The determination of art fraud and trafficking frequently relies on the ability to determine the difference in paint composition based on geographical origin and era of manufacture. It therefore follows that the same analytical techniques that are used for art restoration and historical investigations into artwork can also be used for forensic investigations into art fraud and trafficking.

Recently several famous artworks were stolen from a museum in the Netherlands, and later burned in an oven to cover up the theft [Ass. Press in Bucharest, 2013]. Through the use of analytical techniques, the burned ashes were determined to have come from several of the stolen paintings. The main objective of this project is to 1) develop an analysis protocol for art history and forensic purposes, 2) get a better understanding of paint pigments, binders and powders used by artists and 3) determine the author, the date of manufacture and the amount of non-original restoration. Although many research articles focus on the analysis of paints from art works, the advantage of this project lies in the combined use of a range of techniques as an analysis protocol. An understanding of the use and availability of materials used in paintings, their development and physical characteristics could aid in an investigation of unidentified paint samples. Identification of the individual components in the paint layer can provide valuable information into the materials and techniques used.

Several projects are currently underway with the Art Gallery of NSW. The first is the investigation and conservation treatment of an oil painting on oak panel of Henry VIII thought to date from about 1535 (Fig. 1). In addition to providing detailed information regarding the condition of the painting prior to conservation treatment, forensic analysis is being undertaken in an effort to establish physical similarities to the other panel paintings of the same subject in London. It is hoped that by studying this group of works that new findings will emerge regarding authorship and the artistic practice of portrait painting in the 1530s. The second project is looking at 20th century artist material, in particular with the use of metallic paints. The artists being investigated are paintings by Roy de Maistre (1894-1968), Ralph Balson (1890-1964), Eric Wilson (1911-1946) and Charles Conder (1868-1909) (Fig. 2).

Microsamples of paint have been prepared then investigated using a range of techniques, including Optical Microscopy, Scanning Electron Microscopy and microanalysis, x-ray mapping (XRM), Fourier Transform Infrared (FTIR) and Raman Spectroscopy. The combination of these techniques allows both the inorganic and organic composition of the paints to be determined, including the paint pigments used.

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Fig. 1: Anglo-Flemish workshop, Henry VIII, circa 1535. Oil on oak panel, 54.5 x 38.0 cm. Art Gallery of New South Wales. Purchased 1961.

Fig. 2: Charles Conder, An Impressionist (Tom Roberts), circa 1889. Oil and metallic paint on cedar panel, 28.5 x 23.4 cm. Art Gallery of New South Wales. Purchased with funds provided by the Art Gallery Society of New South Wales 1977.