

ably detailed, and which shifted from place to place and in time.

Most commonly, America was seen as remote. In the German grand duchy of Hesse, the field furthest from the house was called the *Amerika-feld*. A town in Bohemia was nicknamed *Amerika* because flooding often cut it off from nearby villages. A farmer in Mecklenburg might be teased about “trying to get to America” when he plowed an especially deep furrow.

A sleeping person might be said to inhabit *Kamerika*, someone packed off to jail might be described as being *nah Amerika*. Columbus’s discovery was occasionally an oath or a threat: *Geh af Amerika!*—go to hell. A parent in Klentnitz might say to a naughty child, “Do you want to see America?”

Children’s counting rhymes, marble games, and hide-and-seek all referred to going to America. In many parts of Italy, to find one’s America meant to strike it rich. Figures of speech sometimes contained an element of defiance. In Hesse, *Er hodd hie Amerika funn* meant that somebody got rich right in Hesse and didn’t need to go to

America to succeed.

Communities that had undergone high rates of migration knew that making it in America was a struggle and not always a genteel pursuit, Friedman says. In French-speaking Switzerland, to have “the American eye” meant to be avaricious. America was rendered in some songs as *Misery-ca*, a land of bad luck. Departure ceremonies in Ireland were called an “American wake” because most who emigrated were never seen again. The Japanese had a nickname for their country’s emigrants to America: *kimin*, meaning the discarded.

In the Italian Piedmont, an American was a stranger to be wary of. To commit an *americanata* was to act in an eccentric or tasteless manner. In Umbria, an *amerikanu* was a spendthrift, most likely a reference to free-spending immigrants who returned with money in their pockets. One in three immigrants eventually turned around and came home. When the U.S. government began keeping records in 1908, return immigration rates were about 70 percent for people from

the Balkans, 58 percent for Italians, 22 percent for Germans, and 12 percent for the British.

Although there is evidence in surviving letters that some immigrants spoke of their new land as a haven of religious freedom, Puritan John Winthrop’s vision of America (famously quoted by Ronald Reagan) as a shining city upon a hill was only a small part of the Europeans’ image of the continent. Immigration research shows that most immigrants came to America in search not of liberty, but work. Even most of the Puritans were seeking economic betterment, not primarily religious freedom, Friedman says.

European idioms about the upstart nation were extensive and varied, envious and contemptuous. “The vernacular has no monopoly on truth,” Friedman says. But the traces of meaning that are found in the everyday lives of European villagers can serve as a corrective to platitudes, such as the one asserting that 30 million immigrants all voted with their feet for freedom and liberty.

SCIENCE & TECHNOLOGY

Monster Math

THE SOURCE: “The Future of Proof” by Ian Stewart, in *Prospect*, March 2007.

WHEN JOHANNES KEPLER’S inquiry into the structure of snowflakes led him in 1611 to propose the most efficient method for stacking items in three dimensions, little did

he guess that nearly 400 years would pass before his solution would be proven—nor that the proof, by mathematician Thomas Hales, would be about as long as 10,000 full-length novels. It would take “about 30 years merely to read it,” according to mathematician Ian Stewart. Not only are

computers needed to create such monster proofs, Stewart says, but only computers can verify them. And that calls into question the very nature of mathematical proofs.

Ever since Euclid of Alexandria invented proofs in the third century BC, most people have gotten their introduction to them in geometry class. Later mathematicians followed Euclid’s method of writing down proofs so that others could verify their work. There was “an unspoken assumption that the verification

process could, and should, be carried out by one unaided human brain.”

But mathematicians, Stewart says, are “much more interested in solving problems than in philosophizing about their methods.” There is no reason to think they can’t accommodate computer proofs. Even without electronic help, proofs often get incomprehensible, so mathematicians frequently reduce them to essentials. Stewart compares the process to giving driving directions from point A to point B. We leave out details such as “Exit your house, go down the walkway, open your car door, get in.” In the same way, mathematical proofs often begin by jumping ahead to a “signpost” spot.

Mathematical proofs are really narratives, Stewart says. “Poetic” proofs—short, snappy, and sometimes elegant—are the discipline’s delicacies. The mathematician Paul Erdős once speculated that such proofs reside in a book owned by God, who occasionally offers mere mortals a glimpse. More common are the “novel-like” proofs, such as the one occupying several hundred pages in Bertrand Russell and Alfred North Whitehead’s *Principia Mathematica* (1910–13) showing that $2+2=4$. (Russell is said to have come close to a nervous breakdown verifying it.) Today’s computer proofs are more like a “telephone directory.” Yet even they can contain bits of poetry. At the bottom of Thomas Hales’s massive proof of Kepler’s idea is a “poetic” insight that reduces the proof to “a very large list of routine computations.”

At worst, Stewart concludes, computer-driven proofs are “acceptable.” At best, they “open up new realms of discovery, relieving the hum-

an brain of routine tasks, leaving it free to concentrate on the big picture.”

SCIENCE & TECHNOLOGY

How Many Dead?

THE SOURCE: “The Number” by Dale Keiger, in *Johns Hopkins Magazine*, Feb. 2007.

WERE NEARLY 700,000 CIVILIANS killed in the first three years of the Iraq war? When epidemiologists Gilbert H. Burnham and Leslie F. Roberts of Johns Hopkins University’s Bloomberg School of Public Health published that estimate in the British medical journal *The Lancet* a few weeks before the 2006 U.S. congressional election, it made headlines around the world, reports Dale Keiger, a senior writer for *Johns Hopkins Magazine*. British prime minister Tony Blair and President George W. Bush both rejected it. “I don’t consider it a credible report,” Bush said.

Around the time the study appeared, the U.S. and Iraqi governments were citing 30,000 Iraqi deaths, while other sources put the death toll up to several times greater.

Official estimates are based only on reports from hospitals and morgues, and it’s generally believed that they understate the total. Burnham and Roberts used the “cluster survey” technique epidemiologists employ to track the spread of disease to arrive at their estimate. Eight Iraqi surveyors interviewed people from nearly 2,000 households in 47 selected areas in Baghdad and elsewhere in Iraq to determine how many deaths had occurred in their families. Then Burnham and Roberts calculated a mortality rate for the entire country. Their conclusion: Iraqis had

died at the rate of 1,000 per day during the previous year.

The new study’s methodology was quickly questioned. Lurking in the background was a political question: Was it just a coincidence that an earlier controversial Burnham-Roberts estimate had appeared just before the 2004 U.S. election? An article in *Science* (Oct. 20, 2006) highlighted objections by British researchers Neil Johnson, Sean Gourley, and Michael Spagat. “When a survey suggests so much higher numbers than all other sources of information, the purveyors of this outlier must make a good-faith effort to explain why all the other information is so badly wrong,” Spagat said. That was missing. The three argued that the Johns Hopkins researchers had introduced bias by focusing their Baghdad interviews in areas near main-street intersections, where violence is centered. Another British researcher questioned how so large a survey could have been done so quickly.

Burnham and Roberts counter that their researchers *did* sample away from main streets, but say that the records were destroyed to protect the identity of respondents. Since that eliminated the possibility of reproducing or checking the results, it made Spagat, Gourley, and Johnson more suspicious. Spagat, an economist at the University of London, has called for an investigation.

A colleague of Burnham and Roberts, Scott Zeger, believes that the two researchers did “the best science that could be done under the circumstances.” Iraq, after all, is a war zone, not a laboratory. Says Zeger: “Noisy data is better than no data.”