SPECIAL SECTION -

Working with Waste

INTRODUCTION

662 More Treasure Than Trash

NEWS

- 664 World of Waste
- 668 Garbology 101: Getting a Grip on Waste Modern-Day Waste Pickers >> Science Podcast
- 673 Finding a New Way to Go
- 674 Water Reclamation Going Green A Better Way to Denitrify Wastewater
- 676 Save Pave the World!
- 679 Getting Minds Out of the Sewer >> Science Podcast

REVIEWS

681 Taking the "Waste" Out of "Wastewater" for Human Water Security and Ecosystem Sustainability S. B. Grapt et al.

- B. K. Reck and T. E. Graedel
 >> Science Podcast
- 695 Valorization of Biomass:

 Deriving More Value from Waste
 C. O. Tuck et al.

Conversion of Wastes into Bioelectricity and Chemicals by Using Microbial

Electrochemical Technologies

Challenges in Metal Recycling

B. E. Logan and K. Rabaey

PERSPECTIVES

- 700 Recycling of the #5 Polymer
 M. Xanthos
- 702 The Challenges of Reusing Mining and Mineral-Processing Wastes Z. Bian et al.
- >> Editorial p. 623 and videos at www.sciencemag.org/special/waste



page 636

BOOKS ET AL.

- 647 The Viral Storm
 N. Wolfe, reviewed by B. A. Han et al.
- 648 Breaking into the Lab S. V. Rosser, reviewed by K. Andersen

POLICY FORUM

649 Water Sustainability for China and Beyond
J. Liu and W. Yang

PERSPECTIVES

- 651 A Henipavirus Vaccine in Sight
 V. von Messling and R. Cattaneo
 >> Sci. Transl. Med. Research Article by
 K. N. Bossart et al.
- 652 Uncovering the Uranium-Nitrogen Triple Bond A. P. Sattelberger and M. J. A. Johnson >> Report p. 717
- 653 Precursor or Charge Supplier?
 G. D. Fairn and S. Grinstein
 >> Report p. 727
- A Different Angle on Light Communications
 A. E. Willner et al.
- 656 Ice Sheets in Transition
 P. U. Clark
 >> Research Article p. 704
- 658 Leveraging Shear Stress to Bust Clots with Nanoparticles
 E. Lavik and J. Ustin
 >> Report p. 738

CONTENTS continued >>

EDITORIAL

623 An End to Waste?

Janet G. Hering

>> Working with Waste section p. 662;

Science Podcast NEWS OF THE WEEK

628 A roundup of the week's top stories

NEWS & ANALYSIS

- 631 Congress Ready to Extend Budget at Current Levels
- 632 Scientists Sue to Halt Financial Disclosure Rule
- 633 Are World Oil's Prospects Not Declining All That Fast?
- 634 With Eye to Innovation, China Revamps Its Universities

635 A New Face Reveals Multiple Lineages Alive at the Dawn of Our Genus Homo

NEWS FOCUS

- 636 Attack of the Clones
- 539 Can Afghan Universities Recover From War, Taliban, and Neglect?
- 642 Neandertal Champion Defends the Reputation of Our Closest Cousins

LETTERS

644 Predicting the Next Influenza Virus
5. Krauss and R. G. Webster
Steps Forward for Greece

N. M. Stavrakakis et al. Mainstreaming Systems Science

P. Dargusch and C. Smith

644 NextGenVOICES

646 CORRECTIONS AND CLARIFICATIONS
646 TECHNICAL COMMENT ABSTRACTS



COVER

Recycling aluminum cans (shown here in bales at a facility in Philadelphia, PA) is just one of the many approaches directed toward doing something productive with the world's ever-expanding stream of waste. In the special section Working with Waste (page 662), we survey multifaceted efforts to tackle this global challenge. For the story behind the cover, go to http://scim.ag/cov6095.

Photo: Huguette Roe, www.hroephoto.com

DEPARTMENTS

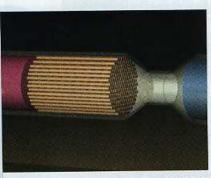
620 This Week in Science 624 Editors' Choice

626 Science Staff

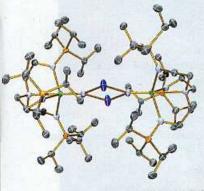
757 New Products

758 Science Careers

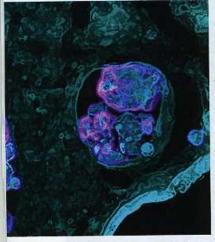
MARYLAND, SCHOOLS OF MEDICINE AND NURSING



pages 659 & 713



pages 652 & 717



pages 658 & 738

- 659 Low-Temperature Oxidation of Methane
 R. J. Farrauto
 - >> Report p. 713
- 661 Retrospective: Elinor Ostrom (1933–2012)
 R. K. Wilson

RESEARCH ARTICLE

704 Evolution of Ocean Temperature and Ice
Volume Through the Mid-Pleistocene
Climate Transition
H. Elderfield et al.
The effects of changes in ice volume and
ocean temperature during the mid-Pleistocene
transition have now been resolved.
>> Perspective p. 656

REPORTS

- 710 Divergent Nematic Susceptibility in an Iron Arsenide Superconductor
 J.-H. Chu et al.

 Electrons are shown to drive a structural
 transition in a pnictide superconductor.
- 713 Exceptional Activity for Methane
 Combustion over Modular Pd@CeO₂
 Subunits on Functionalized Al₂O₃
 M. Cargnello et al.
 A catalyst allows complete combustion of methane, a more powerful greenhouse gas than carbon dioxide, to occur at lower temperatures.
 >> Perspective p. 659
- 717 Synthesis and Structure of a Terminal
 Uranium Nitride Complex
 D. M. King et al.
 A uranium triple bond to nitrogen makes use
 of the heavy element's f orbitals.
 >> Perspective p. 652
- 721 The Provenances of Asteroids, and Their Contributions to the Volatile Inventories of the Terrestrial Planets

 C. M. O'D. Alexander et al.

 Hydrogen isotopic analysis of primitive meteorites implicates asteroids as early sources of Earth's water.
- Rupture Branching During the 2012 M_w 8.6 Sumatra Earthquake
 L. Meng et al.
 The mechanics of the largest strike-slip earthquake ever recorded give clues about how intraplate earthquakes rupture.

Earthquake in a Maze: Compressional

PI4P and PI(4,5)P₂ Are Essential
But Independent Lipid Determinants
of Membrane Identity
G. R. V. Hammond et al.
The phospholipid phosphatidylinositol
4-phosphate defines important physical
properties of the cell membrane.

>> Perspective p. 653

- 730 Lineage Tracing Reveals Lgr5* Stem Cell
 Activity in Mouse Intestinal Adenomas
 A. G. Schepers et al.
 Multicolor reporter genes signal the fate
 of stem cells that fuel the growth of intestinal
 tumors in mice.
- 735 Closed-Loop Control of Epilepsy
 by Transcranial Electrical Stimulation
 A. Berényi et al.
 In a rodent model of petit mal epilepsy,
 the onset of a seizure triggers an electrical
 pulse that cuts short the seizure.
- 738 Shear-Activated Nanotherapeutics for Drug Targeting to Obstructed Blood Vessels N. Korin et al.
 Nanoparticles carrying a drug that dissolves blood clots disintegrate at sites of stenosis.
 >> Perspective p. 658
- 742 Drosophila Dosage Compensation
 Involves Enhanced Pol II Recruitment
 to Male X-Linked Promoters
 T. Conrad et al.
 Boosting gene expression from the entire
 X chromosome in males happens mainly
 at the level of transcription initiation.
- 746 Fate-Restricted Neural Progenitors in the Mammalian Cerebral Cortex S. J. Franco et al. Where cortical neurons end up is determined before they begin to move.
- 749 Bergmann Glial AMPA Receptors Are Required for Fine Motor Coordination A. S. Saab et al. Signaling by glial cells helps to preserve cerebellar neurons that control movements.
 - The Pulvinar Regulates Information
 Transmission Between Cortical Areas
 Based on Attention Demands
 Y. B. Saalmann et al.
 A region of the thalamus synchronizes
 neuronal firing in two cortical areas
 and thus allocates attention.