Restoration in Pellucidar
Val Hildreth-Werker and Jim C. Werker

Pellucidar is a pristine, multi-level flowstone chamber in the Western Branch of Lechuguilla Cave in New Mexico. Cave pearls, subaqueous helictites, and other delicate features were threatened by muddy corrosion residue tracked through the area. Six cavers spent four days and more than 150 caver hours cleaning the pools, pearls, and flowstone of Pellucidar.

Since it is a sensitive area, Pellucidar required very clean and careful restoration techniques. Cavers wore powder-free, nonlatex surgical gloves throughout the project. Lightweight, white-soled flowstone shoes were spot cleaned often. In the Pellucidar area, we allowed only dust-free, lintless clothes—silky-feeling polyester, nylon, or Tyvek® suits worked well.

Restoration garments were not used for travel in the cave. Dirty knee pads were secured inside zippie bags to serve as kneeling pads. Before entering the restoration area, cavers changed clothes and cleaned their helmets and lights with wet wipes.

Brushes, sponges, sprayers, and collapsible buckets were tethered in vertical areas. For all rope work in the restoration area, the team wore restoration clothes and flowstone shoes.

Constant dripping provided plenty of water at the site. For remediation of the muddied flowstone, we drew water with large 60-milliliter (60 cc) syringes and filled new, clean Platypus® flexible bottles.

Platypus containers are easy to fold and transport in cave packs. The threads on industrial hand-held spray nozzles fit Platypus threads. Industrial sprayer mechanisms have a plastic crisscross filter that fits the bottom of the spray tube to restrain crystals and sediments from blocking the tube and nozzle.

Mud and corrosion residues from old boot tracks left silt in three pools—about 7 square meters (80 square feet) of bottom area. Jim Werker adapted a diaphragm pump for removing silt from the pools. Pool water was suctioned up with a large-volume hand pump, then filtered through soft, spongy material that was stuffed into a cut-off water bottle (clean and new, of course). The water was then circulated back into the pools.

We scooped muck, cleaned flowstone, and restored four areas covered with cave pearls—about 5 square meters (50 square feet). Clean-room foam brushes worked like magnets to attract muck from around the pearls. Stainless steel tweezers and nylon toothpicks were handy. We collected grit with sparsely bristled brushes and swept the tidbits onto small, flat, nylon pan-scraping tools made for backpacking.

Orange flagging tape was removed from the pristine flowstone. Solid-colored tape will “bleed” on wet flowstone surfaces. White-backed flagging (for example, red/white candy-striped flagging tape) leaves no stain if the solid white side is in contact with flowstone.

The work in Pellucidar was an especially satisfying restoration experience. As the photos show, a good bit of rewarding work was accomplished.
A diaphragm hand pump was adapted by Jim Werker for removing silt from the Pellucidar pools. (Lechuguilla's drip water had washed muddy footsteps across the flowstone and into pools where the silt settled on the bottoms.) Pool water is filtered through sponge material stuffed into a clean, cut-off water bottle. Dave Hamer is operating the pump to filter and circulate water back into the pool. (See page 12 of color section.)

Sponge dams are positioned downslope as Phyllis Hamer and Aimee Beveridge restore an area of flowstone and pearls in Pellucidar. (See page 12 of color section.)

This area of pearls required extensive work over several days. Plastic toothpicks, tweezers, and other small tools worked well for this tedious job. (See page 12 of color section.)
Figure 4. Justin Shaw is on rope rinsing his restoration sponge off into a small dry bag tethered with a cord. (See page 13 of color section.)

Figure 5 (left). The Pellucidar restoration required clean clothing and careful technique. Justin Shaw is on rope. Allan Cobb is upslope. Phyllis Hamer is working on flowstone and pearls at the top of the image. (See page 13 of color section.)

Figure 6a (before) and Figure 6b (after). Cavers used a large-volume diaphragm hand pump to filter silt (introduced by muddy boots) out of this Pellucidar pool in Lechuguilla Cave, New Mexico. (See page 13 of color section.)