

# MARKETPLACE

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## SCIENCE JOURNAL

By SHARON BEGLEY

### Fingerprint Matches Come Under More Fire As Potentially Fallible

FINGERPRINT EXAMINERS would probably be happy if they never heard the name "Brandon Mayfield" again, but for researchers who study the scientific basis for fingerprint identification Mr. Mayfield is the gift that keeps on giving. Mr. Mayfield is the Portland, Ore., lawyer and Muslim convert whose prints the FBI matched to those taken from a suspicious bag near one of the 2004 Madrid train bombings. When Spanish police insisted the prints didn't match Mr. Mayfield's—and eventually linked them to an Algerian living in Spain—the FBI conceded the error and apologized to the jailed Mr. Mayfield.

Since such an error is supposed to be impossible (an FBI handbook says, "Of all the methods of identification, fingerprinting alone has proved to be both infallible and feasible"), the case has achieved a certain notoriety. So when scientists recently tested fingerprint IDs, they told examiners one set of prints were from Mr. Mayfield and the other set from the Madrid bombings. "We told them we were trying to understand what went wrong in that case," says Itiel Dror of Britain's University of Southampton, who did the study with student David Charlton. "Could they please look at the prints and tell us where the examiners had gone wrong?"

One examiner said he couldn't tell if the pair matched. Three said the pair did not match and helpfully pointed out why. The fifth examiner insisted the prints—notorious for not matching—did match.

Give that one a gold star.

UNBEKNOWN to the examiners, the prints were not from Madrid and Mr. Mayfield. They were pairs that each examiner had testified in recent criminal cases came from the same person. The three who told the scientists that their pair didn't match therefore reached a conclusion opposite to the one they had given in court; another expressed uncertainty, whereas in court he had been certain. Prof. Dror will present the study later this month at the Biometrics 2005 meeting in London.

A study this small would hardly show up on scientists' radar screens. But it comes at a time when traditional forensic sciences—analysis of bite marks, bullets, hair, handwriting and fingerprints—are facing skepticism over the validity of their core claim: that when two marks are not obviously different, they were produced by the same person or thing.

Michael Saks of Arizona State University, Tempe, argues that the claim lacks "theoretical and empirical foundation." There is no basic science that predicts how often marks that match on some number of characteristics actually come from different people, as there is for DNA typing. And data on the frequency of false matches are sparse.

It isn't just fingerprints. Last month the FBI announced that its lab would no longer try to match bullets by the trace elements they contain. Although the FBI "still firmly supports the scientific foundation of bullet lead analysis," the bureau said, "neither scientists nor bullet manufacturers are able to definitively attest to the significance of an association made between bullets."

That decision may be the first move toward what Prof. Saks calls "the coming paradigm shift in forensic science." For too long, he argues, forensic science has been excused from rigorous research on how frequently attributes (ridges and whorls in fingerprints, trace amounts of tin or antimony in bullets) vary and on the probability that marks with identical attributes come from different people or objects.

IN THE MOST serious break with rigorous science, forensic science often regards the very notion of probability as anathema. The International Association for Identification, the largest forensic group, says testifying about "possible, probable or likely identification shall be deemed ... conduct unbecoming." Only 100% certainty will do. The pioneers of DNA typing, in contrast, calculated the probability of false matches, making DNA the most scientific forensic science.

The unsupported, and unscientific, claim of infallibility is being tested in Massachusetts' highest court, which last month heard an appeal on the admissibility of fingerprints. Defense lawyers argued that the technique falls short of the standard the U.S. Supreme Court established in its 1993 "junk science" decision. The decision held that scientific testimony must have a known error rate. It will be interesting to see how much longer fingerprinting can get away with "zero."

What is it if not zero? FBI proficiency exams since 1983 find an error rate of 0.8%. Multiplied by the millions of cases crime labs process, that works out to about 1,900 possible mismatches every year. But misattributions "appear to be occurring at an accelerating rate," says Simon Cole of the University of California, Irvine, who recently compiled 22 cases of mismatches for a study in the Journal of Criminal Law and Criminology. That rise, he suggests, may reflect the fact that examiners are "under greater scrutiny."

According to a 2002 handbook of forensic science, error rates are not what you see on TV. They're as high as 63% for voice ID, 40% for handwriting, 64% for bite marks, 12% for hair. The real numbers may be even higher: Blind tests, slipped into an examiner's workload rather than marked, "Here's the test!", are essentially nonexistent.

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## New Orleans May Need to Bulldoze at Least 50,000 Houses

By COREY DADE

FIVE WEEKS after the floods of Hurricane Katrina devastated portions of New Orleans, city officials are finally making headway in determining which homes and other buildings in the city cannot be saved and mapping out the first clear picture of the scale of the reconstruction effort that lies ahead.

Early indications are grim. Greg Meffert, the executive assistant to Mayor Ray Nagin overseeing the inspection process, estimates that the total number of homes within the city limits that must be bulldozed is around 50,000. In all, state officials estimate—and New Orleans officials confirm—Katrina exacted some degree of damage on roughly 160,000 houses, or 74% of the city's housing stock.

A team of 15 city building inspectors has completed rapid "visual" inspections of the exteriors of most of those 160,000 houses; of those, the city says about 100,000 homes appear unsafe to be reoccupied in their current condition and as many as 25,000 were immediately classified as unsal-

vageable. The most damaged areas generally don't extend into the city's landmark historic districts.

Inspectors have now begun a second phase of more detailed assessments of the other 75,000, revisiting a total of about 1,000 houses per day. The pace is brisk because in some areas, whole blocks of homes are pulverized and require no further review, city officials say. The city hopes to speed examinations even further once the Federal Emergency Management Agency provides additional volunteer inspectors from other jurisdictions.

About 10,000 damaged homes have been assessed in the second round of inspections. Among those, 1,500 are set for condemnation, 3,000 are borderline salvageable and will undergo yet another more-thorough inspection, and 5,500 are safe to inhabit. Officially, city leaders continue to hold out hope that the total number of homes bulldozed will be less than 50,000.

But several factors are conspiring to drive the total number of homes to be demolished much higher. People familiar with the process say the

### Home Wreckage

Of the 215,091 homes in New Orleans...

- 160,000 sustained some damage
- 1,000 inspected each day since Monday
- 100,000 declared unsafe (and potentially set for demolition) or require more review
- 50,000 expected to be demolished

Sources: Census Bureau; Louisiana Department of Environmental Quality; City of New Orleans

complete destruction of much of the Lower Ninth Ward, where standing water continues to prevent thorough sweeps of the area, likely will account for thousands of additional homes to be removed, possibly above and beyond the 50,000 estimate. They say large numbers of sodden homes presently appear intact but actually are crumbling inside.

What's more, there still is no conclusive assessment of the long-term environmental impact on neighborhoods whose household floors, streets and yards are thick with polluted muck or the residue of chemical spills. And it is unclear which governmental agency will ultimately be responsible for deciding if pollution has rendered neighborhoods uninhabitable. In some areas of the Lower Ninth Ward and adjacent neighborhoods, there are hundreds of homes that appear structurally sound, but the area has been declared an unsafe "hot zone" because of a nearby oil spill and bacteria in the soil.

Officials at the Environmental Protection Agency are performing extensive environmental tests in New Orleans, and have repeatedly warned that certain areas aren't safe to re-enter. But the agency says it isn't issuing opinions on which areas, if any, should be demolished. City officials say they are focused on structural inspections, not environmental ones.

To fast-track storm-related demolitions, the city will exercise an exception in its municipal

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## Unorthodox New Year

Some Celebrate Judaism's High Holy Days With Yoga, Hiking, Mountain Retreats

By SUZANNE SATALINE

Falls Village, Conn. TO CELEBRATE the Jewish New Year, Nigel Savage gathered here on Monday with nine other men by a small, weedy lake.

For the next three days, they and their friends and families created their own version of the holiday celebration with prayer, campfire singing, hiking, and yoga classes—one of a growing number of alternative celebrations to traditional synagogue services.

Mr. Savage, who is 44 and was raised an Orthodox Jew, explained to the group that a mikvah, usually an indoor bath, represents a cleansing renewal and a preparation for the new year. The men shared their intentions to grow and improve. Then, one by one, they flung off their T-shirts and shorts and jumped into the water's chilly murk.

"You can't do that on the Upper West Side!" Mr. Savage, a New York resident, said later.

For many Jews, observing the 10-day holy period from Rosh Hashana to Yom Kippur involves hours of reading and prayer at traditional religious services in a temple. Many Reform Judaism and other congregations have added more singing and music.

But Mr. Savage and his friends are part of a growing number of Jews who say they don't identify with traditional Jewish denominations and get more spiritually stimulated outside of temple. Many of them want to revel in their ethnic and familial roots, but without religious doctrine.

Mr. Savage first joined some friends at the Isabella Freedman Jewish Retreat Center here in the Berkshire Hills three years ago. This year, the Rosh Hashana retreat drew 75 people. Elsewhere, other nontraditional alternatives include a rabbi who leads hikes in the Rocky Mountains, performance art that cribs from the Torah, a Berkeley, Calif., meditation center and even yoga teachers guiding participants through Hindu-inspired spiritual exercises. Some groups have modernized High Holy Day services with PowerPoint shows.

For some Jews, the activities personalize, recharge and deepen their faith. "It's not about rejecting the old. It's claiming what's

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Rabbi Jamie Korngold (right) and a congregant (left) observe the holidays in the Rockies; hikers in the Berkshire Hills (bottom)



Photo: Dyer (top left), right; Suzanne Sataline (bottom)

## Some Chickens Carry Bird Flu Without Illness

By NICHOLAS ZAMISKA

PUBLIC HEALTH officials say they've found chickens in Indonesia that appear to be healthy but in fact carry the worrisome H5N1 bird-flu virus—the latest sign that the virus may have mutated, allowing it to infect chickens without killing them.

Ducks are known to carry the virus with no symptoms, but if chickens can do the same, health officials could lose their best early-warning system of an outbreak—dead flocks.

The findings are preliminary. But given the billions of chickens in Asia, a mutated virus could hinder the work of health officials who monitor sick birds to help prevent a human pandemic that some fear may be brewing.

When flocks of birds die en masse, as they did earlier this year in western China, experts can act quickly to quarantine the area and minimize human exposure to the fowl. "A dead chicken is a red flag," said Juan Lubroth, senior officer of the animal-health service for the United Nations' Food and Agriculture Organization.

Mathur Riady, director general for animal husbandry in Indonesia's agriculture ministry, confirmed yesterday that the droppings of a handful of apparently healthy chickens from household farms in Jakarta have been tested positive for H5N1, the deadly strain of avian influenza that scientists have been monitoring. Results of a second test on the samples aren't expected for another week or so.

Asymptomatic bird-flu infections among fowl aren't new. The World Health Organization issued a warning a year ago that ducks could become silent carriers of the virus, after researchers at St. Jude Children's Research Hospital in Memphis, Tenn., exposed healthy mallards to virus samples and found that some shed the virus—which in turn can infect other birds or humans—in great quantities without showing signs of infection. Chickens that have been exposed to the same virus strains have died within days.

Now, the Indonesian tests, while still ambiguous, suggest that the virus can be asymptomatic in chickens as well. The results follow separate tests in Indonesia last month, when 19 out of 27 birds, none of which showed symptoms of infection

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### Sick Chicks

Total outbreaks of influenza among birds in Asia, as of Sept. 30:

Vietnam	1,838
Thailand	1,131
Indonesia	216
China	55
Russia	50

Source: World Organization for Animal Health

## Revamped Audi Has a Big Goal: Matching BMW's U.S. Sales

By GINA CHON

AUDI WANTS to graduate to the major leagues of the U.S. luxury-car market.

After years trailing archrivals BMW AG and DaimlerChrysler AG's Mercedes-Benz brand in the rich American market, the Volkswagen AG unit is gearing up an ambitious effort to close the gap.

Next June, Audi will launch a new seven-passenger sport-utility vehicle called the Q7 in the U.S., with a hybrid version set for 2008. A smaller SUV, the Q5, is scheduled for 2007 to further broaden Audi's product range. Meantime, the German brand this year rolled out a redesigned A4 and introduced the new A3 luxury hatchback, which is aimed at younger buyers.

Audi also is pressing its dealers to offer Audi exclusively rather than sell it alongside other makes, and to upgrade their showrooms. Meantime, the company is adjusting its marketing message.

Chief Executive Martin Winterkorn, and other top Audi executives said last month at the Frankfurt Auto Show that Audi eventually wants to match BMW's sales in the U.S. But achieving that goal would require Audi to more than triple its current sales pace. For the first nine months of this year, Audi sold 59,656 vehicles in the U.S., while BMW sold 193,631 and Mercedes sold 156,379.

And while Audi is a well-regarded brand, it still is relatively unknown in the U.S. compared to BMW and Mercedes. That means the company must educate consumers and raise awareness of its products, say some analysts and dealers.



Audi hopes that its new Q7 SUV will help close the gap with BMW. Vehicles sold in the U.S. Source: Autodata \*Through Sept. 30.

Fred Baker, who owns a dealership that sells Porsches and Audis in Bedford, Ohio, says he would like to see Audi focus more on advertising and getting the word out about the features of its vehicles.

"The company is only now touting they have four-wheel drive when the vehicles have had that for 25 years," Mr. Baker says. "They are years

behind what they should be doing."

And Audi has had some dings in its history. In 1986, a CBS "60 Minutes" report accused Audi vehicles of having sudden-acceleration problems. The charge proved to be unfounded but still sent sales plummeting. Meantime, the company has been trying to boost the quality of its cars since their rating by J.D. Power & Associates fell below the industry average in 2002.

Johan de Nysschen, executive vice president of Audi's U.S. operations, says Audi has returned to the same level of sales and organizational strength as it had before the company nearly collapsed in the aftermath of the "60 Minutes" piece. The company has made quality strides as well, as shown by the 2005 J.D. Power Initial Quality Study, which put Audi at No. 8. Now Mr. de Nysschen says the push is to continue to focus on product quality, customer service and educating consumers about the Audi brand.

He also says it will take time to build Audi sales to meet the goal set by his boss, Mr. Winterkorn. But he says it's the duty of top executives "to put pressure on the organization in the U.S. They are entitled to be frustrated that in North America, Audi doesn't enjoy quite the same benefits" as in Europe, he says. Yet Mr. de Nysschen says he doesn't measure success solely in sales figures, but in factors such as customer satisfaction and shareholder return.

Audi's push to expand U.S. sales has raised eyebrows in the industry, in part because efforts

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#### A Mystical Land

Sony's secret weapon to promote its new videogame "Shadow of the Colossus" is a video comedy series featuring scenes from the game, which will soon be available on the Web. B3

### Health

#### Caution Flag

A class of drugs that holds promise in treating asthma and other ailments could have a drawback: They may increase heart-failure risk in mice. B4

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