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Innovation in Preserving and Conserving Book Heritage

by ARMIDA BATORI

INTRODUCTION

The Istituto Centrale di Patologia del Libro (ICPL) is a branch of the Italian Ministry of Cultural Heritage and Activities whose work is chiefly concerned with research and specialized training in the conservation and restoration of library materials. The Institute was founded in 1938 during a truly propitious period for cultural heritage in general. It was in 1939, in fact, that Law No. 1089 - 'The Safeguarding of Articles of Artistic and Historic Interest' - was issued, and in the same year the Istituto Centrale di Restauro was established under the direction of Cesare Brandi.

The first steps towards a critical approach to restoration had already been taken in the course of the 1898 San Gallo conference, initiated by Cardinal Ehrle, prefect of the Vatican Library. This was the first event specifically dedicated to the conservation and restoration of manuscripts. The conference, which is today considered the historic juncture that launched the modern era of library materials restoration, had above all the merit of drawing attention to the causes of deterioration in manuscripts and the necessity to confirm the validity and efficacy through time of any restoration techniques employed. The role played by Cardinal Ehrle and the experience gained from the recovery of codices in the fire at the Biblioteca Nazionale of Turin in 1904 had drawn attention to the need to rationalize the restoration methods used, and to resolve the problems relating to them on the basis of carefully conducted experimental investigations. We owe Alfonso Gallo credit for having understood that the above mentioned experience could be extended, added to, and inserted into an interdisciplinary framework that anticipates the interaction of chemical, biological, physical and technological research. Gallo presented a proposal for the realization of an institute where this kind of activity and the fulfilment of these goals could be carried out to a commission nominated by the Accademia dei Lincei. The first laboratory set up according to the criteria proposed by Gallo was opened in 1929 in the Badia Greca of Grottaferrata, thereby constituting the first nucleus of the ICPL.

From its beginnings, the Institute, which is not merely a restoration workshop, but rather a research establishment, has represented a structure reflecting the interdisciplinary viewpoint from which it was created: in fact, the Institute is equipped with chemistry, biology, physics, research and book technology laboratories, plus a specialized library and museum. Training courses and international conferences and seminars (for updating and study purposes) are organized at the Institute, forming part of a programme aimed at

the evaluation and diffusion of knowledge on conservation and restoration in the library materials sector. The Institute collaborates in areas such as technical organization and the establishing of norms, in addition to acting as a highly active consultation body dedicated to finding solutions to conservation and restoration problems in Italian libraries. Shortly, the Institute will also activate a specialized training school, as foreseen by Article 9 of D.Lgs. 368/1998, and the recent DDL (26.7.02), with university examinations and those set by other bodies and institutions, both Italian and foreign. In a context such as the restoration of cultural heritage - in which Italy is seen a world leader - the Institute, in common with the Istituto Centrale di Restauro in Rome (with a special branch in Florence dealing with stone), is charged with the task of teaching restoration practice and setting quality standards which all other schools must meet in order to be recognized.

DRAMATIC EVENTS

The Institute, during the now elapsed 20th century, had to confront dramatic events such as the devastating fire at the *Biblioteca Nazionale* of Turin in 1904, the bombardments that occurred in the Second World War, and the disastrous flooding of Florence in 1966. These emergencies spurred research initiatives aimed at tackling the damage suffered by library collections, and identifying the most suitable methods to employ when seeking to salvage, or at least partially recover them. I recall in particular the research project that involved the Institute in Rome, the Biblioteca Nazionale of Turin, and the Department of Nuclear Physics at Milan's Polytechnic, which focused on experimentation aimed at the re-humidifying and stretching out of parchments, hence the recovery of hundreds of codices which, on account of the effects of fire, had conglutinated into solid blocks, contracted or become distorted, often with sheets stubbornly adhering to each other. The flood in Florence in 1966 caused very serious damage to that city's artistic and cultural heritage. Particularly badly hit was the *Biblioteca Nazionale* of Florence, situated close to the River Arno in one of the historic centre's lowest lying quarters: mud and water filled the library's storage spaces situated in the basement, ground and first floors of the building. Approximately one million volumes were damaged: books, manuscripts and newspapers had to be plucked from the mud and water, thanks above all to the commitment and efforts of librarians and the work of volunteers who arrived from all over the world to help. To the merit of Emanule Casamassima, at the time of the disaster the Director of the Biblioteca Nazionale, a rapid operation to dry out and disinfect soaked volumes was placed in action, in order to prevent the growth of mould that would have caused further damage to the flood affected material. A temporary laboratory was set up at the Forte Belvedere and the State Railway System heating plant in November 1966 (the time of the flood) for the restoration of flood damaged materials, and by April 1967 it was already possible to transfer this laboratory to the Biblioteca Nazionale. The work that needed to be carried out required a major organizational commitment and the training of specialized restorers; the need for the latter appeared to be particularly urgent.

Also, the necessity to provide the laboratory with an adequate structure for the restoration of seriously damaged materials on a large scale made itself particularly apparent: on this occasion the technical/scientific consultancy offered by the ICPL was fundamental, as was the contribution of foreign technicians for the professional training of restorers.

INTERNATIONAL COLLABORATION

At Florence, then, experience based on international collaboration came to a head. The indispensable need for careful planning is even more so the case today when tackling problems connected with conservation and restoration. The need to rationalize restoration systems and establish preliminaries for a concrete conservation and restoration policy based on unitary directives and shared principles resulted in 1979 in the publication by IFLA of a work titled *Principles of Conservation and Restoration in Libraries*, and one pays ever greater attention to international collaboration as an indispensable presupposition for rational planning when tackling problems of conservation and restoration. I want to mention the experience of Florence, and the debate arising from it, because the latest developments in the field of conservation and restoration are very closely linked:

- The Florence laboratory was organized as a 'system' within which the entire restoration cycle was carried out: its arrangement into specialized departments, each representing a fixed work phase, has meant that the restorer has been able to abandon a 'do it all' approach, and has highlighted the usefulness of planning a restoration intervention as a team, within which collaboration can take place with the interaction of different skills taking place.
- As part of this experience the awareness has developed that restoration essentially represents an opportunity to gain knowledge.

Not that long ago, the practice of library materials restoration was above all aimed at the conservation of the written message (i.e. text), frequently at the cost of another equally important message carried by the book:

in its material components - in other words, the book as a manufactured object, a particularly rich source of information relating to the history of material culture.

THE ARCHEOLOGY OF THE BOOK

One of the things that has shown itself to be a valuable original contributor to library materials restoration is the development of an archaeological approach to books that has rendered itself concrete in the establishment of a true discipline: the archaeology of the book. The archaeology of the book includes among its principal objectives the reconstruction of the material culture that presided at the time of the ancient book's manufacture. Interest in the study of the material components of a book as documentation of material culture has resulted in the development of a practice aimed at making a restoration intervention a moment when knowledge can be gained during which (in addition to routine restoration operations being carried out) details of these are recorded and data appertaining to the materials and structure of the restored object are registered as they are uncovered during the course of the restoration.

One of the most important initiatives carried out by the ICPL, as part of an archaeological approach to books, has been a project called CLEM - Censimento delle Legature Medievali Conservate nelle Biblioteche Italiane e Presso la Biblioteca Apostolica Vaticana (A Census of Medieval Bindings Kept in Italian Libraries and the Vatican Library). Medieval bindings are handmade objects that were produced between the 9th and 16th centuries; it is calculated that something like 20,000 are kept in Italian libraries, which makes them the most important patrimony of its kind known of till now, and evidence of a material culture closely tied to the world of book production. The 'Census' aimed to reveal the fundamental material, codicological and bibliographical characteristics of volumes, with photographic reproductions of bindings being made, the computerized archiving of all data gathered, the making of rubbings (frottis) of tooling on covers, and the codification of these last. The investigative research was carried out in all Italian libraries belonging to the State, in addition to private and ecclesiastical collections. The 'Census' is primarily an operation aimed at safeguarding cultural heritage: the objective is to create a data bank of images and record cards unique in the world, relating to cultural heritage frequently kept in poor conditions and deprived of specialized personnel qualified to take proper care of it and protect its integrity. The 'Census' requires that the condition of individual bindings is analysed, all components are photographed, and those responsible for the conservation of volumes are briefed on the peculiarities of the objects held under their guardianship. On this basis environmental, conservation and restoration interventions can be scheduled throughout the nation, in addition to initiatives aimed at the utilization and enjoyment of this patrimony which is still largely unknown to those not directly involved with the work. Around the 'Census' (which has already yielded more than 13,500 record cards) interest and appreciation have developed among the most prominent scholars and book historians internationally; furthermore, in the European sphere the 'Census' is playing a stimulating role, resulting in the activation and financing of analogous, parallel or correlated programmes, whether on the part of national governments or the European Community.

PRECIOUS DOCUMENTS

The ICPL has examined and carried out interventions on a great many precious documents from the time of its foundation in 1939 until the present day. Recently, one of the only two documents bearing the signature of St Francis of Assisi that has come down to us - *La Chartula di San Francesco* - was consigned to the experts at the Institute by those responsible for its safekeeping at the Sacro Convento of Assisi . The *Chartula* is a small rectangular sheet measuring 13cm x 6cm. It carries on one side the text of the Laudes Dei Altissimi, and on the other a benediction addressed to Frate Leone, a friend and preaching companion of the Saint. Frate Leone carried the *Chartula* (folded in four) in his pocket for 46 years (until his death in 1271). Following his death, the sheet was destined to become not only an object of worship, but also of study by philologists and palaeographers who wanted to understand to whom added lines (in red ink) on the parchment could be attributed. On this thin sheet of parchment the most advanced diagnostic technologies currently available have been applied with the aim of checking the current state of 'health' of the parchment and settling on eventual restoration treatments. The *Chartula* has been examined using a portable apparatus perfected by Landis in Catania, one of Southern Italy's National Laboratories (established by the Istituto Nazionale di Fisica Nucleare). This apparatus generates a beam of alpha particles (emitted from a sealed source of radioactive Polonium 210) that strips a series of electrons from the atoms present on the uppermost surface of the document being examined. When these atoms replace themselves, capturing other electrons in order to return to stable state, they emit a series of low energy X-rays. By measuring these rays we can work out what atomic species they have produced, thereby enabling us to understand with certainty the type of substance the document is composed of. In the case of the *Chartula* the analyses carried out have allowed us to identify the composition of the inks used by different hands: cinnabar for the added text in red by Frate Leone, and iron-gall-tannic ink for the area signed in black by St Francis. However, the Institute's experts also succeeded in discovering that below the words written by St Francis and Frate Leone there were others even more ancient that were erased at some point in time using a pumice stone. So, given that we have a palimpsest before us, it would be truly interesting to retrace the underlying script. But in order to solve this mystery it would be necessary to carry out further analyses that would have an impact on the parchment that the experts contend the *Chartula* would be unable to tolerate. In fact, the manuscript appears to be badly compromised, as demonstrated by the map of degradation processes created by technicians at the ICPL. Further measurements have revealed calcium loss on the surface of the parchment. In consequence of these results, it was decided to place the *Chartula* in a new case. This too was fabricated by technicians at the Institute. The new case is more appropriate for conservation purposes - it contains an inert gas in place of normal air, and various substances capable of maintaining humidity at ideal levels.

Beyond the *Chartula*, sheets from a Pontifical dating from the 13th century (normally kept at the Museo Diocesano in Salerno) are currently receiving expert attention at the hands of chemists, biologists and restorers (who work in continuous synergy) at the

Institute. The sheets have been damaged in part by humidity. Made from parchment, they are richly illuminated, but have suffered bacteriological attacks by mould and other micro-organisms over the centuries. The list of documents and other works of art examined by the Institute also includes other important names: for example, the manuscripts of Galileo Galilei, a miniature by Botticelli, and a collection of prints from the Quirinale which are currently being worked on. Then there is one of the most valuable and celebrated documents: the *Codex Amiatinus*, the most ancient complete manuscript of the Bible in Latin, carrying the Vulgate text of St Jerome.

So far as research activity is concerned, support from the Ministry's head office and the European Union have given a major impetus, whilst on a theoretical/practical level restoration has helped bring about a previously unknown relationship between the disciplines traditionally tied to the study of the history of the book, thereby achieving a valuable synthesis between the Humanities and Natural Sciences. Many programmes have been carried out in close collaboration with national and international institutes that operate in the sector: from the Consiglio Nazionale di Ricerche (CNR) and various universities, to the principal foreign organizations involved in the field that covers the knowledge and conservation of books, both ancient and modern.

CURRENT RESEARCH AT ICPL

Simply with a view to exemplifying the research and study activities carried out at the Institute with the aid of the latest technology, I would like to describe the project 'Progetto Carta'. At the Institute, in collaboration with the Centre Nationale de la Recherche Scientifique (Paris) and under the auspices of the Progetto Finalizzato Beni Culturali of the CNR, research is being carried out on the degradation of paper used in books produced in Northern Italy in the course of the 15th century. The instrumental analyses effected on more than 1600 sheets and the study of sources - including both archaeological and documentary (not only contracts, judicial proceedings, and account books, but also toll documents and watermarks) - have supplied us with information on the relationship between the original quality of documents and their current state of conservation, and beyond this the speed at which printing shops accelerated the evolution of production techniques. Initial results from the research were published in the companion volumes titled *La Carta Occidentale nel Tardo Medioevo*. This means that the data relating to description methods and information on experimental observation methodologies used throughout the project, together with information that emerged on the qualitative aspects of Medieval paper and the material characteristics of mould types and watermarks, have become available to all.

The objective of research currently underway is to construct, at the Institute, a research and documentation hub, to serve as a reliable reference point for paper historians and

conservators. As regards the degradation processes observed in paper we know that, in common with all materials made from natural materials, it is subject to a spontaneous and irreversible aging process, and so with the passage of time it inevitably deteriorates. Chemical/physical degradation is caused by various environmental factors (temperature, light exposure, relative humidity), or by internal factors, such as impurities found in paper, metallic or acidic inks, and the evolution of materials or manufacturing processes. Ancient paper - made from rags and sized with animal gelatine - in most cases conserves better than paper produced after the first half of the 19th century, when wood pulp started being used as a raw material. In paper made from wood pulp, in fact, sizing is weaker and the wood fibres undergo an oxidation process when they come into contact with the environment. The presence of metallic ions in paper can cause both hydrolysis and modifications in the cellulose content's structure, thus setting up the conditions for that well known process of degradation termed oxidation. Frequently, the two chemical reactions, hydrolysis and oxidation, are correlated and, at a microscopic level, one can observe their consequences as a weakening of sheets and yellow/brown discoloration. Relative humidity, light and temperature, as we have already said, are the principal external degradation factors in library materials. Research on the deterioration of library heritage due to pollution is currently very topical. Pigments undergo alterations in the presence of sulphur compounds that can react with various metals; and polluting substances can act as catalysts in acidic processes. In a polluted atmosphere there are also high levels of ozone, which is noted for its qualities as an oxidizing agent.

CONSERVATION AND RESTORATION

Starting in the 1980's, experimentation has been carried out at the Institute that has resulted in concrete results being arrived at in the field of non-invasive interventions. Plenty of space has also been afforded to research on direct and indirect prevention, in the firm belief that the challenge to save the immense library heritage kept in libraries and archives all over the world can only be met if we take pre-emptive action, in other words, by monitoring storage environments and taking steps to protect volumes adequately. Increasingly, restoration is seen as an extreme remedy for an extreme ill. This position will allow (in a short time) for a reduction of costs, and above all the risks that restorative interventions always entail. The term 'conservation' denotes the useful steps that can be taken to slow down degradation in books caused by time and their use. Conservation treatments, whether they are direct or indirect, are aimed at the material components of books, in other words the materials subject to degradation. Interventions are defined on a case-by-case basis and anticipate the cooperation of experts in different fields.

One can differentiate the following activities:

- indirect prevention procedures, during which the original object is not physically involved in a procedure that addresses environmental standards by means of the regulation and, if necessary, correction of internal microclimatic conditions;
- direct prevention procedures involving the original object without inducing any modification whatsoever in it, examples being dusting tasks, the fabrication of purpose-made containers for volumes on an individual basis, and checks on the condition of materials;
- restoration interventions, meaning physical and chemical treatments carried out on materials and the structures that constitute the manufactured object.

It is still possible to use the verb 'conserve' as a synonym for 'restore', even if it has been amply shown that restoration constitutes a part of conservation, meaning to say that extreme measure which comes into play are when prevention or revision are no longer (or have not been) effective. The role conservation plays is that of preventing the physical loss of the 'book-object' and to avoid restoration, whose potentially negative aspects are understood (irreversibility included among these), until such time an intervention, more than being necessary, quite simply cannot be deferred. To reverse the situation it is necessary, therefore, to consider as being normal prevention and inspection procedures, and exceptional those involving restoration.

Prevention involves the continuous monitoring of environments: often storage areas that seem stable and unchanging can produce microclimatic reactions capable of triggering reactions which, on account of a synergic effect, can be devastating. By now it has been well noted that more than variations in recommended environmental parameters, it is an inconsistent microclimate that prevents equilibrium, thus causing stresses sufficient to modify the characteristics of materials. It must also be taken into account that because of widespread environmental pollution there are many gases present in the air that can combine themselves with water vapour found in the atmosphere and form acids. The complexity of the reactions and interactions create a decidedly unstable situation, thereby turning a library into a precarious place. The study and control of these diverse factors represents the result of the daily work of a team that pieces together a forecast of risks. On this basis, plans for an intervention project can be drawn up. Another fundamental aspect of this planning procedure is the comparison of, at both national and international levels, analogous situations, or at least those that are comparable thanks to the standardization of data gathering techniques. Conservation requires collaboration between different professions. In addition, a work project must foresee checks being carried out on storage facilities, the organization of volumes, the moving and handling of materials, biological and environmental checks, checks on the consultation methods adopted by readers, arrangements for exhibitions, and emergency preparedness. The extent to which conservation policy is omnipresent seems ever more clear, in addition to the pertinence of defining it as a 'solitary activity that must involve everyone' (Keene,

1996, p.107-108). To mention the project SAVE ART, to save artistic heritage from insect pests without using toxic chemical compounds, funded by the European Union and carried out by the ICPL (Italy), the Central Science Laboratory (GB), Naturhistoriska Rikmuseet (Sweden), Consejo Superior de Investigaciones (Spain), Master s.r.l. (Genoa, Italy), and Resource Group Integrator (Genoa, Italy).

Confronted by the serious and widespread problem of bio-deterioration in library heritage, the solutions adopted by those concerned until a few years ago were based on the use of polluting gases, harmful to human beings, the environment, and the materials treated. Methyl bromide, formaldehyde, and in particular ethylene oxide, all effective when applied to both infections and infestations, were the methods most frequently used; the treatments were executed in closed environments or in autoclaves by qualified personnel, always observing stringent safety guidelines. Research for innocuous treatments for library materials conservation purposes has led to the use of a method used in industry foodstuffs preservation. The system is based on modification of the atmosphere, from which virtually all the oxygen present is expelled. The air we breathe in we find a mixture of gases consisting of nitrogen (ca. 78%), oxygen (ca. 21%), argon (ca. 1.1%), with some rare gases present in minute quantities. With the Veloxy apparatus (an acronym for Very Low Oxygen) an atmosphere in which oxygen is replaced with nitrogen is created in special gas-tight plastic containers. This modified atmosphere results in the death by anoxia of all insects at all stages of their life cycles. The system presents many advantages: 100% efficacy, and after three weeks of treatment items can be replaced on shelves without taking any further precautions whatsoever. In addition, regular staff members can carry out treatment in situ; the reduction of costs is impressive.

Following on this project, another initiative was born, which is funded by the PARNASSO programme, the result of an agreement between MURST and the CNR. The project's goal is to investigate the possibility of applying the modified atmosphere treatment to the struggle against aerobic micro-organisms. For the project denominated DISIO (DIsinfection SIne Oxygen) collaboration is foreseen between public institutions and private companies: the ICPL, Rome; the Istituto Centrale di Restauro, Rome; the Opificio delle Pietre Dure, Florence; the Centro di Fotoriproduzione, Legatoria e Restauro, Rome; the Department of Vegetable Biology, La Sapienza University, Rome; and the Istituto di Strutturistica Chimica, CNR, Rome.

As the representative of the Institute - the ICPL - that I have recently be called to direct, I pay much attention to digital technologies, essentially seen as instruments that permit, by means of high resolution, the faithful reproduction of originals, and therefore as techniques that permit the utmost utilization of an original document at the same time as safeguarding it to the maximum degree. In particular, from the point of view of safeguarding and the utilization of library heritage, the synergy that exists between the world of study and the world of research, and between humanistic knowledge and applied technology has allowed us to attain significant and sometimes surprising results.

As regards to reproduction for safeguarding purposes, I am convinced that digital technology today represents an instrument capable of adding further value to this kind of intervention, by transforming a safeguarding operation into an intervention of a scientific type. In fact, a high definition reproduction of a document supplies an image that is cleaner than the original, capable of supplying us with better information than that which can be obtained by a direct viewing of the document. Such an image is also capable of highlighting characteristics of calligraphy and the writing support that would normally escape the human eye. Using this instrument it also becomes possible to make enlargements of details, or highlight script without creating a grainy image, thereby showing itself to be a precious working tool for those who study texts. We can say, then, that digital technology gives us more input - we start with a safeguarding operation, but also obtain support for research purposes.

THE VIRTUAL RENAISSANCE PROJECT

I refer here in particular to technology placed in action by the Ditta Fotoscientifica of Parma and used for the European project 'Rinascimento Virtuale' ('Virtual Renaissance') in which 26 countries are participating - 15 States of the European Union, 8 countries in Eastern and Central Europe, and Iceland, Liechtenstein and Norway, for a total of 52 cultural, academic and research institutions, among which I would like to mention in Italy the Biblioteca Laurenziana, the Marciana, the Biblioteca Nazionale of Turin and that of Naples, the Biblioteca Ambrosiana of Milan, and the Biblioteca del Monumento Nazionale in Grottaferrata. In Ireland the Trinity College Library in Dublin. In Germany the Max-Planck-Institut, the University of Hamburg and the Herzog August Bibliothek in Wolfenbüttel. The motivation to start the 'Rinascimento Virtuale' project stemmed from the positive results achieved in Italy in 1998 during the recovery of information from palimpsests kept in the Biblioteca del Monumento Nazionale in Grottaferrata, and the Biblioteca Apolistlica Vaticana, which would otherwise have remained illegible employing traditional methods. These results induced Austria and Greece to place the foundations, along with various Italian institutions, for a primary nucleus, from which the European network has subsequently developed.

The methodology followed was innovative in comparison to the traditional reproduction techniques used for library heritage research purposes. In particular, in the context of the '*Rinascimento Virtuale'* project, digital multi-spectral technology was applied at medium or high definition as a tool capable of surpassing comprehension levels achieved by objective viewings of original sheets. This technology is capable of going beyond the normally visible and recovering hidden, usually illegible information. Digital multi-spectral technology can, thus, be seen as a non-invasive tool to optimise readings of normally illegible texts, and to guarantee their safety. The high definition digital technique can capture all the information contained in documents, including that invisible to the naked eye. In addition, this kind of technology represents a working tool

useful for the safeguarding and conservation of original documents, because images obtained can be used for any purpose, thereby eliminating the necessity to subject the original to further photographic examination and so protecting it from the possibility of repeated trauma. The digital treatment of images permits one to 'read' and investigate writings, both at upper and lower levels on a support that carries them, even on examples seriously altered by chemical substances used in the past. Digital imaging represents a considerable improvement of the quality of traditional photographic reproductions and the potential legibility of original documents. The consequences are of great significance. They include: progress in the study of texts and handwriting with maximum respect for the original; multiplication of cognitive levels resulting in ever more detailed descriptions of cultural heritage; planning for census programmes, and the reproduction of palimpsest codices kept in Italian libraries, carrying considerable advantages for the teaching of codicology and palaeography. Naturally, this technology is not only applied for the reading of palimpsests (even if this represents the most astonishing application in terms of the results obtained), but also to other kinds of antique documentary material.

VIRTUAL RESTORATION

Today, the adoption of non-invasive or non-destructive techniques for restoration operations is, and rightly so, very much insisted upon. Interventions, if truly necessary, should be reversible, even if it is well known that every intervention includes irreversible aspects. On the other hand, the most recent technologies have rendered possible a series of non-destructive preliminary investigations on objects to be conserved or restored, thus improving knowledge of materials and any possible prior restorative work carried out, without interfering with the objects themselves. One thinks of techniques used for quite some time on handmade historic/artistic objects, ranging from spectroscopy by means of X-rays, scanning electron microscopes, and more recently, digital technology. From this point of view, in the sphere of library heritage, where the transmission of texts and the supports that carry them are regarded with equal importance, operations employing computer-based technologies provide us with new prospects, not only in diagnostics, but also for the exploitation of the books as objects. To be precise, I intend to refer to a phenomenon that presents itself today (its definition remains under discussion) as the 'virtual' restoration of books. Without doubt, if by restoration one means in the narrow sense an intervention upon an object in order to guarantee its survival or permanence through time, we find ourselves outside this semantic field, as always happens when one speaks of 'virtual reality', a phrase that unites in a syntagma two alternative terms. But, if in a wider sense we intend by restoration an action that tends to render a reality exploitable, an object of cultural heritage utilized for a long time and no longer directly accessible, can be put back into circulation as evidence of a culture, thereby returning functionality to the object. Restoration, then, can also be defined as a digital intervention that tends to reinstate - in this case, render legible - a text which would otherwise be lost because of text erosion or overwriting. Moreover, virtual restoration responds to the

principal - unrealisable with all other interventions applied to handmade objects - of non-invasiveness and reversibility: the original manuscript is not, in fact, the object of a direct intervention, but instead only its digital facsimile, which simulates reality and replaces its composite and stratified structure. In addition, it constitutes a very useful aid for research directed on materials and writing supports, a procedure that represents the first step for any intervention to be carried out on a handmade object.

I hope that I have presented, even if somewhat rapidly and by means of mere snippets of information, a fairly exhaustive panorama of the ICPL, illustrating its many facets and the multifarious activities carried out on its premises. It is an institute that I have had the honour and responsibility of directing for a several months now, and one, which I would like to reiterate, makes itself very open to international collaboration.

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