Teaching Conservation and Preservation at the Department of Library Science and Information Systems of the TEI of Athens[1]

by Spiros Zervos

Abstract: The objectives, the learning outcomes and the curriculum of the course "Conservation and Preservation", taught in the Department of Library Science and Information Systems of TEI of Athens are presented.

1. Introduction

It was 1990 when I read Helmut Bansa's article "The awareness of conservation. Reasons for reorientation in library training", published In *Restaurator* (Bansa 1986). At that time I had already been working for the Greek State Archives for about two years as a paper conservator. Although fresh in the profession, I immediately understood what Dr. Bansa was trying to say. Since then, I had plenty of opportunity to agree with him. With few exceptions, archivists and librarians, even formally trained, could not grasp the importance of preservation in the details. Although they seemed to understand the principles and they agreed on the necessity of preservation in general, they often failed when these principles had to be implemented. Something was missing, which was beyond the lack of a common language with conservators. Through the years, I came to understand that although they had the necessary information to make the right decisions, they lacked the formal training in preservation and conservation and the knowledge of the scientific principles behind the information.

At that point, some examples of the misconceptions about preservation and conservation among librarians and archivists that I have encountered during my professional life may be necessary to support my previous claims. Mistakes in terminology, such as "non-rusting paper" (in analogy to non-rusting steel) instead of acid-free paper may just make the reader smile, and are innocuous. But the misconception that putting wet archival material in commercial refrigerator at circa 2 to 3 °C and leaving it there for weeks would be the best way to dry it after a flood may prove disastrous. Small but catastrophic floods caused by clogging or puncturing of the drainage pipes of the air-conditioning system was always a source of awe and wonder among fellow archivists, because air-conditioning is a technical thing and they didn't want to try to understand the principles of its operation, let alone scientific jargon such as condensation, dew point, etc. And the appearance and operation of a sling psychrometer would bring laughter to them, because they could not believe that such a toy is the most accurate instrument for RH determination. The practice of tying bundles of manuscripts with string, although obviously very catastrophic since it tears the paper sheets, seemed very natural to a fellow archivist. It took a lot of persuasion to convince her to stop using this "method" of packaging and use archival boxes, or at least use a wide ribbon instead.

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I finally came to believe that only training in preservation and conservation through integration into the curriculum of the related schools might make the difference. Reeducating the "old guard" of archivists and librarians could improve the situation, but the change will take time. The true difference will come from the young generation of professionals with the proper training in preservation and conservation, and as Dr. Bansa implied, with the retirement of the "old guard" (Bansa 1986).

Today, as a faculty member of the Department of Library Science and Information Systems of the Technical Educational Institute of Athens (TEI-A), I teach preservation and conservation to future librarians and archivists. In 2008, there was a major revamping of the curriculum of the Department and the course on conservation and preservation was reformed (Giannakopoulos et al. 2011). I redesigned the course in 2009, when I started teaching it, having in mind Dr. Bansa's article (Bansa 1986) and drawing from the relevant literature (Dureau and Clements 1986, Zyska and Jarosz 1992, Kufa 1998, Gracy and Croft 2006) and from my past experience of almost twenty years of working together with archivists and librarians. My main goal was to integrate preservation into the principles of the profession. I also aimed at establishing a sciences theoretical background and at teaching practical skills, which students with a humanities background usually lack.

2. The "Conservation and Preservation" Course

The course which primarily concerns preservation is entitled "Conservation and Preservation" and is compulsory. It is taught in the 6th semester (of the 8 that comprise the typical length of studies) for a duration of 13 weeks, with a 3 hour theory and a 2 hour workshop components (65 hours is total), and has 6 ECTS[2, 3]. The course objectives, as officially stated in the study guide of the department are: "To familiarize students with the physical aspect of information media, as well as with their properties, ageing and degradation, conservation and preservation; to teach best preservation practices; to facilitate conservation management".

According to the study guide, the learning outcome of the course is to train the future librarians and archivists so that:

- They can prepare and implement a preservation plan in cooperation with scientists and specialists, which will determine the measures to be taken for the safekeeping of the institution holdings (storage conditions, safety and emergency measures) and standardize the daily routine tasks which directly or indirectly affect their state of preservation (lending, reproduction, distribution and access, withdrawal, selection for conservation, etc).
- They can make scientifically correct decisions that affect the condition of institution holdings, based on international experience and existing standards.
- They understand the capabilities and limitations of the discipline of conservation of books and archival material, so that they may effectively cooperate with conservators (conservation management).

[2] ECTS: European Credit Transfer and Accumulation System, http://ec.europa.eu/education/lifelong-learning-policy/doc48_en.htm

[3] http://www.teiath.gr/sdo/lis/articles.php?mid=5260&lang=en

- They acquire the basic scientific and technical knowledge pertaining to the materials and objects kept in libraries and archives (paper, leather, photograph, film, magnetic media, digital media), so that they may understand the causes and mechanisms of deterioration, as well as the requirements necessary to store and preserve them.
- They become aware of preservation issues and get to know the terminology so that conservators, librarians and archivists share a common language of communication.

The theoretical component of the course is structured in 5 chapters, which are outlined below:

Chapter 1. Introduction
- Objectives and outline of the course
- Definitions: Preservation; conservation; restoration
- Legislation and charters pertaining to the protection of cultural heritage; international organizations; standards; international trends and developments
- Modern theory of conservation; principles of conservation; ethics; values; stakeholders and conflicts of interest; conservation and politics
- Discussion and case studies

Chapter 2. Objects and Materials
History, composition, properties, and structure (books; archival material; photographic material; film; gramophone records; magnetic media; other audio and video media; digital media; paper; leather; parchment, etc.).
- History of paper and writing media; hand and industrial papermaking; paper sizing
- Paper composition and structure; cellulose properties
- Paper properties: chemical (cellulose acid hydrolysis, oxidation, effect of heat and light); physicochemical; mechanical; optical
- Types of paper; paper anisotropy; handmade paper; marbled paper
- Inks, dyes and pigments: iron gall ink; india ink; printing inks; modern inks
- Books and bookbinding: terminology; history; materials and techniques.
- Leather; parchment (production, properties)
- Adhesives
- Modern information media: photographic material (technology, historic techniques); film (cellulose nitrate, cellulose acetate); gramophone records; magnetic tapes; other audio and video media; digital media (types, structure, CD, DVD)

Chapter 3. Ageing and Degradation
Causes, mechanisms, results and typology of ageing and degradation of books and archival material.
- Paper degradation: chemical; physiochemical; mechanical; biological
- Acids and bases; acidity and alkalinity; pH; pH of paper; pH determination
- Internal and external agents of degradation
- Cellulose acid hydrolysis; sources of paper acidity; the effect of alum; effect of paper pH on the rate of ageing; oxidation
- Natural aging of paper, leather and other materials; durability over time
- Typology of degradation; colour changes; foxing; iron gall ink corrosion
- Effects of heat and humidity and their fluctuations on the rate of ageing

- Biodeterioration; agents: fungi; insects; pests
- Accelerated ageing of paper; diagnosis of degradation; sampling; testing methods
- Degradation of leather and parchment; typology of degradation; red rot; gelatinization
- Bookbinding damage and deterioration
- Deterioration of modern media (photographic material; film; gramophone records; magnetic tapes; digital media): causes, mechanisms, results and typology; vinegar syndrome; cellulose nitrate ageing; CD rot

Chapter 4. Conservation

Conservation treatments for paper, books and archival material.

- Analysis of the terms preservation, restoration, conservation
- Aims and principles of conservation; methods and stages of paper conservation treatments
- Insect extermination: carbon dioxide and nitrogen treatments; obsolete methods: sterilization and fumigation
- Cleaning: dry and wet cleaning; washing with water, risks, pros and cons; enzymes; laser cleaning; bleaching
- Methods of chemical stabilization
- Acids and bases; acidity and alkalinity; pH; neutralization
- Deacidification; chemistry of deacidification; alkaline reserve; aqueous deacidification; in organic solvents; gaseous deacidification; best practices; workshop methods; mass deacidification; outlook
- Borohydride treatment; transition metal ion deactivation (experimental methods)
- Treatment of iron gall ink corrosion; phytate treatment
- Consolidation and strengthening: mechanical stabilization; use of japanese papers; adhesives; restoration of mechanical damages; sizing and resizing; lamination; vacuum table; leafcasting; paper splitting; mass mechanical stabilization methods
- Drying of wet books and archival material
- Conservation of bookbinding; restoration of functionality
- Conservation of leather and parchment
- Conservation of modern media: objectives; cleaning and consolidation; specific issues (baking of tape, mechanical restoration of film and tape, etc.)
- Limitations and drawbacks of conservation
- Paper and book conservation workshop infrastructure; preservation quality materials; health considerations
- Documentation of conservation; rationale; methods
- Methodology and criteria for the evaluation of the suitability of conservation treatments
- Principles of conservation management

Chapter 5. Preservation

- Preservation planning; risk assessment and management; setting priorities; preservation and collection survey; preventive and active conservation
- Definition of relative humidity; psychrometric diagram; RH determination; RH monitoring

- Storage conditions and climatic control; principles; dependence of ageing rate on temperature and relative humidity; light; international standards for storage; rationale; monitoring and recording storage parameters
- Air-conditioning; heating; dehumidification; ventilation; atmospheric control and air quality
- Emergencies; fire-detection and fire-extinguishing; prevention of flood; theft; vandalism; emergency plan
- Fungi, insect and rodent Infection; preventive measures; remedial actions; health issues
- Security measures; reading rooms
- Building issues; function and design; “green” archival and library buildings; application of the principles of sustainable development; issues with historical buildings
- Storage practices: archival quality materials; acid-free materials; alkaline reserve; pH and acidity, their significance in preservation; acid migration; archival boxes; polyester sleeves; international standards for paper permanence; ISO 9706, 11108
- Furniture, shelves, bookcases; exhibitions; handling of books and archival material; best practices; common mistakes
- Preservation of modern and digital media: Storage conditions and climatic control; principles; handling; cold storage; nitrate and acetate film issues; AD strips; PAT test; policy issues; preservation of access; permanence of digital media
- Reproduction of books and archival material; photographing, microphotographing, photocopying and digitization; withdrawal from public access
- Digitization: standards and general principles; equipment; digital preservation; format obsolescence; data security; back-ups; best practices; pros and cons of digitization

The theoretical part of the course first introduces the materials and the objects in chapter one, then discusses their degradation in chapter two, and then their conservation and preservation in chapters three and four respectively. This is not the traditional vertical structure, where every object and material has a dedicated chapter that presents its history, properties, conservation and preservation. The present horizontal structure was preferred because it places the emphasis on common properties and procedures that permeate all materials and objects, instead of emphasizing specific issues related to specific materials. It also serves the objective discussed later on, that an important topic has to be discussed at least 5 times in different contexts.

Since the aim of the course is not to train conservators with hands-on experience, the workshop exercises mainly consist of demonstrations, which in some cases are followed by execution of the exercise by the students themselves.

The workshop exercises include the following topics:

- Determining the characteristics of machine and handmade paper; laid paper; wove paper; watermarks; paper anisotropy; rag, chemical pulp and groundwood pulp paper; papyrus; leather; parchment; terminology. Real contemporary and historic samples are examined and observations are discussed in the class. Hand papermaking is explained with the aid of videos, slideshows and models.
- Use of pH-indicator strips and pH-pen for the rough determination of the pH of various papers. The importance of pH in the preservation condition of old papers samples is discussed. A simple experiment demonstrating the significance of paper pH on

permanence is set up, where paper samples of various pHs are exposed to the sunlight for the duration of the semester. At the end of the semester, the differences in colour and pH of the exposed and the non-exposed samples are discussed.

- The book: terminology, history and techniques explained on models, with the aid of videos and slideshows; making marbled paper in the class.
- Case-binding construction; sewing the quires (hands-on exercise). Demonstration of the proper sewing techniques that allow the book to open as wide as possible without damaging the spine; recommendations for library binding.
- Inks and manuscripts: examination of real historic manuscript samples, determination of the ink type; slideshows of iron gall ink corroded papers.
- Slideshows of deterioration and damage of various substrates; real samples examination (brittle paper, foxing, waterstains, biodeterioration, etc.); bookbinding damage; modern media deterioration.
- Paper conservation (presentation, demonstration and hand-on experience): tools and infrastructure; dry cleaning; washing; deacidification with semisaturated calcium hydroxide; sizing; mechanical stabilization; work on the light table (repair of tears; gap-filling); lamination
- Preservation: slideshows of common mistakes, disasters and building issues; case studies and discussion.
- Determination of relative humidity with the sling psychrometer. Use of the psychrometric chart.

Obviously, in the short duration of the course, some very important topics are just scratched at the surface. Taking for example the very important issue of digital preservation, only some superficial aspects are discussed. Although digital preservation is taught as part of other courses also, there is an ongoing discussion among the faculty of the Department to establish a new specific course on digital preservation.

Information technology is extensively used in both theory and workshop classes: presentations, videos and slideshows via video projector, an excellent e-class infrastructure based on moodle[4], the use of internet for communication and dissemination and access of the teaching material, etc. Visits to public and private organizations (for example The General State Archives, The National Library, The Archive of the National Bank of Greece) and their conservation workshops and lectures from invited speakers enhance the teaching experience and provide material for further discussion, case study analysis and reports prepared by students.

3. Other Related Courses

The course “Conservation and Preservation” is not the only one pertaining to preservation and conservation. At least eight more courses deal with relevant subjects:

- Introduction to Archives
- Introduction to Information Technologies
- Library and Information Unit Management
- Publishing
- Museum Studies

[4] Modular Object-Oriented Dynamic Learning Environment: http://moodle.org/

- Managing Archival Materials
- History of Writing & Information Technology
- History of the Book and Libraries

As Dr. Bansa emphatically states, “information a student shall really catch and keep in mind must be repeated at least five times, each time in another context. The context is all-important” (Bansa 1986). The curriculum of the above courses is infused with subjects such as book history, book construction, printing and publishing and their history, modern and digital information media, use of information technology in preservation, digitization, archives and library management, preservation and best storage practices, etc. These courses provide extra opportunities to discuss subjects relevant to preservation outside the preservation context, and thus they fulfill the principle of repetitions in different contexts. They also provide much of the complementary knowledge that Dr. Bansa considers as essential (Bansa 1986).

4. First Results and Outlook

Introducing technical subjects in the curriculum of a school with a humanities background is not an easy task. The further enrichment of the curriculum with information technology (IT) courses had been easily accepted by students, teachers, administration and working colleagues as being necessary, given the penetration of IT in every aspect of life nowadays. This was not the case with the course on preservation and conservation. In the beginning of every semester I face a strong opposition from students when I introduce some elementary chemistry, physics, technology and engineering principles, but after the first shock the students accept it and really enjoy the classes. Students resent the technical and science details, and they wonder why they have to bother learning them. They must first be persuaded for the necessity of the technical details, otherwise they do not want to get involved and participate passively by just being there. To that end, especially in the beginning of the semester, I use a Socratic approach and try to capture the attention of the students by a combination of discussion, presentation of extreme cases, anecdotal stories and with the aid of IT, videos and slideshows.

It is very early to evaluate the results of the curriculum revamping on the professional attitude and performance of the department graduates; especially the effect on their attitude towards preservation and conservation. Such an evaluation is among the plans of the department, but a sufficiently long period of time must pass after the first students that followed the new curriculum graduate. Nevertheless, the overall very good results of the department evaluation offer an indication of the success and the acceptance of the conservation and preservation course among current students. According to their opinion, the course has one of the highest scores among the department courses. Such a result is a very encouraging indication that the curriculum of the course appeals to the students’ expectations, and therefore there is a good chance it can pass them the desired knowledge and awareness concerning preservation and conservation.

References

Bansa, H.: *The awareness of conservation. Reasons for reorientation in library training*. Restaurator 7(1) (1986): 36-47.

Giannakopoulos, G., Kyriaki-Manesi, D., Zervos, S.: *Approaching information as an integrated field: Educating information professionals*. In: International Conference on Integrated Information Proceedings (IC-ININFO 2011), Giannakopoulos, G., Sakas, D., Vlachos, D., Kyriaki-Manesi, D. (eds.), Kos Island, Greece, 29 Sep.-3 Oct. 2011 (in press).

Dureau, J.M., Clements, D.W.G.: *Principles for the Preservation and Conservation of Library Materials*. IFLA Professional Reports, No. 8 (1986).

Gracy, K.F., Croft, J.A.: *Quo Vadis, Preservation Education? A Study of Current Trends and Future Needs in Graduate Programs*. Library Resources and Technical Services 50(4) (2006): 274-294.

Kufa, J.C.: *Preservation education: A pilot project on preservation awareness training in the University of Botswana Library*. Restaurator 19(2) (1998): 108-114.

Zyska, B.J., Jarosz, A.W.: *The awareness of conservation. Ten years of experience at the Silesian University, Katowice, Poland*. Restaurator 13(3) (1992): 138-147.

Contact

Spiros Zervos
Assistant Professor
Department of Library Science and Information Systems
Faculty of Management and Economics
Technological Educational Institute of Athens [TEI-A]
Agiou Spiridonos & Pallikaridi
Aegaleo 12210 – Athens, Greece
T: +302105385268
Mail: szervos@teiath.gr
Home page: http://users.teiath.gr/szervos/

Author

Spiros Zervos is a Chemist trained in Paper Conservation at the Centro del bel Libro in Ascona, Switzerland. He started his professional career in 1989 working as an Archival Material Conservator at the Corfu State Archives up until April 2009, when he was elected Assistant Professor in the Department of Library Science and Information Systems in the Faculty of Economics of the Technical Educational Institution of Athens. He teaches Conservation and Preservation of Archival and Library Material and related topics. He obtained his PhD in material science in 2004 from the Chemical Engineering Department of the National Technical University of Athens. His research interests include paper and cellulose ageing, and conservation and preservation of paper and archival materials. Dr. Zervos is the first author and co – author of several publications.