

From chemistry to social science: the heritage science of paper

Matija Strlič

University of Ljubljana, Slovenia

University College London, UK

E-mail: matija.strlic@fkkt.uni-lj.si

Heritage presents one of the most complex fields of research for chemists to engage in. On the one hand, heritage materials are incredibly variable not only due to methods of production but also due to the myriad of ways of degradation that require complex analytical skills to understand and model. On the other hand, interpretation of results requires advanced knowledge of humanities. The role of chemistry in heritage science is important, but we must also respect its limits, as heritage science is an intensely interdisciplinary domain of research.

The talk will explore historic paper, its degradation and preservation, including diverse analytical methods used for its characterisation. We will explore simple non-destructive spectroscopic methods as well as hyperspectral imaging applications allowing for advanced quantitative chemical imaging. Furthermore, methods of (multivariate) data analysis are indispensable to understand material variability. Although the degradation of cellulose, as the most important structural macromolecule in paper, has been reasonably well researched, the dependence of the rates of hydrolysis and oxidation on various intrinsic and extrinsic variables still presents unknowns. On the other hand, from a user's perspective, chemical degradation often leads to no visible change until advanced stages of decay. This has led to definitions of "damage" that depend on the type of use, rather than on the chemistry of degradation. To understand what damage means to users, we thus need to introduce social science methods into the mix, which further complicates materials heritage science research, yet at the same time, it importantly informs conservation.

Matija Strlič is Professor of Analytical Chemistry at University of Ljubljana and Professor of Heritage Science at University College London. His main research interests are the development of heritage science infrastructure, including instrumentation and methodology, as well as modelling of heritage materials, environments, values and decision making. He has published more than 160 peer-reviewed papers and is Editorial Board Member of *Heritage Science*, *Polymer Degradation and Stability* and *Studies in Conservation*. He is a Fellow of the Royal Society of Chemistry and of the International Institute for Conservation. His track record includes more than 50 national (Slovenia and UK) and international (EU and bilateral) projects, with total funding of more than €65M for heritage science. He regularly reviews proposals for the EU and 15+ national funding bodies and has worked on the development of Strategic Research Agendas for several national and international funding and policy making bodies. In 2015, he received the Ambassador of Science of the Republic of Slovenia Award for the outstanding achievements in science and international collaboration.