• Summer 2006 Workshop
• in Biology and Multimedia
• for High School Teachers
Human Vestigial Organs

By Donna Canuel-Browne
Vestige

• 1 A visible trace, evidence, or sign of something that once existed but exists or appears no more. 2 Biology. A rudimentary or degenerate, usually nonfunctioning, structure that is the remnant of an organ or part that was fully developed or functioning in a preceding generation or an earlier stage of development.

• From dictionary.com
Vestigial Organs

A vestigial organ is an organ whose original function has been lost during evolution.

From reference.com
Examples of Vestigial Organs

- Appendix
- Coccyx
- Wisdom teeth
- Plica semilunaris
- Goose bumps
- Plantaris muscle
- External ear muscles

Image courtesy of BIODODAC website
http://biodidac.bio.uottowa.ca
In 1893 an anatomist named Robert Wiedersheim composed a list of 86 vestigial organs including the following:

- Adenoids
- Body hair
- Ear muscles for wiggling
- Nictitating membrane of eye
- Nodes on ears
- Pineal gland
- Plantaris Muscle
- Toes bones III, IV, V
- Valves in veins
- Appendix
- Coccyx
- Lachrymal glands
- Nipples on males
- Parathyroid
- Pituitary gland
- Thymus
- Tonsils
- Wisdom teeth

From wikipedia.com
He included some very useful organs, that are NOT vestigial organs

**Adenoids and Tonsils** - Important immune system function during the first year of life.

**Lacrimal glands** - produce tears which moisten and cleanse the eyes.

**Parathyroid** - maintains calcium levels

**Pineal gland** - produces melatonin and regulates daily rhythms


**Thymus** - Important for development of white blood cells.

**Toes bones III, IV, V** - important in locomotion and balance.

**Valves in veins** - Assist blood return against gravity to the heart.
The Appendix Controversy

Many scientists believe that the appendix is a vestige of an organ found in mammals that consume large amounts of cellulose, a major component of grass. It is believed that we no longer use this organ because our diets have changed. From http://www.org/faqs/vestiges/appendix.html.talkorigins

Loren G. Martin, professor of physiology at Oklahoma State University, believes that early in development the appendix serves an important function of the immune system. He believes that the appendix “teaches” the immune system to distinguish dangerous pathogens from harmless food particles.  Science Magazine
"Its major importance would appear to be financial support of the surgical profession."


"The appendix *n*, of the colon *n m*, is a part of the caecum and is capable of contracting and dilating so that excessive wind does not rupture the caecum."

Leonardo da Vinci

The Coccyx

- Former function was to support the tail and the nerves associated with the tail.
- Formed from 4 fused coccyx.
- Currently used as a point of muscle attachment for the gluteus maximus.
- Has a shock absorber function

Image courtesy of BIODODAC website http://biodidac.bio.uottawa.ca
Wisdom Teeth

- Called wisdom teeth because they erupt at ages 17-21, an age when a person is wiser than they were when earlier teeth erupted!

- Most people have 4 Wisdom teeth, but the range is usually between 0 and 4. Often they are impacted (lodged in bone or soft tissue) and unable to erupt.

- Several theories exist on why wisdom teeth have such limited utility
  - We eat a more refined diet with less use for extra molars
  - Our teeth are less likely to be lost to decay, making “replacements” unnecessary.
  - Man has evolved a smaller jaw. From https://www.drbunn.com/3rds.htm and
Plica semilunaris

- A remnant of the “third eyelid” or nictitating membrane.
- In humans it still functions to make “sleepies” the crusty waste ejected from the eye.

From http://everything2.com/index.pl?node=Plica%20semilunaris
Goose bumps

• Goose bumps are a vestigial reflex.
• In furry mammals, goose bumps allowed the fur to stand on end, making the animal appear larger to enemies.
• Goosebumps still serve a function in warming humans, as many thousands of tiny muscles contract creating heat.

From www.beakman.com

From wikipedia.com
Plantaris Longus

• Plantaris longus functions weakly to allow us to stand on tiptoes and flex the knee”

• The tendon is often used to replace a damaged tendon with no ill effect.

• In the primates the muscle was used for grasping trees with the feet.

• About 10% of people don’t even have one

From *www.answers.com/topic/plantaris-muscle*
External Ear Muscles

• Humans have 3 small muscles on the outside of the ear.
• Most people cannot control these muscles, but some of us can still wiggle our ears.
• Primates use these muscles to orient their ears toward a sound.


Image courtesy of BIODIDAC website http://biodidac.bio.uottawa.ca
The Myth of Male Nipples

- Male Nipples are not a vestigial structure because the NEVER had a function.
- Nipples in both sexes form early in pregnancy.
- Testosterone which produces “maleness” is not present until 14 weeks, after the nipples have already developed.
We must, however, acknowledge, as it seems to me, that man with all his noble qualities ... still bears in his bodily frame that indelible stamp of his lowly origin.

CHARLES DARWIN, *Descent of Man*
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