

**FEATURE: The Pipe Organ in Your Head – Daniel Geisler**

VOICE: How are your ears like a pipe organ? And what does one researcher mean when he calls the ear a marvel?

PROF.: Bring your ears close to the radio – as we examine the complexities inside them.

FORMAT: THEME AND ANNOUNCEMENT

VOICE: Prof. Daniel Geisler is a researcher in the neurophysiology department of the University of Wisconsin. Today we feature a paper Prof. Geisler presented at an Annual Meeting of the American Scientific Affiliation, entitled, “The Ear's Design as a Signpost of God's Wisdom.” Prof. Geisler began by saying...

PROF.: It may seem to some people that science has eliminated the possibility of God being involved in running the world, or in its creation. Yet as scientists learn more about nature and its workings, many of us are struck with the sense that it all didn't “just happen.” The universe seems too elegant, too well-designed, too finely-tuned to be totally explainable in terms of chance.

VOICE: Albert Einstein said, “The profoundest sort of scientist has a religious feeling, which takes the form of a rapturous amazement at the harmony of natural law – *which reveals an intelligence of such superiority* that, compared with it, *all the systematic thinking and acting of human beings is an utterly insignificant reflection.*”

After that quotation from Einstein, Dr. Geisler continued...

PROF.: For many of us, the ingenious, even elegant manner in which our world functions is a compelling indication of God's existence and creativity. To illustrate this point, I would like to talk about the object of my own research, which is *the ear*.

The outer ear or *pinna* collects sound waves, much as an old-fashioned ear trumpet used to do for people with hearing difficulties before the electronic era. It collects sound waves and transmits them to the eardrum. The eardrum vibrates in synchrony with the incoming sound waves.

In the inner ear, the *cochlea* translates sound into nerve impulses, which travel on the auditory nerve to the brain.

VOICE: As we listened, we wondered: Does the ear need so many parts? For example, what would happen if the eardrum were connected directly to the cochlea? Dr. Geisler answers...

- PROF.: That isn't done because it doesn't work. For reasons that are too complex to cover in our limited time, connecting the eardrum directly would pass the sound energy with an efficiency of about 0.1%. By contrast, the mammalian ear passes 20% of the energy to the cochlea.
- VOICE: In other words, the process of transferring sound through the anvil, stirrup and hammer makes our ears 200 times more efficient than they would be if the eardrum and the cochlea were connected directly. He continues...
- PROF.: My research has been in the inner ear itself. The sound waves come in at the top, and the *cochlea* is spiraled like a helix.  
One end of the cochlea has tiny nerve fibers that resonate at high frequencies. As you look along the cochlea, the fibers become bigger and bigger, because they are tuned to lower and lower frequencies.
- VOICE: That's the same principle as using different lengths of pipes in a pipe organ.
- PROF.: Yes. Human ears have 30,000 nerve fibers. They are arranged very systematically, very much like the way strings are arranged in a piano.  
Let's say "middle C" is sounded. The sound wave travels until it reaches the part of the cochlea that is tuned to middle C, and that part starts to vibrate. The nerve fibers pick up the sensations, and impulses are sent to the brain. The *auditory cortex* of the brain figures out that middle C has been sounded.  
That's really amazing to me. But what amazes me even more is that *this is what would happen in a dead ear.*
- VOICE: A living ear does something even more extraordinary!
- PROF.: The living ear adds another step: A very specialized cell expands and contracts at just the right cadence – amplifying the sound to make it about one thousand times louder.  
A cat's ear is so sensitive, that the sensitivity is down near the level of the noise that air molecules make as they bump against each other.
- VOICE: In other words, if a cat's ear amplified sound any further, it would amplify the static that inevitably exists because of the motion of air molecules.  
Dr. Geisler interprets...
- PROF.: For me, the ear has the marks of a really elegant design. It does what it's supposed to do with great efficiency and great ingenuity. My research specialty is to try to figure out how these amplifying cells work – how such great amplification occurs in such a little cell with so little expenditure of energy.

- VOICE: How do scientists explain the intricate technology that we mammals carry inside our ears?
- PROF.: Feelings of marvel are so widespread that Ward Watt of Stanford University said, “Most working scientists have a profound sense of awe at the...majesty of the universe.”
- VOICE: Is this sense of awe, evidence that God created?
- PROF.: Not in everyone’s opinion. Prof. Geisler answers, “One of the best-known **attacks** on the idea that design in nature points to a wise creator-God, is contained in a recent book by Richard Dawkins, *The Blind Watchmaker*. In an ironic parallel to my paper, Dawkins opens his book with descriptions of mammalian hearing – in his case, bat hearing. Like me, he was overwhelmingly impressed by the ear – so impressed that he wrote, ‘I hope that the reader is as awe-struck as I am by these bat stories.’  
“Yet instead of celebrating God’s creativity in the existence of this marvelous machinery, Dawkins sees only blind natural forces. For him the Darwinian worldview provides, ‘the only known theory that is...capable of explaining certain aspects of life. ...The short, slow, cumulative natural selection is the ultimate explanation for our existence’.”
- VOICE: Why do two scientists look at the same data and arrive at opposite interpretations?
- PROF.: Dr. Geisler says perhaps we differ in what we consider to be an explanation. Natural law explains everything for many people. But an impressive number of working scientists sense that there is a purpose and design behind the universe that is not satisfied by saying that natural laws function blindly. The elegance of creation therefore becomes a signpost of God’s handiwork. Another signpost discovered by modern science is the concept that the universe had a beginning. The awesome picture that science paints of the universe’s development is for some scientists so consistent with Genesis chapter 1, verse 1, that many scientists see it as a proof of Divine activity. I would not call it definite proof, but it is a signpost that makes us think about the possibility of God having done the creating.  
Nobel laureate George Wald, a pioneer in studies of the eye, asked, “How is it that...we are in a universe that possesses just that peculiar nexus of properties that breed life? It is Mind that has composed the physical universe that breeds life.”
- VOICE: If there is a Creator with a mind, what does He want us to know?

- PROF.: The answer will not come from a study of nature alone. Jay Ross, who is a nucleic acid chemist, said, “The existence of a Deity may be unknowable – unless the Deity chooses to let us know unequivocally. ...Nevertheless, I believe in a creator. The findings of the natural sciences are no longer the barrier to belief in God, that they were once.”
- “Today through...science we see apparent fine-tuning of the life-supporting processes in nature, indications of a beginning, and suggestions of a Designer. As a result, many scientists conclude that there is, *or at least could be*, a Creator. In the face of these signposts, it requires a leap of faith to deny the existence of God – just as surely as it requires a leap of faith to affirm it.”
- VOICE: I hadn’t thought of that before. It takes as large a leap of faith to believe God *doesn’t* exist and yet that elegant things were formed, as to believe He *does* exist.
- PROF.: Right. Dr. Geisler commented, “To me, one of the most remarkable aspects of the statement I just read was that it concluded that...discovering God would not depend on further scientific effort, but on Divine communication. Even a nucleic-acid chemist who doesn’t follow Christian doctrine says that.
- “We scientists who are also Christians find that while certain scientific discoveries and conclusions may be compatible with our religious beliefs, we didn’t get those [religious] beliefs from science. We got them from somewhere else – from God’s revelation in the Bible.”
- “To conclude, a number of living scientists find, in the seemingly elegant design of the universe, signposts which bear the mark of a Creator. What we see there instills in us profound sensations of awe and wonder. It leads us to acknowledge, along with the Apostle Paul, “the eternal power and deity of God.”
- “It behooves all of us to continue listening with the ears that I described today, for clearer answers to questions of origins – and to the even more important question of *why* we are here.”

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