

RELIGION & PHILOSOPHY

calamity of Civil War" was "a punishment inflicted upon us for our presumptuous sins."

Not all Presidents have felt so urgently the need for prayer. In 1953, notes Menendez, Dwight Eisenhower declared July 4 a National Day of Prayer, then spent the day "fishing, golfing and playing bridge."

Whether they like it or not, Presidents must now mix politics with religion at least one day a year. In 1952, Harry Truman signed into law a resolution mandating that the President "proclaim a suitable day each year, other than a Sunday, as a National Day of Prayer."

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Is the Sun Shrinking?

"The Shrinking Sun" by Diane Johnson, in *Mosaic* (Jan.-Feb. 1982), Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Scientists have agreed in recent years that the sun is not a placid place. It pulsates, erupts in storms, and is developing holes in its outer atmosphere. The sun, writes Johnson, a Colorado science writer, is an "unpredictable, middle-aged star." Some astronomers now think that it may also be a shrinking star, and that contention has sparked a fierce scientific controversy.

It began in 1979, when, after culling the records of London's Greenwich Observatory dating back to 1750, John A. Eddy of Colorado's High Altitude Observatory reached the startling conclusion that the sun might be shrinking at the rate of two "arc seconds" annually (one and a half meters per hour). Eddy knew his estimate was exaggerated—at that rate, the sun would disappear in 100,000 years. But the archives of the Naval Observatory in Washington, D.C. seemed to confirm it.

Critics, led by John H. Parkinson of London's University College, scoffed at Eddy's evidence. The Greenwich and Washington astronomers had measured the time it took for the sun to cross a fixed point in the sky: The quicker the transit, the smaller the sun. Unreliable instruments, subjective judgments, and the effects of air pollution all could have thrown off their data.

Meanwhile, Irwin Shapiro of MIT took another approach to the problem. Drawing on records of the time it took the planet Mercury to cross the sun in 24 cases since the 17th century, he put the sun's shrinkage at 0.15 arc seconds per century—an insignificant amount, possibly overstated by flaws in the data.

Other scientists tried to resolve the dispute by scrutinizing records on the duration of total solar eclipses—when the moon passes between the sun and Earth—during the past two centuries. Using observations gathered by Edmund Halley in England in 1715 and by legions of *Scientific American* subscribers in 1925, and comparing them to more recent

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findings, NASA's Sabatino Sofia and two colleagues put the sun's diminution at a slight 0.34 arc seconds altogether between 1715 and 1979.

Parkinson contends that the sun has not shrunk at all; Eddy and other scientists still argue that it has, if only by a small amount. Even slight changes in the future, they argue, could affect the Earth's climate. Meanwhile, astrophysicists and astronomers continue to delve into dusty archives in an attempt to resolve the question.

Darwin's Finches

"Darwin and His Finches: The Evolution of a Legend" by Frank J. Sulloway, in *Journal of the History of Biology* (Spring 1982), D. Reidel Publishing Company, P.O. Box 17, 3300aa Dordrecht, The Netherlands.

Newton is struck by an apple, Galileo drops weights from the Tower of Pisa—and theories are born. Thus do legends dramatize the painstaking discoveries of great scientists. But surely the legend of "Darwin's finches" is true? Not so, according to Sulloway, a professor of psychology and social relations at Harvard. The finches of the Galápagos Islands are said to have inspired his theory of evolution, but Darwin never even mentioned them in his landmark *Origin of the Species* (1859).

Charles Darwin (1809–82) visited the Pacific archipelago—16 principal islands about 600 miles west of Ecuador—in 1835, aboard H.M.S. *Beagle*. During his five-week stay, he gathered geological specimens from as many of the islands as he could. But he gathered zoological specimens haphazardly. Of the nine finch species (there are 13 "Darwin's finches") that he did collect, he correctly identified only six as finches. And these he thought were very distantly related—too different to arouse thoughts of evolution.

Darwin did notice that mockingbirds varied slightly from island to island. And he was intrigued to learn "that from the form of the body, shape of scales & general size, the Spaniards can at once pronounce, from which Island any Tortoise may have been brought." (Still, he was not intrigued enough to stop his shipmates from eating the tortoises brought aboard the *Beagle*.) While still at sea, nine months after leaving the islands, the significance of these facts began to dawn on him; he wrote in his notes that they might "undermine the stability of Species."

Returning to England in 1836, Darwin turned over his collections to specialists. Ornithologist John Gould correctly identified Darwin's finch specimens as closely related species. This revelation—plus others' findings about his fossil and plant collections—helped to confirm Darwin's thinking. Only then did Darwin pay close attention to the finches. But while on the islands he had recorded very little about them. He tried to deduce the island of origin for his specimens by going through the collections of his shipmates and servant, but he was wrong half the time. Moreover, he could not prove the impact of natural selection on the finches because he had failed to notice any differences in the birds' diets