

Vestigial Organs

Over many years of presenting evidence for creation and against evolution the subject of vestigial organs commonly comes up. These are organs or structures that appear not to have any function and are claimed by evolutionists to be leftover remnants from an evolutionary ancestor. Because they appear to be useless they are not only presented as evidence for evolution, but as evidence against creation, because no intelligent creator would make useless organs.

The idea that humans and animals carry around a lot of remnants of organs we don't need, but had a function in evolutionary ancestors, goes back to Charles Darwin, who called them "rudiments" and "rudimentary organs". In fact, the word "vestigial" is now defined in terms of evolution. The *Compact Oxford English Dictionary* defines the word *vestigial* as: "(of an organ or part of the body) degenerate, rudimentary, or atrophied, having lost its function in the course of evolution."

This article looks at some of the common examples brought up at Creation Research meetings or written up in the mainstream pro-evolution literature.

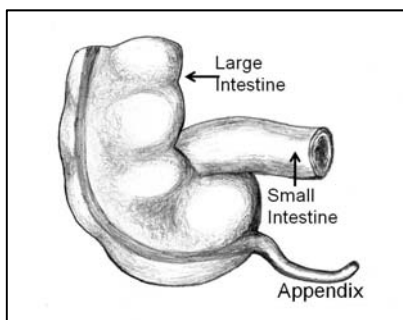
Human Vestiges and Rudiments

In 1893, a German anatomist named Robert Wiedersheim drew up a list of 86 human organs he considered to be "vestigial", i.e. organs that are "wholly or in part functionless" and have "lost their original physiological significance". (Wiedersheim, R. 1893 *The Structure of Man: An Index to His Past History*, Second Edition. Translated by H. and M. Bernard. London: Macmillan and Co. 1895)

The organs listed by Wiedersheim have since been found to have functions, some essential to life, e.g. the pituitary gland. Nevertheless, the concept of vestigial organs and functions is held very strongly, and some of the organs named by Wiedersheim, Darwin and others are still presented as evidence of evolution. For example: in 2008 *New Scientist* magazine published an article entitled "Vestigial Organs: Remnants of evolution" which concludes: "Whether we are talking about useless vestiges or anatomical structures that have taken on a new lease of life, however, it is hard to ignore the evidence that human beings are walking records of their evolutionary past." (*New Scientist*, 17 May 2008, pp42-45.) This article was accompanied by a list of "Five things humans no longer need." They were three well known ones: the tail bone, goose bumps and wisdom teeth; and two rather obscure ones: the vomeronasal organ and Darwin's point. It is interesting they did not include the appendix, because it is commonly believed to be the classic human vestigial organ. Let's consider human vestigial organs in more detail.

Appendix

The appendix is a small blind-ended tubular structure attached to the large intestine close to where it joins the small intestine. It has no digestive function and is commonly assumed to be a vestigial organ left behind from a plant-eating ancestor.



Although it does not have a direct role in the digestion and absorption of food it is not useless. Its location at the junction of the small and large intestine is a clue to its function, as is the collections of lymphocytes (body defence cells) in its lining. The appendix is part of a system that determines which microbes are allowed to live in the intestines and which ones are not. The large intestine needs to have a healthy population of harmless bacteria living on its inner surface.

Babies are not born with these microbes. Babies develop in a germ-free environment in their mother's womb so during infancy and childhood the immune system has to learn which microbes can live on the body surfaces and which cannot. Even the good microbes need to be kept in their place and your immune system helps keep them there throughout your life. This means the appendix had a function in the original very good world, and still has this same function. It also means that it does most of its work in the early years of life, and losing it later in life does not affect the overall immune function. There is also plenty of other immune tissue around the intestines to compensate for the loss. Now that the world is no longer very good, the appendix is prone to disease, because our bodies are not as efficient at keeping microbes in their place.

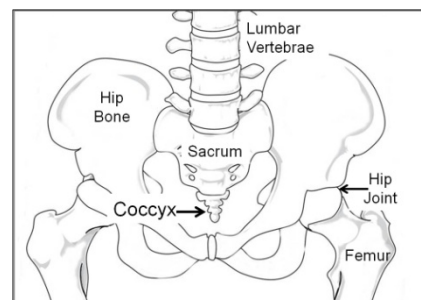
This makes it no different to any other organ that gets diseased and therefore needs to be removed in order to save someone's life. The fallen nature of the world has also given the appendix another function. When the large bowel becomes inflamed and its population of good bacteria is lost due to outpouring fluid that is part of the inflammatory response to injury and infection, the appendix acts as a "safe house" for good bacteria, which can then repopulate the large bowel when the inflammation is over. For more information on this function see article in [Science Daily](#), 8 Oct 2007.

In summary: the appendix is a fully functional, but poorly understood organ, with nothing vestigial about it. The message that the appendix is not useless is gradually getting out to the scientific and medical communities, but the appendix still rates highly in the layperson's list of vestigial organs.

Tailbone (Coccyx)

The coccyx is a small triangular bone made of between 3 and 5 segments fused together at the lower end of the vertebral column. It is commonly claimed to be the remnant of a tail left over from distant monkey-like ancestors. In support of this belief are claims that it has been surgically removed with little or no adverse effects, and *New Scientist* claimed there were "more than 100 medical reports of babies born with tails."

The non-vestigial nature of the coccyx was personally experienced by one of the editors of this article has had the very painful and debilitating experience of tearing the ligaments from the coccyx and wrote: "when that happens - if you were standing (or sitting) – that's where you stayed, as the muscles that helped you sit or stand all gained their ability to move by their attachment to the tail bone, so to call it vestigial and without function – what a painfully false statement."



Bones must never be considered by themselves. They are part of the supportive framework that holds the body together and protects its organs. The coccyx is part of a system of bones and ligaments that act as muscle attachment for the pelvic floor muscles and is only surgically removed if it has been badly damaged and can no longer function as part of the system. The pelvic floor muscles and ligaments help with maintaining upright stance and walking, and support the internal organs of pelvic cavity. The muscles and ligaments need stable anchorage points like the coccyx to carry out their function.

The fact that the coccyx is made of several segments fused together is no indication it used to be a mobile tail. The segmented structure allows it to grow during foetal development and childhood.

We would like to know where *New Scientist* found "more than 100 medical reports of babies born with tails." There are documented cases of infants born with "caudal appendages" which are a birth defects caused by an overgrowth of skin and fibrous-fatty tissue near the base of the spine. These are sometimes associated with more serious developmental defects of the spine, or may be part of a tumour called a sacrococcygeal teratoma. Either way they are not functional, or even partially functional, tails with vertebral bones and attached muscles like an animal tail.

Wisdom Teeth

These are third molars – large grinding teeth located at the back of the jaw and are the last of the teeth to emerge from the jaw. According to Robert Corruccini of Southern Illinois University in Carbondale, problems caused by wisdom teeth not being able to emerge properly because of lack of space in the jaw have increased over the past four centuries as our diet has become softer and more processed. He commented to *New Scientist* “Not only are impacted wisdom teeth becoming more common, perhaps as many as 35 percent of people have no wisdom teeth at all, suggesting that we may be on an evolutionary trajectory to losing them altogether.”

Lack of growth in the jaw and losing teeth may be changes in the human body but they are not evolution. Corruccini’s suggestion about our diet change is closer to the real cause of change that is occurring here. Even if the lack of teeth and the small jaws turn out to be partly caused by genetic mutations, the changes are degeneration, not evolution. Loss or decreased growth of structures is the opposite of evolution.

Goosebumps

Goosebumps are the result of hairs which normal lie at an oblique angle to the skin being pulled up by a small muscle called erector pili muscle, which is attached to the base of the hair follicle. This is considered by evolutionists to be a left over from our animal ancestors who raised their thick body hair to keep warm and to appear larger when threatened by another animal. According to this theory human body hair has become vestigial and no longer has any function. Some people consider human body hair to be vestigial.

Human hair and the erector pili muscles are not useless. Even where it does not have an obvious protective function such as eyebrows or on the top on the head, body hair contributes to our sense of touch. Hair follicles have nerve endings wound around their bases. Whenever a hair is moved the nerve ending is stimulated. The erector pili muscles anchor the hair follicles in the skin and their contractions help expel secretions from the oil glands that are also part of the hair follicle. The oil is essential in keeping the skin and hair from drying out. Normally these contractions go unnoticed. We only notice them when our autonomic nervous system, which controls them, reacts strongly to stress. When subject to strong stresses, such as fear or cold, autonomic nervous system reflexes tend to over-react and the hairs stand on end. The fact that we are subject to strong stresses is a reminder that we no longer live in the “very good” world God originally created, but the degenerate world that followed the Fall of Man and God’s judgement on the whole creation, including human bodies.



Vomernasal Organ

The vomernasal organ (VNO) is a sensory organ in animals that detects pheromones – chemical signals that can be smelled by other animals, used in mating and social behaviour. Humans have an apparently similar organ in the nose but it is considered evolutionary remnant because the genes that code for its cell surface receptors are inactive. Neuroscientist Michael Meredith of Florida State University commented to *New Scientist*: "If you look at the anatomy of the structure, you don't see any cells that look like the sensory cells in other mammalian VNOs" and "You don't see any nerve fibres connecting the organ to the brain."

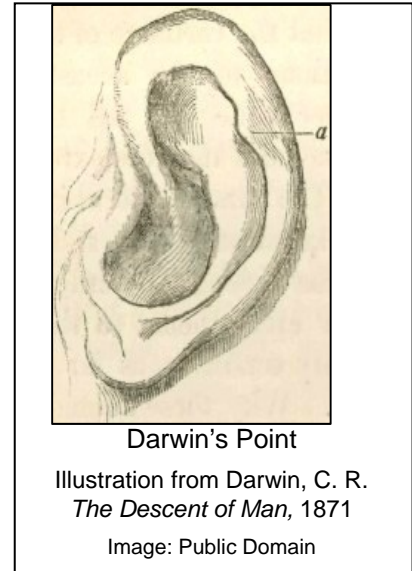
This evidence simply indicates the organ is non-functional, but that is no evidence it was inherited from a non-human ancestor. It may have had a function in previous generations of human beings. In

spite of some creationist claims, there are genuine vestigial organs and this is one of them. However, diminished and defunct organs are not evidence for evolution. In fact, they are good evidence for the Biblical history of the world that tells us the world started out perfect, but has been going downhill ever since the first human beings rebelled against their Creator and the Creator judged them.

Darwin's Point

Darwin's point or Darwins's tubercle is the name for a small thickening on the edge of the ear caused by a minor disturbance in the formation of the ear during embryonic development. It occurs in approximately 10 percent of humans. Some evolutionists classify it as a "vestige of a joint that allowed the top part of the ancestral ear to swivel or flop down over the opening to the ear." Others consider it the equivalent of the point in animal with pointed ears, such as a macaque monkey.

This trivial bump on the ear is claimed to be inherited, but there is some dispute about this, as it does not follow a Mendelian pattern of inheritance. Even if this trait was inherited from one generation of humans to another, that is no evidence it was inherited from a non-human ancestor. It could simply be a minor mutation causing a variation in a gene that influences ear formation.



Arm Swinging

The rhythmic movement of the arms whilst walking has been considered a vestigial evolutionary leftover from ancestors that walked on all fours. However recent research has shown it has a fully human function. Researchers from the University of Michigan, USA and Delft University of Technology, Netherlands have carried out a study to see the effects of arm swinging on how much energy is used when walking. In a series of experiments human volunteers walked in the natural manner with arms swinging opposite arm to leg, and then in unnatural ways with arms held still by the sides or arms swinging with the same side leg. They found the normal arm swinging saved energy and helped counteract the twisting of the body that occurs as weight shifts from one leg to the other. Steven Collins, a biomechanical engineer at Delft University of Technology, explained that the experiments "showed that normal arm swinging made walking much easier. Holding the arms at one's sides increased the effort of walking – measured by metabolic rate – by 12 per cent, which is quite a lot of walking, about the same as walking 20 per cent faster or carrying a 10 kg backpack." In their report in the *Proceedings of the Royal Society*, the researchers wrote: "Although arm swinging is relatively easy to achieve, its effect on energy use during gait is significant. Rather than a facultative relic of the locomotion needs of our quadrupedal ancestors, arm swinging is an integral part of the energy economy of human gait." Steven Collins commented: "This puts to rest the theory that arm swinging is a vestigial relic from our quadrupedal ancestors." Reference: [Royal Society](#)

This discovery is a good example of how the theory of evolution is a hindrance to science. The research described above occurred in spite of evolutionary theory, not because of it. If you don't know why something happens the proper scientific approach is to do more research and find out, not write it off as a useless vestige. The results of these experiments confirm the belief that human beings are designed to walk upright, which means that belief in creation is a much better basis for science.

Non-Human Vestiges

Although most people are more familiar with human examples of vestigial organs. Other vestigial structures claimed by evolutionists include wings of flightless birds, pelvic bones in whales, eyes in blind cave fish, wingless insects, leg remnants in snakes and superfluous pollen in dandelions. Let's consider these in more detail.

Flightless Birds

In their article on vestigial organs *New Scientist* wrote “The existence of something as spectacularly *de trop* as the ostrich wing is only a problem for those who believe in an intelligent designer.” Other birds that have been put on the vestigial list include the cassowary, the kiwi and kakapo – a flightless nocturnal parrot in New Zealand.



Image: Public Domain

The best comment on the ‘vestigialness’ of ostrich wings comes from a letter to *New Scientist* by an ostrich farmer in South Africa, who wrote: “Laura Spinney describes ostrich wings as ‘spectacularly *de trop*’ (17 May, p 42). I have kept ostriches for 18 years and can testify otherwise.” He goes on to describe how ostriches use their wings for many important functions: thermoregulation; providing stability when running and enabling rapid right angle turns; courtship displays and stability while mating; warning signals and other communication; nest building; and providing shade and shelter for young. (*New Scientist* letters, 21 June 2008, p24).

If you consider the overall anatomy and physiology of the ostrich, rather than just its wings, you will see that it is a fully functioning creature that works well, so the *New Scientist* quip against intelligent design wasn't very intelligent. The wings of other large flightless birds, e.g. emus, cassowaries, penguins, rheas, fit into the

same category as ostrich wings – an extreme variation of wings, but still functional and useful structures that are part of a fully functional creature that is not meant to fly. There is no evidence these birds have ever flown but they very intelligently designed for running, cooling, mating and protecting young.

There are some birds that do seem to have lost the ability to fly due to defects in their wings but they have survived in a small protected environment, e.g. flightless cormorants in the Galapagos Islands or the Titi Flightless Grebe. These are usually classified a separate species within a genus of similar flying birds, suggesting that they are descended from a flying bird that suffered some genetic defect in the past. Because the defective birds find it easier to mate with each other, they soon become genetically isolated and effectively become a separate species. The kakapo is probably in the same category. The wings of these disabled birds could be called “vestigial” but this loss of function is not evolution. This is degenerate loss, which is the opposite of evolution. The kiwi of New Zealand seems to be an extreme example of such loss. It has small wings, but no wing muscles, which means it has no muscle covering over its chest and is easily killed by dogs and other animals. It has only survived by living a secluded nocturnal life in forests where there were no predatory mammals before humans accompanied by their cats and dogs came to live in New Zealand.

Wingless Insects

Over the years Creation Research has been asked if wingless beetles and earwigs are examples of genuine vestigial organs, and therefore evidence for evolution.

Many types of insects have wingless varieties, and these are claimed to have evolved to suit unusual environments, e.g. in a book entitled *An Inordinate Fondness for Beetles* (p183), Arthur Evans & Charles Bellamy write: “The combination of New Zealand's cool temperate climates with glaciation,

volcanism and tectonic movements has created numerous ecological niches favouring the evolution of many unusual beetles. Strong winds, stable habitats and the lack of predators have encouraged the development of many large wingless species.”

Beetles with diminished or absent wings are examples of genuine vestigial organs. In some situations their diminished state may be an advantage in the struggle for survival. A windy environment that has few predators may enable wingless beetles to survive. This is natural selection or “survival of the fittest” or but it is not evolution. It does not explain the origin of beetles or beetle wings.

Furthermore, as in the case of some New Zealand flightless beetles, when ground dwelling predators like rats were introduced, wingless beetles were no longer the fittest because they couldn’t fly, and so they did not survive. Their “vestigial-ness” was a major contributor to their extinction. (Ref. vestigial, arthropods, flight)

In spite of their appearance most earwigs do have wings. When they are not flying, the wings are neatly folded up and protected by wing cases. They don’t fly much so most people only see them when they are crawling around with their wings out of sight. There are a few wingless earwigs. These often have diminished forceps (the pincer like projections at the base of the abdomen) and one group of wingless earwigs (the Arixeniidae) are parasites rather than eating plants and detritus or catching prey. These differences from other earwigs indicate these earwigs have lost useful function, i.e. have degenerated, not evolved. See article on earwigs from the [Australian Museum](#).

Blind Cave Creatures

Some fish and salamanders live their lives in total darkness in caves. Although they don’t need to see, they have the remnants of eyes. In his book *The Greatest Show on Earth* Richard Dawkins asks the following question: “Given that a cave salamander lives in perpetual darkness so has no use for eyes, why would a divine creator nevertheless furnish it with dummy eyes, clearly related to eyes but non-functional?” (Richard Dawkins, *The Greatest Show on Earth*, Bantam Press, 2009, p351).

In 2004 scientists studied blind cave fish with ‘vestigial eyes’ as well as their sighted relatives that lived in the light. They found they could get the blind fish to develop eyes when they implanted eye tissue from the sighted into a blind fish. It seems the developing eyes need light to stimulate their growth to complete eyes. Otherwise they stop growing as the eye genes are turned off due to lack of light. When the eye forming tissues get the right signals, via tissue taken from a fish that developed in light conditions, the eyes develop. It is possible that baby salamanders, like fish, need to be exposed to light during embryological development for the eyes to fully develop, so badly formed eyes are the result of a bad cave environment, not bad design. We hope someone does some further research on salamander eyes as we all may learn something about embryological development in general, and how eyes develop and function.

The remnants of the eyes cave fish and salamanders could be called vestigial, but this is nothing to do with evolution. Here we have another example of research carried out in spite of the theory of evolution not because of it. As the intelligent scientists who designed the fish experiment have noted, fish of the same species that develop and live in lighted conditions do have eyes. Therefore, the incompletely formed eyes of the cave fish are a loss of function brought about by an unusual environment, and provide no evidence for how eyes came to exist. Again they are change without evolution. The change is real, but Dawkins and co. are determined to call all change evolution, when it’s really the opposite.

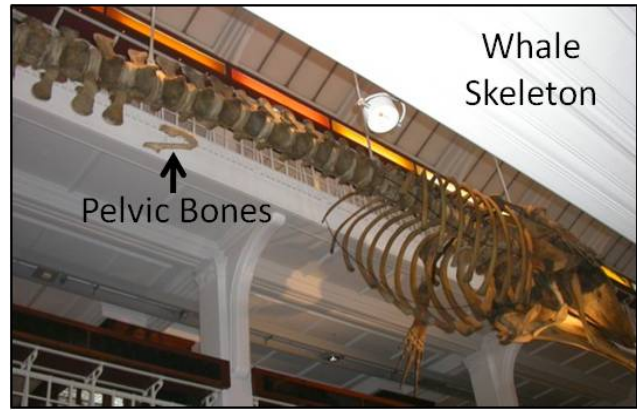
Whale Pelvic Bones

If you have seen the skeleton of a whale or dolphin in the museum you will probably have seen two small bones that seem totally detached from the rest of the skeleton slung below its spine. These are often claimed to be evolutionary remnants of hind legs that no longer have any function.

Just like the human coccyx, we have to look these bones as part of a functioning system. These bones may look useless when you are looking at just the skeleton, but if you put flesh onto the bones you would see that they form attachment sites for the whale's reproductive organs. Providing support and stability for soft tissue structures and organs is just as important a function for bones as is their more obvious functions of serving as levers for movement.

Some fossil whales such as *Basilosaurus* had tiny hind limbs but these also had a reproductive

function, as described by palaeontologist Philip Gingerich, who wrote: "The Pelvis of modern whales serves to anchor reproductive organs even though functional hind limbs are lacking. Thus hind limbs of *Basilosaurus* are most plausibly interpreted as accessories facilitating reproduction. Abduction of the femur and plantar flexion of the foot, with the knee locked in extension probably enabled hind limbs to be used as guides during copulation which may otherwise have been difficult in a serpentine aquatic animal." Gingerich, *et al*, *Science*, vol. 249, pp154-157, 13 Jul 1990.



Snake Legs

Darwin noted that snakes have "rudiments of the pelvis and hind limbs". (Darwin, C. R. 1859. *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. London: John Murray. 1st edition, p450) Some boas and pythons do have small spurs projecting from their pelvic regions that are used in mating. It is possible these are genuinely vestigial organs that still retain a modicum of function.

No living snakes have legs but three fossil snakes have been found with tiny back legs. A group of French and German scientists have used a high tech x-ray scanner to study the internal structure of the limbs of a fossil snake named *Eupodophis descouensi*. The x-ray images revealed the miniscule snake limbs were similar in structure to lizard legs. However the legs had thinner walls and were not as dense as the other bones in the snake. The researchers described the bones as "regressed" and made two suggestions for how this occurred: the limbs had a slower growth rate than the snake's other bones; or they did not grow for as long a time. The fossil was found in Lebanon in Cretaceous rocks dated at 95 million years old. Links: [ABC](#) [BBC](#) [ScienceDaily](#)

The research team's suggestions about these diminutive legs seem reasonable, i.e. the limb bones were not responding to normal growth stimulating hormones as the snake's other bones were. However, that is a loss of function in the growth promoting system, not evidence for evolution. There is no evidence this creature was ever anything else but a snake. The rest of the fossil shows it was a very snakey snake that "went on its belly", just as Genesis 3:14 says. Whatever caused the leg shrinkage and subsequent loss in present day legless snakes - it was a result of degeneration downwards, not evolution upwards.

One of the other fossil snakes found with legs is "Najash rionegrina". The scientists who gave it this name stated it was named after the serpent in Genesis 3 - "from the Hebrew 'Najash' for the legged biblical snake". (*Nature*, vol. 440, p1037)

De-sexed Dandelions

Dandelion flowers have the normal reproductive organs, i.e. stamens holding pollen and stigma to receive pollen. Normally flowering plants need to receive pollen in order to set seed. However dandelions regularly produce seeds without being fertilised. Therefore, some evolutionists have written off their stamens as useless vestiges.

The Dandelion is a good example where plant reproduction can be achieved in many ways and one dominates. Dandelions can reproduce sexually and their stamens and pistils are fully formed and functional, so there is nothing vestigial about them. However, some dandelions can reproduce themselves without being fertilised by a pollen carrying insect, by a process called apomixis. Dandelions that reproduce by apomixis are triploid, i.e. have three sets of chromosomes, instead of the normal two. This means they are abnormal. Because they have an extra set of chromosomes their ovules can develop into a new plant embryo without being fertilised by pollen. The new plants are clones of the parent.



A more detailed explanation of how this happens is explained on the [Killer Plants](#) website

As any gardener knows this is not the only way plants can produce clones of themselves, e.g. grape vines and other spreading plants will take root where their stems touch the ground. This does not make the flowers of these plants redundant or vestigial. Plants seem to be designed to have back-up systems for reproducing themselves, which is why they are easy to propagate by methods such as layering, cuttings, grafting and tissue culture.

Conclusion

Rather than being evidence for our origin, the concept of vestigial organs is evidence of our ignorance. In some cases it is deliberate ignorance, e.g. the ostrich farmer knew the wings had functions, but the evolutionists just ignored it. In other cases, such as the appendix, new scientific methods had to be developed to enable us to understand the functions. In fact, this is what removed most of Wiedersheim's original examples from the list of vestigial organs. However, such scientific developments owe nothing to the theory of evolution. They were triumphs of human curiosity in spite of evolutionary theory, not because of it.

Sometimes scientific research has revealed degeneration in a structure, so that it really is defunct or diminished. These structures, such as the human vomeronasal organ, could be genuinely called vestigial organs, but they are not evidence of evolution. Evolution is a process that requires simple creatures to gain new structures and functions and become more complex. Genuine vestigial organs are the result of the opposite process – degeneration from complex to simple.

Degeneration from complex to simple is evidence for the Biblical history of the world. Genesis tells us that living creatures, including human beings were created in their fully formed state in a very good world that had no disease, and therefore no defunct or partially functioning organs. This state of created perfection was set on a road to ruin when the first human beings rebelled against their Creator God, who condemned them to degeneration and death, and cursed the ground. From then on human bodies and the environment degenerated and some biological structures lost functions. True vestigial organs are therefore evidence of our need for our Creator to rescue us from a perishing world. He has done this by sending Jesus Christ to pay the penalty for our disobedience and give us new life in a new heaven and earth where there will be no degeneration, but everlasting life.

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