Charles Darwin’s abiding interest in the classification of barnacles, illustrated here, was one of the inspirations for his investigations into the origins and diversification of species. Science marks Darwin’s 200th birthday with a special section on speciation beginning on page 727.

Image: Illustrations by George Sowerby, reproduced with permission from The Complete Work of Charles Darwin Online, John van Wyhe, Ed. (http://darwin-online.org.uk); background: iStockphoto.com
CONTENTS

BREVIA

753  The Sea-Level Fingerprint of West Antarctic Collapse  
J. X. Mitrovica et al.  
An uneven pattern of local sea-level rise would result from the collapse of the West Antarctic Ice Sheet.

REPORTS

754  The Formation of Massive Star Systems by Accretion  
M. R. Krumholz et al.  
Numerical simulations show that instabilities can channel gas into growing massive stars despite their high radiation pressure.  
>> Perspective p. 719

757  Confined Crystallization of Polyethylene Oxide in Nanolayer Assemblies  
H. Wang et al.  
Squeezing ultrathin polymer layers can induce crystallization and decrease their gas permeability.  
>> Perspective p. 725

760  Nitrogen-Doped Carbon Nanotube Arrays with High Electrocatalytic Activity for Oxygen Reduction  
K. Gong et al.  
Carbon atoms in nanotubes are activated by nitrogen doping and catalyze oxygen reduction at high pH.

764  Anomalously Metal-Rich Fluids Form Hydrothermal Ore Deposits  
J. J. Wilkinson et al.  
The metal contents of the fluid inclusions that create lead-zinc ores have been drastically underestimated.  
>> Perspective p. 724

767  Signature of the End-Cretaceous Mass Extinction in the Modern Biota  
A. Z. Krug et al.  
Increased rates of marine bivalve speciation after the Cretaceous-Tertiary extinction were most marked in the tropics.  
>> Perspective p. 720

771  A Great-Appendage Arthropod with a Radial Mouth from the Lower Devonian Hunsrück Slate, Germany  
G. Kühl et al.  
Fossil evidence for the great-appendage arthropods extends to more recent periods by about 100 million years.

773  Two Thresholds, Three Male Forms Result in Facultative Male Trimorphism in Beetles  
J. M. Rowland and D. J. Emlen  
A clade of dung beetles can alter their reproductive tactics by switching between three male forms.

776  Sequential Sympatric Speciation Across Trophic Levels  
A. A. Forbes et al.  
A host shift by a fly is causing its wasp parasite to undergo changes leading to speciation.

779  Evolution of the Drosophila Nuclear Pore Complex Results in Multiple Hybrid Incompatibilities  
S. Tang and D. C. Presgraves  
nuclear pore complex proteins are involved in lethal gene interactions in Drosophila melanogaster–D. simulans species hybrids.

782  Queen Ants Make Distinctive Sounds That Are Mimicked by a Butterfly Social Parasite  
F. Barbero et al.  
Sounds made by queen ants denoting rank are copied by the larvae and pupae of a parasitic butterfly, facilitating their infiltration into ant colonies.

785  Stability Predicts Genetic Diversity in the Brazilian Atlantic Forest Hotspot  
A. C. Carnaval et al.  
Modeling ecological niches under past climates establishes a method to improve prediction and protection of tropical biodiversity hotspots.

789  Orc1 Controls Centriole and Centrosome Copy Number in Human Cells  
A. S. Hemerly et al.  
A DNA replication factor ensures that only two centrioles are formed during cell division in animal cells.

793  Function of Mitochondrial Stat3 in Cellular Respiration  
J. Wegryn et al.  
A protein that has a nuclear function as a transcription factor also functions to support respiration in the mitochondria.  
>> Perspective p. 723

797  Platelets Kill Intraerythrocytic Malarial Parasites and Mediate Survival to Infection  
B. J. McMorran et al.  
Mouse and human platelets bind malarial-infected red cells and kill the parasite within.

800  Changes in Cortical Dopamine D1 Receptor Binding Associated with Cognitive Training  
F. McNab et al.  
Training of working memory alters brain biochemistry by changing the density of cortical dopamine receptors.  
>> Science Podcast

802  Axon Regeneration Requires a Conserved MAP Kinase Pathway  
M. Hammarlund et al.  
Axon regeneration in adult nematode worms has distinct signals that are independent of earlier developmental programs.

CONTENTS continued >>
Blue or Red? Exploring the Effect of Color on Cognitive Task Performances
R. Mehta and R. Zhu
Blue favors creativity in humans, whereas red improves attention to detail.
10.1126/science.1167969

Double Pulsar J0737-3039A/B
A. T. Deller et al.
Tests of gravity theories that use this double pulsar, now recognized as being more distant, will be more precise.
10.1126/science.1167968

Dynamic Order-Disorder in Atomistic Models of Structural Glass Formers
L. O. Hedges et al.
The liquid-to-glass transition of a simple mixture is controlled by parameters that drive the system away from equilibrium.
10.1126/science.1166665

Impositions of a VLBI Distance to the
L. C. Deller et al.

SCIENCE CAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists

February 2009 Funding News
J. Fernández
Learn about the latest in research funding, scholarships, fellowships, and internships.

Darwin’s Legacy 1: Rich Collections,
Deep Expertise
S. Carpenter
Natural history museums have reasserted their scientific relevance in recent years.

Darwin’s Legacy 2: Keeping Order
K. Travis
London entomology curator Erica McAlistor is responsible for everything from museum collections to fieldwork.

Darwin’s Legacy: Resources
Science Careers Staff
Here is a collection of resources related to careers in the H.M.S. Beagle’s wake.

SCIENCE POLeCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 6 February Science Podcast to hear about the biochemical behind better short-term memory, the genetics of wolf coat color, the origin of art, and more.

ORIGINS BLOG
blogs.sciencemag.org/origins
A History of Beginnings

SCIENCE INSIDER
blogs.sciencemag.org/scienceinsider
Science Policy News and Analysis

SCIENCE SIGNALING
www.sciencemag.org/sciencesignaling
The Signal Transduction Knowledge Environment

PERSPECTIVE: Extracellular ATP in the Immune System—More Than Just a “Danger Signal”
A. Trautmann
Extracellular ATP is an important modulator of immune responses.

PERSPECTIVE: Bistable Switches for Synaptic Plasticity
H. Ogasawara and M. Kawato
Nearly a decade intervened between theoretical predictions and experimental verification of the mechanisms underlying synaptic plasticity.

PODCAST
P. P. Pandolfi and A. M. VanHook
Inactivating mOR signaling in the adult mouse prostate decreases the incidence of cancer.

E-LETTER: Microarrays Need Phylogenetics
M. Abu-El-Arab
Interpreting microarray experiments might benefit from evolution-compatible analytical tools.

SCIENCE XPRESS
www.sciencexpress.org
Molecular and Evolutionary History of Melanism in North American Gray Wolves
T. M. Anderson et al.
Black coat color in wolves derives from a mutation that originated in domestic dogs.
10.1126/science.1165448

>> Science Podcast

Turtles Island-Hopped Their Way Across a
Widespread volcanism and tropical temperatures provide clues to origins of antisocial behavior.

SCIENCE SIGNALING
www.sciencemag.org/sciencesignaling
The Signal Transduction Knowledge Environment

PERSPECTIVE: Extracellular ATP in the Immune System—More Than Just a “Danger Signal”
A. Trautmann
Extracellular ATP is an important modulator of immune responses.

PERSPECTIVE: Bistable Switches for Synaptic Plasticity
H. Ogasawara and M. Kawato
Nearly a decade intervened between theoretical predictions and experimental verification of the mechanisms underlying synaptic plasticity.

PODCAST
P. P. Pandolfi and A. M. VanHook
Inactivating mOR signaling in the adult mouse prostate decreases the incidence of cancer.

E-LETTER: Microarrays Need Phylogenetics
M. Abu-El-Arab
Interpreting microarray experiments might benefit from evolution-compatible analytical tools.

SCIENCE CAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists

February 2009 Funding News
J. Fernández
Learn about the latest in research funding, scholarships, fellowships, and internships.

Darwin’s Legacy 1: Rich Collections,
Deep Expertise
S. Carpenter
Natural history museums have reasserted their scientific relevance in recent years.

Darwin’s Legacy 2: Keeping Order
K. Travis
London entomology curator Erica McAlistor is responsible for everything from museum collections to fieldwork.

Darwin’s Legacy: Resources
Science Careers Staff
Here is a collection of resources related to careers in the H.M.S. Beagle’s wake.

SCIENCE POLeCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 6 February Science Podcast to hear about the biochemical behind better short-term memory, the genetics of wolf coat color, the origin of art, and more.

ORIGINS BLOG
blogs.sciencemag.org/origins
A History of Beginnings

SCIENCE INSIDER
blogs.sciencemag.org/scienceinsider
Science Policy News and Analysis

SCIENCE SIGNALING
www.sciencemag.org/sciencesignaling
The Signal Transduction Knowledge Environment

PERSPECTIVE: Extracellular ATP in the Immune System—More Than Just a “Danger Signal”
A. Trautmann
Extracellular ATP is an important modulator of immune responses.

PERSPECTIVE: Bistable Switches for Synaptic Plasticity
H. Ogasawara and M. Kawato
Nearly a decade intervened between theoretical predictions and experimental verification of the mechanisms underlying synaptic plasticity.

PODCAST
P. P. Pandolfi and A. M. VanHook
Inactivating mOR signaling in the adult mouse prostate decreases the incidence of cancer.

E-LETTER: Microarrays Need Phylogenetics
M. Abu-El-Arab
Interpreting microarray experiments might benefit from evolution-compatible analytical tools.

SCIENCE XPRESS
www.sciencexpress.org
Molecular and Evolutionary History of Melanism in North American Gray Wolves
T. M. Anderson et al.
Black coat color in wolves derives from a mutation that originated in domestic dogs.
10.1126/science.1165448

>> Science Podcast

Turtles Island-Hopped Their Way Across a
Widespread volcanism and tropical temperatures provide clues to origins of antisocial behavior.

SCIENCE SIGNALING
www.sciencemag.org/sciencesignaling
The Signal Transduction Knowledge Environment

PERSPECTIVE: Extracellular ATP in the Immune System—More Than Just a “Danger Signal”
A. Trautmann
Extracellular ATP is an important modulator of immune responses.

PERSPECTIVE: Bistable Switches for Synaptic Plasticity
H. Ogasawara and M. Kawato
Nearly a decade intervened between theoretical predictions and experimental verification of the mechanisms underlying synaptic plasticity.

PODCAST
P. P. Pandolfi and A. M. VanHook
Inactivating mOR signaling in the adult mouse prostate decreases the incidence of cancer.

E-LETTER: Microarrays Need Phylogenetics
M. Abu-El-Arab
Interpreting microarray experiments might benefit from evolution-compatible analytical tools.

SCIENCE CAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists

February 2009 Funding News
J. Fernández
Learn about the latest in research funding, scholarships, fellowships, and internships.

Darwin’s Legacy 1: Rich Collections,
Deep Expertise
S. Carpenter
Natural history museums have reasserted their scientific relevance in recent years.

Darwin’s Legacy 2: Keeping Order
K. Travis
London entomology curator Erica McAlistor is responsible for everything from museum collections to fieldwork.

Darwin’s Legacy: Resources
Science Careers Staff
Here is a collection of resources related to careers in the H.M.S. Beagle’s wake.

SCIENCE POLeCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 6 February Science Podcast to hear about the biochemical behind better short-term memory, the genetics of wolf coat color, the origin of art, and more.

ORIGINS BLOG
blogs.sciencemag.org/origins
A History of Beginnings

SCIENCE INSIDER
blogs.sciencemag.org/scienceinsider
Science Policy News and Analysis

SCIENCE SIGNALING
www.sciencemag.org/sciencesignaling
The Signal Transduction Knowledge Environment

PERSPECTIVE: Extracellular ATP in the Immune System—More Than Just a “Danger Signal”
A. Trautmann
Extracellular ATP is an important modulator of immune responses.

PERSPECTIVE: Bistable Switches for Synaptic Plasticity
H. Ogasawara and M. Kawato
Nearly a decade intervened between theoretical predictions and experimental verification of the mechanisms underlying synaptic plasticity.

PODCAST
P. P. Pandolfi and A. M. VanHook
Inactivating mOR signaling in the adult mouse prostate decreases the incidence of cancer.

E-LETTER: Microarrays Need Phylogenetics
M. Abu-El-Arab
Interpreting microarray experiments might benefit from evolution-compatible analytical tools.

SCIENCE CAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists

February 2009 Funding News
J. Fernández
Learn about the latest in research funding, scholarships, fellowships, and internships.

Darwin’s Legacy 1: Rich Collections,
Deep Expertise
S. Carpenter
Natural history museums have reasserted their scientific relevance in recent years.

Darwin’s Legacy 2: Keeping Order
K. Travis
London entomology curator Erica McAlistor is responsible for everything from museum collections to fieldwork.

Darwin’s Legacy: Resources
Science Careers Staff
Here is a collection of resources related to careers in the H.M.S. Beagle’s wake.

SCIENCE POLeCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 6 February Science Podcast to hear about the biochemical behind better short-term memory, the genetics of wolf coat color, the origin of art, and more.

ORIGINS BLOG
blogs.sciencemag.org/origins
A History of Beginnings

SCIENCE INSIDER
blogs.sciencemag.org/scienceinsider
Science Policy News and Analysis

SCIENCE SIGNALING
www.sciencemag.org/sciencesignaling
The Signal Transduction Knowledge Environment

PERSPECTIVE: Extracellular ATP in the Immune System—More Than Just a “Danger Signal”
A. Trautmann
Extracellular ATP is an important modulator of immune responses.

PERSPECTIVE: Bistable Switches for Synaptic Plasticity
H. Ogasawara and M. Kawato
Nearly a decade intervened between theoretical predictions and experimental verification of the mechanisms underlying synaptic plasticity.

PODCAST
P. P. Pandolfi and A. M. VanHook
Inactivating mOR signaling in the adult mouse prostate decreases the incidence of cancer.

E-LETTER: Microarrays Need Phylogenetics
M. Abu-El-Arab
Interpreting microarray experiments might benefit from evolution-compatible analytical tools.

SCIENCE CAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists

February 2009 Funding News
J. Fernández
Learn about the latest in research funding, scholarships, fellowships, and internships.

Darwin’s Legacy 1: Rich Collections,
Deep Expertise
S. Carpenter
Natural history museums have reasserted their scientific relevance in recent years.

Darwin’s Legacy 2: Keeping Order
K. Travis
London entomology curator Erica McAlistor is responsible for everything from museum collections to fieldwork.

Darwin’s Legacy: Resources
Science Careers Staff
Here is a collection of resources related to careers in the H.M.S. Beagle’s wake.

SCIENCE POLeCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 6 February Science Podcast to hear about the biochemical behind better short-term memory, the genetics of wolf coat color, the origin of art, and more.