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Scrap Metal Radiation Raises Concerns in India

By **JIM YARDLEY**

NEW DELHI — To walk through the squalor of Mayapuri, a grimy industrial area of hundreds of tiny scrap-metal shops, is to bear witness to the industrial detritus of the world: tons of rusted iron pipes, twisted steel poles, copper and other discarded metals from Europe, Russia, Japan and the United States, as well as from [India](#).

And then there is what came into the small shop owned by Deepak Jain: a piece, or pieces, of metal blamed for an alarming radiation scare this month that hospitalized seven people and caused the police to temporarily cordon off an area barely 10 miles from India's Parliament. Some experts declared it one of the most troubling cases of radiation exposure in recent years.

"We've never seen a problem like this," said Krishna Kumar Jain, another scrap dealer and brother-in-law of Deepak Jain. "Now people are scared, so nobody is coming here."

For years, India and other developing countries, particularly China, have imported different categories of waste from developed countries as a lucrative, if controversial, business. Critics have blamed the importing of discarded computer equipment, known as toxic e-waste, for long-term chronic health problems among workers in scrapyards, as well as environmental damage.

But the Mayapuri problem represents a potentially graver threat. At a time when India and other developing countries are importing growing amounts of scrap metal, partly to help meet rising domestic demand for steel, experts say inadequate monitoring at ports and a lack of international standards make it easier for radioactive materials and other dangerous objects to cross borders.

India has proved especially porous. Four years ago, 10 foundry workers in the city of Ghaziabad were killed by exploding military shells, apparently from Iran, hidden in a container of scrap metal.

Last year, several containers of Indian steel were stopped at European ports after monitors detected high radiation levels; Indian foundries had fabricated the steel, partly, by melting scrap metal that turned out to be contaminated with Cobalt-60, the same radioactive isotope detected in the Mayapuri episode. It is commonly used in [food irradiation](#) machinery as well as for radiotherapy, as in cancer therapy machines.

Indian authorities say the country's guidelines on importing scrap meet international standards, yet enforcement and monitoring is inadequate. A government plan to install radiation monitors at ports and airports is behind schedule.

"I admit that all of it has not yet been deployed," a government minister, Prithviraj Chavan, told members of Parliament.

Critics say that the government has been reluctant to toughen regulations or monitoring because the imported waste business employs large numbers of workers and helps the country meet its demand for steel.

"The only time they have taken action is when there is a crisis or a worst case," said Ravi Agarwal, a founder of [Toxics Link](#), a nongovernmental group focused on the waste trade. "They don't really want to stop it in a real way."

Didier Louvat, a nuclear waste specialist with the [International Atomic Energy Agency](#), or I.A.E.A., said the Mayapuri case was the most serious global instance of radiation exposure since 2006. He said the I.A.E.A.'s nuclear safety review in 2009 found 196 nuclear or radiological "events," including those involving scrap, compared with 140 in 2007.

In February 2009, the atomic agency called for harmonizing the regulatory approaches toward the issue of radioactive materials turning up in scrapyards — a step yet to be taken.

Many countries, including India, have laws for controlling and registering radioactive sources, but Mr. Louvat said the lack of an international standard created loopholes that required tight monitoring at borders or ports to screen for "orphaned" radioactive sources that slipped into scrap containers.

Indian authorities believe that the contamination in Mayapuri originated with a shipment of imported scrap, though Mr. Chavan, the government minister, said investigators were still looking for a definitive, final answer.

Located on the west side of Delhi, Mayapuri has thousands of workers in the scrap trade, with different shops specializing in different metals. Shop owners say most of the scrap originates from overseas. Trading companies import containers of discarded metals to the outskirts of the

city, where they are sold to haulers who sell the metals to the shops of Mayapuri. The shops, in turn, often sell to foundries.

Investigators believe that Deepak Jain bought the contaminated materials in late February or early March. Another shop owner, Anand Bansal, described an object shaped like a capped steel tube, about four inches in diameter. The tube was made of an unidentifiable metal, and Deepak Jain cut a tiny sample so it could be tested to see if it was valuable. This sample wound up with another man, Ajay Jain (no relation to Deepak Jain), who placed it inside his wallet and soon forgot about it.

By late March, Deepak Jain became sick. Relatives and other shopkeepers say he first developed diarrhea but assumed it was an ordinary stomach bug. Within a few days, his skin began to blotch as black rashes spread across his arms and face. His tongue and fingernails turned blue and relatives took him to the hospital in early April.

Five others in contact with the shop also became sick, while Ajay Jain, the man with the small cutting of metal in his wallet, complained of a sore buttock and a black rash on his leg. "One day he was in someone else's shop and he just fell down," said his father, Shital Prashad Jain.

Doctors were initially mystified. But on April 4, physicians confirmed that Deepak Jain had been exposed to radiation and notified the National Radiation Regulatory Authority. The police closed down the Mayapuri shops, and teams of atomic inspectors recovered eight radiation "sources" from Deepak Jain's shop, two more from a nearby shop and, later, the small cutting from the wallet. A patch of contaminated soil was also removed.

"The scrap dealers or the employees working there are the victims of the inaction of these government agencies, which have totally failed to put in the necessary controls and procedures to prevent such an incident," declared D. Raja, a member of Parliament, during a speech on the floor.

On Thursday, about 200 shop owners and workers in Mayapuri gathered under a tent to pray for two hours for those who were sickened — and that life, and business, could return to normal.

"What else can we do except pray to God?" said Jaibhagwan Jain, a shop owner. "We have never faced this kind of situation before."

Hari Kumar contributed reporting.