

# Research in the Field of Conservation of Cultural Heritage at the French Ministry of Culture and Communication

Dr. Astrid Brandt-Grau

Ingénieur de recherche, Adjointe du Chef de la Mission de la recherche et de la technologie, Direction de l'administration générale, Ministère de la Culture et de la Communication, 3 rue de Valois F 75042 Paris Cedex 01, Phone: + 33 1 40 15 84 61, Fax:+ 33 1 40 15 83 84, E-mail : astrid.brandt@culture.gouv.fr

## 1. Frame

The research policy of the Ministry of Culture and Communication pursues the following objectives:

- contributing to the development of scientific and technical knowledge within the fields of its competence (archaeology, history of art, architecture, artistic creation, musicology, cultural sociology and economics, etc.);
- reinforcing, through applied research, the Ministry's missions to preserve, conserve and restore the national cultural heritage and to enhance its value;
- developing information tools (multimedia data banks, cultural statistics, scientific inventories, critical catalogues, specialized publications, etc.);
- facilitating decisions on cultural policy by supporting relevant studies in the social sciences.

Most of the resources required to carry out this policy come from the civil research and development budget (BCRD) allocated by the Ministry of Research. These resources are augmented by funds from the Ministry of Culture and Communication for institutions executing or supporting research and development activities.

Since 1992, an agreement between the Ministry of Culture and Communication and the National Centre for Scientific Research (CNRS) has led to the establishment of mixed research units to promote the exchange of personnel on joint research programmes and to ensure maximum use of the results.

The Research and Technology Mission coordinates, within the general administration of the Ministry of Culture and Communication, all the research resources and programmes (personnel, investment and functioning, programmes) and ensures that the best possible use is made of them.

A ministerial research council gives advice on the general orientation of the research policy of the Ministry of Culture and Communication and evaluates research activities as a whole. Since 1997 there have been two scientific committees within the ministerial research council, one for the analysis, conservation and restoration of cultural heritage and the other for electronic documentation and multimedia. These committees are responsible for preparing the work of the ministerial research council, for harmonizing programme orientations and for setting up their budgets each year. A working group is also concerned with urban cultural policies.

The Research and Technology Mission acts as the general secretariat of the ministerial research council, as well as that of the scientific committees. Each year it draws up a programme document, in collaboration with the various directors. This document gives a detailed analysis of the scientific projects being carried out by the services and other bodies

of the Ministry, ensuring that resources are properly coordinated and making an evaluation of the results. More information can be found on the web site of the Research and technology Mission (<http://www.culture.gouv.fr/culture/mrt/mrt.htm>).

## **2. Applied research to enhance knowledge and preservation of cultural heritage**

In the field of analysis, conservation and restoration of cultural heritage, emphasis has been put on the need to:

- establish joint research programmes;
- promote consultation between the participants in the network of conservation-restoration laboratories and centres in France and abroad;
- make the best use of research results and develop partnerships at European and international levels.

### **2.1 Joint research programmes**

The joint research programmes (Programmes collectifs de recherche, PCR) have a structuring effect on the scientific community. They are usually launched for a period of three years and may constitute a basis for future European programmes as well as make it possible for French partners to valorize their acquired capabilities.

The following fields have been identified for joint research programmes (PCR):

- the disinfecting of storage areas and objects;
- analysis of the alterations in ferrous metals and their stabilization;
- papers, water-marks and inks;
- conservation of audiovisual and electronic documents.

The first PCR dedicated to disinfecting of storage areas and objects, which brought together the laboratories of the National Centre for Scientific Research (CNRS), the National Museum of Natural History, the former ORSTOM (now IRD) and the pharmaceutical laboratories of the Universities of Reims and Montpellier has now been completed and was the subject of a symposium which presented the findings in 1998 (publication is undergoing).

The PCR concerned with the stabilization of ferrous metals, which was launched in 1998, brings together the following conservation laboratories and centres: the Arc'Antique laboratory of Nantes, the laboratory for metal archaeology (LAM) of Nancy, the laboratory of the museum of *Guiry en Vexin*, and the Institute for Research and Restoration in Archaeological and Paleometallurgy (IRRAP) of Compiègne. Research is carried out on the following subjects (publication is undergoing) :

- identifying the role played by chloride in active corrosion;
- identifying the kinetics of chloride extraction and of the corrosion threshold;
- improvement of methods for the diagnosis and evaluation of objects before and after treatment (condition survey, common terminology, damage-map);
- methods for stabilizing corrosion.

In 1999 a new PCR was launched on the subject of "Papers, water-marks and inks". This work is coordinated by a mixed research unit, CNRS-Ministry of Culture and Communication (UMR 171) of the French Museums Centre for Research and Restoration (C2RMF) in association with the Louvre Museum (Department of graphic arts), several CNRS laboratories (ITEM, IRHT, LRP, LADIR), the directorship of Archives of France (Archives of the department of Alpes Maritimes); the National Library of France, the Museum

of Decorative Arts, the Palais des Beaux Arts of Lille, the University of La Rochelle (LEMMA) and the National Museum of Modern Art (Georges Pompidou Centre).

The aim of this new programme is to advance knowledge in the analysis of paper and inks (origin, nature, state of conservation, understanding of the deterioration mechanisms, particularly of ferro-gallic inks). The following work has been undertaken during this programme:

- drawing up a reference work (thesaurus);
- identifying papers and physico-chemical characteristics;
- photography, radiography, betagraphy, digitizing and image treatment

The frame of a database on watermarks as well as on conservation of graphic arts has been developed by the department of graphic arts of the Louvre Museum and the ITEM laboratory of the CNRS. The research coordinated by the University of La Rochelle (LEMMA) led to the publication of a thesis work. This research is now implemented in a new PCR dedicated to ink corrosion on paper and parchment. The LEMMA laboratory has taken part in an European network in the field of ink corrosion.

A PCR on the conservation of audio-visual documents has been initiated in 1999. The emphasis will be on the material conservation of new audio-visual media (CD, CDR and DVD) and the long-term conservation of data (data migration, emulation, etc.). In this field, too, links will be established between the scientific committee on electronic documentation and multimedia of the ministerial research council. One of the projects is to establish a public consortium (GIP) dedicated to research and testing of these new materials. Research on an European level is highly recommended in this field.

Two new PCR have been recently added. One concerns the development of suitable methods for the conservation treatment of complex objects made from metal and wood or leather. It involves the Arc Antique Laboratory, the Arc Nucléart Laboratory and the Centre for Research into the Conservation of Graphic Documents (CRCDG). The other PCR has been set up to evaluate different methods for marking of art objects. This study is carried out by the National Testing Laboratory (LNE) on behalf of the Commission in charge of the inventory of art objects (Commission de récolement des oeuvres d'art).

One of the major joint research infra-structure is going to be built up by CEA for dating purposes (C14 / Mass Spectrometry). The Ministry of Culture and Communication together with the CNRS will participate in the research programmes for dating of archaeological assets as well as art objects in the National collections.

At present the Research and Technology Mission is consulting the French scientific community of laboratories (Ministry of Culture and Communication, CNRS, universities, research centres etc.) involved in the field of conservation science to build up a national research programme which will focus on the most relevant problems in the field. This programme should be supported by several ministries and research organizations. A Research group (GDR "CHIMART") supported by the CNRS and the Ministry of Culture and Communication is already existing.

## **2.2 Promoting consultation between personnel working in the conservation-restoration laboratories and centres of France**

The main central laboratories in the Parisian region involved in the research for the protection of cultural heritage are:

- Centre for research and Restoration of French Museums (C2RMF – UMR 171 of the CNRS)
- Historic Monuments' Research Laboratory (LRMH)

- Centre for Research into the Conservation of Graphic Documents (CRCDG – UMR 8573 of the CNRS).

Side by side with these central laboratories, a range of public and private centres were established in other French regions, often with the assistance from the Ministry of Culture and Communication. Some of these centres have scientific laboratories like the Interregional Centre for Heritage Conservation and Restoration (CICRP) in Marseille, the laboratory Arc'Antique in Nantes, the laboratory Arc Nucléart in Grenoble (which benefits from the infrastructure of the French atomic research organization (CEA)) and the Laboratory for Metal Archaeology (LAM) in Nancy.

Other centres are mainly dedicated to conservation and restoration. The Institute for Teaching of Art Conservators (IFROA) in Saint Denis, which is part of the National Institute of Cultural Heritage (INP), has also an internal laboratory as well as the new technical centre of the French National Library (BnF) in Marne-la-Vallée.

Regulated by different kinds of statute (public corporations, decentralized services, associations, companies) and different types of authorities (the State, local authorities, private enterprise), these centres are distributed throughout the country. They are concerned with most of the different specialized areas in the conservation-restoration of cultural heritage and some of them can conduct research in their fields of competence. For more information ask for the brochure "French Laboratories involved in the Research for the Conservation of Cultural Heritage", published by the Research and Technology Mission).

### **2.3 Making full use of the results and developing partnerships at the European and international levels**

It is indispensable to spread information about the results so that they can be made full use of by all those involved in conservation and restoration research. The new communication techniques, particularly Internet, can be used to improve exchanges and cooperation. One of the first examples is the web-site "Science et patrimoine culturel" which has been developed by the Research and Technology Mission:

<http://www.culture.gouv.fr/culture/conservation/fr/>

This web-site, which was set up in 1997 in cooperation with the National Institute of Cultural Heritage (former ENP, now INP) during a course organized in France by the International Centre for Conservation and Restoration of Museums (ICCROM), is composed of several sections providing information about the chief resource centres in the field of conservation and restoration. The main methods of analysis are described and the full text of certain technical reports are included, together with data banks, current scientific information and recent publications, as well as a yearbook indicating other servers in this field.

Recently a data bank has been added that gives the references to study reports and research undertaken in the analysis and conservation-restoration of cultural assets since 1996.

In 2001 an international course had been held at INP / IFROA "Sharing conservation science : vers un langage commun" This course had been supported by ICCROM, the Getty Institute, and the Ministry of Culture and Communication. Part of this course is on the web site of the Research and Technology Mission.

The Research and Technology Mission attaches great importance to the identification of technological application of certain research which has been carried out in analysis and conservation-restoration, in order to develop and market new products or services. An excellent example of this is the extension of the research carried out by the Laboratory for Research on Historic Monuments (LRMH) on the utilization of lasers in the cleaning of stone, thanks to the EUREKA "RESTOR" programme, co-financed by the Ministry of Culture and Communication, the Ministry of Research and the Ministry of Industry.

The Research and Technology Mission is the national contact point, together with the "Relais Culture Europe", for the theme "protection, conservation and exploitation of cultural assets" in the key action "City of Tomorrow and Cultural Heritage" of the 5<sup>th</sup> Framework Programme for Research and Development of the European Union.

In the 5<sup>th</sup> Framework programme of the European Commission , the main French central laboratories are involved in following European projects :

### ***C2RMF***

- ARTISTE (2000-2002) : development of a new information system for the management of multimedia data (XML),
- CRISATEL (2001-2004) : development of a new ultra-high definition camera for the gathering of UV and IR spectra,
- LABSTECH (2001-2004) : networking between European laboratories involved in the conservation science (exchange of best practices).

The C2RMF is also participating in a COST G8 network (2000-2004) on non invasive analytical methods.

### ***LRMH***

- BIOREINFORCE (2001-2003) : development and testing of a new method to consolidate stones by bio-mineralization,
- VIDRIO (2001-2004) : evaluation of the efficiency of the protection of stained window glasses,
- COMPASS (2001-2004) : development and testing of salt resistant mortars.

### ***CRCDG***

- LIDO (2000-2003) : evaluation of a new system to quantify the sensitivity of fragile art objects related to lighting and setting up of thresholds,
- IDAP(2001-2003) : characterization of parchment degradation