EDITORIAL

777 Time to Deal with Antibiotics

Donald Kennedy

NEWS OF THE WEEK

782 A roundup of the week's top stories

NEWS & ANALYSIS

785 Old Dogs Teach a New Lesson About Canine Origins >> Report p. 871

786 Goal of Ending AIDS Gains Traction

787 Hint of Dark Matter May Be Just Cosmic Ray Debris

788 Initiative Aims to Minister to Mexico's Unique Genetic Heritage

789 A Putative Antiaging Drug Takes a Step From Mice to Men >> Sci. Transl. Med. Focus by S. C. Johnson et al.

NEWS FOCUS

790 The Man Who Bottled Evolution >> Science Express Report by M. J. Wiser et al.

794 Turning Up the Light >> Science Podcast

LETTERS

798 Biomedical Research: Strength from Diversity E. L. Wilder et al.

Pest Control: Embrace Marketing
D. Verissimo

Pest Control: Biopesticides' Potential K. Wilson et al.

Pest Control: Risks of Biochemical Pesticides

G. Hao and G. Yang

799 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

800 Arguments That Count
R. Slayton, reviewed by C. C. M. Mody

801 Social Learning
W. Hoppitt and K. N. Laland,
reviewed by D. M. Fragaszy and Y. Eshchar

802 Browsings

POLICY FORUMS

803 Protected Areas and Effective Biodiversity Conservation S. Le Saout et al.

805 What Does Zero Deforestation Mean? S. Brown and D. Zarin

PERSPECTIVES

808 Out of the African Humid Period
E. Bard
>> Report p. 843

809 Potential of the Synthetic Lethality Principle S. M. B. Nijman and S. H. Friend

811 A Nickel Finish Protects Silicon Photoanodes for Water Splitting J. A. Turner >> Report p. 836

812 Transposons Up the Dosage E. B. Chuong and C. Feschotte >> Report p. 846

814 Can Cancer Drugs Treat Immunodeficiency?

M. E. Conley and D. A. Fruman

>> Report p. 866

815 Understanding Lakes Near and Far S. E. Hampton

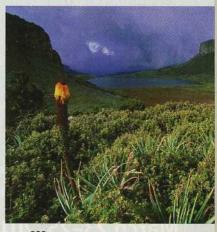
ASSOCIATION AFFAIRS

817 What's So Special About Science (And How Much Should We Spend on It?) W. H. Press

CONTENTS continued >>



page 790



page 803

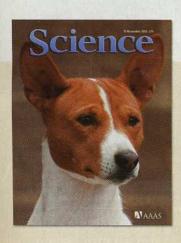
ON THE WEB THIS WEEK

>> Science Podcast

Listen to stories on the origin of domestic dogs, tracking adaptation over 50,000 generations, ramping up solar power with perovskites, 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

The Basenji represents one of the most divergent dog lineages in existence today. Genetic analyses of modern and ancient canids, including some of the oldest known dog remains, place the origin of modern dogs in Europe between 18,800 and 32,100 years ago. See pages 785 and 871.

Photo: © Barbara von Hoffmann/Alamy

DEPARTMENTS

776 This Week in Science

778 Editors' Choice

780 Science Staff

875 New Products

876 Science Careers

REVIEW

823 The Consequence of Tree Pests and Diseases for Ecosystem Services I. L. Boyd et al. Review Summary; for full text: http://dx.doi.org/10.1126/science.1235773

RESEARCH ARTICLES

824 Molecular Architecture of a Eukaryotic
Translational Initiation Complex
1. S. Fernández et al.
Cryo-electron microscopy allows the rapid
analysis of a yeast ribosome-initiator complex
from a tiny data set.
Research Article Summary; for full text:
http://dx.doi.org/10.1126/science.1240585

825 Iron(IV)hydroxide pK_a and the Role of Thiolate Ligation in C—H Bond Activation by Cytochrome P450

T. H. Yosca et al.

The basicity of an iron oxo intermediate helps explain what keeps P450 enzymes from

oxidizing their own backbone.

REPORTS

830 Room-Temperature Quantum Bit Storage
Exceeding 39 Minutes Using Ionized
Donors in Silicon-28
K. Saeedi et al.
Isotopically purified silicon is used to extend the coherence time of qubits based on phosphorus impurities.

833 Layer-Resolved Graphene Transfer via Engineered Strain Layers

J. Kim et al.

A two-step exfoliation process allows multiple transfers of oriented monolayer graphene from a silicon carbide surface.

840 Enantioselective Lewis Acid Catalysis
of Intramolecular Enone [2+2]
Photocycloaddition Reactions
R. Brimioulle and T. Bach
A catalyst attains selectivity in a
photochemical reaction by shifting the
absorption wavelength of its complexed

>> Perspective p. 811

substrate.

843 Abrupt Shifts in Horn of Africa Hydroclimate Since the Last Glacial Maximum

J. E. Tierney and P. B. deMenocal

The mid-Holocene African Humid Period ended abruptly, within centuries rather than millennia, in the Horn of Africa.

>> Perspective p. 808

846 Dosage Compensation via Transposable Element Mediated Rewiring of a Regulatory Network

C. E. Ellison and D. Bachtrog
Transposable elements facilitated

Transposable elements facilitated functional specialization of recently evolved X chromosomes in fruit flies. >> Perspective p. 812

850 High-Resolution Global Maps of 21st-Century Forest Cover Change M. C. Hansen et al.

Landsat data reveals details of forest losses and gains across the globe on an annual basis from 2000 to 2012.

853 | Changes in Cytoplasmic Volume Are Sufficient to Drive Spindle Scaling J. Hazel et al.

856 Cytoplasmic Volume Modulates Spindle
Size During Embryogenesis
M. C. Good et al.
Microfluidic techniques reveal how mitotic spindle size is regulated by titratable cytosolic factors.

860 ERF115 Controls Root Quiescent Center
Cell Division and Stem Cell Replenishment
J. Heyman et al.
Restrained growth of a key root tip region
involves an interplay between hormonal
activation and transcription factor levels.

863 Staphylococcus aureus Degrades
Neutrophil Extracellular Traps to Promote
Immune Cell Death
V. Thammavongsa et al.
Enzymes secreted by a bacterial pathogen
turn immune responses against themselves.

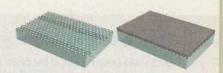
866 Phosphoinositide 3-Kinase δ Gene
Mutation Predisposes to Respiratory
Infection and Airway Damage
I. Angulo et al.
Gene sequencing of unrelated patients
with recurrent airway infections identifies
a common underlying mutation.
>> Perspective p. 814

71 Complete Mitochondrial Genomes of Ancient Canids Suggest a European Origin of Domestic Dogs O. Thalmann et al. Ancient DNA suggests that dog domestication was complex and likely originated in Europe.

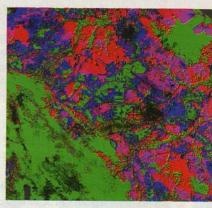
>> News story p. 785: Science Podcast

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 62 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): 5990; Foreign postage extra: Mexico, Caribbean (surface mail) 555; other countries (air assist delivery) 585. First class, arimalls, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1009624. 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 20096-6178. 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 Ubraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$36.00 per article is paid directly to CCC, 28 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0038-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.



page 833



page 850