Science and Faith: A Positive Feedback Loop

Homily, June 12, 2016 Loyola University Maryland

Cosmos & Creation Conference

By David Hoe

Psalm 139:13-18

Good morning! It is a great honor to have this opportunity to give the homily for this year's Cosmos and Creation conference. The Scripture reading this morning will be from Psalm 139:13-18. I've given this homily the title: *Science and Faith: A Positive Feedback Loop.*

I teach here at Loyola in the department of Engineering and when my Chair, Rob Pond, asked me a few months ago if I would give the homily this year, I readily agreed. While reflecting on what to share, it occurred to me that a devotional thought that I typically share with my engineering students might be appropriate. Wait a minute! Why and how does one give an appropriate devotional thought in an engineering class? I know this is what some of you are thinking. That's exactly what I want to share this morning: the idea that science (and engineering) are not mutually exclusive with the practice of one's faith. On the contrary, as the title of this homily suggests, the two are mutually reinforcing.

Prof. James Buckley shared with me a revealing conversation he had with last year's Grand Seminar speaker, the Nobel prize-winning astronomer Adam Reiss. Apparently, Dr. Reiss was concerned about how our students would react to the idea that the universe is older than 6000 years. Prof. Buckley said no worries, they tend to compartmentalize their faith and science. My impression is that we as scientists and engineers can sometimes fall into that mindset as well.

As we look at today's Scripture, we can see some important ideas that show how science rather than being antagonistic to one's faith is rather a source of strength for an *intelligent* faith. In fact, it will be apparent that the Christian faith is not a blind faith as the so-called New Atheists, such as biologist Richard Dawkings, would have us believe, but is rather supported by both science and history.

If we look at the overall context of Psalm 119, traditionally ascribed to King David, we can see the psalmist is actually reflecting on where he can go to escape from an all-knowing and all-powerful God. The psalmist testifies that God knows him better than the psalmist knows himself. Verse 1 reads, "You have searched me, Lord, and you know me … (v. 2b) you perceive my thoughts from afar … (v. 4), Before a word

is on my tongue you, Lord, know it completely." Interestingly, this is a terrifying prospect to the psalmist, as in v. 7 he ponders, "Where can I go from your Spirit? Where can I flee from your presence?" He observes that whether he is in heaven or Sheol, God is there (v. 8). The idea is that God is present in every part of the universe and those areas beyond it. His desire to hide from God is reminiscent of Adam and Eve who tried to hide from the Lord after committing the original sin. Our sin separates us from having a vibrant relationship with the Lord. This might explain the "hope" of the atheist that God does not exist. This can be seen in a recent atheist campaign in Great Britain, where they put up advertisements on buses proclaiming, "Relax: God probably doesn't exist, so enjoy your life." Note the word "probably", a tacit acknowledgment that you cannot know for sure without being omniscient. So how can you really relax?!

In verse 11, the psalmist reasons, "Surely the darkness will hide me" and then he realizes in verse 12 that "even the darkness is not too dark for you". This provides a transition to our Scripture reading this morning. For in verse 13, the psalmist recalls what happened when he was "hidden" in his mother's womb: "For you created my inmost being; you knit me together in my mother's womb."

This thought causes the psalmist to extol the works of the Lord:

> 14 I praise you because I am fearfully and wonderfully made;
> your works are wonderful,
> I know that full well.
>
> 15 My frame was not hidden from you
> when I was made in the secret place,
> when I was woven together in the depths of the earth.

The verb "woven" (NIV) is translated as "intricately wrought" in the RSV. The Hebrew word has the idea of "embroidered," conveying the sense of intricate and fancy stitching. Here the psalmist uses an argument from design as the basis for his praise and belief in God as his Creator. We are in fact wonderfully designed machines. As someone who has research interests in the area of robotics, I can fully appreciate how difficult it is to design some of the things that we often take for granted. For instance, consider the simple task of picking up a pencil from a table. Our eyes and brain have to not only perform object recognition but also coordinate with our hands to determine the location and distance of the object. These tasks are exceedingly difficult to implement using traditional computer implementations, not to mention designing mechanical hands with the tactile feel and the ability to reach out and grasp the object. The astronomer Kepler had a

devout faith in God as seen in many of his writings that show his deep desire to glorify God. When he wrote, "Can I find God, who in the contemplation of the entire universe I can almost feel in my hands, also in myself?" I believe he was thinking of the intricate working of his own hands as a testament to God's handiwork as much as the precise orbitals of the heavenly bodies.

While I'm an engineer, my research involves some biology. I am fascinated with how we can use engineering principles derived from biology. In particular, I am investigating neuromorphic circuits. These circuit, which attempt to emulate the way the human brain processes information, are much more efficient at certain tasks such as image processing and object classification. Also of interest are deep networks based on neural networks structures. These network structures are now routinely used for classification on big data problems.

William Paley originated the classic argument from design with his idea of the divine Watchmaker to argue for the existence of a supreme Creator. Some claim that the Scottish philosopher David Hume demolished Paley's Watchmaker argument due to Paley's reliance on arguing from analogy. However, I'm not so sure this is the case based on our current understanding of how living cells process information at the molecular level. I share this with my students who take EG 471 Digital Logic Design: imagine if we peered into a living cell and saw digital circuits performing Boolean logic functions like AND, OR, and NOT. Would there be any doubt that the cell was the result of an intelligent designer? Well that is exactly how these complex computations are described by Uri Alon, an Israeli biologist. Dr. Alon has observed that there are certain *network motifs* that commonly recur among Genetic Regulatory Networks (GRNs). (More details can be found in his book *Introduction to Systems Biology: Design Principles of Biological Circuits*.) He uses digital logic circuits to explain how these genetic regulatory networks interact and process cellular information. Not only do living cells operate on logic principles but they also make use of positive and negative feedback, the same principles that electronic engineers use to optimize their circuit designs to efficiently process signals. Interestingly, Dr. Alon emphasizes that these networks arose through "evolutionary" pressures. But as Oxford mathematician John Lennox points out, the word "evolution" has become a "lazy" term with respect to origin of life questions as it does not add much explanatory information. (This is akin to scientists fearing the "God of the gaps" argument of creationists, but to discuss this further would be too great a digression for today's homily …)

But the real indication that we are complex designed machines occurs when you look at the information encoded in DNA. A human chromosome contains some 20

billion bits of information. The intricate process by which DNA is unzipped to produced messenger RNA (mRNA) is reminiscent of a magnetic tape passing through a read head. The origins of this amazingly intricate process of translation is difficult to explain using evolutionary theory (i.e. natural selection). Not only do you need a scheme for how this complex specificity arose but also an explanation of how the underlying mechanism for decoding this information came into existence. An apt analogy is describing both how the hardware for your personal computer was built as well as how the software inside of it was developed. The real clincher for an intelligent designer of the living cell is that the genetic code is very ancient. All organisms from bacteria to humans use the same 64 letter code to describe how to code for proteins. So time is not on your side as well. Paul Davies observes that the DNA code is algorithmically incompressible and is unlikely to be created by random processes (*The Cosmic Blueprint*).

Even Carl Sagan himself states, "It is clear, then, that the sequence of rungs on our DNA ladders represents an enormous library of information. It is equally clear that so rich a library is required to specify as exquisitely constructed and intricately functioning an object as a human being" (*The Dragons of Eden*, pp. 23-25)

Now moving to verse 16, the psalmist exclaims:

> 16 Your eyes saw my unformed body;
> all the days ordained for me were written in your book
> before one of them came to be.

This is a wonderful thought to meditate on: before we were born, God had planned out each one of our days. Because God exists outside of our space-time continuum, He sees the beginning from the end. One of the things that convinced me that the Bible is indeed the Word of God are the many prophecies in the OT (especially the ones about Christ) that find their fulfillment in the NT. This is strong evidence of Divine Authorship. If an Intelligent Designer exists and created our minds, is it not reasonable that He would try to communicate with us? In addition, because God sees the entire panorama of the universe's existence, absolutely nothing ever surprises him. This should be a source of comfort in times of distress and trouble. Especially as believers in Christ, we can take comfort in this fact coupled with Romans 8:28, "And we know that in all things God works for the good of those who love him, who have been called according to his purpose" (NIV).

In verses vv. 17-18, the psalmist exclaims:

> 17 How precious to me are your thoughts, God!
> How vast is the sum of them!

> [18] Were I to count them,
> they would outnumber the grains of sand—
> when I awake, I am still with you.

Here what is remarkable is the fact that we have a mind that is capable of understanding the mind of God Himself! The atheist holds that our thoughts are simply due to the firing of neurons in our brain that originated through some random processes. But C. S. Lewis points out that if our minds were merely the results of irrational forces, then there is no basis that our "faith" in the uniformity of the universe tells us anything about the external world. In other words, the "scientific method" which is based upon repeatable observations and the inductive method to derive physical laws assumes a uniformity in the universe with regard to cause and effects within a closed system. But if our brains are simply the result of random forces, we could never know this to be true. Science it seems has some faith component contrary to New Atheist proclamations. The exciting thing is that not only is our mind wired to understand the observable universe but also to understand its Creator. As believers, we have the "mind of Christ" (1 Cor. 2:16).

Finally, when the psalmist exclaims "when I awake, I am still with you" he may simply be declaring that God's all-encompassing presence remains with him in the morning. But this could also be a hint of the future resurrection. Those who put their faith in the Lord have the glorious promise of eternal life with Him. The psalmist is then reflecting on God's hand on his life from conception in this world to the promise of eternal life in the next one.

To conclude: whenever I study a great work of engineering (such as the iPhone, which is a marvel of system integration or a modern microprocessor integrated circuit packed with a couple of billion transistors in an area the size of your thumbnail), it deepens my appreciation for the genius of the designers. Likewise, our reflection upon the beauty of the universe, from the myriads of stars and galaxies at one scale, to the intricate design and computations that occur at the bio-molecular scale, should increase our appreciation for its Designer. The more we learn from science, the more it should strengthen our faith in its Intelligent Designer. The designer, in fact, is the *Logos* that become flesh in John 1:1, the one that upholds the entire universe.

If we may return to Kepler one more time, he wrote, "I was merely thinking God's thoughts after him. Since we astronomers are priests of the highest God in regard to the book of nature, it benefits us to be thoughtful, not of the glory of our minds, but rather, above all else, of the glory of God." That should be our goal as scientist and engineers as well.