Head of a juvenile Nile crocodile (Crocodylus niloticus). The irregular polygonal scales on the face and jaws of crocodiles are not controlled genetically. Instead, the patterns are generated through a self-organizational process in which the stiff skin cracks in a tensional stress field as the crocodile grows. See page 78.

Photo: Michel C. Mitinkovitch and Adrien Debry
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Spin-polarized scanning tunneling microscopy is used to exert the spin-transfer torque on a small atomic cluster.

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H. Renata et al.
A synthesis showcases multiple creative indirect methods of selectively hydroxylating saturated carbon centers.

64  Hydrogen-Nitrogen Greenhouse Warming in Earth’s Early Atmosphere
R. Wordsworth and R. Pierrehumbert
Absorption of solar radiation associated with N2-N2 collisions may have been key to warming the atmosphere of early Earth.

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K. M. Cobb et al.
Coral records show the El Niño–Southern Oscillation may be less sensitive to past climate forcing than previously thought.

70  The Spatial and Temporal Origin of Chandelier Cells in Mouse Neocortex
H. Taniguchi et al.
Chandelier interneurons migrate along well-defined paths as they mingle with pyramidal neurons to build circuits.

74  An Update of Wallace’s Zoogeographic Regions of the World
B. G. Holt et al.
Mapping the geographic distribution and phylogenetic relationships of 21,037 vertebrate species yields 11 realms.

78  Crocodile Head Scales Are Not Developmental Units But Emerge from Physical Cracking
M. C. Milinkovitch et al.
Tension-induced cracks generate random polygonal scales in the keratinized skin on crocodile heads and jaws.

82  Translation Elongation Factor EF-P Alleviates Ribosome Stalling at Polyproline Stretches
S. Ude et al.
EF-P is essential for rapid synthesis of proteins containing consecutive proline residues.

85  EF-P Is Essential for Rapid Synthesis of Proteins Containing Consecutive Proline Residues
L. K. Doerfel et al.
A universally conserved translation factor facilitates synthesis of peptides that would otherwise cause ribosome stalling.

88  Para-Aminosalicylic Acid Acts as an Alternative Substrate of Folate Metabolism in Mycobacterium tuberculosis
S. Chakraborty et al.
A drug used against tuberculosis for the past 50 years is a metabolic poison and not an enzyme inhibitor.

91  Dynamic Persistence of Antibiotic-Stressed Mycobacteria
Y. Wakamoto et al.
Bacterial cells that divide before a pulse of catalase expression survive the application of the antibiotic isoniazid.

96  The End of History Illusion
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Even though we know that we’ve changed over the years, we believe, mistakenly, that we won’t change much in the future.

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71  The End of History Illusion
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Even though we know that we’ve changed over the years, we believe, mistakenly, that we won’t change much in the future.