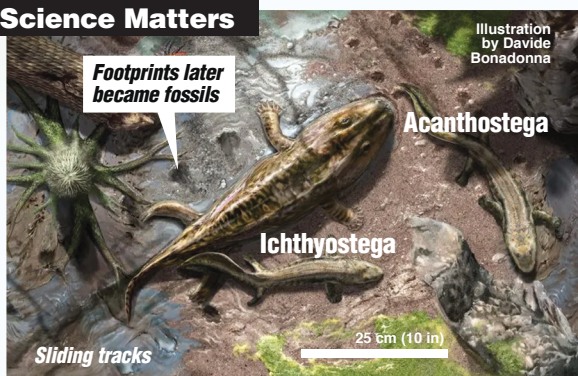


Arms sped first steps onto land

About 390 million years ago, early four-legged animals (**tetrapods**) crept out of the water onto land. New studies show that their upper front leg (**humerus**) bones crucially helped them.



Seen from overhead, two early four-legged animals come out of the water onto land. Their movements leave tracks.

Stages from fins to legs

How humerus bones evolved

Aquatic fish



FISH-LIKE BODY

Blocky humerus



Fins could make backward forces for swimming

Tetrapod (transitional)



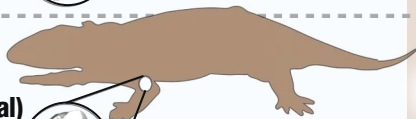
AMPHIBIAN-LIKE PARTS

L-shaped humerus



Legs allowed force both downward and backward

Tetrapod (terrestrial)



Twisted humerus

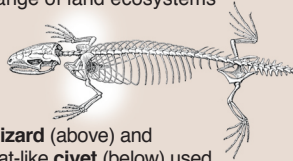


Efficient legs led to dinosaurs, later animals

Source: Stephanie Pierce of Harvard University; Nature (journal)

Animal arms race

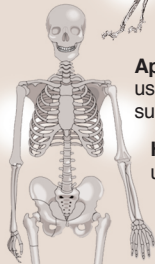
Being able to walk around set the stage for diverse new species, living in a wide range of land ecosystems



Lizard (above) and cat-like **civet** (below) used strong forelegs for running



Apes could walk, using their arms for support or grasping



Humans walk upright, arms free

Graphic: Helen Lee McComas, Tribune News Service