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EDITORIAL

Bright Star Among Billions

As Saul despised David for receiving ten thousand cheers to his own mere thousand, we scientists often stigmatize, for the same reason of simple jealousy, the good work done by colleagues for our common benefit. Because we live in a Philistine nation filled with Goliaths, and because science feeds at a public trough, we all give lip service to the need for clear and supportive popular presentation of our work. Why then do we downgrade the professional reputation of colleagues who can convey the power and beauty of science to the hearts and minds of a fascinated, if generally uninformed, public?

This narrow-minded error—our own Philistinism—arises in part from our general ignorance of the long and honorable tradition of popular presentation of science, and our consequent mistake in equating popularization with trivialization, cheapening, or inaccuracy. Great scientists have always produced the greatest popularizations, without compromising the integrity of subject or author. In the 17th century, Galileo wrote both his major books as dialogues in Italian for generally literate readers, not as formal Latin treatises designed only for scholars. In the 18th century, the Swiss savant J. J. Scheuchzer produced the beautifully elaborate eight-volume *Physica sacra*, with 750 full-page copperplate engravings showing the natural history behind all Biblical events. In the 19th century, Charles Darwin wrote the *Origin of Species*, the most important and revolutionary of all scientific works, as a book for general readers. (My students often ask me where they can find the technical monograph that served as the basis for Darwin's popular work; I tell them that the *Origin of Species* fulfills both allied, not opposing, functions.)

With the death of Carl Sagan we have lost both a fine scientist and the greatest popularizer of the 20th century, if not of all time. In his many books, and especially in his monumental television series *Cosmos*—our century's equivalent of Scheuchzer's *Physica sacra* and the most widely viewed presentation in the entire history of science—Carl explained the method and content of our discipline to the general public. He also conveyed the excitement of discovery with an uncanny mix of personal enthusiasm and clear presentation unequaled by any predecessor. I mourn his passing primarily because I have lost a dear friend, but I am also sad that many of us never appreciated his excellence or his importance to all of us, while a few of the best of us (in a shameful incident at the National Academy of Sciences) actively rejected him. (Carl was a remarkably sanguine man, but I know that this incident hurt him deeply.) Too many of us never grasped his legendary service to science.

I would epitomize his excellence and integrity in three points. First, in an age characterized by the fusion of high and pop culture, Carl moved comfortably across the entire spectrum while never compromising scientific content. He could joke with Johnny Carson, compose a weekly column for *Parade*, and write a science fiction novel while maintaining an active laboratory and publishing technical papers. He had foibles aplenty; don't we all? We joked about his emphatic pronunciation of "billions," and my young son (much to Carl's amusement) called *Cosmos* the "stick-head-up show" because Carl always looked up dreamily into the heavens. But the public watched, loved, and learned. Second, for all his pizzazz and charisma, Carl always spoke for true science against the plethora of irrationalisms that surround us. He conveyed one consistent message: Real science is so damned exciting, transforming, and provable, why would anyone prefer the undocumentable nonsense of astrology, alien abductions, and so forth? Third, he bridged the gaps between our various cultures by showing the personal, humanistic, and artistic side of scientific activity. I will never, for example, forget his excellent treatment of Hypatia, a great woman, philosopher, and mathematician, who was martyred in Alexandria in 415 A.D.

You had a wonderful life Carl, although too short. You will, however, always be with us, especially if we as a profession can learn from you that the common touch enriches science and extends an ancient tradition that lies at the heart of Western humanism, and does not represent (when properly done) a journalistic perversion of the "sound bite" age. In the words that John Dryden wrote about another great artist, the musician Henry Purcell, who died even younger in 1695: "He long ere this had tuned the jarring spheres and left no hell below."

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