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Cover: An epidermal impression of a cotton leaf made on a cellulose acetate huitzite plate and scanned with a high resolution benchtop scanner. The foreground displays a false color image of an epidermal impression of a whole cotton leaf. The background is a negative image of a region of the same impression, subsequently colorized. Gitz and Baker (232–236) discuss the creation and use of these slides to assess stomatal density, a primary determinant of yield. Photo credit: Dennis Gitz.

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Cover: A furrow-irrigated field in southern Idaho, where soils have low organic matter and high volcanic ash fractions, and are highly susceptible to erosion. The furrow stream on the left was untreated and shows head-cut erosion and high sediment load. The furrow stream on the right was treated with 10 mg L⁻¹ water-soluble anionic polyacrylamide (WSPAM) during stream advance. In this issue, R.D. Lentz and R.E. Sojka (305–314) report on a long-term study showing that, in addition to reducing runoff sediment losses, WSPAM significantly increases bean (*Phaseolus vulgaris* L.) and silage corn (*Zea mays* L.) yields in treated furrows compared with controls. Photos by R.D. Lentz.

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THIS ISSUE

This month, Arch Coal's Tony Bumbico shares the company's experience implementing a behavior-based safety program. On the cover, multiple shovels work the pit at Foundation Coal's Belle Ayr mine. (Cover photo: Lee Buchsbaum, www.lmbphotography.com)

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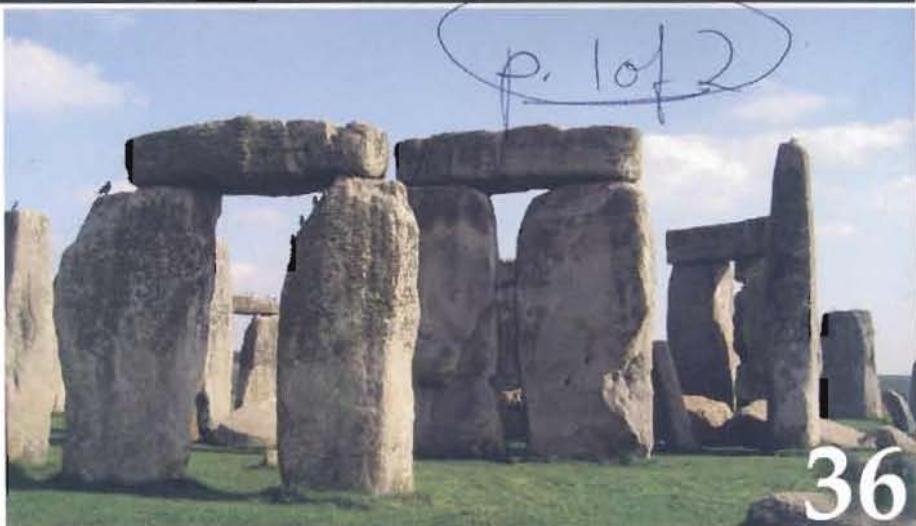
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FEATURE

STONEHENGE'S MYSTERIOUS STONES

Stonehenge is the world's most mysterious prehistoric ruin. Scientists are still trying to figure out who built it and why — and how its builders hauled such giant stones hundreds of kilometers to erect them. Now, geologists are looking to glacial remnants in the Canadian Rocky Mountains to solve this ancient mystery.

Brian S. John and Lionel E. Jackson Jr.



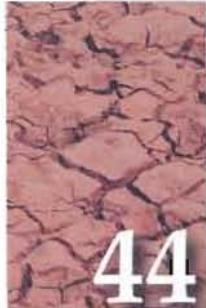
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FEATURE

POPULATIONS ON THE BRINK: CLIMATE CHANGE AND POVERTY

The poor are disproportionately affected by the manifestations of a changing climate and environment, such as stronger storms, longer heat waves and droughts. Reducing poverty and improving economic development therefore can't be accomplished without considering a population's future vulnerability to the effects of climate change.

Gregory E. van der Vink and co-authors



TRENDS AND INNOVATIONS

DANGER IN THE DEEP

After the two world wars, militaries around the world were left with enormous stockpiles of dangerous weapons. Lacking other disposal options, they dumped the weapons into the ocean, where they never expected anyone to ever see them again. But as scientists explore more of the seafloor, they are encountering these forgotten weapons — and trying to determine just how dangerous they still are.

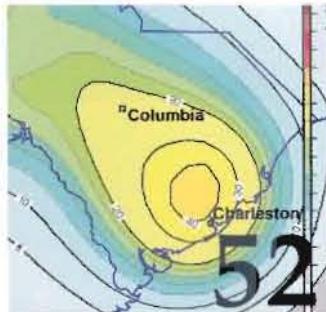
Nicole Branan

FEATURE

CODE RED: EARTHQUAKE IMMINENT?

New earthquake hazard maps suggest parts of the Midwest share the same risk as California for severe shaking from an earthquake. Because these maps affect millions of people, it is important to understand how earthquake risks are set and how much confidence we have in them.

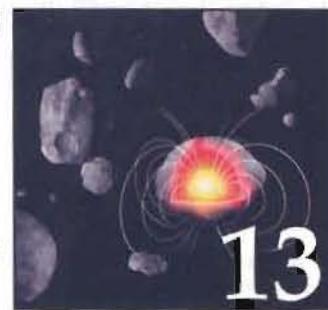
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SCIENCE AS INSPIRATION IN A TIME OF CHANGE

Well before Barack Obama was elected 44th president of the United States, he answered questions about the role he sees science playing during his administration.
Linda Rowan

87 A COMMENT

OIL BARREL POLITICS

How the new Congress and president treat energy research and development — particularly the amount of R&D funds allocated through earmarks — will be telling. If they're smart, they'll avoid allocating R&D funds through earmarks altogether.

Alix R. Broadfoot and Michael E. Webber

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HARVESTING OUR ENERGY

"Power to the people" takes on a whole new meaning when you consider crowd farming — harvesting the energy of your feet.

Lisa A. Rossbacher

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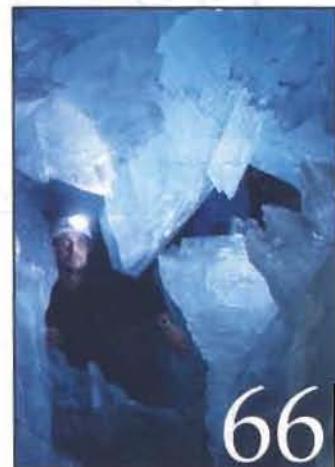
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CAPTURING CARBON FROM COAL PLANTS: IS IT FEASIBLE?

Worldwide, tens of thousands of coal-fired power plants provide nearly half of the world's electricity, as well as 40 percent of the world's annual carbon emissions. And there's plenty of coal to go around. But if coal is going to be the energy of the future, it's going to need to emit less carbon: That's where carbon capture and storage comes in. But is the technology ready?

Cassandra Willyard

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FEATURE

COAL-TO-LIQUIDS: THE GOOD, THE BAD AND THE UGLY

Liquid fuels made from coal can be a substitute for gasoline, jet fuel and just about any other transportation fuel, but whether they are actually better than traditional oil or gasoline is a matter of great debate. Think tanks, policymakers and some scientists have been calling for coal-to-liquids. Certainly there is a lot to love about the fuel, but there is also a lot to worry about.

Michael E. Webber



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FEATURE

GEOSCIENCE'S VOCABULARY MAKES EARTH MORE HUMAN

Whatever the philosophical debates about a living versus an inanimate Earth, many words common in earth science describe Earth's features and processes in terms of the human body or human behaviors.

Rasoul Sorkhabi

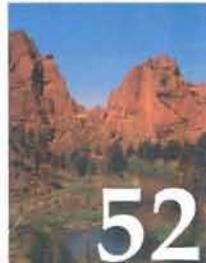
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COLOSSAL RIVERS, MASSIVE MOUNTAINS AND SUPERCONTINENTS

From the Alps to the Himalayas rises the longest mountain chain in the world. The mountains are evidence of an ongoing collision between continental plates, the type of cataclysmic upheaval that once gave rise to even greater mountains and supercontinents. Scientists have found telltale clues about what these ancient worlds looked like from the sediments left behind by rivers that once flowed across these vast continents.

Robert H. Rainbird and Grant M. Young



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TRENDS AND INNOVATIONS

EARTHQUAKE PREDICTION: GONE AND BACK AGAIN

People have been trying to find ways to predict earthquakes for hundreds of years — using everything from strange lightning strikes to animals heading for the hills. And since the Sumatra earthquake in 2004, prediction science has again gained interest and funding.

Brian Fisher Johnson

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ON THE COVER: Is technology ready to capture CO₂ from coal-fired power plants and pump it underground? Background photo by Anne Kitzman, artwork by Nate Burgess, EARTH.

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LEARNING TO SPEAK TO YOUR REPRESENTATIVES

Congressional Visits Day, where scientists descend on Capitol Hill to discuss their science with their congressional representatives, is this month. Here is some advice on how to make the most of a meeting with your representative.

Gabrielle Dreyfus

87 A COMMENT

RUNNING INTO THE BRICK WALL OF CREATIONISM AGAIN

The wall between scientists and Evangelical and Fundamentalist Christianity is composed of diverse building blocks rooted in historical differences between science and religion. Any productive conversation on evolution depends on understanding these differences.

Rev. Penny Greer

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First Look: Atlas Copco's New Low-Profile LHD
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MARCH 2009 | www.miningmedia.com

Atlas Copco's low profile ST7LP Scooptram at work underground. For a comprehensive report on design, engineering and customers' first impressions of this new LHD, please turn to p. 32. Photo courtesy of Atlas Copco.

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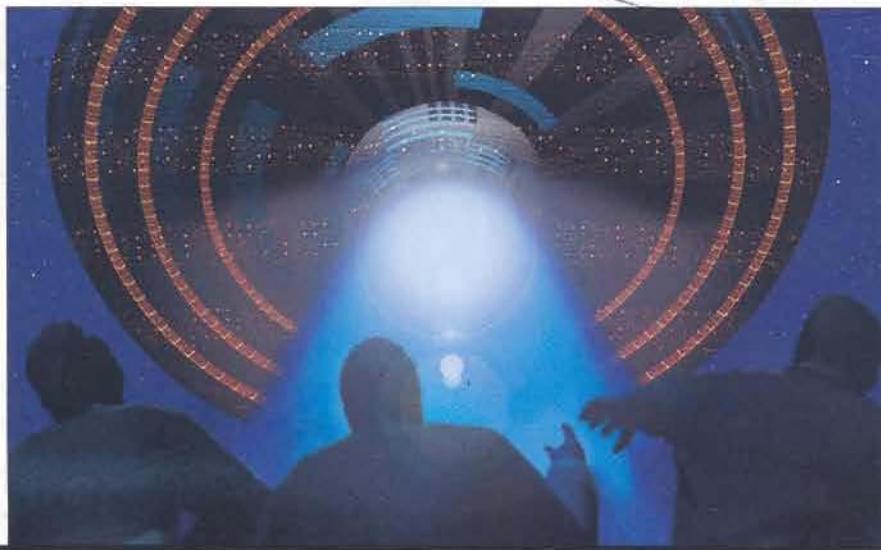
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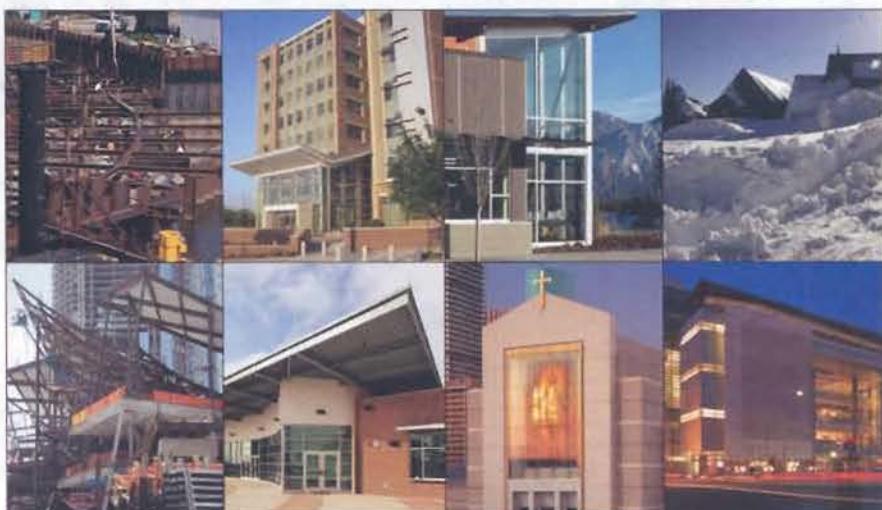
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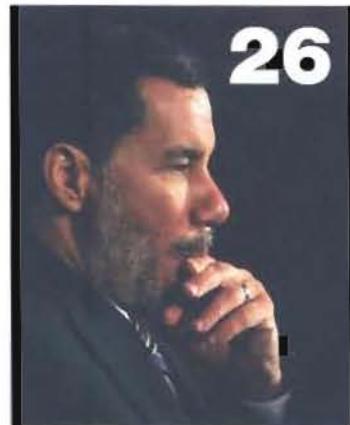
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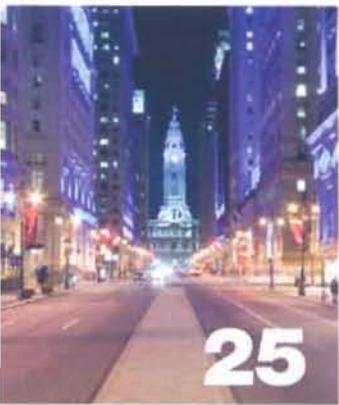
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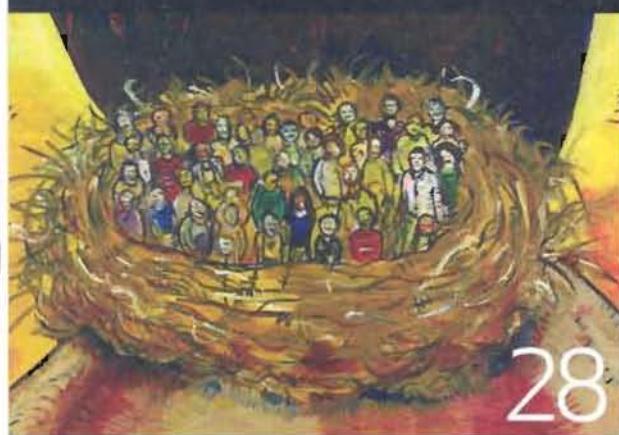


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William R. Dickinson

Cover: Air oblique view of northern rim of Rangiroa atoll in Tuamotu Archipelago of French Polynesia. Visible islets cap a segment of the annular reef of the atoll rim (circumference ~165 km with ~100 total islets). Open ocean to left, with breaker line on atoll exterior. Interior atoll lagoon on right. See "Pacific atoll living: How long already and until when?" by W.R. Dickinson, p. 4–10.



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Erratum: The picture caption on page 21 of the January 2009 *GSA Today* (v. 19, no. 1) erroneously describes the site as mounds built by the Tocobaga Indians. The image is actually from Egmont Key State Park near St. Petersburg, Florida. *GSA Today* regrets the error.



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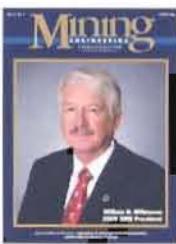
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William H. Wilkinson was installed as the 2009 SME President during the annual meeting in Denver last month. Read his take on the state of the global mining industry, along with his goals as president during the coming year, page 18. Also, Poltak Sinaga explains how increasing the speed of Kaltim Prima Coal's overland conveyor allowed the Indonesian coal mine to increase production, page 22.

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December 2008

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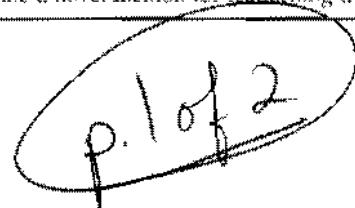
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Cover: The Caribbean giant barrel sponge, *Xestospongia testudinum*, 30 m depth, San Salvador Island, Bahamas. These sponges, 100s - 1000s of years old, are subject to dislodgement, particularly from rope and monofilament line debris dragged during storm events. Detached sponges slowly erode away and die as they are rolled along the reef by currents. In this issue, McMurray and Pawlik (pages 192-195) describe a novel method for reattaching these sponges to the reef substratum. Photo taken by J.R. Pawlik.



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