COVER
Lake Boku at the Ounianga oasis in remote northeastern Chad, one of the few remaining bodies of water in the almost rainless Sahara. Still sustained by fossil groundwater dating from the humid past, it is doomed because of encroaching dunes. See page 765.

Photo: S. Kröpelin

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PSYCHOLOGY

The Right and the Good: Distributive Justice and Neural Encoding of Equity and Efficiency
M. Hsu, C. Anen, S. R. Quartz

A brain region linked to emotion-processing systems is activated as humans weigh fairness to an individual against benefit for a group.

>> News story p. 734
10.1126/science.1153651

MICROBIOLOGY

Anticipatory Behavior Within Microbial Genetic Networks
I. Tagkopoulos, Y.-C. Liu, S. Tavazoie

Predictable sequences of environmental signals can be exploited by bacteria so that they learn to anticipate future metabolic needs and thereby gain a competitive edge.

10.1126/science.1154456

TECHNICAL COMMENT ABSTRACTS

ATMOSPHERIC SCIENCE

Comment on “Absence of Cooling in New Zealand and the Adjacent Ocean During the Younger Dryas Chronozone”
P. J. Applegate, T. V. Lowell, R. B. Alley

Response to Comment on “Absence of Cooling in New Zealand and the Adjacent Ocean During the Younger Dryas Chronozone”
T. T. Barrows, S. J. Lehman, L. K. Fifield, P. De Deckker

REVIEW

MEDICINE

Toward an AIDS Vaccine
B. D. Walker and D. R. Burton

ECOLOGY

Climate-Driven Ecosystem Succession in the Sahara: The Past 6000 Years
S. Kröpelin et al.

A climate record from lake sediments in Chad shows that the Sahara changed gradually from a tropical ecosystem to a desert, not abruptly as implied by Atlantic dust layers. >> Perspective p. 752

CELL BIOLOGY

An in Vivo Map of the Yeast Protein Interactome
K. Tarassov et al.

A method that identifies pairs of proteins that are 8 nanometers apart produces a map of interacting proteins in living yeast, finding known and previously unknown networks.

10.1126/science.1153878

MOLECULAR BIOLOGY

PERSPECTIVE: Slicing and Dicing for Small RNAs
J. A. Birchler and H. H. Kavi

10.1126/science.1159018

REPORTS

APPLIED PHYSICS

Controlled Phase Shifts with a Single Quantum Dot
I. Fushman et al.

A single quantum dot coupled to a photonic crystal can be used to shift the phase of light by up to \( \frac{5}{4} \) radians at the single photon level, as needed for quantum logic operations.

10.1126/science.1159801

APPLIED PHYSICS

Conditional Dynamics of Interacting Quantum Dots
L. Robledo et al.

Controlled coherent manipulation is realized in a pair of self-assembled quantum dots: The optical response of one depends on the state of the other.

10.1126/science.1159802

APPLIED PHYSICS

Subnanometer Motion of Cargoes Driven by Thermal Gradients Along Carbon Nanotubes
A. Barreiro et al.

A segment of the outer shell of a multiwall carbon nanotube can move back and forth in response to a thermal gradient created by electrical current passing through the nanotube.

10.1126/science.1159803

CLIMATE CHANGE

Fracture Propagation to the Base of the Greenland Ice Sheet During Supraglacial Lake Drainage
S. B. Das et al.

A large lake on the surface of the Greenland Ice Sheet drained out through and along the base of the Ice Sheet within 2 hours, revealing an efficient basal hydrological system.

10.1126/science.1159804

CLIMATE CHANGE

Seasonal Speedup Along the Western Flank of the Greenland Ice Sheet
I. Joughin et al.

Measurements of ice motion from Greenland show that summer meltwater accelerates ice sheet flow by 50 to 100% overall but has less effect in the faster outlet glaciers.

10.1126/science.1159805

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**ARCHAEOLOGY**

Monte Verde: Seaweed, Food, Medicine, and the Peopling of South America

T. D. Dillehay et al.

Carbon-14 dates on seaweed brought to Monte Verde, Chile, show that the site was used 14,000 years ago and that the earliest New World people consumed marine resources. >> News story p. 729

**ANTHROPOLOGY**

DNA from Pre-Clovis Human Coprolites in Oregon, North America

M. T. P. Gilbert et al.

Fossil human feces from an Oregon cave predate the Clovis culture by about 1000 years, and DNA from the feces marks the presence of Native Americans in North America.

**BIOCHEMISTRY**

Spatial Regulators for Bacterial Cell Division Self-Organize into Surface Waves in Vitro

M. Loose et al.

Two proteins that define the plane of cell division self-organize into waves and spirals on a flat membrane, suggesting that these patterns underlie their function in vivo. >> Perspective p. 755

**BIOCHEMISTRY**

Reconstitution of Contractile FtsZ Rings in Liposomes

M. Osaawa, D. E. Anderson, H. P. Erickson

A tubulin homolog from prokaryotes can, without other proteins, assemble into rings around liposomes and constrict, suggesting a primordial cell division mechanism. >> Perspective p. 755

**BIOCHEMISTRY**

Architecture of a Charge-Transfer State Regulating Light Harvesting in a Plant Antenna Protein

T. K. Ahn et al.

To protect itself from oxidative damage in bright light, photosystem II operates a tunable shunt that directs excess energy to a yellow accessory pigment that is abundant in corn.

**VIROLOGY**

Phosphorylation of Retinoblastoma Protein by Viral Protein with Cyclin-Dependent Kinase Function

A. J. Hume et al.

A human cytomegalovirus protein takes control of the host cell cycle by mimicking a cell cycle kinase that phosphorylates and inactivates a tumor suppressor.

**ECOLOGY**

Adaptive Phenotypic Plasticity in Response to Climate Change in a Wild Bird Population

A. Charmanter et al.

A 47-year study of great tits in Britain shows that the ability of individual birds to shift their breeding date has enabled the species to thrive as climate has changed.

**NEUROSCIENCE**

Temperature Sensing by an Olfactory Neuron in a Circuit Controlling Behavior of C. elegans

A. Kuhara et al.

An olfactory neuron in Caenorhabditis elegans also senses the ambient temperature and is necessary for worms' propensity to seek out the temperature at which they were raised.

**CELL BIOLOGY**

Discovery of a Cytokine and Its Receptor by Functional Screening of the Extracellular Proteome

H. Lin et al.

A systematic, functional screen of extracellular proteins in yeast identified a previously unknown receptor-ligand pair: the cytokine interleukin-34 and its receptor.

**CELL BIOLOGY**

Regulation of the Cellular Heat Shock Response in Caenorhabditis elegans by Thermosensory Neurons

V. Prahlad, T. Cornelius, R. I. Morimoto

Activation of a heat-sensitive sensory neuron in the worm Caenorhabditis elegans unexpectedly triggers a heat-shock response throughout the animal.
T cell receptor clustering.

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PERPECTIVE: TCR Triggering by the pMHC Complex—Valency, Affinity, and Dynamics
R. Varma
Multiple models compete to explain T cell receptor activation.

REVIEW: Is Zinc a Neuromodulator?
A. R. Kay and K. Tóth
Experiments with metal chelators provide the best evidence for zinc as a regulator of synaptic activity.

FORUM: Open Forum on Cell Signaling
N. R. Gough and J. F. Foley
Read highlights from the Experimental Biology 2008 meeting.

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