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Coal Age

FEATURE ARTICLES

- 24** White Flame Energy Switches to Backhoes
Mountaintop coal operator transitions to different truck-shovel arrangement.
- 28** Optimized Dipper Fine Tunes Shovel Performance
Joint efforts between mine operators, OEMs, and researchers yield unexpected benefits.
- 32** Factors Influencing the Drain and Rinse Operation of Banana Screens
Australian researchers identify the variables and effects on Banana screens.
- 36** ACC Forum Looks at "Burning" Questions
Annual conference explores U.S. coal demand, supply, end-user technology and market trends.

COAL IN THE NEWS

- 6** Warren Buffett enters the coal business
- 6** Mining Media hosts highly successful National Coal Show
- 7** Massey sees best year, buys new equipment
- 10** CONSOL Energy rescue teams complete inspection of Buchanan
- 14** Jim Walter Resources revises long-term plans
- 15** W.Va. coal industry, landowners oppose historic status for mountain
- 19** DOE supports membrane technology for coal-to-hydrogen production
- 20** Natural Resource Partners acquires Illinois Basin reserves

WORLD NEWS

- 7** China's Shenhua shares fall on debut amid coal price concern
Fording may reopen Quintette mine in Canada
CIL to acquire coal blocks in Indonesia and South Africa
- 10** National Mining Museum of Wales wins Gulbenkian Prize
- 18** Philippines awards coal contracts
Ukraine recognizes crisis in coal industry
Polish government digs deep to fund major coal restructuring
- 21** New technology to lift Mittal's South African steel output
Australia encourages early mine rehabilitation

NATIONAL COAL SHOW / 6



MOVING OVERBURDEN / 24



DIPPER DESIGN / 28



THIS ISSUE

This month Coal Age reports on new trends and technologies for moving overburden. Increasingly, surface coal operators in the East are choosing more hoe-configured excavators. Meanwhile, new dipper designs are helping western mines move more tons per payload.

DEPARTMENTS

- 5** Editorial
- 6** Coal in the News
- 7** World News
- 12** People
- 20** Awards
- 14** Calendar
- 36** Marketwatch
- 40** Product News
- 45** Classified
- 48** Legally Speaking

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FOCUS ON SCHOOLS

► **Cover Story**

24 The first new University of California campus in four decades has ambitious green building and energy performance goals (right).

► **Feature**

28 Universities and developers join forces to build housing faster and lure students with amenities not found in typical dormitories.

Cover photo and photo right by Michael Goodman for ENR



SPECIAL REPORT

► **The Top 200 Environmental Firms**

30 Snapping a two-year revenue losing streak, ENR's Top 200 Environmental Firms rebounded in 2004. The firms registered a 5% overall increase in environmental work in the 10th annual survey.

NEWS

► **Business & Economics**

10 Investigations: WTC report triggers debate over safety

14 Labor: Carpenters' union joins coalition while BCTD talks heat up



Carpenters join coalition. Page 14



Illinois bridge surgery. Page 18

- 15 Corruption:** Contractor's guilty plea includes \$7.05-million penalty
- 16 Education:** Engineering group pushes change in college-level study
- **Transportation**
- 13 Bridges:** Self-anchored suspension plan may move forward
- 18 Bridge Repair:** Rare truss 'amputation' saves midwestern crossing
- **Power & Industrial**
- 12 Legislation:** Senate passes broad-based energy bill
- **Environment**
- 17 Drinking Water:** Largest-ever UV facility to be built for New York City supply

DEPARTMENTS

- 5** Calendar
- 7** Construction Week
- 9** Washington Observer
- 20** People
- 21** Construction Economics
- 49** Products
- 53** Pulse
- 61** Official Proposals (cont. on pp. 62-63)
- 64** Editorials

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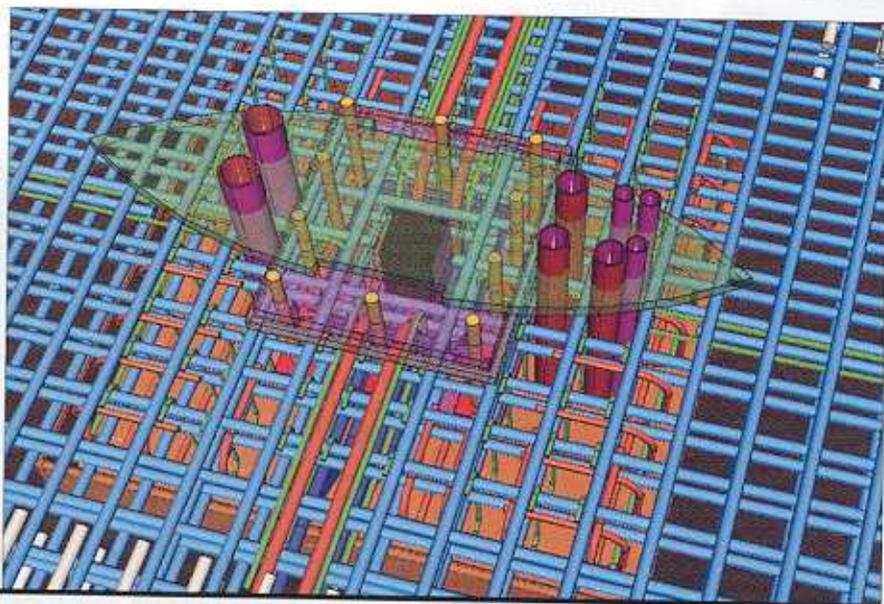
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COVER STORY

► **e-Construction**

28 The use of 3-D and 4-D construction modeling is spreading along with tools to easily generate powerful images that swiftly convey complex ideas and explain procedures to builders. A revolution in construction communication is under way.

Cover images courtesy of MTA/NYCTA, PB/BLL JV; Image right courtesy of Strategic Project Solutions



NEWS

► **Buildings**

10 **Redevelopment:** Team races to revise Freedom Tower plans



Freedom Tower redesign. Page 10

- 11** **Defects:** Full replacement set for leaky arena roof
- 17** **Schools:** Princeton prepares for class of 2010 with major expansion

► **Environment**

13 **Clean Air:** Five states put heat on utility as powerplant issue boils

► **Transportation**

- 12** **Legislation:** Transport bill deal nears, as another stopgap is enacted
- 16** **Accidents:** Officials suspect compaction in British tunnel collapse
- 16** **Project Financing:** Virginia commuter rail extension cost estimate balloons
- 19** **Infrastructure:** Canadian projects fueled by gas-tax share revenue deal
- 20** **Monorails:** Seattle's financial plan is derailed and derided



British tunnel collapse. Page 16

DEPARTMENTS

- 5** Update
- 7** Construction Week
- 9** Washington Observer
- 22** People
- 23** News in Brief
- 25** Construction Economics
- 35** Products
- 37** Pulse
- 49** Official Proposals (cont. on p. 50)
- 52** Editorials

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NEWS
Terrorism

10 Engineers in the U.K. will soon begin assessing tunnel structural damage in the aftermath of bomb attacks that killed at least 52 people June 7 in London. The attacks cast a shadow over the city's elation at being selected to host the 2012 Olympic Games.

Photo right by AP/Wideworld



COVER STORY

► **Codes and Standards**

26 Increasingly complex and ambiguous building design standards have engineers calling for a simplification of codes.

Cover illustration by Guy Lawrence for ENR

FEATURE

► **Equipment Management**

30 Fleet operators outfit vehicles with "black boxes" to monitor operators and machines for increased safety and efficiency.



Alaska fleet management. Page 30

NEWS

► **Business & Economics**

- 12** **Corruption:** Ready mix supplier hit with \$29-million price-fixing fine
- 12** **Small Business:** Changes sought in how DOE measures contracting success
- 13** **Reconstruction:** Corps of Engineers chief calls Iraq rebuild "on-plan"
- 13** **Bidding:** Louisiana road rehabilitation hits \$100-million snag



College building competitions. Page 16

- 16** **Competition:** Students learn life lessons in college building contests
- 20** **Pipelines:** Demand for gas will drive capital investment

► **Transportation**

18 **Bridges:** London crews launch spans over tracks with little room

19 **Ports:** A southern brawl brews over proposed container terminal

► **Environment**

17 **Wastewater Treatment:** New Jersey township working to recharge aquifer

DEPARTMENTS

- 5** Letters
- 7** Construction Week
- 9** Washington Observer
- 21** People
- 23** Construction Economics
- 37** Products
- 38** Pulse
- 43** Official Proposals (cont. on pp. 44-46)
- 47** Viewpoint
- 48** Editorials

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Geobiology

Volume 3, Issue 1, January 2005

Original Articles

- 1 Three-dimensional Raman imagery of precambrian microscopic organisms
J. W. Schopf and A. B. Kudryavtsev
- 13 Palaeozoic tropical rainforests and their effect on global climates: is the past the key to the present?
C. J. Cleal and B. A. Thomas
- 33 Targeted genomic detection of biosynthetic pathways: anaerobic production of hopanoid biomarkers by a common sedimentary microbe
W. W. Fischer, R. E. Summons and A. Pearson
- 41 The experimental silicification of Aquificales and their role in hot spring sinter formation
S. V. Lalonde, K. O. Konhauser, Anna-louise Reysenbach and F. Grant Ferris

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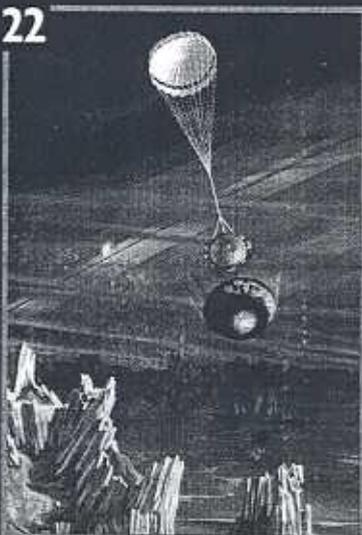
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18



22



30



8



FEATURES

18 COLLISION COURSE: DEEP IMPACT

This month, an 816-pound spacecraft is scheduled to collide with Tempel 1, a comet 83 million miles away, which scientists hope will shed light on the formation of the solar system.

Lucy McFadden and Peter Schultz

22 JOURNEY TO A TITANIC WORLD

Last January, a probe landed on Saturn's largest moon to explore its intriguing atmosphere and terrain.

Jean-Pierre Lebreton

28 MARTIAN VIEWS

Through pictures sent back to Earth, the martian rovers, Opportunity and Spirit, have much to tell of their year-and-a-half-long journey across the red planet.

30 PLANET-FINDER'S GUIDE TO THE UNIVERSE

New-generation telescopes and observing platforms are getting off Earth to find other Earth-like planets.

Naomi Lubick

28

NEWS & VIEWS

8 NEWS NOTES

- Monitoring the most dangerous U.S. volcanoes
- Dinosaur links meat-eaters and vegetarians
- Fossil forests sunk by salt
- Swiss wrap glacier for summer
- Following scientists post-9/11
- Carbon leaching out of Siberian peat
- Mars' lost landers
- The heart of a landslide
- Soaking in extra sun
- Style over function for *Stegosaurus*

ON THE COVER

On July 4, the Deep Impact spacecraft will ram into comet Tempel 1. The aim of the mission is to give scientists a view of crater formation on the comet, while examining the materials that compose the icy body, which they believe represent the composition of the early solar system. Image courtesy NASA/JPL/UMD and adapted from original. Read the story on page 18, and read about how you can participate in the project on page 42.

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46



60



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7 COMMENT Peaking of World Oil Production: Is the Wolf Near?

Determining when the world's oil is going to peak poses a unique challenge to petroleum geologists, economists and policy-makers, but the time to act is now.

Robert L. Hirsch, Roger H. Bezdek and Robert M. Wendling

17 POLITICAL SCENE The Energy Bill: Is It Big and Broad Enough?

The U.S. House of Representatives has finally passed an energy bill, but the effort to shape national energy policy is far from over.

Linda Rowan

38 GEOPHENOMENA American Beaches Awash With Politics

Artificially endowing beaches with sand is an expensive and arduous task that can fail easily if geology is not taken into account.

Orrin H. Pilkey

40 TRENDS & INNOVATIONS Tracking Gorilla Habitat Changes

Both gorillas and the forests where they live are endangered, leading conservationists to look to satellites for land-use monitoring.

Megan Sever

42 EDUCATION & OUTREACH Making a Public Impact

From comet and bird-watching to weather observations, average people are helping scientists in measurable ways.

Megan Sever

44 ENERGY & RESOURCES

Aging Alaska oil pipelines

Mineral of the Month: Boron

46 GEOMEDIA

Books: Seeing landscapes from above

Books: This is not your father's creationism: A review of *Creationism's Trojan Horse*

DVDs: Hubble's anniversary

On the Web: Space and time

On the Shelf: Mars and beyond

51 PROFILES

Marcia McNutt: Oceangoing geophysicist

53 BENCHMARKS July 4, 1997

The Pathfinder mission lands on Mars.

60 GEOLOGIC COLUMN Banking on Earthquakes

The founding of the Bank of America is intimately linked to the 1906 San Francisco earthquake.

Lisa Rossbacher

DEPARTMENTS

4 FROM THE EDITOR

6 LETTERS: Perspectives from readers

36 WHERE ON EARTH?

54 GEOMARKETPLACE

55 CLASSIFIEDS: Career opportunities

ON THE WEB AT www.geotimes.org

36

WHERE
ON EARTH?

26

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**"Instead of pushing paper,
we need to push people
out of management
and into delivery of real
services to real people."**

—Washington Governor Christine Gregoire



JON KRAUSSE

JULY 2005, VOL. 18, NO. 10

GOVERNING

www.governing.com

Features

20 **Instant Influence**

Blogs are sprouting in statehouses and city halls across the country. A new generation of Web scribes is shaking up the political scene.
By Christopher Swope

26 **Open Season on Middle Managers**

As governors get tough on "bureaucratic bloat," mid-level managers are bearing the brunt of the cuts.
By Jonathan Walters

32 **The Set-Aside Syndrome**

Initiatives to increase minority contracts can result in the proliferation of fraudulent businesses.
By Zach Patton

34 **Church and State**

The Christian Right has had limited success on the national level. But in many states, social conservatives are growing in sophistication and strength.
By Alan Greenblatt

40 **Hard Luck on Slots**

Pennsylvania's plan to link slot machine revenues and property tax relief has become a victim of its own complexity.
By Ellen Perlman

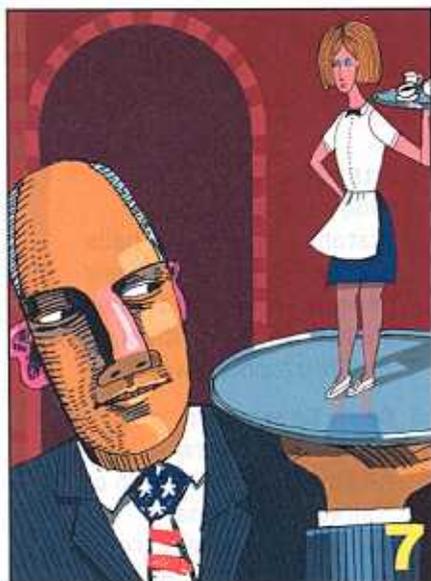
GLIMPSE

64 **The Great Drain Robbery**

The demand for scrap metal is prompting thieves to make off with manhole covers and other government property.
By Alan Greenblatt

GOVERNING

The Magazine of States and Localities



Up Front

- 4 **Publisher's Desk**
- 7 **Assessments**
Alan Ehrenhalt on raising the minimum wage.
- 10 **Dialogue**
Letters from readers.
- 13 **Observer**
Ethics in school testing, boosting arts education, and consent-decree time limits.
- 15 **Urban Notebook**
Airports use subsidies to retain airlines, and postal-code status anxiety.
- 17 **Player**
Anthony Thigpen: L.A.'s rainbow man
- 18 **Potomac Chronicle**
Congress is dumping immigration and identification problems on state DMV agencies.

The Business of Government

LEAD STORY

- 45 States move away from the lowest bid on construction projects.

FINANCE

- 46 John E. Petersen on preparing for the real estate bubble to burst.

ENVIRONMENT

- 48 Briefing: California utilities move toward peak pricing.

HEALTH

- 50 Penelope Lemov on addressing Medicaid's sustainability problem.

TECHNOLOGY

- 52 Briefing: A Web-based service that calculates commuting costs.
- 54 Guide: State technology contracts that focus on improving customer service.

TRANSPORTATION

- 56 Briefing: DFW rolls out its new automated people mover.

MANAGEMENT

- 58 Katherine Barrett and Richard Greene on lessons from failed innovations.

ECONOMIC DEVELOPMENT

- 60 Briefing: A new generation of urban parks.

On Governing.com

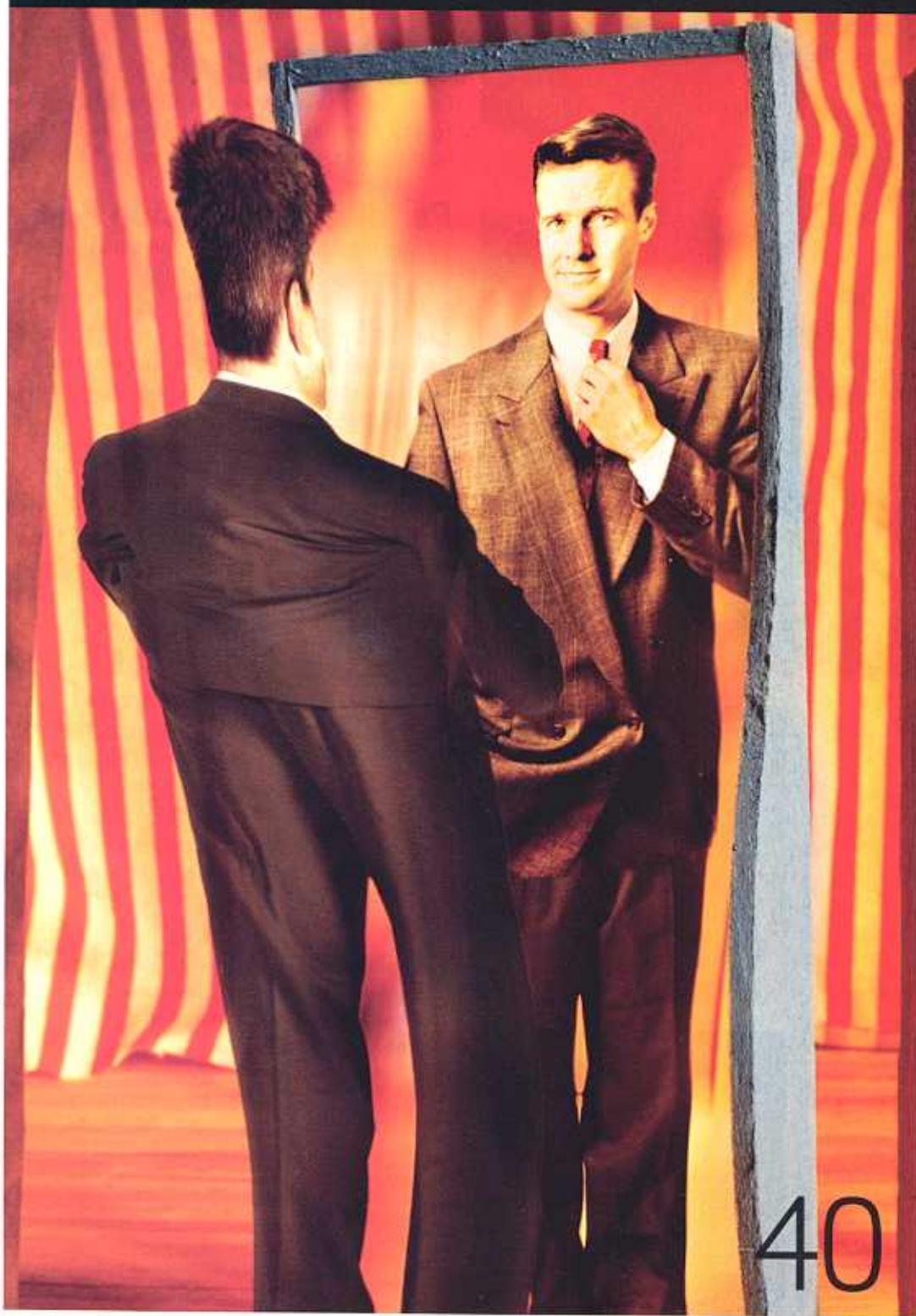
Daily Treats

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- The Daily Digit: an important, useful or interesting statistic: Governing.com/digit.htm
- Who Said That?: an intriguing quote from the world of state and local government: Governing.com/quotes.htm

Contents

JULY 1, 2005 VOL. 37 NO. 11



STEPHEN WEBSTER

FEATURES

On the Line 30

Border control agencies confront disgruntled citizens, vast open spaces, counterproductive policies and more in the Southwest.

By Chris Stroh

The Perfect Candidate 40

Image, not reality, is too often the basis of hiring decisions.

By Shawn Zeller

Invisible Wounds 48

Soldiers are coming back from Iraq and Afghanistan with post-traumatic stress disorder and other problems. Is the Veterans Affairs Department ready?

By Denise Kersten

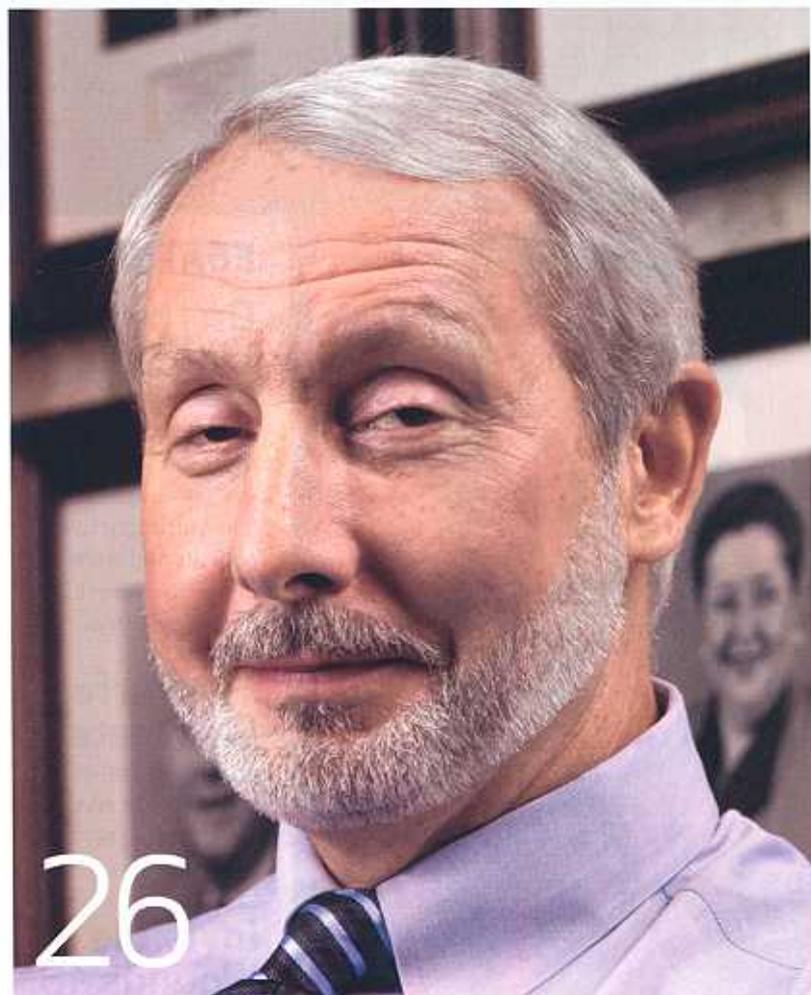
Roads' Toll 54

With scarce funds idling on troubled highway projects, the government could turn to a free market system to fix the nation's gridlock.

By Beth Dickey

On the cover: Border Patrol Agent José Maheda/Photo Illustration by Mark Snyder

40



IN EVERY ISSUE

Editor's Notebook 6

It's time for corporate leaders to get off the sidelines on important public problems.

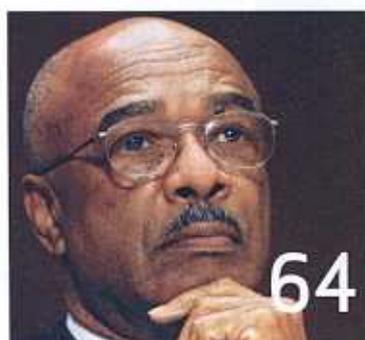
The Buzz 9

On the move, Earth's asteroid-blasting agency, fresh Mint competition and let's make a deal.

Outlook 66

Of course Deep Throat was a bureaucrat. How could we have expected anything else?

By Tom Shoop



NEWS+ANALYSIS

The Plane Truth 15

Air Force leaders tried to clip his wings, but Kenneth Krieg is flying high in the wake of the discredited Boeing deal.

By Katherine McIntire Peters

Techno Translation 18

Faced with a severe shortage of linguists, federal agencies are turning to computers for help. By Katherine McIntire Peters

Peddling Persuasion 21

Lobbyists take a crack at government's toughest watchdog agency. By Daniel Pulliam

Deadly Sins 22

Defense and Homeland Security are creating a list of mandatory firing offenses, and unions are worried. By Shawn Zeller

Workforce Whisperer 26

Leadership Profile Ronald Sanders pushes open the door to a new civil service. By Shawn Zeller

ADVICE+DISSENT

The Hunt 61

Tech Insider Government contractors and intelligence agencies want one thing: skilled hands with a security clearance. By Shane Harris

Chain Reaction 64

Management Matters When the power of suggestion sets off a series of unfortunate events. By Brian Friel

Cleaning Up Their Act 65

Viewpoint What happens when leaders take the time to improve performance.

By Robert M. Tobias

Contents

JULY 15, 2005 VOL. 37 NO. 12



FEATURES

Perpetual Motion 36

For Tom Davis, the powerful and frenetic House Government Reform Committee chairman, government is a thing to be tamed.
By Shane Harris

The Alaskan Edge 46

As contracting officers direct more money toward tribally owned companies, Alaska Native corporations are forced to defend their advantage.
By Kimberly Palmer

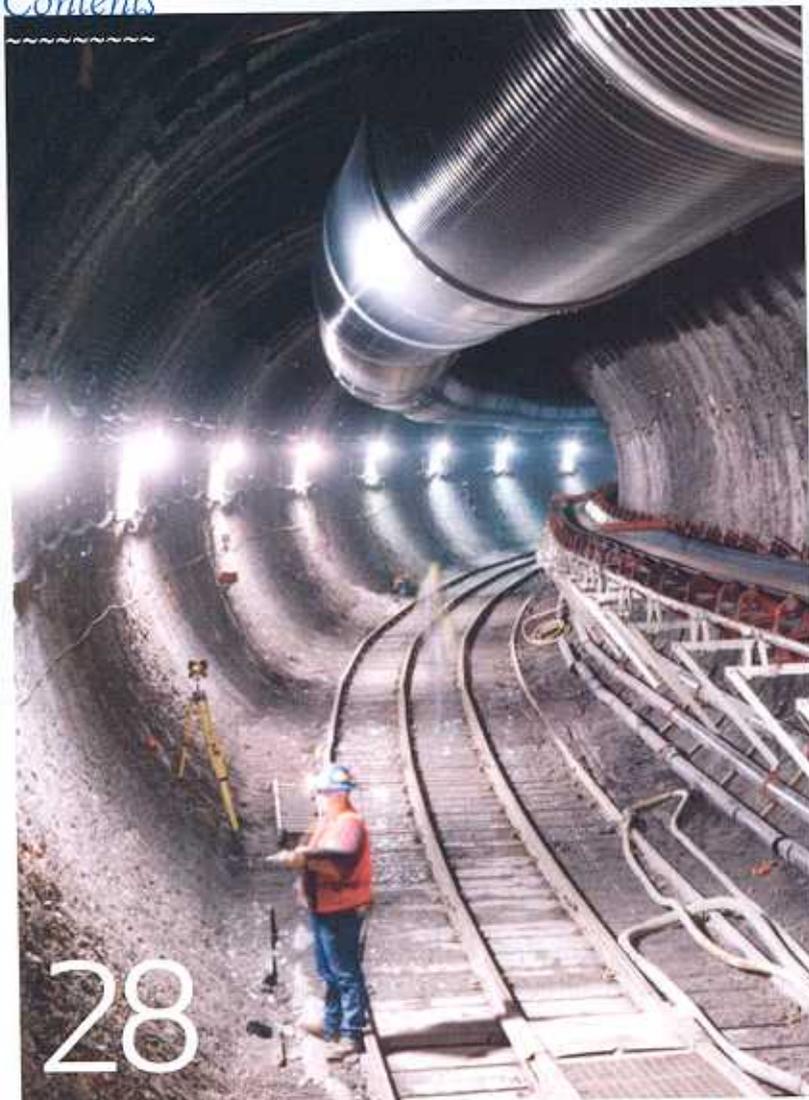
Out of the Ruins 57

FEMA branches out into a new service—helping storm-torn communities plan their futures.
By Denise Kersten

Heavy Seas Ahead 68

The fleet and crew are poised to shrink, but the Navy's missions are growing.
By Sandra I. Erwin

Cover photograph
by James Kegley



28

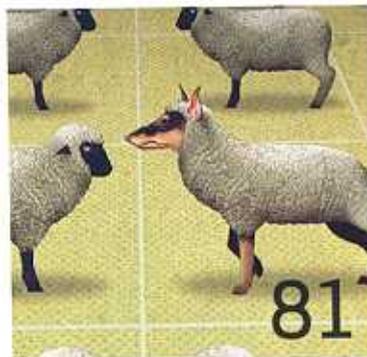
IN EVERY ISSUE

Editor's Notebook 8
Capturing the character of the kinetic.
Tom Davis.

Letters 10

The Buzz 13
Office identity theft, on the outs at NASA, giving vets a hand, America's spies and moving your money.

Outlook 98
The U.S. government puts on a good face overseas. Americans themselves are another matter. By Tom Shoop.



81



88

NEWS+ANALYSIS

Guardian General 19
Whether for a state funeral or a terrorist attack, Maj. Gen. Galen Jackman is on the front line in Washington. By Katherine McIntire Peters

Sticker Shock 25
To slow down satellite programs, Congress clips their budget lines. By Beth Dickey

Face-Off Over Fraud 26
A push to expand the False Claims Act stirs up an age-old clash between whistleblowers and contractors. By Shawn Zeller

Nuclear Reaction 28
Falsified data fuels opposition to proposed Yucca Mountain dump site. By Beth Dickey

Competing With Inmates 32
After years of fighting policies that guarantee customers for prison workshops, private industry is getting its way. By Amelia Gruber

ADVICE+DISSENT

Network Anomalies 81
Managing Technology Agencies can ward off hackers by finding pattern shifts before the damage is done. By Karen D. Schwartz

Linked in the Fight 84
Managing Technology Log on, learn and live another day. By Shane Harris

Red Tape or Redemption 88
Management Matters The performance improvement plan should be a last chance—not a parting shot—before workers get fired. By Brian Friel

The Sums of Silence 90
Viewpoint Failure to cultivate employee idea programs could be costing agencies millions. By Angela Smith

The Fine Print of Firing 94
Viewpoint HR offices have a lot to learn about appeal rights for employees who get the ax. By William N. Rudman

PROF. ED
2005 JUL 27 AM 9:31
HENYER. CL. 3240

Contents/

Volume 43, No. 4

ground water

Association of Ground Water Scientists and Engineers

Guest Editorial/

Nanobots: A New Paradigm for Hydrogeologic Characterization?

W.W. Wood/ 463

Departments/

Book review/ 464

Software Spotlight/ 466

Erratum/ 470

China Series/

The Role of Ground Water in Arid/Semiarid Ecosystems,

Northwest China

Y. Cui, J. Shao/ 471

Implications of Ground Water Chemistry and Flow Patterns for Earthquake Studies

W. Guangcai, Z. Zuo Chen, W. Min, C.A. Cravotta III, L. Chenglong/ 478

Isotopes and Sustainability of Ground Water Resources,

North China Plain

C. Zongyu, N. Zhenlong, Z. Zhaoji, Q. Jixiang, N. Yunju/ 485

Carbon Biogeochemistry of Ground Water, Guiyang, Southwest China

S.-L. Li, C.-Q. Liu, F.-X. Tao, Y.-C. Lang, G.-L. Han/ 494

Research Papers/

Arsenic in Glacial Aquifers: Sources and Geochemical Controls

W.R. Kelly, T.R. Holm, S.D. Wilson, G.S. Roadcap/ 500

An Analytical Solution for Ground Water Transit Time through Unconfined Aquifers

R. Chesnaux, J.W. Molson, R.P. Chapuis/ 511

Analysis of Recharge-Induced Geochemical Change in a Contaminated Aquifer

J.T. McGuire, D.T. Long, D.W. Hyndman/ 518

Temporal Changes in the Vertical Distribution of Flow and Chloride in Deep Wells

J.A. Izbicki, A.H. Christensen, M.W. Newhouse, G.A. Smith, R.T. Hanson/ 531

Correction to Volume 43, No. 3/

Issue Paper/

Is Current Hydrogeologic Research Addressing Long-Term Predictions?

C.-F. Tsang/ 296

Heat as a Tracer to Estimate Dissolved Organic Carbon Flux from a Restored Wetland

K.R. Burow, J. Constantz, R. Fujii/ 545

Vertical Cross Contamination of Trichloroethylene in a Borehole in Fractured Sandstone

S.N. Sterling, B.L. Parker, J.A. Cherry, J.H. Williams, J.W. Lane Jr, F.P. Haeni/ 557

High-Permeability Layers for Remediation of Ground Water; Go Wide, Not Deep

W.D. Robertson, N. Yeung, P.W. vanDriel, P.S. Lombardo/ 574

Impact of Mineral Fouling on Hydraulic Behavior of Permeable Reactive Barriers

L. Li, C.H. Benson, E.M. Lawson/ 582

Multimodel Ranking and Inference in Ground Water Modeling

E. Poeter, D. Anderson/ 597

Technical Note/

Unconfined Linear Flow to a Horizontal Well

M.W. Kawecki, H.N. Al-Subaikhy/ 606

Computer Note/

Estimating Aquifer Transmissivity from Specific Capacity Using MATLAB

S.G. McLin/ 611

Review Papers/

MTBE and Gasoline Hydrocarbons in Ground Water of the United States

M.J. Moran, J.S. Zogorski, P.J. Squillace/ 615

Model Parameters for Simulating Fate and Transport of On-Site Wastewater Nutrients

J.E. McCray, S.L. Kirkland, R.L. Siegrist, G.D. Thyne/ 628

Historical Note/

The Canadian School of Hydrogeology: History and Legacy

J. Tóth/ 640

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(Abstracted/Indexed in: Chemical Abstracts; Current Contents Physical, Chemical and Earth Sciences; Geo Abstracts; PASCAL/CNRS; PROMIS; and the Science Citation Index)

Research Papers

Geology of coalbed methane reservoirs in the Southeast Qinshui Basin of China X. Su, X. Lin, S. Liu, M. Zhao and Y. Song	197
Sorption of carbon dioxide–methane mixtures G. Ceglarska-Stefańska and K. Zarębska	211
Mercury in Eastern Kentucky coals: Geologic aspects and possible reduction strategies J.C. Hower, C.F. Eble and J.C. Quick	223
Characterisation of dispersed organic matter from lower Palaeozoic metasedimentary rocks by organic petrography, X-ray diffraction and micro-Raman spectroscopy analyses A. Guedes, F. Noronha and A.C. Prieto	237
Optical properties of pseudovitrinite; implications for its origin M. Mastalerz and A. Drobnik	250
<i>Book Reviews</i>	
Progress of Coal Petrology in India	259
Geophysical Exploration for Coal: the Indian Scenario	260
<i>Contents Volume 62, 2005</i>	263

<http://www.elsevier.com/locate/ijcoalgeo>

**CONTENTS
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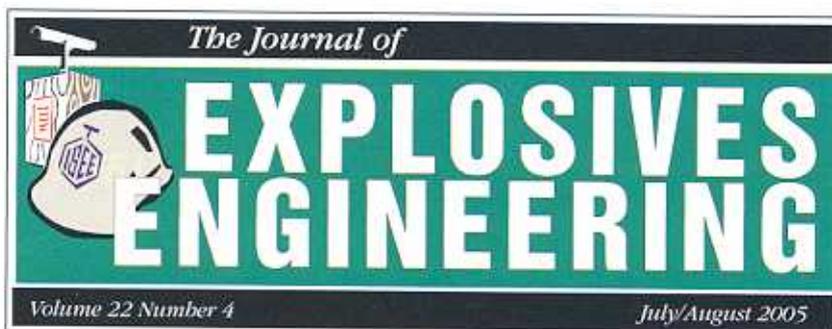


Table of Contents

FEATURES

- 6 Securing the Blast Site to Prevent Blasting Related Injuries**
Blasting Safety - Revisiting Site Security
- 16 SLP-27 – Security Standard for Commercial Explosives**
A summary of the new Safety Library Publication (SLP).
- 20 Safety and Security Talk**
Have you done a safety review of your security changes?
- 34 Near Field Vibration Monitoring for Rock Mass Damage Control**
Case study of the Tala Hydroelectric project in India.
- 42 Give us Your Best Shot**
Specialty blasting winner.

DEPARTMENTS

- 4 From the Executive Director**
Members in the Drivers Seat Planning For the Society's Future.
- 22 Industry News**
News about people, company announcements, new products and events.
- 24 Calendar of Events**
List of upcoming events in the explosives industry.
- 26 Chapter News**
Eastern PA and Best in Show seminar.
- 28 Explosives, 100 Years Ago, More or Less**
Methods and costs of blasting and handling boulders.

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MINING ENGINEERING

VOL. 57, NO. 7 JULY 2005

COVER STORY



COVER — Today's production equipment is bigger, technically more sophisticated, more productive — and more challenging to maintain. Maintenance management is addressed on page 27. Iron ore mining in Minnesota is experiencing one of its biggest turn-arounds in history. Details and outlook, page 32.

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FEATURE ARTICLES

- 27**
Maintenance management: minimizing risk to profitability
Paul D. Tomlison
- 32**
Minnesota iron mining industry remains optimistic
William R. Yernberg
- 35**
New mines, attitudes and opportunities theme of Colorado MPD meeting
Steve Kral
- 37**
Five to be honored by National Mining Hall of Fame
- 42**
Flotation monitor improves copper recovery at Bagdad

2005 SME MEMBERSHIP DIRECTORY

- 2D**
SME directors, divisions and committees
- 5D**
SME student chapters
- 6D**
SME local section contacts
- 9D**
Alphabetical listings
- 185D**
Geographical listings of SME members worldwide

DEPARTMENTS

- 4**
The drift of things
- 8**
Washington survey
- 10**
Industry newswatch
- 41**
New media
- 42**
Coming events
- 44**
New products
- 47**
SME news/
Young leaders/
Local section news
- 48**
Personal news
- 49**
SME Foundation/
GEM
- 50**
Membership
- 51**
2006 SME officer nominations
- 63**
Obituaries
- 64**
Online media
- 68**
Classified ads
- 71**
Professional services ads

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Cover Story: BioteQ plant is making copper, a profit **3**

Mining in the West **6**

Phelps Dodge to use pressure-leach technology at Morenci • Phelps Dodge is boosting Henderson, may restart Climax • Pre-feasibility study started at Copperstone • Golden Phoenix gets county OKs at Ashdown • Feasibility study for Montanore under way • Constellation finds more copper at Lisbon Valley • Wyoming opal rush is not easy to handle • Quadra adding moly circuit at Robinson • Alaska issues all needed permits for Kensington

Energy **15**

Nuclear is best option, utility chief tells his shareholders • Montana governor is looking to coal resources for oil • Wyoming coal still good as feed for gasification

Governments and Mining **17**

House cuts royalties on potash and soda ash • Alliance argues against new tax on explosives • Red Mountain historic area land put together • Tribes don't have funds to pay for Crandon site • DOE, miners team up to cut energy costs

Environment **19**

Report misses role of reining in abandoned-mine cleanup • Deal is reached on water discharge at Pend Oreille mine • Cubin backs new bill to get Wyoming AML funds • Navajo EPA regulating Four Corners station • Major improvement in TRI regarding mercury

The Business of Mining **21**

Hecla, in a 'period of transition,' suffers first-quarter loss • Stillwater suffers loss as costs rise and sales prices decrease • Barrick sees three of its new gold mines starting up in 2005 • Inmet, MK, Leucadia cut deal on Las Cruces • Barrick acquires 11% of Diamondex Resources • Copper balance at surplus in January, February 2005 • Placer Dome earnings and outlook drop

Commentary, 2; Ad Index, 7; Mexico, 8; Latin America, 9; Chile, 10; Peru, 11; Canada, 12; World, 13; Western Briefs, 14; Energy Briefs, 16; Earnings, 26; Companies and Markets, 27; Barstool Mining, 28; Supplying the Mines, 29; Directory, 30; Safety, Health & Labor, 31; Low Grade, 32

On the Cover

Phelps Dodge Mining Co.'s Copper Queen Branch at Bisbee has teamed up with BioteQ Environmental Technologies Inc. to build a minewater treatment plant at the 125-year-old operation. The facility uses biomass to create hydrogen sulfide, which is able to strip metals, including copper, zinc, cadmium and nickel, from the stream, while leaving no sludge or other by-products behind. Phelps Dodge likes it enough that it's building a second facility, in Oklahoma. (Photos by Gary Dillard.)

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Rangeland Ecology & Management

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VOLUME 58

NUMBER 4

July 2005

Table of Contents

Research Articles

- 329 Perceived Effectiveness of Livestock-Guarding Dogs Placed on Namibian Farms
Laurie L. Marker, Amy J. Dickman, and David W. Macdonald
- 337 Survivorship and Causes of Mortality for Livestock-Guarding Dogs on Namibian Rangeland
Laurie L. Marker, Amy J. Dickman, and David W. Macdonald
- 344 Arizona Permittee and Land Management Agency Employee Attitudes Toward Rangeland Monitoring by Permittees
Maria E. Fernandez-Gimenez, Susan Jorstad McClaran, and George Ruyle
- 352 The Effects of Livestock on California Ground Squirrels (*Spermophilus beecheyii*)
Jeffrey S. Febmi, Sabrina E. Russo, and James W. Bartolome
- 360 Rainfall, Temperature, and Forage Dynamics Affect Nutritional Quality of Desert Mule Deer Forage
Jason P. Marshal, Paul R. Krausman, and Vernon C. Bleich
- 366 Elk and Mule Deer Diets in North-Central New Mexico
Leonard Sandoval, Jerry Holechek, James Biggs, Raul Valdez, and Dawn VanLeeuwen
- 373 Diets of Prairie Dogs, Goats, and Sheep on a Desert Rangeland
Miguel Mellado, Abundio Olvera, Adrián Quero, and Germán Mendoza
- 380 Consequences of Selecting Rambouillet Ewes for Mountain Big Sagebrush (*Artemisia tridentata* ssp. *vaseyana*) Dietary Preference
Steven S. Seefeldt
- 385 Spring Growth and Use of Cool-Season Graminoids in the Nebraska Sandhills
Jerry D. Volesky, Walter H. Schacht, Patrick E. Reece, and Timothy J. Vaughn
- 393 Interspecific Competition Interacts With the Spatial Distribution of a Palatable Grass to Reduce Its Recruitment
Pablo A. Cipriotti and Martín R. Aguiar
- 400 Silver Sagebrush Community Associations in Southeastern Alberta, Canada
Paul F. Jones, Roy Penniket, Livio Fent, Joel Nicholson, and Barry Adams
- 406 Remote Sensing Assessment of *Paspalum quadrifarium* Grasslands in the Flooding Pampa, Argentina
Lorena P. Herrera, Vanina Gómez Hermida, Gustavo A. Martínez, Pedro Latorra, and Néstor Maceira
- 413 Fall-Prescribed Burn and Spring-Applied Herbicide Effects on Canada Thistle Control and Soil Seedbank in a Northern Mixed-Grass Prairie
Andrea J. Travnicek, Rodney G. Lym, and Chad Prosser
- 423 New Mexico Blue Grama Rangeland Response to Dairy Manure Application
Lanson J. Stavast, Terrell T. Baker, April L. Ulery, Robert P. Flynn, M. Karl Wood, and Douglas S. Cram

Research Note

- 430 Feeding Value of Singed Walkingstick Cholla
Rachel L. Endecott, Jason E. Sawyer, Clint A. Löest, and Mark K. Petersen

Technical Notes

- 434 A Visual Obstruction Technique for Photo Monitoring of Willow Clumps
Chad S. Boyd and Tony J. Svejcar
- 439 An Unmanned Aerial Vehicle for Rangeland Photography
Perry J. Hardin and Mark W. Jackson

443 Book Reviews

Front Cover Photograph: Anatolian Shepherds with a herd of Boer goats that they have been raised with and protect. Livestock-guarding dogs were born at the Cheetah Conservation Fund and raised on livestock farms in Namibia. Anatolian Shepherd livestock-guarding dogs have significantly reduced livestock loss to predators. Photo by Laurie Marker.

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SOIL SCIENCE

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CONTENTS

Vol. 170 No. 6

- PHOSPHORUS AVAILABILITY TO BARLEY FROM MANURES AND FERTILIZERS ON A
CALCAREOUS SOIL
A. B. Leytem and D. T. Westermann 401
- EASTERN GAMAGRASS UPTAKE OF LEAD AND ARSENIC FROM LEAD ARSENATE
CONTAMINATED SOIL AMENDED WITH LIME AND PHOSPHORUS
Eton E. Codling and Jerry C. Ritchie 413
- WATER TREATMENT RESIDUALS AGGREGATE SIZE INFLUENCES PHOSPHORUS
SORPTION KINETICS AND P_{MAX} VALUES
J. M. Novak and D. W. Watts 425
- OSMOTIC POTENTIAL PROPERTIES OF SOLUTES COMMON IN THE SOIL-PLANT
SOLUTION CONTINUUM
Thomas T. Cochrane and Thomas A. Cochrane 433
- EROSIONAL EFFECTS ON SOIL PHYSICAL PROPERTIES IN AN ON-FARM STUDY ON
ALFISOLS IN WEST CENTRAL OHIO
M. K. Shukla and R. Lal 445
- SOIL FORMATION AT MILLSTONE BLUFF AND JOHNSON RIDGE IN
SOUTHERN ILLINOIS
K. R. Olson, R. L. Jones, and J. M. Lang 457
- SOIL-LANDSCAPE RELATIONSHIPS IN THE TAIGA OF NORTHWESTERN RUSSIA
HIGHLIGHT THE DIFFERENCES IN THE U.S. AND RUSSIAN SOIL CLASSIFICATION SYSTEMS
M. Murashkina, R. J. Southard, and G. N. Koptsik 469
- TO OUR MANUSCRIPT REVIEWERS 481

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Soil Science is now accepting for publication announcements of appropriate meetings. Please send meeting announcements to: *Soil Science*, Lippincott Williams & Wilkins, 351 West Camden Street, Baltimore, MD 21201-2436. Announcements must include: date, name of conference, location, and contact address/phone/e-mail.

2005 JUL 29 AM 10:44

Reviews and Analyses

- 976–982 Limitations of the Chemical Potential *A.T. Corey and S.D. Logsdon*

Soil Physics

- 967–975 Accurate Dye Tracer Concentration Estimations Using Image Analysis *Magnus Persson*
- 976–982 Limitations of the Chemical Potential *A.T. Corey and S.D. Logsdon*
- 983–989 Soil Dielectric Spectra from Vector Network Analyzer Data *S.D. Logsdon*
- 1330–1337 Influence of Organic Matter on the Estimation of Saturated Hydraulic Conductivity *Attila Nemes, Walter J. Rawls, and Yakov A. Pachepsky*
- 1196–1208 Quantifying Pore-Size Spectrum of Macropore-Type Preferential Pathways *K.-J.S. Kung, M. Hanke, C.S. Helling, E.J. Kludivko, T.J. Gish, T.S. Steenhuis, and D.B. Jaynes*
- 1209–1216 Evaluation of Mass Recovery Impacts on Transport Parameters Using Least-Squares Optimization and Moment Analysis *B.S. Das, J.M. Wraith, G.J. Kluitenberg, H.M. Langner, P.J. Shouse, and W.P. Inskeep*
- 1217–1224 Gravel Effect on Wastewater Infiltration from Septic System Trenches *D.E. Radcliffe, L.T. West, and J. Singer*

Soil Physics Note

- 990–995 Gas Transport of Volatile Organic Compounds in Unsaturated Soils: Quantitative Analysis of Retardation Processes *Heonki Kim, Seungjae Lee, Ji-Won Moon, and P. Suresh C. Rao*

Soil Chemistry

- 996–1008 Gibbsite and Goethite Solubility: The Influence of 2-Ketogluconate and Citrate *Michael E. Essington, Julia B. Nelson, and William L. Holdren*
- 1009–1015 Ferrihydrate–Humic Associations: Magnetic Hyperfine Interactions *U. Schwertmann, F. Wagner, and H. Knicker*
- 1016–1025 Characterization of Soil Algal Bioavailable Phosphorus in the Minnesota River Basin *F. Fang, P.L. Brezonik, D.J. Mulla, and L.K. Hatch*
- 1026–1035 Anionic Polysaccharide Sorption by Clay Minerals *Katerina M. Dontsova and Jerry M. Bigham*

- 1036–1046 Effect of Ammonium, Potassium, and Sodium Cations and Phosphate, Nitrate, and Chloride Anions on Zinc Sorption and Lability in Selected Acid and Calcareous Soils *Jim Jian Wang and Dustin L. Harrell*

- 1047–1056 Origin of Tale, Iron Phosphates, and Other Minerals in Biosolids *W.F. Jaynes and R.E. Zartman*

- 1057–1065 Sorption and Desorption of Ammonium from Liquid Swine Waste in Soils *W.A.R. Nishantha Fernando, Kang Xia, and Charles W. Rice*

- 1225–1232 Calcium and Magnesium Effects on Ammonia Adsorption by Soil Clays *Katerina M. Dontsova, L. Darrell Norton, and Cliff T. Johnston*

Soil Chemistry Note

- 1066–1068 A Simple Method for Measuring the Carbonate Content of Soils *Balázs Horváth, Oliver Opara-Nadi, and Friedrich Beese*

Soil Biology & Biochemistry

- 1069–1077 Microbial Properties of Mine Spoil Materials in the Initial Stages of Soil Development *Galina Machulla, Mary Ann Bruns, and Kate M. Scow*

- 1078–1085 The Relationship between Carbon Input, Aggregation, and Soil Organic Carbon Stabilization in Sustainable Cropping Systems *Angela Y.Y. Kong, Johan Six, Dennis C. Bryant, R. Ford Denison, and Chris van Kessel*

- 1057–1065 Sorption and Desorption of Ammonium from Liquid Swine Waste in Soils *W.A.R. Nishantha Fernando, Kang Xia, and Charles W. Rice*

- 1238–1247 Dynamics of Microbial Communities during Decomposition of Carbon-13 Labeled Ryegrass Fractions in Soil *Shawna K. McMahon, Mark A. Williams, Peter J. Bottomley, and David D. Myrold*

- 1248–1255 Investigating the Chemical Characteristics of Soil Organic Matter Fractions Suitable for Modeling *Saran P. Sohi, Nathalie Mahieu, David S. Powlson, Beată Madari, Rienk H. Smittenberg, and John L. Gaunt*

Soil Biology & Biochemistry Note

- 1233–1237 Atmospheric Nitrate Deposition and Enhanced Dissolved Organic Carbon Leaching: Test of a Potential Mechanism *Jared L. DeForest, Donald R. Zak, Kurt S. Pregitzer, and Andrew J. Burton*

Continued on page ii



This issue's cover: 7 + 1 Roles of the Soil: An Inclusive Vision for Integrative Soil Science. 1. Soil is a natural body formed under the influence of climate, organisms, parent material, relief, and time in the earth's system. 2. Soil is a fresh water storage and transmitting mantle in the earth's critical zone. 3. Soil is a gas and energy regulating geoderma in the land-atmosphere interface. 4. Soil is the foundation of diverse ecosystems. 5. Soil is a living porous substrate essential for plant growth, animal production, and food supply. 6. Soil is a popular material for a variety of engineering and construction applications. 7. Soil is a great natural remediation and buffering medium in the environment. 8. Soil is a frontier in extraterrestrial explorations. See "Letter to the Editor 'From the Earth's Critical Zone to Mars Exploration: Can Soil Science Enter Its Golden Age?'" by H. Lin, p. 1351–1353.

Soil Fertility & Plant Nutrition

- 1057-1065 Sorption and Desorption of Ammonium from Liquid Swine Waste in Soils *W.A.R. Nishantha Fernando, Kang Xia, and Charles W. Rice*
- 1152-1161 Nutrient Leaching in Oxisols Under Native and Managed Vegetation in Brazil *Wolfgang Wilcke and Juliane Lilienfein*
- 1256-1265 Predicting Nitrogen Requirements for Corn Grown on Soils Amended with Oily Food Waste *M.T. Rashid and R.P. Voroney*

Pedology

- 1086-1093 Soil Carbon Storage Estimation in a Forested Watershed using Quantitative Soil-Landscape Modeling *James A. Thompson and Randall K. Kolka*
- 1094-1101 Pedostratigraphy and Carbonate Accumulation in the Last Interglacial Pedocomplex of the Chinese Loess Plateau *Z.-D. Feng and H.B. Wang*
- 1266-1274 Modeling Energy Inputs to Predict Pedogenic Environments Using Regional Environmental Databases *Craig Rasmussen, Randal J. Southard, and William R. Horwath*
- 1275-1287 Soil Topochronosequences at Storbreen, Jotunheimen, Norway *R.G. Darmody, C.E. Allen, and C.E. Thorn*
- 1314-1319 Weathering of Pyrite and Sphalerite in Soils Contaminated with Pyritic Sludge *Raúl Hita and José Torrent*

Soil & Water Management & Conservation

- 1102-1109 Tillage and Nitrogen Fertilizer Influence on Carbon and Soluble Silica Relations in a Pacific Northwest Mollisol *H.T. Gollany, R.R. Allmaras, S.M. Copeland, S.L. Albrecht, and C.L. Douglas, Jr.*
- 1110-1117 Soil Carbon Stabilization in Converted Tropical Pastures and Forests Depends on Soil Type *M. López-Ulloa, E. Veldkamp, and G.H.J. de Koning*
- 1152-1161 Nutrient Leaching in Oxisols Under Native and Managed Vegetation in Brazil *Wolfgang Wilcke and Juliane Lilienfein*
- 1338-1350 Spatial Variability Analysis of Soil Physical Properties of Alluvial Soils *Javed Iqbal, John A. Thomasson, Johnnie N. Jenkins, Phillip R. Owens, and Frank D. Whisler*
- 1288-1297 Physical and Chemical Properties of a Minespoil Eight Years after Reclamation in Northeastern Ohio *M.K. Shukla, R. Lal, and M.H. Ebinger*

Nutrient Management & Soil & Plant Analysis

- 1118-1128 Soil-Test Phosphorus and Crop Grain Yield Responses to Long-Term Phosphorus Fertilization for Corn-Soybean Rotations *Jason R. Dodd and Antonio P. Mallarino*
- 1129-1134 Reducing Analysis Variability of the Illinois Soil Nitrogen Test with Enclosed Griddles *Jonathan H. Klapwyk and Quirine M. Ketterings*

- 1135-1145 Laboratory Validation of a Resource Quality-Based Conceptual Framework for Organic Matter Management *B. Vanlauwe, C. Gachengo, K. Shepherd, E. Barrios, G. Cadisch, and C.A. Palm*
- 1146-1151 Soil Salinity Using Saturated Paste and 1:1 Soil to Water Extracts *H. Zhang, J.L. Schroder, J.J. Pittman, J.J. Wang, and M.E. Payton*
- 1152-1161 Nutrient Leaching in Oxisols Under Native and Managed Vegetation in Brazil *Wolfgang Wilcke and Juliane Lilienfein*
- 1057-1065 Sorption and Desorption of Ammonium from Liquid Swine Waste in Soils *W.A.R. Nishantha Fernando, Kang Xia, and Charles W. Rice*

Forest, Range & Wildland Soils

- 1298-1313 Recent Changes in Soil Chemistry in a Forested Ecosystem of Southern Québec, Canada *François Courchesne, B. Côté, J.W. Fyles, W.H. Hendershot, P.M. Biron, A.G. Roy, and M.-C. Turmel*

Soil Mineralogy

- 1162-1172 Color Attributes and Mineralogical Characteristics, Evaluated by Radiometry, of Highly Weathered Tropical Soils *Mauricio P.F. Fontes and Ildeu A. Carvalho, Jr.*
- 1173-1184 Particle-Size and Element Distributions of Soil Colloids: Implications for Colloid Transport *James F. Ranville, David J. Chittleborough, and Ronald Beckett*
- 1047-1056 Origin of Talc, Iron Phosphates, and Other Minerals in Biosolids *W.F. Jaynes and R.E. Zartman*
- 1314-1319 Weathering of Pyrite and Sphalerite in Soils Contaminated with Pyritic Sludge *Raúl Hita and José Torrent*

Wetland Soils

- 1185-1195 Microsite Influences on Productivity and Nutrient Circulation Within Two Southeastern Floodplain Forests *Erik B. Schilling and B. Graeme Lockaby*
- 1320-1329 Macro- and Micromorphology of Subsurface Carbon in Riparian Zone Soils *Gary A. Blazewski, Mark H. Stolt, Arthur J. Gold, and Peter M. Groffman*

Comments and Letters to the Editor

- 1351-1353 Letter to the Editor on "From the Earth's Critical Zone to Mars Exploration: Can Soil Science Enter Its Golden Age?" *Henry Lin*
- 1353-1354 Comments on "Amounts, Forms, and Solubility of Phosphorus in Soils Receiving Manure" *Moshe Shenker and Paul R. Bloom*
- 1355 Response to "Comments on 'Amounts, Forms, and Solubility of Phosphorus in Soils Receiving Manure'" *Andrew N. Sharpley, Richard W. McDowell, and Peter J. A. Kleinman*
- 1356-1357 Comments on "Field Calibration of Water Content Reflectometers" *Arie Nadler*
- 1357-1358 Response to "Comments on 'Field Calibration of Water Content Reflectometers'" *David G. Chandler and Mark Seyfried*



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Sonoran pronghorn family drinks from experimental water source in Arizona. See page 51.

Photo by James J. Hester

TABLE OF CONTENTS

SPECIAL COVERAGE: CAN THE SONORAN PRONGHORN SURVIVE?

Introduction: management for the survival of Sonoran pronghorn in the United States <i>by Paul R. Krausman, John R. Morgart, Lisa K. Harris, Chantal S. O'Brien, James W. Cain III, and Steven S. Rosenstock</i>	5
Home-range and habitat-use patterns of Sonoran pronghorn in Arizona <i>by John J. Herver, Jill L. Bright, Robert S. Henry, Linden A. Piest, and Mark T. Brown</i> ...	8
Sonoran pronghorn habitat use on landscapes disturbed by military activities <i>by Paul R. Krausman, Lisa K. Harris, Sarah K. Haas, Kiana K. G. Koenen, Pat Devers, Daniel Bunting, and Mark Barb</i>	16
Landscape-level models of potential habitat for Sonoran pronghorn <i>by Chantal S. O'Brien, Steven S. Rosenstock, John J. Herver, Jill L. Bright, and Susan R. Boe</i>	24
Habitat use and survival of Sonoran pronghorn in years with above-average rainfall <i>by James C. deVos, Jr. and William H. Miller</i>	35
Adult and fawn mortality of Sonoran pronghorn <i>by Jill L. Bright and John J. Herver</i>	43
Sonoran pronghorn use of anthropogenic and natural water sources <i>by John R. Morgart, John J. Herver, Paul R. Krausman, Jill L. Bright, and Robert S. Henry</i>	51
From the Field: Capture, hand-raising, and captive management of peninsular pronghorn <i>by Jorge Cancino, Victor Sanchez-Sotomayor, and Ramón Castellanos</i>	61
In My Opinion: Politics, promises, and illogical legislation confound wildlife conservation <i>by Vernon C. Bleich</i>	66
Habitat Management	
Douglas-fir's effect on mountain big sagebrush wildlife habitats <i>Adam J. Grove, Carl L. Wambolt, and Michael R. Frisna</i>	74
Waterfowl and Shorebirds	
Autumn diet of greater scaup, lesser scaup, and long-tailed ducks on eastern Lake Ontario prior to zebra mussel invasion <i>R. Kenyon Ross, Scott A. Petrie, Shannon S. Badzinski, and Adele Mullie</i>	81
Feather stable isotopes in western North American waterfowl: spatial patterns, underlying factors, and management applications <i>Craig E. Hebert and Leonard I. Wassenaar</i>	92
Effects of human disturbances on the behavior of wintering ducks <i>Melissa L. Pease, Robert K. Rose, and Mark J. Butler</i>	103
What preys on piping plover eggs and chicks? <i>Jacob S. Ivan and Robert K. Murphy</i>	113

Upland Game and Raptors

A review of northern goshawk habitat selection in the home range and implications for forest management in the western United States

D. Noab Greenwald, D. Coleman Crocker-Bedford, Len Broberg, Kieran E. Suckling, and Timothy Tibbitts.....120

Spatial ecology and habitat selection of breeding male pheasants

Anthony P. Leif.....130

Carnivores and Omnivores

Experimental use of dog-training shock collars to deter depredation by gray wolves

Ronald N. Schultz, Kenneth W. Jonas, Lesa H. Skuldt, and Adrian P. Wyderen.....142

Effect of diet on mass loss of bobcat scat after exposure to field conditions

Iry A. Godbois, L. Mike Conner, Bruce D. Leopold, and Robert J. Warren.....149

The influence of persuasive arguments on public attitudes toward a proposed wolf restoration in the southern Rockies

Robert Meadow, Richard P. Reading, Mike Phillips, Mark Mebringer, and Brian J. Miller.....154

Winter ecology of American black bears in a desert montane island

F. Scott Mitchell, Dave P. Onorato, Eric C. Hellgren, J. Raymond Skelles, Jr., and Louis A. Harveson.....164

Scat removal: a source of bias in feces-related studies

Troy R. Livingston, Philip S. Gipson, Warren B. Ballard, Dana M. Sanchez, and Paul R. Krausman.....172

Experimental evaluation of population trend and harvest composition in a Wyoming cougar population

Charles R. Anderson, Jr. and Frederick G. Lindzey.....179

Molecular testing of observer identification of carnivore feces in the field

Laura R. Prugh and Carol E. Rilland.....189

Evaluating body condition of striped skunks using non-invasive morphometric indices and bioelectrical impedance analysis

Yeen Ten Huang, Serge Larivière, and François Messier.....195

Deer Management and Research

Distinguishing red and roe deer using DNA extracted from hair samples and the polymerase chain reaction (PCR) method

Maxime Galan, Christophe Baltzinger, A. J. Mark Hewison, and Jean-François Cosson.....204

Population characteristics of a central Appalachian white-tailed deer herd

Tyler A. Campbell, Benjamin R. Laseter, W. Mark Ford, and Karl V. Miller.....212

Density-dependent recruitment patterns in white-tailed deer

Patrick D. Keyser, David C. Guynn, Jr., and Hoke S. Hill, Jr......222

Influence of exurban development on hunting opportunity, hunter distribution, and harvest efficiency of white-tailed deer

Charles D. Harden, Alan Woolf, and John Roseberry.....233

A comparison of deer hunters with disabilities and nondisabled hunters in Alabama: motivations and satisfactions in deer hunting

Amy L. Grilliot and James B. Armstrong.....243

Wildlife Damage and Management

Evaluation of Bird Shield™ as a blackbird repellent in ripening rice and sunflower fields

Scott J. Werner, H. Jeffrey Homan, Michael L. Avery, George M. Linz, Eric A. Tillman, Anthony A. Slowik, Robert W. Byrd, Thomas M. Primus, and Margaret J. Goodall.....251

Ranking the risk of wildlife species hazardous to military aircraft

Edward J. Zakrajsek and John A. Bissonette.....258

Nongame

Area of black-tailed prairie dog colonies in eastern Colorado

Gary C. White, James R. Dennis, and Frances M. Pusateri.....265

Value of riverine islands to nongame birds

Ann M. Moser and John T. Ratti.....273

Grassland songbird nest-site selection and response to mowing in West Virginia

Kelly A. Warren and James T. Anderson.....285

Short-term landscape-scale effects of forest management on *Peromyscus* spp. mice within Missouri Ozark forests

Debby K. Fantz and Rochelle B. Renken.....293

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Editorials:

Warren Ballard, Editor-in-Chief.....2
Richard A. Lancia, TWS President 2004-05.....3
Policy News, by Laura M. Bies and Thomas M. Franklin.....302

From the Field:

A system for locating satellite-received transmitters (PTTs) in the field
Lubomir Peske and Michael J. McGrady.....307

An alternative method for handling and marking small carnivores without the need for sedation
Dun W. Forman and Kate Williamson.....313

Testing 2 aerial survey techniques on deer in fenced enclosures—visual double-counts and thermal infrared sensing
François Potvin and Laurier Breton.....317

Wing-molt patterns—a key to aging sandhill cranes
Stephen A. Nesbitt and Stephen T. Schwickert.....326

Efficacy of aerial telemetry as an aid to capturing specific individuals—a comparison of 2 techniques
Vernon C. Bleich, Jeffrey T. Villepique, Thomas R. Stephenson, Becky M. Pierce, and Gochmurat M. Kuttlyev.....332

A new shot at a release mechanism for devices attached to free-living animals
Gabriele Müller, Nikolai Liebsch, and Rory P. Wilson.....337

Changes in ranges of Florida Key deer—does population density matter?
Roel R. Lopez, Patricia M. Harveson, M. Nils Peterson, Nova J. Silvy, and Phillip A. Frank.....343

Armoring the Camtraker® camera-trap in a tropical Asian forest
Lon I. Grassman Jr., Michael E. Teves, and Nova J. Silvy.....349

Use of camera traps to measure predation risk in a puma-mule deer system
Lucina Hernández, John W. Laundré, and Mahesh Gurung.....353

A better beaver trap—new safety device for live traps
D. Müller-Schwarze and Donald P. Haggart.....359

Brown bear habituation to people—safety, risks, and benefits
Stephen Herrero, Tom Smith, Terry D. DeBruyn, Kerry Gunther, and Colleen A. Matt.....362

In My Opinion:

The value of the North American model of wildlife conservation—an International Association of Fish and Wildlife Agencies position
Joanna Prukop and Ronald J. Regan.....374

Wildlife caretaking vs. wildlife management—a short lesson in Swedish
Thomas A. Heberlein.....378

Commentary:

Wildlife ranching in North America—arguments, issues, and perspectives
Matthew J. Butler, Andrew P. Teaschner, Warren B. Ballard, and Brady K. McGee.....381

Book Review:

The Buffalo Wolf: Predators, Prey, and the Politics of Nature
Lu Carbyn.....390

Our Respects.....392

Information Access.....395

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