EDITORIAL

437 Redefining Science Education
Bruce Alberts

NEWS OF THE WEEK

446 Acquittals in CJD Trial Divide French Scientists
447 Western U.S. Forests Suffer Death by Degrees
>> Report p. 521
448 Debate Continues Over Rainforest Fate—With a Climate Twist
449 Confused Pelicans May Have Lingered Too Long Up North
449 Two Americans Win Japan Prize
450 European Pesticide Rules Promote Resistance, Researchers Warn
451 Scientists Puzzle Over Ebola-Reston Virus in Pigs
451 Educators Decry New Louisiana Policy
452 Proposed Regulatory Czar Has Long and Perplexing Track Record
452 U.S. Appellate Court Weighs 'Obvious' Patents
453 Photon Sieve Lights a Smooth Path to Entangled Quantum Weirdness
>> Report p. 483

NEWS FOCUS

454 Friendship as a Health Factor
With Isolation Comes Ill Health
>> Science Podcast
458 American Geophysical Union Meeting
Galloping Glaciers of Greenland Have Reined Themselves In
Tang Hints of a Watery Interior for Enceladus
The Many Dangers of Greenhouse Acid
Snapshots From the Meeting

LETTERS

460 Bailing Out Creatures Great and Small
J. Ghazoul
Proposed French Reforms Miss the Mark
D. Job
Ban Impact Factor Manipulation
C. Wallner
GOP Must Embrace Science Again
R. White
A Word of Caution on the Coca-Cola Way
G. Satchwell

BOOKS ET AL.

462 Dead Pool
J. L. Powell, reviewed by J. Farmer
463 Don’t Sleep, There Are Snakes
D. L. Everett, reviewed by A. S. Calude

POLICY FORUM

464 Could Access Requirements Stifle Your Research?
S. Jinnah and S. Jungcurt

PERSPECTIVES

466 Ex Uno Plura
S. Feau and S. P. Schoenberger
>> Reports pp. 502 and 505
467 Where Bacteria and Languages Concur
C. Renfrew
>> Research Article p. 479; Report p. 527; Science Podcast
469 Teleporting a Quantum State to Distant Matter
M. S. Kim and J. Cho
>> Report p. 486
470 Sources of Asian Haze
S. Szidat
>> Report p. 495
471 Life on an Anaerobic Planet
F. Westall
472 Protein Filaments Caught in the Act
G. J. Jensen
>> Report p. 509

REVIEW

474 Membrane Fusion: Grappling with SNARE and SM Proteins
T. C. Südhof and J. E. Rothman
>> Reports pp. 512 and 516

COVER
Human cells infected with the protozoan parasite Toxoplasma gondii visualized by scanning electron microscopy. In the foreground are parasites (yellow-green) rupturing out of a dying host cell (blue); in the background is an intact host cell containing a large parasite-filled vacuole. See page 530.
Image: Sasha Meshinchi, Michael Robinson, Bjorn Kafsack, and Vern Carruthers

www.sciencemag.org SCIENCE VOL 323 23 JANUARY 2009

DEPARTMENTS
433 This Week in Science
438 Editors’ Choice
440 Science Staff
443 Random Samples
445 Newsmakers
534 New Products
535 Science Careers
BREVIA
478 Earth’s Degassing: A Missing Ethane and Propane Source
G. Etiope and P. Ciccioli
Natural gas seepage contributes far more methane, ethane, and propane to the atmosphere than formerly realized.

RESEARCH ARTICLE
479 Language Phylogenies Reveal Expansion Pulses and Pauses in Pacific Settlement
R. D. Gray et al.
Geographical distribution of Austronesian languages reveals the rate and direction of migrations from Taiwan 5200 years ago.

REPORTS
483 An Entanglement Filter
R. Okamoto et al.
A useful tool for quantum information processing transmits entangled photons only when they have the same polarization.

486 Quantum Teleportation Between Distant Matter Qubits
S. Olmschenk et al.
Transporting quantum states between trapped ions one meter apart may enable local storage of information in quantum memories.

489 Femtosecond XANES Study of the Light-Induced Spin Crossover Dynamics in an Iron(II) Complex
Ch. Bressler et al.
X-ray absorption spectroscopy resolves the dynamics of spin-state interconversions, which take place in less than a picosecond, in a well-studied class of iron compounds.

492 Complementary Active Sites Cause Size-Selective Reactivity of Aluminum Cluster Anions with Water
P. J. Roach et al.
Water dissociates at similar active sites on anionic aluminum clusters that have different sizes and electronic structure.

495 Brown Clouds over South Asia: Biomass or Fossil Fuel Combustion?
O. Gustafsson et al.
Biomass burning accounts for at least one-half of carbon-rich aerosols in the Asian atmospheric brown cloud that forms each winter.

498 Genetic Interactions Between Transcription Factors Cause Natural Variation in Yeast
J. Gerke et al.
Adaptive differences in yeast sporulation arise from single-nucleotide mutations in transcription factors regulating sex.

502 Different T Cell Receptor Signals Determine CD8+ Memory Versus Effector Development
E. Teixeiro et al.
Point mutations in the T cell receptor decide the fate of killer T cells and the development of immunological memory.

505 Secondary Replicative Function of CD8+ T Cells That Had Developed an Effector Phenotype
O. Banard et al.
Killer T cells that developed during a primary antiviral response can become memory T cells in secondary infections.

509 Electron Cryomicroscopy of E. coli Reveals Filament Bundles Involved in Plasmid DNA Segregation
J. Salje et al.
The actin-like filaments that power movement of DNA during bacterial cell division form small bundles of three to five filaments near the nucleoid.

512 Alternative Zippering as an On-Off Switch for SNARE-Mediated Fusion
C. G. Giraudo et al.
A structural motif in the protein complexin may act as a switch during membrane fusion.

516 Complexin Controls the Force Transfer from SNARE Complexes to Membranes in Fusion
A. Maximov et al.
The protein complexin may act as a force-transferring switch during membrane fusion.

521 Widespread Increase of Tree Mortality Rates in the Western United States
P. J. van Mantgem et al.
Regional warming is contributing to the recent acceleration of tree deaths seen in undisturbed forests of the western U.S.

524 The Sphingolipid Transporter Spns2 Functions in Migration of Zebrafish Myocardial Precursors
A. Kawahara et al.
Normal heart development in zebrafish requires the function of a lipid transporter in a membrane surrounding the yolk, a tissue outside of the embryo proper.

527 The Peopling of the Pacific from a Bacterial Perspective
Y. Moodley et al.
The geographical distribution of strains of a specific human pathogen helps to define patterns of colonization out of Taiwan.

530 Rapid Membrane Disruption by a Perforin-Like Protein Facilitates Parasite Exit from Host Cells
B. F. C. Kafsack et al.
The human and animal parasite that causes toxoplasmosis escapes from host cells by using a perforin-like protein to make holes in the intracellular vacuole in which it resides.
PROTOCOL: Genome to Kinome—Species-Specific Peptide Arrays for Kinome Analysis
S. Jalal et al.
Marrying bioinformatics and phosphorylation assays enables the empirical analysis of kinomes of multiple species.

CONNECTIONS MAP: Neuro2A Differentiation by G<sub>α</sub><sub>13</sub> Pathway
A. Ma’ayan et al.
Neurite outgrowth can be stimulated by G protein–coupled receptors that signal through G<sub>α13</sub> and G<sub>αo</sub> proteins.

GLOSSARY
Find out what IRAP, Spred, and DOPA mean in the world of cell signaling.

SCIENCE CAREERS
www.sciencecareers.org/career_magazine
Free Career Resources for Scientists
Mind Matters: Stress, an Uninvited Lab Visitor
I. Levine
Work-related stress is an insidious health hazard.

Consulting Experience for Doctoral Students in France
E. Pain
A program launched by the French government allows Ph.D. students to sell their skills to nonacademic clients.

SCIENCE PODCAST
www.sciencepodcast.org/multimedia/podcast
Free Weekly Show
Download the 23 January Science Podcast to hear about increased tree mortality in the western U.S., human population history in the Pacific, how social networks influence health, and more.

ORIGINS BLOG
blogs.sciencemag.org/origins
A History of Beginnings

SCIENCE INSIDER
blogs.sciencemag.org/scienceinsider
Science Policy News and Analysis

PERSPECTIVE: Protein Kinase Activation Loop Autophosphorylation in Cis—Overcoming a Catch-22 Situation
P. A. Lochhead
The mechanisms by which kinases activate themselves are still emerging.