Detecting Art Fraud: Sometimes Scientific Examination Can Help

by J.M. Taylor

Art fraud is a major problem facing museums, conservation laboratories, dealers, collectors, and the police in Canada. The paintings shown in Figures 1 to 7 were attributed to such artists as Rembrandt, Rubens, Monet, van Gogh, Chagall, and Miró. None are genuine. All were offered to unsuspecting collectors in Canada at substantial prices — some for millions of dollars.

According to a recent article in *The Financial Post Magazine*, it is estimated that in 1990 Canadian collectors spent about $250,000,000 purchasing works of art.[1] Seasoned collectors generally purchase works from reputable art dealers, often from members of the Professional Art Dealers Association of Canada (PADAC). They do so after considerable study of the work and usually after obtaining a second opinion. Unfortunately, unsuspecting collectors purchase works at auctions or from private vendors — often for large sums — without doing any "curatorial footwork". They often accept the "certificates of authenticity" that accompany a work at face value.

When collectors becomes suspicious that an acquired work may not be genuine, it can be a very frustrating experience to establish the attribution. They may seek a second opinion from a well-qualified museum curator or art historian. Another option is to take the work to a dealer who is a member of PADAC. A third approach is to seek scientific assistance. In art fraud court cases, scientific evidence is often requested to corroborate expert testimony. As a result, in recent years the Analytical Research Services Division at CCI has received many requests from private collectors, and from the police, for help.

Figure 1. A Spring Landscape near Arles, *attributed to Vincent van Gogh.*

Unfortunately, inflated claims made in articles in the press have raised undue expectations of the role of scientific examination. Despite these claims, the fact of the matter is that a scientific examination can help only in certain instances. For a successful examination, scientists must be able to compare the materials in the work in question with a data base of information on materials known to have been used by the specific artist or to have been used during definite periods in history. This information is usually obtained by analyzing well-documented objects of known provenance.

At present, reliable reference information is available only for certain periods and for certain types of objects. For example, excellent chronological data is available on the traditional pigments used in European paintings from 1300 to 1900.[2] This is the result of years of research by various laboratories including the National Gallery in London, the National Gallery of Art and the Freer Gallery in Washington, the Mellon Institute in Pittsburgh, the Doerner-Institut in Munich, and CCI. CCI also has a substantial data base on Amerindian paints used north of the 49th parallel since 1800. As well, we have excellent data on North American church and trade silver of the 1750 to 1850 period.[3] Consequently, scientific examinations on objects falling within these categories generally yield useful information. Examinations of objects falling outside these categories are much less useful.

Examples of Scientific Examinations

One of CCI's services is to provide scientific assistance to the police with art fraud investigations.[4] Let us consider a few examples.

The painting shown in Figure 1, *A Spring Landscape near Arles*, bears the signature "Vincent" and was sold as the work of Vincent van Gogh (1853-1890). Although the canvas was old and correct for van Gogh's time, the paint was very soft and pliable — it had not fully dried. A survey analysis of the surface by x-ray spectroscopy indicated widespread presence of the element titanium (Ti) in white areas throughout the painting. A more detailed analysis of the white identified the pigment as a form of titanium dioxide white known as rutile.[5] This variety of the pigment was not available before 1938. Consequently, since the introduction of the pigment postdates van Gogh's death, the painting could not have been done by van Gogh.[6] When the painting was examined using infrared illumination, a second, earlier composition was found under the present image. In order to obtain an aged canvas, the forger had purchased an older painting and had painted *A Spring Landscape near Arles* over the original composition. This is one of the oldest "tricks of the trade" in the art fraud world.

The print shown in Figure 2, *The Gold Weigher (Jan Uytenbogaert, Receiver General)*, bears the etched plate inscription "Rembrandt, 1639" and was sold as the work of Rembrandt van Rijn (1606-1669). An examination of the work by David Tremain of CCI's Works on Paper Section showed that it had been done on a type of paper called "wove paper". Wove paper was not invented until 1757 — some 88 years after Rembrandt's death. A type of paper known as "laid paper", which can easily be distinguished from wove paper by a simple examination using a light box, was used during Rembrandt's

Figure 2. The Gold Weigher (Jan Uytenbogaert, Receiver General), *attributed to Rembrandt van Rijn.*

time. David also noted a number of other stylistic features that were characteristic of prints known to have been made from reworked plates subsequent to Rembrandt's death.

The painting shown in Figure 3, *The Little Jesus, St. John and Two Angels*, was attributed to Peter Paul Rubens (1577-1640) and was valued at many millions of dollars. It had been stolen in Edmonton in 1981 and, when it was recovered in 1989, it became the subject of an extensive police investigation.[7] The police asked CCI to examine the painting in an attempt to establish the date of execution. The analysis of small samples — each about the size of a typewriter period — from original areas showed that the pigments white lead, vermilion, lead antimonate (Naples) yellow, cadmium yellow, and barium sulphate had been used. When the pigment analyses from this painting were compared with the reference data available from European paintings, it was noted that cadmium-based pigments had not become commercially available until the 1840s, barium sulphate had been used in paints only since the early 19th century, and Naples yellow had its greatest popularity between 1750 and 1850. Accordingly, the painting cannot be attributed to Rubens.

Figure 3. The Little Jesus, St. John and Two Angels, *attributed to Peter Paul Rubens.*

The Impressionist-style painting *The Gardens of Luxembourg* (Figure 4), bears a signature "Claude Monet 1923", and was attributed to Monet (1840-1926). An examination of the lower left-hand corner, around the signature and date, revealed that this area had been altered. Using x-radiography and infrared photography, it was found that the original signature, but not the 1923 date, had been removed. A new layer of green paint, and subsequently the signature "Claude Monet", had been added. Although the original date had not been removed, it had been overpainted to match the colour of the new signature

Figure 4. The Gardens of Luxembourg, *attributed to Claude Monet.*

(Figure 5). In this example, the forger had obtained an Impressionist-style painting that could be considered in the style of Monet and had replaced the original artist's name with that of Monet. This is another old and oft-repeated "trick of the art fraud trade."

Figure 5. Infrared detail of signature of The Gardens of Luxembourg. *Note the difference in brushstroke patterns between original and added background, and the fact that the background has not been altered around the date.*

The paintings shown in Figures 6 and 7 were included among a suite of five similar works attributed to the artists Marc Chagall, Joan Miró, and Wassily Kandinsky that were the subject of an art fraud investigation. Little information on the materials and techniques of the artists had been published in 1986 when the work was performed. Consequently, we could not conclude whether the materials present were or were not characteristic of the three artists. Considering the paintings on an individual basis, the analytical data provided little assistance towards establishing attribution. This illustrates the limitation of scientific examinations, and demonstrates the need for reliable reference

Figure 6. Rainbow, *attributed to Marc Chagall.*

information on the materials and techniques used by artists at different periods.

However, in this case, we did notice that the medium used for all five paintings was the same: an alkyd resin commonly used for domestic paints and not frequently used by artists. Further, one of our staff had noted similar versions of the five paintings in catalogues of works by Chagall, Miró, and Kandinsky. This, combined with the fact that the same resin had been used for all the works, led us to believe that the paintings may have been copies made in a single studio. Additional analyses showed that the brown "stains" on the backs of the canvases were identical mixtures of iron oxide pigments in drying oils. The grounds were similar, and each of the canvases was attached to its stretcher with staples from

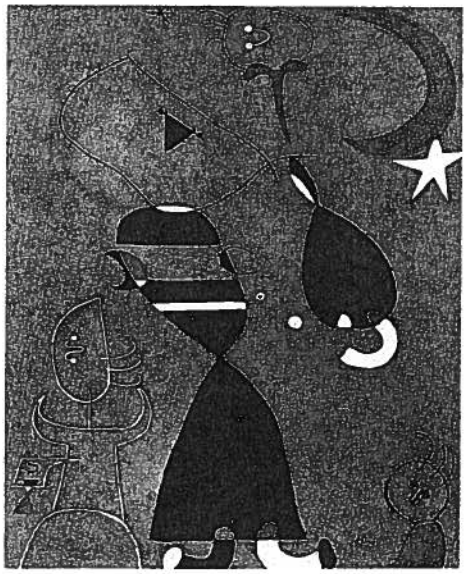

Figure 7. Moon and Stars, *attributed to Joan Miró.*

the back without tacks in the edges. The fact that the same materials and techniques had been used in a suite of five paintings alleged to have been painted by three different artists was considered quite unusual.[8] This information was useful to the Crown in obtaining a conviction.

Applications and Limitations of Scientific Examinations

These examples serve to illustrate the applications as well as some of the limitations of scientific examinations in art fraud investigations. In the cases of the "van Gogh" and "Rubens" paintings, we were able to compare the pigments used with a substantial analytical data base of reference information. The data enabled us to conclude that the works could not have been done by the suggested artists.

The "Chagall", "Miró", and "Kandinsky" examples illustrate the limitations. Very little information on the materials used by these artists has been published, and we were unable to compare the materials found in the paintings with materials known to have been used by the three artists. Accordingly, one of the clear limitations in performing scientific examinations on works of art is the lack of reference data, particularly on materials used by 20th-century artists. As a result, we are often unable to provide assistance in investigations of 20th-century works, particularly by Canadian artists. To address this problem, we initiated the Canadian Artists' Painting Materials Project in 1992.[9] Like the traditional artists' pigments project, it will take years to complete.

In the meantime, when purchasing a work of art, remember the old adage: Buyer Beware!

References

1. Damsell, K., "Missing Treasure," *The Financial Post Magazine* (April 1993), pp. 32-36.

2. See for example: Kühn, Herman, "Terminal Dates for Paintings Derived from Pigment Analysis," in W.J. Young, ed., *Application of Science in Examination of Works of Art*, Proceedings of the Seminar, 15-19 June 1970, Boston: Research Laboratory, Museum of Fine Arts, 1973, pp. 199-205; Feller, Robert L., ed., *Artists' Pigments: A Handbook of Their History and Characteristics*, vol. 1, Washington: National Gallery of Art, 1986; Gettens, Rutherford J. and George L. Stout, *Painting Materials: A Short Encyclopedia*, New York: Dove Publications, 1986.

3. Taylor, John, "A Warning: All That Glitters is Not Trade Silver," *CCI Newsletter*, no. 11 (April 1993), p. 13.

4. CCI provides scientific examination services in art fraud investigations to public institutions such as museums, galleries, and archives as well as to police agencies. Examinations can be undertaken for private collectors on a cost-recovery basis. For information, contact the author.

5. For further information on the techniques used at CCI to examine paintings and to analyze pigments, see Sirois, Jane, "X-ray Diffraction at CCI," *CCI Newsletter*, no. 8 (October 1991), pp. 4-6; Wainwright, Ian N.M., "Examination of Paintings by Physical and Chemical Methods," *Shared Responsibility: Proceedings of a Seminar for Curators and Conservators*, Ottawa: National Gallery of Canada, 1990, pp. 79-102.

6. For further information on this analysis, see Sirois, Jane in the above reference.

7. See for example *The Ottawa Citizen* or *The Edmonton Journal*, 2 August 1990.

8. For further information, see Warner, Glen, "The Truth About the Art of Forgery," *enRoute* (April 1988), pp. 40, 87.

9. Taylor, John M., "The Canadian Artists' Painting Materials Project," *CCI Newsletter*, no. 10 (September 1992), p. 8. ♦

Internships and Fellowships

In response to the diverse training requirements of the conservation community in Canada and abroad, the Canadian Conservation Institute offers Internship and Fellowship programs.

Internships are classified according to need, and comprise four distinct categories: curriculum internships, specialized technique internships, professional development internships, and conservation research internships.

The Fellowship program encompasses work in designated laboratories at CCI, as well as participation in CCI services to museums, galleries, and related institutions and associations throughout Canada (e.g., workshops, surveys).

The following individuals have recently participated or are currently involved in one of these programs at CCI.

Internships

Elke Beck, Student, Fachhochschule Köln, Köln, Germany. March 1 to September 30, 1993 (Curriculum Internship — Textiles Section).

Krystyna Spirydowicz, Assistant Professor of Artifacts Conservation, Art Conservation Program, Queen's University, Kingston, Ontario. March 22 to April 22, 1993 (Special Techniques Internship — Archaeology and Ethnology Sections).

Fellowships

The following people have begun the first year of their fellowship at CCI.

Laura Wardlaw, graduate of the Masters program in Art Conservation (Artifacts), Queen's University, Kingston, Ontario. Laura recently worked as a Conservator on contract at the Canadian Museum of Civilization, Hull, Quebec. April 1, 1993 to March 31, 1994 (Archaeology Section).

Diana Dicus, Objects Conservator, Pacific Regional Conservation Center, Bishop Museum, Honolulu, Hawaii. June 1, 1993 to March 31, 1994 (Ethnology Section).

Alison Murray, doctoral candidate, Conservation Science Program, Johns Hopkins University, Baltimore, Maryland. July 1, 1993 to March 31, 1994 (Analytical Research Services Division).

The following people have begun the second year of their fellowship at CCI.

Joan Marshall, graduate of the M.Sc. program in Textiles Conservation, University of Alberta, Edmonton, Alberta. April 1, 1993 to March 31, 1994 (Textiles Section).