

# CAVES:

» THE UNDERGROUND WILDERNESS

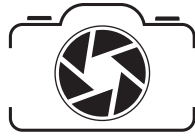


WRITTEN BY  
ANTHONY KLEMM

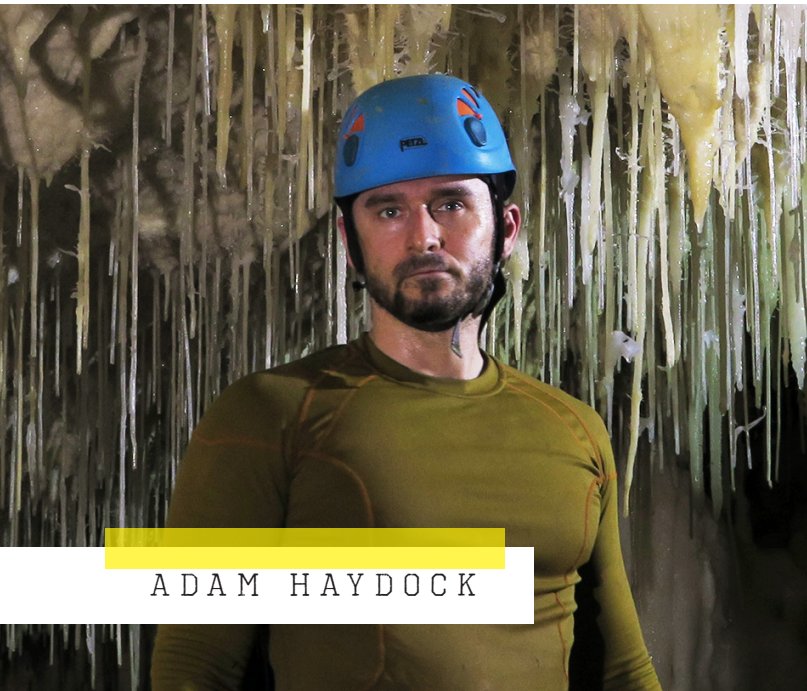


THE GOOD AND THE BEAUTIFUL LIBRARY





# MEET THE PHOTOGRAPHERS



ADAM HAYDOCK

Thirteen years ago, Adam Haydock became divemaster certified through PADI (Professional Association of Diving Instructors). He worked for special maritime operations, first responder rescues, and body recoveries. He is a self-taught photographer and goes on abundant and diverse underwater cave explorations. His knowledge, experience, and expertise are priceless to organizations and universities that want to know more about and document the underwater world of caves. His cave-diving and camping experiences have taken him on cave explorations as long as nine days, as deep as 67 m (220 ft) underwater, and as broad as North, Central, and South America.



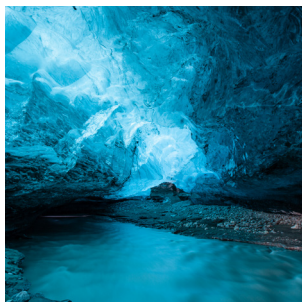
BRANDON KOWALLIS

Brandon Kowallis is the author and photographer of *Fragile Frontiers*, a book about cave exploration, complete with his own spectacular photography. His greatest thrill is to go where no human has ever been before, which he has accomplished numerous times by caving throughout North, South, and Central America. A Fellow of the National Speleological Society (NSS), he teaches online cave photography courses, donating 50% of the proceeds back to NSS. His greatest joy is his wife and kids. They live near Salt Lake City, Utah, where Brandon is the director of Concurrent Enrollment at Salt Lake Community College.



# TABLE OF CONTENTS

1. Types of Caves and How They Form .....	1
2. Speleothems: Cave Decorations .....	21
3. Cave Creatures .....	27
4. Cave Ethics and Conservation .....	33
5. Cave Exploration and Safety .....	41
6. Vertical Caving and Cave Diving .....	49
7. Famous Caves .....	55






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## HUMANS SEEM TO HAVE A NATURAL TENDENCY TO EXPLORE.

This appetite to discover places never before seen is what motivated brave explorers to cross the vast ocean expanse during the Age of Discovery. It is why we reach out beyond our own planet's gravitational pull to walk on the moon and to land rovers on Mars. Here on Earth there remain many mysteries to uncover and places to explore.

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From the depths of our unmapped oceans to the deepest jungles of the rainforest, there is still so much to learn about our own planet. Hidden just beneath our feet, miles of snaking networks of undiscovered caverns lie waiting to reveal their secrets.



A photograph of an ice cave interior. A path of water leads from the bottom left towards the center of the frame. The walls of the cave are made of translucent, layered ice, showing various textures and colors from white to deep blue. The lighting is dramatic, with bright highlights on the water and ice surfaces, and deep shadows in the recesses of the cave. The overall tone is cool and mysterious.

## » ICE CAVES

When the sun shines through the top of a shallow ice cave underneath a glacier, bright hues of blue, green, and sometimes purple flood the enclosed space. Ice caves are hollowed out as the meltwater from the glacier's surface drains through cracks in the ice to create large drainage channels. During the warmer months, when the glaciers are melting, most ice caves are filled with water and are not accessible to visitors. But once the temperatures drop and the melting ceases, ice caverns can be visited and explored. Some ice caves have decorations similar to those typically found in limestone caves, such as stalactites, stalagmites, and beautifully scalloped interior walls.

Deep underneath large ancient glaciers, such as the ice caps in Antarctica and Greenland, ice caves hold important clues about the past.

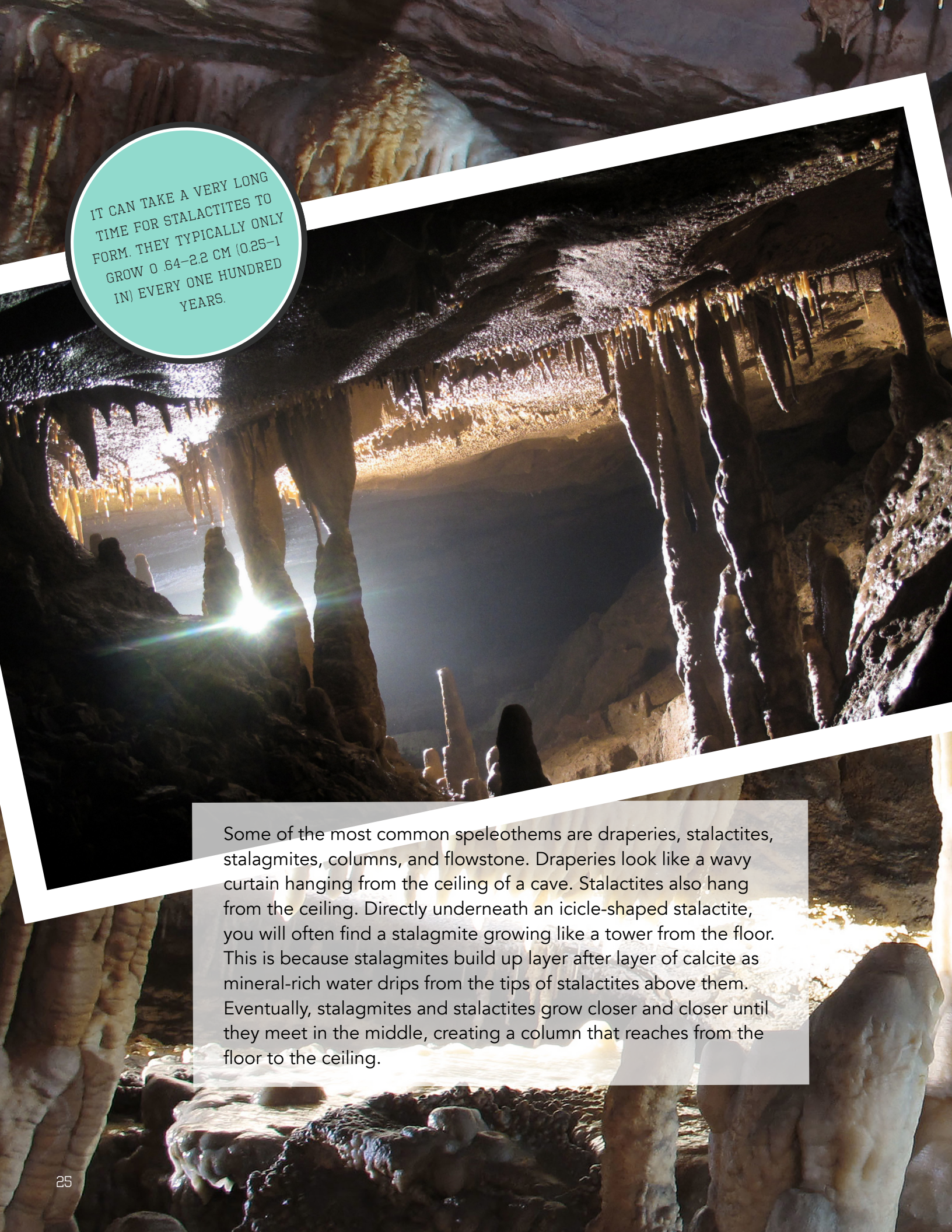


A MAJOR DRAW FOR CAVE VISITORS IS THE FASCINATING AND AWE-INSPIRING NATURAL DECORATIONS FOUND NOWHERE ELSE ON EARTH.

Smooth and shining icicle-like rocks that hang from the ceiling or rise up from the ground, cave pearls, and gypsum crystals are all types of underground formations called speleothems. Some speleothems have oddly descriptive names, such as soda straws, cave popcorn, flowstone, fried eggs, and cave bacon. Not only are speleothems breathtaking to see, but they also hold clues to how caves form and contain a historical record of the climate from the past.







IT CAN TAKE A VERY LONG TIME FOR STALACTITES TO FORM. THEY TYPICALLY ONLY GROW 0.64-2.2 CM (0.25-1 IN) EVERY ONE HUNDRED YEARS.

Some of the most common speleothems are draperies, stalactites, stalagmites, columns, and flowstone. Draperies look like a wavy curtain hanging from the ceiling of a cave. Stalactites also hang from the ceiling. Directly underneath an icicle-shaped stalactite, you will often find a stalagmite growing like a tower from the floor. This is because stalagmites build up layer after layer of calcite as mineral-rich water drips from the tips of stalactites above them. Eventually, stalagmites and stalactites grow closer and closer until they meet in the middle, creating a column that reaches from the floor to the ceiling.



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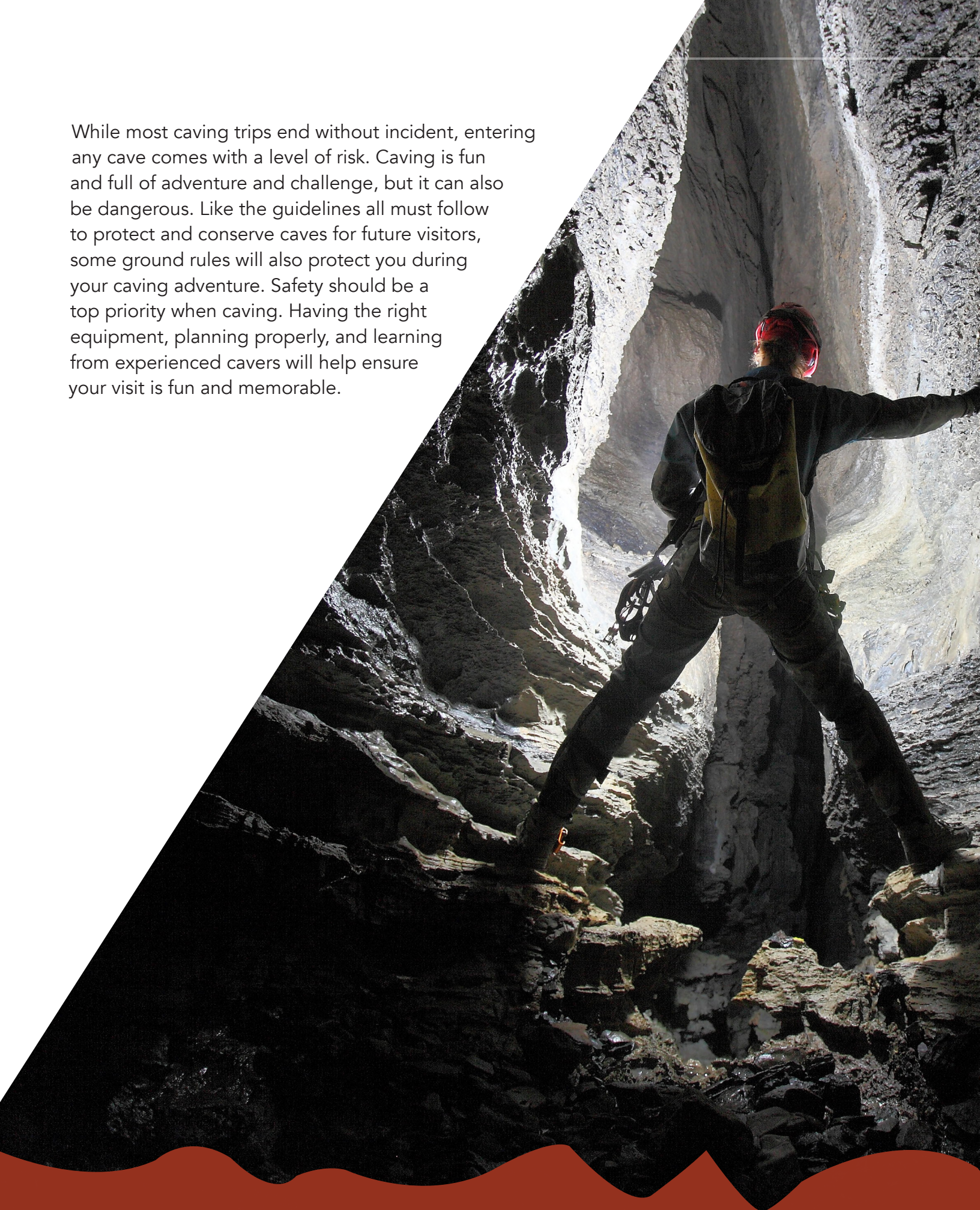
3



CAVE  
CREATURES



While most caving trips end without incident, entering any cave comes with a level of risk. Caving is fun and full of adventure and challenge, but it can also be dangerous. Like the guidelines all must follow to protect and conserve caves for future visitors, some ground rules will also protect you during your caving adventure. Safety should be a top priority when caving. Having the right equipment, planning properly, and learning from experienced cavers will help ensure your visit is fun and memorable.







Another key to a safe caving experience is not to take unnecessary risks. Never try to force yourself into tight spaces. The last thing you want is to get trapped in a constricted area of the cave, making it difficult to be rescued. A final way you can reduce risk is by avoiding unnecessary and dangerous climbs or jumps. By making prudent decisions and following an experienced caver's guidance, you can ensure your caving adventure is both safe and fun.



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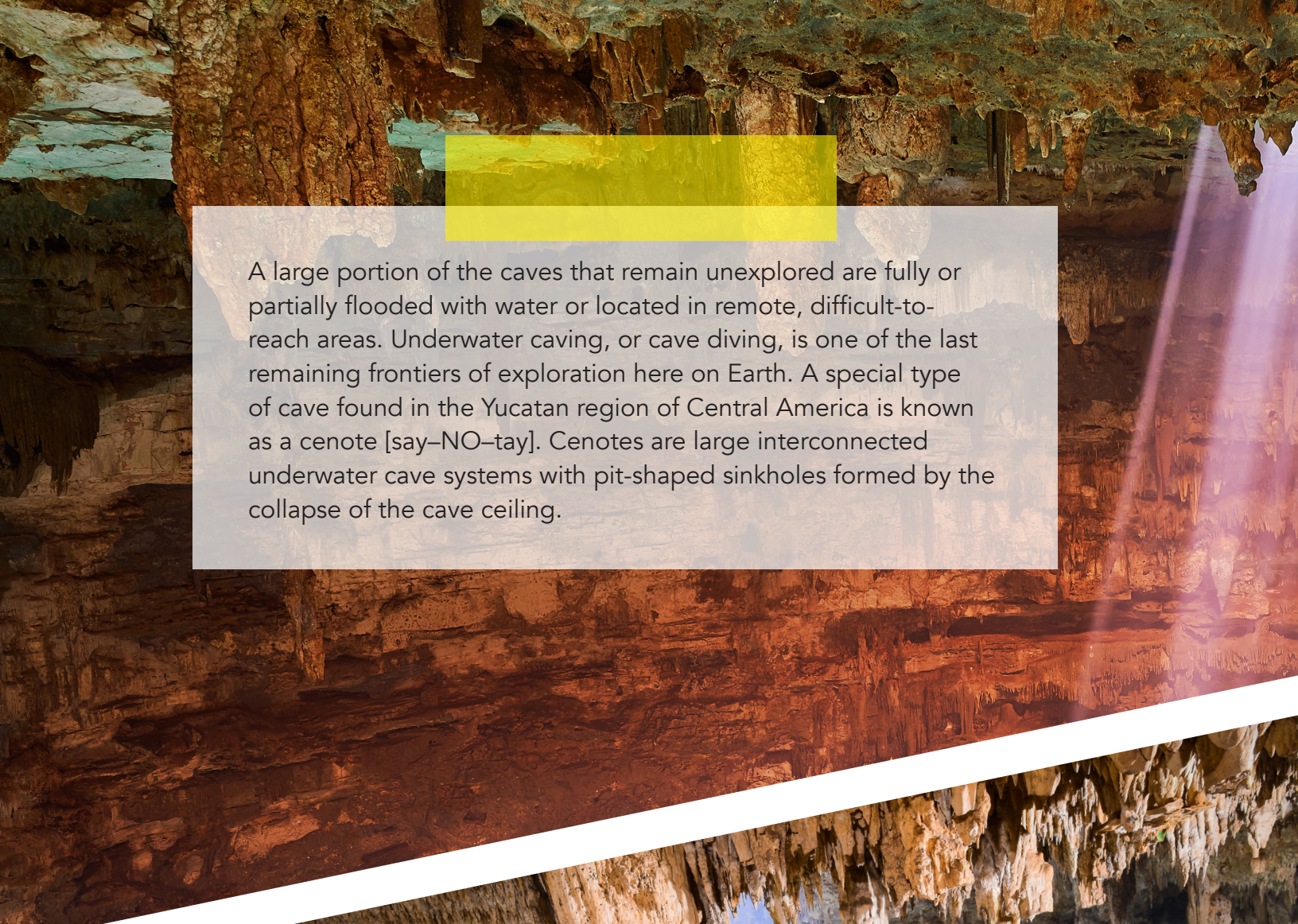
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VERTICAL  
CAVING AND  
CAVE DIVING





A photograph of a cave interior with a yellow rectangular highlight at the top. The cave walls are covered in various types of rock formations, including stalactites and stalagmites. The lighting is dim, with a bright light source visible on the right side, creating a strong beam of light.

A large portion of the caves that remain unexplored are fully or partially flooded with water or located in remote, difficult-to-reach areas. Underwater caving, or cave diving, is one of the last remaining frontiers of exploration here on Earth. A special type of cave found in the Yucatan region of Central America is known as a cenote [say-NO-tay]. Cenotes are large interconnected underwater cave systems with pit-shaped sinkholes formed by the collapse of the cave ceiling.







# THE CAVE OF CRYSTALS

NAICA MINE, CHIHUAHUA, MEXICO

SOME OF THE LARGEST NATURAL CRYSTALS EVER DISCOVERED WERE FOUND UNDERGROUND IN THE NAICA MINE, MEXICO, but visiting the formations is not possible for just anybody. The only way to access the caverns full of selenite, a type of gypsum crystal, is by pumping out thousands of gallons of steamy, geothermally heated water that normally fills the caverns. With temperatures reaching a sweltering 57.2 °C (135 °F), visits of more than a just a few minutes require specialized protective suits with their own air supply.





# MARBLE CAVES

PUERTO RÍO TRANQUILO, CHILE

CARVED OVER MANY YEARS  
OUT OF SOLID MARBLE,  
THE MARBLE CAVES OF  
CHILE CHICO ARE LOCATED  
ON THE BANKS OF A LARGE  
GLACIAL LAKE ON THE  
NATIONAL BORDER OF  
CHILE AND ARGENTINA.



# CAVES:

## » THE UNDERGROUND WILDERNESS



Stepping into a cave is like entering an unfamiliar world. These majestic underground spaces are full of breathtaking sights, from columns of glowing ice and fantastic rock formations to vast networks of underwater caverns. In this book, you'll learn about different types of caves and the strange and beautiful creatures that live inside them as well as how to safely and responsibly explore the subterranean world. Featuring the stunning photography of Adam Haydock and Brandon Kowallis, *Caves: The Underground Wilderness* will inspire a new generation to love and respect nature's buried treasures.

■ ORIGINAL PUBLICATION