

see the right”—says that it “reads like a supplement to the Bible.”

Such examples suggest something much deeper than mere rhetoric, Gelernter says. These “settlers and colonists, the Founding Fathers, and all the generations that intervened before America emerged as a world power in the 20th century” viewed the Bible, particularly the example of the Israelites as the Chosen People, as *their* story. As John Adams put it, “I always consider the settlement of America with reverence and wonder, as the opening of a grand scene and design in Providence.”

According to historian Fania Oz-Salzberger, the British political thinkers who influenced early America, such as Thomas Hobbes and John Locke, saw in the example of Israel “a nearly perfect republic, from the time of the Exodus until at least the coronation of Saul. . . an exemplary state of law and a society dedicated to social justice and republican liberty.”

Understanding these influences on American thought and society are crucial, says Gelernter. Woodrow Wilson “spoke in biblical terms when he took America into the First World War,” and other presidents have used biblical imagery to underscore their ac-

tions. In Gelernter’s view, however, most contemporary culture critics “are barely aware of these things, don’t see the pattern behind them, can’t tell us what the pattern means, and (for the most part) don’t care.”

It may not be easy to correct today’s biblical ignorance. Even well-meaning “Bible-as-literature” electives, crafted to circumvent the minefield separating church and state, may not be the answer. Severing the Bible from its religious roots robs the work of the power that made it such a seminal text for earlier Americans. And the churches and synagogues that might be expected to teach the Bible to new generations are not doing enough, Gelernter says.

His own guess is that America will eventually experience another Great Awakening that will send people back to the Bible. It will begin with the country’s “spiritually bone dry” college students. Mostly, Gelernter says, “no one ever speaks to them about truth and beauty, or nobility or honor or greatness.” But “let the right person speak to them, and they will turn back to the Bible with an excitement and exhilaration that will shake the country.”

## *Locke to the Rescue*

“Natural Rights and Imperial Constitutionalism: The American Revolution and the Development of the American Amalgam” by Michael Zuckert, in *Social Philosophy and Policy* (Winter 2005), Social Philosophy and Policy Center, Bowling Green State Univ., Bowling Green, Ohio 43403.

Once celebrated for his central role in shaping American political culture, John Locke (1632–1704) has been pushed into the scholarly shadows in recent decades, as many historians have stressed the significance of classical republicanism and communitarianism in the American founding. The problem with that, argues Zuckert, a political scientist at the University of Notre Dame, is that it’s impossible to understand the founding without the Lockean philosophy of individual natural rights.

The conflict leading up to the American Revolution was a battle over the true character of the largely unwritten British constitution. The British insisted that Parliament had the right to legislate for the colonists “in all cases whatsoever,” as the Declaratory Act of 1766 stated. The rebellious Americans

maintained that Parliament did not have that right at all—that the colonists were represented, not in Parliament, but in their own legislative assemblies.

The Americans claimed their rights as British subjects. But their case had definite weaknesses, as they knew. Like the North American colonies, Ireland and two English Channel islands were not represented in Parliament, yet they were clearly subject to parliamentary authority. Why not the American colonies? The colonists had let Parliament legislate for them in the past. Why not now?

The British argued that the constitution provided for representation not of individuals but of “estates.” The Americans were part of the “Commons,” and they were represented in the House of Commons, even if they didn’t elect any of its members, insisted Thomas Whately,

the secretary to the British Treasury, in 1765. Indeed, 90 percent of all Britons—including the wealthy merchants of London—did not enjoy the right to vote. “Although the Americans greeted the theory of virtual representation with scorn,” Zuckert writes, “it is in fact an extremely plausible application of the underlying theory of the constitution, as contained in the [1689] Bill of Rights.”

To trump that theory of virtual representation and the inconvenient precedents in their own colonial history, Americans drew on the Lockean theory of individual natural rights, com-

binning it with as much of the historical constitution as possible. Our laws, said John Adams, derive “not from parliament, not from common law, but from the law of nature, and the compact made with the King in our charters.” In this way, says Zuckert, persuading themselves “that the British were nefariously innovating and that the colonists had every right, as loyal subjects, to resist those innovations,” the Americans proceeded on to the Revolution. And the Revolution then cemented their case, giving “the nascent American political culture a fundamentally Lockean orientation.”

SCIENCE, TECHNOLOGY & ENVIRONMENT

*Mr. Wizard at Bat*

“Predicting a Baseball’s Path” by A. Terry Bahill, David G. Baldwin, and Jayendran Venkateswaran, in *American Scientist* (May–June 2005), P.O. Box 13975, 3106 East N.C. Hwy. 54, Research Triangle Park, N.C. 27709–3975.

When the innings stretch lazily through a warm afternoon and the crowd’s murmurings merge into a locustlike drone, baseball seems the perfect summer game. The field itself, however, is an arena of precise violence. Standing 60.5 feet from the batter, the pitcher hurls a ball just under three inches in diameter at a target only 17 inches wide. The ball arrives in less than half a second, sometimes dropping nearly six feet on its way to the plate.

The batter has perhaps one-seventh of a second to determine the ball’s speed and spin, another seventh of a second to decide whether—and where and when—to swing, and a fraction more to muscle the bat.

Science has more to offer the beleaguered man at the plate than illegal steroids, according to Bahill, a professor of systems engineering and computer science at the University of Arizona, and his colleagues, Baldwin, a former major-league pitcher, and Venkateswaran, a graduate student.

The batter can first pick up a few clues from the pitcher’s delivery. “To go through the strike zone, a 95-mile-per-hour fastball must be launched downward at a two-degree angle, whereas a 60-mile-per-hour change-up must be launched upward at a two-degree angle.” A major-league batter can often tell the difference.

The batter can also observe the pitcher’s

hold on the ball as he releases it. “If a pitcher throws a curve ball and a batter has keen eyesight, he might be able to see the index and middle fingers roll across the face of the ball as the pitcher snaps it off.”

But the batter’s best source of information is the way the ball spins immediately after its release. Each type of pitch has its own spin, and detecting it requires excellent “dynamic visual acuity,” that is, the ability to perceive moving objects. For instance, Ted Williams, the great Boston Red Sox slugger, could read the label on a spinning 78-rpm record.

How the pitch appears to the batter depends on the pitcher’s grip. If the pitcher clutches the ball across the seams, it appears that four seams pass in front as the ball makes a revolution; if he holds the ball along the seams, it appears that only two seams do. To see what actually happens in flight, the authors skewered some baseballs on an electric drill and spun them at a fastball’s typical rate (1,200 rpm). The four-seam fastball was a gray blur with thin vertical red lines a seventh of an inch apart. The two-seam fastball showed two big red stripes, each about three-eighths of an inch wide, which made the spin direction more easily detectable.

The “flicker factor” also plays a role in detection, the authors speculate. The seams on