

**Explore/Explain:
Evidence for Change across Time**

**Evolutionary Biologist Copymaster:
Human Vestigial Structures**

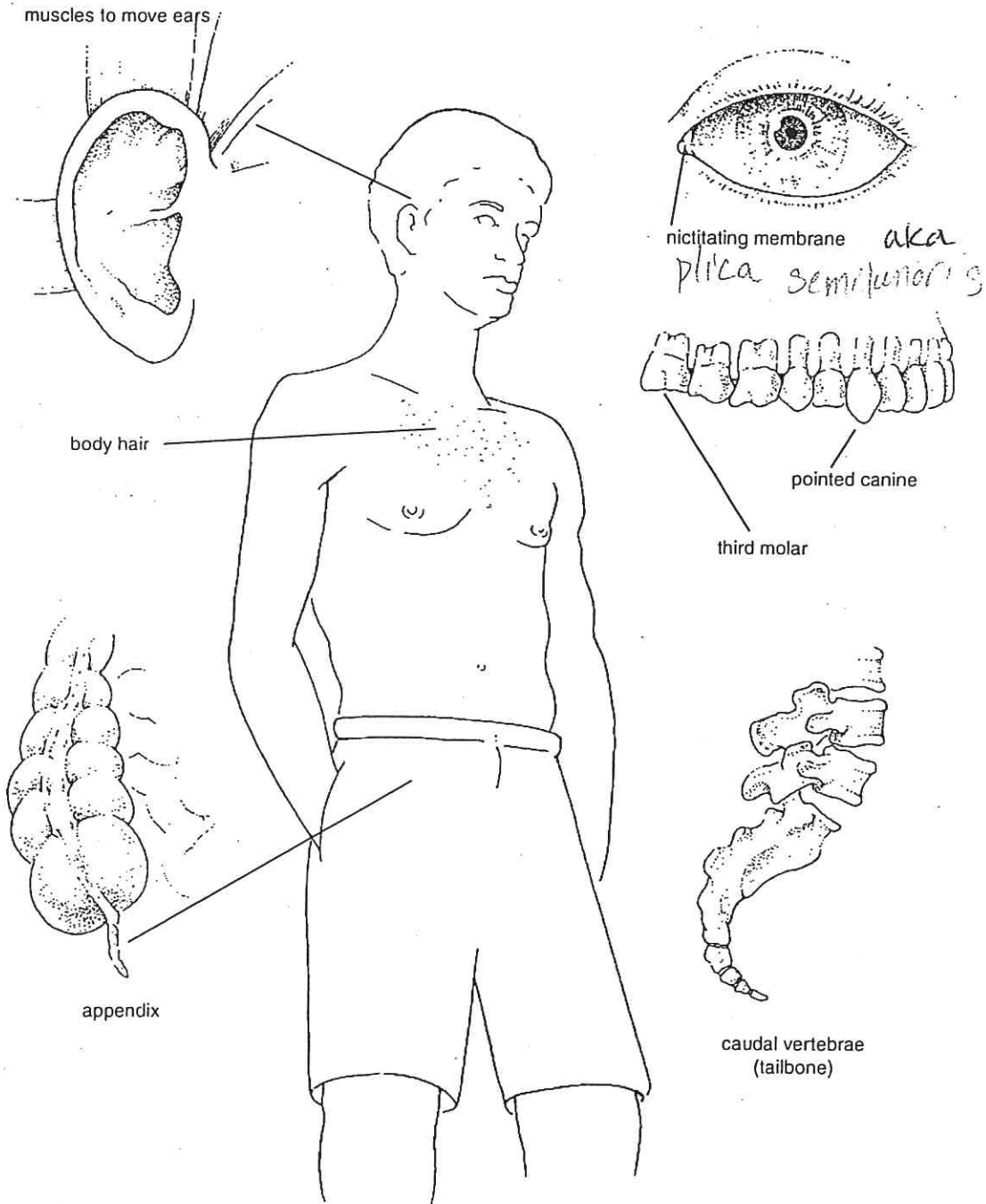


Illustration by Marjorie C. Leggitt

The Human Tailbone (Coccyx)

These fused vertebrae are the only vestiges that are left of the tail that other mammals such as cats, and monkeys, that still use their tail for balance, communication, and in some primates, as a prehensile limb. As our ancestors were learning to walk upright, their tail became useless, and it slowly disappeared. It has been suggested that the coccyx helps to anchor minor muscles and may support pelvic organs. However, there have been many well documented medical cases where the tailbone has been surgically removed with little or no adverse effects.

Wisdom Teeth in Humans

There are two possible reasons why the wisdom teeth have become vestigial. The first is that the human jaw has become smaller than its ancestor, and the wisdom teeth are trying to grow into a jaw that is much too small. The skulls of human ancestors had larger jaws with more teeth, which were possibly used to help chew down plant material to compensate for a lack of ability to digest the cellulose that makes up a plant cell wall. So other hominids would have needed all 32 teeth because of their diets and their larger jaws. The second reason may have to do with dental hygiene. A few thousand years ago, it might be common for an 18 year old man to have lost several, probably most, of his teeth, and the incoming wisdom teeth would prove useful. Now that humans brush their teeth twice a day, it's possible to keep one's teeth for a lifetime.

The Human Appendix

The human vermiform appendix is vestigial; it represents the degenerate terminal part of the cecum, the blind pouch or sac in which the large intestine begins. The human appendix is a small pouch attached to the large intestine where it joins the small intestine and does not directly assist digestion. Biologists believe it is a vestigial organ left behind from a plant-eating ancestor. In other mammals such as mice, the cecum is the largest part of the large intestine and functions in storage, usually of bulk cellulose in herbivores. In plant-eating vertebrates, such as rabbits, the appendix is much larger and its main function is to help digest a largely herbivorous diet.

Nictitating Membrane

The plica semilunaris is the small, pink fold of tissue on the inside corner of the eye. It is claimed to be the vestigial remnant of the nictitating membrane (or the clear "third eyelid"), which is fully present in other animals, and which can be controlled to protect the eye from debris and moisture loss, while still allowing the animal to see. The plica semilunaris in humans currently serves the important purpose of cleaning out dust and other particles from the eye, resulting in common crusted mucus. However, evolutionists claim that it evolved from the nictitating membrane found in other animals, and is thus vestigial. It can be found in birds, reptiles, and some mammals to moisten the eye.

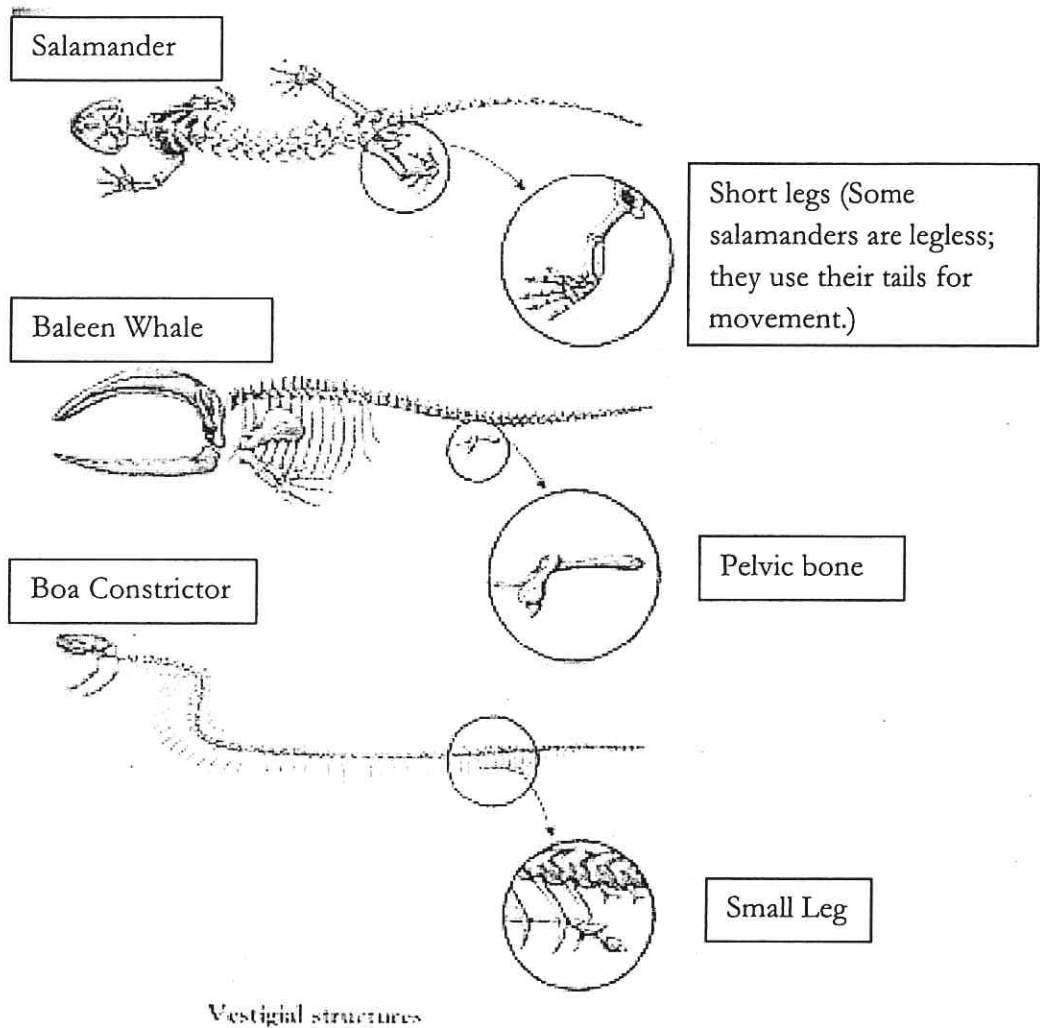
Body Hair

The formation of goose bumps in humans under stress is considered a vestigial reflex; its purpose in human evolutionary ancestors was believed to raise **the body's hair**, making the ancestor appear larger and scaring off predators. Raising the hair also could be used to trap an extra layer of air, keeping an animal warm. Animals such as cats, dogs, bears, ect. are examples of animals that use this reflex. This reflex formation of goose bumps when cold is not vestigial in humans. An ancestral primate would have had sufficient body hair for an infant to cling to, allowing its mother to escape from danger, such as climbing up a tree in the presence of a predator.

Muscles to Move Ears

In the case of the **ears of a human**, it is believed that a function once provided by one structure has been replaced by another. The monkeys have ear muscles that are more developed than those of humans and therefore have the capability to move their ears to better hear potential threats. In humans, the inability to move the ear is compensated mainly by the ability to turn the head on a horizontal plane, an ability which is not common to most monkeys. Few people can wiggle their ears, and none can turn them toward sound.

#3 Vestigial Structures



USEFUL INFORMATION

Vestigial Structure- A bone or organ that is still present in organisms even though it no longer performs any function.

Identify the vestigial structures in each of the organisms above. Why do these organisms no longer “need” these structures?

Other examples of vestigial structures in humans are the tailbone and appendix. How are these vestigial structures?