Truman's Coded Information Systems and Munevar's *Radical Knowledge*

Perhaps because of my education in electrical engineering and epistemology, I have enjoyed Royal Truman's *J. Creation* papers on Information Theory, especially part 4.

After reading Truman's articles my mind made one of those non-linear connections the human mind does so well, and I pulled Gonzalo Munévar's *Radical Knowledge: A Philosophical Inquiry into the Nature and Limits of Science* off the shelf.[1] I think there are some interesting parallels between Munévar's model and Truman's model.

The first parallel occurs when Truman describes coded messages that are closely linked to the Coded Information Systems carrying them. Truman argues effectively for the need "to consider everything involved to permit a message-processing system … to work". Because of the information that can be embedded in a Coded Information System, for example, a simple message can trigger a complex system to take a long series of well-timed actions aimed at achieving a specific result.

Recognizing that Truman distinguishes between coded messages and sensory experience, I was still reminded of Munévar's arguments that perception, intelligence, and knowledge are closely linked to their biological foundation. The experiences of an organism are largely determined by its organs of perception and cognition. Those organs of perception and cognition are as much a part of any knowledge or theory as any propositions are. In fact, the organs of perception and cognition can be viewed as biological realizations of a knowledge or theory about reality.

To illustrate, consider how our understanding of reality (or said another way, our interaction with the environment) might change if human perception changed. What if our eyes could perceive ultraviolet radiation but could no longer perceive red and yellow? What if our eyes could perceive only greys, not colours? What if our eyes did not mix two pure colours to make a third pure colour—for example, mixing red and yellow to make orange—but perceived them separately, the same way our ears do not mix two pure sounds to make a third pure sound? How would our understanding of reality (our interaction with the environment) change if we had electroreception organs like sharks or pit organs like rattlesnakes? What if we had an organ that could perceive nuclear decay like a Geiger counter?

But perception does not work alone. Cognition also silently shapes our understanding of reality. For example, although nothing in a movie truly moves—movies are a series of still photographs—we perceive motion. There is a neuropsychological disorder, 'motion blindness', that makes one unable to perceive motion even in daily life. Also, for example, deaf children reportedly perform better than other children at facial discrimination, spatial construction, and recognizing and interpreting dynamic displays—not surprising to anyone familiar with visual-spatial language such as American sign language.

So with respect to this first parallel, Munévar argues that consideration of any knowledge or theory is incomplete without referring to the biological framework within which it occurs, and Truman argues that consideration of a coded message is incomplete without also considering the Coded Information System carrying it.

The second parallel occurs when Truman warns against inferring the significance of a coded message from the number of bits in the message. A simple message can have great importance, and a complex message can be full of irrelevant information. Instead, Truman seems to want us to look at the contribution the message makes toward achieving a goal. This reminded me of Munévar's arguments that knowledge should *not* be modeled as a list of true propositions, such that a longer list necessarily implies more knowledge. Instead, Munévar puts forward a performance model of knowledge: if an organism interacts with its environment better, then we would say that the organism understands its environment better. The significance of new knowledge can only be measured in terms of its impact on the organism's performance: does the organism more easily deal with its environment? Does the organism increase the number and diversity of environments that it can deal with? Does the organism more easily cope with a continuously changing environment?

In one critical respect, Truman and Munévar are clearly not parallel. Truman argues that natural processes are incapable of creating or improving Coded Information Systems. In contrast, Munévar believes that biological organisms and their perceptions, intelligence, and knowledge are the result of a long evolutionary process. That is no small difference.

Munévar demonstrates his continuing commitment to evolutionary biology in an interview conducted by Paul Newall in 2005 and posted on *The Galilean Library* website in 2010.[2] In that interview Munévar states his belief that "there is no worthwhile science in creationism or in intelligent design". Although he believes neither creationism nor intelligent design belongs in the science classroom, he does allow that they might be brought into the classroom as part of a point-counterpoint teaching method "if it were done right". Munévar says, "Done right it would be a rout in favor of evolution."

I have not read enough of Munévar's writings to explain his preference for evolutionary biology, but I am curious about it. In *Radical Knowledge* Munévar states that the mechanism for selecting one scientific view over another cannot be specified in advance, setting aside "not only theoretical and experimental commitments, or ontological claims,

but also methodological standards". His preference for evolutionary biology is presumably based on his performance model of scientific knowledge. He apparently believes evolutionary biology improves performance in some way I have not recognized. Then again perhaps he rejects creationism and Intelligent Design because he believes they specify a biblical standard in advance of considering competing scientific views.

For me—trained to use Shannon's Theory of Information, appreciating its genius, and yet intuitively sensing it was incomplete—Truman's articles provided several wonderful *Aha!* moments.

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References

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2. Newall, P., Gonzalo Munévar: Feyerabend and Beyond, posted 18 June 2010, www.galilean-library.org/site/index.php/topic/3296-gonzalo-munevar-feyerabend-and-beyond/page__hl__munevar, as at 31 May 2013.

» **Royal Truman replies:**

I am very pleased to see how well Carl Anderson understood the Coded Information System model, expressed in statements like, "A simple message can trigger a complex system to take a long series of well-timed actions aimed at achieving a specific result." Successive refinements toward the intended outcome proceed by combinations of four resources: coded messages, sensors, physical hardware, or pre-existing resources.

It is correct, that just as Munévar forwards a performance model of knowledge, I wish to propose a quantifiable performance model of information.

I believe that looking at biological information processing systems in their entirety permits a better evaluation of the design vs evolutionary models. Evolutionists often focus on only some minor coded message detail, and claim a few random mutations plus selection

would be sufficient. However, *all* the components of a CIS need to be explained.

Here are two examples to illustrate. Dr Tom Schneider made a logical mistake several years ago, claiming co-evolution of a binding site and binding factor would evolve easily, using a computer 'simulation'. I pointed out[1] that over 99.999…% of what was necessary for this to work had been provided for free (e.g. a regulated source of energy; multiple forms of metabolism; reproduction machinery; logic circuitry resulting from the binding interaction, etc). These should be part of the CIS he was analyzing. However, all such necessary *biologically implemented equipment* would be subject to the ravages of random mutations (but were conveniently ignored in the 'simulation'). I've waited for more than 12 years for the promised reply.

As another example, University of Wisconsin professor Sean Carroll claimed that the presence of the *Pax-6* gene in all 40 kinds of eyes implies a common eye-evolution ancestry.[2] However, another leading evolutionist and developmental authority, University of California Institute of Technology professor Eric Davidson, concluded the opposite after looking at more details of the eye development systems. He looked into the regulatory relationships of the subnetwork genes the *Pax-6* gene is involved in for various organisms, and argued that claiming an evolutionary common ancestral eye had existed makes no sense.[3]

Understanding genetically driven information processing (the CIS insight) requires a full accounting of epigenetics (histone modification; DNA attachments; micro-RNAs processes; histone variant substitution). In addition, chromosomes are arranged and rearranged dynamically to simultaneously express collections of genes, in response to various signals (typically sensors in CIS parlance). Precise three-dimensional structures have to be put together with ensembles of proteins working with various DNA 'binding sites'. CIS principles are present everywhere one looks!

CIS thinking facilitates quantitative analysis. This clarifies the absurdity of evolutionary claims. There are only so many mutational opportunities available as 'feedstock'.[4] Yet there are examples of the same DNA pattern placed in *thousands* of different locations to regulate genes. A process of trial-and-error would also be confronted with having to avoid the immensely greater proportion of inacceptable binding locations generated. These binding factors then activate genes and intron/exon splicing in a manner integrated with downstream gene circuits, which would also need to have evolved. Random mutations and selection at a whole organism level can't do the job.

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References

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2. Carroll, S.B., *Endless Forms Most Beautiful: The New Science of Evo Devo and the Making of the Animal Kingdom*, Weidenfeld & Nicolson, London, UK, pp. 66–72, 2011.

3. Davidson, E.H., *The Regulatory Genome: Gene Regulatory Networks In Development And Evolution*, Academic Press / Elsevier, San Diego, CA, pp. 196–199, 2006.

4. Truman, R. and Heisig, M., Protein families: chance or design? *J. Creation* **15**(3):115–127, 2001.

A developing schism in Flood geology

Froede and Akridge[1] are correct to recognize that creation geology includes two widely divergent groups seeking to reconstruct earth history within a biblical framework. Such has been the case throughout the history of creationism, going back to disagreements between Harold Clark and George McCready Price over the reality (or not) of the