



# SKELETON

# CREW

**A professor in the School of Medicine and a student in the School of Podiatric Medicine collaborate on forensic podiatry—or, using feet to solve crimes.**

BY SAMANTHA DRAKE

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JOSEPH LABRINO

A pile of bones behind a Philadelphia elementary school contained clues to a crime—and to the professional future of Michael Sganga, a student in the School of Podiatric Medicine.

Sganga became intrigued when he accompanied Associate Professor Arthur Washburn, CLA '95, '96, who consults with the Philadelphia Medical Examiner's Office, to examine the skeletal remains in spring 2010.

"That case really got me thinking about forensic podiatry," Sganga says, "because we also found a coalition, or fusion, in the foot bones. While it's fairly common, it's uncommon to see in an adult. If one has it as a child, it's often painful or symptomatic and he or she has it taken care of."

Such a bone fusion might have been an identifying feature. And, if investigators had an idea of which neighborhoods to target, they could ask if anyone in the area walked with a limp or complained of a painful foot, Sganga points out.

He and Washburn—who teaches anatomy in the School of Medicine—also did some forensic analysis at the site where the bones were found to help determine the person's identity. "Fortunately, we uncovered a wallet, which made it a little easier," Sganga admits, as he and Washburn laugh.

While taking one of Washburn's anatomy courses, Sganga learned about his work with the city and asked to tag along on his next case. Washburn began consulting with the Medical Examiner's Office about 20 years ago and says he consults on four or five cases annually.

His work begins with measuring and examining skeletal remains and feeding the information into a computer program that compares the data to the characteristics of various racial, ethnic and geographic groups. Washburn then writes a report for the Medical Examiner's Office, which might use the information in an investigation or file it away for use in a future missing-person case.



**Clues Are Afoot**

A wealth of data can be gleaned from just a few key bones. For example, the skull and pelvis are typically used to determine an individual's race, ethnicity and sex. "You can really learn a lot from the skeleton of a person based on the ridges and prominences of the bones," Sganga explains. "If they were stocky, then they were muscular; if they ran, then they were active—things like that."

Foot bones are similarly illuminating, but underutilized by the forensic community. "I was surprised to find out that you can learn the sex of a person from just a heel bone," Sganga says. The length and width of the heel bone, like the more commonly accepted measurements of the skull and pelvis, can accurately determine whether the remains belong to a male or female, he adds. For instance, male skulls tend to be slightly larger, Washburn says, and they tend to have a more prominent brow ridge. Due to women's childbearing capabilities, the standard measurements and angles of female and male pelvises also differ.

Michael Sganga (left), a student in the School of Podiatric Medicine, and Arthur Washburn, CLA '95, '96, associate professor of anatomy in the School of Medicine, underscore the importance of forensic podiatry at Temple.

**In Someone Else's Shoes**

In addition to bones, forensic podiatrists gather information from footprints, which, at first glance, are similar to fingerprints. "Each footprint can only be made by that foot," Sganga says. "No two footprints are alike, and it does take an expert to distinguish that."

But the similarities end there. "Fingerprints are created by ridges and furrows in the layers of the skin, and that's unique to the individual hand," he explains. "It's a little different in that aspect, because the footprint is more [about] weight distribution and length."



Washburn adds, "When you are talking about fingerprints you are looking at the little whorls and unique features of the little dermal ridges and we do have those on the toes. But when you are leaving a crime scene, your weight is distributed very differently than when you are leaving fingerprints. So while there are probably unique whorls and swirls on the toe and heel—though there is a lot of wear on the heel—when you are talking about footprint analysis, it's not the same as talking about fingerprint analysis. It's more along the lines of determining how a person distributes his or her weight."

Distribution of weight comes into play when analyzing the wear and tear on an individual's shoes. "You can figure out just from looking at a pair of shoes where someone is putting pressure," Sganga points out. "One can determine foot types or gait patterns, some of which are very rare and unique."

Gradually, shoes stretch and conform so much to the specific way a person's weight is distributed, Washburn says, that "whenever you put your foot in someone else's shoe, you know right away that it's not yours."

**Welcome to the Club**

Sganga became hooked, but he discovered that no podiatric medical school in the U.S. offered a course in forensic podiatry. So, with Washburn's guidance, Sganga launched the first forensic podiatry club in the country in fall 2010. Through lectures, discussions and other activities, students of podiatric medicine and other club members learn how to process information related to unidentified remains and crime scenes, and promote the field of podiatric forensics.

"There's a lot more to forensics than what is shown on TV," he says. "There's a lot of hard science behind it."

The club attracted about 80 members and a variety of speakers in its first months of existence. Monthly meetings at the School of Podiatric Medicine are open to the Temple and Philadelphia communities. Sganga and Washburn hope to strengthen and expand Temple's relationship with the Medical Examiner's Office and forge a relationship with the American Society of Forensic Podiatry in Bandon, Ore.

Sganga, 26, is in his third of four years in the School of Podiatric Medicine and is the club's president. Along with fellow third-year students Vice President Regina Snow, Secretary Jennifer Lipman, Treasurer Saba Afzal and second-year liaison Carly Chapman, Sganga says he wants to promote forensic podiatry as a profession within the School of Podiatric Medicine and beyond.

"I think it's a great opportunity for interdisciplinary collaborations," he says. He adds that he still plans to become a podiatric surgeon, but he also has become interested in being a forensic podiatry consultant.

A suspect leaving a crime scene was convicted in part by testimony from a podiatrist that a suspect's gait pattern was exclusive to him.

**A New Advantage**

Identifying a suspect based on his or her gait seems like a twist straight out of a television crime drama, but it does happen. In England in 2009, a suspect caught on tape leaving a crime scene was convicted in part by testimony from a podiatrist that a suspect's gait pattern was exclusive to him.

Steve Olszewski, chief forensic investigator at the Philadelphia Medical Examiner's Office, says forensic podiatry has not been a focus for the agency, but "we are open to using it in any way we can." Forensic podiatry is a relatively new field, he says, noting, "Any advantage in solving a crime should be used."

Temple's forensic podiatry club will help spread the word about how fascinating the field of forensics is, Olszewski adds.

Sganga agrees. "Forensics is an area where we would be welcomed, and it's an area where we can use what we've already been taught and really help people in a different way," he says. "Forensic podiatry has a lot of room to grow." ♦

*Samantha Drake is a writer and editor based in Lansdowne, Pa. Her work has appeared in numerous university publications and in regional publications such as Philadelphia City Paper and Main Line Today.*