

Training and Education: the Key Role in Heritage Preservation of Archives, Libraries and Other Cultural Institutions

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ABSTRACT

Preservation of archival documents, library materials and other objects and materials of cultural heritage is one of the principal tasks of archives, libraries, museums, galleries and other cultural institutions all over the world. The key role in their mission in this field plays the training and education. It must be realised that preservation of cultural heritage in general can be solved only as an interdisciplinary complex problem in which the role of chemists, physicists, paper scientists and their co-operation with experts from other fields of science and technology and practical end-users, conservators and restorers, supported by adequate financial background is an inevitable and the only solution. Recently, the new study program “Heritage materials and objects conservation” has been opened at the Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava. The paper deals in detail with the study program, its educational structure and emphasises the need of the profession “conservation scientist” for preservation of cultural heritage.

Key words: Archives, library, document, heritage materials and objects, degradation, preservation, conservation, education, training

Formazione ed apprendimento: le parole chiave nella conservazione del patrimonio archivistico, librario e delle altre istituzioni culturali

SINTESI

La conservazione dei documenti d'archivio, del materiale librario e degli altri oggetti e materiali del patrimonio culturale sono uno dei compiti principali di archivi, biblioteche, musei, gallerie ed altre istituzioni culturali in tutto il mondo. Il ruolo chiave nella loro missione in questo campo lo svolge la formazione e l'istruzione. Bisogna rendersi conto che in generale la conservazione del patrimonio culturale può essere risolta solo come un problema complesso interdisciplinare in cui il ruolo dei chimici, fisici, scienziati della carta e loro cooperazione con esperti di altri campi della scienza e tecnologia è utile agli utenti finali, conservatori e restauratori, supportati da adeguato background finanziario. Recentemente, il nuovo programma di studio “Conservazione del

patrimonio di materiali e oggetti” è stato aperto presso la Facoltà di chimica e tecnologia alimentare, dell’Università della Slovacchia della Tecnologia di Bratislava. Quest’articolo si occupa nel dettaglio del programma di studio, della sua struttura educativa, e sottolinea la necessità della professione di “esperto scientifico della conservazione” per la conservazione del patrimonio culturale.

Parole chiave: archivi, biblioteca, documento, materiali e oggetti culturali, degrado, protezione, conservazione, apprendimento, formazione

Ključna vloga usposabljanja in izobraževanja pri ohranjanju dediščine v arhivih, knjižnicah in drugih kulturnih inštitucijah

IZVLEČEK

Ohranjanje arhivskega in knjižničnega gradiva, in drugih predmetov in materialov kulturne dediščine, je eden od glavnih nalog arhivov, knjižnic, muzejev, galerij in drugih kulturnih institucij po vsem svetu. Ključno vlogo pri njihovem poslanstvu na tem področju, ima tudi usposabljanje in izobraževanje. Potrebno se je zavedati, da je ohranjanje kulturne dediščine možno na splošno reševati le kot interdisciplinarno kompleksen problem. Pri tem imajo pomembno vlogo kemiki, fiziki, strokovnjaki s področja ohranjanja papirja, vsi morajo pri tem sodelovati s strokovnjaki iz drugih področij znanosti in tehnologije, končnimi uporabniki ter konservatorji in restavradorji. Vse pa mora biti ustrezno finančno podprto. Pred kratkim je bil na Fakulteti za kemijsko in živilsko tehnologijo Slovaške Univerze za tehnologijo v Bratislavi, odprt nov študijski program “Ohranjanje materialov in objektov kulturne dediščine”. Prispevek podrobneje predstavlja študijski program, njegovo strukturo in poudarja potrebo po poklicu “znanstvenik s področja konservacije kulturne dediščine”.

Ključne besede: arhivi, knjižnice, dokument, materiali in predmeti kulturne dediščine, degradacija, ohranjanje, konservacija, izobraževanje, usposabljanje

Výchova a vzdelávanie: kľúčová úloha pri ochrane dedičstva v archívoch, knižniciach a iných kultúrnych inštitúciách

ABSTRAKT

Ochrana archívnych a knižničných dokumentov, ako aj ostatných materiálov a objektov kultúrneho dedičstva je jednou z hlavných úloh archívov, knižníc, múzeí, galérií a ostatných kultúrnych inštitúcií na celom svete. Kľúčovú úlohu v tomto procese zohráva výchova a vzdelávanie v uvedenej oblasti. Treba si uvedomiť, že ochrana kultúrneho dedičstva je interdisciplinárna komplexná problematika, v ktorej úloha chemikov, fyzikov, odborníkov z oblasti technológie papiera a ich spolupráca s expertmi z iných oblastí vedy a techniky, konzervátormi, reštaurátormi a koncovými užívateľmi, podporovaná adekvátnymi finančnými prostriedkami je nevyhnutným a jediným možným riešením. Nedávno bol otvorený nový študijný program “Ochrana materiálov a objektov dedičstva” na Fakulte chemickej a potravinárskej technológie Slovenskej technickej univerzity v Bratislave. Príspevek sa podrobnejšie zaoberá týmto študijným programom, jeho vzdelávacou štruktúrou a obsahom a zdôrazňuje potrebu profesie “konzervačného vedca” pre úspešnú ochranu kultúrneho dedičstva.

1 Introduction

Preservation of archival documents, library materials and other objects and materials of cultural heritage is one of the principal tasks of archives, libraries, museums, galleries and other cultural institutions all over the world. The key role in their mission in this field plays the training and education. It must be realised that preservation of cultural heritage in general can be solved only as an interdisciplinary complex problem in which the role of chemists, physicists, paper scientists and their co-operation with experts from other fields of science and technology and practical end-users, conservators and restorers, supported by adequate financial background is an inevitable and the only solution.

Conservation science, with respect to cultural heritage, is the interdisciplinary study of conservation of art, architecture, and other cultural works through the use of scientific inquiry. General areas of research include the technology and structure of artistic and historic works and the materials and media from which they are made. Conservation scientists use scientific methods and principles to support work in the fields of art conservation and architectural conservation, and care of cultural

objects in museums and other collections. Cultural conservation science work includes identifying the materials that make up a structure or piece of art including their chemical makeup, identifying and cataloguing changes that cause deterioration and developing methods to mitigate deterioration of cultural heritage (*AIC 2003*).

The cultural heritage of the Slovak Republic is an indispensable asset of the State and its citizens, is a testament to the evolution of society, philosophy, religion, science, technology, art, the document of educational and cultural level of the Slovak nation, other peoples, national minorities, ethnic groups and individuals who live or have lived in the territory of Slovakia in the past. In the light of international agreements the cultural heritage is defined as follows: “cultural heritage make up the historical and cultural values created by previous generations, regardless of the time and place of their creation. It represents the tangible and intangible values of the movable and immovable things and objects as well as individual objects, files, and integrated complexes.” For the conservation and maintenance of these values it is necessary to educate and train professionals commanding and controlling both - the principles of conservation and restoration of materials, objects and monuments as well as current and historical materials and technologies for their protection, conservation and stabilization (*Bakoš et al., 2008*).

2 Research background

The International Conference of Chemical Technology of Wood, Pulp and Paper, which was held in 2003 in Bratislava - commemorated 60th anniversary of the beginning of education and preparation of specialists for wood processing and pulp and paper production in Slovakia. Since 1943, when the Institute of Chemical Technology of Wood was established by its founder and the long-term director, Prof. Ing. František Kozmál, DrSc. within the framework of the Slovak Technical University (*Mozolová 1998*), rich activities in education, research and publication field can be followed until nowadays (*Kozmál 1963, Lužáková et al., 1993, Krkoška et al., 1998*).

The Department of Chemical Technology of Wood, Pulp and Paper covers in its educational background also problems of paper ageing and preservation. Research activities in paper permanence and durability started at the Department already in 1980 (*Krkoška and Vizárová 2001, Hanus 1987, Hanus 2003*). During the last years several diploma works - completed at this Department and also at the Department of Graphic Arts and Applied Photochemistry - are devoted to problems of preservation of cultural heritage - permanence and ageing behaviour of some pulps and papers, deacidification of acidic paper, interaction of paper and printing inks, their permanence and ageing resistance, etc. At present also several doctor degree students have focused their studies to problems of paper degradation, deacidification and strengthening of acidic paper documents. All these activities are results of good co-operation among the Faculty of Food and Chemical Technology, the Slovak National Archives, the Slovak National Library, University Library, Polymer Institute of the Slovak Academy of Science, Slovak National Museum, the Slovak National Gallery and some other institutions and organisations.

The systematic effort started already in 1989 (*Katuščík and Hanus 1989*) and later on, the effort of the Slovak National Archives and the Slovak National Library for preservation of archives and library paper cultural heritage together with activities of the Department of Chemical Technology of Wood, Pulp and Paper, Slovak University of Technology Bratislava and the Slovak Academy of Science resulted in the State programme of research and development “Preservation, stabilisation and conservation of traditional information carriers in the Slovak Republic - KNIHA SK” (*Katuščík 2003, Bukovský et al., 2001, Hanus et al., 2004*).

The basic aims of the project can be summarized as follows:

- increasing quality of university and continuing education of professionals for the field, including engagement of graduate and postgraduate students of chemical technology into projects on stabilisation of LC carriers of information;
- concentration of the scientific capacity in the field of technology of preservation, stabilization and conservation of ligno-cellulosic (LC) macromolecular materials in the Slovak Republic;
- creation of specialised shared national virtual library and inter-active shared knowledge spa-

ce on the problems of preservation of LC materials of the Slovak Republic for all project participants;

- improvement and verification of method for qualitative classification of endangered library & archives materials according to historical and technological criteria from the point of searching the possibilities for increasing of capacity and decreasing of risks during their machinery treatment;
- new knowledge and new methods proposal for preservation of library & archives materials;
- new information on indoor quality environment for long-term storage of library & archives materials (*Hanus et al., 2009*).

Qualified restorers of archives and library materials as well as other materials and objects of cultural heritage are also inevitable and integrated parts of the system for preservation of this heritage. The Academy of Fine Arts and Design in Bratislava provides education in this field (*VSVU 2014*).

3 Impact of KNIHA SK on education at the Faculty of Chemical and Food Technology

As a consequence of the project KNIHA SK in 2004-2008 the interest of young generation, scientists and teachers considerably increased also in the field of technical education for cultural heritage preservation. Conditions for academic education, bachelor projects, diploma works and dissertation theses are being improved (see Fig. 1) (*Vizárová et al., 2009*).

The interest of young generation is of key importance for qualified preservation of its own cultural heritage in the SR. The social importance of project KNIHA SK is strongly felt also in the field of intensification of education in chemistry and technology of preservation of traditional carriers of cultural heritage.

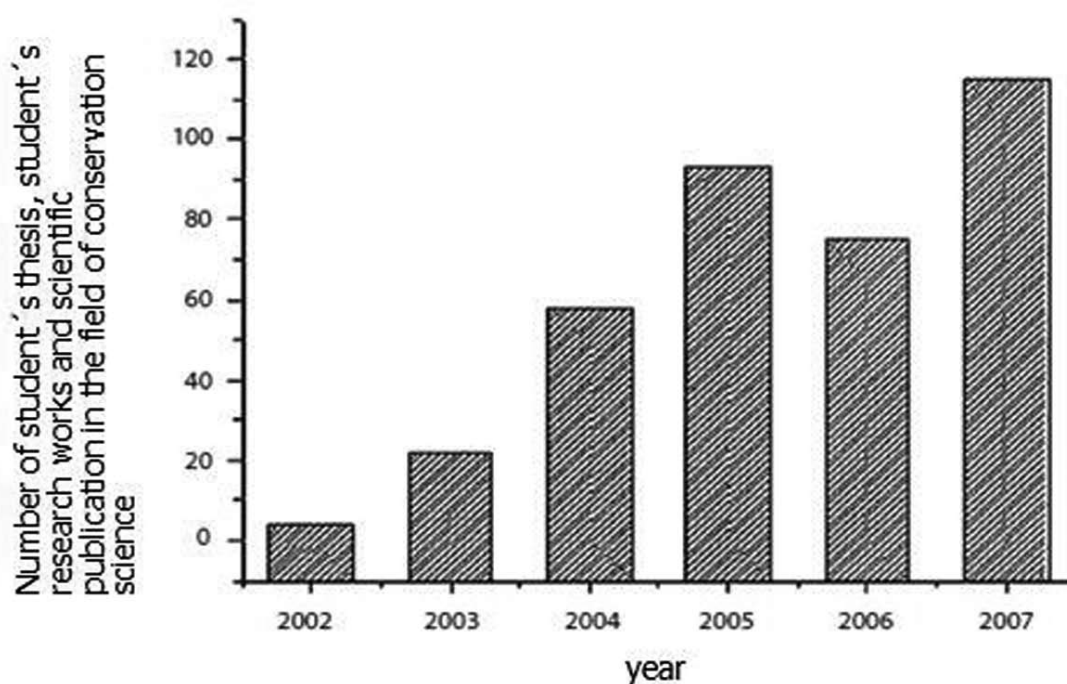


Figure 1: Impact of KNIHA SK on motivation and education of university students in the field of chemistry and technology of preservation of cultural heritage in the Slovak Republic in period of 2002 (before starting the project) to 2007 (*Vizárová et al., 2009*)

On this bases a new conception of education in conservation science on university level has been proposed and elaborated at the Faculty of Chemical and Food Technology, Institute of Natural and Synthetic Polymers, Department of Wood, Pulp and Paper and Department of Graphic Arts Techno-

logy and Applied Photochemistry (*Katuščák et al., 2008, Vizárová and Reháková 2013, Bakoš et al., 2008*).

4 Study programme “heritage materials conservation”

The proposal for accreditation of the new study programme “HERITAGE MATERIALS CONSERVATION” within the framework of the study field “Chemical Technology or Engineering Chemistry” at the Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava was approved at the Scientific Council of the Faculty on December 4, 2007 and further on submitted for accreditation to the Ministry of Education of the Slovak Republic by the rector of the Slovak University of Technology and the dean of the Faculty of Chemical and Food Technology on January 2008.

Study field “Chemical Technology” in accordance with the Decree of the Ministry of Education of the Slovak Republic nr. 2090/2002 can be studied:

- in the first degree of the university education (BSc.) with standard study duration of 3 years,
- in the second degree of the university education (MSc.) with standard study duration of 2 years.

For the second degree study of “Heritage Materials Conservation” it is supposed and required completing of the first degree education in the field of Chemical Technology, Engineering Technology, Chemistry or related fields.

The graduates of the study field Chemical Technology, study programme “Heritage Materials Conservation” are qualified to carry out the profession of:

- chemical engineer - the second degree (MSc., Chem. Eng. Graduated).

The II degree study program “Heritage Materials Conservation” is oriented to the complex knowledge of the structure and properties of chemical substances and traditional as well as modern materials, to the analyses interpretation and diagnostics of defects. Student knows to characterise the materials structure and modify their properties, understands relations between the materials structure, properties and technology. He has wider theoretical and practical technological knowledge, which help him to work in technology as well as in research and development in the field of conservation science. He has also knowledge in informatics, art history, ethics, artefacts conservation, law, management and communication in an interdisciplinary team (*STU 2014a*).

5 Heritage materials conservation - graduate profile

The graduate of the study programme HERITAGE MATERIALS CONSERVATION is a chemical engineer specialized in conservation of heritage materials and objects. The graduate is an expert in the field of composition, structure and properties of chemical compounds and traditional and advanced materials, is able to interpret the analytical results and contribute thus to the diagnosis of defects. The graduate is skilled in characterizing the structure of the materials and modifying their properties, is familiarized with relationships between the structure, properties and technology of materials. He/she has acquired profound theoretical knowledge and practical experience in technology, enabling him/her to apply the knowledge both in technologies and R&D in the area of heritage materials and objects conservation.

The graduate is equipped with the knowledge in the use of information technologies, history of art, ethics of heritage, law, marketing and communication as a member of interdisciplinary team. The graduate manages both the principles of conservation and restoration of materials and artefacts, and the historic and current technologies of their protection, stabilisation and conservation.

Based on the knowledge of inherited laws, principles and possibilities of restoration and conservation, the graduate is able to optimize technological processes, apply the knowledge in research and practice, exploit traditional and new methods and tools in solving technical issues, analyze technological problems and propose their solution by means of adequate methods. Being a member of interdisci-

plinary team, the graduate contributes to unveiling defects and proposing their correction using the most suitable procedures. The graduate is able to govern a team, act as a project leader, formulate research tasks, work and communicate in a team. The graduate has a capacity for further self-education, to lead a business in the field of research, and hold positions in public administration (*Portal VS 2014*).

6 Study programme for academic year 2013/1014

Faculty of Chemical and Food Technology, Slovak University of Technology Bratislava
Study field (STU 2014b)

5.2.18 Chemical Technologies

Initial academic year: WS 2013/2014 - FCFT
Type of study: Master
Programme: 2822T16 I-OMOD Heritage Materials Conservation
Language of instruction: Slovak, English
Form of study: full-time, attendance method
Study duration: 2 years (subdivided into study periods - semesters)

Additional information about programme

Programme supervisor: Prof. Ing. Michal Čeppan, PhD.
Assoc. Prof. Ing. Katarína Vizárová, PhD., Assoc. Prof. Ing. Milena Reháková, PhD.
Programme co-supervisor:

1st semester WS 2013/2014 - FCFT

Code	Course title	Mode of completion	Credits
A group of compulsory courses			
419A0_4I	Applied Inorganic and Organic Chemistry	Exam	5
500D0_4I	History of Art	Classified fulfilment of requirements	5
419L0_4I	Laboratory in Applied Inorganic and Organic Chemistry	Classified fulfilment of requirements	4
437P0_4I	Principles of Conservation and Restoration	Exam	5

Code	Course title	Mode of completion	Credits
A group of semi-compulsory courses (min. 8 crd.)			
416A0_4I	Applied Colour Theory	Exam	4

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427A3_4I	Applied Statistics and Simulation	Exam	4
437M0_4I	Materials in Conservation and Restoration	Exam	4

2nd semester SS 2013/2014 - FCFT

Code	Course title	Mode of completion	Credits
A group of compulsory courses			
421S0_4I	Ageing and Stabilization of Materials	Exam	5
416A1_4I	Analytical and Physical Methods in Conservation Science	Classified fulfilment of requirements	5
431B0_4I	Biological Factors of Degradation	Exam	5
421L1_4I	Laboratory in Materials Analysis	Classified fulfilment of requirements	4
437O2_4I	Special practice	Fulfilment of requirements	0

Code	Course title	Mode of completion	Credits
A group of semi-compulsory courses (min. 8 crd.)			
412D0_4I	Degradation and Conservation of Metal and Inorganic Materials	Exam	4
437C0_4I	Chemistry and Conservation of Wood and Paper	Exam	4
415T0_4I	Textile Materials, Textile Chemistry and Textile Conservation	Exam	4

3rd semester

Code	Course title	Mode of completion	Credits
A group of compulsory courses			
500O0_4I	Conservation and Renewal of Heritage	Exam	5
412L0_4I	Laboratory in Conservation Methods	Classified fulfilment of requirements	4
424L0_4I	Legislation and Management in Cultural Heritage	Exam	5
416P0_4I	Study and Conservation of Paints	Exam	5

Code	Course title	Mode of completion	Credits
A group of semi-compulsory courses (min. 8 crd.)			
600E1_4I	Environmental Engineering of Heritage Objects	Exam	4
422I0_4I	Informatization, Digitalization and Documentation of Heritage	Exam	4
100S0_4I	Special Building Materials and Constructions	Exam	4

4th semester

Code	Course title	Mode of completion	Credits
A group of compulsory courses			
437D0_4I	Diploma Seminar	Classified fulfilment of requirements	3
437D3_4I	Diploma work	Classified fulfilment of requirements	27

Reference list

AIC (2003). *The American Institute for Conservation of Historic and Artistic Works: Defining the Conservator: Essential Competencies*

Bakoš, D. et al. (2008). Nový študijný program STU: Ochrana materiálov a objektov dedičstva. I. Etapa rozvoja VŠ európskeho vzdelávania Conservation Science na Slovensku. In *Knižnica*, roč. 9, č. 6-7, pp. 14-15

Bukovský, V. et al. (2001). Program ochrany papierových nosičov informácií v SR. In: *Zborník z medzinárodnej konferencie Buničina a papier - technológia, vlastnosti, životné prostredie*. pp. 179-182. Bratislava

Hanus, J. (1987). Štúdium starnutia papiera z hľadiska ochrany archívnych dokumentov. (Study of paper ageing from the point of preservation of archives.) PhD. Thesis. 130 p. Bratislava: Chemical Technological Faculty, Slovak Technical University Bratislava

Hanus, J. (2003). Integration of paper education, research and industry for cultural heritage preservation. In: *Baudin G., Fellegi J., Gellerstedt G., Katuscak S., Pikulik I., and Paris J. (Editors): WPP - Chemical Technology of Wood, Pulp and Paper*, pp. 91-95. Bratislava: STU

Hanus, J. et al. (2004). Integrated effort for paper cultural heritage preservation in the Slovak Republic. *Proceedings of the International Conference Durability of paper and writings, Papyrus, InkCor*, pp. 86-87. Ljubljana: MIP

Hanus, J. et al. (2009). Technical problems in preservation of archives from the 20th century. In: *Atlanti Vol. 19* (2009), pp. 57-65. Trieste: International Institute for Archival Science of Trieste and Maribor, University of Maribor, State Archive of Trieste

Katuščák, S. (2003). Chemical Technology of Wood, Pulp and Paper in Culture, Education and Industry. In: *Baudin G., Fellegi J., Gellerstedt G., Katuscak S., Pikulik I., and Paris J. (Editors): WPP - Chemical Technology of Wood, Pulp and Paper*, 490 pages. Bratislava: STU

Katuščák, S. and Hanus, J. (1989). Veľkokapacitná stabilizácia a konzervácia klasických nosičov informácií. (Increasing Capacity of Stabilisation and Conservation of Traditional Carriers of Information). *Res. Report State Forest Products Res. Institute*. SDVÚ 26/89, Bratislava

- Katuščák, S. et al. (2008). Konceptia rozvoja konzervačnej vedy, vzdelávania, technológie a priemyslu na Slovensku. In *Knižnica*, roč. 9, č. 6-7, pp. 4-9
- Kozmál, F. (1963). Dvadsať rokov rozvoja vedy a výskumu na Katedre chemickej technológie dreva a chemických vlákien. In *Zborník prác Chemickej fakulty*, pp. 121-133. Bratislava: SVŠT
- Krkoška, P. et al. (1998). Prehľad vedeckovýskumnej činnosti Katedry chemickej technológie dreva, celulózy a papiera za roky 1993-1998. In: *Zborník z konferencie Chemická technológia dreva, celulózy a papiera*, pp. 13-29. Bratislava
- Krkoška, P. and Vizárová, K. (2001). Stálosť a trvanlivosť niektorých buničín a papierov. In: *Zborník z medzinárodnej konferencie Buničina a papier - technológia, vlastnosti, životné prostredie*, pp. 171-178. Bratislava.
- Lužáková, V. et al. (1993). Hlavné smery vedecko-výskumnej činnosti Katedry chemickej technológie dreva, celulózy a papiera v rokoch 1988-1993. In: *Zborník prednášok odborného seminára Environmentálne programy v chemickej technológii dreva, celulózy a papiera*, pp. 3-28. Bratislava
- Mozoľová, L. (1998). História Katedry chemickej technológie dreva, celulózy a papiera CHTF STU v Bratislave. *Zborník z konferencie Chemická technológia dreva, celulózy a papiera*, p. 11. Bratislava
- Portal VS (2014). Retrieved on 05.05.2014 from <http://www.portalvs.sk/sk/studijny-program/ochrana-materialov-a-objektov-dedicstva>
- STU (2014 b). Presentation of study programmes - Study plans. Retrieved on 05.05.2014 from http://is.stuba.sk/katalog/plany.pl?fakulta=40;poc_obdobi=367;typ_ss=;typ_studia=4;program=541;obor=-2;specializace=-2;new_spec=;podprogram=;forma=1;stud_plan=7136;lang=en
- STU (2014a). Presentation of study programmes - Information about a study programme. Retrieved on 05.05.2014 from http://is.stuba.sk/katalog/plany.pl?fakulta=40;poc_obdobi=367;typ_ss=;typ_studia=4;program=541;info=1;lang=en
- Vizárová, K. et al. (2008). Rast kvalifikácie a potenciál rastu zamestnanosti v oblasti rozvoja konzervačnej vedy, vzdelávania, výskumu a priemyslu na Slovensku po roku 2003 podporovaný konzorciom KNIHA^{SK}. *Knižnica*, roč. 9, č. 6-7, pp. 9-13
- Vizárová, K. and Reháková, M. (2013). Postavenie a úloha konzervačného vedca v súčasnosti na Slovensku. *Interdisciplinárna vo vedeckom výskume pri rozvoji ochrany kultúrneho dedičstva: Zborník príspevkov konferencie CSTI 2013 Conservation Science, Technology and Industry*, pp. 23-29. Bratislava
- VSVU (2014). Retrieved on 05.05.2014 from <http://www.vsvu.sk/en/>

SUMMARY

Preservation of archival documents, library materials and other objects and materials of cultural heritage is one of the principal tasks of archives, libraries, museums, galleries and other cultural institutions all over the world. The key role in their mission in this field plays the training and education. It must be realised that preservation of cultural heritage in general can be solved only as an interdisciplinary complex problem in which the role of chemists, physicists, paper scientists and their co-operation with experts from other fields of science and technology and practical end-users, conservators and restorers, supported by adequate financial background is an inevitable and the only solution. The new study programme "HERITAGE MATERIALS CONSERVATION" within the framework of the study field "Chemical Technology or Engineering Chemistry" at the Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava has been accredited and is presented in details. The graduate of the study programme HERITAGE MATERIALS CONSERVATION is a chemical engineer specialized in conservation of heritage materials and objects. The graduate is an expert in the field of composition, structure and properties of chemical compounds and traditional and advanced materials, is able to interpret the analytical results and contribute thus to the diagnosis of defects. The graduate is skilled in characterizing the structure of the materials and modifying their properties, is familiarized with relationships between the structure, properties and technology of materials. He/she has acquired profound theoretical knowledge and practical experience in technology, enabling him/her to apply the knowledge both in technologies and R&D in the area of heritage materials and objects conservation. The graduate is equipped with the knowledge in the use of information technologies, history of art, ethics of heritage, law, marketing and communication as a member of interdisciplinary team. The graduate manages both the principles of conservation and restoration of materials and artefacts, and the historic and current technologies of their protection, stabilisation and conservation. Based on the knowledge of inherited laws, principles and possibilities of restoration and conservation, the graduate is able to optimize technological processes, apply the knowledge in research and practice, exploit traditional and new methods and tools in solving technical issues, analyse technological

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problems and propose their solution by means of adequate methods. Being a member of interdisciplinary team, the graduate contributes to unveiling defects and proposing their correction using the most suitable procedures. The graduate is able to govern a team, act as a project leader, formulate research tasks, work and communicate in a team. The graduate has a capacity for further self-education, to lead a business in the field of research, and hold positions in public administration.

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