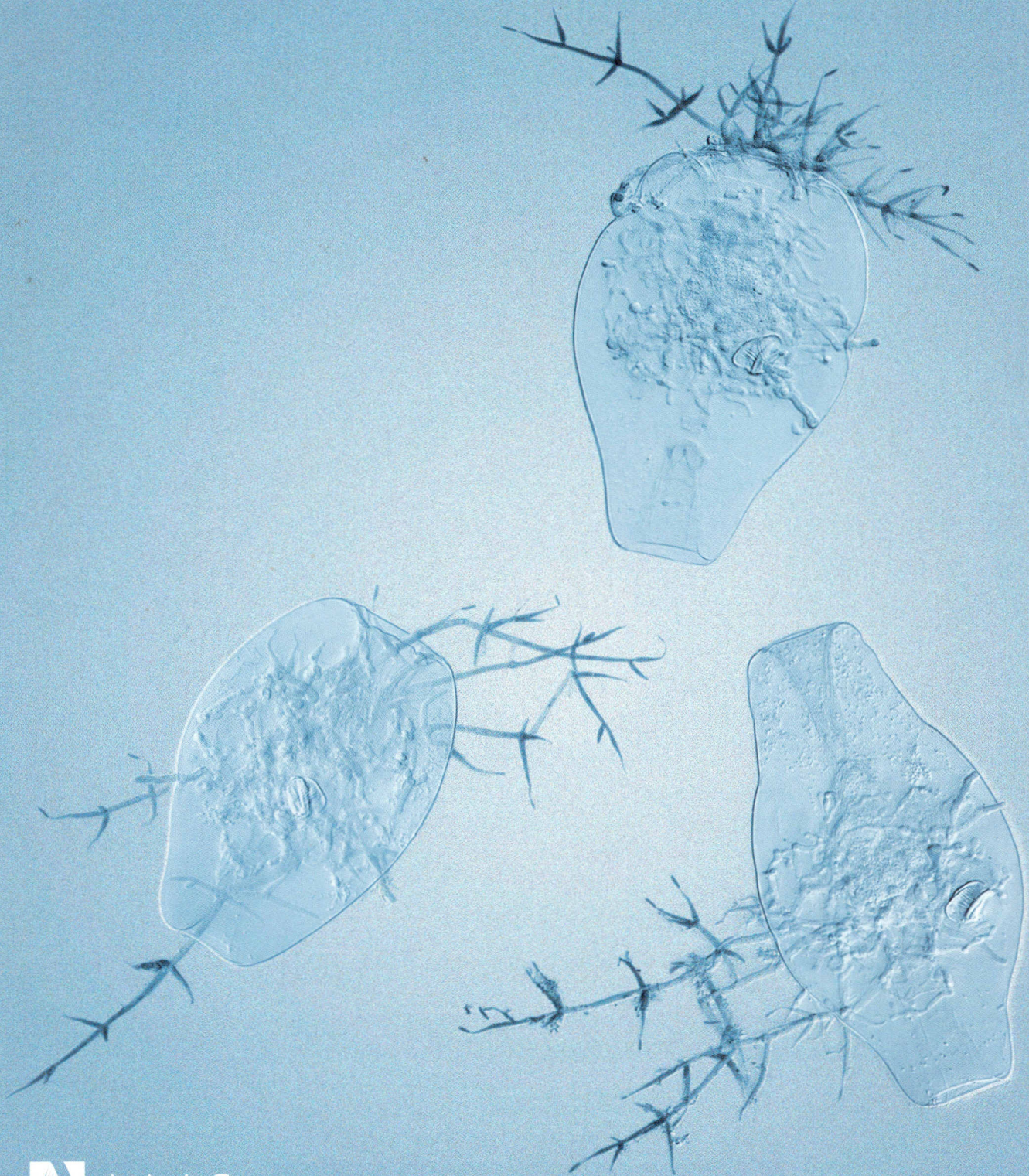


29 January 2010 | \$10

Science



EDITORIAL

- 504 Science Education Web Sites
Bruce Alberts
>> *Science Prize Essay* p. 538

NEWS OF THE WEEK

- 508 Bird-Dinosaur Link Firmed Up, and in Brilliant Technicolor
>> *Report* p. 571
- 509 Haiti's Quake Shifts Clinic's Focus From AIDS to Aid
- 510 Climate Science Leader Rajendra Pachauri Confronts the Critics
- 511 NRC Urges U.S. to Rethink Sale of Helium Reserve
- 512 In Central California, Coho Salmon Are on the Brink
- 513 From *Science's* Online Daily News Site
- 514 Test Shots Show Laser-Fusion Experiment Is on Target
>> *Science Express Report* by S. H. Glenzer et al.
- 515 Did a Battering Rain of Comets Bring Ganymede to Geologic Life?
- 515 From the *Science* Policy Blog

NEWS FOCUS

- 516 Faintest Thrum Heralds Quantum Machines
>> *Science Podcast*
- 519 In the Deep Blue Sea
- 520 Little Castle on the Prairie

LETTERS

- 522 Tracking the Source of Glacier Misinformation
J. G. Cogley et al.
A Role for Postdocs in Undergraduate Education
S. D. Bush et al.

Taking a Cue from the Silver Screen
Z. Faulkes
Give the "Fair Sex" a Fair Shake
M. Nestle

BOOKS ET AL.

- 524 Reading in the Brain
S. Dehaene, reviewed by C. G. Gross
- 525 Heuschrecken [Locusts]
S. Kaegi, reviewed by M. D. Laubichler and G. Honegger
- 525 Browsings

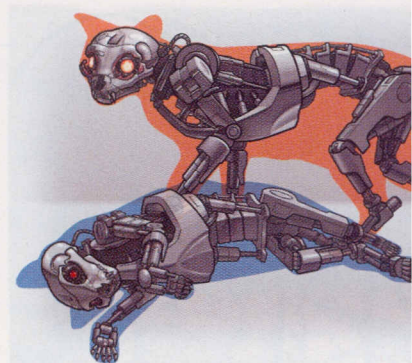
POLICY FORUM

- 527 The Politics of Geoengineering
J. J. Blackstock and J. C. S. Long
>> *Perspective* p. 530

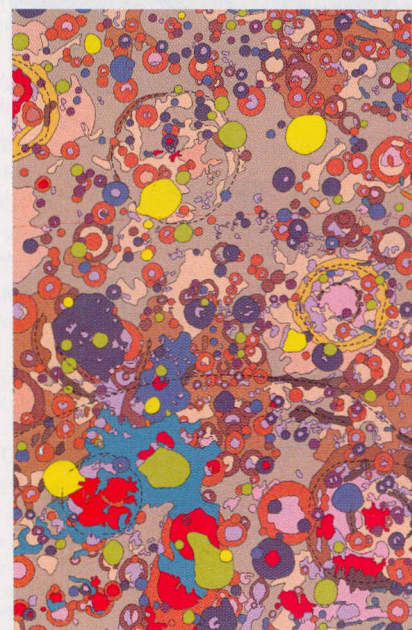
PERSPECTIVES

- 528 Arsonists in Rheumatoid Arthritis
G. A. Zimmerman and A. S. Weyrich
>> *Report* p. 580
- 529 Bundling with X-rays
C. R. Safinya and Y. Li
>> *Report* p. 555
- 530 A Test for Geoengineering?
A. Robock et al.
>> *Policy Forum* p. 527
- 532 Apes Among the Tangled Branches of Human Origins
T. Harrison
- 534 Measuring Subjective Well-Being
R. Layard
>> *Report* p. 576
- 535 Turning Away from High Symmetry
J. C. Crocker
>> *Report* p. 560
- 537 Retrospective:
Edwin G. Krebs (1918–2009)
W. A. Catterall and J. D. Scott

CONTENTS continued >>



page 516



page 525



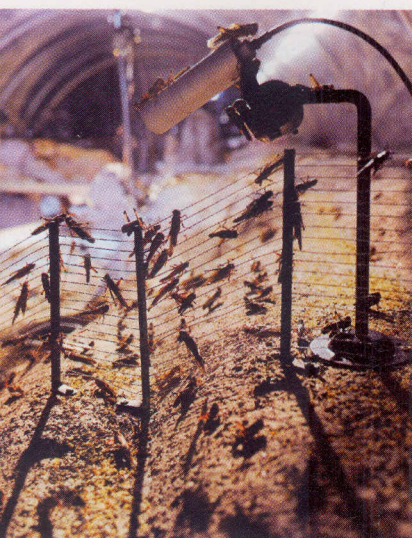
COVER

Spore-bearing fungal parasites emerge from the digested corpses of three bdelloid rotifers. These freshwater invertebrates (length <0.5 millimeters) present an evolutionary puzzle because they have reproduced without sex for millions of years but have not been driven extinct by relentlessly coevolving parasites. Bdelloids can escape fungal parasites in space and time through complete desiccation and dispersal by wind to uninfected habitats. See page 574.

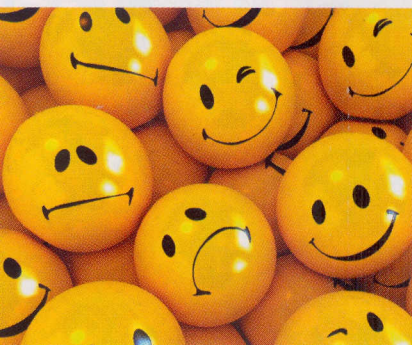
Image: Kent Loeffler, Kathie T. Hodge, Chris Wilson

DEPARTMENTS

- 501 This Week in *Science*
505 Editors' Choice
506 *Science* Staff
507 Random Samples
540 AAAS News & Notes
597 New Products
598 *Science* Careers



page 525



pages 534 & 576



pages 508 & 571

SCIENCE PRIZE ESSAY

- 538** Making Genetics Easy to Understand
L. A. Stark and K. Pompei
>> Editorial p. 504

REVIEW

- 542** Coexistence of Quiescent and Active Adult Stem Cells in Mammals
L. Li and H. Clevers

BREVIEW

- 546** Role of ABA and ABI3 in Desiccation Tolerance
A. Khandelwal et al.
The hormone pathway that stabilizes seeds may have served more primitive seedless plants in supporting desiccation tolerance.

RESEARCH ARTICLE

- 547** Local and Long-Range Reciprocal Regulation of cAMP and cGMP in Axon/Dendrite Formation
M. Shelly et al.
Cyclic adenosine monophosphate and cyclic guanosine monophosphate regulate axon formation and exert opposite actions on dendrite formation.

REPORTS

- 552** Phase Transitions of Adsorbed Atoms on the Surface of a Carbon Nanotube
Z. Wang et al.
The adsorption behavior of rare gases is followed through changes in resonance frequency of a single-walled carbon nanotube.
- 555** Spontaneous and X-ray-Triggered Crystallization at Long Range in Self-Assembling Filament Networks
H. Cui et al.
Dilute solutions of alkyl-terminated peptide filaments can undergo ordering upon x-ray exposure.
>> Perspective p. 529
- 560** The Free-Energy Landscape of Clusters of Attractive Hard Spheres
G. Meng et al.
Entropic effects favor the formation of small clusters of colloidal particles that have lower symmetry.
>> Perspective p. 535
- 564** A Tricyclic Aromatic Isomer of Hexasilabenzene
K. Abersfelder et al.
A structural isomer of benzene in which carbon is replaced by silicon exhibits unexpected electronic stabilization.

- 566** Combined Effects on Selectivity in Fe-Catalyzed Methylen Oxidation
M. S. Chen and M. C. White
An iron catalyst shows selectivity for the oxidation of secondary C-H bonds in organic molecules.

- 571** A Basal Alvarezsauroid Theropod from the Early Late Jurassic of Xinjiang, China
J. N. Choiniere et al.
The Alvarezsauroidea clade extends the clade containing birds and their theropod relatives back to 160 million years ago.
>> News story p. 508

- 574** Anciently Asexual Bdelloid Rotifers Escape Lethal Fungal Parasites by Drying Up and Blowing Away
C. G. Wilson and P. W. Sherman
Asexual bdelloid rotifers avoid the evolutionary parasite trap through desiccation resistance and dispersal.
>> Science Podcast

- 576** Objective Confirmation of Subjective Measures of Human Well-Being: Evidence from the U.S.A.
A. J. Oswald and S. Wu
Subjective life-satisfaction scores agree with objective measures of well-being across 50 American states.
>> Perspective p. 534

- 580** Platelets Amplify Inflammation in Arthritis via Collagen-Dependent Microparticle Production
E. Boilard et al.
Microparticles released by platelets contribute to inflammation underlying rheumatoid arthritis.
>> Perspective p. 528

- 584** Decorrelated Neuronal Firing in Cortical Microcircuits
A. S. Ecker et al.
Despite dense connectivity and shared input, the firing rates of nearby neurons are largely uncorrelated.

- 587** The Asynchronous State in Cortical Circuits
A. Renart et al.
A general theoretical description of correlations in highly connected recurrent neuronal circuits.

- 590** Direct Restart of a Replication Fork Stalled by a Head-On RNA Polymerase
R. T. Pomerantz and M. O'Donnell
Head-on collisions between DNA and RNA polymerases are resolved in vitro.

- 593** p53 Controls Radiation-Induced Gastrointestinal Syndrome in Mice Independent of Apoptosis
D. G. Kirsch et al.
Ionizing radiation destroys gastrointestinal epithelial cells by a mechanism that appears to be independent of apoptosis.

SCIENCEONLINE

SCIENCEEXPRESS

www.scienceexpress.org

N-Terminal Acetylation of Cellular Proteins Creates Specific Degradation Signals

C.-S. Hwang et al.

In vivo protein stoichiometries are regulated through N-terminally acetylated degrons.
10.1126/science.1183147

Generating a Prion with Bacterially Expressed Recombinant Prion Protein

F. Wang et al.

Purified recombinant prion protein recapitulates the characteristics of the infectious agent in prion disease.
10.1126/science.1183748

Contributions of Stratospheric Water Vapor to Decadal Changes in the Rate of Global Warming

S. Solomon et al.

Decreases in stratospheric water vapor after the year 2000 slowed the rate of increase in global surface temperature.
10.1126/science.1182488

Symmetric Inertial Confinement Fusion Implosions at Ultra-High Laser Energies

S. H. Glenzer et al.

10.1126/science.1185634

>> News story p. 514

Charged-Particle Probing of X-ray-Driven Inertial-Fusion Implosions

C. K. Li et al.

Laser-driven temperatures and implosion symmetry are close to the requirements for inertial-fusion ignition.
10.1126/science.1185747

Food Security: The Challenge of Feeding 9 Billion People

H. C. J. Godfray et al.

10.1126/science.1185383

SCIENCENOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Colliding Particles Can Make Black Holes

Simulations do not prove that the Large Hadron Collider will produce them, however.

Birdlike Dinosaur Was Adept Glider

Foam model may clarify origin of bird flight.

Hear That? Bats and Whales Share Sonar Protein

Similar genetic changes helped echolocation evolve in disparate species.

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

RESEARCH ARTICLE: Molecular Basis of the Death-Associated Protein Kinase–Calcium/Calmodulin Regulator Complex

I. de Diego et al.

The structure of the death-associated protein kinase and calmodulin complex reveals how calmodulin binding leads to kinase activation.

RESEARCH ARTICLE: A Crucial Role for RACK1 in the Regulation of Glucose-Stimulated IRE1 α Activation in Pancreatic β -cells

Y. Qiu et al.

RACK1 dictates the response of the intracellular stress sensor IRE1 α to different extracellular stimuli.

PERSPECTIVE: Proteomics Modifies Our Understanding of Cell Cycle Complexity

M. C. Hall

Thousands of modified proteins were revealed in global cell cycle studies of phosphorylation and O-GlycNAcylation.

PODCAST

M. Lafon and A. M. VanHook

A single amino acid substitution in a viral protein is sufficient to attenuate rabies virulence.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Perspective: From 'Pet' to Peer

S. Pfirman et al.

Diverse probationary faculty members may be denied a fair chance to become peers.

Mind Matters: Gossip in the Lab

I. S. Levine

Workplace gossip may not be all bad, but it needs to be handled with care.

Funding News

D. Adams

Get the latest announcements of research funding, fellowships, and internships.

SCIENCE TRANSLATIONAL MEDICINE

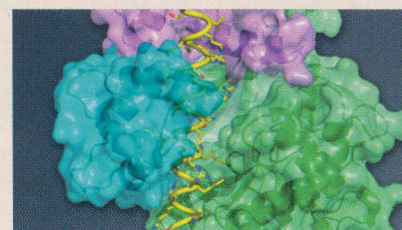
www.sciencetranslationalmedicine.org

Integrating Medicine and Science

PERSPECTIVE: Pathogen Microevolution in High Resolution

R. K. Aziz and V. Nizet

Next-generation high-throughput sequencing provides insight into the origin and spread of microbial pathogens.



SCIENCE SIGNALING
Structural insights into kinase activation by calmodulin.

COMMENTARY: Transforming Medicine via Digital Innovation

E. J. Topol

Digital devices have exceptional promise for changing the future of medicine.

RESEARCH ARTICLE: Resiliency and Vulnerability in the HER2-HER3 Tumorigenic Driver

D. N. Amin et al.

The ability to overcome drug-resistant breast cancers may lie in dosage frequency.

RESEARCH ARTICLE: Metabolomic Imaging for Human Prostate Cancer Detection

C.-L. Wu et al.

Metabolic imaging in the prostate reveals cancerous regions, guides biopsies, and helps prognosis.

SCIENCE PODCAST

www.sciencemag.org/multimedia/podcast
Free Weekly Show

Download the 29 January Science Podcast to hear about dealing with parasites in the absence of sex, the advent of quantum machines, your letters to Science, and more.

SCIENCE INSIDER

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

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2010 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$146 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$910; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96178, Washington, DC 20090-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$20.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.

AAAS

ADVANCING SCIENCE. SERVING SOCIETY