

## The Humble Scientist

*Chase W. Nelson*

A dear atheist friend once turned to me in the middle of a Fernando Ortega concert to whisper, “that’s what holiness looks like.” Shocked by her response to this overtly Christian musician, I later asked what she meant. “I think holiness is when someone finds what they most love to do in this life. You can tell that this guy just lives to play the piano and sing about God. It feels like holiness when you watch it happen.”

The same can be said about the scientific work of University of South Carolina biologist Austin L. Hughes, my teacher, who died in October 2015 at the age of sixty-six. I have never met an intellectual more dedicated to an objective analysis of truth, despite what some might think of as conflicting commitments. A devout Catholic and a relatively conservative man, he spent his career studying evolution and contributing to its understanding with a single-minded tenacity and seriousness. He was first a philosophy student at Georgetown and Harvard in the late Sixties and early Seventies, but during his graduate years came to notice how preoccupied philosophy was with science while eschewing other kinds of knowledge, due especially to the influence of logical positivism. This drew his attention to the sciences, of which biology, it seemed to him, was an area of work relatively tolerant toward people of faith as compared to philosophy.

It turned out, as he explained in a 2013 interview with *Salvo* magazine, that the reason scientists seemed more tolerant at first “was just that they assumed that no one in their field subscribed to religion.” Nevertheless, although it may now stretch credulity to imagine the word “humble” as an accurate descriptor of biology’s attitude toward other disciplines, this was to him an important part of what drew him to study zoology, first at the University of Maryland, then at West Virginia University, and then at Indiana University, where he received his Ph.D. in 1984. In the pages of this journal, he recalled:

When I decided on a scientific career, one of the things that appealed to me about science was the modesty of its practitioners. The typical scientist seemed to be a person who knew one small corner of the natural world and knew it very well, better than most other human beings living and better even than most who had ever lived. But outside of

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their circumscribed areas of expertise, scientists would hesitate to express an authoritative opinion. This attitude was attractive precisely because it stood in sharp contrast to the arrogance of the philosophers of the positivist tradition, who claimed for science and its practitioners a broad authority with which many practicing scientists themselves were uncomfortable.

His work in biology began with examinations of the behaviors of certain beetles, birds, and fishes, and also of human kin groups. He then broke into molecular evolution as a postdoctoral researcher under Masatoshi Nei at the University of Texas at Houston, where he met other molecular-evolutionary greats such as Wen-Hsiung Li. It was there too that he made one of his most influential contributions to science, in a paper coauthored with Nei in 1988, demonstrating a way to detect a form of positive Darwinian natural selection.

His writing was an act of worship, if not of God then certainly of truth. One paper after another poured forth—some three hundred in total, plus two books—addressing gene duplication, natural selection, and phylogenetic relationships as he investigated the evolutionary history of a wide swath of living things. His passion for this work earned him membership with the American Association for the Advancement of Science in 2010.

An extremely private person—we never once had dinner—Hughes's priorities were clearly faith, family, and science. He had little time to bother with anything else, even such trivialities as pleasant greetings. When happening upon him on or off campus, at most a quick nod or grunt might issue forth as he continued on his way. We who circled around him, propelled in our orbits by the mental inspiration he gave, learned not to confuse his brevity for anger or even disinterest. He was shy, and simply had more important things to do: a paper, a class, a coffee with his wife. It was clear that his heart went deeper than a casual acquaintance might notice. Speaking of personal failings, perhaps with family or friends, he once mused in a conversation that "Things might have turned out differently if I'd written a hundred less papers—ah well, it's too late to change that now." If his devotion to family and church were any indication, the importance of love was a lesson he had learned well. As was the importance of tolerance. Despite the fact that I am a relatively outspoken gay activist and Bernie Sanders supporter, both undoubtedly in strong conflict with his views, these things never once altered his respect for or treatment of me. We simply found shared holy ground in our mutual passion for good science, and happily toiled together, whatever differences we might have had.

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Despite his awkwardness in social settings, in lab meetings he could be talkative and energetic, if not downright chipper. No topic was exempt. After bringing everyone up to speed on research and setting a direction for the coming week, we would often speak about politics, philosophy, and religion. With his training in both philosophy and science, and his rich library of books in multiple languages, Professor Hughes had an inexhaustibly vast knowledge. If one topic failed to stimulate, he would find another. Once, while sitting behind him in a departmental biology lecture, I noticed him grow bored and retrieve a French philosopher from his bag, and he proceeded to read, in French, the majority of a chapter before the talk finished. When we lost him, we lost a mentor not only in science but in many other subjects as well, and one with the rare ability to look beyond his own area of accomplishment to gain a fuller image of the world. Despite the independence his personality demanded of others, a certain repose could always be taken in the fact that, should all else fail, one could simply “ask Austin.” His absence means, for me, a loss of that intellectual security. I may never find it again.

In his writing for more popular outlets, Hughes advanced a clear vision for the roles of science and faith in the human experience, as in his 2012 *New Atlantis* essay “The Folly of Scientism.” Here he showed that science, far from being sufficient to address the broad range of questions once tasked to philosophy, is rather itself derivative of and dependent on philosophy. Defining “scientism” loosely as the view that science is the only sure means of acquiring knowledge of any sort, he writes:

In contrast to reason, a defining characteristic of superstition is the stubborn insistence that something—a fetish, an amulet, a pack of Tarot cards—has powers which no evidence supports. From this perspective, scientism appears to have as much in common with superstition as it does with properly conducted scientific research. Scientism claims that science has already resolved questions that are inherently beyond its ability to answer.

His essay helped spark heated debates about scientism, including responses from some of its most ardent champions, such as Jerry Coyne and Steven Pinker, each of whom Hughes critiqued again thereafter. However, contentious claims about science seemed to bother him only when tied to some metaphysical agenda, such as Coyne’s atheism. Conflict on other matters, for instance hostile rejections of his work overturning well-accepted bird phylogenies, prompted easy resignation: “Oh well, I tried.”

Hughes was at his best—and sometimes quite controversial in his field—when pushing back against certain claims about adaptive evolution. In a 2007 article in *Heredity*, provocatively titled “Looking for Darwin in all the wrong places: the misguided quest for positive selection at the nucleotide sequence level,” he called into question the “widespread use of inappropriate statistical methods” that, he claimed, had produced a false impression about how molecular evolution works. Positive Darwinian natural selection—the favoring of advantageous mutations—is far less common than is widely believed, he wrote, and “is unlikely to be involved in the evolution of major morphological and developmental adaptations.” The controversial article led to the misperception among some in the field that Hughes had rejected the methods he had pioneered in the 1980s with Masatoshi Nei for detecting this form of selection. Rather, what he did was clarify the appropriate scope of their use in a time when other scientists sometimes seemed eager to grant an almost magical power to the role of selection in evolution.

The 2007 paper relied heavily on the work of Motoo Kimura, leading architect of the neutral theory of molecular evolution, which states that at the molecular level most genetic variations that permeate populations are “neutral” in the sense that they do not affect the organism’s survival and reproduction. In the original draft of a magnificent 2009 paper about Kimura’s theory, Hughes went so far as to say that Kimura was a figure more important than Darwin. As Hughes told me in one of our weekly meetings, one reviewer fiercely objected (“whoa!”). The final publication is worded somewhat less strongly: “it is not an exaggeration to say that Kimura was the most important evolutionary biologist since Darwin.” A 2011 review Hughes wrote in *Heredity* continued in this vein, proposing a mechanism that explains a great deal of adaptive evolution without recourse to natural selection at all. (In a letter to the editor, two researchers challenged the claims in this paper, but it does not appear that Hughes ever responded.) Why question positive natural selection? In a podcast discussion with *Heredity*, Hughes answers simply that “there really isn’t all that much evidence that it actually happens to the extent to which it would be needed to explain all of the adaptive traits of organisms.” Simple enough.

Hughes’s greatest professional fault was arguably his lack of patience with slower thinkers. Over his roughly forty years working in biology, he took on only a handful of grad students, graduating only five Ph.D.s. Surely his impersonal tendencies had something to do with this. Neither was he exempt from frustration with himself. Once, trying to work out a question I had asked about population genetics, he put down the pen

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with some force and, visibly exasperated, exclaimed, “I’m just too stupid.” Dissatisfaction with his own lack of understanding may be what drove his growth and prowess as an intellectual and scientist.

It will be difficult to carry on without his surprising outbursts (“Biologists are morons!” with a fist slamming the table), or especially without the stern look on his face that would quickly dissolve into a chuckle as he realized his own excess of passion. Hoping to write papers like his, I moved from New York to South Carolina in 2011 and will be ever changed as a result—for good. Would that we could all strive to pursue our goals with a fraction of his diligence, and to form our opinions with an ounce of his objectivity. His guidance will be sorely missed, but will live on in his writings and in those whose lives he touched.