

## EDITORIAL

- 12 **Why Statistics?**  
*Marie Davidian and Thomas A. Louis*  
 >> *Science Podcast*

## NEWS OF THE WEEK

- 16 A roundup of the week's top stories

## NEWS & ANALYSIS

- 19 **On Second Thought, Flu Papers Get Go-Ahead**  
 >> See all H5N1 coverage online at <http://scim.ag/h5n1>
- 21 **U.S. Agencies to Start Screening Biomedical Proposals for Dual Use**
- 22 **Agencies Rally to Tackle Big Data**
- 23 **Updated Review Finds Little U.S. Military Risk in Nuclear Test Ban**
- 25 **In Former Yugoslavia, Academies Keep Fighting**

## NEWS FOCUS

- 26 **A Week in Stockholm**  
 >> *Science Podcast*

## LETTERS

- 32 **NextGenVOICES**

## BOOKS ET AL.

- 35 **Great American City**  
*R. J. Sampson, reviewed by D. S. Massey*
- 36 **Reinventing Discovery**  
*M. Nielsen, reviewed by S. M. Fiore*

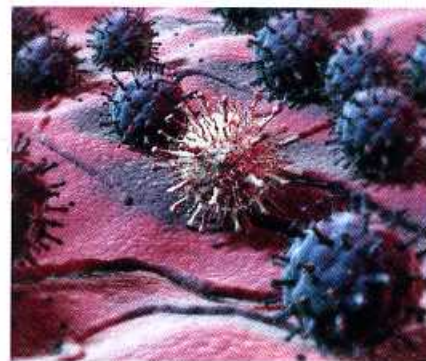
## POLICY FORUM

- 38 **Improving Asia-Pacific Science Collaboration**  
*S. J. Toope et al.*

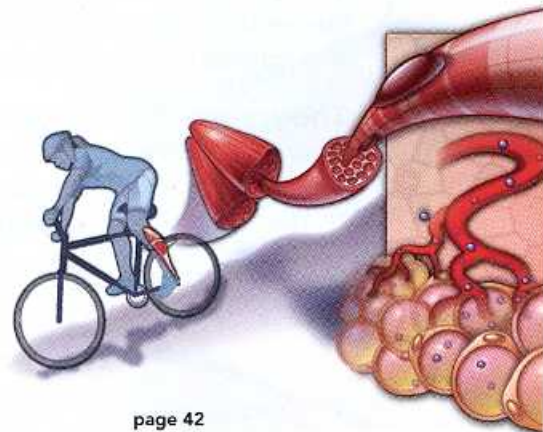
## PERSPECTIVES

- 40 **Rebuilding the Thymus**  
*A. Bhandoola and D. Artis*  
 >> *Report p. 91*
- 41 **Stressing Ferroelectrics**  
*J. M. Gregg*  
 >> *Report p. 59*
- 42 **Irisin, Light My Fire**  
*D. P. Kelly*
- 44 **Watching Solution Growth of Nanoparticles in Graphene Cells**  
*C. Colliex*  
 >> *Report p. 61*
- 45 **How Bacterial Lineages Emerge**  
*R. T. Papke and J. P. Gogarten*  
 >> *Research Article p. 48*
- 46 **Reading Pliocene Bones**  
*J. Njau*

CONTENTS continued >>



page 19



page 42



## COVER

Polarized light micrograph of a thin section of gypsum crystals ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ). Vertical field of view ~4 millimeters. This natural and industrial mineral unexpectedly crystallizes from solution at room temperature upon a transition through a precursor, nanocrystalline bassanite ( $\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$ ), a usually high-temperature phase. A detailed understanding of this crystallization route could lead to a new strategy to control gypsum scale and may open an alternative route for the production of "plaster of Paris" (bassanite).

Photo: Alfred Pasieka/Photo Researchers, Inc.

## DEPARTMENTS

- 10 This Week in *Science*  
 13 Editors' Choice  
 14 *Science* Staff  
 99 New Products  
 100 *Science* Careers



## RESEARCH ARTICLE

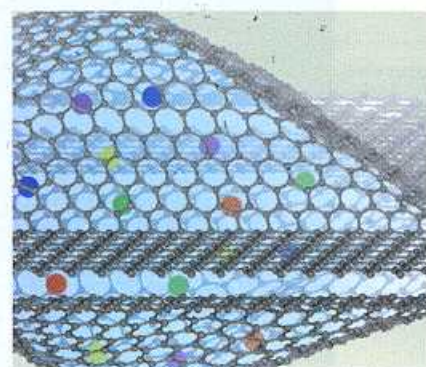
- 48 **Population Genomics of Early Events in the Ecological Differentiation of Bacteria**  
B. J. Shapiro et al.  
Ecologically separated *Vibrio* populations diverge by gene-specific rather than genome-wide selective sweeps.  
>> *Perspective p. 45*

## REPORTS

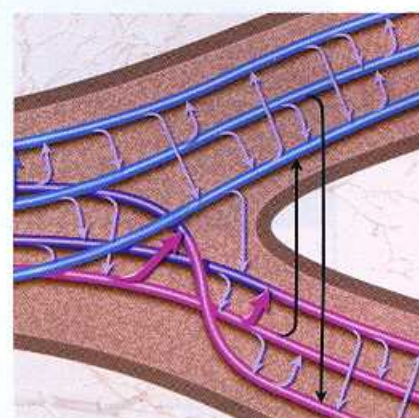
- 52 **The Coexistence of Superconductivity and Topological Order in the Bi<sub>2</sub>Se<sub>3</sub> Thin Films**  
M.-X. Wang et al.  
A thin layer of a topological insulator grown on the surface of a superconductor is shown to acquire a superconducting gap.
- 55 **A 2D Quantum Walk Simulation of Two-Particle Dynamics**  
A. Schreiber et al.  
An optical approach extends quantum walk methodology from one to two dimensions.
- 59 **Mechanical Writing of Ferroelectric Polarization**  
H. Lu et al.  
The stress gradient created with the tip of an atomic force microscope can locally change the polarization of a barium titanate film.  
>> *Perspective p. 41*; *Science Podcast*
- 61 **High-Resolution EM of Colloidal Nanocrystal Growth Using Graphene Liquid Cells**  
J. M. Yuk et al.  
Encapsulating a liquid film between two graphene layers allows the film and growing crystals from the graphene sheets to be studied at an atomic scale.  
>> *Perspective p. 44*
- 64 **Copper Systematics in Arc Magmas and Implications for Crust-Mantle Differentiation**  
C.-T. A. Lee et al.  
The copper contents of magmas imply that the formation of sulfide-bearing cumulates under reducing conditions is a critical step in the formation of continental crust.
- 69 **The Role and Implications of Bassanite as a Stable Precursor Phase to Gypsum Precipitation**  
A. E. S. Van Driessche et al.  
The common mineral gypsum forms when nanoparticles of an undersaturated precursor phase, bassanite, self-assemble into nanorods, followed by ripening.

- 72 **Late Accretion on the Earliest Planetesimals Revealed by the Highly Siderophile Elements**  
C. W. Dale et al.  
Analysis of meteorites shows that unprocessed material was accreted to both planets and asteroids 150 million years after the start of the solar system.
- 75 **Mapping the Core of the *Arabidopsis* Circadian Clock Defines the Network Structure of the Oscillator**  
W. Huang et al.  
Morning and evening components of circadian rhythms are coordinated and stabilized by a repressor.
- 79 **A Major Genome Region Underlying Artemisinin Resistance in Malaria**  
I. H. Cheeseman et al.  
A 35-kilobase region on chromosome 13 of *Plasmodium falciparum* is linked to reductions in parasite clearance in Southeast Asia.  
>> *Science Podcast*
- 82 **Extrachromosomal MicroDNAs and Chromosomal Microdeletions in Normal Tissues**  
Y. Shibata et al.  
The formation of circular microDNAs can result in somatic and germline microdeletions in mammalian cells.
- 86 **A Lineage of Myeloid Cells Independent of Myb and Hematopoietic Stem Cells**  
C. Schulz et al.  
In mice, a population of tissue-resident macrophages arises independently of bone marrow-derived stem cells.
- 91 **Interleukin-22 Drives Endogenous Thymic Regeneration in Mice**  
J. A. Dudakov et al.  
Damage to the thymus caused by infection or radiation is reversed by a cytokine.  
>> *Perspective p. 40*
- 95 **Neural Mechanisms of Foraging**  
N. Kolling et al.  
A brain signal in the dorsal anterior cingulate cortex tracks the average value of a person's environment.

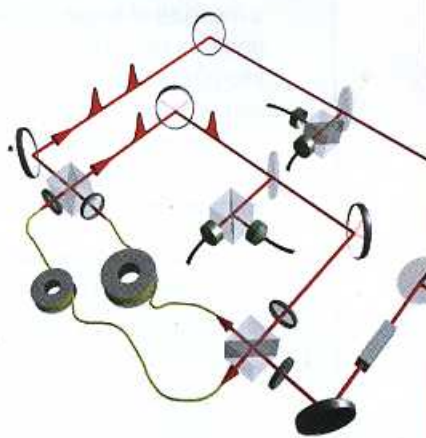
CONTENTS continued &gt;&gt;



pages 44 &amp; 61



pages 45 &amp; 48



page 55