9. See Bergman, J., Why the Miller–Urey research argues against abiogenesis, *J. Creation* **18**(2):74–84, 2002.

10. See also Mills, G.C. and Kenyon, D.H., The RNA World: A Critique, *Origins and Design* **17**(1):9–16, 1996; <www.arn.org/docs/odesign/od171/rnaworld171.htm>.

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12. Compare also Pièrre Teilhard de Chardin's mystical description of 'directed evolution' (which, he believed, culminated in 'something he termed the 'Omega point', which he identified with Jesus Christ'). Ruse, M., *Can a Darwinian Be a Christian?* Cambridge University Press, Cambridge, p. 85, 2001; reviewed by Weinberger, L., Preaching to his own choir, *J. Creation* **19**(2):42–45, 2005. Teilhard, actually, probably would not mind having his work characterized as somewhat pantheist in its overtones—he was quite forthright about acknowledging his sympathies for elements of pantheism. See his essay, Pantheism and Christianity; in: Teilhard de Chardin, P., *Christianity and Evolution*, René Hague, trans., Harcourt, New York, pp. 56–75, 2002. See also Lane, D.H., *The Phenomenon of Teilhard: Prophet for a New Age*, Mercer University Press, Macon, GA, 1996.

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14. For example, Sarfati, J., *By Design: Evidence for nature's Intelligent Designer—the God of the Bible,* Creation Book Publishers, 2008.

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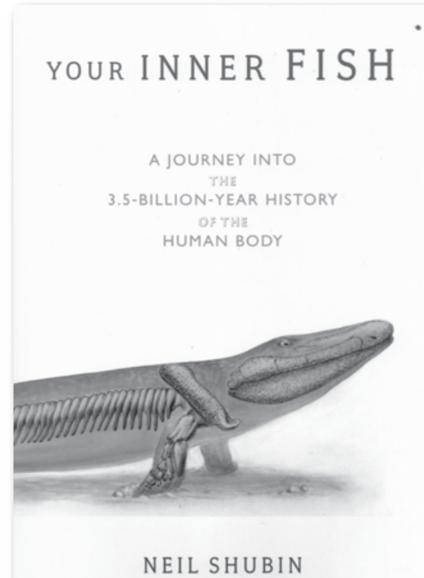
17. Woodmorrappe, J., Miller's meanderings: only the same bogus contentions, *J. Creation* **23**(1):19–23, 2009.

18. Sarfati, ref. 14, chs. 12–13.

19. Although, as other writers have pointed out, just because nothing is offered 'in place of theory X' hardly means that theory X (Darwinism in this case) is *correct*.

Is the fish really our ancestor?

A review of
Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body
by Neil Shubin
Pantheon Books, New York, 2008



Colin Mitchell

The author, Neil Shubin, is Professor of Anatomy at the University of Chicago and Provost of its field museum. He has wide expertise in both fossils and biology. His co-worker, Edward Daeschler, is Curator of Vertebrate Biology in the Academy of Natural Sciences in Philadelphia. The book is well researched with much information about earlier work and a comprehensive reference section. It is highly readable with the author's modest and friendly personality coming through strongly. It incidentally includes a most useful guide to fossil hunting. It is illustrated mainly by Kalliopi Monoyios' graphic and appealing black-and-white drawings.

The author puts his cards on the table from the start. The book's stimulating title indicates that the central thrust is evolutionary—seeking to explain humans as the product of a succession of life forms from an original cell. It supports the whole multi-million year evolutionary sequence. It emphasizes a common origin for body features such as limbs, hair, teeth and senses in both animals and humans.

It emphasizes three types of alleged evidence: a) similarities between the body parts of living creatures, arguing for common ancestry, b) indications from microbiology which seem to argue the same way, and c) detailed examination of one apparent missing link—that between fish and amphibians: *Tiktaalik*.

Body evolution? Summary of the author's views

There are remarkable analogies between body parts of creatures which otherwise differ widely. All advanced creatures have similar architecture.

They have heads containing brains and sense organs, spinal columns with an anus at the opposite end of the body from the mouth and comparable plans of flippers, wings, legs and arms. We can see this especially by comparing upper limbs. Whales, birds and humans have single arm bones leading to two more which in turn connect to fingers or toes. In humans, this series runs from the humerus through the radius and ulna to the wrist bones and fingers.

Fish, amphibians, reptiles, birds and mammals all share hard teeth. The book quotes the claim that this could have evolved from the juxtaposition of two layers of tissue, and that this hardness could have evolved from eel-shaped sea creatures called conodonts with tooth-like hard parts allowing them to bite and feed on other sea creatures. Behind this is the idea that the tooth, which is part of our survival kit, arose originally not to protect mammals but to eat them.

Genes, embryos and microbes

Microbiology has made great advances notably in showing how the differentiation of species depends on small differences in genes which make evolutionary change possible and which can indeed now often be manipulated to effect desired change. The author points out that all appendages, whether fins or limbs, are built by similar kinds of genes. Experiments on mice, sharks and flies show that the great evolutionary transformation from the fin to the limb mainly involved nothing more than using ancient genes in new ways. This holds out wide possibilities of using work on the genes of one species to find one that tells us about the birth defects in another.

The author claims that embryos of all creatures look similar in their early stages and everything from sharks to humans shares four anatomical swellings in the neck called ‘arches’. In comparing how the skeleton developed in birds, salamanders, frogs and turtles the author found that limbs as different as bird wings and frog legs look very similar during their development. Experiments with salamander embryos have shown that lopping off one part of the embryo of one species and grafting this onto the embryo of another species led to the formation of a whole new body including spinal cord, back, belly, even head.

The transferred patch of tissue was called ‘the organizer’. We now recognize that the general structure of the body is initiated by this organizer region which contains what is known as the *Hox* gene, which controls the activity of the organizer in the embryo.[1] It is now known that all mammals, birds, amphibians and fish have organizers. If you take the organizer from a chicken and graft in on to a salamander embryo, then you get a twinned salamander.

The book also reports research on algae which suggests how they can adapt in the battle for life. Some workers took a type of alga and let it live for 1,000 generations. They then introduced a microbe predator to eat the descendants. In less than 200 generations, the alga responded by producing clumps with hundreds of cells, eventually reducing their number to eight. This made each clump large enough to avoid being eaten but small enough for each constituent cell to survive. The interesting fact was that this adaptation to predation caused the algae to adopt this result and continue to reproduce and form individuals with eight cells.

Smell, seeing and hearing

The book also traces the presumed evolution of the senses of smell, seeing, hearing and of the brain itself. Eyes, ears and nasal structures are similar and all show an apparent upward progression from simpler to more ‘advanced’ animals. We have obtained our sense of smell from fish but have many more odour genes which arose ‘by many rounds of duplication of the small number of genes present in primitive species’ (p. 146).

Because of their softness, eyes seldom appear in the fossil record although their presence can be inferred in the earliest marine creatures such as trilobites. The basis of the eye is the light-gathering cell. Most mammals have only two kinds of receptors whereas humans have three and so can distinguish more differences in colour. This from an evolutionary point of view suggests that our colour vision began when one of the genes in an ancestral mammal duplicated and the copies specialized over time for different light sources. The author suggests that this may relate to changes in the flora of the earth. Monkeys living in trees would benefit because colour vision enabled them to discriminate better among many different kinds of fruit and leaves.

The book likewise gives the ear a complex evolution. The inner ear gives us our sense of balance and controls the nerve impulses sent to the brain. It is thought to be the original part. The middle ear consists of three bones in all mammals while reptiles and amphibians have only one and fish none.

These three bones allow us to hear higher frequency sounds than can animals with a single middle ear bone. The evolutionary view is that when we evolved from reptiles the bones originally used by reptiles for chewing became used by mammals for hearing. The outer ear is seen as a recent evolutionary addition to bodies.

Criticism of claimed evolutionary evidence

But when we review all these findings about body form and development there is nothing that conclusively supports trans-specific evolution. Similarities or homologies[2] between the bodies of creatures point at least as strongly to a *single* common designer, as opposed to many designers.[3] Also, the commonalities would even bring such a designer great honour in most cultures, indicating his mastery over his designs.[4] This view is strengthened when one considers the transcendental complexity of even the simplest living cell. Likewise, the similarity of microbiological processes in different species argues as much—indeed more—for their common design than for a common physical ancestry. The reader of the book is left with the feeling that the billion-year evolution model so permeates the author’s thinking that he passes over the much more obvious evidences of ubiquitous design.

A ‘missing link’?

Is there any clear example of a ‘missing link’ in the fossil sequence which will finally prove trans-specific evolution? One proposed step which has provoked much research is the transition from fish to amphibians. Professor Shubin is one of the outstanding researchers in this area and discusses it in the book.

The Devonian geological period is ‘the age of fishes’. In and below this almost all fossil life is marine. Above it there is an increasing presence of land-living reptiles and then mammals. It is generally believed that this change must have come via an evolution from fish to amphibians and then to reptiles.

But there appeared to be no clear link between these groups.

Fish and land-living animals differ in many respects. Fish have conical heads whereas the apparently earliest animals have almost crocodile-like flat heads. Fish lack necks while all land animals have them so that they can bend their heads independently of their shoulders. Fish have fins while land creatures have limbs with fingers and toes, wrists and ankles.

The author and his fellow workers actively sought for a fossil showing 'the advance' from fish to land-living animals. In 2004 they apparently succeeded. They found the fossilized remains of three examples of a creature with both fish-like and amphibian-like characters on Ellesmere Island in the Canadian Arctic. This creature was apparently the link. It appeared in the right place in the geological sequence in Devonian rocks with an assigned age of 375 million years. The author has called it a 'fishapod'.[5–7] Like a fish it has two front fins, two small back fins and no bones in the tail. The front fins have jointed bones which could enable it to raise itself, but it could not walk.

Like a 4-legged reptile, it has a flat head able to move separately from its shoulders and eyes on top, rather than a fish's side-looking eyes near the front of its head. It has spiracles on top of its head which suggest it had lungs as well as gills. This indicates some similarity to lungfishes although it differs from these in having its front fins connected to the spinal column. At the same time virtually all the features it shares with land creatures are apparently primitive, suggesting an evolutionary transition.

The author and his fellow workers, with help from the local Inuit people, named the creature *Tiktaalik roseae*, deriving the first name from that for 'large shallow-water fish' in the Inuktikuk language. The find received wide publicity including headlines in the *New York Times*. Since then more than 20 fossils of this species have been found, ranging in length from less than one metre to nearly three metres.

But is *Tiktaalik* really a link in 'our evolutionary ancestry' supporting the claim in the book title? There are strong reasons why it cannot be.[8]

First, the bones in its front fins differ both from those in fish and from the digits in amphibians. To evolve these would require many changes, none of which appear in the fossil record.

Secondly, *Tiktaalik's* head, as in amphibians, is not connected to the shoulder girdle. In fish the head, shoulder girdle and circulatory system constitute a single mechanical unit. A change from this would require the head to become incrementally detached from the shoulder girdle with functional intermediates at every stage. None are known.

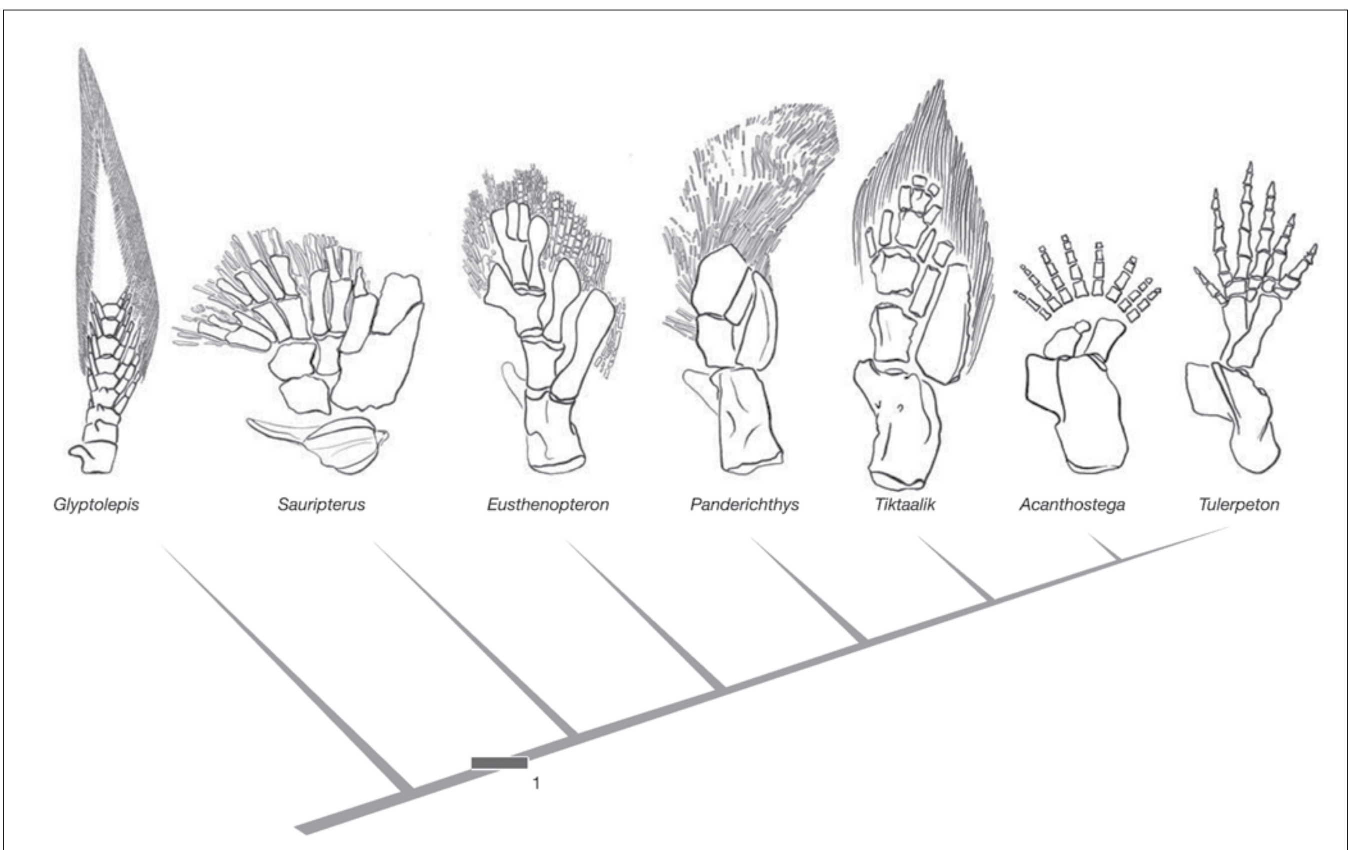


Image from: *Nature* **440** (7085):764–771

This proposed sequence for the evolution of limbs looks impressive: *Glyptolepis—Sauripterus—Eusthenopteron—Panderichthys—Tiktaalik—Acanthostega—Tulerpeton*. But these extinct fossil creatures differ considerably among themselves and don't provide a valid evolutionary sequence.

Thirdly, paleontologists have placed the evolution of limbs connecting fish and reptiles in a proposed sequence which sounds impressive:

Glyptolepis—Sauripterus—Eusthenopteron—Panderichthys—Tiktaalik—Acanthostega—Ichthyostega—Tulerpeton.

But these extinct fossil creatures differ considerably among themselves and are not an obvious evolving sequence. Their order is doubtful. *Panderichthys* 'dated' earlier than its supposed predecessor *Eusthenopteron*. *Acanthostega's* skull is more tetrapod-like than *Ichthyostega's* while the latter's shoulder and hips are more robust and land-animal-like than *Acanthostega*.

Fourthly, all calculations of evolution depend on the assumption of a multi-million-year old Earth to allow time for it to work. But there is now increasing evidence of a much younger Earth.[9]

To summarize, *Tiktaalik* appears to be a unique creature which has both amphibian and fish-like features. It must have been one of a mosaic of fauna living in an area described by Shubin as 'a shallow stream surrounded by large seasonal mud flats' under warm conditions before the Flood.

Conclusions

There are a number of reasons why the approach of this book, despite its wealth of detail, cannot explain our present natural world. The multi-million year chronology depends on two assumptions: the validity of radiometric dating and the operation of gradual inter-type evolution.

The first is doubtful because of sampling problems and ignorance of the past history of samples, the second because of the unlikelihood of organic evolution in the absence of any credible transitional forms in the fossil record. Life forms are too complex for any trans-specific evolution because of the unanswered need for exactly integrated multiple simultaneous changes in one type of creature to give another. There is little evidence for the evolutionary origin of the earliest creatures. All appear without apparent ancestry or evidence of trans-specific change. There is only slight evidence of Precambrian life, contrasting with the considerable fossil assemblage in Cambrian rocks where even the lowest contain representatives of nearly all the main branches of the invertebrate animal kingdom from jellyfish to crustaceans, including complex forms such as trilobites and brachiopods.

Random natural forces cannot explain the 'knowledge' possessed by growing embryos which decides what part of a body they will form or the existence of 'organizers' combining genes to form a body plan. The use of evolutionary forces to explain natural phenomena can lead to some apparent impossibilities such as tracing the evolution of the mammalian middle ear from the reptilian jawbone[10] and the suggested evolutionary origin of hiccups and propensity for hernias.

Nor can evolution explain upward progress of life forms from simple to complex.[11] The tendency of all random action is towards degradation of existing forms. There is no way that it can lead to a progressive advance in their complexity. And deeper questions lie behind these issues. A belief in the evolution theory impacts all moral and social considerations.[12,13] The existence of life with all its wonders and complexities requires a dominant place for intelligent design. There is some good science in this book but it is devalued by the attempt by the author to shoehorn the data into supporting a theory which cannot explain the underlying origin and purposes of nature.

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