

## CollectionsCare: New Challenges in preventive conservation, predictive analysis and environmental monitoring. Dec 1-3, 2021

This was a conference organised within the framework of the EU Horizons 2020 Collection Care Project. With nearly 6 million Euros in funding and 18 partners in 9 countries, the project aims to develop a monitoring system to support preventive conservation decision making in small and medium sized museums ([www. Collectioncare.eu](http://www.Collectioncare.eu)).

Originally planned as a 3-day conference in Valencia, Spain, the organisers took the decision early in 2021 to run a digital conference, so I attended from the comfort of my own living room.

The general themes that I picked up on over the 3 days (42 live papers and 19 pre-recorded) included:

- The use of technology to monitor objects and predict degradation
- Linking existing systems (for example building management systems) to maximise monitoring
- Using data gathered to support widening or loosening of target values
- Monitoring objects during transport
- Sustainability – using technology to monitor, control and reduce energy consumption
- Development of tools to analyse data from data loggers
- Risk management and evidence-based decision making.

Much of the work presented highlighted interdisciplinary cooperation, for example between electrical engineers, system developers and those working with cultural heritage. All the previously gathered temperature and humidity data, that we otherwise have not done so much with, except to hope for flat lines, can be used (and is indeed necessary) to train artificial intelligence (AI) systems to recognise trends and from there to be able to predict behaviours. Low-cost digital electronics will allow collection of a lot of data, cloud computing will allow storage and sharing of the data, and AI will enable better interpretation of the data, analysing patterns, identifying the fluctuations that are normal and those that we need to react to. Several warnings were raised – the data collection from a wireless network can be affected by the efficiency of your signal provider, which in turn can be affected by the location of your institution. There is a shortage of semiconductors, so whilst the project has been successful on designing a sensor, they are currently unable to supply any. The training needs of conservators will in future have to include an understanding of data analysis. (Interesting to note that one of the presentations was by the two data scientists employed full time by the Victoria and Albert Museum, one of whom has started an online group to encourage conservators to learn programming skills<sup>1</sup>).

Abstracts of the papers are available on the conference website, and an open-source publication is expected in late spring. I would like to summarise two papers here.

### [David Saunders – Sustainability in Museum Lighting](#)

David Saunders defines five measures for sustainability in museum lighting, reminding us to consider not only the economic goals of the UN's Sustainable Development Goals, but also the people centred goals. Changes to lighting systems and policies are usually made with reference to reduced energy consumption and therefore economic benefits in terms of reduced energy costs. Beyond these

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<sup>1</sup> [ConCode | A collaborative network | Coding for cultural heritage](#)

environmental and economic factors, Saunders also proposes social, societal and operational factors. Social factors include display visibility (particularly for the elderly), enjoyment and comfort. Societal factors include collection lifetime (or degradation of materials). Operational factors include how complex control systems are to maintain and operate, and any routines required to for example close window blinds to limit daylight. Saunders considers four scenarios and their effect on these categories: Increased daylight use; switching to LED light sources; reducing electric light levels; shorter display times. He concludes that lower energy electric lighting, greater use of daylight and better light management all have positive economic and societal consequences but warns that some of increased environmental sustainability may be at the expense of quality of access or operational complexity.

### Keynote – Jesper Stub Johnsen Storage, Strategies and Facilities for Long Term Sustainable Collection Care in Denmark

Denmark has 6 museums owned by the Danish Government, and an additional 97 approved and supported by the government. All of these are obliged to comply with Danish museum law. In 2003 a report describing challenges that museums were facing identified a significant number of collections as at risk. Better storage was required to reduce the risk of further degradation. In 2006 a report specifically looking at storage and including the expected effects of climate change identified a need to move collections from old, not fit for purpose buildings to purpose built storage. To define the environmental conditions for these new storage facilities a tool to better understand the effect of variation in ambient condition on degradation of materials was sought.

In the mid-1990s The Image Permanence Institute (USA) developed a measure of the rate of chemical decay of organic materials, which can be considered as a measure of collection lifetime. The indicator is known as the Time Weighted Preservation Index (TWPI)<sup>2</sup>. The higher the value the better. Between 2007 and 2011 a project was conducted to evaluate energy consumption and TWPI for museum storage facilities in Denmark. This has resulted in a specification of targets for the new storage of the National Museum of Denmark: Temperature <22 °C, relative humidity 40-60%, annual energy use < 3Kwh/m<sup>3</sup> and TWPI > 100.

In her summing up of the conference at the end of the 3 days, Alison Heritage of ICCROM highlighted the number of PhD students who had presented during the conference, and also how many of the papers had been presented by women. She also commented on the importance of partnership and cooperation.

My own strong impression is how much more useful the data we have been collecting becomes, and how with the development of easily accessible and low-cost monitors it will be possible to predict indoor conditions based on weather forecasts for outdoor conditions and to then take mitigating action before it is too late. To close I would like to recommend two tools, one already available: The Image Permanence Institute's dew point calculator <http://www.dpcalc.org/index.php>, and the other under development Herie [HomeTitle - HERIE2](#)

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<sup>2</sup> For more information see <https://www.clir.org/pubs/reports/pub59/> and [http://www.conservaionphysics.org/twpi/twpi\\_01.php](http://www.conservaionphysics.org/twpi/twpi_01.php)