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EARTH

APRIL 2011
vol. 56 ■ no. 4
www.earthmagazine.org

FEATURE

BACTERIA BACK FROM THE BRINK

Microbes can live for tens of thousands, if not millions, of years inside fluid inclusions in salt crystals. What can such microbes tell us about ancient life on Earth? And could similar microbes also be living on other planets?

Tim Lowenstein



FEATURE

STILL IN A HAZE: WHAT WE DON'T KNOW ABOUT BLACK CARBON

Soot in the atmosphere has long been known to be a health hazard — and over the last decade, scientists have begun studying its effects on climate too. But exactly how it impacts the planet is still hazy.

Carolyn Gramling

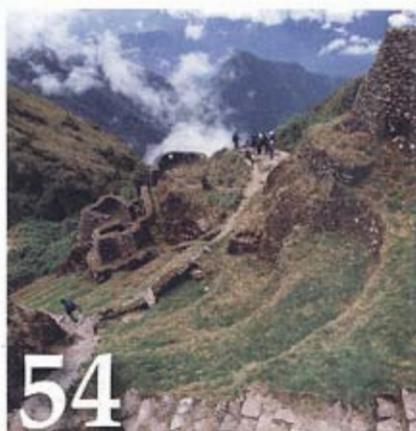


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TRAVELS IN GEOLOGY: TREKKING THE INCA TRAIL TO MACHU PICCHU

Hiking the Inca Trail to Machu Picchu is not for the faint of heart — it's a grueling four-day, 59-kilometer-long hike high in the Peruvian Andes. But the views and experience can't be beat.

Mary Caperton Morton



TRENDS AND INNOVATIONS

THE RISE OF COMMUNITY REMOTE SENSING

Remote sensing has revolutionized science and Earth monitoring, but it fails to collect data at the hyper-local level. That's where the community comes in, using technology such as smartphones, GPS devices and digital cameras to relay information to scientists.

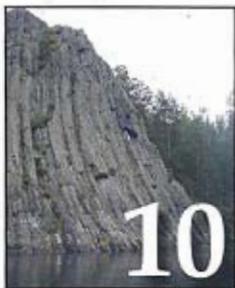
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ON THE COVER: Brian Schubert collects samples in Saline Valley, Calif. Photo is by Michael Timofeeff.

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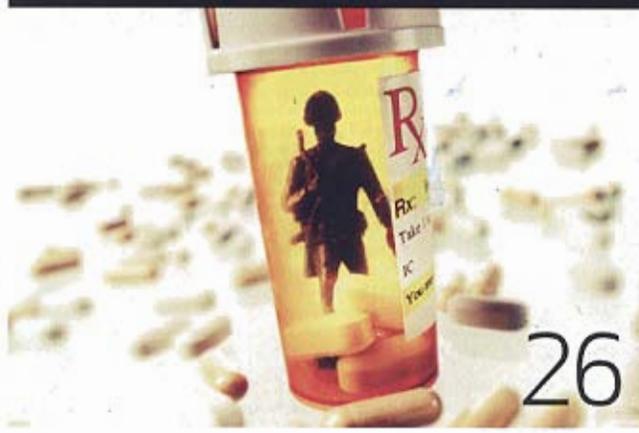


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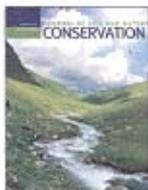
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On the Cover
River in spring season.
Photo by Kapu.

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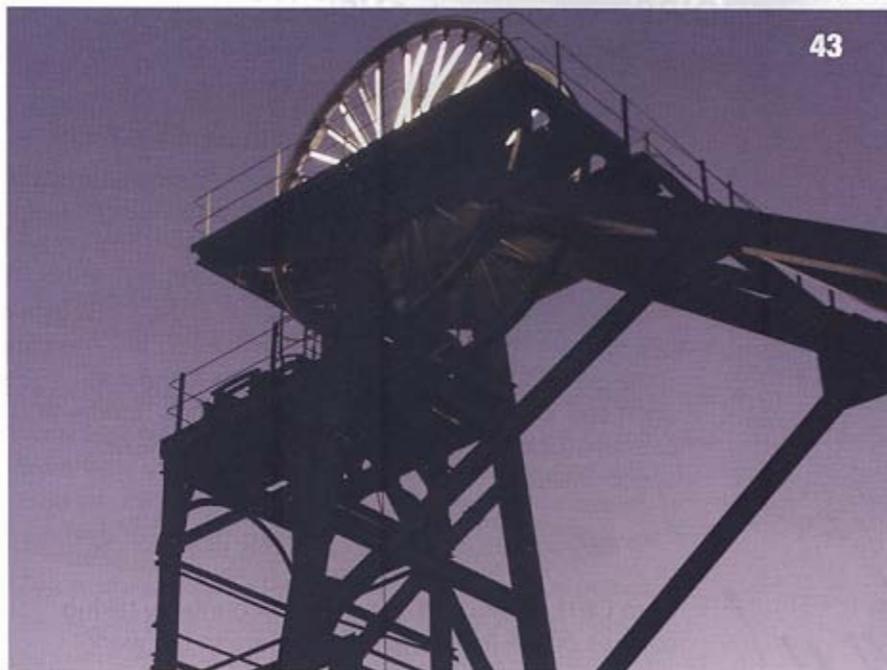
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Cover Story

While remaining optimistic about the short and midterm prospects for the global mining industry, 2011 SME President John N. Murphy knows the industry will continue to face significant challenges, internally and externally. His comments on the state of the mining industry and SME begin on page 31. Throughout its 40-year history, the solvent extraction circuit at Freeport-McMoRan's Bagdad, AZ copper plant has experienced a series of owners and a number of extensive upgrades. The plant is the oldest solvent extraction plant in the world. The plant's history is examined on page 38.



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November 2010

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The cover photo shows completed rock anchors, part of work Hecla Mining Co. already has completed as it works to complete the No. 4 internal shaft. Once the shaft is completed by 2014, it is expected to increase the mine's annual silver production by 50% and extend the mine's life to 2030. Total cost of the expansion is expected to run between \$150 million and \$200 million, with about \$50 million expended by year-end 2010.

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An Interdisciplinary Approach to Soils Research

MARCH 2011

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