Discovery of Ardi -- Against All Odds, Ardi Emerges

The first, fragmentary specimens of Ardipithecus were found in Ethiopia in 1992 but it took 15 years before the research team could fully analyze and publish the skeleton, because the fossils were in such bad shape.

After Ardi died, her remains apparently were trampled down into mud by hippos and other passing herbivores. Millions of years later, erosion brought the badly crushed and distorted bones back to the surface.

They were so fragile they would turn to dust at a touch. To save the precious fragments, scientists removed the fossils along with their surrounding rock. Then, in a lab the researchers carefully tweaked out the bones from the rock using a needle under a microscope, proceeding "millimeter by submillimeter". This process alone took several years.

In the end, the research team recovered more than 125 pieces of the skeleton, including much of the feet and virtually all of the hands—an extreme rarity among hominid fossils of any age, let alone one so ancient.

"Finding this skeleton was more than luck", said scientists. "It was against all odds".

Complete the Cause and Effect sentences as well as the summary sentence:

CAUSE		EFFECT
The fossils of Ardipithecus were in bad shape		
		so Ardi's bones were in lots of pieces.
		so it took several years to remove Ardi's bones from the rock.

Finish the following sentence:

Scientists might not find many more skeletons as old and complete as Ardi's because

_____

_____.

Ardi Discovered, Continued

Directions: *Read about Ardi's movement and complete the exercise on Claims and Evidence below.*

Ardi's Weird Way of Moving

The biggest surprise about *Ardipithecus*'s biology is its bizarre means of moving about.

All previously known hominids—members of our ancestral lineage—walked upright on two legs, like us. But Ardi's feet, pelvis, legs, and hands suggest she was a biped on the ground but a quadruped when moving about in the trees.

Her big toe, for instance, splays out from her foot like an ape's, the better to grasp tree limbs. Unlike a chimpanzee foot, however, *Ardipithecus*'s contains a special small bone inside a tendon, passed down from more primitive ancestors, that keeps the divergent toe more rigid. Combined with modifications to the other toes, the bone would have helped Ardi walk bipedally on the ground, though less efficiently than later hominids like Lucy. The bone was lost in the lineages of chimps and gorillas.

According to the researchers, the pelvis shows a similar mosaic of traits. The large flaring bones of the upper pelvis were positioned so that Ardi could walk on two legs without lurching from side to side like a chimp. But the lower pelvis was built like an ape's, to accommodate huge hind limb muscles used in climbing. Even in the trees, Ardi was nothing like a modern ape, the researchers say. Modern chimps and gorillas have evolved limb anatomy specialized to climbing vertically up tree trunks, hanging and swinging from branches, and knuckle-walking on the ground.

While these behaviors require very rigid wrist bones, for instance, the wrists and finger joints of *Ardipithecus* were highly flexible. As a result Ardi would have walked on her palms as she moved about in the trees—more like some primitive fossil apes than like chimps and gorillas.

"What Ardi tells us is there was this vast intermediate stage in our evolution that nobody knew about", said Owen Lovejoy, an anatomist at Kent State University in Ohio, who analyzed Ardi's bones below the neck. "It changes everything".

Read the claim about Ardi. Go back through the paragraph using the prompts below and find the evidence that supports the claim.

Claim: Ardi was bipedal, moving on two feet, when she was on the ground, but she was a quadruped, using all four limbs, in the trees.

Evidence:

1. What is it about Ardi's feet that supports this claim?

2. What is it about Ardi's pelvis and legs that supports this claim?

3. What is it about Ardi's wrists that supports this claim?