

the world as it is perceived. Every individual of every species has an umwelt. The beetle umwelt is framed primarily by chemical senses. Our human umwelt is visual. Umwelts evolve along with our senses, which struggle to notice the things most relevant to our survival.

Yoon argues that the central battle in taxonomy is between truth—the world as it is—and the umwelt. Historically, humans named the things around them based on what they saw, a dose of local culture, and a set of relatively consistent and near-universal rules (e.g., that each species has a two-word name, whether “fruit fly” or *Drosophila melanogaster*). Traditional peoples the world over continue to do so. But scientists have sought to devise a true system for categorizing nature. The tension lies in the fact that they do so through senses that did not evolve to find truth. (There is no fitness advantage in looking for truth. In fact, if you look at the reproductive fitness of scientists, there may be some cost . . .) Instead, we evolved to keep an eye out for sexy cavewomen, predators, or tasty fruits.

Yoon concludes by asking whether there are costs to this quest for truth. Where once taxonomy was based on experts’ experiences and opinions, today it is based on data. Fewer and fewer scientists are well acquainted with the life histories of the organisms they study. They rely on what DNA analyses and computer outputs tell them. Yoon suggests that while these superficially less biased approaches have increased our collective knowledge, they may have done so at the expense of what each of us knows individually. Specialists look through ever narrower lenses at the world in greater and greater depth, even as they believe themselves to be, each day, coming to truer visions of what is out there breeding, feeding, and dying among the weeds. Our ancestors looked at a snake and called it by the name they had given it, a name every child knew. Many biologists today look at a snake and wonder if anyone knows a relevant expert who might be able to identify it.

Naming Nature is rich in insight, characters,

humor, and even, yes, truth. The book is almost good enough that if there were a man and a woman in a room with it, the story would still be about the book.

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Arts and Sciences

Reviewed by Britt Peterson

BIOGRAPHER RICHARD

Holmes’s *The Age of Wonder* is one of those books that starts to look like essential background reading for just about everything: kids’ movies about mad explorers and balloonists, novels deconstructing the

Frankenstein story, a trip to the dentist. Holmes describes the birth of professional science in England in the late 1700s and early 1800s, when explorers, astronomers, balloonists, and chemists cemented their art into an occupation. It’s also, of course, the period during which Samuel Taylor Coleridge, John Keats, Percy Bysshe Shelley, and Mary Wollstonecraft Shelley wrote poems and novels that confronted and in some cases even anticipated the scientific leaps occurring all around them. Holmes argues that the scientists and the poets of this period were motivated by the same rampant curiosity about the world, the same exhilarated sense that the ceiling of what was known had been torn off and a whole new universe beckoned.

Holmes’s book, which often reads like a Balzac novel, is organized in a series of mini-biographies over successive generations. He begins with Joseph Banks (b. 1743), who became an avuncular figure to most of the important scientists of his time. (Holmes calls him a “scientific Virgil.”) But in 1768, when he set forth from Plymouth with Captain James Cook aboard the *Endeavour*, Banks was just an adventurous young ship’s botanist at the beginning of his career, independently wealthy and possessed

THE AGE OF WONDER:

How the Romantic Generation Discovered the Beauty and Terror of Science.

By Richard Holmes.
Pantheon. 552 pp. \$40

of an urgent need to explore. The *Endeavour's* encounter with the natives of Tahiti must be one of the great moments in the history of social awkwardness, as Banks—in all forthrightness—grappled with Tahitian cultural and sexual mores. Holmes's telling makes clear how fundamental the meeting was, as it shaped Western ideas of the noble savage and the adventurer-discoverer for centuries to come.

Banks's ecumenical, energetic spirit dominated British science for the next 50 years, especially after he ascended to the Royal Society presidency, a position he kept until his death in 1820. He convinced King George III to bankroll William Herschel, the astronomer who discovered Uranus and helped change our sense of the universe from a fixed landscape of stars to a volatile and doomed galaxy. In the sections on Herschel, Holmes's interest is—understandably—diverted by the astronomer's sister and closest assistant, Caroline, one of the most complex characters in the book and the author of extensive, often rancorous diaries and many letters over her nearly 100 years of life. For example, in a letter to a friend in the late 1790s, she wrote, "Was there ever a woman without vanity? . . . Or a man either? Only with this difference, that among gentlemen the commodity is generally styled ambition." Caroline Herschel became a respected astronomer in her own right, partially through a specific fund for her that Banks coaxed out of the king, making her the first professional female scientist in Britain.

Of Banks's many other protégés, Humphry Davy (1778–1829) stands out as a huge personality, flawed but brilliant. Davy began his scientific life as an experimenter with nitrous oxide. (Most scientists of the time experimented on themselves, with sometimes horrific results: Michael

Faraday had a glass tube explode into his eyes while working on chlorine crystals.) But Davy's real accomplishments included lectures that redefined the role of science. "It has bestowed on [man] powers which may almost be called creative; which have enabled him to modify and change the beings surrounding him, and by his experiments to interrogate nature with power, not simply as a scholar . . . but rather as a master, active with his own instruments," Davy declared in 1802. Science was about the scientist, the genius, making his mark on a chaotic and misunderstood world; it's no wonder Mary Shelley's *Frankenstein* (the doctor, not the monster) resonated so widely in theatrical productions in the 1820s.

One finishes this book feeling that Banks and Davy would have been proud. With a generosity similar to theirs, Holmes has offered up a collection of curious specimens, earlier permutations of debates, paradigms, and characters that absorb us today. It may not be possible to under-



Sir Joseph Banks (1743–1820) mentored a generation of British scientists.

stand the apparent irreconcilability of modern science and religion or the archetype of the mad scientist without also understanding the people and the controversies Holmes elucidates so beautifully here.

BRITT PETERSON is deputy managing editor of *Foreign Policy*.

Girth of a Nation

Reviewed by Lynne Lamberg

THE AVERAGE AMERICAN adult is now 23 pounds overweight. That's according to Thomas Frieden, director of the Centers for Disease Control and Prevention, who spoke in July at a CDC conference on obesity in Washington, D.C. Obese Americans—those who have a body mass index of 30 or greater, a number calculated from an individual's weight in relation to height—spend about 40 percent more on health care annually (nearly \$1,500 per person) than people of normal weight. Obesity increases the risk of developing heart disease and stroke, type II diabetes, certain cancers, and other diseases.

The prevalence of obesity among Americans has more than doubled in the past 30 years; one in three adults is now deemed obese. The problem is not peculiar to the United States: Human beings as a species are the fattest they have ever been, Michael L. Power and Jay Schulkin report in *The Evolution of Obesity*. While obesity may lead to pathology, and even be viewed as pathology, its biological underpinnings likely helped enable human evolution, say Power, a nutrition and metabolism researcher at the Smithsonian National Zoological Park, and Schulkin, a behavioral neuroscientist with the American College of Obstetricians and Gynecologists. To thrive in a world where food often was scarce and hard to acquire, the earliest humans stored fat on their bodies. Since they rarely had enough to eat, they probably stayed lean.

"We evolved on the savannas of Africa; we now live in Candyland," the authors declare. We eat out more than our parents did. We supersize: Twenty years ago, a typical bagel was three inches in diame-

THE EVOLUTION OF OBESITY.

By Michael L. Power
and Jay Schulkin.
Johns Hopkins Univ.
Press. 392 pp. \$40

ter and had 140 calories; today's bagel is six inches wide and contains 350 calories. We eat highly processed foods: The added sugars and fats they contain may activate reward circuits in the brain, stimulating further eating. These foods are often cheaper than healthful alternatives, such as fresh fruits and vegetables. The result is one of the great ironies of our time: Obesity often coexists with poverty and malnutrition.

Most jobs now involve little physical labor. Exercise has become a leisure-time pursuit that often requires special clothing and equipment, health club fees, and child-care arrangements. Our built environment also discourages physical activity, with transportation routes favoring cars over bicyclists or pedestrians. At the

typical two-story shopping mall, it is a lot easier to find escalators than stairs.

Lack of sleep also may contribute to weight gain. In 1960, most adults in the United

States reported that they slept eight or more hours each day. Recent surveys show that adults sleep less than seven hours on average, and nearly one in three reports habitually sleeping less than six hours. Laboratory studies show that sleep loss increases appetite, particularly for high-carbohydrate foods. It also raises levels of ghrelin, a hunger-stimulating hormone, and lowers levels of leptin, a hormone thought to help suppress hunger and regulate reproduction and development.

So why isn't everyone fat? The answer is that humans vary. Even people with a genetic predisposition to obesity do not inevitably become obese. Power and Schulkin say that their aim in writing this book was to understand the how and why of human obesity, not to suggest how to prevent or "cure" it. Their scholarly review, with 51 pages of references, left me feeling overstuffed yet also hungry for solutions.

The CDC also has an appetite for answers, and after convening experts and reviewing hundreds of

Twenty years ago, a typical bagel was three inches in diameter and had 140 calories; today's bagel is six inches wide and contains 350 calories.