RESEARCH HIGHLIGHTS

Selections from the scientific literature

NEUROSCIENCE

Bee exploration mechanism

Honeybees orient using similar molecular pathways to many vertebrates.

Gene Robinson and Claudia Lutz at the University of Illinois at Urbana–Champaign identified a protein in honeybees (*Apis mellifera*) similar to the transcription factor Egr1, which is expressed in the brains of vertebrates such as rodents during the exploration of new environments.

Egr was upregulated only in regions of the bee brain called mushroom bodies — which integrate sensory input and process memories — and only as the bees learned to orient in unfamiliar surroundings. This was true of both young bees that had previously never left the hive and experienced foragers placed in a new environment. The results demonstrate the deep evolutionary conservation of Egr-related molecular pathways in experience-dependent learning, say the authors.

J. Exp. Biol. 216, **2031–2038 (2013)**

GENOMICS

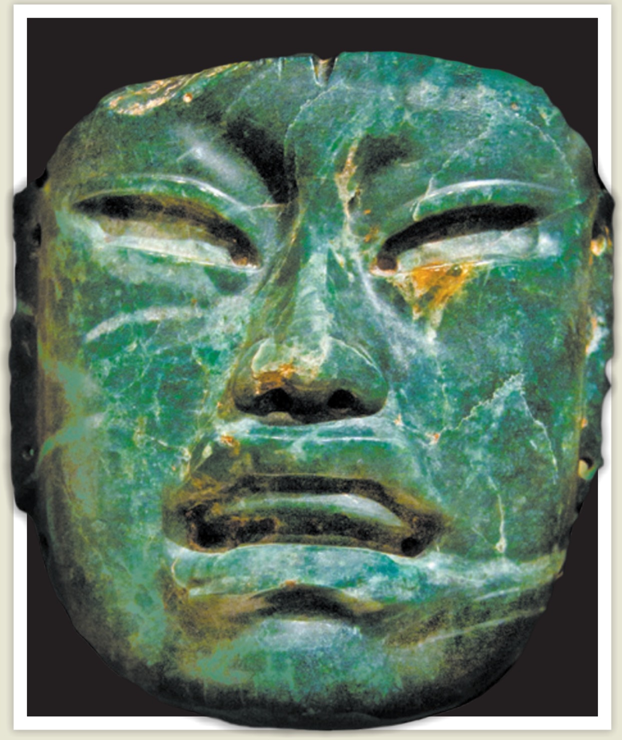
Irish-famine pathogen decoded

Researchers have sequenced the genome of the microorganism that devastated the Irish potato crop in the 1840s — the first time the genome of a historical plant pathogen has been decoded.

Kentaro Yoshida at the Sainsbury Laboratory in Norwich, UK, and his colleagues identified the strain of *Phytophthora infestans*, which causes potato late blight, from nineteenth-century dried leaves. The researchers sequenced DNA from 11 historical specimens, which had been stored in herbaria, and from 15 modern strains of *P. infestans*. The famine strain was closely related to another strain that is still prevalent around the world, and the researchers suggest that the two strains diverged in the early 1800s. The famine strain may now be extinct, the authors say.

eLIFE **http://dx.doi.org/10.7554/elife.00731 (2013)**

For a longer story on this research see go.nature.com/qg2aov



PETER HORREE/ALAMY

GEOLOGY

Gemstones from the deep

The precious stones jade and ruby can be used to identify the sites of ancient collisions of tectonic plates.

Robert Stern at the University of Texas at Dallas and his colleagues suggest that these two substances could be called "plate tectonic gemstones". Jadeitite, a type of jade, forms where one tectonic plate plunges beneath another. Fluids that rise from the diving slab of oceanic crust condense to form the gemstone (pictured in an Olmec mask from southern Mexico — the site of one such subduction zone). By contrast, ruby forms where continental crust rich in aluminium collides, as in Southeast Asia.

These stones should be recognized not only for their beauty but also for what they reveal about their tectonic setting, the authors say.

Geology **http://dx.doi.org/10.1130/G34204.1 (2013)**

HUMAN EVOLUTION

Footprints reveal hominin size

Fossil footprints indicate that hominins were already as large as modern humans by 1.52 million years ago.

Undamaged fossil skeletons from that time are rare, and so determining characteristics such as the size and walking speed of human ancestors has been challenging. Brian Richmond and Heather Dingwall at George Washington University in Washington DC and their colleagues measured foot size and stride length from fossil footprints of seven individuals — which were probably *Homo erectus* or *Paranthropus boisei* — discovered in northern Kenya. To translate these measurements into physical attributes such as stature, body mass and walking speed, the researchers studied the relationship between body dimension and gait in habitually barefoot modern adults from Kenya. The authors were then able to infer that the size of these hominins was comparable to that of modern humans.

J. Hum. Evol. 64, **556–568 (2013)**

CHEMISTRY

Metabolites, cell by cell

Single-cell measurements are revealing how individual yeast cells react to environmental and genetic challenges.

Advances in mass spectrometry, which identifies individual compounds in complex mixtures, have given researchers the chance to compose cell-by-cell portraits of metabolism. Renato