

# Missing links in evolution

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How does science identify a missing link ?



One of several fossils of *Archaeopteryx*. This has feathers like modern birds but the skeleton has dinosaur type teeth and tail.

Scientific discoveries start with observations, followed by formulating theories relating to the significance of these observations. Further observations then serve to test the theories. Soon after the publication of Darwin's Theory of Evolution, a fossil of *Archaeopteryx* was found. In the light of knowledge at

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that time, this seemed to be a wonderful example of a missing link on the evolutionary line from dinosaurs to birds.

This status of ‘missing link’ has lasted for 150 years but recent discoveries of feathered dinosaur fossils in China has thrown serious doubt on whether *Archaeopteryx* is a ‘missing link’ on the line leading to modern birds.

An article in New Scientist Journal summarizes the new evidence that now places *Archaeopteryx* squarely in dinosaur territory. I quote, “*We used to think Archaeopteryx was so different from other dinosaurs that it was ancestral to birds, but recent discoveries show that this is no longer the case*”, says Xu. “*Our main conclusion is that Archaeopteryx is no longer a bird*”.

Biologists still think that birds did originate from one line of dinosaurs and several different dinosaur fossils have been found with feather like body coverings. However, this discovery, relating to *Archaeopteryx* serves to illustrate how science must continually adapt to new findings and seemingly well established ‘facts’ have to make way to new discoveries.

In a previous news brief I discussed ‘Changing concepts of evolution’. This *Archaeopteryx* case highlights the need to be cautious about identifying any fossil as a missing link between major levels of genetic complexity. Part of the present re-examination of evolution theory, is an acceptance that the evolutionary mechanisms are far more varied and complex than originally thought and we are only now starting to understand them.

Biologists now have to accept that we cannot explain all evolutionary changes as having taken place through a very long

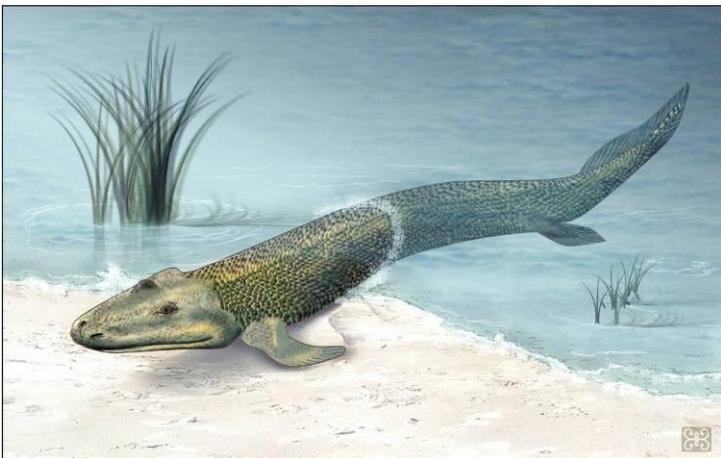
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series of minute changes, acted on by environmental selection over long time-scales. The fossil record and genetic studies are showing that some very large changes seem to have taken place very fast. In fact so fast that there was apparently not time for a fossil record of these changes. It even seems possible that some big advances took place without intermediate stages.

These large changes, such as from invertebrates to vertebrates, fishes to amphibians, amphibians to reptiles, reptiles to birds and other examples where large increases in genetic complexity are involved, cannot all be the result of our traditional understanding of Darwinian evolution.

What caused these sudden large changes is at present not at all clear. However, the fossil record has many examples of the sudden appearance of new life forms, such as the appearance of flowering plants, bats, birds and many others.

This new melting-pot in evolutionary theory should make us more cautious about claiming a fossil to be a 'missing link'. One recent claim involves a fossil called *Tiktaalik roseae* that some scientists think could be on the evolutionary line from fish to amphibians.



*Tiktaalik roseae*.

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Present day life forms have examples of creatures that superficially appear to have features from diverse types of animal. For instance, the Duck-billed Platypus from Australia. This is a warm blooded animal with fur, lays eggs like a bird and has a duck-like bill.

When the Platypus was first discovered many thought it was a hoax. Imagine if we only knew these animals from fossils. Would we develop theories linking birds with mammalian ancestors or mammals from bird ancestors?



The Duck-billed Platypus from Australia. Clearly, an animal can have bird-like features and mammal-like features without it being on any evolutionary tree between these two major groups of animals.

**Is there a lesson to be learnt?** Maybe a need for greater caution by some biologists, especially when some give the impression to the general public that science has pretty much tied up the evolutionary history of life on earth.

At the same time, it is totally wrong to claim that evolutionary processes do not exist. Evolutionary changes within any one level of genetic complexity have been very well illustrated. Furthermore, the great age of the earth (billions of years old) and the history of life (covering at least 600 million years) is very well established. In other words, no matter what processes have been involved during the long history of life on earth, the existence of birth, growth, reproduction and death, has been a fundamental part of life from the beginning, from long before the biblical date for Adam!

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For those who accept God as the Creator, there is an urgent need to face these issues and re-examine traditional interpretations of scriptures. Our God has to be big enough to be aware of, and involved in, every detail of His creation. In that way it is possible to rule out chance from the equation.

Furthermore, I personally believe that the need for 'genetic upgrades' during the history of life, and the existence of numerous examples of intricate complexity in biological systems, cries out for a guiding Mind behind it all.

Reference: O'Donogue. J: 2011. *Archaeopteryx is knocked off its perch*. New Scientist: 30 July: 10.

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