

**EDITORIAL**

- 380 Teaching Real Science  
*Bruce Alberts*  
>> *Essay p. 418*

**NEWS OF THE WEEK**

- 384 A roundup of the week's top stories

**NEWS & ANALYSIS**

- 387 Flu Controversy Spurs Research Moratorium  
*Ron Fouchier: In the Eye of the Storm*  
>> *Letter by R. A. M. Fouchier et al., p. 400*
- 390 An Explosive Return of the 'Great Pox'
- 391 Worldwide Telescope Aims to Look Into Milky Way Galaxy's Black Heart
- 392 DOE Funding Crunch Threatens Future of Only U.S. Collider Still Running

**NEWS FOCUS**

- 394 What It'll Take to Go Exascale  
>> *Science Podcast*
- 397 Ferreting Out the Hidden Cracks in the Heart of a Continent
- 398 Modernizing an Academic Monastery

**LETTERS**

- 400 Pause on Avian Flu Transmission Research  
*R. A. M. Fouchier et al.*  
>> *News story p. 387*
- Recognizing Existing Models  
*W. J. Rosenberg*
- Portugal's Age of Enlightenment  
*N. C. Santos*

- 401 CORRECTIONS AND CLARIFICATIONS
- 401 TECHNICAL COMMENT ABSTRACTS

**BOOKS ET AL.**

- 403 The Statues That Walked  
*T. Hunt and C. Lipo, reviewed by R. Torrence*
- 404 Understanding Autism  
*C. Silverman, reviewed by B. A. Malow*

**POLICY FORUM**

- 405 Mixed Messages on Prices and Food Security  
*J. Swinnen and P. Squicciarini*

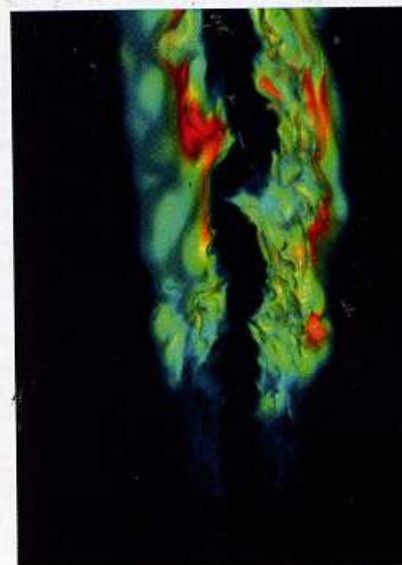
**PERSPECTIVES**

- 408 Antigen Feast or Famine  
*M. L. Dustin and M. Meyer-Hermann*  
>> *Report p. 475*
- 409 A Clearer View from Fuzzy Images  
*M. E. Herberstein and D. J. Kemp*  
>> *Report p. 469*
- 410 The Role of Coevolution  
*J. N. Thompson*  
>> *Research Article p. 428*
- 411 The Risk of Prion Zoonoses  
*J. Collinge*  
>> *Report p. 472*
- 413 Creating New Types of Carbon-Based Membranes  
*D. R. Paul*  
>> *Reports pp. 442 and 444*
- 415 Another Remembered Present  
*K. Meyer*
- 416 The Inner Workings of a Dynamic Duo  
*H. Poulsen and P. Nissen*  
>> *Research Articles pp. 432 and 436*

**SCIENCE PRIZE ESSAY**

- 418 An Inquiry-Based Curriculum for Nonmajors  
*D. P. Jackson et al.*  
>> *Editorial p. 380*

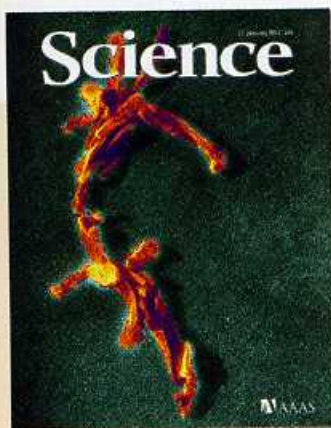
CONTENTS continued >>



page 394



pages 409 & 469



**COVER**

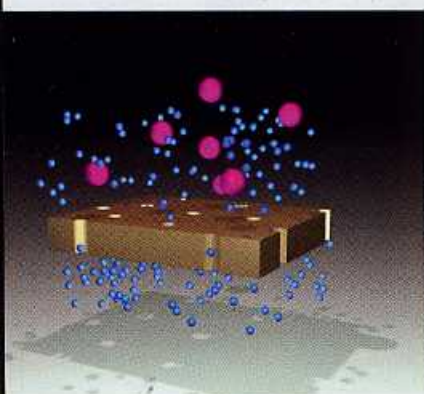
False-colored transmission electron micrograph of a prion [average dimensions: ~150 nanometers (nm) long, 10 nm thick], the infectious protein responsible for deadly brain diseases in animals and humans. Although cross-species prion transmission may show no detectable sign of disease in the brain, lymphoid tissue is much more susceptible to infection. This discovery may be relevant when assessing the public health risks of exposure to animal prions and silent carriers of prion disease. See page 472.

Image: Eye of Science/Photo Researchers, Inc.

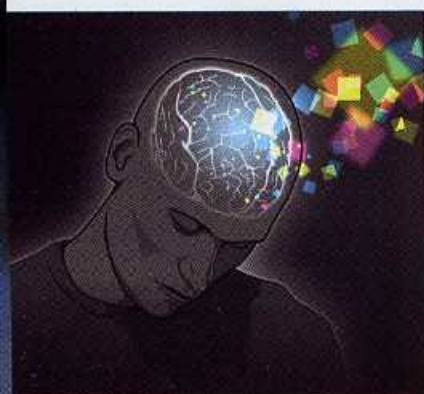
**DEPARTMENTS**

- 377 This Week in Science
- 381 Editors' Choice
- 383 Science Staff
- 420 AAAS News & Notes
- 481 New Products
- 482 Science Careers

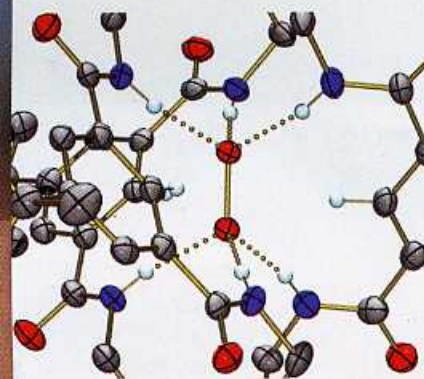




pages 413, 442, &amp; 444



page 415



page 450

## REVIEW

- 422 The Centrosome in Cells and Organisms  
*M. Bornens*

## BREVIA

- 427 Broadband Light Bending with Plasmonic Nanoantennas  
*X. Ni et al.*  
A plasmonic antenna array is used to control the propagation of a light beam across an interface.

## RESEARCH ARTICLES

- 428 Repeatability and Contingency in the Evolution of a Key Innovation in Phage Lambda  
*J. R. Meyer et al.*  
A receptor shift required four mutations that accumulated by natural selection and with the host's coevolution.  
>> *Perspective p. 410; Science Podcast*
- 432 Crystal Structure of the Human Two-Pore Domain Potassium Channel K2P1  
*A. N. Miller and S. B. Long*
- 436 Crystal Structure of the Human K2P TRAAK, a Lipid- and Mechano-Sensitive K<sup>+</sup> Ion Channel  
*S. G. Brohawn et al.*  
Structural features provide a basis for understanding gating and ion conduction of these channels.  
>> *Perspective p. 416*

## REPORTS

- 442 Unimpeded Permeation of Water Through Helium-Leak-Tight Graphene-Based Membranes  
*R. R. Nair et al.*  
Graphite oxide membranes are impermeable to many liquids, vapors, and gases, including He, but allow evaporation of water.
- 444 Ultrafast Viscous Permeation of Organic Solvents Through Diamond-Like Carbon Nanosheets  
*S. Karan et al.*  
Membranes made from diamond-like carbon are used to rapidly separate organic compounds.  
>> *Perspective p. 413*
- 447 An All-Silicon Passive Optical Diode  
*L. Fan et al.*  
A silicon-based device is developed that allows the asymmetric propagation of light.
- 450 Reversible Reduction of Oxygen to Peroxide Facilitated by Molecular Recognition  
*N. Lopez et al.*  
The highly reactive peroxide dianion (O<sub>2</sub><sup>2-</sup>) can be captured and stabilized by hydrogen bonding in a molecular box.
- 453 A Long-Lived Lunar Core Dynamo  
*E. K. Shea et al.*  
Analysis of a lunar basalt sample suggests that a lunar core dynamo existed between 4.2 and 3.7 billion years ago.
- 457 The Molecular Diversity of Adaptive Convergence  
*O. Tenaillon et al.*  
Replicate *Escherichia coli* lines show multiple convergent adaptations via different mutations in response to high temperature.
- 461 Centrosome Loss in the Evolution of Planarians  
*J. Azimzadeh et al.*  
Analysis of centriole assembly in planaria gives insight into the evolution and function of the centrosome in animal cells.
- 464 Global Correlations in Tropical Tree Species Richness and Abundance Reject Neutrality  
*R. E. Ricklefs and S. S. Renner*  
Comparison of species numbers between forests shows that patterns of diversity are dominated by deterministic processes.
- 467 Heavy Livestock Grazing Promotes Locust Outbreaks by Lowering Plant Nitrogen Content  
*A. J. Cease et al.*  
High-protein plants inhibit locust swarming, which explains why grazed systems are more prone to outbreaks.  
>> *Science Podcast*
- 469 Depth Perception from Image Defocus in a Jumping Spider  
*T. Nagata et al.*  
To jump exact distances to capture prey, spiders, like computers, use defocus as a major cue for depth perception.  
>> *Perspective p. 409*
- 472 Facilitated Cross-Species Transmission of Prions in Extraneural Tissue  
*V. Béringue et al.*  
Lymphoid tissue is more permissive than the brain to foreign prions.  
>> *Perspective p. 411*
- 475 Asymmetric Segregation of Polarized Antigen on B Cell Division Shapes Presentation Capacity  
*O. Thaunat et al.*  
Antigen distribution across activated B cells influences B-T lymphocyte interactions.  
>> *Perspective p. 408*