Canadian Conservation Institute

6

Editorial

This issue includes a message from the Director regarding progress with development of new facilities for the Institute and of regional advisory committees and their activities. Mr. Dix, Regional Director of the Pacific Conservation Centre, has contributed an outline of progress; we hope to include a report from Mr. Roche, Regional Director, Atlantic, in a future issue. Conservation Queries, a regular feature, is included; Mr. Guldbeck will be taking care of this column in future. He has been busy in past months lecturing at Algonquin College, Ottawa, the University of Texas, and attending a seminar at St. John's, Newfoundland, in addition to his normal work programme. Travel for other members of staff has included Mr. Wainwright's attendance at a microscopy course in Chicago, Mr. Bokman's visit to Cologne, London and Brussels and my journey to Rome, Paris and London. Both Mr. Bokman and I studied equipment and documentation systems in other institutions.

R. D. HARLEY

From the Director

New Building, C.C.I. Headquarters

At last C.C.I. will have a new building for its headquarters operations in Ottawa. Occupancy is expected in early summer of this year. Treasury Board approval was granted in September 1974 to lease on long term a new structure at the intersection of Innes Road and St. Laurent Boulevard, in the east-central section of Ottawa. This building has been designed by the Ottawa Architects, Schoeler, Heaton and Co., in collaboration with the Department of Public Works, the C.C.I. and the Director of Building Planning of National Museums of Canada.

The new conservation centre has a total of 65,000 square feet of usable space in a bright, well-designed structure which will accommodate all the essential headquarters activities. These include administrative, specialized consultant conservation services in fine art, decorative arts, ethnology, archaeology, artistic and historic works on paper, historical artifacts, conservation research, analytical services, environment and deterioration studies, exhibition conservation research, scientific documentation, library, the training programme class rooms, seminar and lecturing facilities, exhibition centre for conservation, photography, radiography, microscopy, computer facilities, scanning electron microscope, test chambers and technical workshops for all activities. The building will be humidity-controlled between 35 and 55% relative humidity, the latter representing the norm for the summer period. Provision is made for indoor handling of vehicles. Precious objects entrusted to C.C.I. for examination and treatment will be kept under secure, safe conditions, normally in specially designed vaults.

The new building for C.C.I. arrives after months of negotiation with various federal authorities and results from the particular interests of the Secretary-General to advance conservation programmes in Canada. Further progress reports will be issued in the months ahead concerning this most important development in Canadian conservation.

C.C.I. headquarters building during construction – exterior (Photo: W. Bokman)

L'édifice de l'administration centrale de l'I.C.C. en construction – extérieur

Regional Advisory Committees

At present there are two established satellites of C.C.I., the Pacific Conservation Centre in Vancouver, B.C., and the Atlantic Conservation Centre in Moncton, N.B. Mr. Ursus Dix is Regional Director for Vancouver, and Mr. Roger Roche for Moncton. Both centres are now operational, being equipped with the most modern facilities for examining and conserving works of art, archaeology, ethnology, and paper. According to established policy, an advisory committee is appointed for each of the regional centres of C.C.I. (This year action will be taken to start up committees and centres for Quebec, the Prairies and Ontario.) The members for these committees are prominent in museum and educational institutions fostering the preservation of the cultural patrimony. At the meetings, usually quarterly, conservation priorities are discussed and recommended based on surveys carried out by C.C.I. experts. In this manner each centre develops a work programme based on regional needs. Our surveys have revealed the vast extent of conservation required for the east and west coasts alone,

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measured in thousands of man-years as reported in Newsletter 2, January, 1974. C.C.I. assistance through regional centres has not arrived too late! In addition to their efforts in supplying conservation services, the Regional Directors will organize seminars and related training activities in co-operation with museums, art galleries and universities.

Advisory Committee Members 1975

Atlantic Region

Prof. Ghislain Clermont – Département d'Arts visuels, Université de Moncton, Moncton, N.B.; Dr. C. Bruce Fergusson – Provincial Archivist, Public Archives of Nova Scotia, Halifax, N.S.; Mr. F. Burnham Gill – Provincial Archivist, Department of Tourism, St. John's, Nfld.; Mr. Keith Ingersoll–Director, The New Brunswick Museum, Saint John, N.B.; Mr. Niels W. Jannasch – Curator, Marine History, Nova Scotia Museum, Halifax, N.S.; Mr. F. L. Vallis – Historic Sites Chief, Newfoundland Museum, St. John's, Nfld.; Mr. David A. Webber – General Manager, Historical Settlement, Kings Landing, Fredericton, N.B.; Dr. Moncrieff Williamson – Director, Confederation Art Gallery and Museum, Charlottetown, P.E.I.; Dr. N. Stolow – Director, Canadian Conservation Institute, Ottawa, Ont.; Mr. Roger Roche, Regional Director, Atlantic Conservation Centre, Moncton, N.B. (Secretary).

Pacific Region

Prof. Michael Ames – Director Museum of Anthropology, University of British Columbia, Vancouver, B.C.; Mr. Colin D. Graham – Director Emeritus, The Art Gallery of Greater Victoria, Victoria, B.C.; Mr. C. W. Jones – President, The Fraser-Fort George Museum Society, Prince George, B.C.; Prof. George Knox – Professor and Head, Department of Fine Arts, The University of British Columbia, Vancouver, B.C.; Mr. John E. Kyte – Provincial Museums Advisor, British Columbia Provincial Museum, Victoria, B.C.; Mr. J. R. Longstaffe – Vice-President, Canadian Forest Products Ltd., Vancouver, B.C.; Mr. R. Lynn Ogden – City Archivist, City of Vancouver Archives, Vancouver, B.C.; Mrs. Doris Shadbolt – Associate Director, The Vancouver Art Gallery, Vancouver, B.C.; Mr. Philip R. Ward – Chief Conservator, British Columbia Provincial Museum, Victoria, B.C.; Dr. N. Stolow, Director, Canadian Conservation Institute, Ottawa, Ont.; Mr. Ursus Dix, Regional Director, Pacific Conservation Centre, Vancouver, B.C. (Secretary).

N. STOLOW

'Standing Nude', oil study by Robert Harris, badly cracked owing to the canvas having been rolled paint layer inwards, photographed before treatment. (Photo: John Evans)

«Nue debout» étude de Robert Harris, huile sur toile, craquelures accentuées dues à l'enroulement de la toile dans le sens de la couche picturale, photographie avant le traitement.

Pacific Conservation Centre - Progress

The Pacific Conservation Centre of the Canadian Conservation Institute has reached a stage where active conservation on paintings and works of art on paper can begin. Until now the small staff has been busy setting up the equipment and collecting the materials needed in a modern conservation laboratory. The interior of Room 403 in the old Federal Building in Vancouver's bustling Granville Street had to be changed considerably to accommodate our various requirements. Partitions were erected to separate the paper conservation studio and other clean areas from the general workrooms; a photographic darkroom and studio were created; plumbing and electricity had to be installed; and the work areas and offices were redecorated. Laboratory benches, work tables, sinks, a fume hood and varnish spray booth were ordered, offices were furnished and tool cabinets stocked. The purchase of standard solvents and chemicals presented no difficulties, but many of the materials used in conservation are not readily available from any but a few specialist firms and much time was spent tracking these down.

Specialists from C.C.I. Headquarters contributed to the establishment of various facilities by advising, ordering equipment and seeing it installed and tested. Some pilot projects had already been through our hands by August: the repair of a minor tear on a still life painting by Goodrich Roberts for the Vancouver Art Gallery, the examination of an exhibition of drawings circulated by the National Gallery, and the examination of two portraits and several watercolours for the Public Archives of Canada. Further items such as a Nootka transformation mask purchased by the National Museums of Canada, an 18th-century Crucifixion from All Saints Church, Vernon, and a number of book-plates from Maltwood Museum, Victoria, are currently undergoing treatment. However, the majority of works waiting for treatment were brought to the Centre by B.C. museums in response to a letter sent to a few institutions prior to the formal decision by the Regional Advisory Committee. The objects were chosen from those examined briefly during last year's Pacific Region Survey. The choice was discussed with the institutions concerned, and was limited to paintings and works of art on paper on account of the present small staff.

Planning and installation of facilities will continue while the first projects are being treated. Already requests for services are being received from institutions which were not even included in the 1973 Pacific Region Survey. C.C.I. conservators will be very busy indeed for the foreseeable future.

URSUS DIX

Conservation Queries

● *I have heard about a glue marketed in California that sells for about thirty dollars and matches the refractive index of glass. What is the name of this glue and from whom may it be obtained?*

The product to which you refer was mentioned in the correspondence section of *Studies in Conservation,* August 1972, by H. Brinch Madsen. The adhesive is called UV-57 and is manufactured by:
Opticon Chemical
P.O. Box 2445
Palos Verdes Peninsula
California 90274, U.S.A.
It is a single component, photosensitive synthetic resin adhesive which is soluble in acetone.

If this does not meet your needs you might write to:
Epoxy Technology Incorporated
Grave Street
Watertown, Mass., U.S.A.
They supply a product, 'Epo-tek 301', a two compound, low temperature curing adhesive which is also optically transparent. I am not certain about its reversibility.

No one here has had any experience with either adhesive, so we cannot make specific recommendations. In any case, I would suggest testing these two adhesives to see if they fit your requirements.

● *I am interested in a book which explains the methods and materials of painters.*

There are several sources that can help you find the information you require. *Painting Materials* by R. J. Gettens and G. L. Stout (Dover, New York, 1966) gives information in encyclopaedia form about painters' materials from ancient times to the present. An excellent up-to-date guide to studio techniques and materials is found in Reed Kay's book *The Painter's Companion* (Doubleday, Garden City, 1972). *The Artist's Handbook of Materials and Techniques* by Ralph Mayer (The Viking Press, New York, 1957) describes tools, methods and materials used by artists and includes many practical sections.

The first two books are available in paperback editions.

'Standing Nude' by Robert Harris after the relining process at C.C.I. Before and after treatment photographs by courtesy of the Confederation Art Gallery and Museum, Charlottetown, P.E.I. (Photo: John Evans)

«Nue debout» de Robert Harris, après le rentoilage de l'oeuvre à l'I.C.C. Photographies avant et après le traitement avec la gracieuse permission de la Galerie de la Confédération, Charlottetown, Î.-P.-É.

New Information

In Newsletter #2 the Conservation Queries section included information about obtaining ultra-violet absorbing tube filters for fluorescent lights. Since then the price has risen considerably. On checking with the Commercial Plastic and Supply Company, 1127 New Market Street, Ottawa, tel (613) 745-7043, Mr. Alex Farmer the branch manager said that he would be pleased to give a 'museum discount' to those who qualify for it. This would be about 10% on tube filters, retail price $104.52 for two dozen 48" tubes. A discount is also offered on UF-1 Plexiglass which can be purchased for about $2.50/sq. ft., including cutting. Please take into account the fact that any prices quoted in 'Conservation Queries' are those current about two months before the Newsletter appears in print.

RUSTIN LEVENSON

Problems Connected with the Cleaning of Drawings

Drawings come in a variety of forms. They can be fine artwork on paper such as finished works in pastel, watercolour, or studies for a larger composition. Historically a drawing can be the base for an architectural layout, a topographical survey, or a colonial artist's first impression of the flora and fauna of a new land. The drawing can be coloured, a monotone with a variety of media such as ink, chalk, charcoal or pencil, but in almost all cases the support for these designs is paper.

In this article we are concerned mainly with the category of fine art on paper. It is not intended to go into detailed problems of each specific medium or a precise account of their deterioration – this may follow step by step in a series. The intention is to give general information on the problems that face the person who attempts to tackle the restoration treatment of a drawing, be it in pencil or a fully completed watercolour. From the outset the delicacy of the materials that form the work create the criteria for making a decision as to how the work is handled. Adequate photographs of the picture should be taken; this should be done exactly as the conservator or technician receives it, just after unwrapping, framed or otherwise. For record purposes photographic documentation of the work should continue throughout its treatment.

Once removed from the wrapping and frame, drawings, particularly those belonging to a collection, are generally encased in a mat. The portion of the mat may be lightly hinged over the work or pasted solid to the backboard along the edges outside the area of the work. In this case, removal of the front portion must be done with care, as it is difficult to assess just how much adhesive has been applied. Another point is that random spots of adhesive can be found extremely close to the edge of the work so that as the front portion is lifted away, the mechanical effect of the adhesive will pull the surface of the backboard along with it. If this is too close to the edge of the work itself, it could result in a tear at the edge of the

Example of careless removal of the front part of a mat (J.W. Lewin)

Partie antérieure d'un passe-partout enlevée à la hâte (J.W. Lewin)

drawings. An example of careless mat removal is illustrated; there it can be seen that the edges of the work have been badly damaged and some previous attempt at repairing the edge loss is clearly shown. Having removed the front portion of the mat, we are often left with a drawing laid down completely on to the background where the remains of the adhesive left by the front portion are clearly evident (see illustration). This watercolour by Copley Fielding will now have to be removed from the backboard by anchoring the work face down and carefully pulling away the board piece by piece, usually with a scalpel, and sometimes dampening the area with a cotton wool swab. Depending on the solubility and age of the work, warm water may be used for dampening, along with some wetting agent or combinations of water and alcohol.

After removal of the board, all adhesive and accretion should be removed as far as possible. If this is not done old material which is allowed to adhere could in time cause deterioration, even after treatment.

At this stage the work of art is now stripped down completely as at the time of its execution, that is, simply the design and support. The principles which govern the cleaning of a drawing or watercolour can at times be complex, and, before embarking on any treatment, one should discuss all intended manoeuvres with the curator or custodian who has final responsibility.

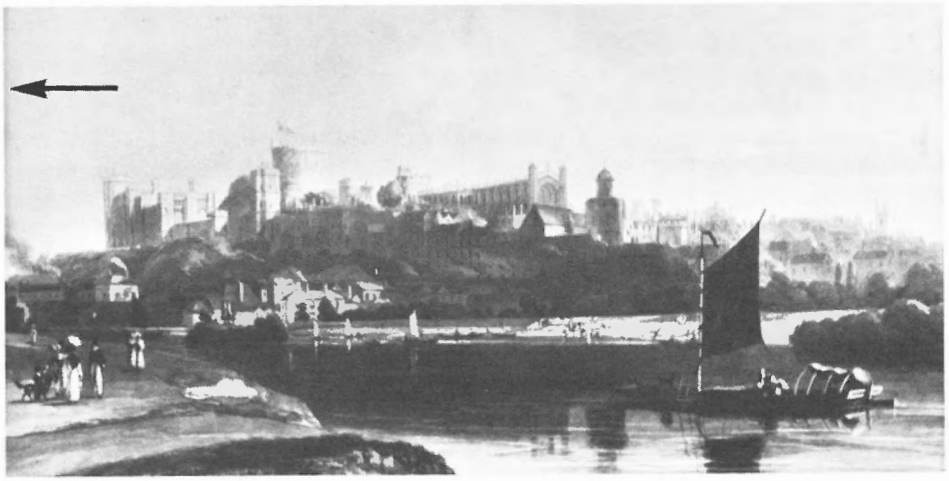
Invariably if a watercolour has been exhibited in such a way that the mat aperture has been allowed to lie slightly over the edge of the work the protection of that narrow strip from harmful light rays afforded by the mat board means that strip may be the only area that has not faded, so it gives some indication of the original value and intensity of some of the colours. The left-hand side of the detail illustration of the G. den Hengst is an example of this phenomenon. Alternatively, however, a poor quality mat board can transfer some of its own oxidation staining to the edge of the work as is shown in the illustration of a coloured aquatint by Paul Sandby. Furthermore, maintaining the importance of original intensities and balanced cleaning, we come to an important problem when cleaning watercolours and one that probably should be resolved by the scholar responsible for the work. In the pure watercolour technique, that is, colour applied in thin transparent washes, the tonal value of the paper is used for the highest lights in the composition as well as a luminescent base to hues and other values. As the watercolour is set by the artist to reflect a certain mood or atmosphere at the time of its execution, there exists between the paper tone and the design covering it a specific ratio. As time passes, both the colour and the paper are exposed to an equal amount of degrading factors, such as oxidation, UV exposure, temperature and humidity variations, so that after a number of years only these natural causes have interfered with that original ratio in the work resulting in a uniform degradation. Now the problem arises that, although discolouration due to deterioration may have changed the artist's original conception, it nevertheless remains that there has been no unnatural interference.

Although it is frequently very difficult for a restorer to assess the original paper tone it is nevertheless usual to attempt to remove the discolouration even though this means that the original ratio is upset, for ideally the medium itself, whether faded or not, is unchanged during this treatment. The reason the ratio is changed is that the optical appearance of coloured areas is likely to have changed where the paper tone reflects more light through them. The restorer relies very much on his experience and the expertise of the custodian in deciding the extent to which a watercolour should be cleaned.

Having made the decision to proceed with treatment we have to consider a number of facts separately. First the solubility of the drawing, whether it will stand immersion, require spraying or a gaseous method of cleaning. If immersion is selected one has to decide upon the solution to be used. If the medium is water soluble or contains accretions of undiluted body colour, aqueous solutions could be harmful. Variations of solu-

Aquatint by Paul Sandby showing oxidation stains at edges caused by mat

Aquateinte de Paul Sandby, dont les bords présentent des taches d'oxydation laissées par le passe-partout



tions containing water plus solvents such as methyl alcohol and acetone could cause loss with certain yellows and browns.

Deciding upon an adequate compound is only half the problem, for this now has to comply with the requirement of the paper support. Unlike other fields, such as easel paintings and panels, works of art on paper do not have the advantage of clearly defined stratification in their structure. Apart from the aesthetic requirements for cleaning the paper, the chemical and structural stability has to be considered. This is quite often where difficulties arise when working on drawings. The requirements for treating the paper may be limited or negated by the solubility of the design. Consequently the latitudes in which to work are considerably narrower when working on paper than on many other materials.

In this brief outline I have tried to describe some of the problems in general terms to help curators, who may not have a restorer specializing in drawings on their staff, be fully aware of the complications encountered in treatment. ROY GRAF

The pictures by Copley Fielding and Paul Sandby are reproduced by courtesy of the Art Gallery of New South Wales and that by J.W. Lewin by courtesy of the Mitchell Library, Sydney, Australia. The den Hengst is reproduced by courtesy of W. Bokman.

Petroleum Solvents

Petroleum solvents are used by conservators for a multitude of purposes. The choice of such solvents for conservation treatment is made difficult because of the confusion over nomenclature and the complex nature of the organic compounds themselves. However, the conservator can anticipate many properties of a petroleum solvent if he understands a few basic concepts and standard industrial designations.

Crude Petroleum

Petroleum is a complex and variable mixture of organic compounds of which two main types – saturated hydrocarbons and aromatic compounds – predominate. A solvent is produced when petroleum is separated into fractions by distillation. The behaviour of the solvent depends largely on two factors: the types of compounds it contains and its boiling range.

Boiling Ranges of Petroleum Solvents

The petroleum fractions used as solvents are classified according to their boiling ranges. In Canada, the low boiling fraction (20°C to 60°C) is properly termed petroleum ether. The fraction boiling between 60°C and 100°C is light naphtha. The general term naphtha can be used for solvents with boiling ranges up to 250°C.

The American Society for Testing and Materials (ASTM) has designated names for three classes of high boiling range petroleum solvents, all naphthas:

(a) petroleum spirits (also called mineral spirits) with a boiling range up to 210°C;

(b) Stoddard solvent with boiling characteristics close to the ordinary petroleum spirits;

(c) heavy petroleum spirits (also called heavy mineral spirits) which boils between 171°C and 251°C.

Very similar to Stoddard solvent is what the British term white spirit. It has a boiling range of 155°C to 210°C and may have an aromatic content of 16% to 20%.

Confusingly enough, solvents available on the market may not have specifications exactly coinciding with the standard specifications. For example, the solvent sold by Imperial Oil that is most similar to white spirit or Stoddard solvent is their Iosol 1520, a petroleum distillate boiling between 152°C and 202°C. This boiling range differs slightly from the specifications of Stoddard solvent, but it is the Imperial Oil equivalent.

Another petroleum solvent frequently encountered is V.M. & P. naphtha (Varnish Makers' and Painters' naphtha). Again, variations occur in the specifications quoted but a boiling range of 100°C to 140°C is commonly used.

Effect of Boiling Range on Solvent Properties

Petroleum solvents with a low boiling range evaporate more quickly than those with high boiling ranges. A slow evaporation rate can be an advantage to a conservator, as for example, where the slow swelling action of a relatively mild solvent is necessary. A faster evaporation rate is an advantage if a solvent is strong. In these cases there is a possibility that prolonged solvent contact could endanger original material.

In selecting a petroleum solvent it is preferable to choose one with a narrow boiling range. Even though distillation and possible subsequent chemical treatment removes many of the compounds present in the original crude petroleum, the various fractions that result are still mixtures of hydrocarbons. The narrower the boiling range, the more likely the solvent is to be a single compound. Thus the material which Fisher Scientific Company formerly sold under catalogue number B-264 had a boiling range of only two degrees (68° – 70°C) and was largely hexane. Hexane is the hydrocarbon C_6H_{14} which boils at 68.95°C. The advantage of using pure compounds is that one then knows exactly what one is using and can better control the results; the disadvantage is the higher price. Since the energy crisis, the moderately pure hexanes, such as the Fisher B-264, which are very useful to conservators, are being phased out of production. The price of purer hexane is quite high, one (Canlab HX-300-2) is currently priced at over $7.00 per litre.

Aromatic Content

Aromatics are compounds containing benzene rings; some, particularly the lower boiling ones, can change solvent action considerably, often in unanticipated ways. Thus, Ruhemann in *The Cleaning of Paintings* says, 'Benzene, although a good solvent for a number of materials, is not used in picture cleaning, partly because of its high toxicity, but mainly because when mixed with alcohol in certain proportions, instead of behaving as a diluent and reducing the solvent action of the alcohol, it actually increases it'. If aromatics are actually desired in a solvent, far better control can be achieved by starting with an aromatic-free solvent and adding a known aromatic to achieve the desired effect.

Solubility Parameters

Use may be made of solubility parameters when one is selecting solvents and developing solvent mixtures from pure components. Briefly, the solubility parameter is a measure of the energy required to separate solute or solvent molecules. Any solute such as a polymer is more likely to dissolve in a given solvent if their solubility parameters are similar. The informative book by Feller, Jones, and Stolow, *On Picture Varnishes and their Solvents,* contains a detailed description of the concept of solubility parameters.

Choosing Petroleum Solvents

Petroleum compounds can be used in many ways. They are solvents for certain waxes, greases and synthetic resins. Since petroleum solvents have little or no action on aged natural resin films, surface cleaning of paintings is often done with V.M. & P. naphtha or a hexane. This cleaning, in combination with soap and water will remove most surface accretions on an aged natural resin film. These solvents are also often used to dissolve excess wax after infusion of wooden artifacts or on lined paintings. Grease stains on paper can sometimes be softened and removed by petroleum solvents. Surface cleaning of gold leaf on a water soluble ground is often undertaken with petroleum solvents in place of water which might lift the gold leaf.

To choose the petroleum solvent one must consider whether a slow evaporation rate (low boiling range solvent) is desirable. A solvent of narrow boiling range is preferable, owing to the fact that it is likely to contain fewer impurities, for, as already mentioned, impurities, especially aromatic content, can produce undesirable results. Understanding solubility parameters can also help in choosing a petroleum solvent for a specific purpose. The usual caution in the use of solvents is imperative. Work should always be done in a well ventilated area for the protection of the conservator.

Useful References

R.L. Feller, E.H. Jones, N. Stolow, *On Picture Varnishes and their Solvents,* Cleveland and London, revised and enlarged edition, 1971. (Information on solubility parameters, solvent tables, use of solvents.)

R. J. Gettens, G. L. Stout, *Painting Materials: A Short Encyclopedia,* New York, 1966. (Excellent short encyclopedia of solvents.)

H. Ruhemann, *The Cleaning of Paintings: Problems and Potentialities,* London, 1968. (Information on the use of solvents.)

R.L. Feller, 'Solubility Parameter' *Bulletin IIC-AG,* 8 (1968), ii, 20–24.

C.M. Hansen, 'The Three Dimensional Solubility Parameter, Key to Paint Component Affinities: solvents, plasticizers, polymers, and resins', *Journal of Paint Technology,* 39 (1965), 104–117.

RUSTIN LEVENSON and K. J. MACLEOD

Mr. U. Dix, Regional Director, Pacific Conservation Centre, preparing a canvas for relining

Preparation d'une toile pour rentoilage par M. U. Dix, directeur régional du Centre de conservation du Pacifique

Personnel

Mrs. Mary-Lou Florian has joined staff at headquarters as Conservator, Biological Studies on Collections. Mr. Jaroslav John is Conservator, Decorative Arts and Ethnology, at the Atlantic Conservation Centre.

Mr. George Rogers, formerly Research Chemist, is now Consultant, Exhibition Conservation Research, at Ottawa, taking the place of Mr. Marriner who is taking up a post in the Department of Transport.

Mr. Holm has left to become Chief, Historic Resources Conservation, Parks Canada, Quebec. Ms. Levenson is now conservator of paintings at the National Gallery of Canada. Mr. Graf has left to follow his career as conservator of works of art on paper in England. Mr. Bosshard is returning to Switzerland to become head of the conservation department at the Swiss Institute of Art Research, Zurich.

R. D. HARLEY

Dr. Rosamond D. Harley is editor of the Newsletter.

The column Conservation Queries is prepared by Mr. Per Guldbeck to whom questions should be sent at the Canadian Conservation Institute National Museums of Canada. Ottawa K1A 0M8