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**RELIGION & PHILOSOPHY**


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Both authors, Fox concludes, fail to see the extent to which America has become secularized. When some mainline Protestant churches have become places where God is merely "a beaming, glad-handing spiritual consultant," he asks, how can the social transformation necessary to restore communal life be achieved?

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**SCIENCE & TECHNOLOGY**


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*Smelling the Past*

"Remembering Odors and Their Names" by Trygg Engen, in *American Scientist* (Sept.-Oct. 1987), Sigma Xi, 345 Whitney Ave., New Haven, Conn. 06511.

"Memory can restore to life everything except smells," novelist Vladimir Nabokov once wrote, "although nothing revives the past so completely as a smell that was once associated with it." Nabokov's insight has recently been confirmed by science.

Engen, a psychologist at Brown University, identifies two distinct types of olfactory memory: the ability to call up the sensation of a particular odor and the ability to identify a smell when presented. New research has illuminated these differences.

Until recently, researchers classified odors by the "smell prism," developed by German psychologist Hans Henning over 70 years ago. The prism separates all odors into six categories, such as "flowery," "spicy," or



*Wine tasters use smell to distinguish subtle differences among vintages, although they generally have only average skill in identifying other odors.*

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"tarry." Engen found "not a shred of evidence" to support the validity of such a system, which assumes that people categorize odors by name.

Engen believes that people organize odors according to personal experiences. In one set of tests, Engen presented test subjects with 10 different odors, ranging from chemical "odorants" such as amyl acetate (banana oil) to "brand name" stimuli such as Vicks Vaporub. Responses such as "baby wipes" for the smell of Johnson's baby powder show that people remember odors by association with similar smells and by "the context or kind of object in which odors may be perceived."

Engen found that women name odors more easily than men, perhaps reflecting differences in hormones or verbal felicity. On the average, however, people can provide names for only about six common smells.

We can rarely recreate a smell (as we can a visual image) from its name, Engen concludes; odor memories are not retrieved "with words, but with odor." Yet encountering a familiar odor can evoke vivid memories—a judgment once made by French novelist Marcel Proust in *Remembrance of Things Past*. Once a visual memory has vanished, Proust wrote, "The smell and taste of things . . . bear unfaltering, in the tiny and almost impalpable drop of their essence, the vast structure of recollection."

### *Out of Africa?*

"In Search of Eve" by Rebecca L. Cann, in *The Sciences* (Sept.-Oct. 1987), New York Academy of Sciences, 2 East 63rd St., New York, N.Y. 10021.

Scientists have long used fossilized skeleton bones as evidence for determining man's history. In recent years, the electron microscope has joined the pick and shovel in the paleontologist's investigative arsenal. Using recently developed techniques, scientists may have found "a mother of all modern humans"—an African who lived about 200,000 years ago.

Cann, assistant professor of genetics at the University of Hawaii, Manoa, argues that using electron microscopes to trace the ways that DNA molecules have mutated over time "has become the best hope for answering questions" left unresolved by years of archeological excavation.

Scientists have been researching DNA mutations for decades. In 1962 Linus Pauling and Emile Zuckerkandl of the California Institute of Technology discovered that the differences in hemoglobin between different living primate species proportionally increased as the "evolutionary distance" between the species increased; two species of monkeys whose common ancestor lived 10 million years ago had hemoglobin twice as different as monkeys whose common ancestor existed five million years ago. In 1967 Vincent M. Sarich and Allan C. Wilson of the University of California, Berkeley, studied albumin (a blood protein) in apes and Old World monkeys and found that amino acids in their samples changed once every 1.25 million years with the regularity of a "molecular clock."

More sophisticated technology allowed later researchers to examine evolutionary changes in the components of cells. In 1979 Cann began a seven-year effort to collect specimens of mitochondrial DNA—the component of the cell that metabolizes food and water—from placentas of new-