

ENVIRONMENT

Somebody save the honeybees

Picnickers may call honeybees pests, but not farmers. They spend millions of dollars annually to rent bees for crop pollination. But pesticides have been linked to massive bee kills that have destroyed 10 percent of the nation's honeybee hives and substantially reduced populations of another 30 percent, according to Harvey M. Caine of the University of California at Santa Cruz. He says in the November ENVIRONMENT that "one-third of the average American diet depends directly or indirectly on honeybee-pollinated crops," and "six percent of the U.S. agricultural farm production (\$3.5 billion) is at least indirectly dependent on honeybee pollination." Two percent more bees die from pesticides each year than can be replaced by reproduction, he says, and quotes the recently retired chief bee expert at the University of California extension service as saying, "Continued bee losses at the present rate will undoubtedly cause large-scale pollination shortages within the next 10 to 15 years."

The bees, which do not develop high resistance to pesticides, die from doses of less than one-millionth of an ounce. They contact pesticides while collecting nectar and pollen from flowering plants or while flying through pesticide clouds which can drift miles via microinversions—a climatological process similar to the one that produces photochemical smog.

Dangerous pesticides already carry labels saying they should not be used on flowering plants because of their toxicity to honeybees. But this "is totally ineffective, as pesticides often are applied whenever they are needed, regardless of honeybee activity," Caine says. Similarly, pesticide sprayers seldom notify beekeepers in time to allow them to move their bees, he says. His solution is to ban use of very toxic pesticides on flowering plants and abolish farm subsidies that pay for damage from pesticides. The latter eliminates any incentive farmers and sprayers have to be more careful, he says.

Brief contact with oil hurts fish

"Chronic exposures to low levels of petroleum hydrocarbons are probably more harmful to fish than are spills and blowouts," says the National Oceanic and Atmospheric Administration. NOAA's Sid Korn, Nina Hirsch and Jeanette Struhsaker studied sublethal doses of two volatile aromatic crude-oil components in Pacific herring. Fish were exposed to 100 parts per billion of either benzene or toluene for 48 hours. Gall bladder uptake was highest; 31 times the initial water concentration for benzene, 340 times the initial water concentration for toluene. Most tissues flushed the chemicals out within a few days, but the prevalence of toluene and other organic chemicals in water points to the need for related studies, the researchers say.

Their results were consistent with previous studies using striped bass and northern anchovy. A study exposing mature spawning herring to benzene showed high accumulation in the ovary with associated deleterious effects on eggs and larvae.

Nonpolluting asphalt recycle

Rohlin Construction Co. in Kossuth County, Iowa, has developed what it believes is the first nonpolluting method of recycling asphalt pavement. A demonstration plant produces a three-to-one mix of recycled and virgin material. The 43,000 tons already used on two miles of secondary road at full depth and for resurfacing 13 miles of existing roads has shown no apparent loss in durability. Recycled material costs less and decreases the asphalt demand on crude oil. Previous recycling technologies burned asphalt, resulting in air pollution, Rohlin says. This process, however, doesn't burn asphalt. To date, Rohlin reports that all emissions meet state and federal requirements.

BIOMEDICINE

Pig valve: Don't use the coupon

Most surgeons consider Hancock Laboratories to be the "Cadillac" of the heart prosthetics industry. Their pig aortic valves, which are used to replace human aortic valves, are long-lasting, pliable and easily implanted into small hearts. Unfortunately, some of them are also dirty.

In the past year, 20 heart patients have been given pig heart valves that later proved to be contaminated with bacteria that attack heart muscle, report investigators at the Center for Disease Control. Two of the 20 have become ill with symptoms normally associated with *mycobacterium chelonae*, a microbe also found on cuttings of pig heart tissue that accompany the valves in hermetically sealed packages.

These "coupons" are sent along so surgeons can determine whether the valves are sterile. The problem is that it takes three weeks to check the coupons, while the valves must be implanted immediately to prevent their contamination from the surrounding air. To make matters worse, many coupons turn out to be contaminated, while the valves rarely cause infection.

In effect, surgeons in many cases just have to wait and see if the implanted valve will induce myocardial infection.

Officials at Hancock, CDC and the Food and Drug Administration stress that the 20 valves are a minute proportion of the 10,000 implanted within the last 13 months, and that no one has died. But CDC official Mack Hooten says his agency is "taking it seriously.... As far as the risk to patients, it's up in the air... [and we] are at a loss here as to what way things should go."

One obvious move was for the FDA to ask Hancock to stop bothering to send along the cuttings. Hancock's solution was a massive recall. While company spokesmen maintain at least one of the two cases of infection occurred in the hospital, they have agreed to replace all valves distributed between October 1975 and July 1976.

Easing senseless pain

Acute pain can help locate and define disease, but the intractable suffering of the moribund cancer patient often seems pointless. In an apparent attempt to provide physicians with a larger armamentarium of pain killers, the Carter administration earlier this month urged researchers to test marijuana and heroin along with other potential analgesics. As part of this new interest in the formerly "dangerous drugs," the Sloan-Kettering Institute has begun a \$1.9 million, five-year study on the pharmacological effects of heroin.

Heroin, however, is a derivative of the currently used morphine; at best, its use would only provide a stronger version of the same effect. Most experts believe a \$650,000 study just begun by the National Cancer Institute will prove more valuable in the long run. That inquiry will be the first ever to focus on the pain of cancer, investigating such areas as what kinds of carcinoma are more painful, what type of treatment best alleviates the pain and how often oncologists resort to these treatments.

"There is not one piece of datum" on the frequency and distribution of cancer, says John J. Bonica of the University of Washington School of Medicine in the Nov. 25 SCIENCE. But anecdotal evidence, he says, indicates that 70 to 90 percent of cancer patients experience great pain, pain that is often improperly treated because doctors don't always know how. Arnold Trebach, chairman of the National Committee on the Treatment of Intractable Pain, agrees. "Most doctors don't know cocaine is legal [for medical use]. When mixed with morphine and antiemetics [to prevent vomiting], it can induce euphoria and alleviate pain. It's called Brompton's cocktail. Many doctors have never heard of it. I've even had pharmacists ask me how to spell the name."