

The PolyMuse Project: Challenges and Lessons in Australian Polymer Conservation Research

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Galleries, libraries, archives and museums (GLAMs) have significant and growing collections of polymer-based objects, which they have a responsibility to preserve for present and future generations. Initially believed to possess long-term physical and chemical stability, a number of plastics have proven to be inherently unstable. Institutions are faced with vast amounts of deteriorating materials that also have the potential to compromise neighboring items within a collection (Shashoua 2008). Several collaborative research projects, beginning with the 2008-2012 project POPART (Preservation of Plastics ARTefacts) (Lavédrine, Fournier & Martin 2012), have been established internationally, bringing together conservators, polymer scientists and plastics technologists.

An Australian collaborative project, PolyMuse, brings together museum professionals and academic researchers from four universities, five museums and one gallery across four Australian cities (Nel et al. 2015). From 2017-2020, PolyMuse aims to establish informed management strategies for identifying and assessing polymers in collections, and prioritizing actions to improve the useful life of this vulnerable set of objects. Four doctoral researchers on the project are investigating plastics in the contexts of archives, textile collections, three-dimensional objects and the archaeological record.

A key advantage of PolyMuse is the collaborative nature of the project. Researchers are provided access to internationally renowned and varied collections, input from GLAM partners is given high priority, and all partners are granted access to a wide variety of instrumentation and expertise. As a result, the collections studied represent multiple locations and climatic zones in Australia, and data collected is of significant quantity and range. However, together with these benefits, collaborative research also presents challenges.

This paper first provides a brief introduction to the PolyMuse project, followed by the specific research pathways of the authors, focusing on three-dimensional plastic objects, and plastics in archives respectively. Major elements of the PolyMuse project, including plastic-focused collection surveys, identification methodologies, relational database development, industry interviews and surveys, and accelerated aging experiments are then presented, highlighting research strategies, intended outcomes, challenges experienced and lessons learned.

The paper aims to illustrate some ongoing challenges to plastics research in the context of the Australian cultural heritage field. Limitations and benefits described may inform future collaborative projects and plastics research design.