SPECIAL SECTION

Cities

INTRODUCTION
Reimagining Cities 739

NEWS
China’s Living Laboratory in Urbanization 740
Calming Traffic on Bogotá’s Killing Streets 742
Durban’s Poor Get Water Services Long Denied 744
Pipe Dreams Come True 745
Rebuilt From Ruins, a Water Utility Turns Clean and Pure 746
Living in the Danger Zone 748
Choking on Fumes, Kolkata Faces a Noxious Future 749
From Gasoline Alleys to Electric Avenues 750
Unclogging Urban Arteries
Upending the Traditional Farm 752
Imagining a City Where (Electrical) Resistance Is Futile 753
Money—with Strings—to Fight Poverty 754
Building on a Firm Foundation

REVIEWS
ECOLOGY: Global Change and the Ecology of Cities 756
N. B. Grimm et al.
ECONOMICS: Urbanization and the Wealth of Nations 772
D. E. Bloom, D. Canning, G. Fink

PERSPECTIVES
The Urban Transformation of the Developing World 761
M. R. Montgomery
Reproducing in Cities 764
R. Mace
Health and Urban Living 766
C. Dye
The Size, Scale, and Shape of Cities 769
M. Batty

>> Editorial p. 697; for related online material, see p. 691
or go to www.sciencemag.org/cities

NEWS OF THE WEEK
Kenyan Scientists Endure Violent Unrest, University Closings 708
Lifting the Veil on Traditional Chinese Medicine 709
Exotic Disease of Farm Animals Tests Europe’s Responses 710

SCIENCESCOPE 711
Prizes Eyed to Spur Medical Innovation 713

NEWS FOCUS
A Science Budget of Choices and Chances 714
A Broken Record?
Near-Term Energy Research Prospers
NIH Hopes for More Mileage From Roadmap
Earth Gets a Closer Look

Can the Upstarts Top Silicon? 718
MESSENGER Flyby Reveals a More Active and Stranger Mercury 721
Berkeley Hyenas Face an Uncertain Future 722

>> Cities special section p. 739
Land Clearing and the Biofuel Carbon Debt
J. Fargione, J. Hill, D. Tilman, S. Polasky, P. Hawthorne
10.1126/science.1152747

Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land Use Change
T. Searchinger et al.
Converting forests and grasslands to biofuel crop production results in a net carbon flux to the atmosphere for decades despite any displacement of fossil fuel use.
10.1126/science.1151861

TOPLESS Mediates Auxin-Dependent Transcriptional Repression During Arabidopsis Embryogenesis
H. Szemenyei, M. Hannon, J. A. Long
A transcriptional co-repressor is part of the protein complex that inhibits developmental gene activation in Arabidopsis until the growth hormone auxin triggers its degradation.
10.1126/science.1151461

Synaptic Protein Degradation Underlies Destabilization of Retrieved Fear Memory
S.-H. Lee et al.
Upon recollection, mouse memories of fearful situations become labile, as postsynaptic proteins are degraded by proteosomes and are then reconsolidated via protein synthesis.
10.1126/science.1150541
just before it collides with a nickel

Physical sciences

Observation of the Spin Hall Effect of Light via Weak Measurements
O. Hosten and P. Kwiat
Displacement of light at an air-glass interface depends on its polarization, showing that photons have a spin Hall effect comparable to that seen for electrons. >> Perspective p. 733

Chemistry

Bond-Selective Control of a Heterogeneously Catalyzed Reaction
D. R. Killelea, V. L. Campbell, N. S. Shuman, A. L. Utz
Exciting the CH bond in CHD3 just before it collides with a nickel surface minimizes dissipation of the collision energy throughout the molecule, allowing selective bond scission. >> Perspective p. 736

Materials science

Colossal Positive and Negative Thermal Expansion in the Framework Material Ag3[Co(CN)6]3
A. L. Goodwin et al.
Like a lattice fence, a silver-based framework material expands greatly in one direction upon heating, while contracting even more in the orthogonal direction.

Biophysics

Elastic Anisotropy of Earth’s Inner Core
A. B. Belonoshko et al.
Simulations show that at high pressures sound waves travel through the body-centered cubic structure of iron faster in one direction, explaining seismic data on the inner core.

Climate change

The Spatial Pattern and Mechanisms of Heat-Content Change in the North Atlantic
M. S. Lozier et al.
Warming and cooling in different parts of the North Atlantic since 1950 reflects variable atmospheric circulation, complicating understanding of anthropogenic changes.

Ecology

Direct and Indirect Effects of Resource Quality on Food Web Structure
T. Bukovinszky, F. J. F. van Veen, Y. Jongema, M. Dicke
Food webs that contain either Brussels sprouts or a wild Brassica relative have surprisingly large differences in structure and complexity, extending to three trophic levels.

Biophysics

Biomechanical Energy Harvesting: Generating Electricity During Walking with Minimal User Effort
J. M. Donelan et al.
A knee-mounted device can generate several watts of power at the end of each leg swing in a process similar to regenerative braking in hybrid cars.

Biology

Three-Dimensional Super-Resolution Imaging by Stochastic Optical Reconstruction Microscopy
B. Huang, W. Wang, M. Bates, X. Zhuang
Three-dimensional fluorescence images of cellular structures in fixed cells are realized at 20- to 30-nanometer lateral and 50-nanometer axial resolution, without scanning.

Genetics

An Association Between the Kinship and Fertility of Human Couples
A. Helgason et al.
The extensive genealogies of the Icelandic people show that couples who are 3rd or 4th cousins have more children and grandchildren than couples whose relationships are more or less distant.

Molecular biology

Runx Complexes in Cytotoxic T Cell Development
R. Krishnakumar et al.
Repression of the transcription factor Th-POK by the Runx complex—necessary for a cytotoxic rather than a helper T cell—is controlled by repression of the helper T cell transcription factor by a second transcription factor.

Medicine

A Heme Export Protein Is Required for Red Blood Cell Differentiation and Iron Homeostasis
S. B. Keel et al.
A mouse cell-surface protein exports excess heme, which is toxic when free in the cytoplasm, ensuring normal red blood cell maturation and systemic iron balance.
Team Uncovers New Evidence of Recent Human Evolution
Adaptation to disparate environments resulted in mutations related to obesity and diabetes.

Don’t It Make Your Brown Eyes Blue?
Researchers locate genetic change that leads to baby blues, and it’s not where they expected.

Move Over Beavers, Here Come Salmon
The big fish don’t just swim upstream—they shape the stream.

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C. Wald
A mentor and student turned their differences into strengths as they became scientific collaborators.

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P. Fiske
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Perspective: Novel Roles for the NF-κB Signaling Pathway in Regulating Neuronal Function
M. C. Boersma and M. K. Meffert
Components of the NF-κB pathway may use multiple mechanisms to influence synaptic plasticity, learning, and memory.

Perspective: Exosomes Secreted by Bacterially Infected Macrophages Are Proinflammatory
H. C. O’Neill and B. J. C. Quah
The release of bacterial components in vesicles secreted by infected macrophages helps promote inflammation.

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Video: Cities
An accompaniment to this week’s special section exploring the benefits and challenges of urbanization.

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