Curator's Choice

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Under Pressure: Cleaning Archaeological Artifacts with Precision and Care

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Cleaning is one of the most impactful steps in archaeological conservation. The burial environment is a complex system of physical, biological, and chemical forces, and over time these forces obscure the original surfaces of the objects. Removing that obscuring layer is not only cosmetic, it is an act of discovery and can be an essential component of an artifact's preservation. The original surface of an artifact holds information about its age, its use, the social context in which it was made and owned, and the techniques by which it was manufactured. Cleaning, done well, makes that information legible again.

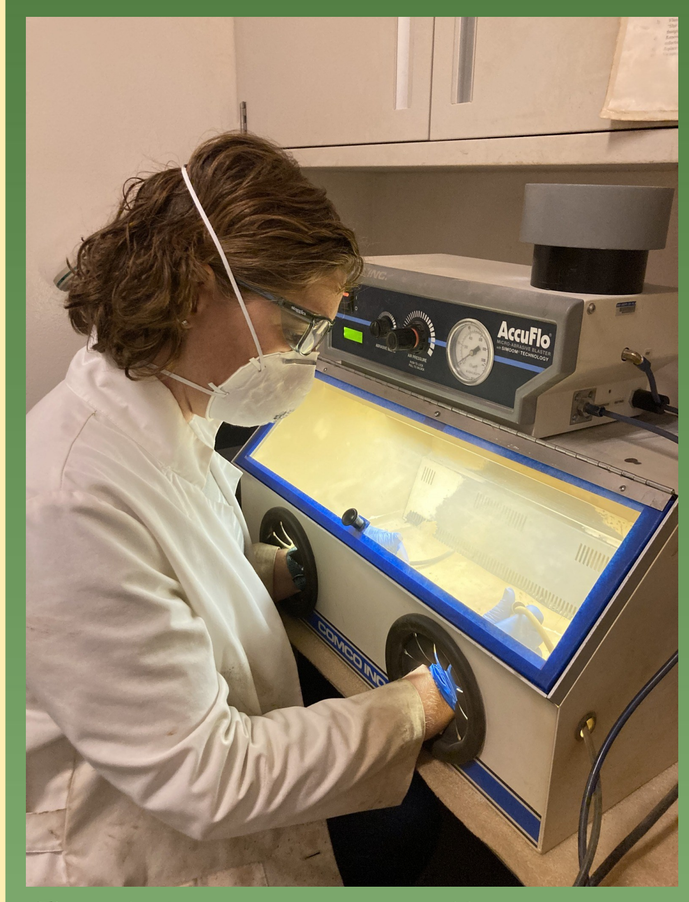

Figure 1: Conservator using a micro-blasting unit to remove corrosion from small iron artifacts

Conservation cleaning methods fall into two broad categories, chemical and mechanical. Chemical methods can be efficient when treating large groups of objects but they can be difficult to control, and without careful monitoring there is real risk of unintended damage. Mechanical methods, by contrast, are inherently slower and more labor-intensive, but under the direct observation of an experienced conservator the process is controlled and adjusted in real time often yielding superior preservation outcomes.

Within mechanical cleaning, the choice of tool and technique is guided by the stability of the object and the strength of the interface between the artifact and the material being removed. When that interface is weak, such as when soil or accretion sits loosely on the surface, gentle approaches like soft brushes, vacuum suction, or the careful use of a scalpel are often sufficient. When corrosion or encrustation has bonded tightly to the artifact, more assertive methods are warranted.

Figure 2: Iron artifact undergoing precision cleaning with a micro air abrasion tool.

Among the more powerful options in the mechanical toolkit is air abrasion, a technique that conservators at the MAC Lab use regularly, particularly for removing excess corrosion from archaeological iron. Air abrasion uses a high-speed stream of particles propelled by compressed air directed at the artifact's surface. The mechanical energy of the compressed air is converted to kinetic energy in the particles, and that energy does the work of removing unwanted material through friction.

The process is controlled by adjusting air pressure (psi) and the choice of blasting medium. Abrasive particles differ in hardness, shape, and size, and these properties determine their effect on the surface. When gentle cleaning or surface polishing is the goal, cornstarch can be a useful medium. It is relatively soft and fine-grained, making it effective without being aggressive. When the target is dense, strongly adhered corrosion, aluminum oxide is often the preferred choice. Its hardness and sharply angular particle geometry give it cutting power suited to the toughest deposits.

Figure 3. Conservator using a large air abrasive lance inside a containment tent to remove corrosion from an oversized iron artifact.

The range of tools and techniques available to conservators reflects the range of problems they encounter. Every artifact poses its own cleaning challenge, and the skill of the conservator lies in reading that challenge accurately, understanding the object, the deposit, and the interface between them, and selecting an approach that will reveal the surface without causing harm in the process. That combination of knowledge and judgment is what distinguishes conservation cleaning from simple removal, and what makes it such a central part of the preservation process.

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