

diet, says Charles H. Peterson, a marine ecologist at the University of North Carolina's Institute of Marine Sciences at Morehead City. "It's a cosmic irony of food-web ecology that a rare species is only rare because it's kept in check by predators," he adds. "Maybe krill was one of [the penguins'] favorite foods all along."

Modern-day fishing around Antarctica has depleted fish stocks there. Meanwhile, krill populations have declined as much as 80 percent in the past 2 decades. Understanding why penguin diets changed 2 centuries ago may be vital for their future survival, says Emslie. —S. PERKINS

E-Waste Hazards

Chinese gear recyclers absorb toxic chemicals

Residents of a Chinese region where 80 percent of families include workers who dismantle and recycle electronic devices have high concentrations of flame-retardant chemicals in their blood, researchers report. Inhabitants of a fishing village not far away also carried elevated amounts of the chemicals, called polybrominated diphenyl ethers (PBDEs).

Much of the world's electronic waste ends up in China, where most handlers of the materials work without protective gear. They smash the components and strip out metals, releasing dust laden with deca-BDE, a flame retardant commonly added to plastic components.

In this first study of PBDE occupational exposure in China, researchers at the Chinese Academy of Sciences in Guangzhou and Lancaster University in England analyzed blood samples from individuals at two sites in southern China. One group of people lived in Guiyu, an electronic-waste-dismantling area in southern China. People in a comparison group lived in Haojiang, a fishing village 50 kilometers away.

PBDEs come in 209 forms that include different arrangements of up to 10 bromine atoms. Studies in mice and rats have shown that PBDEs with 5 or 8 bromine atoms harm brain development (*SN*: 10/13/01, p. 238; 10/25/03, p. 266). Growing evidence suggests that deca-BDE, which contains 10 bromine atoms, can cause the same developmental problems either on its own or



STRIKINGLY UNPROTECTED Electronics recyclers in Guiyu, China, often work outside and without safety equipment, exposing themselves and the environment to contaminated dust.

when it breaks down into PBDEs with fewer bromines, says Linda Birnbaum, director of the Environmental Protection Agency's experimental toxicology division.

Deca-BDE is widely used in electronics and upholstery. The Guiyu residents had a median concentration of deca-BDE up to 200 times as high as were typically seen in two Swedish studies of industrial workers.

Total PBDE concentrations among individuals in Guiyu had a median value three times as high as did the individuals in Haojiang, the researchers report in an upcoming *Environmental Science & Technology*. The elevated concentrations of PBDEs in villagers in Haojiang indicate that airborne dust particles might have carried the chemicals to the village, says Gareth Thomas of Lancaster University, a coauthor of the study. The highest deca-BDE contamination ever reported was recorded in a 32-year-old Guiyu man whose blood contained 3,100 parts per billion (ppb) lipid. Lipid molecules, or fat, accumulate these chemicals.

The astronomical concentrations of deca-BDE, a median of 310 ppb lipid in Guiyu, indicate regular, heavy exposure to the chemical, comments Åke Bergman of Stockholm University. That's because deca-BDE has a half-life in the body of just 15 days. "In order to keep up these very high concentrations, the people need to be continuously exposed," he says.

The overall PBDE concentrations seen in the Guiyu residents are in "a risk region" for exposing a woman's fetus to amounts of the compounds that could damage a developing brain, Bergman adds.

He notes that electronic-waste recycling is done in other countries by workers who may be no better protected than the Guiyu workers are. "We may have a few more areas in the world where we have [elevated] exposure to humans and also to the environment," he says. —S. WEBB

Smoke This

Parkinson's is rarer among tobacco users

Call it a flimsy silver lining to a noxious blue cloud: Long-term smokers have half the risk of Parkinson's disease that nonsmokers do, according to a new report.

In 12,000 people studied, those who smoked the most—the equivalent of at least a pack a day for 60 years—had the lowest risk. And after smokers stubbed out their last butts, the protective effect faded.

Cigarette, cigar, and pipe smoking appear to offer similar anti-Parkinson's benefits, according to the report in the *July Archives of Neurology*.

Author Beate Ritz of the University of California, Los Angeles characterizes the amount of Parkinson's protection provided by smoking as moderate. "Never-smokers have about a twofold higher risk of Parkinson's disease than ever-smokers," she says.

However, because Parkinson's disease is fairly rare—only about 60,000 new cases are diagnosed each year in the United States—and because smoking causes can-