

It was only during the 1950s that religion, which previously had been confined largely to seminaries and university divinity schools, emerged as a separate academic field, when private colleges and universities began to establish religion departments. Many state universities followed suit during the next decade. But “clerical motives dominated the field. Not only did religion faculty still harbor older notions of caring for the souls of students, but the courses they offered were virtually identical to the curriculum at Protestant seminaries and divinity schools, minus the practical work in pastoral ministry,” Hart says. Reflecting “a mainstream Protestant hegemony” and narrowly focused on church history, religious historians at the time gave short shrift to Mormons, Christian Scientists, African Americans, and others outside that mainstream.

To rectify this and to integrate their subject into the respectable ranks of professional history, religious historians began in the 1970s to turn away from the Protestant mainstream. They took their lead from social historians, and set out to demonstrate the relevance of religion to “the victims of American hegemony.” Leaving “the straight and narrow path” of church history, they

took “the long and winding road of diversity,” through the study of minorities: Jews, ethnic Catholics, evangelicals, African Americans, women, Hispanics, Native Americans, and gays and lesbians.

This academic strategy, Hart writes, “inevitably identifies religion with the latest census statistics rather than with the practices and beliefs of religious traditions and communions.” It also fails to add much to what other academic historians have been doing in their studies of cultural diversity. Those historians “largely remained indifferent to American religious history.”

But “pure church history,” even if carried out with more intellectual integrity than in the past, “would not have succeeded any better,” Hart says. Accounts of “the religious life of individuals and communions” are of little interest to those outside the particular fold.

What historians of religion in America should be addressing, in Hart’s view, are the ways in which religion has influenced “the policies, institutions, and culture that have shaped the United States.” The failure of religious history, and the reason the field remains marginal, he says, is precisely that “it has focused for most of the past three decades on marginal topics.”

SCIENCE, TECHNOLOGY & ENVIRONMENT

Searching for Web Equality

“Shaping the Web: Why the Politics of Search Engines Matters” by Lucas D. Introna and Helen Nissenbaum, in *The Information Society* (July–Sept. 2000), Taylor & Francis, 325 Chestnut St., Ste. 800, Philadelphia, Pa. 19106.

Commercialization has already dampened hopes that the World Wide Web will serve as an egalitarian force. Now, Introna, a lecturer in information systems at the London School of Economics, and Nissenbaum, a lecturer at Princeton University’s Center for Human Values, worry that “biased” search engines are making some Web sites more “equal” than others.

The World Wide Web contains, by one estimate, some 800 million “pages.” Search engines steer users to particular Web pages. A 1999 study of leading search engines found that none indexed more than 16 per-

cent of the total, and that all combined covered only 42 percent. An unindexed Web page is almost impossible for users to find if they do not know its Uniform Resource Locator (URL), or “address.”

Who decides whether to index a particular Web page? At “directory-based” search engines such as Yahoo!, editors do most of the work. The criteria for inclusion are vague, and apparently not applied with any consistency, Introna and Nissenbaum assert. At Yahoo!, by one estimate, a submitted Web page has roughly a 25 percent chance of being accepted. Inclusion becomes more likely, the

authors say, as the number of links a page has to and from other sites increases. Also, “when editors feel they need more references within a category, they lower the entry barriers.”

Other search engines, such as Alta Vista, Lycos, and Hotbot, dispense with the human editors and use software “spiders” to identify candidates. Precise details about how the spiders operate are closely guarded trade secrets, which stirs the suspicion of Introna and Nissenbaum. Pages with many links from other valued sites, especially sites that themselves have many “backlinks,” are likely candidates.

Getting noticed by a search engine is only the first hurdle for creators of Web pages, the

authors note. “Because most search engines display the 10 most relevant hits on the first page of the search results, Web designers jealously covet those . . . top slots.” Search engine owners are reluctant to detail their ranking rules, but a site’s chances of doing well apparently improve if it has many keywords and they are high up in the document, and if many other sites are linked to it.

In the end, Introna and Nissenbaum argue, “popular, wealthy, and powerful sites” threaten to overwhelm the Web’s other voices. They urge full disclosure of search engines’ underlying rules, and the development of “more egalitarian and inclusive search mechanisms.”

What Caused the Ice Ages?

“Ice, Mud Point to CO₂ Role in Glacial Cycle” by Richard A. Kerr, in *Science* (Sept. 15, 2000), 1200 New York Ave., N.W., Washington, D.C. 20005.

Every 100,000 years or so for the last million years, vast, miles-high glaciers have moved southward from the Arctic, relentlessly driving all life before them. The last ice age ended only about 10,000 years ago, when the ice retreated to its present polar extent. What caused these monstrous ice ages? In recent decades, notes Kerr, a *Science* staff writer, scientists have come to think that the glacial cycles were somehow linked to slight variations in the shape (or eccentricity) of the Earth’s orbit that occur at about the same 100,000-year intervals. John Imbrie, a paleoceanographer at Brown University, has also proposed that the ice sheets themselves amplified the orbital variations’ weak effects.

Kerr reports that Nicholas Shackleton, a paleoceanographer at the University of Cambridge (whose original research also appears in this issue of *Science*), has found a new actor in the drama: carbon dioxide. Shackleton “finds that orbital variations may muster carbon dioxide into and out of the atmosphere, and the resulting waxing and waning of greenhouse warming may drive the glacial cycle.”

The mixture of heavy and light oxygen isotopes preserved in skeletons in deep-sea mud and in ancient air bubbles in Antarctic

ice provided Shackleton with windows on conditions millennia ago.

The isotope mixture in the fossils of microscopic, bottom-dwelling marine animals depended partly on the mixture of oxygen isotopes in the seawater in which they lived—and that, in turn, depended on the amount of ice trapped on land. But the isotope mixture in the skeletons also partly depended—though to a lesser extent, it was long thought—on the temperature of the seawater. This unknown influence made the isotope mixture in the skeletons an imprecise gauge of the ice volume as it varied over time. Using that gauge, Shackleton saw an apparent correlation between the ice-volume changes and the 100,000-year orbital variations, although the link “was not impressive,” Kerr says.

Shackleton then looked at air bubbles in a 400,000-year-long ice core from Antarctica. The oxygen-isotope composition of that air was not affected by ocean temperatures, but was affected by the volume of ice that existed. By comparing this geologic record with the other one, writes Kerr, Shackleton was able “to tease out [the] intimately entangled climatic influences with unprecedented accuracy.”

To Shackleton’s surprise, “deep-sea temperature accounted for more variation of