

### Betel nuts tasting a bit metallic?

It's estimated that one-tenth of the world's population chews betel nuts, the astringent, addictive seeds of the betel palm. Researchers have associated chewing betel nuts with mouth cancer since 1984 but hadn't been able to pinpoint the precise connection. Now, a study suggests copper may be the culprit.

Betel nuts, also called areca nuts, are widely sold and consumed in southern Asia. Using a spectrophotometer to analyze content, researchers at the Royal College of Surgeons and Dental Science at Kings College in London find that the average betel nut snack contains from 1.5 to 10 times more copper than similar snacks consumed in Great Britain. They report in the May 17 *LANCET* that saliva tests of people chewing 3 grams of packaged betel nuts turned up high concentrations of copper. Absorption is difficult to measure, but the researchers estimate that an adult in India could ingest five times as much copper daily as the typical U.S. citizen.

Earlier research linked betel nut chewing to a buildup of scar tissue under the mucus membrane, a precancerous condition. The London researchers suggest that copper may damage some genes, leading to this buildup. Copper has also been linked to liver scarring and scleroderma, a rare autoimmune disease that causes degeneration of connective tissues and can damage blood vessels. —N.S.

### New cold sore cream on the market

It's not a cure, but it's progress. For the one person in five who suffers from cold sores, researchers report that a new cream shortens by a day the time it takes for the painful lip lesions to heal.

In a study at six sites in the United States and the United Kingdom, half of 1,573 otherwise healthy patients smeared their cold sores every 2 hours with penciclovir, an antiviral cream. Compared to a placebo used by the other participants, the drug dispelled pain more quickly and rendered cold sores noninfectious sooner. The researchers report their findings in the May 7 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

Most cold sores take 7 or 8 days to heal, but some can last 15 days. The sooner penciclovir was applied, the better it worked. In other studies, acyclovir, an ointment cousin of penciclovir, was inconsistent in speeding healing.

Both drugs block the virus' metabolism. "The difference is, penciclovir is retained inside the cell longer," which may make it more effective, says Spotswood Spruance, a coauthor of the study and professor of medicine at the University of Utah School of Medicine in Salt Lake City.

On the basis of this and another study, penciclovir has been cleared for prescription use in the United States. —N.S.

### Fidgety babies = healthy babies

European researchers are touting a noninvasive method of discerning brain damage in newborns.

Heinz F. R. Prechtl of Karl Franzens University of Graz, Austria, and his colleagues used ultrasound brain imaging to categorize 130 premature infants in Austria, Italy, Germany, and the Netherlands as being at high risk or low risk for neurological damage. The researchers videotaped each infant for 1 hour every week until the babies were discharged from the hospital and then for 15 minutes every 3 to 4 weeks until age 24 months.

Of babies with normal fidgeting, 96 percent were diagnosed as neurologically sound. Of babies that didn't fidget much or showed abnormal, abrupt writhing movements, 95 percent had brain damage, the researchers report in the May 10 *LANCET*.

Recording babies' movements yielded more accurate predictions of brain damage than the ultrasound measures did, say the researchers. They view the filming technique as a cost-effective way to identify babies requiring early therapy. —N.S.

### Making a prisoner out of methane

Deep in the ocean, intense pressure and cold temperatures can trap methane gas inside a cage of water molecules, forming an icy white substance called methane hydrate. Hiding under the seafloor, vast deposits of this solid methane represent the largest remaining source of fossil fuel known. Despite the potential economic importance of these molecules, oceanographers know few details about methane hydrates and their deep-sea behavior (SN: 11/9/96, p. 298).

A team of California researchers is trying to unlock the secrets of this substance by fabricating methane hydrates in a natural setting. Peter G. Brewer of the Monterey Bay Aquarium Research Institute in Moss Landing, Calif., and his colleagues used a remote-controlled submersible to carry acrylic cylinders 910 meters below sea level. They then pumped methane gas into the cylinders in an attempt to coax seawater and methane to form the hydrate cage.

"The folklore is that these things are very difficult to make," says Brewer. In past laboratory experiments, researchers found that hydrates formed slowly and required as much special care as an infant. Sometimes, investigators had to rock the experiments to get the hydrates to develop.

In the deep ocean, however, methane hydrates are not so temperamental. As the scientists bubbled methane gas into the cylinders, the hydrates formed within minutes, sometimes seconds, Brewer and his colleagues report in the May *GEOLOGY*.

Some cylinders contained straight seawater. Others held a layer of sand or mud through which the gas had to seep—a situation much closer to the natural process of hydrate formation in seafloor sediments.

The team is now conducting follow-up experiments, such as testing how long methane hydrates survive when left on the ocean floor. Initial results suggest that they can last for months. —R.M.

### Earth's temperature grows more uniform

The temperature difference between the equator and the poles—the engine powering Earth's weather—has decreased since the late 1800s, possibly altering the frequency and intensity of storms over that period, according to a new study.

Researchers gauged the temperature span of the globe by analyzing land and sea measurements for two well-monitored latitudinal zones: a belt between 30°N and 35°N and another between 50°N and 55°N. Over the last 111 years, both latitude bands have warmed, but the northern band has warmed more than the southern one, a sign that the temperature difference between the tropics and the Arctic has also fallen. The temperature gap between the two bands decreased at a rate of 0.30°C to 0.46°C per century, report Alix I. Gitelman and James S. Risbey of Carnegie Mellon University in Pittsburgh and their colleagues. They describe their study in the May 15 *GEOPHYSICAL RESEARCH LETTERS*.

Gitelman and Risbey caution that they cannot tell what forces are causing this change. The results are broadly consistent with computer projections of greenhouse warming, which predict that the Arctic will warm more than the tropics. It is possible, however, that natural fluctuations in climate have helped shift the temperature balance.

Another question is how the change has altered weather over the last century. According to meteorological theory, the shrinking gap between tropical and polar temperatures should have reduced the storminess of the atmosphere, either by weakening storms or decreasing their frequency, says Risbey. The real story is probably not that simple, he adds, because other factors also influence storminess. For instance, global warming over the last century has expanded the atmosphere's ability to hold water vapor, which could lead to more intense storms, the scientists say. —R.M.