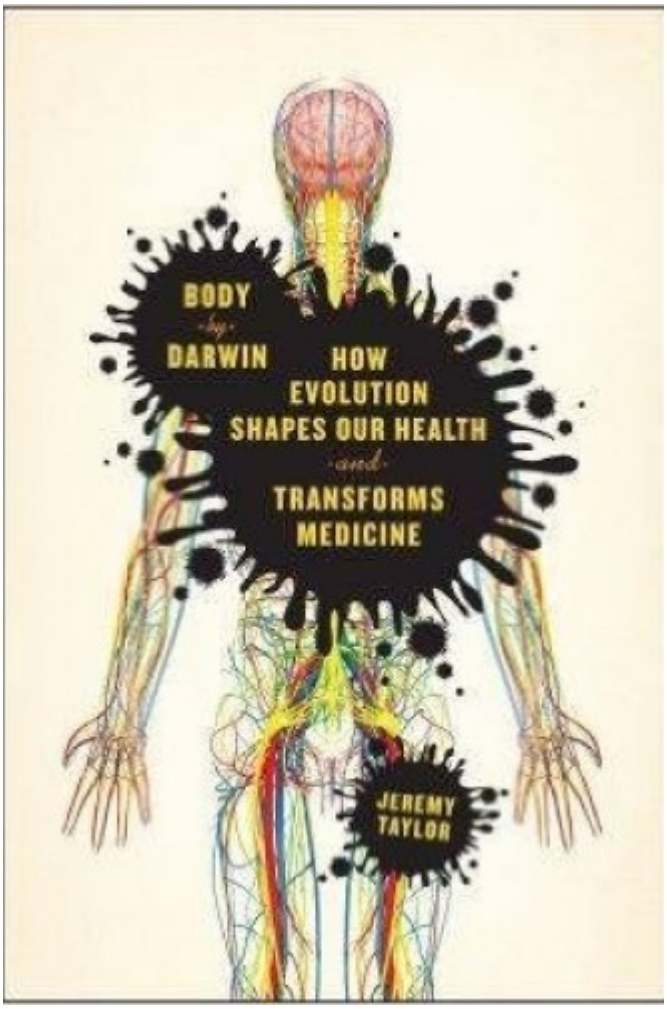
Evolution heals

by Brian Volck in the April 27, 2016 issue

In Review



Body by Darwin

By Jeremy Taylor
University of Chicago Press

Some years ago, a French company developed a ready-to-use peanut-based therapeutic food to treat severe malnutrition. The simply made, vitamin-fortified paste requires no water, mixing, or refrigeration; it can be fed to those in need

without admission to a hospital; and it has proven highly effective in preventing death or further illness in starving children in developing countries. When American physicians learned of the new product, they often asked about children who are allergic to peanuts. Schools in the United States, after all, set aside peanut-free lunchroom tables to prevent serious reactions in susceptible children.

As it turns out, peanut allergies—and food allergies in general—are rare in Africa, where the therapeutic paste is most often used. The best explanation for this is that children in developing countries, unlike those in much of the Global North, are exposed early and often to a variety of microbes, including wormlike parasites called helminths. The human immune system reacts to helminths and their ilk with the same cells, antibodies, and chemical signals implicated in allergic conditions. This question is not a matter of general cleanliness, as some have supposed, but of exposure and response to certain organisms that have accompanied humanity throughout most of its time on this planet. Only in the past two centuries has the combination of public sanitation and antimicrobial agents freed some of us from these so-called old friends, which unfortunately has permitted the immune system to turn some of its weaponry against the body itself, in the form of eczema, allergies, and asthma.

The old-friends hypothesis is incompletely understood and still controversial, but it may also explain why autoimmune diseases such as multiple sclerosis, inflammatory bowel disease, and type I diabetes are rare in tropical countries with high rates of parasitic infection. As the theory goes, when components of the immune system that were once crucial to human survival are underused, they may act in misdirected and poorly controlled ways. In fact, inoculating multiple sclerosis patients with relatively benign parasites, such as the pig whipworm, has shown promise as a way to temporarily reduce relapses and to slow progression of the disease.

Science writer and television producer Jeremy Taylor explores the old-friends hypothesis and other new ways of looking at human health and disease using an evolutionary lens. Readers will learn what evolutionary medicine brings to the understanding and treatment of various diseases of pregnancy, certain forms of blindness, cancers, coronary artery disease, and dementia. He also has a chapter on the orthopedic consequences of walking upright rather than on all fours, and on how the human spine makes the best of a challenging business. Parts of Taylor’s narrative may be difficult to follow for readers who are not medical professionals (I had to reread several passages to grasp the content and implications), but he does

what he can to keep things accessible, often using patient experiences to demonstrate practical consequences.

The recurring theme is that evolutionary adaptations come with advantages and drawbacks, the net balance of which depends on the situation.

For example, Taylor describes the development of the heart from fish to mammals, with special attention to a particular structural problem: how to supply a muscular organ in constant motion with oxygen-rich blood. The solution in humans and other mammals is a handful of surprisingly small arteries running across and then directly into the heart muscle. This works quite well for a few decades—long enough for humans to mate and reproduce—but these small vessels clog easily after 40 or more years of chronic inflammation or mismatch of diet and exercise. In the case of coronary arteries, as with many other evolved traits, the human body is well equipped to propagate the species in challenging environments, but is also vulnerable to disease—particularly, but not solely, in the postreproductive years.

Taylor keeps his narrative interesting and informative, though he overstates the extent to which new evolutionary insights threaten the medical establishment. He claims that “many medical professionals are, and always have been, actively hostile to the very idea of evolution.” I do know physicians who summarily reject evolution by natural selection. One of them ran for president of the United States. Yet in the entirety of my medical education, I encountered only one faculty member who publicly endorsed creationism, while countless lectures and conferences addressed the medical implications of human evolution.

What’s new is the scope and detail of evolutionary insights into human health and disease that are leading to novel therapeutic possibilities, though most are more promising than actually proven. The choice of whether to use them will depend on efficacy and ethics, not a perceived institutional bias against evolution.

Taylor devotes relatively little space to refuting creationism and intelligent design, though he apparently associates these positions with generic religiosity rather than a particular strand of English-speaking, Protestant Christianity. Taylor is obviously familiar with William Paley’s 19th-century work on natural theology and its divine watchmaker argument. He doesn’t mention Augustine’s word of caution, in *The Literal Meaning of Genesis*, that Christians must not discredit the faith by insisting on literalist readings in flat contradiction of shared reason and observation. Nor does he

consider Adelard of Bath’s 12th-century claim that although God is the Creator and Sustainer of all things, direct appeals to specific divine action should not substitute for the careful use of our God-given intellect. Augustine and Adelard were sufficiently orthodox not to confuse the unfathomable God of Israel with Paley’s tinkering demiurge.

Then again, Taylor has written a book on evolution and medicine, not theology and history, and his brief engagements with Christianity are mostly peripheral to his argument. He never lowers his rhetoric to the level of the condescending diatribes by Jerry Coyne and Richard Dawkins. He even takes Dawkins to task for claiming that the human eye is poorly engineered and pauses to consider the advantages of our compact “retinal design.” The word choice is fascinating.

Writers like Taylor and Dawkins have trouble discussing evolution without attributing something like agency to natural selection, even when they deny that evolution is a series of conscious choices—as they should. Words like *design, solution*, and *strategy* pepper this and other evolutionist texts. Perhaps human consciousness can’t resist teleological metaphors. The sciences, however, have much to say about how things happen and almost nothing about why. Scientifically literate Christians in the tradition of Augustine and Adelard may quibble with parts of Taylor’s dense and interesting book, but they need not feel threatened by its contents.