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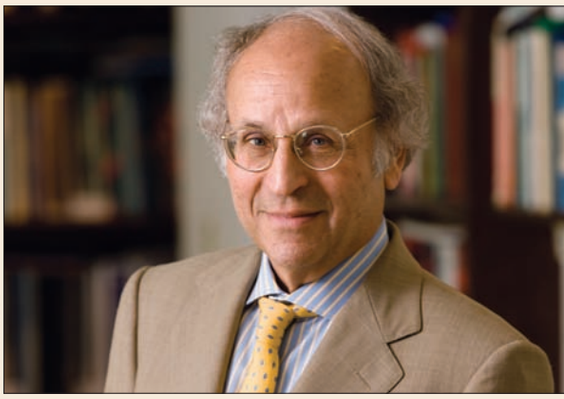
'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe
— Lewis Carroll,
Through the Looking-Glass


JOSHUA FRANZOS

Recently, I read an article in *Nature* by William Martin and Eugene Koonin that frames a hypothesis about the origin of the nuclei within our cells. The cells that emerged earliest in evolution, e.g., bacterial cells, lacked nuclei, and the question of why nuclei later appeared has long intrigued contemplative and philosophic biologists. The common wisdom has been that the nuclear envelope was "invented" to protect chromosomes from shearing during cell division, but this seems to be a less-than-plausible selective mechanism. Martin and Koonin, in contrast, propose that the origin of the nucleus marked a seminal evolutionary transition, a transition that came about when bacterial DNA invaded cells morphologically similar to our own but sufficiently early in evolution to not yet have nuclei. This invasion had two consequences: Bacterial genes became the ancestors of mitochondria (they now act as "power plants" for cellular metabolism); further, bacterial DNA also invaded the central genome, creating stretches of DNA sequence in that genome ("introns") that, after mutational decay, disrupted the job of our information-laden genes to code for proteins. This information is copied from the DNA into messenger RNA (mRNA), which is exported to the cell sap, where the mRNA is "translated" into proteins. To protect the function of the informative DNA stretches ("exons"), cells developed a mechanism to splice out the introns and join the exons before the mRNA is exported. One problem remained: Splicing is a slow process, but translation is rapid, so the two processes had to be separated. This then, in the Martin-Koonin hypothesis, explains the emergence of nuclei and their surrounding envelopes—which serve to slow mRNA export until the cell is done splicing.

I have warmed to this notion of necessary, time-dependent separation and its underlying evolutionary selective pressure. Why? I worry that we are so bombarded—and so rapidly—by the "unspliced" information that invades our lives through the Internet that we often fail to translate that information in productive ways. The metaphoric "introns" in our brains may even be harmful, yielding, for example, misleading medical advice or political imperatives lacking in true and unbiased substance. Before the Internet, when we queried one another in writing, we didn't expect instantaneous responses. Now, we read the screen and respond in an instant. Information may be absorbed but not metabolized, and if it is parsed at all, the parsing is done often without context and nuance. We're a bit like Lewis Carroll's Alice, bumping up against half-baked ideas or a dose of nonsense at every turn. Imagine if our brains had a semipermeable barrier that would allow information and the response to that information to equilibrate. Regrettably, evolution has not caught up with the Internet!

This is not to say that computers aren't welcome. I could not function professionally (nor retrieve my shirts from the cleaners) without them. Yet we pay a price when our rate of accurate comprehension is challenged. Here again, science not only yields data and hypotheses about the world, it instructs us—even if by metaphor—as to how we might better live our lives.

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