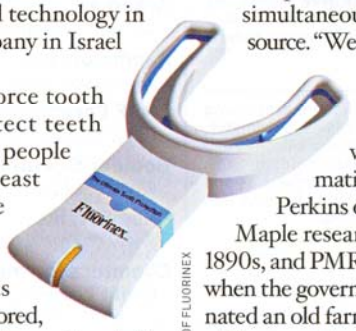
Oral electrochemistry

GLEAMING TEETH CAN ATTRACT ATTENTION, but positively charged teeth catch more fluoride. That's the premise of an electrochemistry-esque dental technology in development by a company in Israel called Fluorinex.

Fluoride ions reinforce tooth enamel and help protect teeth against cavities. Many people love, loathe, or are at least familiar with fluoride treatments available in the dentist's office. A dental assistant loads U-shaped trays with flavored, fluoride-enriched gel and pops them in the patient's mouth for a minute or so.



COURTESY OF FLUORINEX

Fluorinex' process uses two pairs of trays. The first set is prepacked with a preparatory liquid, to which teeth are exposed for one minute. A dental assistant fills the second set, which includes an anode and cathode, with the familiar fluoride goo. The company claims that applying 4.5 V (and less than 30 amp) to this tray for five minutes while it is in the patient's mouth increases the amount of fluoride that adheres to the patient's tooth enamel such that the treatment won't need to be repeated for two years. No current actually passes through the rest of the body. One version of the trays has built-in batteries and another has an external power supply. David Tabor, the company's CEO, says the treatment should be on the market in six months.

Maple syrup science

ONLY OLD SAPS USE BUCKETS TO MAKE MAPLE syrup these days. Reverse osmosis sap extractors and air injectors are more modern syrup production techniques. However, the syrup ends up a lighter color than with traditional methods. Does the new technology have any effect on flavor? Researchers at the University of Vermont's Proctor Maple Research Center (PMRC) opened a new building last month to find out.

On March 15, researchers conducted their first experiments in the world's only maple research processing facility. Two days later, the facility opened to the public for the 25th annual Vermont Governor's Tree Tapping Ceremony.

"Syrup is not just concentrated sap," says center Director Timothy D. Perkins. Each bottle, ranging from amber tones to chocolate hues, can be as distinct as varieties of wine. Seasonal tree biology, boiling temperature, microorganisms, sugar chemistry, storage time, and the final container all influence the final product. UVM's new facility allows experiments on up to four evaporators simultaneously fed by a common sap source. "We collect samples throughout the evaporation process to assess color development, chemistry, and flavor development in the transformation of maple sap to syrup," Perkins explains.

Maple research began at UVM in the 1890s, and PMRC was established in 1946 when the governor, Mortimer Proctor, donated an old farmhouse to UVM. It is one of three maple research stations, including Cornell University and the Centre Acer in Quebec.

Chemical comedy

MANY PROFESSORS ATTEMPT TO START their classes with a joke. Few professors, however, actually have enough of a repertoire to perform stand-up comedy in clubs or in front of corporate audiences. Peter J. Ludovice, an associate professor of chemical engineering at Georgia Institute of Technology, can actually work something other than the classroom.

Eighty attendees at the ACS national meeting last month in Atlanta caught Ludovice's act at a packed local brewery. He performed a show called "Pocket Protectors and Other Fashion Statements." Much of his "nerd comedy" draws from encounters with his family and students, and, to a certain extent, he hams up the stereotypes associated with scientists and engineers. Like other comedians, he jokes about politicians, too.

Ludovice started doing comedy two years ago, as part of his self-described midlife crisis, but he's not willing to give up his day jobs. His research interests include using molecular simulation to provide insight into structure-property relationships for synthetic and biological macromolecules.

And this month, he started cohosting a Saturday morning radio show on Radio Sandy Springs in Georgia. Ludovice describes the show as "a lighthearted approach to science and technology." On April 29, he plans to decipher food labels as part of "Chemistry in the Grocery Store." No tomato throwing allowed.

This week's column was written by **Rachel Petkewich.** *Please send comments and suggestions to newscripts@acs.org.*

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