

Glowing dots on a chip indicate a patient's allergies—in this case a variety of grasses.

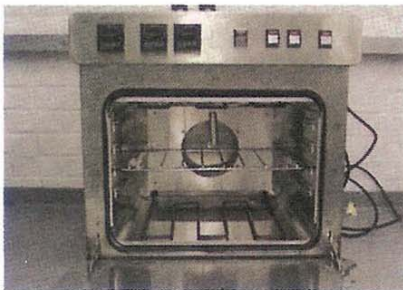
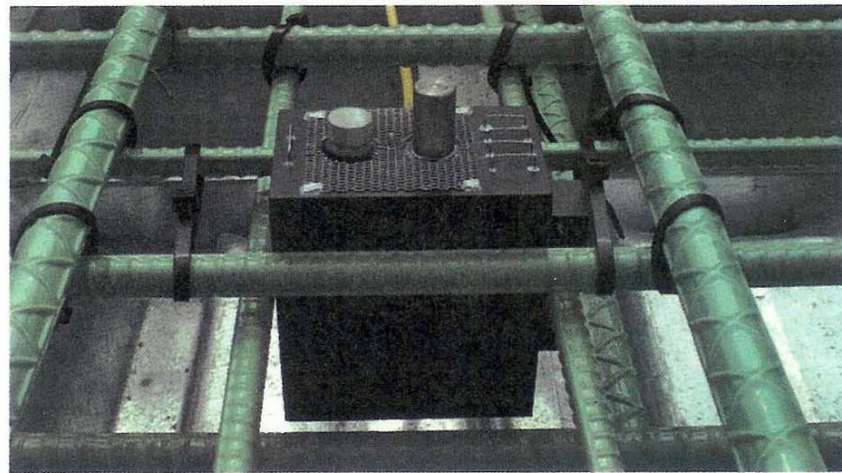
NOTHING TO SNEEZE AT

A new, biochip-based allergy test may soon tell you everything you're allergic to from just a single drop of blood. That's good news for the 50 million or so Americans who suffer from allergies—often without knowing it. Conventional allergy testing requires either injecting suspect allergens under the skin and watching for a reaction or sending a blood sample off for testing. Both methods are painful, cumbersome and costly.

The new test, being developed by New Haven, CT-based Molecular Staging, looks for as many as 100 different allergens at once in a finger prick of blood smeared on a chip. Allergy-causing antibodies in the blood bind to allergens on the chip; the company has a method of amplifying the resulting fluorescence so it can be sensed in a conventional biochip-reading instrument to determine the existence and severity of allergies. The company is in discussions with biochip makers; once an agreement is made, a product should follow within 18 months.

CONSERVATION COOKING

Electric ovens are not generally known for energy conservation. Researchers at England's Cranfield University have built one that consumes 35 to 60 percent less electricity than those now available. Mechanical engineers Marcus Newborough and Bryan Shaughnessy lined the walls of the oven with a heat-reflecting aluminum alloy (*photo*). "About 93 percent of the radiation striking the chamber's lining is directed back at the food being heated," says Newborough. A second reflective lining between the cooking chamber and its outer insulation further prevents heat from escaping. The researchers are seeking partners to license the technology, which they expect to reach the market in about two years.



RUST REPORTER

Crumbling bridges often get that way because steel reinforcement bars have rusted within the concrete. A Charlottesville, VA-based company called Virginia Technologies has devised a system of networked sensors that can be embedded in concrete, tell when the steel is corroding and report the information through a wireless link—avoiding the need to drill holes or install probes that must be checked individually.

The networked probes are tethered to the steel bars and wired together before concrete is poured (*photo*). Each sensor monitors electrochemical factors that indicate rusting, such as changes in salinity, moisture and conductivity. If any one instrument detects a relatively high corrosion rate, it can check with neighboring sensors to gauge how far the problem has spread. Sensor readings travel by wire to a communications module, from which the data can be accessed wirelessly. The company expects to bring the sensors to market early next year.

MAGIC FINGERS

A device the size of a car-alarm remote could one day unlock cars and homes as well as validate credit card purchases and bank transactions—all by reading the user's fingerprint and wirelessly transmitting it to a third party for authentication. The tiny gizmo (*photo*) is the brainchild of Palm Beach Gardens, FL-based Cross Match Technologies, which specializes in fingerprint capture devices. The device will also sense blood flow patterns in the finger. This will add an extra layer of security to the device; not only must the finger be attached to a living person, but if the blood is flowing faster than normal (say, if the person attached to the finger is being held at gunpoint), the sensor can void the transaction. The sensitivity can be set for different applications, so runners could still unlock their doors after a jog but might have to wait 20 minutes to use the ATM. Cross Match hopes to build a working model in the next two and a half years. The company's target is a product selling for less than \$50.

