

New “Cave of the Crystals” at Naica, Chihuahua, Mexico

David London



Mineral collectors are familiar with the large, clear gypsum crystals that come in abundance from the state of Chihuahua, Mexico. Some fine samples are on display in the Youngblood Energy Library and in the School’s Geologic Gallery on the second floor of the Sarkeys Energy Center. Though large gypsum crystals are sometimes attributed to “The Cave of Swords” in the base-metal mine at Naica, Chihuahua, “The Cave of Swords”, which was discovered at a depth of ~120 m in 1910, is probably not the actual source. It is a sealed national treasure that is, today, mostly intact and accessible only with difficulty through the current mining company, Peñoles.

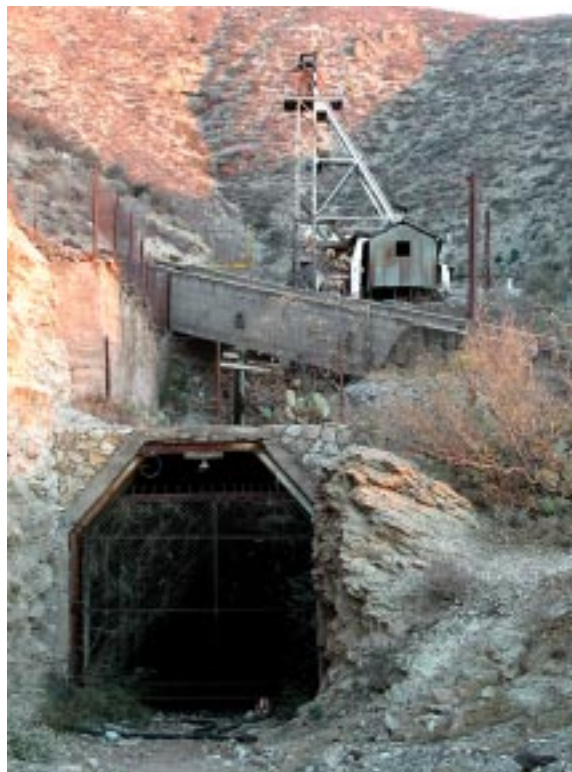


Figure 2

Recent news of new caves full of gypsum at Naica started coming out a year ago, and some sketchy information is available on the web*. At the 2002 Denver Gem & Mineral Show, Mexican mineral dealer Benny Fenn (Las Cruces, NM) told me he had recently been able to visit the new “Cave of the Crystals”, and he urged me to join him or his son if he could arrange a return trip. That trip finally materialized for me and professional cave photographer Kevin Downey (Amherst, MA) on December 14, 2002. The cave visit was preceded, of course, with a fine day of buying minerals (Fig. 1) and visiting mine sites (Fig. 2) in the famous mining center of Santa Eulalia, just southeast of Chihuahua City. Once at Naica, all talk of collecting or buying minerals ceases, as it is a Federal crime to remove specimens from the mine (naturally, in Santa Eulalia, I was offered specimens from Naica).

As we drove into Naica, I noticed mine waste water that was “steaming” on a balmy day of 21°C (70°F) (Fig. 3), a harbinger of conditions to come. At the headquarters, Peñoles has created an excel-



Figure 1



Figure 3

lent display of minerals from the mine, featuring gypsum (Figs 4, 5), that gave us something to look at for the three hours it took to arrange our (prearranged) underground trip. The trip down by pickup truck followed a long series of circular inclines to the ~ 300 m. level of the mine. There we faced a

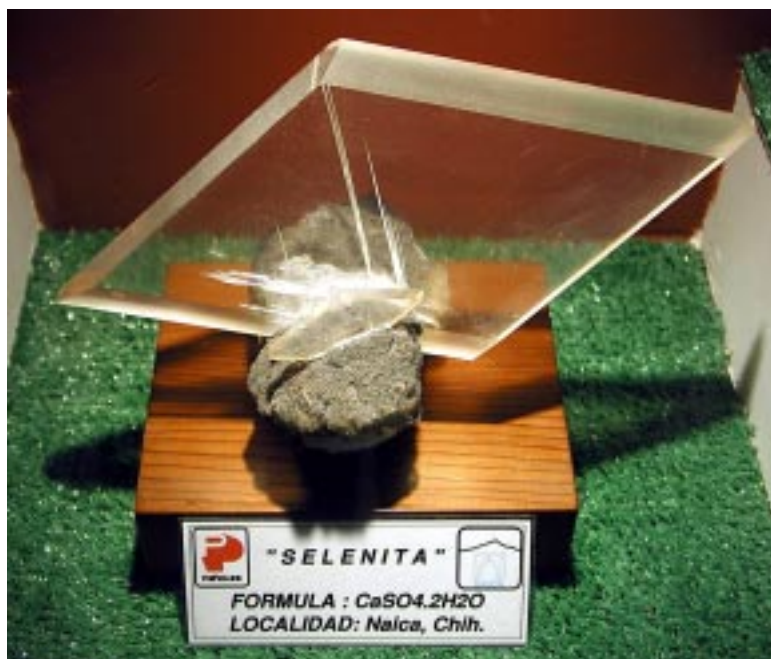


Figure 4

locked steel & concrete barricade (Fig. 6). The barricade serves mostly to protect the gypsum in the new “Cave of the Crystals”, but as it turns out, it is also a thermal barrier.

During our mine overview, the mine geologist explained that following the main orebody down to



Figure 5

~ 700 m., temperatures at the bottom of the mine rose to 71°C (160°F), and miners can work only a few minutes before having to be removed to shallower and better ventilated areas. So the company drove exploratory adits laterally, seeking ore at shallower levels. One of these lateral shoots at ~ 300 m. crossed a fault and opened into the “Cave of the Crystals”.

Past the steel barricade, the temperature rises slightly but perceptibly from ~ 27°C (~ 80°F) outside to ~ 32°C (~ 90°F) inside the barrier (based solely on my perception, not on any measurements). Walking along the adit toward the new cave (Fig. 7), temperature does not rise much, but one notices immediately that the air is saturated in water. At just 50 cm. from the portal to the new cave, temperature ramps up sharply, and proceeding just 1 m. across the barrier, temperature rises to 65°C (150°F), measured and steady, at 100% relative humidity. It’s hard to recollect which was the greater shock, the clear gypsum crystals measuring up to ~ 1 x 2 x 9 m (Fig. 8, 9), or the stifling, steaming heat. The combined effect, in any case, was as invigorating as it was awesome.

I had heard that the caves were hot. Our professional photographer came prepared with a

New “Cave of the Crystals” at Naica, Chihuahua, Mexico, *continued*



Figure 6

home-rigged cooling circuit for his body (Fig. 10). The rest of us just gritted it out. Except for the ice-bath-cooled photographer (24 minutes, by his count), we lasted nearly 12 minutes in the cave, with the previous record at 14 minutes. I made two trips in as well.

I had not heard about the fact that the air was water saturated. Glasses and cameras don't just fog up, but water starts condensing in buckets on everything that comes into the cave. With experience and inside information, the photogra-



Figure 8 (as seen on the front cover)



Figure 7



Figure 9



Figure 10

pher was again prepared, with water-tight cameras in plastic glove bags. The rest of us had expensive but otherwise ordinary camera equipment, certainly not rated for underwater use at high temperature. You might think, “fine, just wait until everything comes up to equilibration temperature”, but if that includes your body, then you’re dead. I was surprised when I

took off my glasses, wiped them until they remained clear, only to have them fog up again when I put them on my head. My face was that much cooler than the air, even after 10 minutes in the cave, that water condensed immediately on my glasses. I was able to get a clean camera lens, but just as the lens started to come clean, I

noticed on my digital viewer that the image was fully fogged—water had condensed on the photodiode inside my camera. The only solution—go out, let the water evaporate from the hot camera body, then reënter—doesn’t work, of course, because you go through the same sequence again.

Despite all this, I was able to enjoy a true marvel of nature. The gypsum crystals are sharp, clear, clean, perfect. They are immense, and not a single crystal in the new “Cave of the Crystals” is broken, that I could see. Crystals of 1 m. fan across the roof (Fig. 9), and the real giants grow up from the floor (Fig. 8, 9).

A visit to the “Cave of Swords” (Fig. 11, 12) on the way out proved as disappointing as a dust devil must be to a meteorologist who’s just witnessed an F5 tornado. I missed the heat as much as the flawless perfection and giant scale of the “Cave of the Crystals”.

I doubt that the “Cave of the Crystals” will ever become a tourist attraction. For the sake of the crystals it contains, I hope not. I thank Benny Fenn, profusely, for giving me the opportunity to see it.

- <http://www.smithsonianmag.si.edu/smithsonian/issues02/apr02/phenomena.html>
- <http://www.showcaves.com/english/mx/caves/Naica.html>
- <http://www.cesmat.asso.fr/English/naica.htm>



Figures 11 and 12