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THE WARSAW SCHOOL OF PAPER CONSERVATION



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ABSTRACT: The paper presents the history and development of conservation of books, graphics and paper objects in Warsaw Poland, both in practical approach as well as in the process of teaching at the Academy of Fine Arts. The theoretical assumptions are followed by a review of chemical methods used today, but also abandoned ones. There were two turning points in the history of conservation in Warsaw: beginning co-operation with professional chemists at the Academy and developing the system of microbiological controls at the National Library. A short description of the most important conservation projects is included: *Acid Paper* and *Energy Efficiency of Museums and Libraries*.

INTRODUCTION

In Poland, “paper conservator” is a common term referring to a graduate of the Department for Conservation and Restoration of Old Prints and Manuscripts (the “Department”) of the Faculty of Conservation and Restoration of Works of Art at the Academy of Fine Arts in Warsaw (ASP), or of

the Department of Paper and Leather Conservation of the Institute of Studies on Historic Monuments and Conservation of the Faculty of Fine Arts at the Nicolaus Copernicus University in Toruń (UMK). The main purpose of this simplification is to highlight the specialisation of those conservators and to distinguish them from others (also as understood by laymen), specialising for example in painting, sculpture, weaving etc.

If we analyse the diversity of objects processed by paper conservators, we will realise that the existing name of this department fails to reflect the full extent of their works; however, should we try to extend it, the list would become never-ending.

The Polish paper conservators are graduates of these two schools. Based on the educational profile as well as the curriculum requirements for students, who later become graduates and conservators, we can distinguish two distinct schools, one from Warsaw and the other one from Toruń. This said, it should also be borne in mind that irrespective of their university or the major completed, each conservator is bound by the regulations of the *Act on the Protection and Guardianship of Historic Artefacts*, the *Code of Ethics for Conservators and Restorers* and of the *Conservator's Documentation Scheme*.

Hence, despite certain discrepancies in the conservator's practical approach to the objects which result from his or her educational background, the limits established by the above legal acts must always be observed. Additionally, in museums, archives, and libraries the current preservation policy also needs to be respected.

In this context, the "Warsaw School of Paper Conservation" can be defined as the art of conservation and restoration of (technologically) defined objects pursued by the Department as well as by numerous museums, archives, and libraries in Warsaw or elsewhere by graduates of the Department. As most directors of conservation workshops at Warsaw institutions are graduates of the Warsaw ASP, the "Warsaw School" can be seen as largely uniform, at least as far as the fundamentals of conservation are concerned, despite the pronounced presence of UMK graduates in the Polish capital too. Also, one must not forget that conservation is a highly individual and creative process — this is the reason why graduates of the ASP Faculty of Conservation and Restoration of Works of Art are granted the Master of Arts title. For it is not by chance that the term "conservation art" has been devised.

DEPARTMENT FOR CONSERVATION AND RESTORATION
OF OLD PRINTS AND MANUSCRIPTS OF THE FACULTY
OF CONSERVATION AND RESTORATION OF WORKS OF
ART AT THE ACADEMY OF FINE ARTS IN WARSAW (ASP)

Professor Marzenna Ciechańska of the Warsaw Academy of Fine Arts, the current Dean of the Faculty of Conservation, states:

“The history of our Department dates back to 1947, when the Conservation Workshop for Books and Engravings was established as part of the Artwork Conservation Studio. The workshop was set up by the eminent artist and professor Bonawentura Lenart [founder of the National Library Conservation Studio (1929) and its head until 1939 – author’s note], together with its subsequent head and professor, Tadeusz Tuszewski. Since 1983, the Department was managed by assistant professor Zofia Pieniązek, followed by Józef Charytoniuk, MA, in the years 1990-1998. Today, its director is Wojciech Chrościcki, MA.

Our curriculum is based on a programme perfected and verified for many years by prof. Tuszewski; however, over time and with new methods and means of conservation emerging, it became necessary to modernise it. In 1991, the curricula for the 3rd, 4th and 5th years of studies were extended, and in 1995 the curricula for the 1st and 2nd years were radically changed to form a block for the preliminary introduction to conservation. The programme is constantly adjusted in search of the optimum model.

(...)

The studies last 6 years and are divided into 3 stages [preliminary conservation studies – 2 years, practical conservation studies – 3 years, Master’s project – 1 year – author’s note], finished with the defence of the Master’s project.

(...)

Special focus is put on ethics and perfection in all conservation procedures as well as on the ability to work independently”¹.

Since the time this article was published, the Department, previously consisting of 3 workshops:

1. the Workshop for Conservation and Restoration of Old Prints and Manuscripts,
2. the Workshop for Conservation and Restoration of Engravings and Drawings,
3. the Workshop for the Techniques and Technologies of Book Binding, has been expanded to include the Workshop for Conservation and Restoration of Photography and Decorative Arts.

Changes in the educational process are evident if we have a look at the list of items subject of conservation within the master’s projects completed by students of the Department (according to the list available from the Faculty website for the years 1950–2013, <https://wkirds.asp.waw.pl/konserwacja-i-restauracja-ksiazki-grafiki-i-skory-zabytkowej/>, accessed: January 2016).

¹ M. Ciechańska, *Program nauczania w Katedrze Konserwacji i Restauracji Starych Druków i Grafiki Wydziału Konserwacji i Restauracji Dzieł Sztuki ASP w Warszawie* [Teaching Curriculum at the Department for Conservation and Restoration of Old Prints and Engravings of the Faculty of Conservation and Restoration of Works of Art at the Academy of Fine Arts in Warsaw], *Notes Konserwatorski* [Conservator’s Notebook], issue 3, Warsaw 1999). pp. 187-193

year	students	Codices		(Single) sheets		Others	
		prints	manu- scripts	prints/ engravings	manu- scripts	paintings	other
Up to 1968	3	2		1		1 watercolour painting	
1968	2	2		2			
1970	1	1		1			
1971	1	1		1			
1972	1	1		1			
1974	2	2		2			
1975	1	1		1			
1977	2	2		2			
1978	2	2		2			
1979	5	4	1	4		1 watercolour painting	
1980	4	3	1	2	1		
1981	2	2		2			
1982	5	3	2	5			
1983	5	3	2	4			
1984	3	2	1		1	2 (pastel paintings)	
1985	6	4	2	4		2	
1986	1		1	1			
1988	2	1	2			1	
1990	5	4	1	1		3	
1992	2		2	2			
1993	8	6	2	5	3		
1995	4	2	1	2		1 oil painting	
1996	2	2					
1997	3		3	1			1 handheld fan
1998	1	1					
2000	4	3		1			
2001	5	1	3				1 tableau vivant
2002	1				1 papyrus		
2003	5	2	2				1 terrestrial globe

2004	1			7 engravings			
2005	3	2				1 pastel painting	
2006	3	1				1 pastel painting	1 painting/silkwork
2007	1			1			
2009	7			1	1	1+ 1 collage	1 photographic album 1 handheld fan
2010	4			1 poster	1		1 terrestrial globe 1 piece of wall upholstery
2011	1						2 photographic objects
2012	2			1			1 oriental photographic album
2013	1		1				
Total	114	60	26	58	8	14	11
	students	prints	manuscripts	prints/ engravings	manuscripts	paintings	other
		Codices		(Single) sheets		Others	

Two clear tendencies relating to those master's projects can be observed: an ever smaller number of students opt for the conservation of an object consisting of a codex and a single sheet (manuscript or engraving, usually with a water-sensitive painting layer), and a tendency to perform conservation of a single object. At the same time, there are added theoretical (or both theoretical and practical) works on conservation rather than bibliography, iconography, and art history, unlike the period up to the late 1990s.

CHEMICAL CONSERVATION TREATMENT AT THE DEPARTMENT UNTIL THE APPOINTMENT OF WŁADYSŁAW SOBUCKI AS ITS HEAD (1979) AND DURING HIS TERM OF OFFICE (UNTIL 1980)

Up to 1979 (review of the master's projects available in the Department's archive)

The advanced level of conservation in terms of artistic and manual skill was not always accompanied by an optimal use of chemical substances in paper conservation. However, this did not significantly differ from worldwide tendencies in paper conservation. From the very beginning, the stand-

ard procedure was to determine the objects' pH with the contact method prior to conservation in order to decide whether deacidification was required. Domestically produced pH-metres, electrodes and standard solutions were used.

Wet treatment usually started with (generally) warm water baths at a temperature between 35 and 40°C, occasionally reaching 50°C. The order of treatment procedures — water baths, bleaching, deacidification — has remained unchanged to this day.

The following two methods of deacidification (also called “neutralisation”) were employed (with modifications as regards the exposure time and method, i.e. bath or use of a tampon, or exposure of the verso side only):

- a saturated $\text{Ca}(\text{OH})_2$ solution (ca. 0.2%) and a 0.2% $\text{Ca}(\text{HCO}_3)_2$ solution (in fact a $\text{Ca}^{2+} + 2\text{HCO}_3^-$ aqueous solution) applied sequentially, e.g. a 20' bath in the first one and a 20' bath in the second.

- a buffer mixture of two solutions: 1.4546ml of distilled water and 54.3g of H_3BO_3 (boric acid), and 2.454ml of distilled water and 8.5g of $\text{Na}_2\text{B}_4\text{O}_7$ (borax).

Another frequent type of treatment was bleaching both in whole – through a bath – and locally; following such local bleaching the remaining stains were duplicated in a bath to achieve a unifying effect. The following substances were applied:

- 2-3% H_2O_2 solution,
- 0.5%-6% chloramine-T aqueous solution,
- chloramine-T aqueous solution in an acidic medium obtained through a bath or by using a tampon with a citric acid solution (1%-6%),
- sporadically, sodium hypochlorite bleaching was applied (using a tampon with 0.5% aqueous solution of NaOCl),
- 1% chloramine-T in 45% ethanol was used once only (through a tampon),
- sporadically, rust and ink stains were removed with thioglycolic acid.

Typically enough, despite long flow-through baths, bleaching was rarely followed by application of an “anti-chlorine agent”, i.e. a compound neutralising the remains of chlorine (hypochlorite) in paper, in this case a 1.8% aqueous solution of sodium thiosulphate $\text{Na}_2\text{S}_2\text{O}_3$, occurring only twice in the documented seventeen cases of chloramine bleaching.

The solutions and baths were prepared with distilled water; adhesives (starch clusters or gelatine) were prepared with distilled water with NaF added (5g per 1 litre; a 0.5% solution) to increase resistance to microbiological threats. Paper was sized after conservation with aqueous gelatine (1-4.5%) solutions. 5% gelatine was also applied to protect manuscript pieces before the bath.

Leather bindings were cleaned with beef bile solutions in ethanol, the only recorded proportions being 1:2. A less frequent type of treatment was to improve the leather quality by rubbing a solution of lanolin in hexane into it (this substance was described once only, as a 5% solution). One case

of “neutralisation” of acidified leather was recorded, with a 20% aqueous solution of potassium lactate (with pH=10.7) applied twice on the hypodermis side.

Aside from gelatine solutions, water-sensitive parts were protected with:

- acetone and polyamide 1:20,
- toluene with synthetic resin 1:15,
- Winoflex in toluene (proportions unknown),
- Movital (polyvinyl butyral) made by Hornbaker – two solutions: 5% and 15% Movital solutions in ethyl alcohol.

Chemical conservation treatment under Władysław Sobucki (after 1980)

In 1980 (the date of the first master’s project listing Władysław Sobucki as the chemical test supervisor), Władysław Sobucki, a paper chemist who graduated from the Gdańsk University of Technology in 1969, started to work with the Department. In practice, this cooperation lasts to this day and has resulted in two book publications:

- *Konserwacja papieru. Zagadnienia chemiczne* [Paper Conservation. Chemical Issues] (Warsaw, National Library of Poland, 2013)
- *Wiedza o papierze dla konserwatorów zbiorów* [Paper Conservation for Conservators and Restorers] (with co-author Elżbieta Jeżewska), (Warsaw, National Library of Poland, 2015)

Konserwacja papieru. Zagadnienia chemiczne [Paper Conservation. Chemical Issues] was a breakthrough publication (the first and only such work in Polish) defining the approach to chemistry and chemical treatment in paper conservation in a broader sense. Its contents correspond to the conservation chemistry curriculum for 2nd and 3rd-year students of the “Paper Conservation” Department. In general terms, this approach can be summarised as follows:

- chemical treatment is a means of implementing the principles of conservation;
- any alterations of the object must be reduced to the necessary minimum;
- only indispensable treatment shall be performed (to eliminate, stop or slow down the object’s deterioration);
- restoration (i.e. bleaching) shall be used with caution and as a last resort;
- deacidification (if necessary) is the most important type of conservation treatment;
- ideally, conservation treatment shall be reversible and removable (which is not the case with Filmoplast or cellulose acetate treatment, since although the repair itself can be reversed, the adhesive cannot be fully removed from the paper).

The book discusses the types of chemical treatment currently applied in the Department as well as historical ones – this is important to understand for the secondary damages brought about by discontinued methods such as chloramine bleaching without neutralising the residues of chlorine

compounds. The curriculum includes several types of treatment for didactic purposes, with a special focus on the limitations of each method and due justification of their use. The graduates shall be familiar with a broad range of conservation treatment methods and the details of their implementation, as well as know when they should be applied and, more importantly, when they should not.

Microbiological control (microbiological tests, disinfection)

Starting from the very first master's projects at the Department, disinfection is mentioned in their documentation, however rarely. This includes microbiological tests (in 1968, during the conservation of the *Tacitus Opera* (block of prints, Venice, 1497) and *Scriptores Historiae Augustae* (Venice, 1490) incunables, microbiological tests were performed by prof. Jerzy Ważny from the Faculty of Forestry of the Warsaw University of Life Sciences, who isolated and identified the following fungi species: *Aspergillus pulverulentus*, *Aspergillus ochraceus* and *Trichotecium roseum*). Disinfection with Rotanox gas (a mixture of ethylene oxide and carbon dioxide in a 1:9 proportion by weight) was carried out in a fumigation chamber located most likely at the Faculty of Forestry of the Warsaw University of Life Sciences; however, the tests and disinfection treatments lacked the conservation approach currently applied at the National Library. Likewise, the descriptions of disinfection included in the documentation are laconic: "a 60-70mmHg vacuum was produced", then the gas was introduced at atmospheric pressure. Exposure time varied from 4 to 6 hours; such 6-hour exposures were sometimes repeated. Occasionally, the object could be disinfected for as long as 24 hours. There is no mention of any post-fumigation ventilation of the objects or any tests to determine how efficient the disinfection was; however, the following quote from the conservation documentation of Dvinker's Map, a coloured copper engraving (belonging to a private owner), seems significant: (1980, Monika Feorczyk, supervisor: Tadeusz Tuszewski) "*The disinfection failed to bring the expected results, as visual inspections of the object carried out within several months led to questioning its viability. The object was disinfected again, this time with absorbent paper impregnated with a 10% p-chloro-m-cresol alcohol solution. The object was placed in it for 7 days at 20°C.*"

Both the "methodology" of effectiveness assessment and the first ever case of employing p-chloro-m-cresol (PCMC) may cause surprise. This compound was to be used at the ASP for the next 15 years, until this method was ultimately abolished. At the National Library, the last documented case of disinfection with this method was performed in 1999. In total, in the years 1988-1992, the National Library disinfected or ordered disinfection of 9,816 objects (data from the order notebook of the Department of Conser-

vation of Library Collections; as the type of disinfection remains unknown, the use of PCMC cannot be excluded; also, probably some of the objects were not owned by the National Library). However, PCMC disinfection in the years 1993-1999 is well documented (see table below).

PCMC disinfection of objects at the National Library of Poland, 1993-1999

Disinfection was mostly carried out using the interleaf method, by means of filter paper moistened with a 10% PCMC solution in 70% ethanol (with an approx. 2-week exposure). It is estimated that no more than 5% of the recorded numbers correspond to disinfection through applying a 1-2% PCMC solution in 70% ethanol. At this stage, the PCMC disinfection method was not divided into the interleaf and rubbing variants.

year	National Library organisational unit or type of objects (number of disinfected objects)							annual total
	<i>Old prints</i>	<i>Manu- scripts</i>	<i>Icono- graphy</i>	<i>Carto- graphy</i>	<i>OMB*</i>	<i>Music documents</i>	<i>Others</i>	
1993	24	4	10	-	-	-	-	38
1994	64	8	9	17	7	5	2	112
1995	111	-	64	10	-	2	-	187
1996	117	7	2	9	-	5	-	140
1997	36	2	30	19	6	5	1	99
1998	67	10	1	4	1	5	2	90
1999	-	-	1	-	-	7	-	8
total	419	31	117	59	14	29	5	674

*- Library Storerooms Unit.

When microbiological workshops were developed at the Central Laboratory of Archive Conservation (CLKA) of the Central Archives of Historical Records in Warsaw and at the National Library Department of Conservation of Library Collections, our ASP paper conservation department began working together with these institutions in the areas of microbiological control and ethylene oxide fumigation, using a chamber belonging to CLKA.

Both laboratories use the microbiological test method where a sterile filter paper is imprinted onto the object and then placed in a dish with microbiological medium.

After the tragic "flood of the millennium" in 1997, the National Library developed a programme to save flooded collections, and purchased a freeze-dryer and an ethylene oxide disinfection chamber for this purpose. The chamber was put in service in April 2000. The 12 years of its opera-

tion have been summarised in a paper by Bogdan Zerek entitled: *The ethylene oxide disinfection system of the National Library of Poland – summary of over 12 years of activity* presented at the *Men and Books: From Microorganisms to Megaorganisms* conference (St. Pölten 28/04 – 01/05/2014).

In 2007, Bogdan Filip Zerek, a graduate of the “Paper Conservation” Department of the Warsaw ASP and of the Faculty of Biology of the University of Warsaw, was appointed head of the Section of Microbiological Control and Conservation of Atypical Collections at the Department-Laboratory of Conservation of Library Collections (the microbiological workshop with its disinfection chamber continued its over 20-year activity within this unit). In 2008, the National Library microbiological control instructions were newly drafted from scratch, and in 2010 the new manual for microbiological air control within the National Library premises was drawn up.

Today, the work of the Department-Laboratory of Conservation of Library Collections is based on the fundamental principle that disinfection is a type of conservation treatment; therefore, it is the chief conservator or the supervisor of conservation works for the specific object who shall make any decisions regarding disinfection. Such decisions shall be based on microbiological analysis carried out on the object before and after any such disinfection, the entire process being documented by the Object Microbiological Test Sheet.

The scope of the microbiological tests currently performed at the National Library includes:

- impress contact sampling (on the objects),
- sampling with (dry) swabs,
- ATP detection tests, and
- tests in the impact method (applied to the air).

In 2015, at the 13th IADA Congress in Berlin, Bogdan Zerek presented the results of studies comparing the efficiency of microbiological sampling of library objects made of paper using the above contact sampling methods and the procedure of using ATP tests to detect units developing mould fungi colonies on library and archive objects [http://www.iada-home.org/fileadmin/01-Redaktion/uploads/Concept_Program_Berlin.pdf, accessed: 01/2017].

In the academic year 2014/2015, the curriculum of all majors offered by the Faculty of Conservation and Restoration of Works of Art was extended to include microbiology, taught by Bogdan Zerek.

RESEARCH WORK

The beginning of research on conservation techniques and methods coincides with the period in which Władysław Sobucki started working at the Department. In a master’s project documentation of 1980 (Dvinker’s Map, as mentioned above), whiteness measurement of the object’s paper

was mentioned for the first time as a method of verifying the effectiveness of conservation treatment (whiteness measurement based on a freshly prepared magnesium oxide standard model with a Carl Zeiss leucometer). At the same time, the negative impact Mowital had on the whiteness of paper was discovered following ageing tests, despite the previous positive opinion concerning this agent. This opinion, however, was issued on the sole basis of naked-eye visual inspection of aged samples. As Władysław Sobucki worked with both the ASP Department and the National Library Department of Conservation of Library Collections, the equipment base of the former was gradually expanded, acquiring devices for testing both the mechanical (tear, break and bending resistance) and optical (colour, also expressed as whiteness and yellowness) properties of paper. Today, both institutions have ageing chambers (ageing agents being temperature and relative air humidity); additionally, the National Library possesses a Xenotest device (ageing through exposure to light). An example of such tests is found in *Ocena możliwości zastosowania Lichenicydy 246 do dezynfekcji papierów zabytkowych* [Evaluation of the possibilities of using Lichenicide 246 for disinfecting of antique papers]². The purpose of research in materials science is to check the impact of conservation methods and materials on paper (and its graphic layer), both directly after use and following artificial ageing. The results of such works were published in general professional journals such as *Ochrona Zabytków* [Heritage Protection], *Przegląd Papierniczy* [Papermaking Review], and *Biuletyn Informacyjny Konserwatorów Dzieł Sztuki* [Information Newsletter for Conservators of Works of Art], as well as in *Noty Konserwatorski* [Conservator's Notebook], a review dedicated exclusively to the protection of library and archive holdings (as well as paper and parchment museum artefacts) published since 1998 by the National Library. With this new periodical (issued on average once a year), the number of research papers on paper conservation has significantly risen. Making descriptions of the full conservation process available to the public, including detailed accounts of the methods and materials employed, is in line with the Polish Code of Ethics for Conservators and Restorers.

Conservation and conservation research work have also become the subject of doctoral dissertations. So far, four academics from the Department have obtained their PhD titles:

- Weronika Liszewska, *Japońskie techniki dublowania – możliwości zastosowania i modyfikacji w konserwacji zabytkowych malowideł na jedwabiu i tkanin jedwabnych* [Japanese doubling techniques. Possibilities of application and modification in the conservation of paintings on silk and silk fabrics], Faculty of Conservation and Restoration of Works of Art at the Academy of Fine Arts in Warsaw, 2002

² W. Sobucki, D. Jarmańska *Przegląd Papierniczy* [Papermaking Review], 1998, year 54, issue 1, pp. 32-34.

- Marzenna Ciechańska, *Rekonstrukcja komputerowa. Wprowadzenie techniki komputerowej do konserwacji dzieł sztuki na podłożu papierowym* [Computer reconstruction. Introducing the computer technique of conservation of paper-based works of art], Faculty of Conservation and Restoration of Works of Art at the Academy of Fine Arts in Warsaw, 2003

- Jacek Tomaszewski, *Oprawa książkowa w Polsce 1450-1600. Studium telementologiczno-ikonograficzne* [Bookbinding in Poland 1450–1600: Bibliographical-iconographical study], 2007, Institute of Art of the Polish Academy of Sciences.

- Izabela Zając, *Historia zabytkowych albumów do fotografii* [The history of vintage photographic albums], 2011, Institute of Art of the Polish Academy of Sciences.

At the moment, a further four doctoral dissertations are underway.

Two habilitations have been awarded based on the following book publications:

- Marzenna Ciechańska, *Papierowe obicia ścienne w pałacu w Wilanowie – studium portretowe* [Paper wall upholstery in the Wilanów Palace. A study of portraits], The Wilanów Palace Museum, Wilanów, 2010

- Weronika Liszewska, *Konserwacja zabytkowych pergaminów. Nowe metody uzupełniania ubytków z użyciem włókien pergaminowych* [Conservation of historical parchments. New methods of leafcasting with the use of parchment fibres], Academy of Fine Arts in Warsaw, 2012.

CONSERVATION AT THE NATIONAL LIBRARY OF POLAND IN WARSAW

The first Conservation Studio at the National Library of Poland was launched in 1929 by Bonawentura Lenart, and resumed its activity after WWII in 1954. For microbiological tests, documentation is available since 1990. This unit underwent numerous organisational transformations; however, irrespective of having its name changed on several occasions, it has always kept its essential subsections (divisions, workshops) in charge of: manuscript conservation, print conservation, conservation of engravings and drawings, documentation, and the laboratory (of chemistry, later also of microbiology and disinfection).

The Long-term Government Programme “Acidic Paper” and the rise of mass conservation based on mass deacidification methods marked a breakthrough moment. Restructuring began in 2007, when the Section for Mass Conservation of Sheets was launched (based on the Neschen C-900 system); then, after the Bookkeeper installation was put into service, the Mass Conservation Department was divided into the Department of Conservation of Library Collections and the Department-Laboratory of Conservation of Library Collections. Because of its most recent reorganisation, the

Institute for Conservation of Library Collections was set up, composed of the following workshops:

- Workshop for Conservation of Library Collections
- Workshop for Mass Conservation of Sheets
- Workshop for Mass Conservation of Books
- Laboratory of Conservation of Library Collections
- Specialised Bindery

[<http://www.bn.org.pl/o-bn/struktura/instytuty/instytut-konserwacji-zbirow-bibliotecznych>, accessed: 01/2017].

The results of their work are published in specialised conservation journals. An account of their ongoing activities is also provided in the National Library annual report [<http://www.bn.org.pl/o-bn/sprawozdanie-bn>, accessed: 01/2017]. The Institute currently employs 48 people, including 10 certified conservators of works of art (graduates of both the Academy of Fine Arts in Warsaw and the Nicolaus Copernicus University in Toruń), as well as biologists, chemists, renovators and bookbinders.

CONSERVATION AT THE CENTRAL ARCHIVES OF HISTORICAL RECORDS IN WARSAW (AGAD), THE ARCHIVE OF NEW FILES IN WARSAW (AAN) AND IN OTHER POLISH ARCHIVES

It is a peculiarity of the Polish heritage conservation system that while the National Library cannot directly influence the conservation policies of other libraries, all state archives are governed by the Head Office of the State Archives, and all their conservation workshops are bound to follow the guidelines of the Central Laboratory of Archive Conservation (CLKA) of the Central Archives of Historical Records in Warsaw. CLKA currently employs 9 people, its head being Anna Czajka (who graduated from the ASP Department in 1988). CLKA is a traditional conservation workshop, like its counterpart at the Archive of New Files (AAN) (headed by Magdalena Wiercińska, a 2003 graduate of the Department). AAN also has a mass conservation workshop operating in parallel (based on the Neschen C-900 system), launched within the “Acidic Paper” Programme. Both workshops closely cooperate with mass and traditional conservation workshops all over the country (Katowice, Gdańsk, Bydgoszcz, Cracow, Lublin, Łódź, Olsztyn, Poznań, Przemyśl, Suwałki, Szczecin, Toruń, Wrocław, Zielona Góra).

CONSERVATION AT OTHER INSTITUTIONS IN WARSAW

As the country’s capital, Warsaw is home to numerous cultural institutions collecting national heritage objects as well as works of art and historical artefacts. Most of these have their own conservation workshops or closely cooperate with conservators both on an inter-institutional basis and

within private assignments performed by conservators as part of their individual professional practice. Conservation workshops often employ professionals from various backgrounds and are not necessarily divided into subsections responsible for specific types of work. Below, I present a list of conservation workshops operating at Warsaw institutions, with a special mention of paper conservation:

- National Museum: 7 conservation workshops, including the Paper-based Object Conservation Workshop and Laboratory
- The Royal Castle Museum: 4 conservation workshops, including the Furniture, Gilt and Paper Conservation Workshop
- Warsaw Uprising Museum: Conservation Department
- University of Warsaw Library: Preservation and Conservation Department
- Jewish Historical Institute: Conservation Workshop
- Institute of National Remembrance (IPN) (Warsaw Office): Section for Conservation and Preservation of Archive Resources of the Office for Archiving and Sharing IPN Documents.
- Museum of Warsaw: Conservation Department, Paper Conservation Workshop
- Ethnographic Museum: Conservation Department, with the position of Conservator of Paper-based Historical Objects
- Asia and Pacific Museum: Workshop for Collections Conservation.

LONG-TERM GOVERNMENT PROGRAMME “ACIDIC PAPER”

The Long-term Government Programme “Acidic Paper” was unique on a worldwide scale. The programme, entitled “Acidic Paper. Saving Endangered Library and Archival Collections (19th and 20th centuries) by Mass-treatments”, was conceived in 1998-1999, to be implemented in 2000–2008. Its principal objective was “to gather thorough information on mass conservation methods and to conduct preliminary research in this field. It also projected launching the first installations for mass deacidification of library collections in Poland” [source: <http://www.bn.org.pl/inne/wpr/kwasny.html>, accessed: 01/2017].

In 2000-2006, the following objectives were successfully accomplished:

- *assessment of the state of preservation of book collections in four libraries and three archives;*
- *assessment of the degree of paper deterioration in holdings according to regions;*
- *stock-taking of threats to holdings in libraries and archives;*
- *complete assessment of the degree of biological deterioration (caused by insects and fungi) in 19th and 20th century library and archive holdings.* [Papers presenting the methodologies and results of these works are available from the National Library website: <http://www.bn.org.pl/inne/wpr/stan00.htm> accessed: 01/2017];

- *adapting the conservation and microbiological protection methods to the specificity of 19th and 20th-century holdings, including the specificity of deacidified items; researching the possibility of limiting microbiological and entomological threats by providing conditions of exceptional cleanliness, with stable temperature and humidity;*

- *durability assessment of the types of paper currently used in document copies, and developing the respective guidelines and standards for libraries and archives;*

[quoted from: <http://www.bn.org.pl/inne/wpr/aktlprog3.pdf>; tasks not strictly related to conservation have been omitted, accessed: 01/2017]

in 2007-2008, further tasks were completed:

- *building rooms as well as purchasing and setting up installations for deacidification/strengthening of sheet objects [Neschen C-900 – author’s note] and books [Bookkeeper – author’s note] at the National Library, together with the preliminary equipment;*

- *mass conservation of holdings using the equipment installed at the National Library;*

- *building rooms as well as purchasing and setting up installations for deacidification/strengthening of archive documents [Neschen C-900 at AAN – author’s note];*

- *mass conservation of archive documents in state archives*

[quoted from: <http://www.bn.org.pl/inne/wpr/aktlprog4.pdf>; tasks not strictly related to conservation have been omitted, accessed: 01/2017].

Today, Poland has two operative deacidification installations for books using the Bookkeeper technology: at the Jagiellonian Library (since 2005) and at the National Library (since 2007), along with 6 Neschen C-900 devices for sheet deacidification: at the Jagiellonian Library (since 2003), the National Library (since 2005), the Archive of New Records in Warsaw (since 2006), the State Archives in Gdańsk (Office in Gdynia, since 2007), the State Archives in Katowice (since 2007) and in the Central Laboratory of Archive Conservation (CLKA), Workshop in Milanówek.

Together with introducing the mass deacidification technology, mass conservation was adopted. This referred to a set of procedures aimed at protecting the objects before and after deacidification, applying traditional conservation methods adapted to the needs of mass processes. The difference between mass conservation and traditional methods is that the former avoids techniques using humidity which require the object to be dried and pressed; instead, local repairs (also through cauterisation with Filmoplast) and Filmoplast lamination (as a last resort) are performed. The characteristic feature of the C-900 process developed in Warsaw is the brief (2-day) pressing of the sheets between cardboard sheets under load. In its original version (implemented in Germany), the objects were dried exclusively in the drier of the C-900 device, which caused their physical volume to expand (they were not straightened afterwards). Applying such an intense circulation of cardboard sheets required the use of a cardboard drier to dry them for the next day’s work.

NEW CHALLENGES

The “Acidic Paper” Programme revealed the scale of the workload required to handle the consequences of a technology which revolutionised paper making: the invention of typing paper. An overview of master’s projects completed at the Department shows that the rise of new techniques, especially in photography, has entailed certain conservation issues. It is already known that preserving 20th century polychrome photography will be a major conservation challenge in the future. The mass print and digital print technologies may pose conservation problems comparable to those with watercolour and pastel paintings, or any other water-sensitive objects. Another difficulty will be the lack of full information regarding the technologies applied by commercial vendors. We are also witnessing a digital revolution which, with its unquestionable advantages in improving access to objects, has created the following challenges:

- it offers a “digital image of the object” (and never its “digital copy”), of a quality usually incomparably lower than that of the original (excluding highly specialised (and extremely expensive) documentation techniques of limited application);
- it overshadows the analogue original, which may decrease interest in its proper preservation for the future.

While teaching a course on *Identification and Protection of Photographs at the Library*, I have regrettably noticed that knowledge of classic analogue photography is on the decline. For it was only twenty years ago that I was spending hours and hours in a darkroom as an ASP student. The National Library still employs graduates of the Technical Secondary School of Photography with experience in producing gelatin silver glass plate negatives, while today over half of this school’s curriculum is dedicated to (broadly understood) digital techniques. Even though progress cannot be stopped, we must bear in mind how it affects cultural heritage. In 2017, the National Library is launching its *Patrimonium* project of digitisation on a massive scale. It will also involve the inspection of objects (specifically those from special collections) in terms of their state of preservation, to ensure additional conservation work is performed prior to scanning (cleaning to improve legibility, straightening, ad-hoc repairs, securing their structure). It is worth asking the question how such reviews compare to full conservation treatment, and when the latter will cease to be necessary or to be considered necessary.

On the other hand, the development of (especially digital) technologies provides conservators with tools we did not even dream of 25 years ago, not only in terms of specialised test equipment. One example is the *Energy Efficiency of Museums and Libraries* (Heriverde) project joined by the National Library. Its goals are to develop software for qualitative risk assessment for

objects that are sensitive to climate parameter fluctuations as well as a specialised module of the WUFI® Plus software for more precise micro-climate modelling and programming of energy consumption in museums, libraries, and archives. [<http://heriverde.nimoz.pl/o-projekcie/>, accessed: 01.2017].

CONCLUSION

A graduate of “Paper Conservation” – who as a student may have performed the full conservation treatment of 6-8 objects – may be overwhelmed by the massive scale of conservation issues in libraries, archives, and museums. On the one hand, documentation becomes simplified, but on the other his or her professional life turns into a series of deadlines much closer than the end of the semester. Academy only partly prepares one for work at institutions where small (sometimes even single-person) conservation teams may also have to contribute to drafting the institutional heritage protection policies, or even take full responsibility for them. In this context, it seems to be a positive thing that institutions with conservation workshops are concentrated in the same city as the conservator’s school. Conservators often come back to their alma mater as part-time lecturers. Employment in two institutions seems to be a positive solution. All of this creates a community which avoids isolation and excessive focus on local problems, facilitating the exchange of experience (and not only at conferences). It has become a widespread practice to temporarily hire equipment and devices owned by other institutions, which makes research and conservation projects easier. This is also beneficial for students, as visiting institutional workshops and summer training placements form an integral part of the curriculum. As a result, academic knowledge is combined with practical solutions applied by libraries, archives, and museums. My current students have had a chance to learn how to oversee, from the conservator’s perspective, the operation of moving 500,000 iconographic objects from the Palace of the Commonwealth to the main building of the National Library (2010-2012) and the replacement of windows at the Palace without removing the collections... as well as how to practically control microbiological cleanliness in 70 storerooms with 10,000,000 items. In the future, I will also be telling my prospective students about moving 40,000 manuscripts and 160,000 old prints to a new location.