

SPECIAL SECTION

Breast Cancer

INTRODUCTION

1451 A Race Still Unfinished

NEWS

1452 Breast Cancer: A World of Differences

1454 Dare to Do Less

1457 The 'Other' Breast Cancer Genes

1460 The Advocate

PERSPECTIVES

 1462 "The Race" to Clone *BRCA1*
M.-C. King

>> Science Podcast

 1466 Two Decades After *BRCA*:
Setting Paradigms in Personalized
Cancer Care and Prevention

F. J. Couch et al.

 1470 Cancer Suppression by the Chromosome
Custodians, *BRCA1* and *BRCA2*
A. R. Venkitaraman

 >> Editorial p. 1403; Perspective p. 1445; Science
Signaling Focus Issue; Sci. Transl. Med. Research Articles
by L. M. Zasadil et al. and T. N. Pathiraja et al.; Science
Careers feature by J. Carpenter; and additional reading
at www.sciencemag.org/special/breastcancer


page 1422

EDITORIAL

1403 Breast Cancer—Thinking Globally

Benjamin O. Anderson

>> Breast Cancer section p. 1451

NEWS OF THE WEEK

1412 A roundup of the week's top stories

NEWS & ANALYSIS

 1415 China Gets Serious About Its
Pollutant-Laden Soil

 1416 25 Years After the *Exxon Valdez*,
Where Are the Herring?

 1417 Oldest *Homo sapiens* Genome
Pinpoints Neandertal Input

 1418 Pioneering Womb Transplant Trial
Highlights Risks and Ethical Dilemmas

 1419 Search for Martian Life Clears
Another Hurdle

 1421 Synthetic Biologists Design 'Living
Materials' That Build Themselves

NEWS FOCUS

1422 The Camel Connection

 1426 Building the Ultimate Yeast Genome
Student Assembly Drives Yeast Project

 >> Science Express Research Article
by N. Annaluru et al.

LETTERS

 1430 Australia's Drought:
Lessons for California

A. Aghakouchak et al.

 Drug Trafficking's Effects
on Coastal Ecosystems

K. Benessaiah and J. Sayles

1431 The Buzz: Keystone XL

BOOKS ET AL.

1433 Visions of Science

J. A. Secord, reviewed by B. Lightman

1434 Particle Fever

M. Levinson, director, reviewed by M. Reece
POLICY FORUM

1436 Next Steps for Citizen Science

R. Bonney et al.
PERSPECTIVES

1439 The Axis of Tolerance

T. Aycheh and S. Jung

>> Research Article p. 1477

1440 A Different Class of Planets

A. Brandeker

>> Report p. 1490

1441 Why Mineral Interfaces Matter

A. Putnis

1443 The Resolution Revolution

W. Kühlbrandt

>> Research Article p. 1485

 1444 Molecular Tuning of Quantum
Plasmon Resonances

P. Nordlander

>> Report p. 1496

1445 Cholesterol and Cancer, in the Balance

S. Silvente-Poirot and M. Poirot

>> Breast Cancer section p. 1451

CONTENTS continued >>

ON THE WEB THIS WEEK

>> Science Podcast

 On this week's show: a look back at the race for the *BRCA1* gene and a roundup from our daily news site.

>> Find More Online

 Check out Science Express, the weekly podcast, videos, daily news, our research journals, and Science Careers at www.sciencemag.org.

COVER

 Detail of *Wishing It Was Just A Bad Dream*, a 1995 painting by Hollis Sigler. Sigler's art was featured on the cover of the 7 October 1994 issue of *Science*, which reported the discovery of the breast cancer susceptibility gene *BRCA1*. She died of the disease in 2001. In this issue, *Science* examines breast cancer research 20 years after the cloning of *BRCA1*. See the special section beginning on page 1451 and at www.sciencemag.org/special/breastcancer.

Image: Courtesy of the Jean Howard and Joseph Virde collection, Salt Lake City, UT, and the Carl Hammer Gallery, Chicago, IL.

DEPARTMENTS

 1397 This Week in *Science*

1405 Editors' Choice

1410 Science Staff

1447 AAAS News & Notes

1545 New Products

1546 Science Careers

RESEARCH ARTICLES

- 1477 **Microbiota-Dependent Crosstalk Between Macrophages and ILC3 Promotes Intestinal Homeostasis**

A. Mortha et al.

Myeloid cells, innate lymphoid cells, and the cytokines they secrete cooperate to maintain immune tolerance in the gut.

Research Article Summary; for full text:

<http://dx.doi.org/10.1126/science.1249288>

>> Perspective p. 1439

- 1478 **Early Childhood Investments Substantially Boost Adult Health**

F. Campbell et al.

Large investments in preschool children's education, health care, and nutrition provide long-term health benefits.

- 1485 **Structure of the Yeast Mitochondrial Large Ribosomal Unit**

A. Amunts et al.

The mitochondrial ribosome structure has substantially diverged from that of bacterial and eukaryotic ribosomes.

>> Perspective p. 1443

REPORTS

- 1490 **Molecular Gas Clumps from the Destruction of Icy Bodies in the β Pictoris Debris Disk**

W. R. F. Dent et al.

An asymmetric disk of dust and carbon monoxide indicates a recent large-scale collision or shepherding by an unseen planet.

>> Perspective p. 1440

- 1493 **Observation of Brownian Motion in Liquids at Short Times: Instantaneous Velocity and Memory Loss**

S. Kheifets et al.

The motions of Brownian particles are tracked and evaluated on short time scales where solvent effects play a role.

- 1496 **Quantum Plasmon Resonances Controlled by Molecular Tunnel Junctions**

S. F. Tan et al.

The optical properties of silver plasmonic dimers depend on the selection of bridging molecules.

>> Perspective p. 1444

- 1499 **Optical Broadband Angular Selectivity**

Y. Shen et al.

A photonic crystal heterostructure is designed to provide optical selection based on propagation direction.

- 1502 **Hydrologic Regulation of Chemical Weathering and the Geologic Carbon Cycle**

K. Maher and C. P. Chamberlain

Consumption of carbon dioxide through silicate weathering is regulated by the intensity of the hydrologic cycle.

- 1505 **Contribution of NAC Transcription Factors to Plant Adaptation to Land**

B. Xu et al.

Similarities are revealed in the generation of internal water transport systems in moss and *Arabidopsis*.

- 1509 **A Bacterial Tyrosine Phosphatase Inhibits Plant Pattern Recognition Receptor Activation**

A. P. Macho et al.

A plant pathogen and its host compete for control over a key phosphorylation site in an innate immune receptor.

- 1513 **A Non-Cell Autonomous Role of E(z) to Prevent Germ Cells from Turning on a Somatic Cell Marker**

S. H. Eun et al.

Somatic cells within the gonad produce a protein that stops *Drosophila* germ cells from becoming somatic.

- 1516 **The *Drosophila* Circadian Clock Is a Variably Coupled Network of Multiple Peptidergic Units**

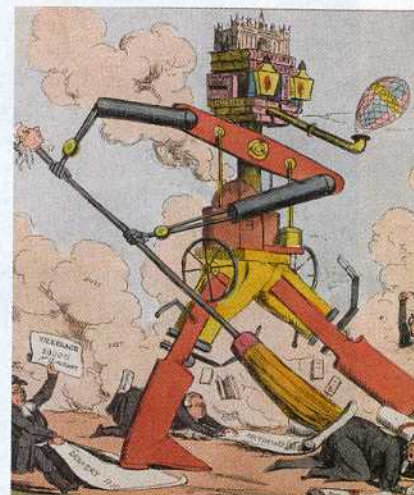
Z. Yao and O. T. Shafer

Behavioral rhythms emerge from the interactions of many independent oscillators rather than from a group of master pacemakers.

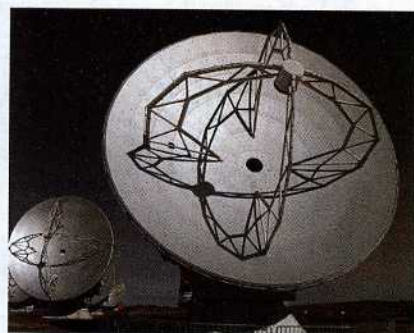
- 1520 **Quantifying Global International Migration Flows**

G. J. Abel and N. Sander

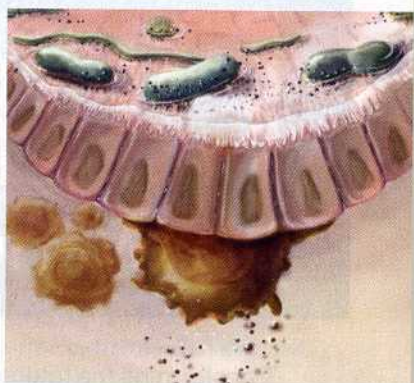
Estimates are provided for the international flow of people over 5-year periods between 1990 and 2010.



page 1433



pages 1440 & 1490



pages 1439 & 1477

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 © 2014 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): \$153 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$1282; 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.