

## Squashing a Dry Hypothesis

The origins of agriculture in the New World have been thought to center in the dry highlands of Mexico and Central America. Evidence for domestication usually involves a noticeable increase in the size of seeds compared to those of local wild plants. **Piperno and Stothert** (p. 1054; see the Perspective by **Bryant**) present new radiocarbon dates from two sites in Ecuador that push the origins of domestication of a squash there back to perhaps 12,000 years ago. Such a date would be concurrent with, or even earlier than, those of sites in the dry highlands. Thus, agriculture may have arisen first or independently in the wet lowlands.

## Reversing Replication

DNA replication can be dangerous business, especially if damage to the DNA blocks replication before it has finished. The stalled replication fork is vulnerable to further mutations and rearrangements, and these can be lethal to the cell and potentially cause cancer. **Courcelle et al.** (p. 1064) examined the structure of the stalled replication fork and found how it is rescued—the stalled forks transiently reverse. The authors suggest that the reversed forks facilitate the repair of the initial DNA damage. Consistent with genetic analyses, RecA and RecFOR are required for the stable maintenance of the reversed forks and, in their absence, the forks are degraded by RecQ-RecJ. **X**

## Information Processing in the Auditory Cortex

The early processing circuits for auditory stimuli, like the auditory brainstem, contain multiple parallel pathways for both sound localization and general acoustic feature extraction. The analysis of sound features in higher centers, like the auditory cortex, is still not fully understood. **Barbour and Wang** (p. 1073) used parametric wideband acoustic stimuli to explore auditory cortical responses in a more realistic way. They could classify the neurons into two putatively important groups: High- and low-contrast-favoring cells. They also found that the effective bandwidth of the neuronal frequency response as measured with these stimuli is intensity invariant.



**1073**

## Poison Control Centers

Hydrogenases catalyze the separation of  $H_2$  into protons and electrons. At the heart of the enzyme resides a metal cluster containing nickel and iron, with multiple cyanide groups ( $CN^-$ ) serving as iron ligands. How are these groups synthesized while avoiding the suicidal liberation of free  $CN^-$ ? **Reissmann et al.** (p. 1067) describe the biochemical reactions that attach a carbamoyl group to a sulfhydryl side chain of the hydrogenase maturation protein HypE and subsequently convert it to a thiocyanate (HypE-SCN), which ultimately serves as a cyanide donor to the iron atom.

## The Basis of the fMRI Signal

Blood oxygen level-dependent (BOLD) functional magnetic resonance imaging (fMRI) allows the detection of minute fluctuations of deoxyhemoglobin in the central nervous system during the performance of a specific task. The nature of the signal and its correlation to the underlying neuronal activity has been controversial. **Thompson et al.** (p. 1070; see the Perspective by **Mayhew**) used single-cell recording and direct measurement of tissue oxygenation to determine the relation between neural activity and changes in oxygenation within the primary visual cortex of the cat. Neural activity was closely related to reduction in oxygenation, consistent with other reports that a period of hypoxemia precedes the hyperemia thought to underlie the BOLD response. Apart from their theoretical implications, these results suggest a number of ways in which the precision of fMRI could be further improved.