

# New Cave Discovery Affords Perfect Baseline

By John Roth

About 13 years ago, a geology Master's thesis tried to explain how a mysterious boulder came to rest on a certain hill in central Pennsylvania. After completion of the thesis, it was discovered that the boulder had been hauled up to the hill with the aid of a large truck!

Ideally, scientific investigations should be undertaken without the complications and confusions caused by human disturbance of natural features. So it is not surprising that scientists are delighted with Lechuguilla Cave, perhaps the most significant new cave discovery in the West since Carlsbad Cavern was explored around the turn of the century.

Lechuguilla Cave is the perfect environment for gathering baseline data as over 99 percent of the entire cave was not entered by people until just three years ago. New passages are being found as fast as they can be surveyed.

The cave is now known to extend at least 1,412 feet deep and to contain more than 16 miles of passages. Yet, except for a narrow, taped trail, there has been virtually no human impact within the cave.

The cave contains a wide variety of speleothems. Lechuguilla is one of five caves in the United States and one of a handful in the world to have hydromagnesite balloons. Lechuguilla also appears to have the best display of gypsum speleothems in the world. These include a gypsum rim approximately one by two feet in diameter, blisters, flowers, crusts, needles, thick gypsum beds and large crystals oriented to wind directions. The cave may have the thickest gypsum beds of any cave in the world not formed within gypsum layers. Gypsum hair over 15 feet long may be the longest in the world. Gypsum stalactite clusters exceed in size and beauty those known anywhere in the world.

The cave also contains some of the best and largest examples of cave ice, cave pearls, "silticicles," red and orange velvet flowstone and boxwork known in the Guadalupe Mountains. Time and dryness has resulted in a variety of mineral forms not found in most caves in the world and include delicate aragonite anthodites, moonmilk, cave popcorn and rims, as well as speleothems so unique that apparently they have not yet been scientifically described, such as "helictites" growing underwater and immense gypsum "stalagmites." Rare cave minerals include sulfur, ranceite, todorokite, corundum, and endellite.

Exploration apparently has extended into the Capitan Limestone and Goat Seep, Yates, Seven Rivers and Queen Formations, making it possible for speleologists, paleoecologists and stratigraphers to study nearly continuous exposures of the transitions between upper Permian forereef, reef and backreef sequences and to relate this to the regional picture. The reef complex is one of the least altered in the world; many of the original depositional features still are visible. Etching by acidic condensation has revealed exquisite details of fossils, breccia, bedding planes, and other wall features that are not usually visible in surface outcrops. Nearly 100 percent exposure of wall rock in large parts of the cave gives geologists "windows" on large scale features, such as reef collapse, that cannot be studied with the usual methods of surface outcrop, thin section, or drilled core analysis.

Bones tentatively identified as those of a woodrat (*Neotoma*) species, a ringtail (*Bassariscus astutus*), a weasel (*Mustela*), and bats have been found in the cave.

A leg bone larger than that of a mule deer (*Odocoileus hemionus*) has also been found. Some bones have been well preserved by a layer of calcite flowstone. The cave may have served as a natural trap for animals during the Pleistocene and Holocene.

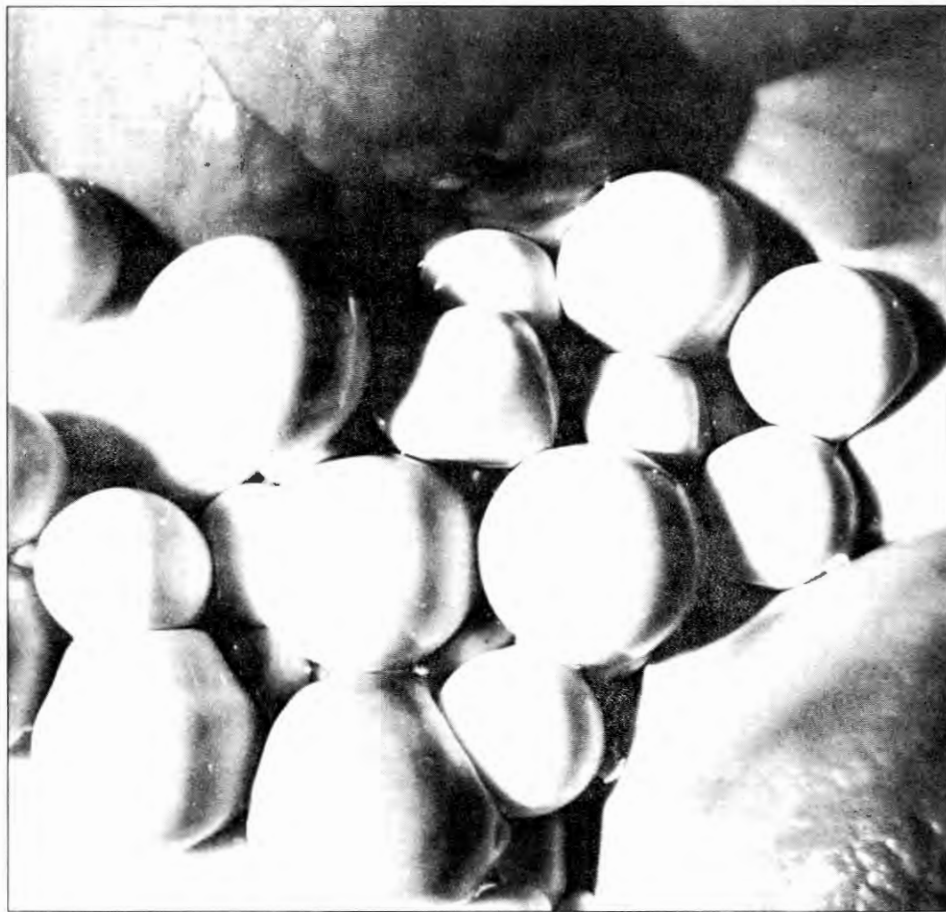
Lechuguilla Cave has a relatively simple system of insects and microbes that can be studied to shed light on more complex systems on the surface. Diplurans, flies, ringtails, tenebrionid and rhadine beetles and camel crickets have been found in the upper levels of the cave but a preliminary survey has not yet been made of the cave fauna. The cave offers a unique opportunity to study cave fauna in a large cave relatively uncontaminated by humans. Comparisons can be made with the tourist trail area of Carlsbad Cavern and with Lechuguilla Cave in the future. Air circulation in the cave appears sufficient to flush out the effects of human breathing within a few hours.

In summary, Lechuguilla Cave offers scientists outstanding views of undisturbed geological and biological processes rarely seen on the surface or in caves even moderately impacted by people.

Roth is a Resource Management Specialist at Carlsbad Caverns NP.



*Helictites* growing underwater were found growing out from the walls in a chamber deep in Lechuguilla Cave – a speleothem variety never before described.



Cave pearls two inches in diameter shine through the water in a pool in Lechuguilla Cave.