

# Fort Stanton Cave Notes:

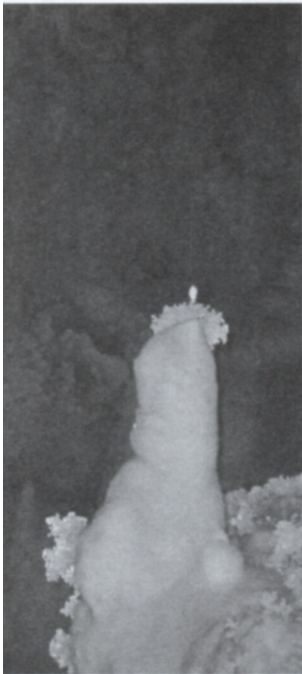
## THE SUMMER 2009 EXPEDITION

BY DONALD G. DAVIS

The June 27-July 5 Fort Stanton Cave expedition, organized by John Corcoran, had many tasks done, but this time no major extension of Snowy River was made. Bureau of Land Management permission had not yet been given to dive the sump at the downstream end of Snowy River North, nor to continue exploring the continuing Snowy River South borehole across the thin-crust section of Snowy River South. The exploration focused on "loose ends" previously bypassed. Here are a few highlights.

### Last High Lead Above SRS218

In April 2009, the southward-trending lead above SRS218 in Snowy River South had been climbed, and found to go several hundred feet



at the "Seal" in Glenwood  
visit to Colorado.

mann.

west along a low passage (named Fallen Arrows Corridor) to a connection with the similar Pretty Dirty Things passage, completing an upper-level loop that rejoins Snowy River at SRS241. The best remaining lead along the known part of Snowy River was thought to be a low opening across an exposed ledge on the opposite side of SRS218. Since no likely reconnection had been seen

downstream along Snowy River, it was hoped that this lead might go a long distance toward an unknown destination.

On June 27, Stan Allison, James Hunter, John Lyles, and Brian Kendrick formed a climbing team with this lead as main goal. Protecting the Snowy River calcite floor with three 9-foot by 12-foot plastic tarps, they used a combination of bolt protection and step-cutting to cross the mud-slope ledge to the lead. They then surveyed (SRH) about 261 feet northeast into a low passage similar to Fallen Arrows Corridor. Called Upper Crust because of old flowstone, the passage at first seemed to be getting bigger, but then ended abruptly at an earth choke with a funnel in the floor. This had airflow, but was only a few inches wide, with no sign of opening up beyond. This could be dug, but did not look promising to the team. They also checked a blind crawl at SRS227, and climbed 50 feet to a ceiling lead at SRS200 (previously named the Eccentric Climb by Chris Andrews); neither of these went.

In the same part of the cave, on July 1, John Lyles, myself, and Jennie McDonough also returned to dig through a low spot in the muddy SRG side passage that had been surveyed 125 feet west from SRS157 in April. This was interesting because it aimed toward Lincoln Caverns, about 1,000 feet away in the original cave. Unfortunately, only one more 25-foot shot was gained, after which there was a complete mud choke with no airflow.

### Snowy River Flow Route—Mud Lizard Sump Verses SRS147 Extension?

Also on June 27, I was teamed with Henry Schneiker and David Hunter to survey into a crawl where the breakdown slope descends to rejoin the Snowy River channel in a T-junction at the upstream end of the Return to Snowy River Room. The upstream branch goes to southern Snowy River. The down-



stream branch had been scouted for a limited distance, but not yet surveyed.

We hoped that this would settle an uncertainty about the hydrology of Snowy River. I had previously assumed that the Snowy River flow into this crawlway probably entered the Return to Snowy River room breakdown that bounded the left side of the crawl, and passed under the RtSR room to flood the Mud Lizard sump. Henry, who had looked farther into the crawl on prior trips, believed it diverged from the breakdown room and took a separate route through bedrock to resurge at the "Snowy River Springs" near SRS126. A major objective of the present survey was to clarify the evidence for each of these interpretations.

We began the survey by making six perimeter shots from SRS144, in the upper end of the RtSR room, to two holes in the breakdown below the wall, which Henry had determined connected to the calcite-lined crawlway below. We then changed to clean-clothing mode and began surveying the crawlway from SRS147. For the first four shots, the route was fairly spacious, several feet wide with space extending above the upper margin of the Snowy River calcite deposit. At SRS147C, shots to left and right, up the left-wall breakdown slope, connected to the linking stations at SRS144B and SRS144F.

From SRS147D onward, the ceiling dipped below the Snowy River level, and the entire passage was thickly lined with a mammillary coating of crystalline Snowy River calcite. The survey was moderately difficult, because the walls were rough, and squeezes and projections made for awkward crawling and sighting. Good locations for anchoring my preferred "floating" survey station marker tapes were scarce because of the calcite coating, but there were enough crevices between the mammillaries to allow for affixing most flags well enough that they will probably survive flooding.

At SRS147J, we downclimbed a four-foot pit, below which we could shoot through a narrow slot too small for us to fit, but which Henry and I bypassed via a sharp bend through a separate hole to the right. David was uncertain whether he would get stuck there, and declined to go beyond SRS147K. Henry and I were able to make another shot to SRS147L. From L, Henry scouted about another 20 feet around a left bend, where the passage split in two, with one fork going up to the right, and one staying low on the left. Both were tight, so he retreated. He made a provisional shot (L > LX) with Disto meter and Suunto sighting to the passage bend to an unmarked station. Since a two-person survey

would be marginally safe and effective, and the travel was getting more difficult, we decided to stop the survey and head out of the cave. Our final station is only about 1/3 of the distance to the Snowy River Springs.

The results of the survey support Henry Schneiker's hydrologic interpretation. From SRS147D onward, the crawlway is definitely in bedrock, and diverges increasingly from the Return to Snowy River room, aiming close to the direction toward Snowy River Springs. The present survey has dropped significantly downward, more than 15 feet below the Snowy River surface level (SRS147L plots about two feet lower than the lowest station in the Mud Lizard sump), so it will be necessary for the route to go up again somewhere if it is to connect with the Snowy River Springs. The SRS147 passage merits further survey, which would be best conducted by a team of small, determined people.

It appears, from its larger size, that the Mud Lizard sump was the original primary flow route for the Snowy River passage in its earlier developmental stage. The Return to Snowy River room probably collapsed while aggressive water was still flowing through, creating a partial dam that diverted part of the flow through a bedrock bypass to the right. After the transition from cave enlargement to deposition of the Snowy River calcite, most of the flow has followed the newer SRS147 route. At the present low input, even though the Mud Lizard sump bottoms about 15 feet lower than Snowy River, only minimal flow is able to filter through the breakdown dam to Mud Lizard. This explains why the bypass crawl is heavily calcite-encrusted, but only thin calcite has accumulated in the Mud Lizard sump and at its overflow into the Two-Way Hill breakdown.

This situation is also consistent with the scarcity of evidence for filling of the Mud Lizard sump during recent runs of Snowy River. Station SRS141, the lowest point in Mud Lizard, had been coated with

mud since the 2008 trips went through the sump, but none of the markers higher along the sump route showed clear evidence of having been submerged. This is probably why airflow from Snowy River into the original cave does not seem to change during floods: the sump is not regularly filled to the ceiling, thus does not block air movement. (There was only slight airflow through the SRS147 crawl while we were in it. The Mud Lizard sump is much larger, thus is the preferential airflow route.)

The role of the SRS147 crawl as the primary Snowy River water route vs. the Mud Lizard sump also has positive implications for the safety of explorers in Snowy River South. If floods do not regularly fill the Mud Lizard sump, the possibility of being trapped upstream from Mud Lizard during a flood becomes much less likely than we had previously assumed. (Conversely, the SRS147 crawl clearly sumps with every flood, and should not be entered if there is any reason to expect a flood might be approaching.)

### Folia-Like Speleothems in the SRS147 Passage

Other than the Snowy River calcite coating itself, the surveyed portion of the SRS147 passage has almost no speleothems. However, there is one exception of considerable interest. On the irregular ceiling starting 20 or 30 feet upstream from SRS147A, and extending to a few feet downstream from it, are numerous small curtain-like speleothems that curve



Curving folia-like speleothems on calcite-crusting ceiling between SRS147 and 147A. Longest rib is about four inches long.

Photograph by Henry Schneiker.



between ceiling points and bulges. These curtains are mostly nearly vertical, though in a few cases having a slope of as little as about 50 degrees, and average about 1/8 inch thick. Their downward extent from ceiling to curtain margin is up to about 3/4 inch, and their lateral extent up to several inches. Some extend between other cross-oriented curtains in a way superficially resembling boxwork. Henry Schneider took many photographs of them.

Of all speleothem types known to me, these most nearly match the properties of folia. However, they are not typical folia, which form contoured tiers of closely overlapping shelves each slanting at a lower angle of perhaps 20 degrees. The present examples are very similar in size, shape and distribution to the mud folia previously recognized on a ceiling in the Main Corridor above the trail about 100 feet inward from the Crystal Crawl intersection. In fact, one of the SRS147A examples had a crack that showed a dark interior coated by calcite crust, and it is possible they originated as mud folia that have subsequently been coated with calcite. But I have also seen isolated near-vertical, curtain-like folia in locations such as the Lake of the White Roses fissure in Lechuguilla Cave, where there is no mud and the walls are covered with calcite folia of more typical form.

Calcite folia, in my experience, are invariably associated with calcite rafts, and that is also the case at SRS147A. Abundant small raft flakes are stuck to the ceiling and walls here, and trapped in hollows in the floor. Some are

attached to the folia curtains and oriented up/down in such a way that they might serve as nuclei for further folia growth. The origin of folia is presently controversial (the most prominent theories are accretion of suspended particles at a fluctuating water line, vs. subaqueous origin via precipitation around bubbles of degassing CO<sub>2</sub>, or subaqueous development via brine/freshwater mixing). These Fort Stanton Cave examples are consistent with the particle-accretion model.

### A New Tributary (?) at SRS129

On July 4, at the downstream end of the Two-Way Hill breakdown along SRS, an overlooked branch was found that is now the most promising lead left in Snowy River, other than the main borehole itself. A team of John Lyles, Paul Dunlap, David Hunter and Joe Koby probed cavities under the breakdown where the bedrock Rock Lobster Passage intersects the base of the breakdown mass. From SRS129, they found a crooked continuing series of breakdown crevices and tube segments trending primarily northwest past the north side of the Two-Way Hill breakdown. They began a new SRK survey, stopping at SRK15 in a walking-height room where the route split. John Lyles reported "beyond 15, the right lead trended 230 degrees and was roughly 2 feet high by 8 feet wide, going into the distance, with air. Straight ahead continued at 210 degrees and slowly climbed up over breakdown."

This find is particularly interesting because the floor along this survey has considerable water-transported sand and small gravel (but no Snowy River calcite), showing it has been a significant streamflow route. But it is diverging from Snowy River proper, and SRK15 plots about 10 feet above the general level

of Snowy River in this area. This suggests that a loop connection to the Snowy River conduit was not the source of the sediment-bearing stream, unless perhaps at an early time when the sediment level in the Snowy River conduit was that much higher. We have reason to hope that a true tributary to Snowy River, beyond the Mud Turtle Passage, has finally been found. SRK is expected to be the initial focus of any survey efforts done during the forthcoming September/October expedition.

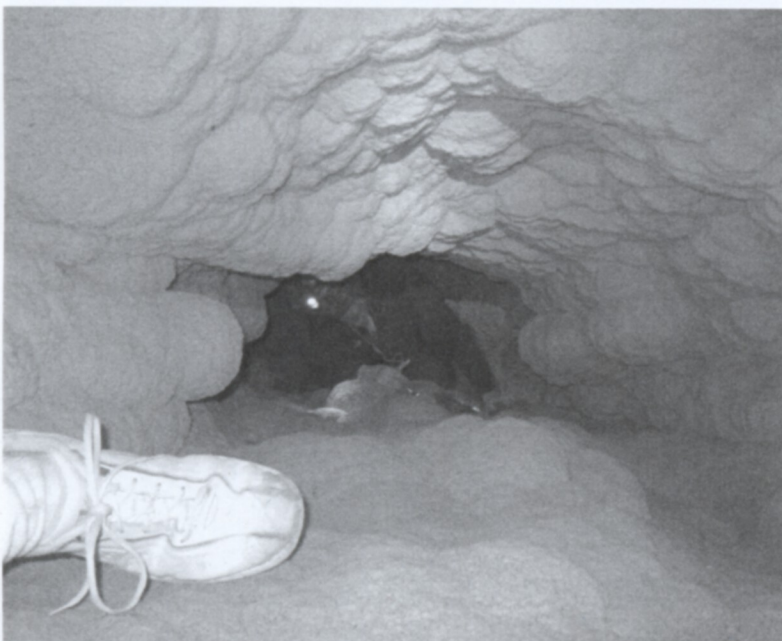
The surveyed length of Fort Stanton Cave now stands at 15.58 miles.

### Other Notable Non-Exploration Activities

Radiolocation of station SRS302, at the downstream edge of the Mount Airy breakdown in far Snowy River South, which had failed in April, was repeated successfully during this expedition. SRS302 was found to be about 460 feet beneath the surface, directly below the middle of Highway 220 about 150 feet west of the center of its intersection with the airport highway. From there, the Eggshell Trail passage continues southwest, crossing under the airport highway and getting ever farther beneath the surface.

Jim Goodbar, BLM Cave Specialist, led a two-day FARO Technologies team doing a color laser scan of 1,600 feet of Snowy River South between Independence Hall and Mud Turtle junction. This resulted in continuous high-resolution imaging of the entire surface of that section of the Snowy River gallery, which can have both scientific and presentation applications.

Precision theodolite survey continued into the Roaring Hill passage toward Don Sawyer Memorial Hall. Bat surveys were conducted in Fort Stanton Cave and in other cave and surface sites nearby. Additional resistivity lines were run on the surface between the airport junction and airport, detecting two weak anomalies at about the Snowy River level. ■



Crawl lined with Snowy River calcite, downstream from SRS147.

Photograph by Henry Schneider.

**Take Nothing But Pictures**

**Leave Nothing But  
Footprints**

**Kill Nothing But Time**