

advance, he observes, showed “a small but consistent improvement in the readability, compactness, and expressive powers of numerals”—as in the shift from Roman numerals to base-10 Arabic numerals.

Physicist Eugene Wigner famously marveled at the “unreasonable effectiveness of mathematics in the natural sciences.” The efficacy of abstract mathematics in describing natural processes has led many thinkers to conclude that the universe must be constructed along mathematical lines. Dehaene, however turns this argument on its head when he asks, “Isn’t it rather our mathematical laws, and the organizing principles of our brain before them, that were selected according to how closely they fit the structure of the universe?” In other words, bad mathematics and bad mathematicians have been ruthlessly eliminated by the forces of cultural and natural selection. “Is the universe really ‘written in mathematical language,’ as Galileo contended?” asks Dehaene. “I am inclined to think instead that this is the only language with which we can try to read it.” In this book, he goes a long way toward persuading the reader that he is right.

—Ronald Bailey

ABOUT FACE.

By Jonathan Cole. MIT Press.
223 pp. \$25

Life begins with the face. A baby learns to distinguish its mother’s countenance from others within days of birth, then begins imitating her expressions. Through mimicry, the baby gradually discovers how to interact. Cole, a neurophysiologist who teaches at the University of Southampton in Great Britain, suggests that “the face is

perhaps most important in the first weeks and months of life.”

Cole also explains how evolution has refined the primate visage. From the simple respiratory function of cold-blooded vertebrates to the primate’s finely controlled matrix of muscles, the face has advanced to permit greater expression. When primates stood upright, the face became more visible. Instead of having to use the whole body for physical expression, creatures could manipulate a smaller palette, which offered communicative advantages: “The face was more private, allowing communication to be directed at groups or even individuals, and it may have been more eloquent, allowing the development of a different, more refined, sort of body language.”

In addition to signaling emotional states, facial expressions influence them. Researchers have found that when we smile or laugh, we feel happier. In a case study recounted in the book, a man’s personality grew less vibrant as his Parkinson’s disease progressed and he lost the use of facial muscles. His voice grew monotonous; his emotional range shriveled. When physical therapy revived some of the muscles, his voice and his personality were reanimated as well.

Although Cole’s compassion and curiosity always show through, *About Face* never quite coalesces. Lacking his friend Oliver Sacks’s deft touch, the author over-relies on long quotations and neglects descriptive detail. Still, the book includes many thought-provoking, poignant moments. In one, a man who lost his eyesight in middle age laments that he can no longer tell if his wife is smiling. “There’s no doubt that the loss of the face is a profound loss,” the man says. “A deeply dehumanizing loss.”

—Polly Bates