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## Stringing Together The Clues of DNA; Fairfax Lab Solves World's Mysteries

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That some people can't see the connection between JonBenet Ramsey's long Johns and the charred bones from a mass grave in Peru doesn't surprise Ed Huffine.

Huffine has spent his life exploring the thin scientific strands that connect such tabloid stories with the unwritten histories of places that are easy to ignore.

With the same understated, patient tone he has used for decades – first as a top U.S. military expert on soldiers' remains, then as leader of international efforts to identify victims of massacres in Bosnia – Huffine, a top executive at the Lorton-based DNA identification lab Bode Technology, walks through the connections he finds amid the static.

"You see, DNA technology never works in a vacuum," Huffine said. "If you improve a technique that might help get DNA results from a very challenging environment, like in the JonBenet Ramsey case, those same types of techniques could be used to help identify people who are missing in other countries. It could help to address systematic and government-sponsored rape in other countries, and so on."

And so, on a typical afternoon in a lab near a landfill and storage warehouse in Fairfax County, scientists can be found churning through shipments of bones and samples and swabs from a world of cases. Technicians with hammers and centrifuges and lasers are using extraction techniques developed in Bosnia to help decipher 13,000 bone fragments from the World Trade Center.

Experience with the Trade Center, where bones were subjected to intense heat, is in turn applied to the work in Peru, where soldiers tried to hide killings by burning bodies.

"It's very September 11-like material. It's very degraded," said Jose Pablo Baraybar, executive director of the Peruvian Forensic Anthropology Team, which has been sending exhumed remains from a massacre in southern Peru's Accoramarca area to Lorton. "There are a lot of children. That's a problem. The bones are very fragile."

Catching criminals by using genetic clues has become commonplace in courtrooms and ubiquitous on crime dramas. Bode's work on the remains flowing into its Virginia headquarters shows how leaders, lawyers and investigators are seizing lessons from here and around the world to spread DNA's impact to new areas.

The grinding work is being done by a cadre of investigators at Bode and beyond who are surprisingly philosophical and upbeat for people who spend their days handling disturbing evidence of tragedy.

"Day to day, we're motivated by the challenges, the techniques, the science, technology improvements," said Mike Cariola, vice president of forensic operations for the firm. "But at the end of the day . . . there's an impact.

It's solving crimes; it's making identification of remains from 20 or 30 years before. It's always been something

that's just been incredibly motivating."

This summer, Bode's discovery of skin cells on 6-year-old JonBenet's long johns helped clear her parents and brother in her killing. So-called "touch DNA" can find results without blood drops or swabs.

A similar analysis of skin cells found on the handle of a bloody bat in Howard County provided key evidence in the killing of a teenage boy there last year.

Bode has translated its work on an estimated 40,000 criminal cases into a focus on unraveling mass tragedies and human rights abuses around the world. The analysis of thousands of bone fragments from the World Trade Center led to hundreds of DNA matches.

Bode's results are also being used to help build a case against a longtime Montgomery County resident and former Peruvian lieutenant accused of conspiring to commit war crimes.

Juan Manuel Rivera Rondon was part of a planning meeting with fellow Army officers before a group of Peruvian villagers was massacred in 1985.

Bode has compared DNA profiles from the villagers' bones to reference samples from family members, helping to create a scientific tally of victims – a key point for any possible prosecutions. A Peruvian forensic report at the time catalogued ribs and other bones. But it could state definitively only that six people were killed, because that was the number of heads that were found. The updated toll is 69.

Sen. Patrick J. Leahy (D-Vt.) earmarked \$3 million for groups in Peru, Guatemala, El Salvador and Argentina to use DNA to uncover abuses. Bode is doing some of the analysis in the effort, which is overseen by the State Department's Bureau of Democracy, Human Rights and Labor.

Rivera Rondon's unit is accused of blocking a possible escape route and burning houses nearby, but not of the killings. In an interview, his court-appointed attorney, Cary J. Hansel, said Rivera Rondon had no advance knowledge of any plans to kill civilians and harmed no one.

On Aug. 15 federal agents flew Rivera Rondon, who had been in a Maryland detention center, to Peru, where he was turned over to local authorities.

Bode will also analyze a separate set of bones that Baraybar's team unearthed in May from a mass grave in a village called Putis. Residents there were told to dig a trout pond, then were buried in it. "We are also trying to preserve the memory of the forgotten," Baraybar said.

DNA can document hidden patterns and cut through lies, said Huffine, who is vice president of Bode's humanitarian efforts.

After Huffine arrived in Bosnia in 1999, Serb leaders were still denying that there had been a massacre in the eastern city of Srebrenica. Serbian leaders said victims in mass graves were Serbs, or suicides.

"We'd find a leg in one grave, an arm in one grave and a skull in another grave," Huffine said. "Suicide victims don't migrate."

Huffine, who lives in Springfield, started working with DNA after finding out that his wife was having twins. He was in graduate school at the University of Oklahoma and needed insurance, and the Federal Aviation Administration needed a DNA lab to handle plane crashes. He later headed part of the Armed Forces DNA Identification Laboratory in Rockville, where he developed new techniques for deciphering the weathered, aging remains of service members.

He moved to Bode after leaving Bosnia in 2004. The company, with 90 employees, was founded 13 years ago. Now Huffine inspects parcels of evidence from some of the **world's** harshest conflicts.

After a disputed election in Kenya last year, women reported being gang-raped. But there was little ability to test the samples locally. Earlier this year, hundreds of samples started arriving in Lorton. Most show multiple male profiles.

"We might be able to determine if it's the same group of men responsible for these attacks," Huffine said. "DNA can't tell you if there's sponsorship going on, but it can tell you if there are patterns."

Some of the cases farthest from home hit him hardest. Earlier this summer, Pedro Aragonéz, a Bode collaborator who was the lead DNA scientist in northern Mexico, was assassinated. He fought organized crime and was working with Bode on identifying missing women.

"In some cases, you might be committing an entire generation to this work," Huffine said.

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