Symphony of Science
with John D. Mays

Episode 8: Christian Reflections on Scientific Theories

Outline:

Causation

- "In the premodern vision of things, the cosmos was seen as an inherently purposive structure of diverse but integrally inseparable rational relations – the Aristotelian *aitia* or *causae*, for instance, which are nothing like the uniform material 'causes' of the mechanistic philosophy – and so that natural order was seen as a reality already akin to intellect." (David Bentley Hart, *Theological Territories*, 154)
- Aristotle's Four Causes (Hart: *causae* = rational relations)
    - Material Cause: the substance of a thing (today, we would refer to its matter and energy)
    - Efficient Cause: the mechanism by which a thing comes to be
    - Formal Cause: the idea of a thing, in the mind of an intelligent being, that leads to the thing's existence itself
    - Final Cause: the purpose (telos) of a thing, implying the intentionality of a purpose
- Christian reflections on scientific theories
    - All scientific theories are reductive, by the standards of the science of the post-Enlightenment era, because they are limited to efficient and material causation only. This is how science is defined today.
    - A Christian view of the world necessarily involves the form and final causation as well, because it involves ideas, intentionality, and purposes of the creator.
        - When I look at you heavens, the work of your fingers, the moon and the stars which you have set in place…(Psalm 8)
    - "Once the notion of causality has been reduced from an integral system of rationales to a single kind of local efficiency, it becomes mere brute fact, something of a logical black box; description flourishes, but on because explanation has been left to wither." (David Bentley Hart, *Theological Territories*, 129)
        - I made the earth and created man on it; it was my hands that stretched out the heavens and I commanded all their host. (Isaiah 45)
    - "At the ground of all nature is personal presence." (David Bentley Hart, interview)
        - Where shall I go from your Spirit? Or where shall I flee from your presence? If I ascend to the heavens, you are there! If I make my bed in Sheol, you are there! (Psalm 139)

    - "While I am describing to you how Nature works, you won't understand why Nature works that way. But you see, nobody understands that." (QED, Richard Feynman 10)
        - This is the distinction between description and explanation.
            - This is as true today as ever on the deepest questions.
            - Science describes (or maybe only conjectures), but does not explain.
            - On the deepest questions, scientists – and perhaps teachers – don't know what they are talking about.
            - Scientists are well aware of how little we know…but teachers rarely communicate this to students thus giving a false impression about the accomplishments of scientific theories.
            - We are just describing the things we know.
- Questions science can't answer – and never will:
    - Key people we are tracking in this presentation:
        - David Bentley Hart (Christian; world-class theologian, philosopher, and essayist)
        - Thomas Nagel (atheist; world-class philosopher)
    - Additional contributors to the conversation you may want to look into:
        - Paul Davies (agnostic; physicist)
        - Antony Flew (atheist converted to Christianity; philosopher)
        - Robert Spitzer (Christian; priest, apologist)
        - Walker Percy (Christian; author, physician)
    - Physics
        - Why do things exist? (And what sustains them in existence?) (Leibniz: Why is there anything at all, and not – much rather – nothing? Hart: This is an enigma, and an infinite question.)
        - What is light?
        - What are electrons? (Quarks too, for that matter)
        - What is energy?
        - What happens when light encounters matter? (Feynman: no one understands; we can only describe)
        - Why are there physical laws of nature? (Where did they come from? How did they arise?
        - Why can mathematics (imagined, in our minds) describe nature (not in our minds)? Witness the stunning application of the SU(3) Lie Group to the Standard Model, leading to the prediction of the Higgs Boson, subsequently discovered in 2021. (Eugene Wigner: "The Unreasonable Effectiveness of Mathematics")
        - Why does beauty correlate to mathematical usefulness when modeling nature? (Polkinghorne: beauty as a research criterion)

        - How could conditions for the Big Bang occur? Roger Penrose's improbability value for the low-entropy condition at the Big Bang (Spitzer, 58)
        - How can quantum entanglement happen? (Weird, but it does)
        - How is it that the entire creation seems to be governed by quantum probabilities? Einstein: God does not play dice) (And Bohm's hidden variables hasn't seemed to help.)
        - Why does the double-slit experiment produce an interference patter with electrons, and only if no one is looking? (Feynman: "the only mystery")
        - Why is a conscious observer required for the collapse of a wave function to a single reality? (And what does this mean?)
        - Why does the world possess a hidden mathematical structure that cannot be observed by human perception alone?
    - Origin of Life
        - How did life arise? Note: For a rudimentary form of life to be initiated, the organism must possess, at a minimum:
            - Ability to replicate its genetic material
            - "Autonomic" genome-replication function
            - Instinct and ability to consume nutrients and/or energy somehow
            - Instinct and ability to reproduce, including ability to manufacture molecular components for offspring
            - Instinct and ability to take action to avoid harm and stay alive
            - Functionality for homeostasis, including chemical regulation and the ability to metabolize and process food
            - A nearby source of food
            - Molecular complexity to perform all of the above
            - Genome sufficiently complex to encode for all of the above
            - Instructions to switch all these "on" and keep them on
    - Biology - Evolution
        - What is the difference between life and non-life (Stephen J. Gould: No scientist can say what the difference is between a living person and a fresh corpse.) (J. Scott Turner: There is a mystery at the core of homeostasis we have not come close to addressing; biology is in crisis but doesn't want to admit it.)
        - How can the existence of consciousness be explained?
        - How can the existence of intentionality be explained? (Nagel: "the materialist neo-Darwinian conception of nature is almost certainly false")
        - How can the existence of triadic communication be explained? (Walker Percy: It cannot evolve from dyadic.)

- How can the existence be explained of meaning, purpose, thought, value, reasons, beliefs, desires, and qualia (the experiences of different sense impressions)?
- Why is there "the natural intentionality of the rational intellect toward Truth"? (Hart) (Spitzer adds the universal human longing for Love, Goodness/Justice, Beauty, Home)
- Why is the world intelligible, i.e., why would evolution give us the power to understand anything about how the world works?
- How are eyes and brains able to generate a live 3D experience of the environment replicated in the minds of conscious beings?
- Why do we experience beauty in nature (sunsets, flowers, etc.), while all others animals exhibit indifference?
- Why do we see ourselves in a mirror? (Percy: A chimp looks behind the mirror to find the other chimp.)
- Why have traits "evolved" far beyond survival and fitness:
    - The colors on a blue jay wing (Stephen Weinberg)
    - The extravagant peacock feathers (made Darwin ill to at them; numerous competing theories)
    - The stupendous prowess of birds in flight (This cannot be simply waved away, especially given the unique features of avian physiology.)
    - The human mind and dexterity (ability to invent and perform vector calculus, threading needles, playing Liszt, watchmakers, Michelangelo, super polyglots).
    - The incredible capabilities of savants (Stephen Wiltshire drawing London from memory, etc.)
    - Bizarre feats of human memory (70,000 digits of pi, etc.)
- How could human evolution produce both Hitler and Mother Teresa? (You can't have it both ways.) Also, all humans do some good and some bad (Why? And why is this limited to humans?). Note also that we can decide whether to do good or bad. (All in all, an evolutionary explanation for morality is far from available.)
- How can the beyond-stupefying dances of mitosis and meiosis be explained? (Every appeal to chemical signaling gradients, etc., seems just to make the problem worse.)
- Why is the universe fine-tuned for both complex life and scientific discovery? (*The Fitness of the Environment, The Priveleged Planet)*
- How is it that the incredibly unlikely complex eye supposedly evolved 40 times independently, while the long giraffe neck evolved only once, even though lots of animals eat foliage from trees? (This makes the evolutionary accounts seem like just-so stories.)

- How can animal intentionality be explained (i.e. intentionality without rationality)? (Pelicans and vultures riding thermal currents, and clearly doing it for fun – with pelicans even doing it in formation, also birds dancing, birds singing year-round, birds snow skiing, whales and dolphins playing, cows frolicking, puppies playing. But out of the entire animal kingdom, only humans have rationality.)
    - Are you willing to say bird song is meaningless? One cannot construct an explanation for bird song – and its meaning – with appealing to all these:
        - Intention
        - Aesthetics
        - Joy
        - Pleasure
        - Praise
        - Creator
- Why do organs and systems in living things seem so purposeful if they arose merely by chance? (It is difficult even to discuss organs etc. without referring to purpose.)
- Every organism seeks to stay alive and reproduce – but why? (This too is intentionality, and includes even plans and microorganisms.)
- Why are we affected deep in our souls by art, calmed or delighted by music, compelled to burst into tears by hearing a poem, etc.? (And nothing else does these things, except birds like to dance.)
- How does memory work? Saying that memories are "recorded in synapses in the brain" is absurdly reductive.
    - Speaking of memory:
        - Every memory (i.e. the continuous stream of it) contains 4D color, video, with a soundtrack; and with smell, tactical feeling, emotional states, time of day, time of year (season); and with how old you were, whether you had learned to play the piano yet, where other people were at the time, whether you were unemployed at the time, or ill that day, whether you had had a good meal that morning or just a bowl of Rice Krispies (and maybe remembering the Rice Krispies ad you saw on TV back in 1968), and how tired you were, and whether you had taken a shower that morning. And so on.
        - Consciousness in humans (and maybe other species) means that every memory encompasses all other.

Job 38

Where were you when I laid the foundation of the earth? Tell me, if you have understanding, who determined its measurements – surely you know! Or who stretched the line upon it? On what were its bases sunk, or who laid its cornerstone, when all the morning stars sang together and all the songs of God shouted for joy?

This is not only God telling Job that Job doesn't know. It is God telling humans what humans will never know (at least not in this age!)