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# At Morgue, Ceaselessly Sifting 9/11 Traces

By DAN BARRY

Outside the chalk-white tent, the whistle of traffic along the Franklin D. Roosevelt Drive signals the forward movement of a city. But inside, 16 refrigerated trailers hum in a ceaseless chorus, giving voice to the dead whose remains are contained in their hold.

The trailers hummed as time separated the city from the 11th of September: as the smoking mountain of what had been the World Trade Center became a yawning hole; as 1.6 million tons of debris were sifted through on a Staten Island landfill; as commemorative services caused heads to bow. They hummed and they continue to hum, a mantra-like reminder that talk of closure is premature.

The trailers' contents are in the custody of Dr. Charles S. Hirsch, the chief medical examiner of New York City, who for 13 years has explained the city's deaths to its living. His duties now include the historic challenge of trying to identify the nearly 20,000 body parts carried to his agency's bleak, even forbidding building.

The human remains recovered at the disaster site and the landfill all came to an open-air bay on the East 30th Street side of the medical examiner's building on First Avenue in Manhattan. In close and hectic surroundings, they were examined by a succession of experts -- the pathologist, the forensic dentist, the fingerprint analyst, the DNA specialist -- all in search of something distinguishable, from an inscribed wedding ring to a set of genetic markers.

The remains were then carried across 30th Street to the white tent, where they were received with a preacher's brief prayer and then stored while others worked to try to attach a name to them.

Today, more than 10 months after the terrorist attack, the remains of 1,229 of the estimated 2,823 victims, or nearly 44 percent, have been identified through laboratory analyses, computer wizardry and old-fashioned detection. More than 500 identifications have been made through DNA alone: for one victim, nearly 200

pieces have been identified, while for others, there was a single shard of bone.

Amid the investigative swirl -- of trying to match thousands of victims with six times as many body parts -- the medical examiner's office has made a few misidentifications. In one case, there was a folder mix-up. In another, a toothbrush collected for DNA was mislabeled.

"We are fallible," Dr. Hirsch said. "But when we have made mistakes, we've modified our procedure to avoid repeating that mistake."

The story of the medical examiner's continuing response to Sept. 11 is largely unknown, partly because of Dr. Hirsch's privacy concerns, and partly because of his office's aura. It is, of course, the city morgue.

Many of his employees are so consumed by a mission with no clear end that they have barely reflected on their experiences. In recalling certain moments, several cried. A central part of their job, after all, is to tell all that they know, no matter how disturbing, to the victims' relatives.

In an anteroom with a water-stained ceiling, people have asked where the remains of their loved ones were found. One staff member, Shiya Ribowsky, has had to jab his finger at a grid map of Lower Manhattan and gently say: "Here. And here. And here. And here."

Usually, the people summoned to that sad little room have at least had something to bury. The remains of more than half the victims have not been identified, in part because hundreds died without leaving a trace. The hope is to identify 2,000 victims, or about 71 percent. "That's been our whisper number around here," Dr. Hirsch said.

Firsthand experience informs these tempered expectations; he was there when the first tower fell. Hours later, bloodied and bruised, he pulled from his pocket a fistful of pulverized concrete -- a sign of all that had been reduced to dust. That dust, mixed with coins, rests now in a glass bowl on his desk.

Dr. Hirsch, 65, smokes a pipe and wears suspenders; he is fastidious and reserved. But when he discusses his office's time-consuming efforts to identify the dead -- which so far have cost \$24 million -- his emotions rise a tick or two. "It's important to people and we're here to serve people," he said. "If a government can't do that, what good is it?"

That is why the medical examiner's office has begun to preserve the 16,000 body

parts that have not been identified or returned to family members. One by one, the remains are being air-dried in a kind of giant dehumidification chamber to stem the decomposition and protect the DNA.

That is why Amy Zelson Mundorff was at her familiar post in the open-air bay the other day, examining a piece of a spine while others jotted notes. And why Dr. Zoran Budimlija was at a steel table beside her, scraping a piece of bone in search of material that might yield telltale DNA.

Their efforts were part of the agency's resolve to re-examine every body part; as Mr. Ribowsky put it, "to see September's remains with July eyes." The double-checking has already paid dividends in identification, the coin of the medical examiner's isolated realm.

Ms. Mundorff recently found a mandible imbedded inside a torso. A discovery that might have caused gasps elsewhere elicited only cheers in an ugly building on First Avenue, where a hum is always at the door.

### Danger in the 'Kill Zone'

As soon as word arrived that a jetliner had struck the World Trade Center's north tower, Dr. Hirsch and his colleagues prepared to receive the dead.

While other staff members set in motion a well-rehearsed disaster plan, Dr. Hirsch and six aides drove to the scene to establish a temporary morgue. And when the first tower roared and fell, shooting steel and concrete through the air, the doctor and his contingent found themselves well within the "kill zone."

One investigator broke her leg so severely that the bone was exposed; another suffered a blow to the back of the head and took months to recover. Ms. Mundorff, 33 and barely 5 feet tall, was thrown headfirst into a wall. Dr. Hirsch was hurled to the ground, badly cutting his hand and bruising much of his reed-thin body.

Back at the office, staff members tried to sift fact from rumor. "We shut down 30th Street, got the refrigerated trucks coming, the forensic dentists arrived, and so on," said David R. Schomburg, the director of medicolegal investigations. "But there were these rumors, false, of a ferry bound for Staten Island with 350 dead."

His staff soon learned that Dr. Hirsch had survived, but still, the sight of him that afternoon was breathtaking. Covered from head to toe with white dust, he was a ghost with horrible stories to tell.

For his aides, it was an unforgettable moment. Here was Dr. Charles Hirsch, the

man who had resurrected the country's largest and busiest medical examiner's office -- handling more than 25,000 deaths and more than 700 homicides a year -- from the mire of mismanagement; whose leadership had persuaded others to marry their career paths to his. Here he was, awed and covered with the dust of others.

"I had a surge of emotion that I can't describe," recalled Dr. Mark Flomenbaum, the first deputy chief medical examiner. "I'm in New York because he's in New York. If he were in Chicago, I'd be in Chicago. It was horrible."

Dr. Hirsch emptied his pockets and had a medical examiner's epiphany. "If reinforced concrete was rendered into dust," he said later, "then it wasn't much of a mystery as to what would happen to people."

It was evening before the first body arrived, one of the very few that would be found intact: the Rev. Mychal Judge, a Franciscan and the well-known New York Fire Department chaplain. His case was called DM-01-00001, with DM standing for Disaster Manhattan.

Mr. Ribowsky, now the deputy director of investigations, grabbed a thick ledger book and started to log descriptions and case numbers for the flood of body parts that was only beginning. "Each piece had to be treated as its own person," he said.

The book's entries came to reflect the deluge of body parts that would last for many months. The seventh entry says "unk: male," or "unknown"; the 18th, "left hand"; the 19th, "body fragment." There are rows of entries that say, simply, "unk: fragment -- bone," or "skeletal muscle."

And when that book ran out of space more than four months later, on Jan. 22, the 13,486th entry was made -- "unk: fragment -- bone" -- and a second book was begun. Its first entry, for the 13,487th body part, reads: "unk: fragment -- bone."

The agency's officials had put together an elemental but effective operation. An escort, usually a police officer, would be assigned to follow a body part as it passed before the eyes of a pathologist, a forensic dentist, a detective from the missing-persons bureau, a DNA analyst. It would not leave the escort's sight until it was stored in one of the refrigerated trailers parked in the weed-covered lot that is known as Memorial Park.

The never-ending flow of remains shocked even the most experienced in death's indignities.

"In one day," Dr. Flomenbaum recalled, "I was seeing more homicides than in my

11 years in this office."

Late that first night, stacks of dental charts, X-rays and photographs began to pile up in the lobby. They had been left by police officers, firefighters and others who thought that the medical examiner's office could use them.

### Follow the Forensic Trail

Then came what seemed like a timeless blur: of the unthinkable becoming mundane, of the constant engagement in what Dr. Hirsch calls the "dialogue with the dead." The nature of the disaster had already answered some of the basic questions that a medical examiner asks when standing over the dead, such as where and when the death had come. But, he said, there was still that first question: "Who are you?"

People became obsessed with that question, among them Ms. Mundorff. The forensic anthropologist, her eyes blackened by her head injury, became the traffic director of a triage center that mushroomed onto East 30th Street. She examined every body part for something distinctive -- an old fracture, a steel screw in a hip, a clothing label -- sealed it in a bag, and wrote in indelible ink what she had found.

Then, she directed its escort where to go. For example, "Table 1 needs a case," she would say.

A few yards away, Dr. Jeff Burkes oversaw a team of forensic dentists who, whenever possible, were accounting for every tooth in a jaw, then creating new dental charts. As soon as dental charts that could be used for comparisons arrived, he said, "We got hits almost immediately, within hours."

And down the corridor, as many as 40 people were jammed into a conference room, coordinating death certificates and fielding frantic calls from family members, while also trying to control the overflow of vital information. The noise in the small room would become so loud that Mr. Ribowsky occasionally called a timeout and asked everyone to take a long, relaxing breath.

Concentration was needed for the proper release of remains. "Somebody would have to go out and physically view the remains," recalled Chuck Smith, a medical investigator who came from Baton Rouge, La., to help. "This was to make certain that what we were releasing was the same thing that was detailed on the intake sheet."

The system was nearly flawless, but anything short of perfection meant pain for

family members. Out of thousands there were three or four misidentifications, including the odd case of two firefighters from the same firehouse with the same anomaly in the same neck vertebra.

In another case, a forensic dentist gave the wrong folder to a person in the conference room. As a result, Dr. Hirsch said, "We changed the policy and required the sign-off of two dentists to make an identification."

So much was being done for the first time that people joked that they were transforming a Cessna into a 747 -- in flight. There was the assembly of a comprehensive database that, with a click of a mouse, could call up a photograph of a body part or show the latest conversation with a family member. There was the coordination of the services of hundreds of people summoned to New York by the federal program, Dmort, which is short for Disaster Mortuary Operational Response Teams. There was the start of a groundbreaking practice to issue death certificates without bodies, eliminating a source of pain for grieving families.

All the while, the people of New York City continued to have fatal accidents, to kill one another, to die. In November, a jetliner crashed in the Rockaways, killing 265 people; Dr. Flomenbaum and the 31 medical examiners under his supervision were now handling two large-scale disasters on top of their normal workload.

"Death did not take a holiday otherwise," Dr. Hirsch said.

But it was the World Trade Center disaster that never seemed to end. Trucks fresh from the disaster site and the landfill kept pulling up to the open bay, where the presence of police officers and firefighters -- looking for lost friends -- had long since breached the building's traditional wall of dispassion.

"They knew these people," Ms. Mundorff said. "They'd say, 'Oh, he just got married,' or 'Oh, he has three kids.' It's not like this was Bosnia. This was our home turf, and it was hard."

One day in the first month, Deputy Commissioner Thomas J. Brondolo took a walk. He had not left the medical examiner's office since the disaster -- except to sleep in his car -- and now he saw for the first time the photographs of the missing that covered the walls and windows of the city. They were snapshots, from vacations and weddings, of the people now coming to his place of business in pieces the color of earth.

"The farther and farther I got from the office," he said, "the harder and harder it became."

## DNA Takes Time and Patience

For a while, patience was about all that the DNA specialists on the sixth floor could bring to their agency's mission. To make identifications, they had to compare the DNA being extracted from the body parts with DNA taken from the victims' personal effects or their blood relatives. The collection of that material took time.

The nature of the disaster also complicated matters. "It was like a huge mortar and pestle," Dr. Robert Shaler, the director of forensic biology, said. "There were many, many small fragments, commingled remains, many pieces from a single person."

While the state police set out to collect things to compare -- from toothbrushes to cheek swabs -- Dr. Shaler worked the telephone to find the best databases and analysts in the country. A first-generation computer system was set up and, on Oct. 24, the medical examiner made its first identification through DNA.

But by early January, Dr. Shaler received confirmation that the chaotic nature of the collection process in the first days had created doubt about the usefulness of the samples.

To ease the pain and confusion for relatives being asked again to provide DNA samples and personal items, the medical examiner established a DNA hot line that allowed them to check on the status of their loved one's case. So far the hot line has received more than 6,300 calls.

More than 5,000 cheek swabs have been taken from blood relatives, and more than 15,000 personal articles have been collected. Some items, like a victim's teddy bear or pillow case, have been of no value, while others -- including 1,400 toothbrushes, 140 razors and 126 hairbrushes -- have yielded valuable DNA.

Today, the responsibility for making further identifications in the most ambitious forensic investigation in history rests almost entirely with Dr. Shaler and his staff. "Here on out," Dr. Hirsch said, "any additional identifications will likely be exclusively DNA."

Assistance is coming from across the country. In Springfield, Va., the Bode Technology Group is pulverizing bone samples to extract DNA. In Rockville, Md., the Celera Genomics Group is trying to trace the maternally inherited DNA from the remains. In Dallas, the GeneScreen division of Orchid Biosciences Inc., will be analyzing DNA samples that have so far yielded nothing.

But the work also continues in the medical examiner's DNA laboratory. There, on a

recent day, boxes of bones lined the wall of a walk-in cooler, boxes of personal effects were stacked in the hall, and binders with labels like "Bone/Teeth/Hair" and "Muscle/Soft Tissue" lined book shelves. In one corner, technicians were reading data from a sophisticated computer system that did not exist on Sept. 11, while in another corner, a robotic machine processed liquefied profiles of DNA.

And on a counter sat a plastic tube, inside of which was a small piece of bone and tissue, just recovered at the landfill. Preparations were already being made to somehow unlock its mysteries.

### Families Are Grateful

The mysteries of death can prey on the minds of those who lost loved ones in the World Trade Center collapse. They have struggled with loss, waded through months of misinformation and, in many cases, been denied the age-old ritual of burying the dead.

But Jennie Farrell, a leader of a family group called Give Your Voice, said that many have been heartened by the unvarnished facts provided by perhaps the most daunting government agency in the city, the medical examiner's office. "There's a sense of comfort when you're given the information that you need," she said.

Several months ago, in November, Dr. Hirsch was heckled during a meeting with family members, who thought it was insensitive of him to say that many victims had been vaporized. Now, Ms. Farrell said, his agency is widely applauded for its dealings with family members: gently explaining the drying-out process, sharing hopes for DNA breakthroughs, giving choices about when -- or if -- to be notified when another piece of a loved one is identified.

Most of all, she said, the agency provides details that demystify.

When an identification is made, the family members are escorted to that room off the lobby and told that there are difficult things to discuss. They usually jot down every word in notebooks, and they often ask whether their loved one jumped from a window, or was burned by fire. Sometimes they have preconceived stories -- of a husband dying while rescuing others -- for which they seek confirmation.

"There is this kind of surrealness," said Katie Sullivan, a member of D.M.O.R.T. from Portland, Ore., who has counseled more than 100 families. "We'll bring out the grid of the site, they'll be taking notes. And in a couple of minutes we're talking about this horrible, unthinkable event, and what happened to the bodies after they died. You kind of float out of yourself sometimes."

She added, quoting Dr. Hirsch, "But we're the caretakers of their information."

It is unclear what will happen to the many remains never identified, or claimed. It is likely that they will be interred beneath a memorial of some kind. For now, there is a prayer service every Friday afternoon for family members under that tent just off the F.D.R. Drive.

On a recent Friday, with rain beating down against the chalk-white canvas, two preachers led half-dozen people in prayer. Then a clerk from the medical examiner's office sang a hymn, his powerful voice soaring above the pervasive hum.

At the end of the service, the preachers asked people to place lighted lanterns at the foot of each of the 16 trailers. The medical examiner for the City of New York did as he had been asked, then disappeared as quietly as he had entered.

Photos: Each shard of bone has been logged in the painstaking effort to identify World Trade Center victims. (Tyler Hicks/The New York Times)(pg. 1); Dr. Charles S. Hirsch, 65, the chief medical examiner. "Any additional identifications will likely be exclusively DNA," he said.; To identify those killed Sept. 11, the medical examiner uses, clockwise from top left: body part tags; frozen DNA samples; scissors and a tool to measure ring sizes; foot measurers; many case files; and a computer database. (Photographs by Tyler Hicks/The New York Times); From the scene of the destroyed towers, via the chief medical examiner's jacket pocket, a few coins and reinforced concrete that turned to dust. (pg. 26)