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By Steve Twomey
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GAVLE, Sweden — The rain that remade the future — the rain that could kill one day — began at 6:30 in the evening of Monday, April 28, a steady shower along the Baltic coast 100 miles north of Stockholm. All night it rained, tapering off about 7 in the morning, having drenched the docks, the downtown mall, the two paper mills, the schools and the fields with seven-tenths of an inch of water.

It had also soaked them with iodine-131, cesium-137 and 14 other radioactive isotopes. As Gavle rose for work that Tuesday morning, its radiation rate was 80 times normal.

By chance, the rainy weather had drifted across Gavle at the same time as radiation from the Chernobyl nuclear accident, and each raindrop had become an atomic carrier. No one knew about that part of the storm; everyone would learn.

Now, six weeks later, the world's anxiety over the reactor accident is waning. But in Sweden, the first nation to detect and report the Chernobyl radiation, and in Gavle, whose rain made it the worst-hit area in Sweden and one of the worst in Western Europe, it is clear that Chernobyl's legacy will last for years. The fear is not over, even this far from the Soviet Union.

"We're living in a polluted area, we're living in a polluted country," said Jan Ekoth, 29, who runs a youth hostel here. "I haven't met a single person who isn't concerned about the future."

Last week, experts told hunters not to eat reindeer that they kill during the fall because the meat — a favorite in Sweden — could be tainted. Cows are still being kept and fed indoors in some places, at costs to the government that could exceed \$100 million, because radiation is still too high to permit grazing.

Thousands of man-hours are being spent to figure out what will happen to hay and vegetable crops this year and next year and beyond. No one knows yet. Seven-hundred phone

calls a day still pour into the Swedish Institute for Radiation Protection in Stockholm, from people seeking information about the quality of food and the effects on pregnant women, or just seeking reassurance.

The most important legacy, however, is the risk to health. It seems certain now that at least several dozen Swedes will die — not right away, as people have in the Soviet Union, not even in two or three years, but eventually.

From ground samples, as well as from air samples taken by Swedish royal air force planes flying as low as 500 feet at 30-mile intervals the length and breadth of the country, the radiation institute has concluded that about as much radiation fell on Sweden after Chernobyl as fell during the entire period of the late 1950s and early 1960s when the United States and the Soviet Union were conducting above-ground nuclear tests.

Because much of this radiation will decay very slowly — cesium-137 has a half-life of 30 years — Swedes will be exposed for years to radiation from the ground and through the food chain.

The institute estimates that the average person will absorb an additional millisievert of radiation over the next three decades and that some Swedes, such as those here in Gavle, will get up to five additional millisieverts. From natural sources, each person in Sweden normally receives one millisievert a year. (A millisievert is one-tenth of a rem, or about five standard chest X-rays.)

Given these additional dosages, experts at the institute believe that, over the next 30 years, up to 100 Swedes will die of cancer who otherwise would not have died, and 50 additional babies will be born with birth defects. Other scientists and environmental groups believe that these figures are far too low, and suggest that the number of deaths could reach 3,000, or an average of 30 a year over the next 30 years.

Certitude is impossible, though. One of the things Sweden has learned is that it cannot come up with exact figures on the national dose of Chernobyl radiation because the radiation fell haphazardly across the country. While news maps in the early stages showed a "cloud" moving uniformly across places like Sweden, the reality was that areas only a few miles apart received vastly different amounts, depending on weather conditions.

Because of the atmospherically

cleansing effect of the local rainstorm, Gavle was hit hard. But the large city of Uppsala, an hour's drive away, received much less radiation, and Stockholm received hardly any.

As a result, Swedish estimates about long-term health risks offer little help in projecting what can happen elsewhere in Europe, where radiation presumably arrived in equally random ways. The World Health Organization is trying to gather data from every nation af-

fectured to get some idea of future health problems, but these will be rough estimates at best. It seems likely, however, that at least several hundred people outside the Soviet Union will die.

Swedish authorities have sought to minimize forecasts about deaths, saying that even if the worst comes true and 3,000 die over 30 years, the total will be too small to even create a "blip" in mortality rates here. About 20,000 of the 8.3 million Swedes die

annually of cancer; 30 more per year would not represent an obvious "Chernobyl effect," they say.

"Even in this peaceful country, the chances of being murdered are higher than [the probability of] deaths from radiation," said Jack Valentin, one of the four deputy directors of the radiation protection institute. "There's nothing to worry about."

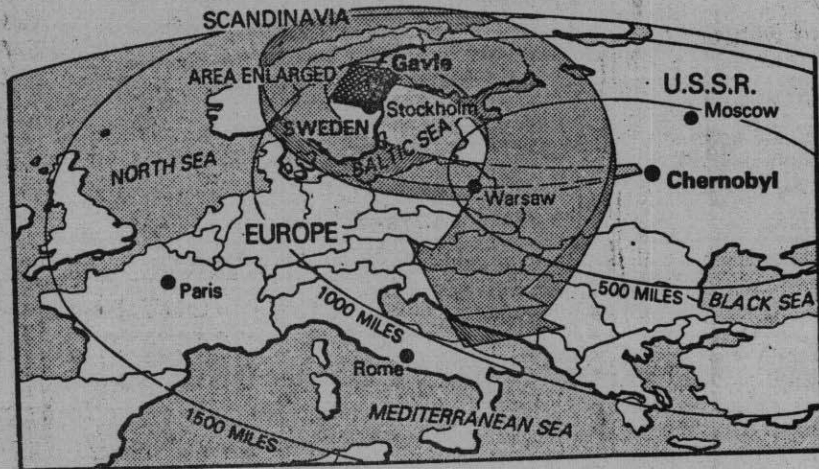
Indeed, more than 100 people are murdered in Sweden every year. Still, people will die from Chernobyl who wouldn't have, just as if they were murdered. "It's some 100 new cases of cancer we didn't ask for," said Sven Lofveberg, the institute's press officer.

As for Gavle, "Oh, they are scared," Lofveberg added. Residents, in fact, now call it "the black area," Jan Ekoth, the hostel operator, said, referring to the institute's maps of radiation totals, which show Gavle as the darkest-shaded area.

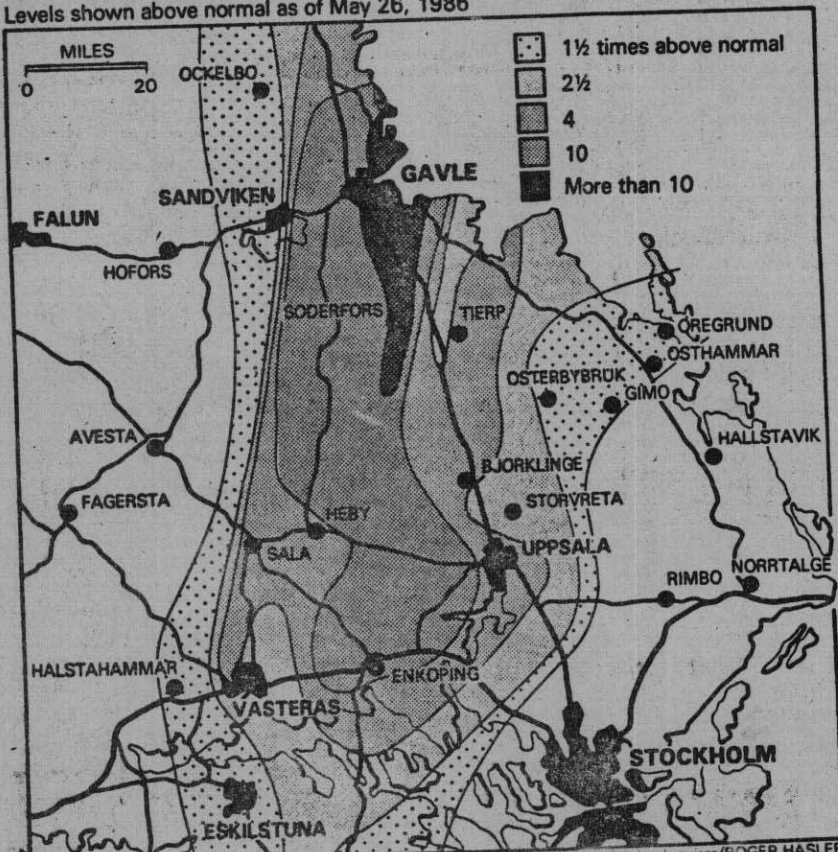
A city of 87,000, about 850 miles from Chernobyl, Gavle could be in the American Midwest. Its streets are wide and, at dusk, full of tots on bikes. Subdivisions sit on the town fringe, along with a single-story brick school surrounded by carefully manicured lawns. Teenagers hang out in pizza parlors or ride their motorcycles down the main streets.

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General path of Chernobyl radioactive cloud



Radiation levels in the Gavle area
Levels shown above normal as of May 26, 1986



SOURCE: Swedish Institute of Radiation Protection

The Philadelphia Inquirer/ROGER HASLER

Like the rest of the world, Gavle learned of the reactor accident on April 28, when the Soviet Union acknowledged that high radiation found at a Swedish reactor near here was from Chernobyl. Its first inkling that it had become a victim probably came the next morning when, knowing how well rain washes out drifting radiation, physicist Bengt Bodfors at Gavle Hospital took a sample from a office by the overnight shower. "We could see there were a hell of a lot of isotopes," said Bodfors.

At no time was evacuation considered because radiation, while high, never reached immediate-danger levels, said Lars Hoegberg, the county environmental director. At no time has there been panic, and no one has moved out of the city, he said.

But so much anxiety remains that two weeks ago, the radiation institute mailed 250,000 brochures to homes in the area around Gavle, telling how much radiation was recorded and estimating that very few cancers would result in the immediate area.

People are especially worried about children. This far north, win-

ters are long, and there are only a few hours of sun. By spring, when daylight lasts to 10 p.m. and the sun comes up at 3 a.m., children are eager to spend hours romping outside.

"It's hard to tell children about a nuclear accident. They don't understand it," said Ekoth, who has let his two children and friends play outside. "Me and my friends just think, 'It won't be me who dies, it won't be my wife, it won't be my kids.'"

What frightened many is that while the authorities insisted that there was no major health risk, they also banned the sale of milk, told farmers to not use grazing grass, and ordered that cows be kept in barns. Officials said they did so only because the steps were easy ways to prevent the slightest absorption of radiation by people, but many Gavle residents thought that they had to mean something worse.

"If the grass isn't dangerous, why are we cutting it?" asked Ingrid Jarlebring, a local farmer and mother of four.

Faced with such fear, some officials say they have learned from Chernobyl that no matter how much they explain or reassure, many people will still be afraid because radiation is such an unseen, long-term threat.

"I think people got more scared than the accident was worth," said the institute's Loefveberg. "Our figures on cancer deaths, for example: Our estimates don't match their fears and, because they don't, our figures must be wrong. They don't accept them. They think things are more dangerous than they are."

Radiation levels have dropped since April 28, although they remain far above normal and restrictions still are in effect for farmers. As of the last week of May, 13,000 of the 20,000 cows in Gavle County were still confined to barns, and many farmers still did not know whether hay and vegetable crops will be tainted with radiation as the summer wears on.

A key problem is that no one in the county government knows anything about radiation. No one ever thought he would need to know. Another outcome of Chernobyl is that each Swedish county will probably get a radiation specialist.

"We know a lot about agriculture and nothing about radiation," said Anders Enquist, the county grass specialist, "and the authorities in Stockholm know everything about radiation and nothing about farming."

"Nobody had calculated this situation," said Hoegberg, "that it would come from another country and be so big."

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