

been laid out earlier by two 18th-century thinkers, the Earl of Shaftesbury and Lord Kames: Moral and religious sentiments are not the product of associations that need to be analyzed; they come directly from experience.

That perspective, says Wilson, is one of the things that gave Wordsworth's poetry its beauty. But it was beauty and philosophy both that revived the young John Stu-

art Mill and inspired him to reconcile "associationism" with Wordsworth's "irreducibility." In the theory of psychology he developed, moral and religious sentiments were irreducible, but gained value and character by "association" with more basic sensations of pleasure. The romantics would have been pleased by this chain of events: The poet taught the philosopher, who instructed the scientist.

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## SCIENCE & TECHNOLOGY

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### *Primate Politics*

"Political Animal" by Meredith F. Small, in *The Sciences* (March–April 1990), 2 E. 63rd St., New York, N.Y. 10021.

Scientific opinion about human evolution is undergoing, well, evolution.

The basic facts are not in doubt, notes Small, a Cornell anthropologist. The first human species, *Homo habilis* (literally, handy man) appeared about two million years ago in Africa. He was succeeded 1.5 million years ago by *Homo erectus*, who retained many simian features but boasted a relatively well developed brain. Then, a mere 100,000 years ago, *Homo sapiens* debuted, with a brain nearly twice as large.

The obvious question for scientists: What accounts for this phenomenal brain growth? They thought they had an answer during the early 1960s, when Louis and Mary Leakey unearthed tools made by *Homo habilis*. Creatures with the mental capacity to make tools (i.e. big brains) would be highly favored by evolution. But Jane Goodall's discovery that chimpanzees also use tools, albeit primitive ones, shot that theory down. A consensus later emerged, at least among anthropologists, that a combination of tool-use, the rise of group hunting, and the development of language spurred rapid human "encephalization."

But now some anthropologists are beginning to wonder whether they have been asking the right question. Without challenging the new consensus about humans, they suggest that the real puzzle is how to account for the impressive brain development of the entire primate order over the

past 60 million years. And they think they have an answer. "In contrast with the vast mammalian majority," Small observes, "most primates live in some kind of group. In contrast with schools of fishes or herds of ungulates, the primate groups are not mere aggregations but true social organizations."

Primatologist Alison Jolly first made the case for the importance of "social intelligence" in 1966. Since then, scientists have discerned many ways in which primates recognize and catalogue social relationships. For example, when Dorothy Cheney and Robert Seyfarth of the University of Pennsylvania played recordings of an imperiled young vervet's cries, the mother immediately turned toward the loudspeaker. But her two female companions turned toward her. Apparently, they recognized the young vervet's shrieks and associated them with the mother—a relatively complex act of social cognition. Lately, many researchers have begun to focus on the importance of what might be called primate politics: the ability to manipulate others for individual gain.

Small cautions that it is too soon to draw any conclusions. While the social intelligence of primates is now well documented, nobody has yet been able to prove that a mastery of primate politics and social graces leads to "reproductive success," and thus to an evolutionary advantage—or even to larger brains.