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# SUSTAINABLE AND CAREFUL USE OF CONSERVATION MATERIALS IN DIVERSE CULTURAL CONDITIONS

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In this very unequal world, the distribution of wealth, skills and the access to materials are challenges that require careful consideration from the conservator. This inequality is especially so when working in remote locations and in the developing world. The exciting materials developed and developing in recent years which introduce new approaches and methods to the preservation of most objects, made from most materials, lead to the tendency of the research conservator to favour the use of innovative materials rather than research traditional and locally practiced techniques of repair that may be adapted for conservation use.

While field and laboratory research begins and when proposing interventions to any object or site, there are a number of issues that need to be carefully addressed. The importance of cultural differences and difference of cultural response to historic structures varies enormously around the world. In American and European regions and in countries where conservation training has followed "western" values, conservation of the original fabric, maintaining integrity and authenticity, reversibility and so on can all feature within 'best practice'.

In other cultures best practice may include the demolition of the original building and faithful reconstruction, over-painting of ancient wall paintings and other ethically challenging considerations that leave the "western world" out of its comfort zone. It is appropriate that conservation activity at all levels is constantly re-examined and the culturally sensitive view is to be encouraged. These things are well discussed in the Nara document on Authenticity (drafted by the participants at the Nara Conference on Authenticity in Relation to the WHC, Nara (Japan) 1994; organizers UNESCO, ICCROM, ICOMOS). While this thesis may represent the extreme of cultural differences, among conservators, every part of a conservation intervention must be considered on its merits.

When an object or structure is to be conserved in situ and retained in situ, open, shelter-coated or sheltered, then conservators have to consider the cultural implications of every part of the proposed intervention. In an ideal world the only issues would be of the technology of the intervention and the performance values of the materials selected, but during the materials selection process other matters must be addressed.

1. **What technology can be fully understood, maintained and sustained locally?**
   Evaluation of traditional and local techniques of conservation; are they sufficient and sustainable? Can traditional techniques be adapted to an acceptable conservation use? Can traditional technologies be incorporated in a more sustainable conservation use?

   **Example**: Where traditional materials are used for conservation consolidation and shelter, especially where the materials used are very similar to the ancient materials, separation and indicator systems can be included.

2. **What materials are locally available and affordable, therefore replicable in other places?**
   Especially in remote and developing countries, what can be locally and affordably resourced, in the long term?

   **Example**: Empirical understanding of "original" or "traditional" materials can often demonstrate subtle and sophisticated use, including admixtures specific to particular applications. Adjustments to suitability for conservation applications are often readily understood by local artisans.

**3. What will the maintenance and inspection cycle require?**

The conservation staff on any project must provide an assessment of inspection and maintenance cycles. Visions of no maintenance solutions need careful examination. Such solutions may have little validity and often, less ethical dimension.

**Example**: In the Nepal Terrai areas, families inspect and repair slender walls and thatches before breakfast in the morning, floors receive "votive" reapplications and so on. Maintenance is a way of life and until recently this rule applied in many societies. The conservation operatives in most places will respond positively to the need for maintenance.

**4. What is the program for the training of inspectors and maintenance conservators?**

Given that all conserved monuments and sites require regular inspection and maintenance schedules, what is the local capacity for achieving this? What training is required to raise local capacity?

**Example**: Training in the ethical requirements of the World Heritage Convention and the implementation guidelines together with appropriate technology.

**5. What are the local cultural values of different materials?**

Frequently materials have cultural, sometimes "magical"significance in different communities. Are these values of importance in the intervention design materials specified by conservators?

**Example**: Rear walls in Ancestral Halls in the Orient are often built using earth materials, while the rest of the structure may be made in other masonry forms. The reason often given for this is that "prayer" passes more readily through unreinforced earth materials than it does in other masonry forms. In some areas spirits pass through earth walls without interruption, cement walls can be impassable. Whatever the conservator's philosophical approach, these cultural values are important considerations and must be researched and engaged.

**Brief Case Study.**

**Kazakhstan, UNESCO, Japanese Funds in Trust. Otrar project, 2000-2005.**

One of the major silk roads mud-brick monuments in Central Asia is the huge ancient city of Otrar. Large-scale archaeological excavations carried out at this site for more than 40 years have revealed the remains of a spectacular earthen town, including structures from different religions, such as mosques and temples, as well as bathhouses, workshops, residential quarters, and defensive walls. However, these structures, which were excavated many years ago, have in many cases already collapsed, and those excavated more recently are quickly deteriorating. While Otrar has historically become buffered and accustomed to regular small rainfall and snow cover, in recent years violent weather events with heavy rainfall and strong winds are dissolving large areas of excavated structures.

The site was carefully documented under the leadership of Prof. Michael Jansen and his team from the University of Aachen. John Hurd and Enrico Fodde, consultant conservators to UNESCO, made thorough examination of the local loose Loess subsoils from which the structures were built, in a search for the appropriate materials for consolidation, pointing and capping of a selection of structures to be conserved and left open on site. All of the standard technical questions were asked together with exhaustive weathering testing being made close to the site, most importantly the questions described in this paper were engaged and the decisions were answered as follows:

**"What technology can be fully understood, maintained and sustained locally"? And "What materials are locally available and affordable, therefore supplying use replicable in other places"?**

Located between the two great Central Asian Adobe cities of Shimkent and Turkestan, the local building material is earth. It is well understood, can be mixed to sacrifice to historic material and make an excellent conservation mortar. Brick is also manufactured locally and the team were able to design a brick suitable for wall capping when used with soft mortars. Local craftspeople had a good understanding of the subtleties of variant mixes.

**"What will the maintenance and inspection cycle require"? and "What is the program for the training of inspectors and maintenance conservators"?**
The materials selected for use as pointing mixes, capping mixes, brick capping mortars and consolidant grouts were selected to be fully sacrificial to the ancient material and yet as hard wearing as possible. Due to changing environmental conditions, indicator finishes and systems were designed to indicate the time at which maintenance was necessary. Local conservators were trained in this discipline and it is expected that they will improve in this application as experience grows.

**"What are the local cultural values of different materials"?**
While there are shamanistic values associated with adobe in the region, the local people had agreed to use any locally sourced material which offered the best performance. Although polymeric admixtures could have been used in this case, they were neither available, replicable or understood in the region.

The final selection of the range of materials required was limited to local earth, occasionally with non-hydraulic lime admixtures and to specially made local bricks used with soft, hydrophilic and sacrificial mortars. These traditional materials found ready acceptance and technical capability with local conservators. The materials were replicable and could be made widely available for use over this large site. The project trained local conservators in field laboratory analytical techniques and the project supplied a permanent maintenance staff house and field laboratory, in a village close to the site.

The conservation decisions both in technological use and in the chemical performance of the materials selected, took all of the cultural and tested performance decisions into account and resulted in and a close to appropriate approach to local environmental and cultural conditions.

The author here demonstrates the responses to the opening points and questions in this paper. These specific questions are then compared and evaluated alongside all other technical and practical considerations, the synthesis of these evaluations will lead towards a careful and locally sustainable project.

To complete this paper the Author had intended to examine several less satisfactory solutions employed around the world, however, he has decided to save blushes.

To demonstrate, I use an example of a highly technical shelter coat material including synthetic polymers, being applied to cap an ancient rubble-stone wall in the Crimea region.

Without full agreement within the conservation team, "white stuff" (the exact recipe is less important), was flown in from USA, in plastic tubs, to be the chosen conservation capping material. The material was not fully tested on site or understood by those locally responsible for ongoing maintenance, nor was it locally available.

Despite concerns, this material was applied and rapidly failed as it responded badly to local environmental conditions; freeze thaw cycles aggravated by soluble salt mobilisation and wind driven sand were important contributors to the failure. No maintenance program was designed.

Site conservators and local people were not impressed and pointed out that pre- cementitious, traditional materials were more accessible and could work very much better. Fortunately little damage was done, but if the practical and culturally sensitive considerations described above had been properly considered, perhaps a more appropriate approach would have emerged, leading to a workable and sustainable solution.

The use of inappropriate materials is often due to the lack of a full spectrum of data and their use. The example above has been repeated across the world and the author simply wishes to remind those colleagues responsible for effective scientific decisions to remember often forgotten ethical principles.

Concepts like the importance of reversibility and minimum intervention, and perhaps above all, the caution, not to make experimental treatments on historic survivals and to test fully in the field before using any proposed materials, are still vital considerations and ethically important.

"Appropriate" requires both an holistically based approach, stringently scientifically proved, but also sufficiently culturally and locally approved and comprehended, to represent a truly sustainable solution.