note changes in color relationships where yellowed varnish is removed in test cleaning.
2. Detail, partly cleaned: The white areas along lower edge at left represent fillings of an old repair treatment.
3. Detail, partly cleaned.
4. After cleaning, before any inpainting. Compare with no. 1.
5. Detail, head of figure at left, half-cleaned.
6. Detail, normal light. Compare with no. 7.
7. Detail, infrared photograph: Reveals artist's preliminary drawing.

(Cleaning treatment performed by Louis Pomerantz. Photographs by Anton Konrad and L. P.)

"M. P." Monogram
Mary Magdalen and a Donor
Oil on canvas mounted on wood panel, 18 1/4 x 15 1/4
Private collection

1. **Master of Moulins** (French, active c. 1480-99)
Ste. Marie Madeleine et une donatrice
Painting on wood panel
Original in Louvre Museum, Paris
2. Detail, Master of Moulins painting, normal light
3. Detail, Master of Moulins painting, radiographic duplicate print: Reveals characteristic brushwork of the artist. The lack of overall density in the radiograph is typical of a glazing technique rather than direct painting. (Photographs, courtesy Laboratory of the Louvre Museum)
4. Radiograph of painting by "M. P.": Compare with radiographic print of the original for stylistic differences. (Radiograph by Dr. Herbert Pollack, Chicago)

5-6. Details, painting by "M. P." showing false crack patterns.

The presence of the artist's initials, "M. P.", in the lower left corner removes this painting from the realm of mischievous intent to deceive. However, the extensive false crack patterns, made with stylus, paint, or by rolling, misrepresent the painting's modern origins.

Harry Roseland (American)
The Blessing, 1905
Oil on canvas, 30 x 48
The Brooklyn Museum, gift of Mrs. Charles D. Ruwe

1. After treatment: wax-lining and cleaning.
2. Specular reflecting light photograph shows human figure.
3. Radiograph of entire painting shows head and racket of young man under figure of elderly man at left.
4. Detail of radiograph, lower section, viewed bottom edge up. Note head, flowers, drapery and hand, unrelated to visible painting.
5. Photomicrograph of cross-section of paint film embedded in a plastic medium which shows the many layers of paint in this structure, photographed through the microscope at 100x magnification. There are probably two complete and two incomplete paintings on this canvas. Only when it has been proven that the under painting is historically or monetarily more valuable is the visible painting ever removed.

Radiograph, courtesy Charles F. Bridgman, Eastman Kodak Company. Treatment and photographs by Mrs. Susanne P. Sack, The Brooklyn Museum.

Jan Steen (Dutch, 1626-79)
* *Fair at Warmond*
Oil on canvas, 44 x 71
Private collection

1-4. Progressive stages of cleaning.

5-8. Details of repainted female figure during cleaning.

The painting is documented here for the first time in its original state. The squatting figure in central foreground had been repainted to show her emptying a large jug of water. Since the repainting was over varnish covering age cracks, it was obviously not done by Jan Steen, but probably executed to suit the taste of a former owner.

(Inside cover photograph by EPS Studios, Evanston)

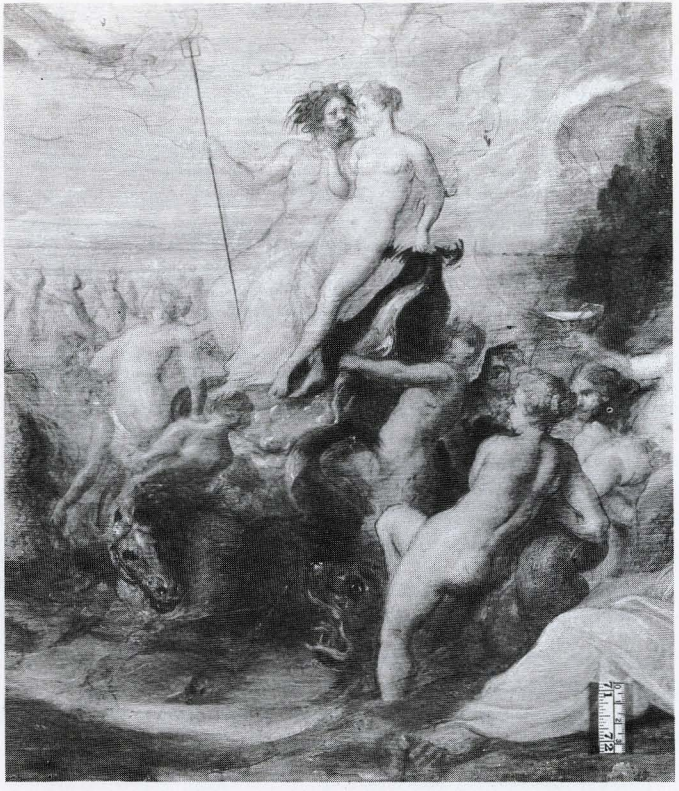
Hendrik van Balen (Flemish, 1575-1632)
* *Triumph of Neptune and Amphitrite*
Oil on wood panel, 21 1/2 x 30 1/16
Private collection

1. Half-cleaned
2. Detail, center, half-cleaned
3. Test-cleaned, normal photograph
4. Test-cleaned, infrared photograph
5. Detail, center test-cleaned, normal photograph
6. Detail, center test-cleaned, infrared photograph

This painting, by a contemporary of Rubens, represents an excellent subject for study by infrared photography, because the technique of painting is one of thin layers of oil glazes over a strong preliminary drawing.

(Photographs by EPS Studios and L. P.)

Hendrik van Balen, *Neptune and Amphitrite,* center section, normal photograph, before treatment.



Hendrik van Balen, *Neptune and Amphitrite,* center section, infrared photograph, before treatment.

* *George Washington on a White Charger (Jack)*

1. **Unknown Artist,** New York, c. 1830
   George Washington on a White Charger (Jack)
   Oil on wood panel, 38 1/8 x 29 3/8
   Original in National Gallery of Art, Washington D. C., gift of Edgar William and Bernice Chrysler Garbisch
   (Scale approximately 1:2)
2. Before treatment: A dense layer of grime and discolored varnish obscures the brilliance of the original colors below and hides darkened repaint in the waistline at left. (Scale 1:2)
3. Half-cleaned: The overpainted waistline is now visible at left. The oil paint film once matched the surrounding areas, but has gone through a normal darkening with age, one of a number of reasons why oil paint is considered undesirable as a retouching medium. (Scale 1:2)
4. Cleaned except for overpaint in waistline at left: Note the 'alligatoring' type of paint cracks in right foreground.. In final treatment these were inpainted to minimize their distracting effect. (Scale 1:2)
5. Detail, macrophotograph of partly removed overpaint: The darkened overpaint has filled in the age cracks. It was removed mechanically with sharp knives by fracturing the layer of overpaint while observing the work through the microscope. (Scale 2:1)

Transfer Treatment of a 15th Century Wood Panel Painting

1. **Alvise Vivarini** (Italian, 15th century)
   Portrait of a Man
   Oil on cradled wood panel, 17 7/8 x 12 7/8
   Original in The Brooklyn Museum, gift of Mrs. Watson B. Dickerman

   Detail of head before treatment shows buckling and flaking paint due to shrinking of wood support.
2. After completion of treatment. (Scale 1:2)
3. Reverse of paint film after removal of all material except the paint layers. Vivarini's preliminary drawing can be seen on the reverse of paint film (Scale 1:2)
4. Reverse of wood panel after removal of cradle (Scale 1:2)
5. Detail of preliminary drawing of nose and mouth on reverse side of paint film. (Scale 1:1)

(Treatment and photographs by Professor Sheldon Keck, Consultant Conservator, The Brooklyn Museum)

Crack Patterns and Their Meanings

1. Drying Cracks: A form of 'alligatoring' created by internal stress when drying rates differ in a multi-layered structure. The top layer or layers only are affected. This is a form of inherent vice or faulty craftsmanship. (Detail, 19th century American, oil on canvas, scale 3. 5:1)
2. Cleavage Cracks: The flexing of the canvas support, with changes in relative humidity, cannot be followed by a dry and brittle paint film, causing cleavage cracks. These cracks resulted in the eventual flaking of paint due to loss of adhesion. (Detail, Willem de Kooning, oil on canvas, scale 1.75:1)
3. 'Mud Cracks': Another form of paint cleavage. This oil paint film shows extensive cupping and flaking condition caused by the dimensional instability of an excessively thick layer of glue sizing reacting to extreme seasonal changes in relative humidity. The small rectangle at right indicates an area already treated with an adhesive. (Detail, Alexei Jawlensky, oil on paper board, scale 2:1)
4. 'Mud Cracks': The extreme cupping and flaking condition of the paint film was caused by an excessive amount of honey mixed with the paint originally to prevent embrittlement. Exposure to extreme fluctuations of relative humidity caused dimensional changes in the support and paint film, resulting in flaking paint. (Detail, Ben Shahn, tempera on paper on plywood, scale 5:1)
5. Drying Cracks: A form of 'alligatoring' with an irregular branch pattern mostly in thick areas. The artist had ignored the rule of painting "fat on lean." The cracks were formed largely by shrinkage of underpaint in drying, with subsequent fracturing of the lean, dried, upper paint layer. (Detail J.B.C: Corot, oil on wood panel, scale 3.5:1)
6. Sigmoid-type Cracks: These form a spider web or bull's eye pattern, caused by spot pressure. The pressure point is marked by a paint loss in the center. This is an example of mechanical damage. (Detail, 19th century American, oil on canvas, scale 3.5:1)
7. Most often this pattern of cracks is due to a combination of age, stress at each corner, as well as tensions exerted by the stretcher. (Detail, 19th century American, oil on canvas, scale 1.5:1)
8. Varnish stains trace the cracked paint on the rear of the canvas, indicating that cracks penetrate the entire film, including ground layer. (Detail, rear of no. 7)

Some Things Affecting the Appearance of Paintings

1. Ivan Albright, oil on canvas, detail: before treatment. Unvarnished painting showing grayish background pattern unrelated to original design, caused by exposure of the excessively lean paint film to high humidity and atmospheric impurities.
2. Ivan Albright, oil on canvas, detail: rear view of same area before treatment. The extreme porosity of the canvas priming has allowed the painting to stain through rear of canvas.
3. Ivan Albright, oil on canvas, detail: after treatment of the affected areas with a solution of diluted stand oil to compensate for the lack of sufficient binder in the paint. No inpainting was performed.
4. Berthe Morisot, oil on canvas, detail: blister-like textures resulting from faulty restoration treatment during lining procedure.
5. Pablo Picasso, oil and sand on canvas: grime removed in lower right.
6. Theodore Johnson, oil on canvas, detail: bloom on varnish film.
7. Theodore Johnson, oil on canvas, enlarged section of no. 6
8. Fernand Léger, oil on canvas, normal photograph.
9. Fernand Léger, oil on canvas, infrared photograph: clearly documents working method of artist, i. e. enlargement graph lines and brush stroke patterns. The latter shows blue areas painted on either side of black areas, rather than underneath.
10. Fernand Léger, oil on canvas, detail: white borax crystals can be seen growing out of blue paint.
11. Actual layer of discolored varnish removed from 19th century oil painting. The missing central area represents an actual paint loss and the brown paint surrounding it, retouches applied by a restorer. The retouching should have been confined to the area of loss alone.

Color Is How You Light It

Jordan Davies (American, born 1942)
Untitled, 1970
Acrylic on canvas, 22 x 22
Phyllis Kind Gallery, Chicago

A different "white" fluorescent lamp is installed on each side of the painting, top, bottom, left and right. As each in turn lights up, it causes visible changes in the color relationships in the painting which it frames.

"Different light producing sources have different effects on colors. Unless the color is in the light source, it cannot be seen in the object." *Color Is How You Light It,* Sylvania Lighting Center, Danvers, Mass.

The quality of illumination is an important factor to consider when viewing, judging or comparing works of art. It raises an interesting question regarding the literature of connoisseurship and art criticism. Under what conditions of light have these authors viewed and judged the works described? Was it by oil lamp, candle light, daylight, incandescent or fluorescent lamp? Should contemporary critics and scholars include a descriptive note on the quality of light when commenting on the subject of color?

Some Applications of Science in the Examination of Works of Art

1. Chronology Chart (courtesy of the Institut Royal du Patrimoine Artistique, Brussels) This chart shows the systematically arranged data regarding pigments found in works of art from earliest times to the present.
2. Application of X-ray macroprobe for determining pigment elements, e. g. copper, lead, iron, in layers of cross-section. Bluish-gray paint from Jan Lievens' *Job in Misery.*
3. Photomicrograph, ordinary light, Rembrandt's *Bathsheba.* The layered structure of the painting can be seen. Each layer can be identified to supply important data regarding problems in dating, artist's technique, repaint, etc. (Scale 160:1)
4. X-ray diffraction studies of Rembrandt and Lievens grounds.
5. Photomicrograph, ultraviolet light, Rembrandt's *Bathsheba.* The absorption and reflection characteristics of the various components found in the paint sample are a further aid to their identification in ultraviolet light.
6. X-ray spectographic laboratory, National Conservation Research Laboratory, National Gallery of Canada.
   a) X-ray generator; b) X-ray diffraction camera and goniometer; c) X-ray macroprobe and spectograph for analyzing layers of pigment in cross-sections; d) electronic panels and read-outs.

Photographs of paintings referred to are from the National Gallery of Canada and John Evans.

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