The 26th Annual Gerry Hedley Student Symposium

COURTAULD INSTITUTE RESEARCH FORUM

Monday, 9 June 2008
9.30am - 6.00pm, Kenneth Clark Lecture Theatre (with registration from 9.00am)

SPEAKERS' ABSTRACTS

COURTAULD INSTITUTE OF ART

Jane McCree, Courtauld Institute of Art

Analysis of the Capabilities of a New Multi-Spectral Imaging Camera for the Study of Modern Paintings: Case Studies from the MoMA Collection, New York

A multi-spectral imaging (MSI) system using a standard commercial digital camera was designed by Rochester Institute of Technology for the Museum of Modern Art (MoMA), New York. The aim was to integrate the camera for day-today use by conservators and is based in the Conservation Department rather than a Science Department. The overall performance of the MSI system was evaluated by assessing the practical application of the camera, as well as colourmetric and spectral accuracy.

The advantages and limitations of MSI as a non-invasive technique for analysing 20th century paintings are evaluated using the results from the test boards and case studies. The case studies from the MoMA collection include works by Mark Rothko, Jackson Pollock and Lyubov Popova.

Initial investigations into painting technique and material identification utilised images taken in the visible, near infrared and UV regions of the spectrum using false colour. Improvements in the results were gained by the application of remote sensing image analysis techniques. This enabled the simultaneous analysis of sets of MSI from different parts of the electromagnetic spectrum. These techniques in conjunction with spectral and XRF data have shown promising results for characterising pixels both spatially and spectrally.

Rose Miller, Courtauld Institute of Art

An Investigation into the Materials and Techniques of John Sell Cotman's Paintings in Oil

28 oil paintings by John Sell Cotman (1782-1842), an artist renowned for his watercolours, were examined from the collections of Norwich Castle Museum and Gallery, Tate Britain, Leeds City Art Gallery, Manchester City Art Gallery, the National Museum and Gallery of Wales, the Fitzwilliam Museum and a private collection. Examination involved observations with and without a microscope and in ultraviolet and infrared light. Samples were taken on 24 paintings, followed by pigment and layer identification using light microscopy and SEM EDX. Staining tests were used as indications of oil, protein and gum content on some samples. Analysis on five paintings carried out at the Tate in 2000 was also included. 18 further paintings were included in research into supports, conservation history and related work in other media. A framework of technical knowledge was formed to aid the attribution and dating of 9 paintings. The techniques of his work in watercolour were discussed in comparison.

Laura Mills, Courtauld Institute of Art

Water-Sensitive Oil Paints: An Experimental Investigation Characterising the Causes of the Phenomena and Analysis of a Case Study Painting by Karel Appel

This study investigates the cause of water-sensitivity in well-bound, manufactured twentieth-century oil paints. Test films of seven pigments from three manufacturers were prepared with additions of metal stearates, aluminium hydroxide and fatty acids. Sensitivity was determined by swab rolling tests with water and saliva. Paints containing ultramarine, cadmium yellow and red were most sensitive with and without additives, before and after light ageing. Light ageing and additions of 2% or 5% metal stearates marginally increased the sensitivity. Analysis, carried out with FTIR, GCMS and SEM/EDX identified metal stearates in five unadulterated Talens paints and two Winsor & Newton paints. Phase separation was observed in ultramarine and cadmium paints. Stearates lost their dispersant function and aggregated upon drying and ageing. Les Animaux by Karel Appel was investigated alongside the paint films.

Emily Nieder, Courtauld Institute of Art

The Effects of Wax-Resin Lining and Varnishing on Historically Accurate Reconstructions of Van Gogh's Grounds

Wax-resin lining and varnishing in the style of J.C. Traas were performed on historically accurate reconstructions of Van Gogh's grounds prepared as part of the HART project, and the effects on colour change were analysed quantitatively and qualitatively. Ground layer composition influenced the degree of colour change: binding medium was found to be the most significant variable, followed by the size layer, the inert materials and the support. Application of the data to paintings in the Van Gogh Museum collection in an effort to assess how these paintings had been altered by treatment yielded inconclusive results.

Shelley Sims, Courtauld Institute of Art

Retouching Acrylic Emulsion Paintings: A Preliminary Investigation into the Suitability of Retouching Media

A preliminary investigation of several retouching media was carried out to determine their suitability in the treatment of acrylic emulsion paintings. Conservators were surveyed to ascertain the materials commonly employed and the practical issues encountered with this treatment. A selection of retouching materials were then submitted to natural and accelerated light aging and monitored for physical changes such as colour and gloss. The materials were also used in retouching treatments on mock acrylic emulsion paintings to compare their relative handling properties. Aquazol and Lascaux Water Resoluble Medium possessed the best potential for this application and suggestions for further research have been made.

HAMILTON KERR INSTITUTE, UNIVERSITY OF CAMBRIDGE

Andrea Kappes, Hamilton Kerr Institute

The Conservation of a Ruined Church-Painting: A Test Series for Appropriate Adhesive Materials

An oil painting on canvas, The *Holy Saints Wolfgang, Erasmus and Leonhart*, had many different damages and problems. These included mould infestation, flaking paint, many losses to the paint layer and large tears in the canvas. With the knowledge that the painting will be returned to a church with an uncontrolled climate and no maintenance once the conservation and restoration are complete, it is tempting to use materials that overcompensate. The aim was to find the most appropriate materials that would fulfil the requirements of the treatment, while minimizing the level of intervention.

After giving a short introduction I will talk about the problems of the painting and the aims we wanted to reach. After this I will talk about the treatment so far, including the most interesting series of tests to find appropriate materials. In the end I will give a short preview of the future restoration of the painting.

Christine Slottved Reelsbo, Hamilton Kerr Institute

Observations on the Complex History of a Religious Image: Examination and Treatment of a Fifteenth-Century Virgin and Child Panel Painting

The treatment and examination of a fifteenth-century Italian panel painting is discussed. Through predominantly non-destructive methods of examination, including X-ray and infrared photography, a greater understanding of the damaged and heavily restored panel's provenance was acquired. On the grounds of this research and the expert-advice from art historians and conservators it was possible to give the panel a likely attribution to the Italian painter, Gentile da Fabriano. The original appearance of the work is however obscured by an early adaptation of the panel into an icon. The implications of this adaptation for the choices related to restorative treatment are discussed. The panel received a full structural treatment as the substrate was badly worm-damaged, had severe splits throughout the length of the structure and was suffering from extensive delamination between ground and substrate. Materials used were Paraloid B72TM, Lascaux 4176TM (MFC), sturgeon

and rabbit-skin glue and Evo-stick Resin WTM with micro balloons and coconut-shell flour.

UNIVERSITY OF NORTHUMBRIA

Jennifer Bullock, University of Northumbria

An Investigation into the Use of Horsehair as a Material for Tear-Repair

This project has been centred on an investigation into the use of horsehair as a material for the repair of tears in canvas supports. Horsehair is an extremely strong fibre that when woven into a textile has been used as a fabric for furniture. The experiments have included measuring the tensile strength and breaking strength of horsehair to determine its suitability for use in the conservation of canvas paintings. These tensile properties of the horsehair have been measured using an Instron 3382 tensometer and by using Young's Modulus to quantify the obtained results. British Standards testing and the American Society for the Testing of Materials were used to obtain the standards for measuring tensile and breaking strength of similar fibres. The reaction of the hair to changes in RH and temperature are being measured and assessed. In order to understand the interaction of the hair with different adhesives used for tear repair, some of the experiments were done to determine if the adhesives weaken, strengthen, degrade, or change the tensile and breaking strength of the horsehair.

The most significant results gained from the testing were that the horsehair fibres behave like a polymer when subjected to stress. Because the horsehair is extremely strong, more tests will be required to ascertain if horsehair will be appropriate material for tear repair.

Elizabeth Courtney, University of Northumbria

A Report on the Conservation, Art Historical Research and Scientific Analysis of "Sheep in Yorkshire", painted in 1981 by Mary Fedden, with Particular Investigation into the Causes and Treatment of Cracking in the Paint Film

The project concerns the conservation treatment, scientific analysis and art historical research of *Sheep in Yorkshire*, painted in 1981 by Mary Fedden, which is part of a larger collection of her work in Trevelyan College, Durham. The main conservation concern was the severely cracked and cupped paint film. Discussion with the clients and visits to the site revealed that environmental conditions were not ideal, which may have contributed to the deterioration of the painting. In order that the conserved painting remain in a safe state on its return, the provision of a stable environment, through glazing and backing, became a priority. Scientific analysis focused on the identification of the paint media to gain a fuller understanding of the causes of cupping the paint layer. Art historical aspects of the research include an historical assessment of Mary Fedden's influences and influence.

Bettina Ebert, University of Northumbria

The Scientific Analysis and Conservation Treatment of Two Vietnamese Paintings

Portrait of the Artist's Wife and *Portrait of a Student*, two paintings from 1963 by Vietnamese artist Nguyen Trong Kiem, are discussed. The paintings required conservation treatment due to their fragile and severely deteriorated condition. Their technical examination and scientific analysis are elaborated upon in order to improve our understanding of the paintings' material composition and the causes of deterioration. Subsequently, extensive consolidation tests undertaken are evaluated with the aim of determining a suitable consolidant for matt paint surfaces. Initial conservation treatment, which is currently under way, is discussed.

Scott Fletcher, University of Northumbria

The Restoration and Conservation of a Twentieth-Century Oil Painting on Hardboard, with the Development of a New Auxiliary Support

This presentation will describe and discuss the restoration and conservation treatment of a twentieth-century oil painting on a hardboard primary support. The painting was broken into three large pieces with a collection of smaller fragments. With no recommended procedure for repairing broken hardboards, trials and tests were conducted to understand both the materials and techniques needed to piece the painting back together. The findings and results of the testing will be described, as well as detailing the design and development of a new auxiliary support for works of art on hardboard supports.

Natalie Richards, University of Northumbria

An Investigation into the Effects of Limonene on Aged Oil Paint Films

This presentation examines the feasibility of the use of limonene in conservation by determining the solvent's effect on aged oil paint films. Sample paint films of four different pigments were prepared using linseed oil and artificially aged, after which they were subjected to two different methods of solvent exposure. Data was collected which measured the mechanical and surface properties of the paint films. Possible changes in the physical and chemical nature of the surface of the films were tested using the scanning electron microscope and Fourier transfer infrared spectroscopy. Solvent extracts were analyzed using combined gas chromatography-mass spectrometry to identify any oil component extracts. Changes in weight, thickness, colour, and gloss were also measured. The amount of surface alteration, extracted oil components, and changes in weight, thickness, colour and gloss varied according to the pigment and duration of solvent exposure. The changes noted in the samples were comparable to those found with similar hydrocarbons, such as toluene. The results of this preliminary study will hopefully be used as a basis for further study into the potential uses for limonene as a substitute for solvents whose use carries significant health and environmental concerns.