COVER
Laser-surveyed topography of the elevation in a Pennsylvania landscape, showing evidence of sediment-filled early American millponds along a stream valley. Terraces around the stream channel descend stepwise from upstream to downstream (dark purple, light purple, pink), each associated with a dam. The deeper stream incision into the two downstream terraces is due to more complete dam breaching. See page 299.

Image: U.S. Geological Survey (LIDAR data and preliminary processing); Michael Rahnis (image analysis and generation)

NEWS OF THE WEEK
Uncle Sam’s Biomedical Archive Wants Your Papers 266
Satellite Company Offers Earth-Observing Researchers a Ride 267
Mirror Neurons May Help Songbirds Stay in Tune 269

SCIENCESCOPE
New Dark-Matter Map Reveals Where Galaxies Gambol 270
Polynesians Took the Express Train Through Melanesia to the Pacific 270
Most-Massive Black Hole Confirms Relativity Rules the Universe 271
Isolated Tribe Gives Clues to the Origins of Syphilis 272
Calculating Iraq’s Death Toll: WHO Study Backs Lower Estimate 273

NEWS FOCUS
Gene Tests for Psychiatric Risk Polarize Researchers Hoping for a Glimpse of What’s Ahead 274
Seeking the Roots of Ritual Just Don’t Call It the Garden of Eden 278

LETTERS
Conservation with Sense M. L. M. Lim et al. 281
Scientific Meetings: Worth Attending M. McNutt
Scientific Meetings: Call In Instead R. Roy
Putting a Human Face on Energy Usage R. Burruss

BOOKS ET AL.
Cool It The Skeptical Environmentalist’s Guide to Global Warming B. Lomborg, reviewed by W. F. Ruddiman (U.S. and U.K. editions)

POLICY FORUM
Aging Infrastructure and Ecosystem Restoration M. W. Doyle et al.

PERSPECTIVES
Organizing the Source of Memory E. A. Grove
Orion Continues to Surprise C. R. O’Dell and L. K. Townsley
Managing Coastal Wetlands I. Valiela and S. E. Fox
Dreams of Natural Streams D. R. Montgomery
Probing Quantum Magnetism with Cold Atoms M. Lewenstein and A. Sanpera

EDITORIAL
258 Engaging Iran by Glenn Schweitzer and Norman Neureiter
MOLECULAR BIOLOGY
A Shared Docking Motif in TRF1 and TRF2 Used for Differential
Recruitment of Telomeric Proteins
Y. Chen et al.
Two similar members of the protein complex that protects the free ends of
chromosomes have distinct binding sites for other complex members and
accessory proteins.
10.1126/science.1151804

CELL BIOLOGY
Differential Regulation of Dynein and Kinesin Motor Proteins by Tau
R. Dixit, J. L. Ross, Y. E. Goldman, E. L. F. Holzbaur
The motor proteins dynein and kinesin both encounter the protein tau as they move
along the microtubules; the former reverses direction, whereas the latter detaches.
10.1126/science.1152993

RESEARCH ARTICLES
PHYSICS
Time-Resolved Observation and Control of
Supereexchange Interactions with Ultracold Atoms
in Optical Lattices
S. Trotzky et al.
Ultracold atoms trapped at sites of optical lattices are used to
investigate the superexchange interaction between neighboring
spins. >> Perspective p. 292

NEUROSCIENCE
Lhx2 Selector Activity Specifies Cortical Identity
and Suppresses Hippocampal Organizer Fate
V. S. Mangale et al.
The brain’s cortex begins as a one-cell-thick sheet of stem cells,
whose ultimate identity is specified by a gene that suppresses
noncortical cell fates. >> Perspective p. 288

REPORTS
ASTRONOMY
Million-Degree Plasma Pervading the Extended
Orion Nebula
M. Güdel et al.
Million-degree gas fills the Orion Nebula, implying that shock-heated
gas from stellar outflows is common in our Galaxy. >> Perspective p. 289
CHEMISTRY
Elementary Structural Motifs in a Random Network of Cytosine Adsorbed on a Gold(111) Surface
R. Otero et al.
Upon cooling, cytosine molecules on a gold surface form a disordered network based on the assembly of three elementary structural units, which may have analogies with glasses.

GEOPHYSICS
The Subduction Zone Flow Field from Seismic Anisotropy: A Global View
M. D. Long and P. G. Silver
Identification of the fastest seismic-wave propagation speed in subduction zones reveals that trench migration induces flow in the mantle above and beneath the subducting slab.

EVOLUTION
A Localized Negative Genetic Correlation Constrains Microevolution of Coat Color in Wild Sheep
J. Gratten et al.
Although the fitness of wild sheep increases with size, large, dark sheep are becoming rarer because color is genetically linked to genes that decrease fitness.

ECOLOGY
Coastal Ecosystem-Based Management with Nonlinear Ecological Functions and Values
E. B. Barbier et al.
Taking into account the nonlinear relation between preserved habitat area and wave attenuation facilitates integrated management of coastal conservation and development.

DEVELOPMENTAL BIOLOGY
β-Catenin Defines Head Versus Tail Identity During Planarian Regeneration and Homeostasis
K. A. Gurley, J. C. Rink, A. S. Alvarado
Smed-β-catenin-1 Is Required for Anteroposterior Blastema Polarity in Planarian Regeneration
C. P. Petersen and P. W. Reddien
After the head or tail of a planarian is severed, the signal intensity of a prominent developmental signaling pathway controls whether a new head or tail regenerates.

GENETICS
Natural Genetic Variation in Lycopene Epsilon Cyclase Tapped for Maize Biofortification
C. E. Harjes et al.
Identification of the gene that controls vitamin A levels in maize will allow production of varieties that can improve global health without using transgenic methods.

CELL BIOLOGY
Dual Positive and Negative Regulation of Wingless Signaling by Adenomatous Polyposis Coli
C. M. Takacs et al.
An important developmental signaling molecule known to be a tumor suppressor can also activate growth, possibly explaining the responses of some cancers.

MEDICINE
Initiating and Cancer-Propagating Cells in TEL-AML1–Associated Childhood Leukemia
D. Hong et al.
Identical twins each carry preleukemic cells containing the characteristic chromosomal translocation, but only one undergoes further genetic changes and develops leukemia.

BIOCHEMISTRY
Effects of Molecular Memory and Bursting on Fluctuations in Gene Expression
J. M. Pedraza and J. Paulsson
A theory of stochastic gene expression suggests that noise can be modulated without feedback loops, complicating interpretation of single-cell experiments.
SCIENCE SIGNALING

PERSPECTIVE: The Endoplasmic Reticulum Takes Center Stage in Cell Cycle Regulation
P. Fearon and O. Cohen-Fix
The ER appears to play a key role in controlling the spatial localization of proteins involved in the cell cycle.

ST NETWATCH: UCSC Genome Bioinformatics
Analyze your gene of interest in a range of organisms using the tools available at the UCSC Genome Browser; in Bioinformatics Resources.

CREDITS: (SCIENCE NOW) JACQUES TIZIOU/CORBIS/SYGMA; (SCIENCE CAREERS) SYLVIA WESTENBROEK/CREATIVE COMMONS

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