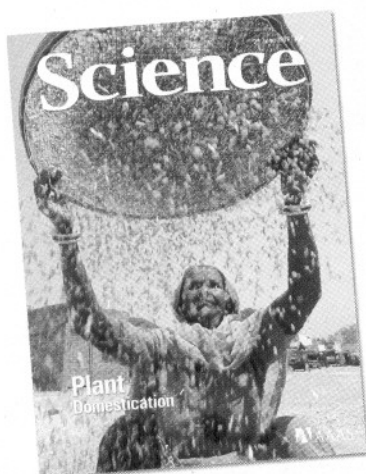




COVER

A laborer uses a sieve to separate wheat husks from the grain at a market in Amritsar, India. Two Reviews on pages 1862 and 1866 and a News story on page 1830 discuss human domestication of plants.

Photo: Narinder Nanu/AFP/Getty Images

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- 1813 *A New Dawn for Science in Africa*
by Mohamed H. A. Hassan

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- In Support of Academic Freedom 1840
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- Problems with Genome-Wide Association Studies
- D. Shriner, L. K. Vaughan, M. A. Padilla, H. K. Tiwari; S. M. Williams et al.*
- What Makes a Book a Work of Science? *M. Hewlett*
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- Summer Reading: To While Away Some Time... 1845

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- Empowering Green Chemists in Ethiopia 1849
- N. Asfaw, P. Licence, T. Engida, M. Poliakov*

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- Tantalizing *timeless* 1851
- W. Bradshaw and C. Holzapfel*
- >> *Reports pp. 1895 and 1898*
- Inside a Cosmic Train Wreck 1852
- P. Coppi*
- >> *Reports pp. 1874 and 1877*
- Evolutionary Insights from Sponges 1854
- M. W. Taylor, R. W. Thacker, U. Hentschel*
- >> *Report p. 1893*
- A Reversal of Fortune in HIV-1 Integration 1855
- A. Engelman*
- >> *Report p. 1912*
- Rhythm Engineering 1857
- W. L. Kath and J. M. Ottino*
- >> *Report p. 1886*
- A Narrow Road to Cooperation 1858
- R. Boyd and S. Mathew*
- >> *Report p. 1905*



1845



SCIENCE EXPRESS

www.sciencexpress.org

GENETICS

Genome Transplantation in Bacteria: Changing One Species to Another
C. Lartigue et al.

The intact DNA genome was isolated from one *Mycoplasma* species and transferred to another, replacing the recipient's genome and conferring its own phenotype.

10.1126/science.1144622

STRUCTURAL BIOLOGY

Crystal Structure of Inhibitor-Bound Human 5-Lipoxygenase-Activating Protein

A. D. Ferguson et al.

The structure of a human membrane protein involved in biosynthesis of the inflammation-related leukotrienes may help guide the development of therapeutics.

10.1126/science.1144346

EVOLUTION

The Near Eastern Origin of Cat Domestication

C. A. Driscoll et al.

The domestic cat and several of its closely related wild relatives originated in the Fertile Crescent over 100,000 years ago, earlier than had been thought.

10.1126/science.1139518

PHYSICS

Quantum Hall Effect in a Gate-Controlled p-n Junction of Graphene

J. R. Williams, L. DiCarlo, C. M. Marcus

Graphene sheets can be prepared to contain different regions with electron or hole carriers, at the junctions of which conductance is quantized.

10.1126/science.1144657

PHYSICS

Quantized Transport in Graphene p-n Junctions in a Magnetic Field

D. A. Abanin and L. S. Levitov

The mixing of quantum Hall edge states at the interface between different carrier regions in a graphene sheet accounts for the quantized transport through the gates.

10.1126/science.1144672

TECHNICAL COMMENT ABSTRACTS

CLIMATE CHANGE

Comment on "The Spatial Extent of 20th-Century Warmth in the Context of the Past 1200 Years"

G. Bürger

full text at www.sciencemag.org/cgi/content/full/316/5833/1844a

Response to Comment on "The Spatial Extent of 20th-Century Warmth in the Context of the Past 1200 Years"

T. J. Osborn and K. R. Briffa

full text at www.sciencemag.org/cgi/content/full/316/5833/1844b

REVIEWS

PLANT SCIENCE

Genome Plasticity a Key Factor in the Success of Polyploid Wheat Under Domestication

J. Dubcovsky and J. Dvorak

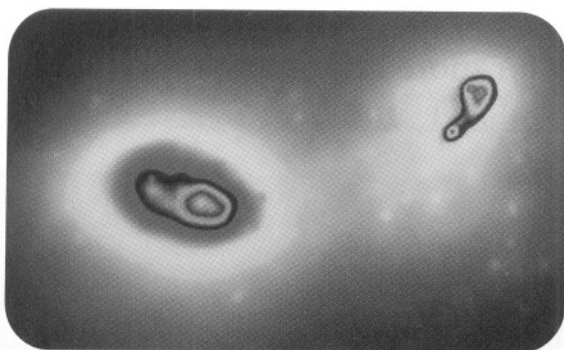
>> News story p. 1830; Report p. 1890

ECOLOGY

Domesticated Nature: Shaping Landscapes and Ecosystems for Human Welfare

P. Kareiva, S. Watts, R. McDonald, T. Boucher

>> News story p. 1830; Report p. 1890



1852 & 1877

BREVIA

BIOCHEMISTRY

Nitrite, an Electron Donor for Anoxygenic Photosynthesis

B. M. Griffin, J. Schott, B. Schink

A purple sulfur bacterium that grows in the absence of oxygen uses nitrite as an electron donor for photosynthesis, forming a nitrate product.

1870

REPORTS

PHYSICS

Non-Fermi Liquid Metal Without Quantum Criticality

C. Pfleiderer, P. Böni, T. Keller, U. K. Rößler, A. Rosch

Changes in the thermodynamic properties of MnSi at low temperature and high pressure indicate a new metallic phase rather than proximity to a quantum critical point.

1871

ASTROPHYSICS

Rapid Formation of Supermassive Black Hole Binaries in Galaxy Mergers with Gas

L. Mayer et al.

Simulations demonstrate that drag by the surrounding gas, rather than by nearby stars, slows galactic black hole pairs enough for them to coalesce within 1 million years.

1874

>> Perspective p. 1852

ASTRONOMY

Locating the Two Black Holes in NGC 6240

C. E. Max, G. Canalizo, W. H. de Vries

Adaptive optics are used to pinpoint the positions of two black holes in the collision zone between two merging galaxies.

1877

>> Perspective p. 1852

GEOPHYSICS

Body-Centered Cubic Iron-Nickel Alloy in Earth's Core

L. Dubrovinsky et al.

Experiments simulating conditions at the Earth's core show that iron nickel alloy adopts a body-centered cubic, rather than close-packed, structure above 225 gigapascals and 3400 kelvin.

1880

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CHEMISTRY

- Reversible Control of Hydrogenation of a Single Molecule** 1883

S. Katano, Y. Kim, M. Hori, M. Trenary, M. Kawai

A scanning tunneling microscope is used to dehydrogenate the N-H bonds, but not the C-H bonds, of an organic molecule adsorbed on a metal surface.

CHEMISTRY

- Engineering Complex Dynamical Structures: Sequential Patterns and Desynchronization** 1886

I. Z. Kiss, C. G. Rusin, H. Kori, J. L. Hudson

Weak, nonlinear delayed feedback among up to 64 simple electrochemical oscillators can switch them between unstable states or desynchronize all of them.

>> *Perspective p. 1857*

ARCHAEOLOGY

- Preceramic Adoption of Peanut, Squash, and Cotton in Northern Peru** 1890

T. D. Dillehay, J. Rossen, T. C. Andres, D. E. Williams

In the Peruvian Andes, agriculture began at high altitudes by about 10,000 years ago, and subsequently peanuts, squash, and cotton were farmed near large settlements.

>> *News story p. 1830; Reviews pp. 1862 and 1866*

EVOLUTION

- Sponge Paleogenomics Reveals an Ancient Role for Carbonic Anhydrase in Skeletogenesis** 1893

D. J. Jackson, L. Macis, J. Reitner, B. M. Degnan, G. Wörheide

Analysis of an extant but evolutionarily ancient reef-building sponge shows how, through duplication, one early gene gave rise to later genes for calcification.

>> *Perspective p. 1854*

EVOLUTION

- Natural Selection Favors a Newly Derived *timeless* Allele in *Drosophila melanogaster*** 1895

E. Tauber et al.

- A Molecular Basis for Natural Selection at the *timeless* Locus in *Drosophila melanogaster*** 1898

F. Sandrelli et al.

A recent variant of a circadian clock gene may alter diapause timing in wild European *Drosophila*, and selection may explain its north-south distribution.

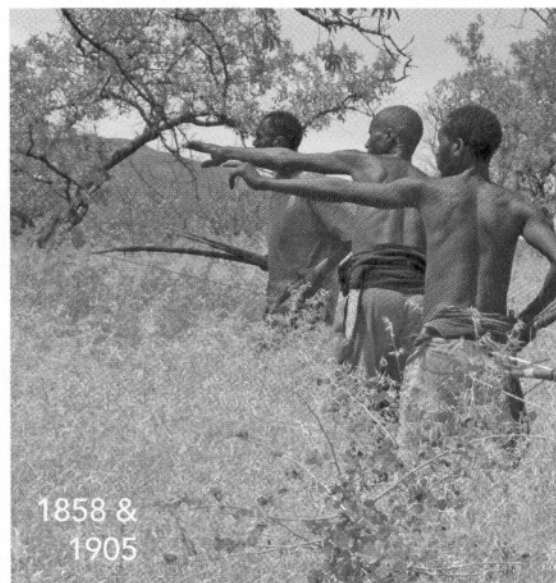
>> *Perspective p. 1851*

NEUROSCIENCE

- Dopamine-Mushroom Body Circuit Regulates Saliency-Based Decision-Making in *Drosophila*** 1901

K. Zhang, JianZeng Guo, Y. Peng, W. Xi, A. Guo

Drosophila require dopamine neurons within a memory-related area of the brain to make nuanced choices between similar stimuli.



1858 &
1905

BEHAVIOR

- Via Freedom to Coercion: The Emergence of Costly Punishment** 1905

C. Hauert, A. Traulsen, H. Brandt, M. A. Nowak, K. Sigmund

Paradoxically, a stable model of a cooperative society in which noncooperators are punished emerges if individuals have the freedom to abstain from participation. >> *Perspective p. 1858*

CELL BIOLOGY

- Parallels Between Cytokinesis and Retroviral Budding: A Role for the ESCRT Machinery** 1908

J. G. Carlton and J. Martin-Serrano

Cytokinesis, the process by which daughter cells are physically separated during cell division, uses the same machinery as viruses such as HIV use to bud from infected cells.

AIDS

- HIV-1 Proviral DNA Excision Using an Evolved Recombinase** 1912

I. Sarkar, I. Hauber, J. Hauber, F. Buchholz

Test-tube protein evolution was used to design a recombinase enzyme that can excise HIV sequences after they have been integrated into the DNA of the host cell. >> *Perspective p. 1855*

CELL BIOLOGY

- Restriction of DNA Replication to the Reductive Phase of the Metabolic Cycle Protects Genome Integrity** 1916

Z. Chen, E. A. Odstrcil, B. P. Tu, S. L. McKnight

Yeast cells in alternating respiratory and glycolytic phases synthesize new DNA and divide only during glycolysis, avoiding high mutation rates that characterize respiration.



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