

Subterranean SPLENDOR

Painted by the hands of time, these eight caves underscore the complexity and beauty of Earth's otherworldly hollows.

by PAUL RUBIO

Beneath Earth's surface lies an elaborate system of cavernous chambers, each a unique, rock-hewn expanse crafted by the gradual chemical erosion of bedrock as acidic, carbon dioxide-rich rainwater eats through planetary pores. It wasn't until the early 20th century and the work of researcher Édouard-Alfred Martel that speleology gained credibility as its own scientific discipline, meaning we've only just begun to unravel the arcane world of caves. While many underground greats are credited to exploratory speleologists, even more have been uncovered by pure chance. It seems that even technology cannot unlock all the secret maps of inner Earth—protected by extreme temperatures, sheer darkness, ethereal creatures, and physical instability—leaving the vast majority of Earth's caves unknown and unexplored.

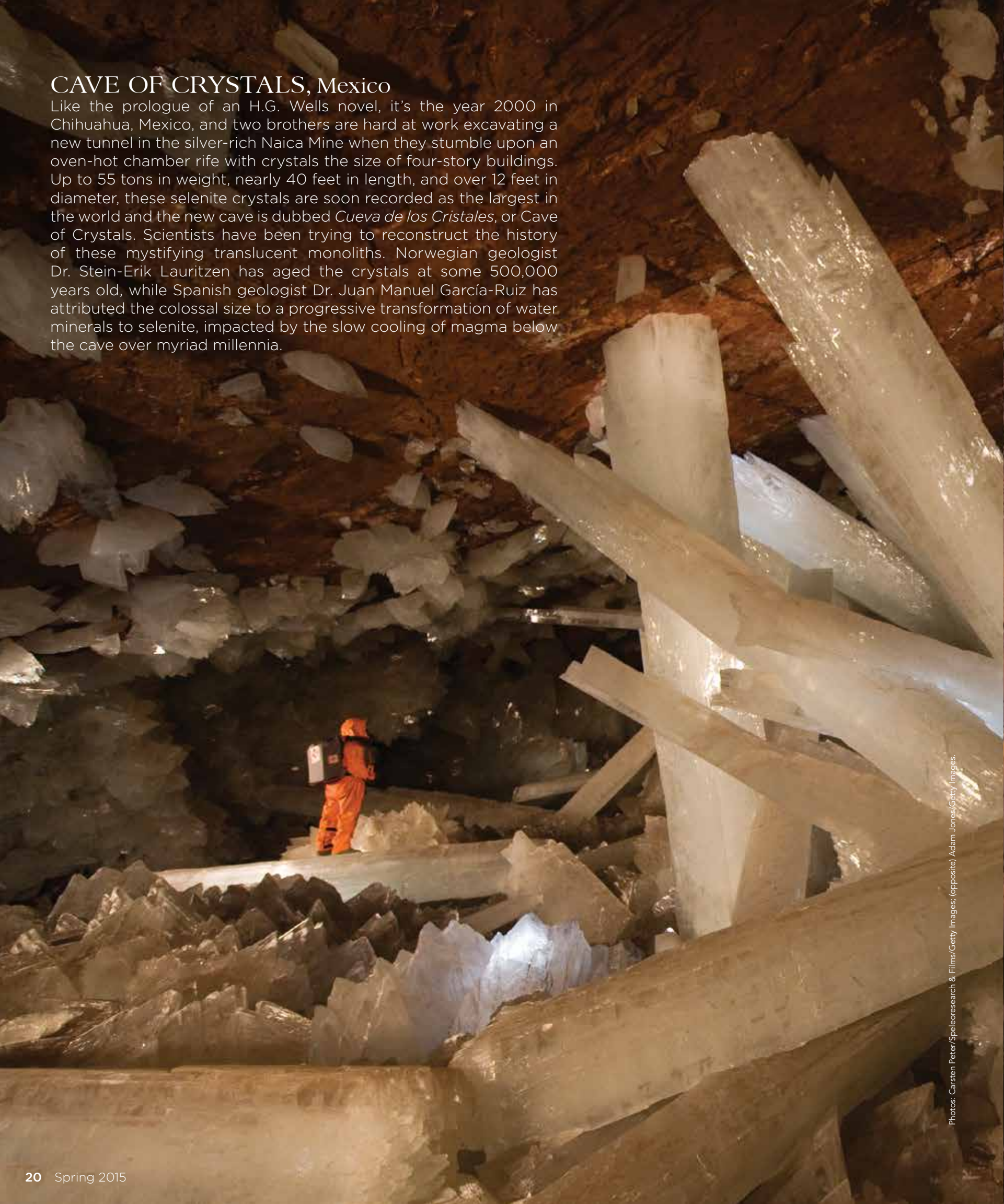
MARBLE CAVES, Chile

Young by cave standards, at approximately 6,200 years old, Chile's *Cavernas de Mármol*, or Marble Caves, are the result of wave action and water penetration through the metamorphosed limestone or marble islands dotting Lake General Carrera in central Patagonia. According to geological history, once this glacial lake, fed by the melting snow of the Patagonian Andes, reached its present equilibrium level over six millennia ago, the midlake landmasses began to erode and fracture from constant water contact at the surface, fostering an elaborate network of tunnels, hollows, and columns at the base of these marble isles. Reflecting off the Windex-colored icy waters, the striated swirls and mesmerizing patterns of these marbled caves vacillate among hues of gray and blue, an ever-changing kaleidoscope dictated by sunlight intensity and seasonality. ▷

Photo: Danita Delmon/Getty Images

CAVE OF CRYSTALS, Mexico

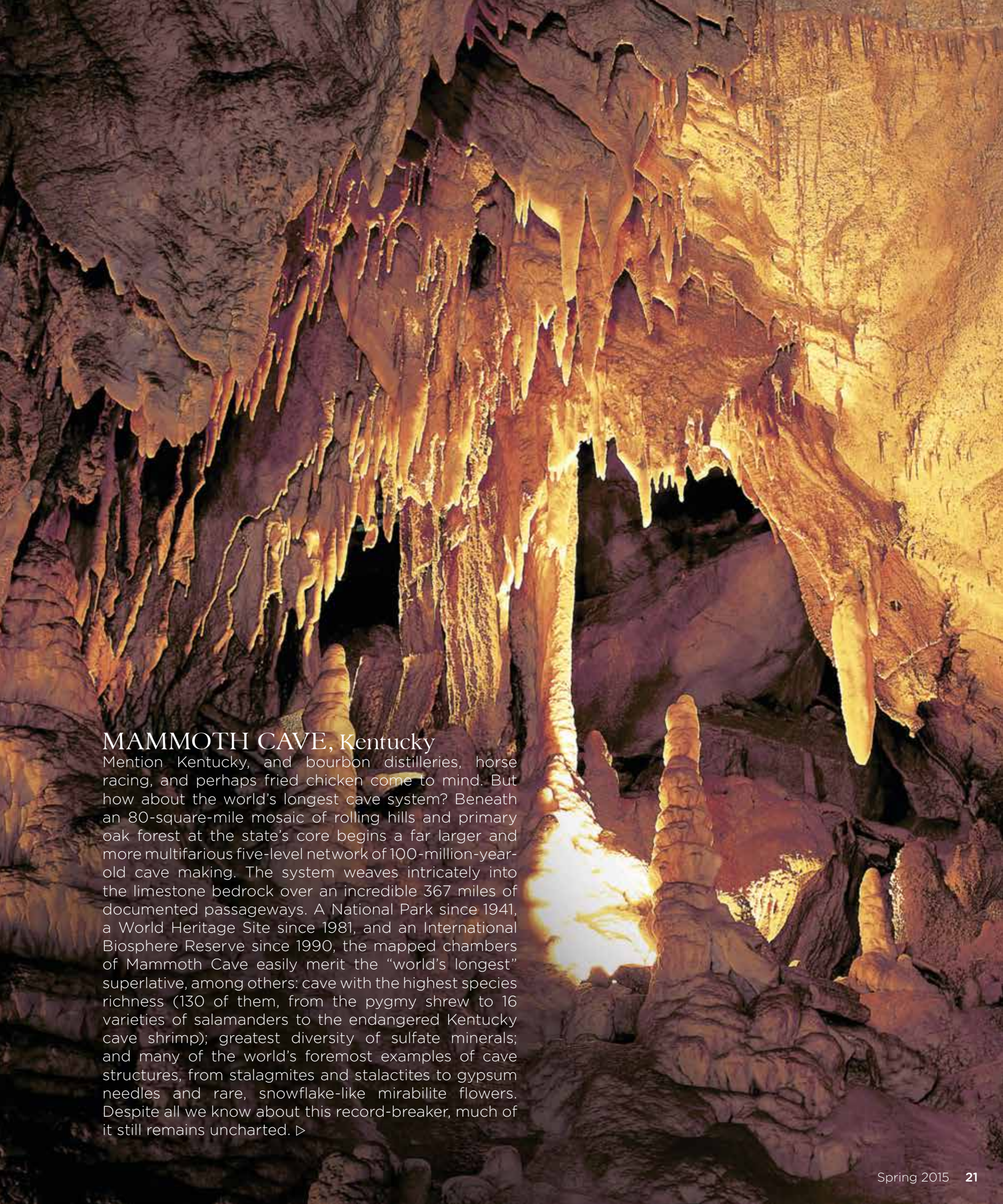
Like the prologue of an H.G. Wells novel, it's the year 2000 in Chihuahua, Mexico, and two brothers are hard at work excavating a new tunnel in the silver-rich Naica Mine when they stumble upon an oven-hot chamber rife with crystals the size of four-story buildings. Up to 55 tons in weight, nearly 40 feet in length, and over 12 feet in diameter, these selenite crystals are soon recorded as the largest in the world and the new cave is dubbed *Cueva de los Cristales*, or Cave of Crystals. Scientists have been trying to reconstruct the history of these mystifying translucent monoliths. Norwegian geologist Dr. Stein-Erik Lauritzen has aged the crystals at some 500,000 years old, while Spanish geologist Dr. Juan Manuel García-Ruiz has attributed the colossal size to a progressive transformation of water minerals to selenite, impacted by the slow cooling of magma below the cave over myriad millennia.



Photos: Carsten Peter/Spelaeoresearch & Films/Getty Images; (opposite) Adam Jones/Getty Images

MAMMOTH CAVE, Kentucky

Mention Kentucky, and bourbon distilleries, horse racing, and perhaps fried chicken come to mind. But how about the world's longest cave system? Beneath an 80-square-mile mosaic of rolling hills and primary oak forest at the state's core begins a far larger and more multifarious five-level network of 100-million-year-old cave making. The system weaves intricately into the limestone bedrock over an incredible 367 miles of documented passageways. A National Park since 1941, a World Heritage Site since 1981, and an International Biosphere Reserve since 1990, the mapped chambers of Mammoth Cave easily merit the "world's longest" superlative, among others: cave with the highest species richness (130 of them, from the pygmy shrew to 16 varieties of salamanders to the endangered Kentucky cave shrimp); greatest diversity of sulfate minerals; and many of the world's foremost examples of cave structures, from stalagmites and stalactites to gypsum needles and rare, snowflake-like mirabilite flowers. Despite all we know about this record-breaker, much of it still remains uncharted. >





HANG SON DOONG, Vietnam

In remote central Vietnam, near its border with Laos, Hang Son Doong, or Mountain River Cave, stakes claim as the world's largest, ballooning at its apex with a continuous passageway over 2.5 miles long, a width of 300 feet, and ceilings over 650 feet tall. To put the latter one in perspective, that's about the height of New York City's 50-story 1 Wall Street building or more than two Statues of Liberty, which stands at 305 feet (pedestal and foundation included). Etched into Vietnam's Annamite Mountains, the cave is named after the raging Rao Thuong River, which flows through its core. In parts, sundrenched cracks in the earth have fostered growth of a subterranean jungle, at once strewn with vines, ferns, palms, throngs of birds...and stalactites.

Photos: Ryan Deacock/Aurora Photos, (opposite) David Laif/Reuters/Corbis

DEER CAVE, Malaysia

Above the ground at Gunung Mulu National Park in Malaysian Borneo, the towering, razor-sharp limestone pinnacles compose some of Asia's most extraordinary natural scenery. This limestone love affair extends far beneath the surface, too, ultimately revealing the world's second-largest cave passage hewn into the ancient bedrock. Prior to the official survey of Hang Son Doong in 2009, Malaysia's Deer Cave held the "world's largest" title, with a length and width as remarkable, but with a height later discovered to be less than its Vietnamese counterpart. The cave's interiors are draped by millions of bats roosting on the ceilings and walls, the floors blanketed with equal numbers of cockroaches feeding on mountains of bat guano. Come sunset, the three million resident wrinkle-lipped bats make a mass exodus in search for food, overtaking the sky for at least two hours in an intense display that recalls Alfred Hitchcock's *The Birds*. ▸



FINGAL'S CAVE, Scotland

On the deserted island of Staffa off the western coast of Scotland, a series of hexagonally jointed basalt columns rise from the depths of the North Atlantic Ocean. Perfectly stacked like Tetris pieces, they collectively line and inscribe a sea cave known as Fingal's Cave. Steeped in national folklore thanks to 18th-century poet James Macpherson and named in 1772 after the protagonist of Macpherson's magnum opus, this seemingly mythological home of gods and monsters continues to wow with its geometric precision. Adding to this storybook surrealism: the mist that often carpets the cave's sole entrance and principal corridor, as well as the cathedral-like acoustics piping out raw sounds and reverberations of crashing waves at unlikely intervals, composing a natural yet haunting symphony. >



Photo: Gmsphotography/Getty Images.

CRYSTAL CAVE OF SVÍNAFELLSJÖKULL, Iceland

The remarkable glacier caves in the southern Skaftafell territory of Iceland's Vatnajökull National Park are the result of an epic "once upon a time" meeting between the Vatnajökull ice cap (Europe's largest glacier) and the Icelandic coast, spawning voluminous cavities capped by highly compressed, deep-blue glacial ice. Arguably the most photogenic is the Crystal Cave of Svínafellsjökull, an icy, azure hollow formed above the frozen lagoon of an outlet glacier. Highly unstable in existence, the cave is persistently moving, cracking, melting, and refreezing—yet still standing unscathed. Though interchangeably referred to as both a glacier cave and an ice cave, the lack of bedrock beneath its frozen fantasia technically disqualifies Crystal Cave as the latter, branding it a true glacier cave, simply a crater in the glacier ice. ▶

Photo: Fotosearch/Getty Images

WAITOMO CAVES, New Zealand

It's neither the spectacular layers nor the prolific stalactites that garner fame for the 30-million-year-old Waitomo Caves on New Zealand's North Island. The caves' celebrity status instead stems from its star tenant, the endemic New Zealand glowworm, or *Arachnocampa luminosa*, gifted with bioluminescence and present in numbers large enough to illuminate an entire chamber. This real-life, glow-in-the-dark *Fraggle Rock* attracts tourists from far and near, as its excellent infrastructure facilitates small boat journeys through the underground Waitomo River, where the twinkles are most palpable. While most visitors are initially surprised to discover the "glowworms" are in fact mosquito-sized fungus gnats in the larval stage, the awe that follows an experience through the Waitomo Caves quickly imbues a new respect for any bug's life. ♦

Photo: PhotoNewZealand.

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