

# THE SYNERGY BETWEEN HUMAN SCIENCES AND EXPERIMENTAL SCIENCES FOR THE PROTECTION AND VALORIZATION OF CULTURAL AND ENVIRONMENTAL HERITAGE: SALVATORE LORUSSO'S ACTIVITIES IN EDUCATION AND RESEARCH

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*Keywords:* interdisciplinarity, internationalization, training, research, creativity

## 1. Introduction

Interdisciplinarity and internationalization in the field of cultural and environmental heritage are fundamental aims and objectives as well as being two of the underlying ideas in education and research. They also respond to the requirements of competitiveness, growth and innovation in the context of a global economy and culture.

The complex system of national and international actions and interactions we have come to know, is rapidly evolving: all stakeholders are offered the opportunity to intervene in defining new scenarios and future processes. It is within this framework that future financing scenarios are built together with new challenges, new priorities, new tools and channels.

These concepts, acquired in the course of many years, represent the culmination of forty years of activity in the field of education and research in the cultural and environmental heritage sector.

*"The road is long, but the journey is a remarkable one!"* sang the pilgrims going to the holy land. And it was just as difficult to convey the message that the conceptual terms interdisciplinarity, internationalization, training and research represented fundamental goals also in the cultural and environmental heritage sector.

The prelude to this journey, which led to the synergy between human sciences and experimental sciences for the protection and enhancement of cultural and environmental heritage, involved:

- the institution of the Ministry for Cultural and Environmental Heritage (with Decree Law dated December 14, 1974, No. 657, passed as Law 29 Jan. 5, 1975), according to the dictates of Giovanni Spadolini who claimed that for the protection and enhancement of the cultural and environmental heritage the human sciences and the experimental sciences had to be: "Not two worlds but one world, not two cultures but one culture for the good of cultural goods";

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- the establishment of the first, chronologically speaking, Faculty of Conservation of Cultural Heritage in the University of Tuscia (1989-1990) by the then Rector of the University of Tuscia (Viterbo) and President of the CRUI (Conference of Italian University Rectors), Prof. Gian Tommaso Scarascia Mugnozza, who called me to be the one and only technician among the historians and humanists;

- the institution, in 1997, on the initiative of the then Rector Magnifico of the University of Bologna Professor Fabio Roversi Monaco and then the Dean of the second Faculty of Conservation of Cultural Heritage, Prof. Antonio Carile, of the Department of Histories and Methods for the Conservation of Cultural Heritage (DISMEC), based in Ravenna, which later became the Department of Cultural Heritage (DIB); once again my presence was as the only technician among the historians and humanists;

- the founding, in 2001, of the historical-technical Journal "*Quaderni di Scienza della Conservazione*" (from 2007 renamed "*Conservation Science in Cultural Heritage*") at the University of Bologna, with the intent and the objective of representing a synergistic scientific testimony of the human sciences and of the experimental sciences for study and research in the field of cultural and environmental heritage. The Editorial in the first issue of the Journal is emblematic: "*The incompleteness of any culture is its first virtue, because it leaves the door open to encounters, to interpretations, to the truth*".

These are the salient steps, but not the only ones, of a path that has led over the years to a vision and awareness of the importance of interdisciplinarity and internationalization in training and research in the cultural and environmental heritage sector [1-11].

Below are some tangible examples of my experience in the field of training and research in this particular sector.

## 2. Training and education

In the area of training, I would like to mention the two book series "*I beni culturali e l'ambiente*" (Pitagora Editrice – Bologna) and "*La formazione e la ricerca nel settore dei beni culturali e ambientali*" (Mimesis Edizioni, Milano-Udine) of which I am the founder and Editor-in-Chief, the Master in "*Planning and promotion of artistic and cultural events*" that I set up and directed and several significant Study Days that I organized and conducted.

### 2.1. Book series "*I beni culturali e l'ambiente*"

Opened in 1992 the series "*I beni culturali e l'ambiente*" (Pitagora Editrice, Bologna) is a collection of 11 volumes dealing with issues from the vast and varied sector of cultural and environmental heritage [12-22] (Figure 1). For each volume in the series there is an emblematic figure illustrating one of the research themes dealt with.



Figure 1. The volumes in the book series “I beni culturali e l’ambiente”

More specifically, the volumes are:

***Le metodologie scientifiche per lo studio dei beni culturali. Diagnosi e valutazione tecnico-economica***

The text aims to provide students and scholars with a useful tool to acquire general knowledge in the field of cultural heritage. It attempts to chart a course and indicate the objectives that are characteristic of the technical-experimental methodologies used to support historical-humanistic methodologies for heritage study (Figure 2).

The volume is also in French with the title of: “*La methodologie scientifique appliquée à l’etude des biens culturels. Dignostic & évaluation technico – economique*” (EREC Editeur, Paris).



Figure 2. Infrared (IR) image of the painting *Orazione di Cristo nell’Orto* (Christ praying in the garden), attributed to Benvenuto Tisi, also known as *Il Garofalo*. The preparatory drawing is highlighted.

**La contaminazione ambientale e il degrado dei materiali di interesse storico-artistico**

This volume addresses issues related to cultural and environmental heritage and gives an overview of the studies on the interaction between artifacts and environments (Figure 3).

The volume is also in French with the title of: *“Pollution de l’environnement et impact sur les biens culturels”* (EREC Editeur, Paris).



Figure 3. The Theatre of Marcellus in Rome, one of the research sites in the case study: *“Inquinamento atmosferico e degrado di monumenti e ambienti storico-artistici”*

**Caratterizzazione, tecnologia e conservazione dei manufatti cartacei**

The book deals with the age-old evolution of techniques in the use and application of materials such as parchment, paper, inks and the conservation and restoration of library, archival and documentary heritage (Figure 4).



Figure 4. State Archive of Florence, Manuscript 639: illuminated internal pages

**Conservazione e trattamento dei materiali costituenti i beni culturali**

The volume describes the characteristics and properties of the materials constituting the cultural heritage and are related to activities carried out in cultural heritage conservation (Figure 5).



Figure 5. Punic terracottas from excavations conducted at Mozia, Trapani, Italy

**Caratterizzazione, tecnologia e conservazione dei manufatti tessili**

The book describes the different types of textile products, highlighting their characteristics and indicating ways to preserve and restore textile heritage (Figure 6).

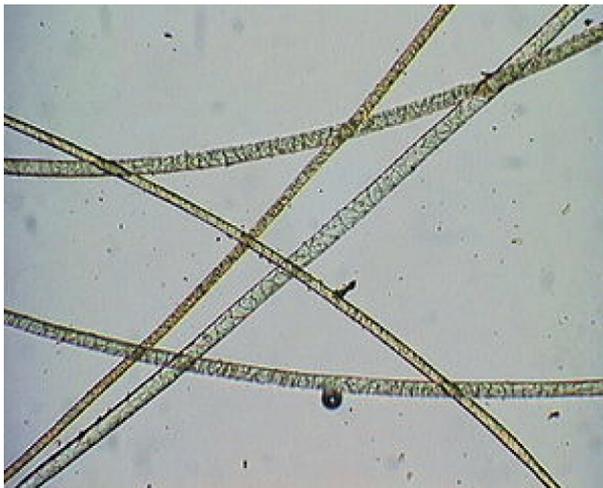


Figure 6. Wool fibers viewed with a Scanning Electron Microscope (SEM)

### ***L'ambiente di conservazione dei beni culturali***

The contents of this volume refer to the cultural value of the environment and to problems relating to outdoor and indoor environments in relation to artifacts whether in exposed or confined spaces (Figure 7).

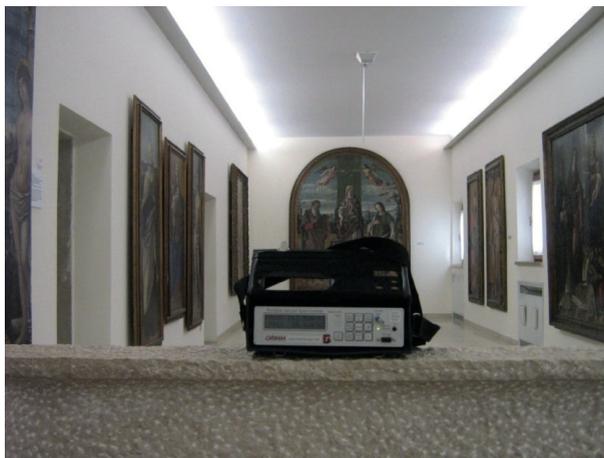


Figure 7. Quantification of Total Suspended Particle (TSP) and fine particles (PM10) by portable spectrometer

### ***La diagnostica per il controllo del sistema manufatto-ambiente. Alcune applicazioni nel settore dei beni culturali***

The volume brings together the research and experiments conducted over the years with the scientific contribution of many experts, reflecting the long intensive road that needs to be followed not only for the advancement of research and the methodologies used, but also for the progression and detailed study of issues related to the conservation of cultural heritage (Figure 8).



Figure 8. Casanatense Library, Rome, Italy

***Restauro, manutenzione, conservazione dei beni culturali: materiali, prodotti, tecniche***

The topics addressed in this volume represent the expression of the skills and experiences which, though varied, nevertheless complement each other within the context of the multiple and complex problems encountered in the field of restoration (Figure 9).

The volume is also available in e-book format.



*Figure 9. Mausoleum of Theodoric, Ravenna, Italy*

***La tutela e la valorizzazione dei manufatti di interesse storico in archeologia navale***

The topic covers the methodological path which may, in part, relate to any work of historical and artistic interest and in part address the specific peculiarities typically found in the field of naval archeology (Figure 10).

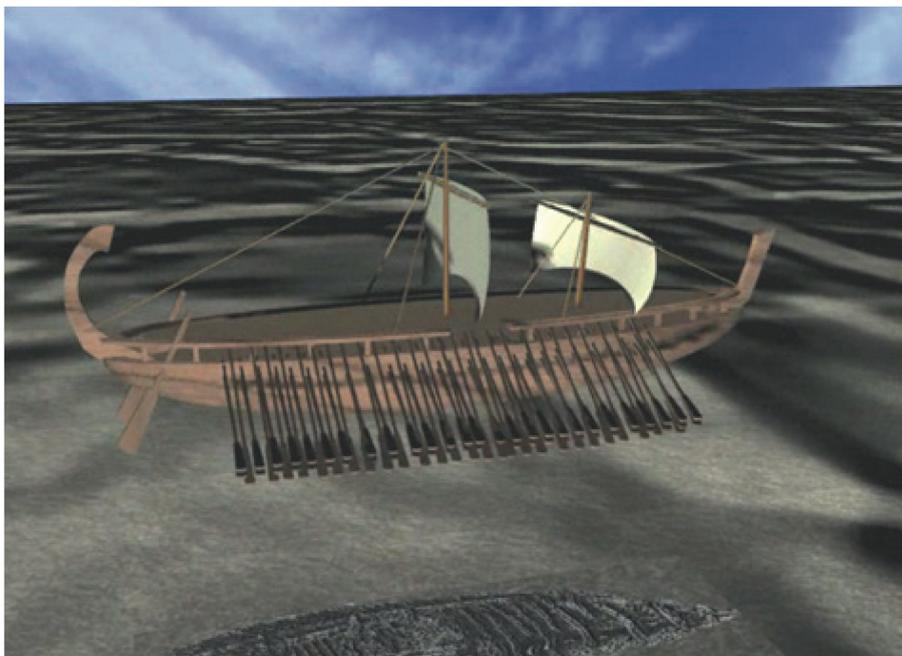


Figure 10. Virtual reconstruction starting from the wreck of the Kyrinia.

***Anamnesi storica, indagini analitico-diagnostiche e monitoraggio ambientale: alcuni casi di studio nel settore dei beni culturali***

The volume examines case studies related to the conservation and management of graphic documents, diagnostic investigations and the historical-stylistic evaluation of several paintings and various problems relating to stone materials and their consolidation (Figure 11).

***Il mercato dell'arte e le case d'asta: valutazione diagnostico-analitica e economico-finanziaria. L'autentico, il falso, il riprodotto nel settore dei beni culturali***

Auction houses have been operating for years in a buy-and-sell market based on the subjective evaluation of an art work. The book highlights the need to accompany and complete this subjective evaluation with an objective evaluation employing scientific methodologies and diagnostic-analytical technologies in order to confirm or refute the former (Figure 12).



*Figure 11. Oil painting on wood "Madonna with Child and Saints Jerome and Catherine of Siena", Domenico Beccafumi.*



*Figure 12. "Gioconda with columns", private collection*

## 2.2. The book series “La formazione e la ricerca nel settore dei beni culturali e ambientali”

Launched in 2012, the 3 volumes in the series “*La formazione e la ricerca nel settore dei beni culturali e ambientali*” (Mimesis Edizioni, Milan, Udine) specifically deal with the training, research and management of cultural and environmental heritage [23-26 ] (Figure 13). Here, as before, for each volume in the series, an emblematic figure bears witness to one of the research themes covered.



Figure 13. Volumes in the book series “*La formazione e la ricerca nel settore dei beni culturali e ambientali*”

The volumes, also in e-book format, include:

### ***I beni culturali e ambientali: formazione e ricerca, interdisciplinarietà e internazionalizzazione***

The volume is a collection of presentations given by personalities with different competences who participated in a number of Study Days. All the presentations focus on topics that suitably represent a good basis for training in the specific sector (Figure 14).



Figure 14. National Museum of Castel Sant'Angelo, Rome, Italy

***La gestione del rischio nel settore dei beni culturali: musei, biblioteche, archivi***

Adopting an interdisciplinary approach, this volume addresses problems in managing and controlling the possible risks that trigger deterioration processes in collections by resolving the root cause of the problem, thus eliminating the need for restoration and / or curative treatment of the artifacts (Figure 15). An English version is available entitled ***“Risk Management in the Cultural Heritage Sector: Museums, Libraries, Archives”***.



Figure 15. Baldassarre Carrari, “La Pietà”

### ***Progettazione e promozione degli eventi artistici e culturali***

The volume provides a direct testimony of the educational experience and knowledge acquired by the students of the Master (academic year 2013-2014) in “*Planning and promotion of artistic and cultural events*”. Six editions of the Master were completed at the Alma Mater Studiorum University of Bologna (Ravenna) and this volume is a testimony to its success. It includes the reports written by the students during their various job placements in reference to their “project work”, alongside a selection of commentaries judged to be the best on conclusion of the Master. The students were then asked to write about and illustrate their experiences, also following the frequent and synergic exchanges that took place among the students themselves as well as with the teachers. (Figure 16).



Figure 16. *Byblos Art Hotel Villa Amistà, Corrubio di Negarine, Verona, Italy. One of the work placement locations.*

### ***2.3. The Master in “Progettazione e promozione degli eventi artistici e culturali”***

The idea for the Master comes from the awareness gained during the many years of teaching of the limited educational offers the University provides in the practical training of human resources to draw value from culture (Figure 17). This limit stems from the fact that:

- there is little dialogue and interaction between University and territory;
- as a result, supply does not match demand;
- consequently, within the labour market training is not a priority.

Added to this are economic problems exacerbated by spending cuts for artistic and cultural events.

In continuing along a metabolic path of awareness and acculturation, as Severino Salvemini of the Bocconi University of Milan points out, what is required and today is

emerging is “a new concept in the value chain of cultural heritage: making culture is not aimed at giving but receiving”.

It starts from the concept that in an immaterial economy, where the value of using the product or service becomes increasingly less important, what really counts is the symbolic and evocative value that the experience of the goods and services express and convey: the substitution of industrial capitalism with cultural capitalism.

Today, companies, in the various sectors of manufacturing and even credit services, alongside economic-business theories relating to productivity and profitability and aimed at the performance of the manufactured products, produce and sell the meanings that are given by and incorporated into such products: the finer elements of cultural production catalyze the “memory” of the product itself and determine “loyalty” in consumer behavior.

In the end, in the relationship between culture and economics, we have gone from planning the spending of residual economic-financial resources on culture, to the current situation in which the cultural aspects, meanings, intentions and aims constitute the fabric and the drive to achieve a full sense of well-being.

In this regard, the 1st level University Master in “*Planning and promotion of artistic and cultural events*” (PPEAC,) opened in the Department of Cultural Heritage of the Alma Mater Studiorum University of Bologna (Ravenna) set out to dialogue and correspond with the territorial fabric to form a collaborative relationship to mutually satisfy their needs. This meant that the institutional function of the University, in other words its “training”, responded to the needs of both the Cultural and Productive Units.

The intents and aims pursued to train the professional figures described in the Master refer to and draw inspiration from the professional opportunities in both the artistic-cultural sector and entrepreneurial sector: competitiveness, profitability and reliability can thus be concepts as well as objectives to strive towards together.

The specific goal of the Master (which enabled each student to acquire 60 university credits) was, therefore, to train all those who, for work reasons or personal interest, found themselves either managing, organizing and promoting artistic and cultural events or participating in one or all of these activities. At the same time it was directed at those who wished to approach the management, control, enhancement, and promotion of artistic and cultural activities, but did not possess the necessary skills.

The subject areas covered by the Master include:

- Analytical, documentary and IT technologies for cultural heritage
- Performance measurement in cultural and artistic organizations
- Communication and sociology of cultural events
- Economics and the arts and events market
- Regulatory aspects and verification of operational plans
- Evaluation and creation of value in cultural events
- Internationalization and fund raising in culture and research
- Managing a cultural institution

The important need to dialogue and correspond with the territorial fabric was provided by the work placements and the integrative seminars given by specialists in the field and held at appropriately selected locations. All this was in line with the various taught subjects and responded to the needs of Cultural (museums, libraries, archives, superintendencies, cultural centers, etc.) and Productive (banks, industries, companies, etc.) Units, thus completing the training offered by the Master.



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA

Master di I livello

in:

Progettazione, promozione, gestione  
degli eventi artistici e culturali:  
la figura dell'eventologo

VI edizione



Figure 17. A detail of the brochure of the Master

#### 2.4. Study days

Below, in chronological order, are some of the Study Days among the many I have organized and conducted, Study Days that have contributed to increasing awareness of the importance of interdisciplinarity and of internationalization in training and research in the field of cultural and environmental heritage.

- *Il contributo storico-umanistico e tecnico sperimentale nello studio dei beni culturali: una necessità, una realtà*, Società Italiana per il Progresso delle Scienze, Faculty of Conservation of Cultural Heritage, University of Tuscia (Viterbo), Rome, 7 October 1998.

- *Le scienze storiche, giuridiche e tecnico-sperimentali per la conservazione dei beni culturali*, Società Italiana per il Progresso delle Scienze, Exhibition of the Cassa di Risparmio Foundation, Rimini, 10 May 2005.

- *La formazione e il mercato del lavoro nel settore dei beni culturali*, Faculty of Preservation of Cultural Heritage Alma Mater Studiorum University of Bologna Ravenna, 16 November 2005.

- *Il Progetto di ricerca industriale e di formazione: "Blu-Archeosys. Tecnologie innovative e SISTemi avanzati a supporto dell'ARCHEologia subacquea"*, University Consortium of the Province of Trapani, Trapani, 22nd February 2010.

- *I volumi della Collana "I Beni Culturali e l'Ambiente"*, Accademia Nazionale dei Lincei, Rome, 11 June 2010.

- *La formazione e la ricerca nel settore dei beni culturali e ambientali*, Ministry for Cultural Heritage and Activities, Sala dello Stenditoio, Monumental Complex of San Michele a Ripa, Rome, 4 March 2011. [23]

- *I beni culturali e ambientali: Interdisciplinarietà e Internazionalizzazione*, Alma Mater Studiorum University of Bologna, G. Prodi Hall, Monumental Complex of San Giovanni in Monte, Bologna, 5 October 2011. [23]
- *Fra gli eventi, GLI EVENTI*, Department of Cultural Heritage, Alma Mater Studiorum University of Bologna, Ravenna, 4 July 2013.
- *Expo Milano 2015: l'Italia nel mondo*, Department of Cultural Heritage, Alma Mater Studiorum University of Bologna, Ravenna, 25 March 2015.
- *Memory becomes future*, Accademia delle Scienze dell'Istituto di Bologna and Russian Academy of Natural Sciences, Accademia delle Scienze dell'Istituto di Bologna, Bologna 25-26 October 2016.
- *Scienze Morali e Scienze Fisiche per la tutela e la valorizzazione del patrimonio culturale e ambientale*, Accademia delle Scienze dell'Istituto di Bologna, Bologna, 9 May 2017.

### 3. Research

In the research sector, two aspects are of particular relevance: the Diagnostic Laboratory for Cultural Heritage and the historical-technical Journal “*Conservation Science in Cultural Heritage*”.

#### 3.1. The Diagnostic Laboratory for Cultural Heritage

The aims pursued by the Department of Cultural Heritage at the Alma Mater Studiorum University of Bologna which was established in 1998 as the Department of Histories and Methods for the Conservation of Cultural Heritage, are linked to what was already foreseen in 1967 by the Parliamentary Inquiry Commission for the protection and enhancement of objects of historical, artistic and landscape interest (Franceschini Commission) which gave emphasis to the fact that “Cultural heritage is a material testimony of civilization and an instrument of human elevation”.

The Department was created with the precise aim of offering full support in developing strategies and methods for the protection and valorization of cultural heritage. In accordance with the previously mentioned objectives, I founded and set up in the Department in 1999, a Diagnostic Laboratory for Cultural Heritage, of which I was in charge until 2015 (Figure 18).

The Laboratory carries out research and investigations in the field of cultural heritage diagnostics and conservation environment using advanced scientific instruments and has various equipment for the study and control of the system: artifact of historical-artistic interest – conservation environment – biota (operator, restorer, user). The equipment can be easily transported *in situ*, an extremely functional aspect for the study of different artifacts, particularly when they are immovable.

Their use makes it possible to deal with the various problems when characterizing the materials constituting the cultural heritage and assessing their state of conservation, in addition to analyzing and monitoring macro-and micro-environmental factors related to the external environments and interiors in which the artifacts are found. This work represents a preliminary and fundamental step for any subsequent restoration, maintenance, conservation and / or maintenance of the system.

Other research topics with a didactic purpose, and related to artifacts of historical-artistic, archaeological, archival, book, musical, architectural, demo-ethno-anthropological interest include:

- a. appropriate methodologies and analytical techniques for the characterization of cultural heritage [27, 12].
- b. atmospheric pollution and degradation of monuments and historical-artistic environments [28, 13].
- c. micro and macroclimatic monitoring in confined environments: Museums, Libraries, Archives [29, 21]
- d. artistic diagnostics and verification of authenticity [30, 22]
- e. evaluating the suitability of products used for the restoration, conservation and maintenance of cultural heritage [31, 19]



Figure 18. Diagnostic Laboratory for Cultural Heritage at the University of Bologna (Ravenna)

Change Performing Arts, an international company that organizes artistic and cultural events, together with the Ministry for Cultural Heritage and Activities (MiBAC) and the Italian National Institute for Foreign Trade (ICE) have indicated the Diagnostic Laboratory for Cultural Heritage of Bologna University as an Italian public and university institute of excellence. Following this particular acknowledgement, as part of the Shanghai 2010 Universal Exposition, Change Performing Arts, MiBAC and ICE asked for the results and images linked to the Diagnostic Laboratory's research activities in order to create a video-installation representing the city over time. The work was entrusted by the ICE to Change Performing Arts S.r.l. of Milan and was directed by Peter Greenaway.

### 3.2. The historical-technical Journal “*Conservation Science in Cultural Heritage*”

It was with dedication and enthusiasm and with the intent of launching an idea that proposed ways and means to inform and train readers that the Journal was opened. It was initially called: “*Quaderni di Scienza della Conservazione*”, in fond memory of “*Quaderni di Merceologia*”, the journal set up during my years of training with Prof. Walter Ciusa at the Institute of Commodity Science at the University of Bologna. Its focus was on young people, who in a subsequent tomorrow, would give meaning to our efforts and feel encouraged to improve it.

Looking beyond the medium to long term, the efforts made to start the Journal off on its journey, by planting the seeds for a future that was uncertain, but which today has become a certainty and a much sought-after goal, have convinced the media and the international market. Consequently, there was the almost immediate need for new space for the Journal to grow, so in 2005 with AlmaDL (University of Bologna) the Journal's official website was opened and became available online as well as in hard copy. In 2007, it was renamed “*Conservation Science in Cultural Heritage*” (Figure 19).

The Journal's peculiarity and achievements in the world of scientific information are described below. Its distinct features lie in two conceptual terms: interdisciplinarity and internationalization.

As a historical-technical Journal, it publishes research, studies, experimental contributions, thematic collections, in addition to conference proceedings and seminars involving complex diversified interdisciplinary issues related to cultural and environmental heritage. In this regard, all submissions are evaluated following a “double blind peer review” procedure by Qualified Reviewers.

From the point of view of internationalization, it can be said that the value of cultural and environmental assets is not necessarily attributable to a specific place or region or country, its value goes beyond both spatial and temporal limits. As such, the international vision and mission of the Journal is illustrated in the contents represented by the authors in the published articles, representative of a reality that goes beyond any boundaries.

The Journal has thus achieved over the years, from 2001 to 2018, with annual publications, various acknowledgements and certification, having been officially included in international databases and prestigious aggregators such as: ESCI (Emerging Sources Citation Index – Journal List) Web of Science, EBSCO (Elton Bryson Stephens Company), DOAJ (Directory of Open Access Journals), ERIH-PLUS (the European Reference Index for the Humanities and Social Sciences), SPARC (Scholarly Publishing and Academic Resources Coalition), ANVUR (National Evaluation Agency for University and Research in Italy).

Opened at the University of Bologna, the Journal's structure embraces Universities, Academies, Study Centers, Ministries, Research Centers, both nationally and internationally, while the Scientific Board comprises prestigious members representing the various historical, humanistic, technical and scientific areas as well as experimental, socio-juridical, economic-managerial ones. Pragmatic and creative, through its 18 years the Journal has formed a vast collection of papers and is always ready to add new works from all parts of the globe, while continuing a program aimed at discussing and dealing with the most current issues in the cultural and environmental heritage sector. The editorial aspect is also a precious element within the artistic context in a broad sense and in a style that is new and clear and has influenced the intercontinental readership.

The Journal has moreover responded to another concept that permeates its work, that of “creativity” synonymous with “innovation” and, at the same time, “usefulness”, carrying out its function with its “*habitus*” not only attributable to its history of intense activity, but also to its continuing ‘allure’ of dealing with topical themes.

It is a way of indicating that the world of scientific publishing, particularly the one relating to the cultural and environmental heritage sector, is not just a vehicle for recounting, preserving and valorizing the past, but also for reflecting on the cultural and social changes that are offered for reading: education, therefore, as a process of synthesis in training and experience.

This has meant that a network has been created leading to a synergy between the various skills and institutions that has constituted an added value and in turn has contributed to the acceptance and dissemination of the Journal.

The Journal has thus satisfied the need for a network building capability and from theory has become practice. This has allowed the initial intent to become a tangible reality through its annual publication over the last eighteen years and to achieve those objectives:

- of a scientific nature, related to the use of the correct scientific methodologies;
- of an institutional nature, promoting the coordination, progress and dissemination of the sciences and their application in the cultural and environmental heritage sector;
- of a cultural nature, carrying out a social and educational function;
- of a communicational nature: the “quality” of the information must reflect the “truth” of science and the “clarity” of communication.

In the field of internationally recognized organizations considered as reference points for the evaluation and quality control of scientific journals, the Journal’s indexing in Clarivate Analytics’ ESCI has led to improving its visibility and contributed to accelerating communication within the scientific community. This picture testifies to the role of “*Conservation Science in Cultural Heritage*” in the field of training and research and is a mark of quality as well as a valuable asset for authors.

#### 4. Conclusion

Over the years my intention has always been to correspond with colleagues and students to exchange experiences and opinions and to offer my knowledge, as well as to understand what is really needed to achieve a common goal that can be scientifically and humanly shared.

But “courage” was needed to accomplish this, which meant daring, resisting and confronting circumstances and situations. It is only human to be gripped by a fear that may become doubt and even lead one to make mistakes, but at the same time may be considered audacity or even imprudence.

There is no doubt, however, that it takes courage to recognize when there are adverse circumstances and when errors have been made, as well as acknowledging when perseverance and audacity are useless or even harmful, but it is equally true that courage is needed to be innovative and to challenge habits, prejudices and conventions.

Courage, perseverance and creativity have led over time to the synergy of the various skills and institutions involved in the various activities carried out, creating a circuit between various realities, which has constituted added value. In this way, as previously

pointed out, it answers today's prevailing affirmation and wish to increase cooperation, create partnerships and promote interaction between all the stakeholders (network building), so that the equation “*habitus*” and “*habitat*”, from being only a theory, is effectively put into practice.

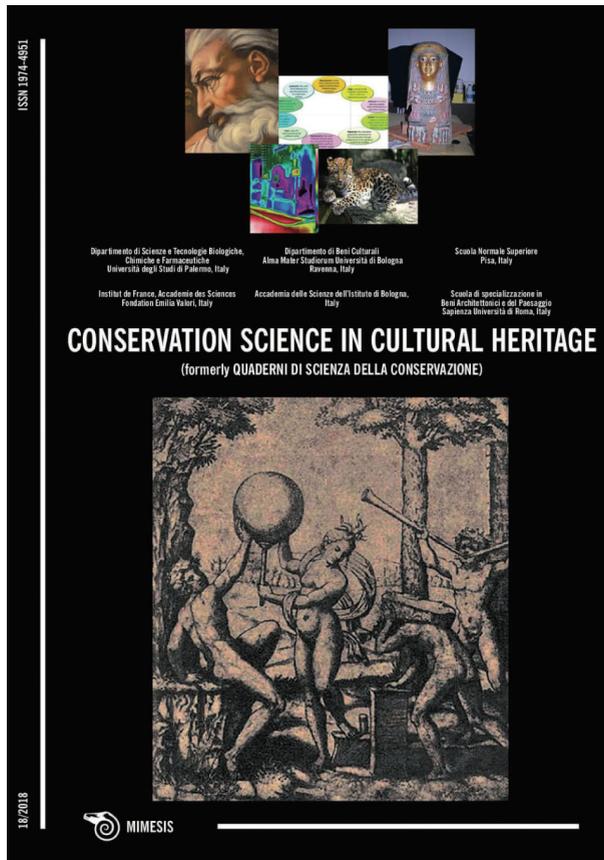


Figure 19. Journal cover N.18

## References

- [1] Lorusso S., (1991) Obiettivi della merceologia nello studio dei beni culturali, *Biblioteche Oggi*, Vol.IX, 3, 359-363.
- [2] Lorusso S., (1999) Il contributo storico-umanistico e tecnico sperimentale nello studio dei beni culturali: una necessità, una realtà, *Scienza e Tecnica*, 341, 5-6.
- [3] Lorusso S., Carbonara G., Gentile M. T., (2002) Il restauro architettonico: le diverse concezioni nel corso dei secoli, *Quaderni di Scienza della Conservazione* 2, 56-83.
- [4] Lorusso S., Vandini M., Laterna G., Lesniakova P., Toreno G., Matteucci C., Pinna D., Iannucci A. M., Alberti A., (2003) Studio storico, analitico-diagnostico e

- ambientale dei soffitti lignei rivestiti di carta dipinta a "Casa Romei" (Ferrara): Sala del 500, *Quaderni di Scienza della Conservazione*, 3/2003, 93-114.
- [5] Lorusso S., Natali A. (2007). Lo studio e il controllo del "sistema: ambiente/ manufatto di interesse storico-documentale" Casi di studio. In: Plossi M.; Zappala' A., Libri e Documenti / Le scienze per la conservazione e il restauro. Mariano del Friuli: Edizioni della Laguna.
- [6] Lorusso S, Matteucci C, Natali Tumidei S. (2009), Materia e segni della storia sostanzialmente e formalmente uniti: alcuni casi di studio. In: Scienza e patrimonio culturale nel mediterraneo. Diagnostica e conservazione, esperienze e proposte per una carta del rischio. Proceedings of the 3rd International Conference on "La materia e i segni della storia", Palermo, 18-21 October 2007, Palermo, Priulla s.r.l., 295-303.
- [7] Lorusso S, Matteucci C, Natali A, Apicella S., (2013) Traditional and non-traditional, innovative and ephemeral materials and techniques in today's cultural heritage, *Russian Chemical Bulletin*, International Edition, Vol. 62, No. 7, pp. 1671-1681, Juli 2013 ISSN: 1066-5285 (Print) 1573-9171 (Online)
- [8] Lorusso S., Natali, A., (2015) La ricerca storico-artistica e tecnico-scientifica per la tutela e la valorizzazione del patrimonio culturale, *La Chimica e l'Industria*, 2(5), pp. 35-42.
- [9] Lorusso S., Natali A., (2015) Promozione e conservazione dei beni culturali, in *Pensieri nascosti nelle cose. Arte, Cultura e Tecnica*, edited by Lombradi G. and Mantovani M., LAS (Libreria Ateneo Salesiano) – Angelicum University Press, Roma, pp. 352-373
- [10] Lorusso S., Cogo G.M., Natali A., (2016) The Protection and Valorization of Cultural and Environmental Heritage in the Development Process of the Territory in *Conservation Science in Cultural Heritage*, Vol.16, Mimesis Edizioni, Milano-Udine, Italy, pp.59-73.
- [11] Lorusso S., Natali A., (2017) Drawing Value from Culture and the Territory, Athens: ATINER'S Conference Paper Series, No: CUL2016-2185. Printed in Athens, Greece by the Athens Institute for Education and Research. ISSN: 2241-2891
- [12] Lorusso S., Schippa B., (2004) (2nd Edition), Le metodologie scientifiche per lo studio dei beni culturali. Diagnosi e valutazione tecnico-economica, Bologna, Pitagora Editrice (1st Edition, Bulzoni, Roma, 1992)  
La méthodologie scientifique appliquée à l'étude des biens culturels. Diagnostic et Evaluation tecnico-économique, traduction et adaptation par M. Stefanaggi, E.R.E.C. Editeur, Paris, 1995.
- [13] Lorusso S., Marabelli M., Viviano G. (2004) (2nd Edition), La contaminazione ambientale e il degrado dei materiali di interesse storico-artistico, Ed. Bulzoni, Roma, Bologna, Pitagora Editrice. (1st Edition, Bulzoni, Roma, 1995)  
Pollution de l'environnement et impact sur les biens culturels, E.R.E.C. Editeur, Paris, 1999.
- [14] Lorusso S. (2006) (2nd Edition), Caratterizzazione, tecnologia e conservazione dei manufatti cartacei, Bologna, Pitagora Editrice. (1st Edition, Bulzoni, Roma, 1995)
- [15] Lorusso S. 2004 (2nd Edition) Conservazione e trattamento dei materiali costituenti i beni culturali, Bologna, Pitagora Editrice.
- [16] Lorusso S. (2001) L'ambiente di conservazione dei beni culturali, Bologna, Pitagora Editrice.

- [17] Lorusso S., Gallotti L. (2006) (2nd Edition), Caratterizzazione tecnologia e conservazione dei manufatti tessili, Roma, Bologna, Pitagora Editrice. (1° Società Italiana per il Progresso delle Scienze, Roma, 2000)
- [18] Lorusso S., (2002) (2nd Edition) La diagnostica per il controllo del Sistema: Manufatto-Ambiente. Alcune applicazioni nel settore dei beni culturali, Bologna, Pitagora Editrice. (1st Edition, Longo, Ravenna, 1998).
- [19] Fiori C., Lorusso S., Pentrella R., (2003), Restauro, manutenzione, conservazione dei beni culturali: materiali, prodotti, tecniche, edited by S. Lorusso and F. Prestileo, Bologna, Pitagora Editrice.
- [20] Lorusso S., (2004) La tutela e la valorizzazione dei manufatti di interesse storico in archeologia navale, Bologna, Pitagora Editrice.
- [21] Lorusso S., Matteucci C., Natali A. (2007) Anamnesi storica, indagini analitico-diagnostiche e monitoraggio ambientale: alcuni casi di studio nel settore dei beni culturali, Bologna, Pitagora Editrice.
- [22] Lorusso S., Matteucci C., Natali A. (2010) Il mercato dell'arte e le case d'asta: valutazione diagnostico-analitica e economico-finanziaria. L'autentico, il falso, il riprodotto nel settore dei beni culturali. Bologna, Pitagora Editrice. p. 1-208, ISBN:88-371-1797-3
- [23] Lorusso S., Matteucci C., Natali A. (2013) I beni culturali e ambientali: formazione e ricerca, interdisciplinarietà e internazionalizzazione. Milano Mimesis Editore. P.1-182, ISBN:978-88-5750-803-0
- [24] Lorusso S., Natali A., Matteucci C., Palla F. (2014) La gestione del rischio nel settore dei beni culturali: musei, biblioteche, archivi. Milano Mimesis Editore.
- [25] Lorusso S., Natali A., Palla F. (2015) Risk Management in the Cultural Heritage Sector: Museums, Libraries, Archives, Milano Mimesis Editore
- [26] Lorusso S., Natali A., Lamborghini M., Rossi E. (2016) Progettazione e promozione degli eventi artistici e culturali. Milano Mimesis Editore.
- [27] Lorusso S. (1992) Lo studio e l'analisi dei beni culturali, *Kermes. Arte e tecnica del Restauro*, 15, 49-65;
- [28] Lorusso S., Marabelli M., Viviano G., Ziemacki G., (1993) Il degrado dei materiali storico artistici esposti all'aperto: aspetti tecnici, legislativi e ambientali per lo studio e la conservazione delle opere d'arte", *Viterbo*, 4-8/10/1992; *ECO Il Notiziario dell'Ecologia*, 2, 18-27.
- [29] Lorusso S., Riganti V., Tupini P. G., Viviano G., (1991) Indagini sull'inquinamento in ambienti confinati, *ECO Il Notiziario dell'Ecologia*, 4, 41-44.
- [30] Lorusso S., Penna M., (1993) Il messaggio innovativo di Ferrara '93, Conferenza Nazionale sulle Prove non Distruttive. Monitoraggio. Diagnostica, Ferrara, 3-6/10/1993, *Il Giornale delle Prove non Distruttive. Monitoraggio. Diagnostica*, 4, 18-19.
- [31] Lorusso S., (1994) Idoneità dei prodotti impiegati per il restauro, la conservazione e la manutenzione dei beni culturali, *Accademie e Biblioteche d'Italia*, 2, 61-73.

### Biographical notes

**Salvatore Lorusso** is a former full Professor of the University of Bologna. He is Foreign Member of the Russian Academy of Natural Sciences; Emeritus Professor

of the Cultural Heritage Institute of Zhejiang University, China; former Visiting Professor of the Academy of Social Science of Zhejiang University, China; Visiting Professor of the Faculty of Arts, Lomonosov Moscow State University, Russia; former Vice-president and now, a Councilor of the Società Italiana per il Progresso delle Scienze (SIPS-established in 1839). Direttore Generale of the Accademia della Cultura Enogastronomica. His biography appears in the 2016 Marquis Edition of Who's Who in the World. He is the founder and director of two book series relating to the specific issues pertaining to the sector of cultural and environmental heritage. He is the author of over 430 publications in national and international journals and of 22 volumes and monographs covering commodity science, cultural heritage and environment. In 1997, he founded the Diagnostic Laboratory for Cultural Heritage at the Ravenna Campus of the University of Bologna and remained head of the Laboratory for eighteen years. In 2001, he founded, and is Editor-in-Chief of, the historical-technical Journal "Conservation Science in Cultural Heritage". His scientific work deals mainly with the study of the "system-artifact-environment-biota" and diagnostic, analytical, technical and economic evaluation within the context of the protection and valorization of cultural and environmental heritage.

**Andrea Natali** carries out research, teaching and consulting activities in the field of "Conservation of Cultural Heritage". He graduated in "Conservation of cultural heritage" at the University of Tuscia; received two research grants from the Department of Cultural Heritage of the University of Bologna; has a Master in "Community Narrators" at the University of Tuscia (Viterbo). He is the owner of the company, Andrea Natali "Conservazione Beni Culturali". He has carried out teaching activities in University Courses and Masters and done research in the fields of conservation, restoration, artistic diagnostics, authentication of works of art, management and enhancement of cultural and landscape heritage, planning and promotion of artistic and cultural events. He is a mediator / conciliator and expert of the Arbitration Chamber for public contracts with ANAC (Anti-corruption Authority). He is the author and co-author of over 60 publications in the field of conservation and valorization of cultural and landscape heritage. He has been a speaker at over 60 national and international conventions and conferences.

### Summary

Interdisciplinarity and internationalization in the field of cultural and environmental heritage represent two fundamental concepts and objectives in the field of academic training and research. These are the concepts and objectives achieved in the forty years of activity of Salvatore Lorusso and represent the culmination of his long experience, which has been directed at creating a synergy between the human sciences and experimental sciences for the protection and enhancement of cultural and environmental heritage. In this paper, as well as providing a brief summary of this activity, emphasis is placed on how courage, perseverance and creativity have led to the current assertion to 'build networks' between stakeholders and players, so that the equation "*habitus e habitat*" from theory has become reality.