OF NOTE

ARCHAEOLOGY

Getting a read on early Maya writing

Researchers excavating the ruins of an ancient pyramid in northeastern Guatemala have discovered examples of the earliest known Maya writing, produced between 300 B.C. and 200 B.C.

The discovery shows that the Maya developed a writing system at around the same time as script emerged in ancient societies of what is now Mexico, say William A. Saturno of the University of New Hampshire in Durham and his colleagues.

Saturno's team found hieroglyphic symbols on painted walls and plaster fragments buried inside the remains of a pyramid at a Maya site called San Bartolo. Dating relied on radiocarbon measurements of bits of burned wood buried with the script samples.

Much of the writing is difficult to decipher, the investigators report in an upcoming *Science*. They regard one hieroglyphic symbol at San Bartolo as an early version of a Maya sign meaning *lord*, *noble*, or *ruler*.

Until now, the first fully legible Maya writing dated to around A.D. 250. However, preliminary studies by independent teams suggest that inscriptions carved in stone monuments at two other Maya sites were made between 300 B.C. and 100 B.C. —B.B.

BIOTECHNOLOGY

Cranberry aid for assay

Cranberry juice, often used to stave off urinary-tract infections caused by *Escherichia coli*, also keeps the bacteria from reducing a biosensor's specificity, scientists report.

Past research had shown that cranberry juice fights the infections by stopping *E. coli* from adhering to human cells. Frances S. Ligler, Brandy Johnson-White, and their colleagues at the Naval Research Laboratory in Washington, D.C., tested whether the juice would also prevent the bacteria from attaching to biosensors' glass surfaces.

On its surface, the sensor has a pattern of different antibodies that capture targets—proteins or microbes, for example—from food or clinical samples. A subsequent application of antibodies that have a fluorescent tag pinpoints the location of the target, revealing its identity.

E. coli bacteria, often found in biologic samples, bind all over the glass surface, says Ligler. Since this bacterium shares surface proteins with other microbes, the fluorescent antibodies can attach to the *E. coli* in a sample along with the desired target, producing areas of brightness that obscure a target's location.

When the team mixed cranberry juice with its samples, however, the juice "prevented the sticking of these very sticky bacteria" to the slides, Ligler says. A 50 percent solution of the juice eliminated almost all the background fluorescence. The researchers found no such effect with other juices, they report in an upcoming *Analytical Chemistry*. —A.C.

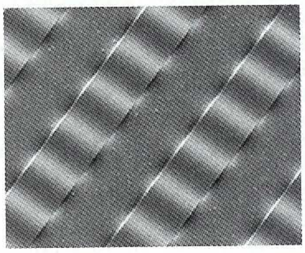
MATERIALS SCIENCE

Making waves

Flexible silicon is no longer an oxymoron. Scientists have created thin, wavy silicon ribbons that stretch along with their rubber backing. The technique could lead to comfortable, sensor-filled uniforms that monitor a soldier's vital signs or to electric devices that can wrap around complex shapes such as aircraft wings.

Fashioning a rigid material such as silicon into a thin film can make it bendable but not stretchable, says materials scientist John A. Rogers of the University of Illinois, at Urbana-Champaign. Rogers' team uncovered silicon's flexible nature by accident, he says.

A lab member inadvertently stretched the rubber stamp used to apply thin silicon strips to a plastic backing. When the rubber snapped back, the silicon ribbons buckled along their lengths into a rippled shape. These strips turned out to be 10 to 20 times as stretchy as rigid silicon is.



RIPPLED RIBBONS These micrometer-wide ribbons of silicon flex when their rubber backing is stretched.

ROGERS

The ribbons expand and compress much as an accordion bellow might, notes Rogers. His team makes them in thicknesses ranging from 20 to 200 nanometers, widths of a few micrometers, and lengths up to an inch.

To make devices such as transistors and diodes out of the flexible material, the researchers added components such as conductors to thin strips of silicon on a wafer. Then, they transferred the device onto a uniformly stretched rubber backing and released the rubber's strain to introduce waves. The device's electrical properties withstood 100 cycles of stretching and compression, the group reports in the Jan. 13 *Science*.

Rogers says that the team is now working on squares of silicon that give in two directions, and the researchers are investigating how they might increase silicon's stretchiness by an additional factor of 10. —A.C.

ASTRONOMY

Gravity at play

Astronomers are delighted to have found 19 galaxies that appear to be bent out of shape. The distorted images are cosmic mirages, arcs or rings of light created when the gravity of a massive foreground object bends and magnifies the light from a galaxy lying behind it. Albert Einstein predicted the effect, known as gravitational lensing, in 1936, but telescopes at the time weren't powerful enough to discern it.

In the study, Adam Bolton of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass., and his colleagues combined the power of the Hubble Space Telescope with the breadth of the Sloan Digital Sky Survey. That survey of one-fourth of the sky employs a ground-based telescope in Apache Point, N.M. Using Sloan data, the team picked out large, elliptical galaxies capable of acting as gravitational lenses. When they pointed Hubble at 28 of these lensing candidates, they found arcs and rings close to 19 of them, indicating that they were indeed distorting the images of more-distant galaxies.

Eight of the 19 lensed galaxies have had their light bent into a circle called an Einstein ring. This pattern arises when one galaxy is almost exactly aligned behind another, as seen from Earth. Astronomers had previously identified only three Einstein rings.

In addition to providing curious shapes, gravitational lensing is a powerful probe of dark matter, the invisible, exotic material that theorists say resides in massive halos around every elliptical galaxy. Although dark matter halos can't be directly seen, astronomers can deduce the presence of this material by the extent to which its mass bends the light of background galaxies.

Bolton and his colleagues describe their study in the February *Astrophysical Journal*. —R.C.