

NEANDERTAL INTELLIGENCE
Surprising Clues to What They Knew

ALZHEIMER'S ADVANCES
New Keys to Thwarting Dementia

SCIENTIFIC AMERICAN

June 2010

www.ScientificAmerican.com

Does
TIME
Really Exist?
PAGE 40

The Big One
Synthetic Life
Self-Aware Machines
Extra Dimensions
Alien Intelligence
Human Cloning

Nuclear War
Fusion Energy
Everyday Superconductors
Asteroid Collision
Deadly Pandemic
Polar Meltdown

12 EVENTS THAT WILL CHANGE EVERYTHING AND NOT IN THE WAYS YOU THINK



\$5.99 U.S. U.K. £4.20

20

WHAT THE FUTURE HOLDS

12 Events That Will Change Everything

Certain natural and man-made events could happen suddenly and at any time, completely transforming societies.

MEDICINE

32 Alzheimer's: Forestalling the Darkness

By Gary Stix

Intervening before symptoms appear may be key to avoiding the leading cause of dementia.

PHYSICS

40 Is Time an Illusion?

By Craig Callender

The concepts of time and change, argue some physicists, emerge from a universe that, at root, is utterly static.

ENVIRONMENT

48 Washing Carbon Out of the Air

By Klaus S. Lackner

Machines could absorb carbon dioxide from the atmosphere, slowing or even reversing its rise and reducing global warming.

ARCHAEOLOGY

54 Did Neandertals Think Like Us?

By Kate Wong

In an interview, Neandertal expert João Zilhão defends his controversial view that our oft-maligned relatives shared our cognitive abilities.

EARTH SCIENCE

58 The Earth's Missing Ingredient

By Kei Hirose

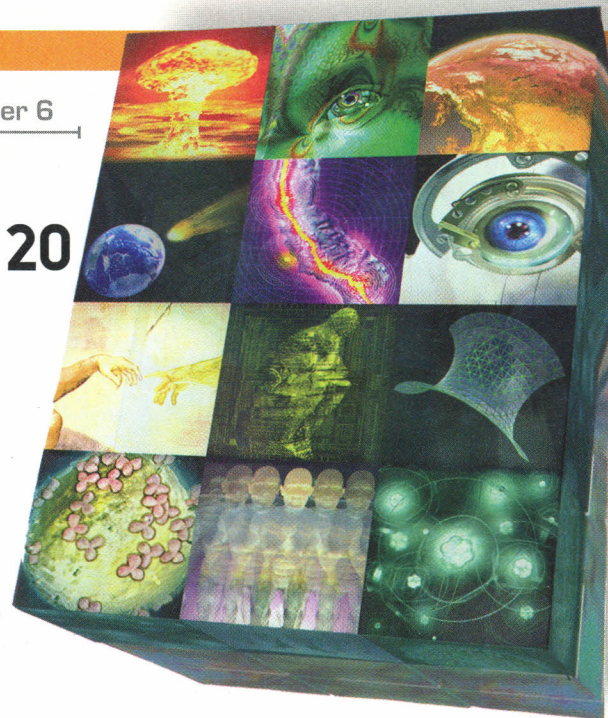
The discovery of a highly dense mineral that sits at the bottom of the mantle has yielded fascinating clues to the planet's history.

SECURITY

66 Fake Botox, Real Threat

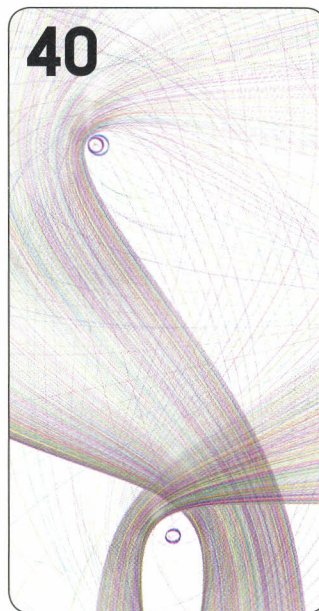
By Ken Coleman and Raymond A. Zilinskas

A booming market for a counterfeit beauty product is raising the odds that a deadly biological weapon will fall into the wrong hands.



JEAN-FRANÇOIS PODEVIN

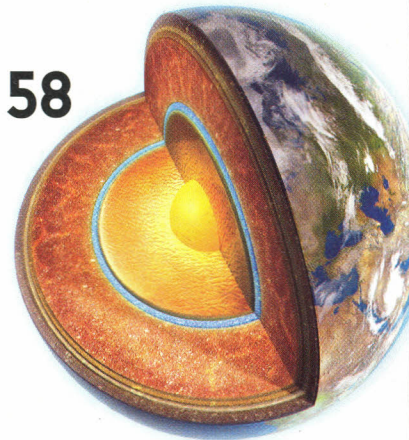
40



48



58



54



ON THE COVER

What if someone clones a human? Computers become conscious? Extraterrestrials contact us? Answers to these questions and more. Image by Jon Valk Design.

- 4 From the Editor
- 5 Letters
- 7 50, 100 & 150 Years Ago
- 8 News Scan

RESEARCH & DISCOVERY

- A new human ancestor.
- String theory revolution with “twistors.”
- A macroscopic Schrödinger’s cat.
- Teaching expertise without the need for experience.

MEDICINE & HEALTH

- Finding ways to resuscitate the Orphan Drug Act.
- A potential broad-spectrum antiviral compound.

ENERGY & ENVIRONMENT

- Predicting traffic jams one hour before they occur.
- How to get steady power from the wind.

TECHNOLOGY

- Faster transistors from a decades-old idea.
- Acoustic “bullets” for scalpel-free surgery.

16 Perspectives

By the Editors

Bioweapons prevention needs to get more scientific.

17 Sustainable Developments

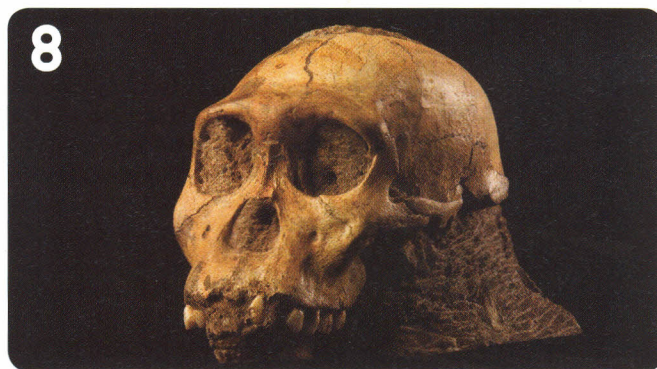
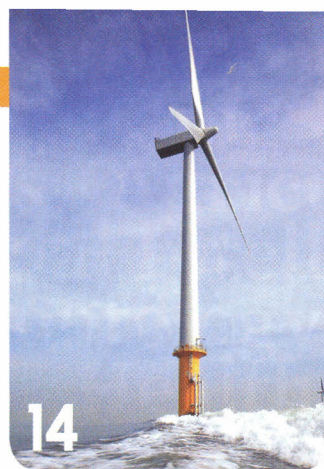
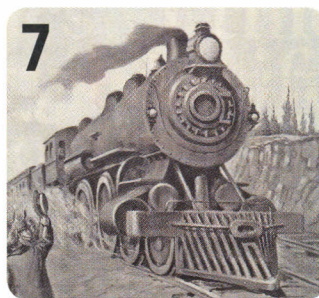
By Jeffrey D. Sachs

Millennium development goals at 10.

18 Skeptic

By Michael Shermer

When ideas have sex.



19 Critical Mass

By Lawrence M. Krauss

Why I love neutrinos.

72 Recommended

Industrious ants. Seeds of despair.

Discovering Antarctica.

C3 Anti Gravity

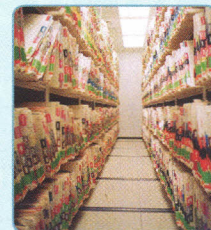
By Steve Mirsky

Presidential Harrisment.

GO TO SCIENTIFICAMERICAN.COM

Modernizing Medicine: Health Care in the Information Age

As medical records are digitized and information technology becomes more sophisticated, physicians and hospitals face a rapid transformation in the way they treat patients and track diseases.



More at www.ScientificAmerican.com/jun2010

Scientific American (ISSN 0036-8733), Volume 302, Number 6, June 2010, published monthly by Scientific American, a division of Nature America, Inc., 75 Varick Street, 9th Floor, New York, N.Y. 10013-1917. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post International Publications Mail (Canadian Distribution) Sales Agreement No. 40012504. Canadian BN No. 127387652RT; QST No. Q1015332537. Publication Mail Agreement #40012504. Return undeliverable mail to Scientific American, P.O. Box 819, Stn Main, Markham, ON L3P 8A2. Individual Subscription rates: 1 year \$39.97 (USD), Canada \$49.97 (USD), International \$61 (USD). Institutional Subscription rates: Schools and Public Libraries: 1 year \$69 (USD), Canada \$74 (USD), International \$81 (USD). Businesses and Colleges/Universities: 1 year \$299 (USD), Canada \$304 (USD), International \$311 (USD). POSTMASTER: Send address changes to Scientific American, Box 3187, Harlan, Iowa 51537. Reprints available: write Reprint Department, Scientific American, 75 Varick Street, 9th Floor, New York, N.Y. 10013-1917; fax: 646-563-7138; reprints@SciAm.com. Subscription inquiries: U.S. and Canada (800) 333-1199; other (515) 248-7684. Send e-mail to sacust@sciam.com. Printed in U.S.A. Copyright © 2010 by Scientific American, a division of Nature America, Inc. All rights reserved.

