



CREATOR

VOLUME 23

NUMBER 4

WORLDS OF DARKNESS – Part One HIDDEN TREASURES OF CAVES

*“It is He who reveals the profound and hidden things;
He knows what is in the darkness,
And the light dwells with Him.” Daniel 2:22*

Our Lord Jesus has filled the world with countless ecosystems to the glory of our Triune God. Some of these environments are so alien and otherworldly, it’s hard to believe that life can survive in them. The lightless realm of caves and the crushing depths of the ocean deep represent two such ecosystems.

It’s our hope that our present study of these two habitats will help you adore the Lord Jesus more for He magnifies the glory of God. Christ is Life and Light (John 1:4), and in Him there is no darkness (1 John 1:5). Join us now as we listen in on a conversation between two of our Lord’s creatures—both of whom have spent a great deal of time in the dark.

Whale: “Bat, what’s it like living in a cave? How do you find your way around?”

Bat: “Creator Jesus gave me sonar, a form of echolocation.¹ I ‘see’ in the dark as I fly using

high-pitched sounds. . . . I’m equally intrigued that God gave you the ability to dive more than a mile down into the inky black depths of the sea. The thought terrifies me!”

Whale: “Our Lord Jesus has equipped me with the necessary skills to make deep dives in search of food. But, please, first tell me about your underground world.”

Bat: “Caves are truly fascinating places. Creator Jesus has hidden many treasures of geology and life within them, treasures that ‘speak’ loudly of God’s glory and beauty.”

Whale: “I see a treasure of living things in the ocean deep as well. But why do you think He hides them away in such inhospitable places?”

Bat: “Well, I suppose He wants people to work at knowing Him better; it often takes effort to discover the ‘buried treasures’ of His glory. Those who long to know God in this way readily show their love for Him.”



¹ God provides bats with the ability to produce high-pitched squeaks that bounce off objects. A bat uses these sounds to “paint a picture” of its surroundings in its mind.

Scripture teaches that “deep calls to deep” (Psalm 42:7). The exact meaning of this verse is not entirely clear. An ancient Aramaic paraphrase renders it, “The abyss above calls on the abyss below.” This exhorts us to see God’s glory being declared from one remote part of creation to another (as Bat and Whale will soon reveal), moving us to long for Him all the more in the face of our daily trials (Psalm 42:1-2).

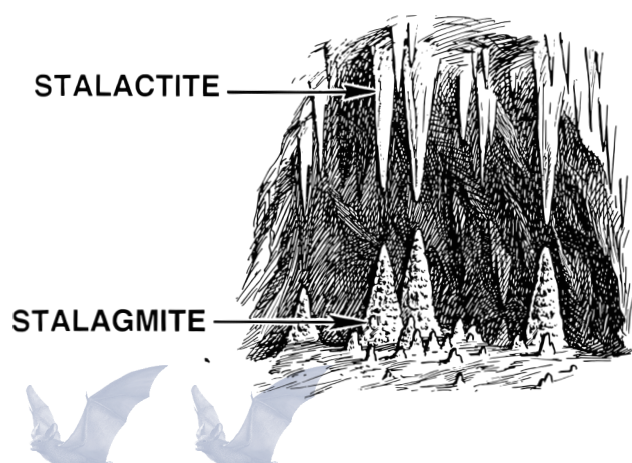
Bat: “All across the globe, limestone caves contain amazing and beautiful rock formations and minerals. No one knows the exact number of underground habitats Creator Jesus has formed, but there are at least 150,000 caves and caverns worldwide. Geologists ² suspect that that number may eventually reach one-half million as the search for new caves continues.”

Whale: “Are all caves formed out of limestone?”

Bat: “The vast majority are. God also creates caves in lava, ice, and salt, but these represent only a small percentage of all caves.

“Throughout the world, our Lord has placed large deposits of limestone rock underground. Limestone is composed of the mineral calcite, which is another name for calcium carbonate. Where there is limestone, there will almost certainly be caves. It’s thought that Jesus uses mildly acidic groundwater to dissolve portions of the limestone, creating caverns and passageways.”

Whale: “I know that many caves contain fascinating pointy structures . . . sta . . . stala . . .”



Bat: “Stalactites and stalagmites. God also creates these using mild acid.”

Whale: “Acid, really?” *Whale appears somewhat surprised.*

Bat: “I’m no chemist, but when it rains, raindrops absorb carbon dioxide from the air and the soil through which they pass. Creator Jesus then turns this dissolved carbon dioxide into carbonic acid:³

carbon dioxide + water \longrightarrow carbonic acid

“When the acidic water reaches the limestone beneath the soil, it starts to dissolve the rock:

carbonic acid + limestone \longrightarrow calcium bicarbonate

calcium bicarbonate \longrightarrow calcite (stalactite)
+ carbon dioxide (air)
+ water

“Then, as water seeps through cracks and crevices in the cave ceiling, carbon dioxide gas escapes, leaving behind the mineral calcite. Very slowly over time, drip by drip, calcite forms stalactites, much the way icicles are created in winter. Water falling from the ceiling also carries dissolved limestone to the cave floor where it forms stalagmites.”

Whale: “I’ve always had a hard time remembering which is which—stalactites and stalagmites.”

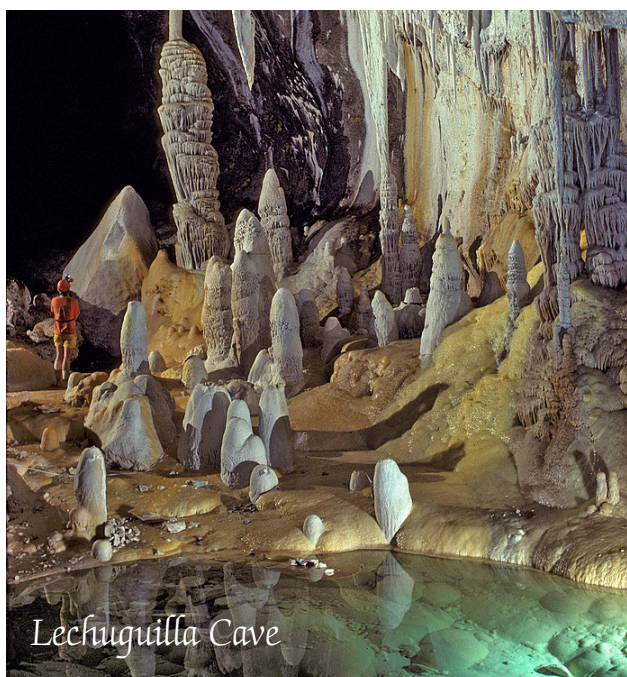
Bat: “A stalactite holds ‘tight’ to the cave ceiling; a person ‘might’ trip over a stalagmite if they’re not careful.”

Whale: “Hey, Bat, that’s pretty clever!”

Bat: “I can’t take credit . . . I heard it from another bat. God reveals His amazing creativity through other cave features as well: helictites, soda straws, flow stone, rock draperies, brimstone dams, cave pearls, and many more.”

² Geologists are scientists who study caves, volcanoes, rocks and minerals.

³ Read more about acids in **CREATOR** Volume 23 Number 3.



It's thought that the most spectacular of these rock and mineral treasures are found in Lechuguilla Cave in the United States.

Whale: “Are you bats all alone in the cave? I mean, are there any other creatures that live with you?”

Bat: “Oh yes! There aren’t as many species as live in the sea, but all the major groups of animals can be found in caves: mammals, birds, reptiles, amphibians, fish, insects and spiders, as well as many other invertebrates.⁴ As strange and seemingly inhospitable as this subterranean world can be, it is ‘homier’ than most ecosystems because its climate—humidity, air temperature, air flow—is so constant and stable.”

Whale: “The same is true of the deep sea. The temperature, though cold, does not vary much and water currents are fairly gentle.

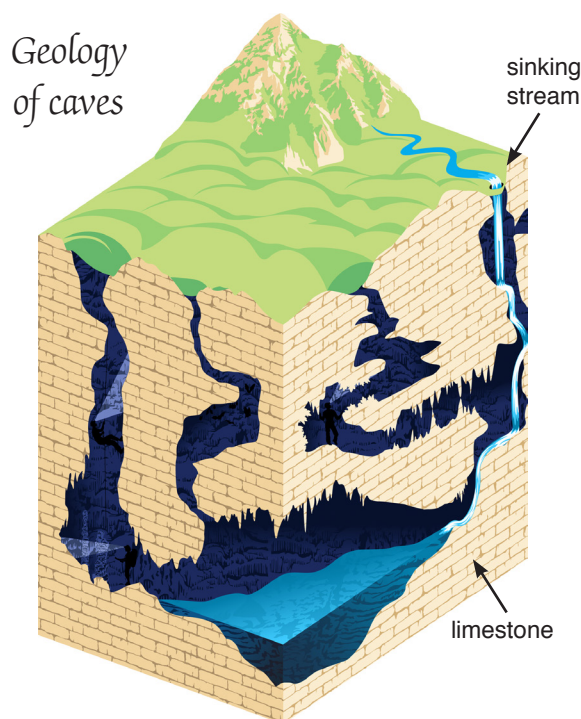
“Being that caves are so isolated from the surface, how does Creator Jesus feed His creatures living there? Sunshine doesn’t reach very far into a cave, so nothing can grow . . . which is also true of the ocean deep.”

Bat: “It’s true, Whale, that green plants

⁴ Other invertebrates include amphipods, isopods, copepods, and crayfish.

cannot grow underground, except very near the cave entrance. But our loving Lord faithfully provides His ‘creatures of the dark’ with a variety of meals, though most people would find them unappealing.

“Many caves and caverns are fed by ‘sinking streams.’ In limestone regions, it is not uncommon for a surface stream to suddenly disappear out of sight as it drops down underground. Creator Jesus uses these sinking streams to transport bugs, fish, small dead animals, sticks, leaves, even logs



into the subterranean world. He specially designed cave creatures to eat these things. Because food is generally scarce, our good Lord slows down the metabolism of most cave animals—in turn, they require less food, making them resistant to starvation.

“Oftentimes, the sinking stream reemerges at the surface cleared of all its debris. It’s then known as a freshwater spring. In this way, God uses the creatures of a cave to provide the surface with purified water.”

Whale: “What about you, Bat?”

Bat: “Oh, I’m a ‘troglophile,’ an animal that lives in caves, but ventures outside to find food.”

Whale: “Hey, I do just the opposite. I live most of my life in well-lit shallow water, but dive deep into the inky blackness of the sea to capture a meal, usually squid.”

Bat: “Calamari, huh?”

Whale: “It’s my favorite!”

Bat: “We bats exit the cave at dusk in search of flying insects, and return by daybreak. Animals that live their entire lives in the cave—often in total darkness—are known as ‘troglobites.’ And creatures that live outside the cave but sometimes venture inside—like raccoons—are called ‘trogloxenes.’”

Whale: “Wow, those are big words.”

Bat: “Creator Jesus also graciously supplied most caves with a variety of microorganisms, like bacteria. In almost all ecosystems, bacteria are extremely important because they decompose debris that other creatures cannot. Their colonies often form thick mats on stream bottoms and rocks. It is these bacterial mats—composed of billions of microbes—that become food for fish, snails, and other invertebrates. The muddy bottom

Isopod
(closeup)



of cave streams is home to insect larvae, small creatures known as amphipods and isopods, and all kinds of worms.”

Whale: “Creator Jesus is so amazing because He placed many of the same kinds of creatures on and in the ocean floor! I think scientists call these animals ‘the benthos.’”

Bat: “Yes, and the muddy habitat in which they live is the ‘benthic zone’—whether it is the bottom of the sea or the bottom of a cave stream.



“Our Lord is amazing and full of surprises. There are a handful of caves scattered around the world that contain sulfuric acid, yet animals live and thrive there. A sulfidic cave system, as it is known, gets most of its food energy from hydrogen sulfide gas.”

Whale: “Isn’t hydrogen sulfide poisonous?”

Bat: “Very poisonous and it smells really bad, like rotten eggs. But our Creator proves Himself over and over to be the God of the seemingly impossible. Jesus created special bacteria that can convert hydrogen sulfide into sulfuric acid. As they do, they harvest energy:

hydrogen sulfide + oxygen \longrightarrow sulfuric acid
+ energy



“We might say that these bacteria literally ‘eat’ toxic hydrogen sulfide. They can also form bacterial mats that float on water; these mats then become food for other creatures. What is more, God uses the sulfuric acid that the bacteria produce to modify the cave, transforming its limestone walls into the mineral gypsum, which is calcium sulfate.”

Whale: “You know, Bat, essentially the same thing happens at hydrothermal vents in the deep ocean. . . . I’ll tell you about it later.”

Bat: “The first ever sulfuric acid cave discovered was Pesteria Movile in Romania.⁵ What’s incredible is that, despite poisonous hydrogen sulfide gas and caustic sulfuric acid,

⁵ Discovered in 1986.

these caves are teeming with life. Sometimes they possess more organisms than are found in nontoxic caves, proving that God is indeed the Lord of Life! It's almost as if He creates an 'impossible habitat,' then demonstrates to the world His incomparable greatness by sustaining life there." *Whale nods in eager agreement.*

Bat: "The process by which bacteria obtain energy from hydrogen sulfide is called chemosynthesis. It's similar to photosynthesis, except in photosynthesis life-sustaining energy comes from the Sun.⁶ Apparently, the exact same chemosynthesis takes place at the deep-sea hydrothermal vents you mentioned."

Whale: "With these sulfuric acid caves, where does the hydrogen sulfide come from?"

Bat: "From the groundwater. Once hydrogen sulfide is converted into sulfuric acid, the pH of the cave water is greatly altered. Most cave streams are slightly basic—with a pH between 8.0 and 8.5—which is similar to the ocean water in which you live. In some sulfuric acid caves, however, the water has a pH of 0. People exploring such environments must wear protective clothing and gas masks because of the dissolved acid and toxic levels of hydrogen sulfide in the air. Yet many animals, including bats, seem unaffected by the chemicals. If Creator Jesus enjoins to protect us, then we're safe no matter what danger 'lurks in the dark!'"

Whale: "As we discussed earlier, the same is true for how God designed me. I'm able to dive into the pitch black, icy cold, crushing depths of the deep ocean without harm. Few creatures can do that."

"Say, Bat, you mentioned that much of the food our Lord provides to cave creatures would be unappealing to people. Aside from bugs and bacteria, what else is there to eat?"

Bat: "Several species of animals feed on guano, which is bat feces. Sometimes a large animal will wander into a cave and die. Many



cave creatures find such a carcass a veritable feast. Beetles regularly enjoy cricket eggs, and a tiny organism known as the ostracod eats the accumulated debris on the backs of cave crayfish." *Whale gives Bat a truly disgusted look.*

Bat: "One of the most fascinating things about cave creatures is that Creator Jesus set their metabolism much lower than animals that live above ground. As I said earlier, He probably did this to compensate for the thin rations of food coming into the cave from the surface. But, as a result, many subterranean organisms live fairly long lives."

Whale: "I've heard that the total darkness of a cave environment can really mess up the internal clock of a creature wandering into it for any length of time."

Bat: "Yes. People and animals daily reset their internal clocks when exposed to the Sun. But someone who explores the lightless world of caves for days on end often loses track of time. For instance, the longer a person stays underground, the longer he or she sleeps at a stretch."

"If outsiders limit their exploration, however, they can stay healthy and experience a world of breathtaking beauty and natural hidden treasures. As with so much of God's glory, it takes sacrifice, courage, and hard work to discover its expression in nature. But if people are committed to the task, they

⁶ Read about photosynthesis in **CREATOR** Volume 21 Number 4.



will find few things so serene and peaceful as sitting silently by an underground pool of crystal-clear water, surrounded by beautiful cave formations. Ours is a truly awesome Creator!"

So ends Part One of the discussion between Bat and Whale. Please read "Light in Darkness," then flip the issue upside down to learn about Christ's amazing work in the deep sea.

LIGHT IN DARKNESS

The Bible teaches that our Lord Jesus is the Light (John 1:4-5) and the Life (John 14:6) of the world. Our study of caves has shown us that wherever Christ declares life to exist, it flourishes. God has ordained the Sun to be the energy source for the vast majority of plants and animals He has created. Using the Sun, Christ demonstrates His supreme authority in establishing life across the globe. He puts an exclamation mark on His creative activity, however, by causing some creatures to thrive in the absence of light. Who other than our amazing God could accomplish such things?

The Bible also teaches that natural man resides in spiritual darkness because he lacks the light of truth (Romans 3:10-18). The book of Exodus describes the physical darkness that came upon the Egyptians during the days of Moses as a darkness that could be "felt" (Exodus 10:21). Have you ever been on a cave tour and had the guide turn off all the lights? If so, you know what darkness feels like. Sadly, most people don't sense the crushing weight of spiritual darkness surrounding them. They naturally reject the light of the glory of God seen in the face of Christ (2 Corinthians 4:6; Hebrews 1:3).

In order for a person to see and enjoy their holy God (Matthew 5:8), their heart must be purified by the blood of Christ and illuminated by the Holy Spirit. We cannot do this on our own. Trying to see the glory

of God in Christ, apart from His Spirit, is like expecting a blind man living in a cave to comprehend the nature of the Sun, after leading him into the daylight. He may feel its warmth—as all people experience the goodness of God—but, being blind, he cannot see the Sun's beauty and brilliance.

In order for anyone to know the beauty of God in Christ, and salvation from his or her sins, they must be brought out of darkness by Christ's Spirit and have their sins washed away by the blood Jesus shed upon a cross. Only the Spirit can give someone the faith to truly believe in God's Son and repent of their sins. Otherwise, oppressive darkness remains.

If you feel that your life is dark and devoid of true faith in Christ, this sense is a great mercy from God! Please ask Him to give you His Spirit, and to open your eyes (Ephesians 1:18). Plead with Him to rescue you from the domain of darkness and transfer you to the kingdom of His beloved Son (Colossians 1:13). He alone is able to do this, and He is willing!



R.J. DESTREE
Editor

PASTOR CHRIS KAWA
JOSEPH ADRIAN
Theology Editors

TREY TIPPIE
Science Editor

DR. SEAN ALLISON
MAGGIE RICHARDSEN
Editorial Panel

KELLEY CARLSON
COLLEEN DESTREE
Art Directors

VISIT US AT OUR WEBSITE:
www.hiscreation.com

CREATOR is published quarterly by **HIS CREATION**, PO BOX 49082, Colorado Spgs, CO 80949. Copyright © 2018 by **HIS CREATION**. All rights reserved. Our publications are offered without charge, however donations are greatly appreciated!

Scripture references are from the New American Standard Bible, Copyright © 1960, 1962, 1963, 1968, 1971, 1972, 1973, 1975, 1977, 1995 by the Lockman Foundation.

PHOTO/ILLUSTRATION CREDITS

- 1 Bat—© Linda Bucklin / Shutterstock.com
- 2 Stalactites/stalagmites—Public domain
- 3 Lechuguilla—Dave Bunnell CC BY-SA 2.5
- 3 Sinking stream—© SaveJungle / Dreamstime.com
- 4 Isopod—André Karwath CC BY-SA 2.5
- 4 Cave—© National Geographic Image Collection / Alamy Stock Photo
- 5 Cave cricket—Public domain