
1,000 a year in the late 1960s, ordinations fell to roughly 500 annually during the '80s, before climbing back to about 600 a year in the early '90s. What little encouragement might be taken from that increase, Schoenherr notes, is dimmed by the fact that the number of Catholic seminarians in the final years of study before ordination has been decreasing steadily, from 8,325 in 1966 to 3,416 in 1993.

Compounding the problem of dwindling enlistments is the chronic defection of young priests from the active ministry. Although nowhere near as bad as it was in the early 1970s, when 95 percent of newly ordained priests were needed to fill vacancies created by resignation rather than death or retirement, the hemorrhaging continues. Today, four out of 10 newly ordained priests must fill such vacancies—and the other six are not enough to replace all the older priests who have retired or died. In the coming years, as the many priests ordained during the 1950s and '60s reach the end of their careers, Schoenherr points out, "natural attrition rates will begin to soar and the already limited supply of active priests will precipitously dwindle."

Meanwhile, he notes, membership in the Catholic Church in the United States has con-

tinued to grow, from roughly 45 million in 1965 to some 70 million today. "High fertility rates of Catholic families and the steady immigration of Asian and Hispanic Catholics account for most of the growth," Schoenherr says. For every active priest in 2005, there are expected to be 2,200 lay Catholics—twice the number in 1975.

The shortage of priests has been mitigated by greater lay participation in the Mass, Schoenherr observes. "Lay people now help plan the liturgy [and] actively participate by reciting prayers, singing hymns, reading the Scripture passages, serving at the altar, even preaching homilies, and distributing Communion." But priests are still required "to preside over sacramental celebrations, principally the eucharistic sacrifice of the Mass." Eventually, the church may be forced to limit the frequency of such rites.

Study after study in recent decades has concluded that mandatory celibacy, a requirement for Catholic priests since the 12th century, is at the root of the church's problems in recruiting and retaining priests. "The full weight of history and social change," Schoenherr concludes, "is turning against male celibate exclusivity in the Catholic priesthood."

SCIENCE, TECHNOLOGY & ENVIRONMENT

The Mystery of The Double Tongue

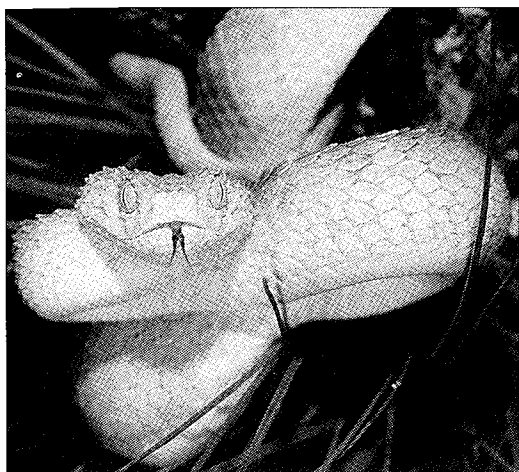
"The Serpent's Tongue" by Kurt Schwenk, in *Natural History* (Apr. 1995), American Museum of Natural History, Central Park West at 79th St., New York, N.Y. 10024.

Everyone knows that some humans employ a forked tongue to get around inconvenient truths, but why do *snakes* have forked tongues?

Aristotle imagined that the fork in their tongues gave snakes "a twofold pleasure from savors, their gustatory sensation being as it

were doubled." Plausible, notes Schwenk, a professor of ecology and evolutionary biology at the University of Connecticut—except for the fact that snakes have no taste buds. Early-20th-century scientists believed that the delicately forked organ helped to give snakes a sense of fine touch. But the serpents' frequent flicking of their tongues into the empty air suggested that that wasn't the answer, either.

During the 1920s and '30s, experimenters in Germany and the United States found some important clues. They discovered that when a snake flicks its tongue, it picks up chemical particles and brings them into its mouth. The



A venomous African Bush Viper flicks its forked tongue, picking up chemical particles in the air.

particles then are somehow delivered to two tiny, bulb-shaped structures—the vomeronasal organs—that lie side by side in the snake's snout, just above the roof of the mouth. Some German researchers "suggested that the slender tips of the forked tongue must be inserted *into* the openings of the [vomeronasal organs], delivering scent particles directly." This hypothesis eventually became dogma and can still be found in some textbooks. But the evidence contradicts it. Snakes can deliver chemical particles to the vomeronasal organs even after their tongue tips are surgically removed. Pads on the floor of the mouth probably make the delivery.

So *what* is the function of the double tongue? Scientists in recent years have found the answer: it is used to follow scent trails. By spreading the tongue tips far apart as they touch the ground, snakes (and fork-tongued lizards) are able to sample scent particles from two different points; they then can compare the strength of the chemicals on each side and follow the stronger scent. This ability is especially useful for following pheromone trails left by prey or potential mates. For both venomous and nonvenomous snakes, Schwenk says, the forked tongue is vitally important: "In many ways, the tongue and the tremendously sensitive vomeronasal system it serves are the essence of being a snake."

PC Science

"Science by Quota" by Sally L. Satel, in *The New Republic* (Feb. 27, 1995), 1220 19th St. N.W., Washington, D.C. 20036.

In a 1993 measure that President Clinton signed into law, Congress required the National Institutes of Health (NIH) to develop guidelines to ensure that women and minorities are included as subjects in clinical research. "The seemingly laudable goal is to compensate for years of actual and perceived underrepresentation," says Satel, a professor of psychiatry at the Yale University School of Medicine, but the likely result will be *fewer* medical breakthroughs.

"Wholesale inclusion of minority groups, defined as black, Hispanic, Asian/Pacific Islander, and American Indian/Alaskan native, makes little sense," Satel says, "unless there's a specific reason to expect that different groups will respond differently to particular treatments." Usually, there isn't—yet wholesale inclusion is what the new policy demands. Most investigators probably will have "to search far and wide for minority research subjects," she says, and including them in adequate numbers will make the clinical studies many times larger and far more expensive. "How the policy will affect NIH's allocation of its coveted award budget remains to be seen," Satel says. "But, if priority goes to costly 'inclusive' projects, the agency clearly will be funding fewer studies." Hence, fewer medical breakthroughs.

The NIH guidelines do allow exemptions from the inclusion rule when the particular disease under study is largely confined to a specific minority group (as sickle cell anemia, for example, is to blacks). But few diseases limit themselves so neatly.

Satel sees a better way to satisfy the desire for inclusion. Congress "should encourage the NIH to fund more projects designed explicitly to investigate whether group differences in response to certain medical therapies actually exist." And it should let each of the 21 institutes within the NIH "devote a certain percentage (based on demographic representation, perhaps) of its budget to minority-related