

# The Eye: An Evolutionary Dilemma—Part One

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The whole issue of design in the world disturbed Darwin. He called it “that endless question.” It bothered him a great deal and he engaged in a great deal of correspondence with friends about design in nature. He very much preferred a universe that did not manifest evidence of a purposeful artificer, a designer, namely God. Therefore, he hoped his evolutionary explanation would be a way in which he could completely short-circuit or bypass an “ultimate designer.”

Nonetheless, he continued to look at nature and see things that appeared to worry him a great deal and challenged his faith in evolution. One such thing was the human eye. Of this Darwin wrote, “to suppose that the eye with all of its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I confess, absurd in the highest degree.”

It was evidence that brought Darwin to the conclusion that the eye could never have developed through chance. Today, there is much more startling evidence about the eye than in Darwin’s era. Let’s think a little bit about what an eye is. Most people don’t realize that the eye is actually part of the brain. It is central nervous system tissue. A little bud-like bulb grows out of the fore part of the brain in the embryo. As it approaches the surface of the skin it becomes a cup-shaped, double-walled structure, sort of like if you took a balloon and pushed your fist into it. The inner layer becomes the retina, which would be comparable to the film in a camera. A lens forms in front of this cup, and the eye induces the skin in front of the eye to form the cornea. The cornea is a marvelously transparent window that allows the eye to look out.

Now quite apart from the incredible developmental mechanism required to produce all this, let us consider briefly some of the complexity of the eye. Darwin was familiar with only part of this information. Since his day we have learned much more about the eye, so that we know the unfathomable complexity of this marvelous organ.

We should point out that the eye has a lid which acts like a lens cap on the camera, or like a windshield wiper. It actually scrubs over the transparent skin called the cornea. Indeed the cornea is derived from what we would have called skin if it had been somewhere else in the body. But this lid rubs the eye for several reasons: first, it removes irritants from the surface of the eye. But keep in mind that just like running dry window wipers on your car, you could do a great deal of damage to your eye if you didn’t have the washer running. You could scratch the surface. But you do not have to worry as there is a built in window washer close to the eye called the tear gland, or the lacrimal gland. It is situated out toward the periphery of the eye and squirts its jet of water across the eye so that the tears flow toward our nose on each side. From there the tears go down a little drain called the puncta which we see as a little spot near the nose at the base of the eye. This drain for the window washer of the eye runs into the nasal cavity which is why, when we cry, we have to blow our nose.

As the eyelid opens and closes, oil glands in the lid spread a lubricant over the eye to aid the scrubbing, and to keep the eye from drying out. This is a living layer of cells, and is hydrated so that it stays clear. If the eye is allowed to dry out, it becomes milky, so it’s terribly important that moisture be applied to the surface of the eye and that it be scrubbed by the lid.

The lid is not only a nice attachment to the eye like a lens cap on the camera, the lid is essential for vision. Without the lid and the mechanism to cover the eye we would not be able to see. All parts must be present for the eye to function.

Another important facet of the lid are the muscles which are needed to close it and the muscles needed to open it. Think about what it takes to keep your eyelids open. If we hold our arm up we eventually get tired and our arm drops. Why? Because voluntarily skeletal muscles get fatigued. The muscles that are a part of our eyelid include these kinds of voluntary skeletal muscles. That's why we can open and close our lids at will. But these muscles would fatigue if that's all there were, so the upper lid also has a layer of smooth muscles. These are the kinds of muscles over which we normally do not have voluntary control: that is, we don't have to think to make them work. In the eye this smooth muscle automatically holds the lid up. If this smooth muscle is not functioning, people will experience the problem of their lid drooping down once in a while. I mention these facts to point out all of the little subtleties that work together in concert every day, and are essential for the normal function of the eye.

Next we want to look at the muscles that move the eye. Did you know there is a pair of muscles, top and bottom, on the eyeball as it sits in its bony socket? Did you also know that there is a pair of muscles on the left and right that move the eye side-to-side? Then there is a muscle that goes through an interesting pulley at the top of the head, and a muscle from the bottom that rolls the eye in its socket. Now it's understandable why we have muscles that can steer our eyes left and right and up and down, but why do we have muscles that can roll the eyes in a circular fashion? Look deeply into the eyes of a friend and then have them tip their head. If you'll look at a spot on the iris, maybe a tiny little spot, you'll notice that as the head tips, the eyes stay right side up with the world. When the head tips the other way, the eyes rotate that way. If you just look at the eye, it's so symmetrical you won't notice this, you'll have to focus on a little spot on the iris to be aware of this. There are reasons why the eyeball must rotate in this fashion. It has to do with the fact that the eye is set in the socket in such a way that the muscles need to do very complex movements to move the eyes together so that they move as a pair. It would be very difficult to see if one eye looked one way and the other eye looked somewhere else. But through all of these intricate and marvelously complex parts working harmoniously together, we can see. Do you understand why Darwin, realizing just a small part of the eye's complexity, said, "To suppose that the eye...could have been formed by natural selection, seems, I confess, absurd in the highest degree."

Next week, we will learn additional surprising facts about the intricacies of the eye that point to the ultimate designer—God.