

EDITORIAL

- 1265 A Perverted View of "Impact"
Marc Kirschner

NEWS OF THE WEEK

- 1270 A roundup of the week's top stories

NEWS & ANALYSIS

- 1272 Network Science at Center of Surveillance Dispute
- 1273 Bold Plan, Uncertain Future for Gun Violence Research
- 1274 Educators, Lawmakers Question Proposed Reorganization
- 1275 NSF Cedes Little Ground on Political Science Reviews
- 1277 Magnet on the Mighty Mississippi: A New Life for Muon Experiment

NEWS FOCUS

- 1278 On the Trail of Ancient Killers
 >> *Science Express Report* by *V. J. Schuenemann et al.*
- 1283 Geophysical Exploration Linking Deep Earth and Backyard Geology
 >> *Science Podcast*

LETTERS

- 1287 The Age of Man: A Father Figure
U. Kutschera
- The Age of Man: Outpacing Evolution
J. Settele and J. H. Spangenberg
- Shale-Gas Plans Threaten China's Water Resources
H. Yang et al.
- The Human Animal
K. Quillin

1288 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

- 1289 Exotic Aliens
V. Thapar et al., reviewed by C. Packer
- 1290 The Quantum Divide
C. Gerry and K. Bruno, reviewed by D. Browne

POLICY FORUMS

- 1291 A Human Right to Science
A. Chapman and J. Wyndham
- 1292 Dark Clouds over Spanish Science
L. Santamaría et al.

PERSPECTIVES

- 1293 Better Oxygen Delivery
E. L. Rezende
 >> *Research Article p. 1303; Reports pp. 1324 and 1327*
- 1294 Watch Water Flow
J. Abramson and A. S. Vartanian
 >> *Report p. 1346*
- 1295 Circuit Logic of Avoidance and Attraction
C.-Y. Su and J. R. Carlson
 >> *Reports pp. 1334 and 1338*
- 1297 Cold-Atom Magnetism
J. V. Porto
 >> *Report p. 1307*
- 1298 Two Two-Dimensional Materials Are Better than One
J. M. Hamm and O. Hess
 >> *Report p. 1311*
- 1299 Rapid Aging Rescue?
T. E. Johnson
 >> *Report p. 1330*
- 1300 Water in the Balance
J. S. Famiglietti and M. Rodell
 >> *Science Podcast*

REVIEW

- 1302 Cerebral Asymmetry and Language Development: Cause, Correlate, or Consequence?
D. V. M. Bishop
Review Summary; for full text: <http://dx.doi.org/10.1126/science.1230531>

CONTENTS continued >>



page 1278



page 1289

ON THE WEB THIS WEEK

>> **Science Express**
 Read about medieval versus modern leprosy, fossilized muscles for primitive jaws, ice shelf melting around Antarctica, and more.

>> **Find More Online**
 Check out *Science Express*, our podcast, videos, daily news, our research journals, and *Science Careers* at www.sciencemag.org.



COVER

Polished thin section (70 micrometers) of volcanic glass, sample catalog number NMNH115296-3, in transmitted light (14 by 18 millimeters). Molten lava erupted onto the sea floor freezes to glass and minerals that contain clues to the lava's ancient past and origin in Earth's deep interior. Volcanic glasses such as this one may reveal a link between Earth's oxidation state and the deep carbon cycle. See page 1314.

Image: *G. Macpherson, T. Gooding, and E. Cottrell*

DEPARTMENTS

- 1264 This Week in *Science*
- 1267 Editors' Choice
- 1268 *Science* Staff
- 1353 New Products
- 1354 *Science Careers*

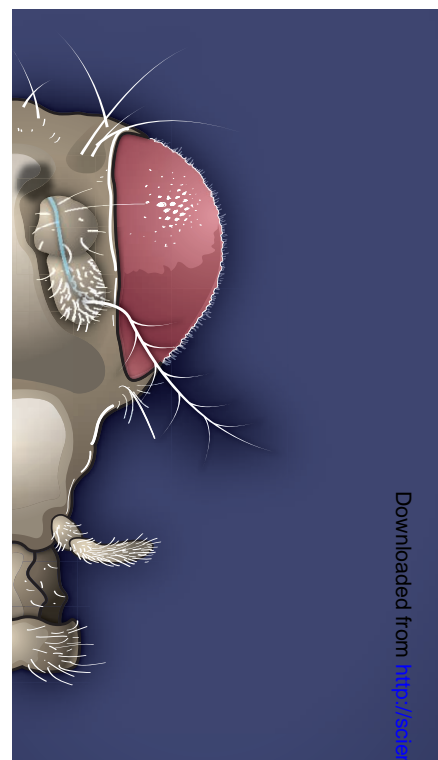
RESEARCH ARTICLE

- 1303** Evolution of Mammalian Diving Capacity Traced by Myoglobin Net Surface Charge
S. Mirceta et al.
Increasing the number of charged amino acids allows for higher myoglobin concentrations in the muscles of diving mammals.
Research Article Summary; for full text:
<http://dx.doi.org/10.1126/science.1234192>
>> *Perspective p. 1293; Reports pp. 1324 and 1327*

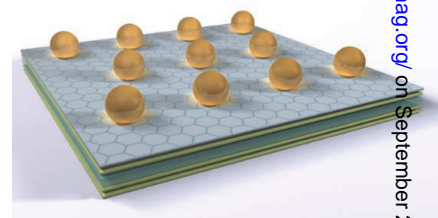
REPORTS

- 1304** Terahertz Metamaterials for Linear Polarization Conversion and Anomalous Refraction
N. K. Grady et al.
A metasurface-based design is used for polarization conversion in the terahertz regime.
- 1307** Short-Range Quantum Magnetism of Ultracold Fermions in an Optical Lattice
D. Greif et al.
A redistribution of entropy in an optical lattice loaded with atoms leads to magnetic correlations.
>> *Perspective p. 1297*
- 1311** Strong Light-Matter Interactions in Heterostructures of Atomically Thin Films
L. Britnell et al.
Transition metal dichalcogenides sandwiched between two layers of graphene produce an enhanced photoresponse.
>> *Perspective p. 1298*
- 1314** Redox Heterogeneity in Mid-Ocean Ridge Basalts as a Function of Mantle Source
E. Cottrell and K. A. Kelley
Subducted carbon from ancient oceanic crust results in a more reduced mantle.
- 1317** Hydrogen Isotopes in Lunar Volcanic Glasses and Melt Inclusions Reveal a Carbonaceous Chondrite Heritage
A. E. Saal et al.
Hydrogen isotope ratios in lunar samples imply a common origin for Earth's and the Moon's water.
- 1320** Clarifying the Dominant Sources and Mechanisms of Cirrus Cloud Formation
D. J. Cziczo et al.
Mineral dust and metallic particles initiate most ice nucleus condensation during cirrus cloud formation.

- 1324** Epistasis Among Adaptive Mutations in Deer Mouse Hemoglobin
C. Natarajan et al.
Deer mice have discovered that mutations distant from the oxygen-binding site help them live at high altitude.
- 1327** Root Effect Hemoglobin May Have Evolved to Enhance General Tissue Oxygen Deliveries
J. L. Rummer et al.
The evolutionary origin of the unloading of oxygen at low pH is traced back to teleosts.
>> *Perspective p. 1293; Research Article p. 1303*
- 1330** Targeting Isoprenylcysteine Methylation Ameliorates Disease in a Mouse Model of Progeria
M. X. Ibrahim et al.
Reduced protein methyltransferase activity improves progeria-like disease phenotypes.
>> *Perspective p. 1299*
- 1334** The Molecular Basis for Attractive Salt-Taste Coding in *Drosophila*
Y. V. Zhang et al.
Low or high concentrations of sodium chloride activate distinct receptor pathways and, hence, elicit attractive or aversive responses.
- 1338** Parallel Neural Pathways Mediate CO₂ Avoidance Responses in *Drosophila*
H.-H. Lin et al.
Different concentrations of carbon dioxide activate distinct projection neurons and, hence, elicit different responses.
>> *Perspective p. 1295*
- 1342** Multisensory Control of Hippocampal Spatiotemporal Selectivity
P. Ravassard et al.
Virtual reality reveals how sensory cues differentially influence brain activity involved in sensing place in rats.
- 1346** Subangstrom Resolution X-Ray Structure Details Aquaporin-Water Interactions
U. Kosinska Eriksson et al.
A really, really close-up view of an aquaporin hints at how water passes through but protons do not.
>> *Perspective p. 1294*



pages 1295, 1334, & 1338



pages 1298 & 1311

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2013 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96178, Washington, DC 20090-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$30.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.

Science

340 (6138)

Science **340** (6138), 1264-1353.

ARTICLE TOOLS

<http://science.sciencemag.org/content/340/6138>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2013 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works.