Book Review: â€˜Your Inner Fish â€“ A Journey Into the 3.5-Billion-Year History of the Human Bodyâ€™

by Scott_LaFee

Your Inner Fish: A Journey Into the 3.5-Billion-Year History of the Human Body" by Neil Shubin; Pantheon; 240 pages; $24.

Back in 2006, University of Chicago paleontologist Neil Shubin and colleagues made international headlines when they announced their discovery of a Tiktaalik, a fish-like creature that lived 375 million years ago.

YOUR INNER FISH - Neil Shubin's new book is a remarkably enthusiastic and easy-to-read explanation of evolution. CNS Photo. What made the Tiktaalik (an Inuit word for burbot, a kind of shallow-water fish) so noteworthy was that it wasn't a fish at all. It was something more, a "fishapod," a transitional species between fish and four-limbed, land-living tetrapods.

The media breathlessly declared Tiktaalik to be "the missing link."

That's something of an overstatement. Tiktaalik is a link, not the link. And it's no longer missing. Nonetheless, there's no disputing the fact that Tiktaalik was - and is - an extraordinary discovery. It had scales and gills like a fish, but also lungs and a neck, the latter allowing it to move its head independently of its body, something no fish can do.

Moreover, Tiktaalik had arm-like skeletal structures akin to modern-day amphibians and reptiles, including a shoulder, elbow and wrist.

Tiktaalik is further proof that Darwin was right. But for those who want more, there's Shubin's new book, a remarkably enthusiastic and easy-to-read explanation of evolution described through the synthesis of paleontology, developmental genetics and genomics (the study of genes).

"Your Inner Fish" isn't about Tiktaalik, but rather about how the human body is the result of 3.5 billion years of evolution. Far from being unique, humans share almost everything about our anatomy, biochemistry and behavior with other organisms, past and present.

Not just fish, but insects, worms, yeast and bacteria. Shubin presents his arguments creatively and concisely, tackling sometimes profound questions about origins and evolution directly, even humorously. The evidence mounts, chapter after chapter.

He notes, for example, the common architecture of many animal limbs, from theropod dinosaurs to birds to whales to lizards to humans: "one bone, followed by two bones, then little blobs, then the fingers and toes." The architectural details may be different (bone proportions vary wildly between species) but all share the same, basic plan.

It's a theme Shubin repeats:

Teeth, feathers and breasts all develop from basic interactions between layers of skin.

Like worms, our bodies are segmented - not only obvious things like our vertebrae, but also the way nerves are organized.

Invertebrates like a worm called Amphioxus don't have backbones, but they do possess a stiffening line of nerves down the back called a notochord. Human embryos have notochords too, but ours break up during development, ultimately becoming part of the disks that lie between our vertebrae.

To be sure, an evolved human body is not without its disadvantages, Shubin wryly observes. "Take the body plan of a fish, dress it up to be a mammal, then tweak and twist that mammal until it walks on two legs, talks, thinks, and has superfine control of its fingers - and you have a recipe for problems."

For example, the nerve controlling the diaphragm - a sheet of muscle between the chest and abdomen - begins in the brain stem, near the neck. In fish, the same nerve is ideally situated because it controls nearby gill muscles. In humans, the nerve must stretch halfway down the body, leaving it vulnerable to all manner of trauma.

It's one way, writes Shubin, that our past comes back to bite us.

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