

Current Books

Their goal is to find the present-day descendants of the legendary Lovedu, a cooperative, peaceable tribe led by a rainmaking queen. The quest begins as “a good excuse for gallivanting,” Jones writes, but it becomes the book’s defining theme in an unexpected way as she finds herself struggling over gender roles with the supermacho Muggleton. In one recurrent battle, he is hell-bent on getting into and out of countries as fast as he can; Jones, who calls herself an “inspecteur du monde,” wants to go slowly enough to see what she terms “the real Africa.”

Jones is at her best when they do manage to slow down. Their traverse of the Sahara is unforgettable, and her description of Zaire’s infamous roads should give pause to anyone contemplating a similar trip. At one point, the mud is so thick that it takes them five days to drive a distance that two women with heavy loads cover on foot in two.

Thanks to Muggleton, however, most of Africa remains a blur outside the window of the speeding Rover. Jones doesn’t have time

to connect with many locals beyond immigration officials and customs agents, so she succumbs to generalizations: “In the United States, if you don’t like conditions, you try to change them. In Africa, you accept”—a statement that would surprise those who fought to make Africa more than just a collection of colonies. Likening her view of the continent to an astronaut’s view of Earth, Jones is reduced to providing capsule histories of each country she passes through. She relies so heavily on John Reader’s *Africa: A Biography of the Continent* (1998) and other sources that she could have written much of her own book without leaving home.

Jones eventually dumps Muggleton and finds more congenial traveling companions. But, suffering from a sort of Stockholm syndrome, she presses on with Muggletonian haste. By book’s end, she has found the Lovedu but lost the spirit that animated the search in the first place.

—REBECCA A. CLAY

SCIENCE & TECHNOLOGY

DOGS:

A Startling New Understanding of Canine Origin, Behavior, and Evolution.

By Raymond Coppinger and Lorna Coppinger. Scribner. 352 pp. \$26

Even with dogs, there is a backlash. Elizabeth Marshall Thomas wrote a brilliant book, *The Hidden Life of Dogs* (1996), a masterpiece of observation, description, and empathy. It inspired many readers, and was followed by other books in a similar vein, including Marjorie Garber’s thorough study *Dog Love* (1997), Caroline Knapp’s beautifully written *Pack of Two* (1998), and Thomas’s own follow-up, *The Social Life of Dogs* (2000). So it was inevitable, I suppose, that Stephen Budiansky would write the bad-tempered *The Truth about Dogs* (2000), faulting the earlier books for being sentimental. I have never understood what is so terrible about being sentimental, for which read *emotional*, when one feels passionate about a topic.

The Coppingers—he is a professor of biology at Hampshire College and the author of

Fishing Dogs (1996); she is the author of *The World of Sled Dogs* (1977)—are scientific but not disputatious. Their bibliography lists only specialized works, with nothing for the general reader. Theirs is not an easy book to read, understand, or love, but it is plainly the work of two people who know a hell of a lot, and anybody interested in dogs ought to read it.

A chapter on sled dogs illustrates the book’s strengths and weaknesses. When the distance to be covered exceeds 10 miles, the Coppingers point out, modern racing sled dogs are the fastest animals in the world. In the annual Iditarod Trail Race in Alaska, teams average 125 miles a day for nearly nine days—which is the equivalent of running five marathons a day for nine days. Why do the dogs do it? The Coppingers argue that the reward is intrinsic in the performance—it just feels good. Fair enough, but they say almost nothing about the relationship between dog and driver, or about the costs of the sport, such as the selective culling (i.e., killing off puppies) required to get the perfect sled dog.

While mostly enthusiastic about sled dogs, they raise serious questions about service dogs, such as seeing-eye dogs and dogs that pull wheelchairs. They question whether the animals can possibly enjoy work that, unlike the work of sled dogs, is not in their genetic history. They also demonstrate that the physical work of pulling a wheelchair is very hard on the dog. But, again, they say nothing about the bond that develops between dogs and their guardians (I won't call them owners). And they apply their master-slave critique selectively; the exploitation of sled dogs and herding dogs doesn't trouble them.

The Coppingers' interest in the emotional lives of dogs seems limited to aggression, but they do a fantastic job of exploring that topic. I always wondered how a dog that guards sheep could possibly fend off a wolf much stronger than itself. According to the Coppingers, a predator rarely engages a dog in a fight, because victory is bound to be costly in terms of energy and potential injuries. Even bears, consequently, are cautious around dogs.

There is lots more here that is first rate—scientific explanations and conjectures that are intelligent, well observed, even brilliant. But sometimes you wish the Coppingers were not quite so scientific, that they were willing to indulge readers, if not themselves, with a bit more sentiment, a few more telling anecdotes, and a great deal more imaginative empathy.

—JEFFREY MOUSSAIEFF MASSON

BOLTZMANN'S ATOM:
The Great Debate That Launched a Revolution in Physics.

By David Lindley. Free Press. 272 pp. \$24

Though they may grasp little of its meaning, most reasonably educated people who encounter the equation $E = mc^2$ immediately think of Albert Einstein. But only true physics aficionados know that the equally illustrious expression $S = k \log W$ is inscribed on the grave of Ludwig Boltzmann (1844–1906).

The Viennese theorist's work marked the transition between two great ages of scientific thought: the classical and the quantum. His formula describes entropy, a measure of disorder. Implicit in the arrangement of the symbols is an explanation of why, as the Second Law of Thermodynamics holds, entropy tends to increase in the universe. Lindley, the author of

The End of Physics (1993), provides a lucid account of Boltzmann's discovery and its implications. By the time readers reach the end, they will have a good idea of what his epiphany means.

In the late 19th century, when Boltzmann was making his mark, physicists knew how to describe a gas using such measures as temperature and pressure. Inject a gas into a container, heat it with a flame or squeeze it with a plunger, and the outcome could be foretold by a collection of seemingly ironclad laws. For

many physicists, that was enough. Temperature and pressure were treated as irreducible components of the physical world.

Boltzmann was among those determined to look deeper, to show that temperature, pressure, viscosity, heat conduction, and other qualities were epiphenomena arising from



Ludwig Boltzmann

the jostling of invisible specks of matter: molecules and atoms. The motion of each of these tiny objects could, like that of marbles or billiard balls, be described by simple laws of mechanics. But because there were far too many individual trajectories to track, their mass behavior had to be treated statistically using the mathematics of probability. First, though, one had to believe in atoms—and the only evidence for them seemed to be that positing their existence made the theories work. Skeptics, led by the physicist/philosopher Ernst Mach, denounced the “atomists” and the statistical magicians for straying into metaphysics.

Boltzmann ultimately prevailed by showing that his approach could explain the Second Law. Given a collection of atoms or molecules, there are vastly more disorderly arrangements than orderly ones. So it was most likely that, without outside intervention, order would give way to entropy. Before long, almost everyone believed in atoms, and statistical methods became an important tool in the development of quantum mechanics. More significantly, Lindley shows, the constricting Machian philosophy—rejecting any phenomenon that could not be directly perceived by human