CONTENTS

13 MAY 2016 • VOLUME 352 • ISSUE 6287

NEWS

IN BRIEF
748 News at a glance

IN DEPTH
751 NEW SCRUTINY FOR A SLOWING ATLANTIC CONVEYOR
Researchers retrieve data from biggest effort yet to monitor currents that warm Europe By E. Hand

752 ANIMALS SHOW HOW ZIKA HARMs FETUSES
Mouse and monkey models detail viral attack on the placenta and the brain By J. Cohen

754 UNEXPECTED REVELATIONS FOR STUDY VOLUNTEER
Years after signing up for a cholesterol study, a woman learns she's central to a paper By J. Couzin-Frankel

755 NSF DIRECTOR UNVEILS BIG IDEAS
Plan is aimed at the next president and Congress By J. Mervis

756 HOW THE VENUS FLYTRAP ACQUIRED ITS TASTE FOR MEAT
Plant turned preexisting defenses against insect pests into tools for catching and eating prey By E. Stokstad

FEATURES
758 RESISTANCE FIGHTERS
Evolutionary biologists are challenging old dogmas about the way antibiotics should be used By K. Kupferschmidt

762 MUSEUM DRAWERS GO DIGITAL
New technology speeds efforts of museums to display billions of natural history specimens online By N. Rogers

INSIGHTS

PERSPECTIVES
766 RECONCILIATION IN SIERRA LEONE
Short, low-cost interventions can help communities to recover from civil war By K. Casey and R. Glennerster

768 IDENTIFYING REMNANTS OF EARLY EARTH
Isotope analysis reveals portions of Earth that have remained the same since accretion By T. W. Dahl

769 TOWARD A PROSPECTIVE MOLECULAR EVOLUTION
Fitness landscapes provide a prospective understanding of chance and necessity in evolution By X. He and L. Liu

770 REMEMBERING WHAT YOU LEARNED
Specific brain activity during REM sleep affects memory consolidation By B. Kocsis

772 REFUGEE PROTECTION AND RESETTLEMENT PROBLEMS
Refugees face painful uncertainties that could be ameliorated by aid agency coordination By E. C. Dunn

774 NANOPHOTONICS GETS TWISTED
Simple structures process complex light beams that carry angular momentum By G. Molina-Terriza

775 LIVING SENTINELS FOR CLIMATE CHANGE EFFECTS
Migrating birds affected by climate change in the Arctic may have lower survival chances in their tropical habitats By M. Wikelski and G. Tertitski

776 CONFRONTING STEM CELL HYPE
Against hyperbole, distortion, and overselling By T. Caulfield et al.

778 STATES OF MIND
E. Sargent, curator; reviewed by G. Frazzetto

BOOKS ET AL.
779 THE SEVEN PILLARS OF STATISTICAL WISDOM
By S. M. Stigler, reviewed by H. Wainer

LETTERS
780 REMINDER TO DEPOSIT DNA SEQUENCES
By M. Blaxter et al.

780 CRIMEA REPORT LEAVES READERS IN THE COLD
By A. Goushchta et al.

781 RESPONSE
By T. Appenzeller

781 NEW ALLIES FIGHT FOR CHINA’S ENVIRONMENT
By S. Lu et al.
### CONTENTS

13 MAY 2016 • VOLUME 352 • ISSUE 6287

### RESEARCH

#### IN BRIEF

783 From Science and other journals

#### RESEARCH ARTICLES

786 MUCOSAL IMMUNOLOGY

IgA production requires B cell interaction with subepithelial dendritic cells in Peyer’s patches. A. Reboldi et al.

RESEARCH ARTICLE SUMMARY: FOR FULL TEXT: dx.doi.org/10.1126/science.aaf4822

787 PSYCHOLOGY

Reconciling after civil conflict increases well-being. J. Cilliers et al.

#### REPORTS

795 NONLINEAR OPTICS

Large optical nonlinearity of indium tin oxide in its epsilon-near-zero region. M. Z. Alam et al.

797 CATALYSIS

Photochemical route for synthesizing atomically dispersed palladium catalysts. P. Liu et al.

801 ORGANIC CHEMISTRY

A general alkyl-alkyl cross-coupling enabled by redox-active esters and alkylzinc reagents. T. Qin et al.

805 APPLIED PHYSICS

On-chip noninterference angular momentum multiplexing of broadband light. H. Ren et al.

806 GEOCHEMISTRY

Preservation of Earth-forming events in the tungsten isotopic composition of modern flood basalts. H. Rizo et al.

812 SLEEP RESEARCH

Causal evidence for the role of REM sleep theta rhythm in contextual memory consolidation. R. Boyce et al.

816 ZIKA VIRUS

Zika virus impairs growth in human neurospheres and brain organoids. P. P. Garcez et al.

819 CLIMATE CHANGE

Body shrinkage due to Arctic warming reduces red knot fitness in tropical wintering range. J. A. van Gils et al.

822 METALLOPROTEINS

Radical SAM catalysis via an organometallic intermediate with an Fe-(5’-C)-deoxyadenosyl bond. M. Horliti et al.

825 ATMOSPHERIC SCIENCE

Empirical evidence of contrasting soil moisture–precipitation feedbacks across the United States. S. Tuttle and G. Salvucci

828 HIV-1 ANTIBODIES

Fusion peptide of HIV-1 as a site of vulnerability to neutralizing antibody. R. Kong et al.

833 ORIGIN OF LIFE

A high-yielding, strictly regioselective prebiotic purine nucleoside formation pathway. S. Becker et al.

837 MOLECULAR EVOLUTION

The fitness landscape of a tRNA gene. C. Li et al.

840 CANCER

Histone H3K36 mutations promote sarcomagenesis through altered histone methylation landscape. C. Lu et al.

### DEPARTMENTS

747 EDITORIAL

Pursuit of integral ecology

By Marcelo Sánchez Sorondo and Verarábadran Ramanathan

862 WORKING LIFE

My seismic career shift

By Julia MacDougall

#### ON THE COVER

Red knots (Calidris canutus canutus) migrate between the high Arctic, where they breed during summer, and the West African tropics. Chicks born under rapidly warming conditions in the Arctic attain smaller sizes before migrating, and the shorter bills of these smaller birds hamper their ability to reach food on the wintering grounds. Similar warming-induced morphological changes with downstream survival effects may also extend to other Arctic migrants. See pages 775 and 819.

Photo: Jan van de Kam

Science Staff ............................................. 746
New Products ........................................... 853
Science Careers ....................................... 854

Published by AAAS

13 MAY 2016 • VOL 352 ISSUE 6287 745

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 © 2016 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): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1522; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist postage (publication No. 484460) paid at Washington, DC, and additional mailing of offices. Copyright © 2016 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): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1522; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist postage (publication No. 484460) paid at Washington, DC, and additional mailing of offices. Copyright © 2016 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): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1522; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist postage (publication No. 484460) paid at Washington, DC, and additional mailing of offices. Copyright © 2016 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): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1522; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist postage (publication No. 484460) paid at Washington, DC, and additional mailing of offices. Copyright © 2016 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): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1522; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist postage (publication No. 484460) paid at Washington, DC, and additional mailing of offices. Copyright © 2016 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): $165 ($74 allocated to subscription). Domestic institutional subscription (51 issues): $1522; Foreign postage extra: Mexico, Caribbean (surface mail) $55; other countries (air assist postage (publication No. 484460) paid at Washington, DC, and additional mailing of offices. Copyright © 2016 by the American Association for the Advancement of Science. The title SCIENCE is a register