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Linda Billings
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SETI as a Spiritual Quest

One of my favorite Hoosiers, Kurt Vonnegut, has written some interesting things about life beyond Earth....

I'd like to read you the opening passage from his novel,*The Sirens of Titan,* published in 1959....

"Everyone now knows how to find the meaning of life within himself.

"But mankind wasn't always so lucky. Less than a century ago men and women did not have easy access to the puzzle boxes within them.

"They could not name even one of the fifty-three portals to the soul.

"Gimcrack religions were big business.

"Mankind, ignorant of the truths that lie within every human being, looked outward -- pushed ever outward. What mankind hoped to learn in its outward push was who was actually in charge of all creation, and what all creation was all about.

"Mankind flung its advance agents ever outward, ever outward. Eventually it flung them out into space, into the colorless, tasteless, weightless sea of outwardness without end.

"It flung them like stones.

"These unhappy agents found what had already been found in abundance on Earth -- a nightmare of meaninglessness without end. The bounties of space, of infinite outwardness, were three: empty heroics, low comedy, and pointless death."

I can't really argue against this point of view. But I don't share it. It's a fact that no one has produced any conclusive evidence of extraterrestrial intelligence -- but absence of evidence is not evidence of absence. I think we should look, and listen. The scientific rationale for the search for evidence of extraterrestrial intelligence is reasonably sound, as far as I'm concerned. And it is not in conflict with the spiritual rationale for doing whatever we can to understand our connection with the universe, to prove to ourselves that we are not alone.

Let me run through the Cliff Notes version of the scientific heritage of SETI.... In the nineteenth century, astronomers learned to record the spectra of celestial objects and found that they were made of the same stuff as things on Earth -- including us. Then Darwin's theory of evolution gave further weight to the idea of life as a result of natural processes. In the mid-20th century, radio astronomy was invented, giving scientists a way to listen for signals of extraterrestrial origin. In the 1950s, the famous chemistry experiments of Stanley Miller and Harold Urey reinforced the idea of life as the upshot of natural processes involving universal building blocks.

(Stanley Miller's still at it....) Add the right type of energy -- available anywhere in the universe -- to a certain prebiotic soup of elements -- ingredients available throughout the universe -- and you get organic molecules that start to replicate. That's life -- as we know it. Since then, astronomers have found organic compounds in interstellar space. Some scientists now believe that some key ingredients of life on Earth may have been delivered here by a comet or an asteroid laced with organic materials, in some colossal smash-up with Earth billions of years ago. Others believe that liquid water may exist beneath the surface of Mars. And if there's water, there might be life, at least of the bacterial kind. You probably remember that in 1996, a team of scientists announced they'd found what they believe to be fossil evidence of past life on Mars. Lots of people are still arguing over this one....

But as with most important questions in science -- the more we learn, the more we realize we need to find out. It's not unreasonable for critics to point out a number of holes in the scientific rationale for SETI. This rationale rests on a long string of assumptions that stem from what we *think* we know about our cosmic environment. The so-called Drake equation offers a way of "guesstimating" the likelihood of intelligent life elsewhere by multiplying the rate of star formation in our galaxy, the number of stars in our galaxy that may have planets around them, the number of those planets that may support life, the number of such life forms that may have developed intelligence, the number of intelligent life forms that may have developed technology like ours, and the number of those technological civilizations that may have lasted long enough to send us signals. And take my word for it, scientists are *always* arguing about the range of numbers to attach to every single element of this formula. Imperfect as it may be, this scientific rationale underlies Project Phoenix, an ongoing privately funded SETI search. This project is a continuation of the one that NASA operated for a year before Congress cancelled it in 1993. This search is designed to cover only part of our own galaxy, which is one of billions of galaxies in the known universe. Each of these galaxies could contain billions of stars. Our Milky Way galaxy measures 100,000 light years across and contains up to 400 billion stars, including up to 30 billion that are like our sun. There's a lot of ground to cover.... A few other even more limited searches are under way as well -- at Ohio State University, Project Serendip in California, and Project BETA, a privately funded search sponsored by The Planetary Society... What scientists are doing is a start -- and if we don't get started, we'll never get anywhere....

As I've already said, I think we should look and listen. Why not? Based on what I've learned about the origin and nature of life on Earth, I find it impossible to believe that this planet is the only place in the universe where life exists. Intelligent life elsewhere may not be recognizable to us. And extraterrestrial life, familiar or not, may only exist so far away from us that we may never be able to detect any signs of it. But so what? We know that Mission Impossibles often succeed.... Even if scientists do find a signal, and verify that it is coming from an extraterrestrial technological source, there will always be some who will argue that it's not real, that it must be something else. There will always be people who will argue that we can't really *prove* that extraterrestrial intelligent life is out there somewhere, just by listening for signals. But we can *believe* it. Or not....

It's easy for me to talk about belief in relation to science. I'm a writer, not a scientist. In my mind, knowledge and belief are simply two different ways of describing how we understand our environment.... Those of you who have seen the movie "Contact" know that the story, based on a novel by the late Carl Sagan, revolves around a seeming conflict between knowledge and belief. Sagan was our best known SETI scientist -- and he also was well known for his defense of scientific knowledge against its rival, blind faith. This is what his last book was about -- "The Demon-Haunted World: Science as a Candle in the Dark." But when I recall the many times I listened to Sagan talk about SETI, and other scientific endeavors to understand the cosmos, I remember thinking: this is a man of great knowledge and understanding -- *and* a man of strong beliefs, a man of faith -- faith in our abilities to figure things out. I talked to him myself about SETI. I believe he had no doubt that something was out there. And of course, he had no evidence that there was. I call that faith, or belief.

For those of you who are postmodernists, you might think about SETI in the broader context of space exploration in the late 20th century. Space exploration is a part of our ongoing search for identity. It is a way for us to define, develop, and understand our humanity and find our place in the order -- or disorder -- of the universe. Searching for evidence of extraterrestrial intelligence is just one path toward greater understanding..... We are all curious, and we explore because we are curious. Outer space is endless -- it's not the final frontier, it's the endless frontier -- and the possibilities it offers are limitless. We know enough about the universe today to understand that we know virtually nothing about who we are and why we're here. Evidence of life elsewhere would certainly tell us something about who we are.... And this may not be rational, but I find it hard to believe that we are "it"...

I'd like to close by telling you about a spiritual experience I had not too long ago. In 1992, I visited NASA's Goldstone Deep Space Communications Complex -- a spacecraft tracking station in the Mohave Desert near Barstow, California. This complex houses several radio antennas and a signal-processing center. The antennas can do double duty as radio telescopes. They were used, briefly, to search for radio signals of extraterrestrial technological origin, in a SETI project begun by NASA in 1992 and cancelled by Congress in 1993. I was meeting at Goldstone with the scientists who were working on this NASA project. On a tour of the facilities, we climbed up to the top of the focal point of the complex, a 70-meter-diameter antenna that was built for tracking the 1964 Mariner mission to Mars. This antenna is seventy-one meters tall and weighs more than 7,000 metric tons. It can home in on a spacecraft to within six thousandths of a degree from a billion miles away. The people who use the antenna like to brag that it can pick up a signal with the power of a candle burning beyond Pluto.... It impressed *me*.... When I got to the top, I reached up and placed my hand on the bottom of the antenna dish. And I started to cry. I was surprised. Damn, how embarrassing -- I was the only female in a bunch of guys with Ph.D.s in physics.... I turned away from them to hide my face... But I remember feeling moved. I remember standing there and thinking, how can puny little human beings of *clearly* limited intelligence conceive of things like this? And I realized that this monument to human achievement stood out there in the middle of nowhere just because we're curious. We've come up with the most amazing ways to make some cosmic connection..... As I wound my way back

down to the ground, I wondered whether the scientists I was with ever thought about -- or cried about -- the sheer *beauty* of their accomplishments.

I think about it all the time now....

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