

Issues in Earth Science

“Topics for Debate”

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This is part of a series of essays from writers and scientists on the topic “At What Point Does Science Fiction Turn Into Fantasy?”

Science Needs Fantasy

by

Tabb C. Prissel



This might not be the essay you were expecting from a scientist.

First, I agree wholeheartedly with Dr. C’s definition of science: “*science is*

about how we figure things out, not what we know.”

Following, Dr. C then suggests if an effort is being made to understand how things work or why things are, regardless if they appear to be magical-like tools or fantastical elements of the setting, a story becomes “science fiction,”

not “fantasy.” Under this definition, it is the pursuit of understanding that defines a line between science fiction and fantasy.

On the other hand, science exists and controls several aspects of our every day lives irrespective of our effort to understand it. The apple dropped long before it bounced off of Newton’s head. In fact, many scientific breakthroughs were not the specific focus of an effort, but merely coincidental or accidental discoveries (e.g., Velcro and penicillin).

So if the natural world is happy to exist and rule without our intent or effort to understand it, what does it mean to assign meaning to the natural world? Further, how accurate and precise is our understanding and/or the meaning we assign?

The Earth is flat! Spherical. Earth is the center of the Universe! Gravity. The atom is the smallest particle! Don’t let anyone fool you; we scientists love to proclaim “conclusivity” while attempting to solve problems with no possible means of determining an absolute conclusion. Despite our best efforts, we humans may never know everything there is to know about any one given subject,

let alone all things. Scientifically speaking, this means that we currently do not have a complete data set concerning any one natural process from which to assess complete certainty to 100%. This doesn't directly refute Dr. C's definition of "science fiction" and it certainly doesn't negate the significance of scientific models at 99% confidence, but it raises another important question: if 100% of even one subject cannot be known regardless of any effort to understand it, what then is truly fantasy? In other words, is "fantasy" all that different from "science fiction?"

Rather than try to define the point at which "science fiction" transitions into "fantasy," I suggest we instead attempt to scientifically define fantasy: "the faculty or activity of imagining things, especially things that are improbable or impossible." Generally speaking, "simple fantasy" considers me imagining a volcano that no one has ever seen before, but clearly volcanoes exist whether I imagine them or not. Science.

"Improbable fantasy" includes wishing for the completion of a "Hail Mary" miracle-time-expired touchdown pass in American Football. Yet Aaron Rodgers (Quarter Back,

Green Bay Packers) alone completed 3 such passes over the last two NFL seasons. The 31 other teams not named the Green Bay Packers combined for a total of 3 “Hail Mary” plays during the same time span. Just because something has a small chance of occurring does not make it any less scientifically relevant – just go ask the Lions, Cardinals, and Giants... Science.

Now, have you ever stopped to think about what is truly, and unequivocally, impossible? I have. It’s impossible.

The issue here is that I cannot come up with a falsifiable hypothesis for “impossible fantasy.” Without knowing all things possible, no amount of scientific reasoning can be applied or assigned to define the 0.00000% absolute impossible. After all, *“absence of evidence is not evidence of absence.”* – Carl Sagan. In the same breath however, I just as strongly must include the possibility of something being absolutely impossible.

Regarding the debate between “science fiction” and “fantasy,” Dr. C. brings up a magic wand example, *“Something becomes magic, and part of a fantasy, when powers and processes simply exist, and there is no curiosity, explanation, or pursuit of discovery related to*

them. A magic wand is simply a magic wand, and it has powers because it is a magic wand." The same can be argued for my all-time favorite movie, *Star Wars*, and the seemingly impossible use of "the force." Disclaimer: I'm not a big fan of midi-chlorians, so if I were back home blasting womp rats in my T-16 you'd better believe I'd spend the appropriate effort researching and developing new theories about midi-chlorian-independent force use. However, I don't particularly care how the force works when Darth Vader is breathing down my neck as I scream down the trench of the Death Star attempting a miracle-last-second-hail-mary-one-in-a-million-shot at saving the universe. In this particular case, the story focuses on a moment where there is no reasonable time to investigate a fantastical element, but this fantastical element isn't any less scientifically relevant or omnipresent due to a lack of curiosity.

I believe time is the key to defining "impossible fantasy" if it even exists. To Neanderthals, for example, we are technological wizards with magic wands (ipads) and the force (magnets). To humans a million years from now (and Bothans 10 billion light years from now!?), we are

perhaps Neanderthals that would assign Jedi mind tricks to the simplest of scientific concepts.

So for me, there really isn't a transition between "science fiction" and "fantasy." In fact, I think science needs fantasy. When fantastical ideas are sitting outside of our interpretation of the natural world, science is pushed to the limits in order to assess the seemingly impossible. Prior to the Apollo program, Jules Verne was blasting us all out of a cannon (in Florida!) to visit the Moon!

In this way, I believe "fantasy" proposes the ultimate scientific question: is there a limit to our understanding? I believe the answer to this question, the pure and objective scientific truth, exists. The answer may not have a desire to be discovered however, nor require an effort to understand it. Our understanding of the objective truth might simply require some dirty dishes (penicillin), or maybe truth is just waiting for you to take your dog for a walk (Velcro).

Whatever the story brings, I believe an open mind with infinite time will come to discover that what was once "fantasy" may become "science fiction," may become scientific truth. For it was also said,

*“Truth is stranger than fiction, but it is because
Fiction is obliged to stick to possibilities; Truth isn't.”*

– Mark Twain.



Tabb C. Prissel is a husband, son, brother, uncle, and geologist exploring rocky planets and astromaterials throughout the solar system. He believes geologists are storytellers, and empowers others to reach out and discover the natural world(s) around them. Tabb presently works as a Research Faculty in the Department of Earth & Planetary Sciences at Rutgers University. You can follow him on Twitter [@OMGsuite](#) and/or at his blog, [PINK MOON](#).

Image Credit: Russ Colson

This is part of a series of essays from writers and scientists on the topic “At What Point Does Science Fiction Turn Into Fantasy?” You can link to the other essays at [Issue 7 essays](#),

or link directly below.

- [Spaceships and the Force – How Exactly are Science Fiction and Fantasy Different?](#)--By S E Jones
- [Fantasy versus Science Fiction: A Curious Divergence](#)—By Alex Stargazer
- [At What Point Does Science Fiction Turn into Fantasy?](#)--by S. L. Card
- [Seed Thesis for 'At What Point Does Science Fiction Turn Into Fantasy?'](#)--by Russ Colson

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