

Flatfish caught evolving, thanks to its roving eye

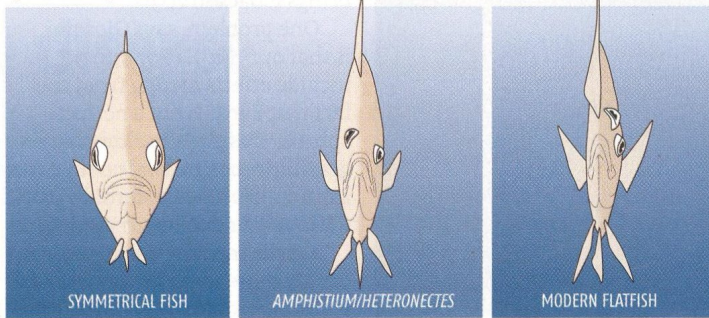
THE slightly skewed faces of two fossil fish have caught the evolution of flatfish eyes in action, filling a gap in the fossil record that has plagued the theory of evolution since Darwin's day.

The asymmetric placement of flatfish eyes has long been a puzzle. Larval flatfish have their eyes on opposite sides of the skull, but when they are still tiny – around one centimetre long – one eye migrates to the opposite side so that both eyes point upwards when the fish lies on its side on the sea floor.

"Both the initial and final states make sense" because they offer evolutionary advantages for swimming in open water or along the bottom, respectively, says Matt

EYE GETS AROUND

Amphistium and *Heteronectes* provide an evolutionary "missing link" between fish with symmetrical eyes and modern flatfish, such as flounders



SOURCE: M. FRIEDMAN

Friedman at the University of Chicago. The problem for natural selection is that intermediate forms seemed to offer no clear advantage, and no examples had been found. As such, flatfish eyes have been used to challenge Darwin's theory ever since it was published in 1859.

Now Friedman reports finding two different missing links. They are fossil fish with their eyes in different places

on the two sides of their skulls – one in the normal position and one closer to the midline (see Diagram). One is *Amphistium*, a previously described genus found in several fossil deposits in Europe, in which the asymmetry went unnoticed because in fish fossils only one side of the animal is generally preserve. The other is *Heteronectes*, a new genus. At 10 to 20 centimetres long, the specimens

were clearly adults and not larvae in which the eyes were migrating (*Nature*, DOI: 10.1038/nature/07108).

Both species lived alongside modern-looking flatfish for several million years. Friedman thinks they made their living by ambushing prey, laying nearly flat on the sea floor to escape notice but propping themselves up with their fins, as modern flatfish often do. In that position, "a small asymmetry is better than none to see the water column above you", he says.

"This is very cool. All you have to do is look at the asymmetrical frontal bones and it hits you – well, right between the eyes," says Kevin Padian at the University of California, Berkeley. "This is a great argument against the intelligent design proponents who keep telling us that we won't find intermediate stages between features in the fossil record so we should stop looking and admit divine intervention." Jeff Hecht ●