Part 4—Repair: Werker—Large Speleothem Repairs

Section C—Specialized Mechanical Assists

**Apparatus for Large Speleothem Repairs**

Jim C. Werker

Large or tall stalagmites may require gantries to aid in lifting speleothem pieces into place (Figure 1). Sizable stalactites may require a scissors jack or other jacking mechanisms that apply upward pressure while the epoxy cures (Figure 4). Scaffolding and mechanical assist devices may be adapted for safe use in some cave environments. (See Colossal Cave repair, page 503–506.)

**Specialized Mechanical Assists**

Sometimes, a speleothem shape or location does not lend itself to typical bracing aids. More specialized mechanical aids are occasionally necessary. This section describes a variety of specialized bracing and lifting devices (page 489 and pages 491–494). Simpler bracing and propping devices are discussed in an earlier chapter (pages 456–457).

**Figure 1.** A caver fell against and broke this 9-foot tall (2.75-meter) stalagmite, a totem that stands in the Grand Canyon of Endless Cave, New Mexico. Jim Goodbar is pictured with the overhead gantry system that was erected to raise the broken top into position for repair.

**Figure 2.** The gantry held the top part of the speleothem in place while Jim Werker applied epoxy. Notice the rock placed for safety in the gap while Jim reached in between the two pieces to spread the epoxy. (See other Endless photos, page 497.)
Figure 3. Jim Werker completed the repair with touch-up around the break joint of this tall, stately stalagmite in the Grand Canyon of Endless Cave, New Mexico.

Figure 4. Jim Werker constructed a wood support with a simple jacking mechanism to apply upward pressure to a large stalactite repair in Colossal Cave, Arizona. The two broken pieces in the foreground weigh a total of about 225 pounds (102 kilograms). (See other Colossal photos, page 504.)