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EARTH: Cold Case Files; Forging Forensic Isoscapes

Alexandria, VA – Law enforcement may have a new crime-solving tool, courtesy of geoscientists. About five years ago, scientists coined the word “isoscape” to describe a new kind of map: a spatial distribution of stable isotope ratios (from elements such as carbon, hydrogen, oxygen, nitrogen and strontium) in different parts of the world, based on known ways that these isotopes behave in the environment. Different isotopes tell different stories — carbon can help identify diet, whereas hydrogen and oxygen can help identify provenance (for example, about 30 percent of the hydrogen deposited in a human hair comes from the water or water-based beverages the person drank) — so the combination of different isotopic values into one map creates a far more powerful tool than a map based on any single element.

As EARTH explores in “Cold Case Files: Forging Forensic Isoscapes,” the potential usefulness of isoscapes is wide-ranging and thrilling: By measuring the isotopic ratios in anything from bones to hair to plants to gems, and then comparing those values (perhaps even changing over time, as bones, plants and teeth grow) with an isoscape, it might be possible to track human geographic origins, identify the source of illicit drugs, detect counterfeit food products and follow the migration of wildlife.

Read how researchers helped law enforcement solve a murder case in Wales and how they’re tracking counterfeit Scotch whisky using isoscapes, and read other stories on topics such as how one retired scientist spent years trying to confirm the discovery of an impact crater; how acid mine drainage is threatening South Africa’s water supply; and how modern tools are helping researchers solve a World War I tunnel mystery in the October issue. And don’t miss the second part of our series on the commercialization of geologic sites.

These stories and many more can be found in the October issue of EARTH, now available digitally (<http://www.earthmagazine.org/digital>) or in print on your local newsstands.

For further information on the October featured article, go to <http://www.earthmagazine.org/earth/article/497-7db-9-1e>

Keep up to date with the latest happenings in earth, energy and environment news with EARTH magazine, available on local newsstands or online at <http://www.earthmagazine.org/>. Published by the American Geosciences Institute, EARTH is your source for the science behind the headlines.

The American Geosciences Institute is a nonprofit federation of 50 geoscientific and professional associations that represents more than 250,000 geologists, geophysicists and other earth scientists. Founded in 1948, AGI provides information services to geoscientists, serves as a voice of shared interests in the profession, plays a major role in strengthening geoscience education, and strives to increase public awareness of the vital role the geosciences play in society's use of resources, resiliency to natural hazards, and interaction with the environment.

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