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Schoolyard yields troubling secrets

Sunday, November 21, 1999

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MARION, Ohio -- One day, a yellow plastic flag sprouted in the schoolyard. The next afternoon, nine yellow flags were fluttering in the breeze. Soon, 13 speckled the campus of the River Valley High School and Middle School.

They looked like a cluster of dandelions. But to Kent and Roxanna Krumanaker, whose daughter is among an alarming number of graduates diagnosed with leukemia, the flags were malevolent: They looked like cancer.

Each of the flags was placed by the Army Corps of Engineers to mark a spot on the 80-acre campus with a high radiation reading, worthy of further study. Roxanna Krumanaker and many others believe they might be important clues to the cause of so much suffering.

"It scares the hell out of me," she said. "I believe if you look long and hard enough you will find the answer. It's a puzzle."

No one in town may ever find out for sure what has caused the sickness. Early tests showed that radiation has mixed with other toxic chemicals, all possibly left behind by the Army, creating a stew of poisons that even the best government scientists are not likely to unravel.

But even if the mystery never is solved, the case

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illustrates the massive government effort that goes along with the very existence of stray radioactive materials. And it shows the fear that the discovery of anything radioactive can strike in a community.

"I have always believed radiation was there and it's a problem," Roxanna Krumanaker said. "I've talked to too many old-timers from the depot, and I suspect the Army scattered the stuff all over the area playing their war games. If they say there's no radiation there, it's a lie."

Radiation was the first culprit investigators looked for in August 1997, when their search for answers to heightened leukemia rates began; it was logical to suspect radiation because it is a known cause of the disease. Moreover, the school campus sits on land used for nearly 20 years by the Marion Engineering Depot, a U.S. Army storage facility that held thousands of radioactive devices.

Soon, technicians got high nuclear readings in the front yard of the high school and dug up a radium disk the size of a dime.

For more than two years, that search has continued, with two state agencies and the Army digging trenches on the school property, taking more than 600 samples, and sweeping athletic fields with Geiger counters. In addition to the radioactive disk, they've found high levels of polyaromatic hydrocarbons, which also are known to cause leukemia, and arsenic on some athletic fields.

Last month, community anxiety intensified yet again when the investigation turned to a top-secret laboratory at the defunct Scioto Ordnance Plant, five miles north of the River Valley campus. The lab was built to make triggers for atomic bombs in the early days of the Cold War, and local residents have bombarded government investigators with decades-old stories of spills and mishaps involving radioactive material.

Now, at the prodding of Sen. Mike DeWine, R-Ohio, the U.S. Department of Energy is preparing a full-scale survey to see if any of the radioactive polonium used for the bomb triggers might have escaped into the environment.

The hunt for answers has sparked fear and loathing as a

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small Midwestern city comes to grips with its past. At public meetings and in chance encounters at the mall, some townspeople accuse concerned neighbors of threatening Marion's economic recovery by drawing publicity to what people call the "cancer cluster." There have been nine confirmed cases of leukemia among the 4,000 graduates since 1967, a period during which only 1.7 cases would be expected, the state Health Department has found. Citywide, the leukemia mortality rate rose 122 percent between 1966 and 1995, the state says.

It is possible there is a statistical anomaly, officials say, but leukemia is one of the few forms of cancer that science knows can be caused by environmental radiation.

"If it's coincidence, it's got to be the most bizarre thing that could have ever happened," said Linnea Cummings, whose daughter, Jami, a 1990 graduate, was diagnosed with chronic myeloid leukemia two years ago. "What you have is young people getting old people's diseases. They need to find it and get rid of it. . . . I can't believe it's nothing."

And there's a scary lesson in Marion's plight for the rest of a nation facing up to the fact that it has lost control over some of its nuclear material: Science does not have a precise understanding of health risks from low levels of radiation, or how it might interact with other dangerous pollutants.

As she slipped on her bridal gown for a fitting, Jami Cummings noticed that it was tighter than before. She felt bloated.

"I thought it was time to break out the exercise tapes," she said.

It was the spring of 1996, and she was 23 years old and getting ready to marry her high school boyfriend. She figured the dull ache in her abdomen was an ulcer, maybe from the stress of organizing the wedding.

Cummings' doctor found her spleen, usually the size of a fist, had swollen as big as a football -- and was alarmed because that often means white blood cells are dying and collecting in the organ, a symptom of leukemia. The eventual diagnosis: chronic myeloid leukemia. Even with

a bone marrow transplant, she would have a 40 percent chance of dying a slow death.

"I'd never heard of leukemia," Cummings said.

That summer, she was blasted with nine doses of chemotherapy in six days, then spent six weeks in the hospital, losing 20 pounds. Well enough to go back to work at a bank in Delaware, Ohio, Cummings bought fake bangs and attached them with velcro to floppy hats in hopes people wouldn't notice she was bald.

In January 1997, she got a bone marrow transplant at Johns Hopkins University in Baltimore, where she stayed for five months before returning home. When her body started rejecting the transplanted marrow, she had to fly back in an air ambulance for treatment.

Now she's back at work with a full head of hair, doing well but living with the fear of a relapse.

The wedding never happened. "I asked him, 'If I get sick again, can you take care of me?' " she said. "He said 'no.' I told him I couldn't marry him."

Her first inkling that school might have something to do with her disease came in a Columbus, Ohio, hospital before she went east for the transplant.

"My volleyball coach came to visit and said, 'Did you know about Kim Krumanaker?' Another teacher said did you know so-and-so had it? They just brought in lists of people."

Cummings played basketball, volleyball, and softball at River Valley, and she remembers that even on dry days the ground was wet in spots. She wonders now if that was because dangerous chemicals or radiation were even then bubbling to the surface. "I was always up there at the school; I lived there," she said.

Kim Krumanaker Tolnar was a track star at River Valley High School, a fan of the Vikings football team, and treasurer of the Class of 1983.

She was 27 and newly married when she went to a doctor to complain of chronic fatigue, pounds melting off her body, and migraines. A routine diagnostic blood test confirmed she had leukemia.

Several months later, Tolnar matched with a Pennsylvania schoolteacher for a bone marrow transplant that could save her life. In January 1994, accompanied by her family, Tolnar went to the Fred Hutchinson Cancer Research Center in Seattle for the procedure.

Her body rejected the new bone marrow, and it shut down. By June, she'd lost all the donated marrow and was near death. The teacher agreed to donate a second time, and this time it took. She went home in October 1994, albeit given only a 50 percent chance to live.

Now the leukemia is in remission, but the cost has been high. Kim walks with a limp, the joints in her knees are crumbling, she has arthritis, high blood pressure, and flaccid muscles. She can't hear out of her right ear and will never realize a lifelong dream: bearing a child.

"I have no hormones," she said. "I'm post-menopausal."

It began with whispers. "The phone never stopped ringing," Linnea Cummings said. "People were saying, 'He's got cancer. I've got cancer.' The saleslady in J. C. Penney's told me about her grandson's leukemia." Too many of the victims, it seemed, had gone through the River Valley schools. She picked up a letter of support that Roxanna Krumanaker had written when she heard Jami got sick; the two women got together.

They bombarded political leaders with letters demanding an investigation: the president, the vice president, the governor, senators, Congress members, state legislators. A group of concerned families joined them, and before long, the Ohio Department of Health, the Army corps, and the Ohio EPA began investigations.

In August 1997, the state found elevated radiation readings on the front lawn of the high school, and benzo(a)pyrene, a petroleum compound in the benzene family, in the practice football field. The next month, the Army dug up the radioactive disk, buried five inches below ground. Officials said the disk was coated with radium and probably had been used to illuminate portable bridges in World War II. Nobody knows how it got there.

After these discoveries, the state announced it had found a high leukemia rate in Marion. The effect was

explosive. Alarmed parents grilled environmental officials at public meetings, and statewide media coverage shone a spotlight on Marion.

Later, the state roped off five athletic fields and warned students to stay away from the drainage ditches that edge the property. In addition to possible radiation, further testing had found high levels of arsenic in the ditches and concentrations of polyaromatic hydrocarbons that were 10 times higher than expected on the fields.

The examination of the schoolyard mushroomed. Stakes were set out dividing the property into 174 grids, each 100 feet by 100 feet, so that contractors working for the Army corps can pinpoint every reading they find.

Last summer, the grounds were repeatedly swept with Geiger counters in a search for radiation. Then, the crews drove 100 tubes 10 feet into the earth to capture any gases that might be coming from substances in the soil. And in the fall, 25 wells were sunk on the property to monitor the ground water.

Recently, the investigation took another turn as the Army corps began drilling underneath the school buildings themselves to take soil samples.

A full risk-assessment combining the results from all these tests, along with a cleanup plan, won't be completed until February, the Army corps has said.

"Then I'll have a pretty good chemical picture of this whole area and we'll be able to see if there's a pathway from here to humans," said Wes Watson, a project scientist for the corps. "If there's any needle in this haystack, I'll find it."

While investigations continue, a spokeswoman for the corps said her agency is confident there is no radiation to be found on the school grounds. The government does not believe the bomb-trigger plant was ever operational, but investigators still need to get classified records opened up and study the ground there, said the spokeswoman, Barbara Kehoe.

Her claims echo a preliminary report released by the corps last fall that said there are no elevated radiation readings on the campus.

But those findings have been called into doubt. A whistle-blower who was in Marion for the corps' testing contractor claimed that workers were ordered to fudge results to make sure they found no worrisome radiation reading. The Army's criminal investigation command is looking into the allegations.

At the same time, the Ohio Department of Health is preparing to have new tests performed by separate contractors.

And the school district, because of the uncertainty, hired its own company to do a radiological survey of the grounds in September. While the surface scan found no "extraordinary" sources of radioactivity, the company told the district that the study could not rule out "buried radioactivity."

Army records show that more than 80,000 radium disks were stored in its former depot. Also stored there: an undetermined number of early night-vision devices that were powered by radium and strontium. Watson says it is possible that some of the radioactive material was lost on the land.

Even though the school complex lies on a relatively small patch of ground, it's not easy to profile. For instance, some of the 13 yellow flags symbolizing elevated radiation readings may reflect the decay of isotopes from radium-flecked rocks used to build a water line, Watson said.

"All of that makes this a complex thing," Watson said. "Is it a fake scare or a real scare? Who knows?"

Fixing blame for the cancer rate in Marion will be even more difficult. Leukemia is a slippery adversary and there's plenty of ambiguity about Marion's cluster of cases, scientists say. Do the victims have genetic predispositions to the disease? Were they exposed to other pathogens in their lives? Were they attacked by viruses? How strong were their immune systems? Also, the sharp jump in Marion's overall leukemia rate was due primarily to a bump from 1986 to 1995, a small sample that can throw off the statistics.

Moreover, there's an environmental wrinkle specific to Marion. The area's soil contains uranium-rich deposits,

which generate radon as they decay. And high radon levels may cause myelogenic leukemias, according to a study from Britain. The theory is that radium ingested in drinking water attacks bone marrow.

"It is doubtful that any causal explanation for the recent increase in leukemia mortality can be found," concluded Robert Indian, the author of the study and chief of chronic and environmental disease surveillance for the Ohio Department of Health.

That is the norm, according to experts on epidemiology. Citizens report an estimated 1,200 suspected cancer clusters to state health departments each year, and an average of 10 percent of them warrant a cursory investigation. As few as 1 percent to 2 percent of the clusters are deemed suspicious enough to trigger a full-blown epidemiological investigation.

And over the past 20 years, when the field of studying geographical cancer clusters became widespread, not one study has been conclusive, scientists say. That's because the number of variables involved in each case of cancer is almost infinite. An epidemiologist has to get a fix on what risks a victim incurred years before, when the cancer started.

"People move away, they move in from elsewhere, people die for other reasons . . . there are a huge number of confounding factors when you're looking at something with a long latency period like cancer, especially at low levels of exposure," said Michael Greenberg, a professor of urban studies and community health at Rutgers University.

The Marion mystery plays out in odd, contradictory ways. Some students at the school joke about going to "Death Valley." A few members of the Class of '98 printed T-shirts that read, "I survived the cancer scare." On the other hand, the visiting Whetstone High football team brought bottled water to a game at River Valley last fall.

"Almost no one talks about it," said Jeremy Jones, a junior who was practicing the discus and shot put on a late summer evening. "I feel that it's not all they say it is, or more people would be affected. Kids are not very worried about it."

Nearby, preteen girls were playing softball on one of the fields that had been marked off as part of the environmental probe. Several parents said they were not worried, and some were more than a little frustrated.

"I couldn't sell my house now," said Angie Force, 31, a mother of three. "Who wants to move into the River Valley school district?"

She said she wouldn't hesitate to enroll her children, now 11, 9, and 4, in the schools. "There may be a risk but, I'll tell you what, so is eating a hamburger at Rally's or Burger King," she said. "E. coli -- that's killed kids."

Thomas Woodard wrestled with his dog while his daughter's team was warming up. "I played ball in that field they have roped off when I was a little kid," said Woodard, pointing to the back of the school property. "You've got coaches that have been out here for 20 years and none of them has got sick."

But among those who have been touched by illness, and many who have not but are afraid, it's hard to avoid wondering what is wrong in Marion.

"It's like a sleeping dragon. You tiptoe around it and hope it never wakes up," said Sherrie Dunn, whose daughter Abby, now 5, is in remission from leukemia diagnosed two years ago. It struck her as odd that two other children in a Columbus hematology ward also had Marion ties.

"The experience of holding her down for bone marrow tests and spinal taps and chemo, watching her lose her hair and having people stare at her, and other kids laugh at her. . . . We don't want other people to experience that pain."

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