ited funds for personnel and equipment, current levels of scientific knowledge would hamper realistic monitoring in many areas. The threshold versus linear controversy—whether a given toxin causes some damage in the smallest amounts, or no damage until a certain threshold is reached—is still not resolved for many pollutants.

A further difficulty is that scientists often do not know the subtleties of how a given ecosystem works, and thus it is difficult or impossible to measure subtle sublethal effects of pollutants on such a system. The IBP's terrestrial biome studies (SN: 9/5, p. 204) will be of great help in establishing some of these basic parameters, but the studies have just gotten under way. The undersea habitat approach to marine ecosystems developed by Tektite 1 and 2 (SN: 10/3, p. 283) will provide some of the same kinds of parameters for marine environments could.

Establishing baselines poses some difficult problems, too. Since so much pollution now touches even remote areas, it is difficult to learn what these areas were like in their natural state. But there are approaches to this problem, says Dr. Blair: Museum specimens can be analyzed, and locked-up water in glaciers can be studied.

Although the reports of the three nations are not yet public, Dr. Blair indicated some of the general outlines. Baseline stations would be established in more-or-less remote locations, manned by interdisciplinary scientific teams, perhaps using some of the current biome study sites. Also to be established: impact stations near developed areas to measure the effects of industrialization and urbanization. In addition to the effects of pollutants, natural changes—such as genetic alterations—would be studied at the baseline stations.

**No clear-cut cost** estimates for such a system are available yet. But Dr. Glenn Hilst of the National Academy of Sciences, a member of Dr. Blair's U.S. IBP committee, says monitoring is "definitely feasible on a global scale." He admits, however, that the systems grow more costly as they are narrowed down to precise studies on a national or multinational scale. Both Drs. Hilst and Blair cautiously conceded that existing systems in Western Europe and Japan may be ahead of those in the United States—because, Dr. Hilst says, the crunch on resources came sooner in these more thickly populated areas.

While the international discussions continue, the President's Council on Environmental Quality is working to ready the United States for participation once the worldwide system is established. But the council, in its recent first annual report (SN: 8/15, p. 133) made it clear this country has a long way to go. □

Montreal Children's Hospital

*Lead-glazed pot: A killer in Montreal.*

LEAD POISONING

## Earthenware pitcher hazard

A two-year-old boy died not long ago in Montreal Children's Hospital from an overdose of apple juice and lead. His desperately ill elder brother recovered after five days in the hospital.

A physician in Buffalo was hospitalized with severe intestinal problems. It seems that for some time he had been drinking a little lead with his evening Coke.

None of these victims of lead poisoning had any idea he was ingesting lead. For the Buffalo doctor, the road to chronic lead poisoning began when his son presented him with an earthenware mug made in a university ceramics class. Each night thereafter he unwittingly consumed about 3.2 milligrams of lead, released from the mug's glaze. At that level, the poison worked slowly; it was two years before lead poisoning was diagnosed.

**The children** in Montreal were poisoned more quickly. Because they liked warm apple juice, their parents kept it on a kitchen shelf in a handcrafted pitcher having a lead glaze. (The parents themselves stored their apple juice in its container in the refrigerator.) It never occurred to them that apple juice, or any other drink with high acidity, might be dissolving the glaze and releasing lead into the juice. When scientists tested the apple juice in the ill-fated pitcher, they discovered lead levels above 1,000 milligrams.

Lead poisoning in North America is generally presumed to be confined to slum children who eat paint off the walls of buildings constructed prior to World War II, at a time when lead was a usual constituent of household paint. This presumption, according to Dr. Michael Klein, may be dangerously false. The flourishing interest in handcrafted pottery, the proliferation of potters clubs and the increasing number of small shops and boutiques that market their wares are three good reasons to fear that chances of exposure to lead are rising, not falling.

After treating the two boys in Montreal, Dr. Klein and his colleagues, particularly Rosalie Namer, herself a potter, examined hand-crafted and commercial earthenware purchased from shops, large and small, in the Montreal area. The results, reported in the Sept. 24 NEW ENGLAND JOURNAL OF MEDICINE, are disconcerting. Testing of 264 earthenware glaze surfaces revealed that 50 percent released sufficient lead to make them unsafe for culinary use. Almost 25 percent released enough lead to cause severe, acute poisoning.

While all of the pieces studied were purchased in Canada, Dr. Klein, who is now at Strong Memorial Hospital in Rochester, N.Y., points out that virtually all of the frits, or raw glazes, used by Canadian potters come from chemical companies in the United States. "Thus," he says, "there is no reason to think the risk is peculiar to Canada." Furthermore, he observes, many potters are under the mistaken impression that the lead in commercially prepared frits is tightly bound to other chemicals and cannot be leached out.

**In considering** whether it is safe to use pitchers, mugs and the like, it is important to distinguish between earthenware and stoneware. Earthenware, by definition, is made with a lead-based glaze, which will produce a shiny surface to pottery fired at relatively low temperatures—no higher than 2,050 degrees F. By contrast, stoneware is never made with a lead-based glaze and is fired at considerably higher temperatures in larger kilns than earthenware.

"Unfortunately," Dr. Klein comments, "it is next to impossible for anyone but a real expert to tell the difference by merely looking. The only way a customer can know what he is buying is to ask."

Lead poisoning from pottery is nothing new. It was known to the Romans of antiquity, and has been rediscovered periodically by various cultures. In 1723 the Massachusetts Bay Colony forbade rum distillation from leaded stills. Warnings against lead-glazed pottery have even cropped up from time to time in the last decade. As the number of amateur potters soars, it is urgent that the warnings be repeated because, in spite of existing regulations aimed at checking the problem, there is no way any regulations can constitute a sufficient guarantee in an era of mass amateur potting for fun and profit. □