100 TOP SCIENCE STORIES OF 2007

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PLUS OLIVER SACKS: WHY THE BRAIN CRAVES MUSIC
Great Ancient City Unearthed in Syria

While the corpses of their enemies still lay on the battlefield, the victors celebrated by slaughtering cattle and holding a gigantic feast. Then they dumped the war dead into a pit, heaved in the animal bones from their repeat, and tossed their plates on top of the pile.

Now—nearby 6,000 years later—the unwrapping of these remnants of war is now northeastern Syria is a spectacular archaeological find, one of several important discoveries made recently at Tell Brak, a 130-foot-high mound jutting above the northern fringe of the Mesopotamian plain.

Archaeologists from the University of Cambridge, the University of Edinburgh, and Harvard University say Brak was one of the earliest and largest cities in the region—and therefore the world. That assertion is shaking up Near Eastern archaeology, which scholars long assumed that the first substantial cities arose in southern Mesopotamia in today's Iraq.

The remains of the battle date to about 3600 B.C., nearly a thousand years before writing, manufacturing-style craftsmanship, and other urban activities took a firm hold in the region. Yet the citizens of Brak were already using imported materials to make fine goods in large workshops, including a marble-and-obsidian chalice and a lamp seal with the image of a lion being caught in a net—a classic symbol of kingship in the ancient Near East.

Furthermore, this was no mere village: Close examination reveals the settlement extending over an astonished 136 acres in the period of 4200 to 3900 B.C., larger than other settlements of the time, with the sole exception of Uruk in southern Mesopo-
tamia. The team of archaeologists, led by Joan Oates of Cambridge, will return to Brak in the spring to continue their work.

Andrew Lawler

Glue Clues From Geckos

A team of biomedical engineers and materials scientists at Northwestern University have invented a glue that behaves like the adhesive on a Post-it note, with the advantage that it also works on wet surfaces. Once out of the lab, it may drive the creation of a host of medical, military, industrial, and consumer products.

Inspired by the sticking strategies of both geckos and mussels, the glue is called Geckel. "We borrowed useful properties of both animals," says Philip Messersmith, who announced the findings in June.

Geckos cling to walls and ceilings by means of microscopic hairs on the underside of their feet. The hairs' adhesive ability is believed to come from weak molecular-level interactions, called van der Waals forces, between the dry surface and the gecko's foot—strong enough to counter the gecko's weight but weak enough that the gecko can easily pull free. The hairs have almost no sticking power under water, however. That's where mussels come in—the shellfish use an adhesive protein to attach firmly to wet surfaces.

The creators of Geckel used electron-beam lithography to drill nanoscale holes in a thin polymer film, creating a mold. They filled the holes with liquid silicon and allowed it to solidify; when the film was peeled away, there remained a dense array of tiny pillars much like gecko hairs. When coated with a polymer that wets the mussel's adhesive proteins, the pillars can stick to wet surfaces. The glue remains sticky in or out of water, even after being pulled away and reattached more than a thousand times.

Stephan Ornes

Jeffrey Weiters