Wolpoff of the University of Michigan, disagree. They argue that many of the Neandertal features are also seen in some early modern Europeans who came later, such as the ones found at Mladec, a site in Moravia (Czech Republic), and that this is evidence of extensive interbreeding.

But scientists who hold with the separate-species view dismiss that idea. "When I look at the morphology of these people [from Mladec]," says Christopher B. Stringer of London's Natural History Museum, "I see robustness, I don't see Neandertal." The question seemed settled when a 1997 analysis found that mitochondrial DNA from a Neandertal fossil was vastly different from that of living moderns: "Neandertals Were Not Our Ancestors," shouted the scientific journal *Cell* on its cover. Nevertheless, Wong says, "undercurrents of doubt have persisted."

Much recent research also has focused on Neandertals' behavior. In the past, they were often depicted as unable to hunt or plan ahead, but animal remains from a Croatian site indicate they were skilled hunters, and several Neandertal burial sites contain what might have been grave goods, indicating a capacity for symbolic thought.

"If Neandertals possessed basically the same cognitive ability as moderns," Wong says, their disappearance becomes all the more puzzling. It did not happen overnight. Anthropologists have recently shown that Neandertals still lived in central Europe 28,000 years ago, thousands of years after moderns appeared.

Gradually, in Stringer's view, the Neandertals were supplanted by the new species, "because moderns were a bit more innovative, a bit better able to cope with rapid environmental change quickly, and they probably had bigger social networks."

Not so, contends Wolpoff: The Neandertals were vastly outnumbered, and after thousands of years of interbreeding, their distinctive features were diluted and ultimately faded away. Clearly, the same cannot yet be said of the passionate scientific debate about Neandertals.

Paging Dr. Joe Camel

"The Good Side of Nicotine" by Mairin B. Brennan, in *Chemical & Engineering News* (Mar. 27, 2000), 1155 16th St., N.W., Washington, D.C. 20036.

A good word about nicotine seldom is heard these days, but scientists have discovered that the demonic chemical that makes smoking addictive has some therapeutic virtues, reports Brennan, a *Chemical & Engineering News* senior editor.

Nicotine can help some people suffering from Tourette's syndrome, an inherited neurological disorder that afflicts as many as 150,000 children and adults in the United States. Though some people with Tourette's can lead productive lives without medication, others need help to control the symptoms, which include repetitive twitching, shrugging, and gesturing, as well as "barking" and throat-clearing noises, word repetition, and, in some cases, involuntary cursing. Haloperidol, which is an antipsychotic drug sold commercially under the name Haldol, controls the tics in most Tourette's patients but has undesirable side effects. Researchers have learned that nicotine boosts the effectiveness of Haloperidol, enabling its side effects to be minimized.

Nicotine may also be beneficial in treating other brain disorders, such as Alzheimer's

and Parkinson's diseases. "Cigarette smokers are believed to have a lower risk of contracting either of these diseases, and nicotine is thought to afford the protection," Brennan writes. Numerous studies have shown that smoking wards off Parkinson's; the evidence on Alzheimer's is less clear.

Of course, smoking carries lethal risks: lung cancer, heart disease, stroke. At a scientific symposium earlier this year on nicotine's therapeutic potential, Edward D. Levin, a professor of psychiatry and behavioral sciences at Duke University, began with this advice: "Don't smoke!"

Animal Numeracy

"What Do Animals Think about Numbers?" by Marc D. Hauser, in *American Scientist* (Mar.–Apr. 2000), P.O. Box 13975, Research Triangle Park, N.C. 27709–3975.

More than 1,000 rhesus monkeys live on the Puerto Rican island of Cayo Santiago. Hauser, a psychology professor at Harvard University and the author of *Wild Minds* (2000), gave some of the wild monkeys there an arithmetic test. He and his students conspicuously placed two bright purple eggplants behind a screen but when they removed the screen the monkeys might behold one, two, or three eggplants. Just as human infants had done in similar tests, the monkeys tended to look longer when one or three eggplants appeared instead of the expected two.

From those and other experiments, Hauser says, it appears that wild rhesus monkeys, like human infants, can distinguish among *one*, *two*, *three*, and *many* objects. Other research, moreover, has shown that with training, monkeys and other animals can develop more sophisticated numerical abilities. Pigeons and rats, for instance, have learned to peck or press a button 24 times, no more, no less, to obtain a food pellet. Recent experiments by Columbia University psychologists demonstrated that captive rhesus monkeys can grasp the ordinal relations among the numbers one to nine and indicate the proper numerical order for various quantities of different images. "The rhesus monkeys' performance was excellent—but only after receiving hundreds of training trials," notes Hauser.

Though the situations that animals confront in the wild may call for limited numerical abilities—chimpanzees, for instance, insist on "strength in numbers" (at least three adult males) before they'll attack an intruding chimp from another pack—they apparently do not require the numerical precision and skills found in humans. This prompts Hauser to ask: "What kind of evolutionary or ecological pressures would have favored the numerical competence found in *Homo sapiens*?" His admittedly speculative answer: When trading appeared on the scene, precision became necessary to ensure a fair exchange. "Selection favored those individuals capable of enumeration and combinatorial computation with symbols." And thus, he says, was the groundwork laid for algebra, calculus, and set theory.

What's in a Meme?

"The Meme Metaphor" by Mark Jeffreys, in *Perspectives in Biology and Medicine* (Winter 2000), Johns Hopkins Univ. Press, Journals Div., 2715 N. Charles St., Baltimore, Md. 21218–4363.

Darwinist Richard Dawkins's speculative concept of a *meme*—a replicating cultural entity analogous to a gene, that might explain how human culture evolves—has caught on in recent years. There's even a three-year-old academic journal devoted to the fledgling science of memetics. Unlike some prominent scientists, Jeffreys, an English professor at the University of Alabama at Birmingham, does not dismiss memetics out of hand, but he says much work is needed to make the meme metaphor scientifically useful.

What is a meme? A lexicon on the *Journal of Memetics* website (*www.cpm.mmu.ac.uk/jom-emit*) gives this definition: "A contagious information pattern that replicates by para-