ENVIRONMENT

Is It Safe to Drink?

The government may not be doing enough to regulate contaminants in tap water

More than 6,000 chemicals pollute U.S. drinking water, yet the U.S. Environmental Protection Agency has added only one new pollutant to its regulatory roster in the past 15 years. Environmental groups have long raised questions about this track record, and the U.S. Government Accountability Office recently joined the chorus, releasing a report that charges the agency with taking actions that have "impeded … progress in helping assure the public of safe drinking water."

Among other things, the GAO report says, the EPA relies on flawed data. To determine the level of a particular pollutant in drinking water—which the EPA does before making a regulatory ruling on it—the agency relies on analytic testing methods so insensitive that they cannot identify the contaminants at levels expected to cause health effects. In addition, since 1996 the EPA has been required to make regulatory decisions about five new pollutants each year, ruling on those that might pose the biggest threats to public health. The GAO report asserts that the agency has been ruling only on the "low-hanging fruit"—contaminants for which regulatory decisions are easy rather than those that might be the most dangerous. "They're not actually doing anything to protect public health," says Mae Wu, an attorney at the Natural Resources Defense Council.

For its part, the EPA has pledged to review the nation's drinking-water standards and to add at least 16 new contaminants to the list of those it regulates. This past February the agency reversed a long-standing decision to not regulate the rocket-fuel ingredient perchlorate, making the chemical the first new drinking-water contaminant to be regulated since 1996. In its response to the GAO, the EPA stated that "no action" was necessary to better prioritize the contaminants on which the agency will rule in the future, nor did it acknowledge the need for improvements in data collection. The agency did, however, agree to consider improving its methods for alerting the public when there are drinking-water advisories.

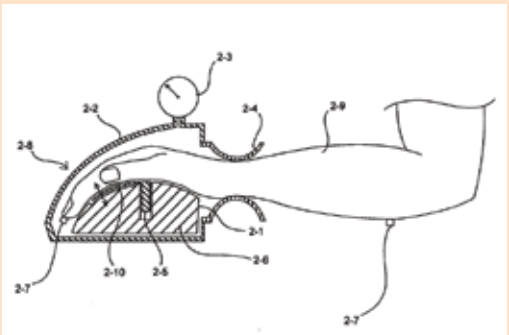
—Melinda Wenner Moyer

GALLERY STOCK (*top*); COURTESY OF U.S. PATENT AND TRADEMARK OFFICE (*bottom*)

PATENT WATCH

Controlled heat transfer with mammalian bodies: In the 1990s Stanford University biologists Dennis Grahn and H. Craig Heller discovered a novel way of treating patients with a condition known as postanesthetic hypothermia, in which patients emerging from anesthesia are so cold that they shiver for up to an hour. The condition develops in part because anesthesia reduces the body's ability to control its own temperature. Applying heat alone does not always help, so Grahn and Heller tried another approach: they increased the volume of blood flowing to the skin of patients' hands and then applied heat to the same area. "These people were fine within 10 minutes," Grahn says. "Then the question was, 'What the heck is going on here?'"

They had stumbled on a feature of mammalian biology that can be manipulated for a wide array of other applications, including ones requiring cooling. Among these uses is increasing athletic endurance, because overheating is one of the primary factors limiting physical performance. One of the main ways the human body regulates internal temperature is by controlling the amount of blood flow through nonhairy skin areas, such as the palms, the cheeks, the nose and the soles of the feet. Underneath the skin of these areas are unique vascular structures designed to deliver large volumes of blood to the surface. When the body needs to release heat, it expands these vessels and floods the area with blood, throwing off heat through the skin. The body holds in heat by constricting blood flow to these areas.



Patent No. 7,947,068 outlines a variety of ways to manipulate these processes. One, called the Glove, is already in use by the San Francisco 49ers. Players stick their hand into the coffeepot-size device, which creates an airtight seal around the wrist. The Glove then uses a pressure differential to draw blood to the palm and rapidly cool it, which leads to an overall decrease in body temperature. The device can be used at any point during a game and takes only a few minutes to work. Tests in the lab, Grahn says, have shown that devices like the Glove can dramatically increase athletic output and reduce heat stress. *—Adam Piore*