

What is the Ant, Sir?

by Bernard Leikind

God sits in the captain's chair in the Universe's control room wearing a virtual reality helmet.

Angels waft gently from one flickering control panel to another, adjusting the knobs and peering at computer screens. Are they PCs or Macs? Wouldn't you like to know? They are running a pre-creation simulation of the Universe. The knobs control the fundamental properties of the Universe. Time has not yet been created so nobody is in a hurry, or maybe everything is happening at once. "What's the matter with you?" God snaps at one of the angels. "The speed of light is much too slow. I thought we agreed on 300,000 kilometers per second." An angel spins a dial to a new setting and carefully adjusts the vernier. "That's much better," God says as he relaxes back into his chair. "Let me see. Didn't we agree that in order to achieve my purpose for the Universe the fine structure constant must be precisely $1/137.07$? Where are my notes? Yes. Here it is: $1/137.07$, exactly." An angel drifts to the electromagnetic field section and carefully adjusts a control until the display shows this peculiar number. Following God's instructions the angels set all the other fundamental numbers. God removes the helmet which has displayed simulations of the Universe-to-be. "It looks good to me." In a moment commemorated on T-shirts, God gazes at a blackboard with Maxwell's equations on it, and commands, "Let there be light!"

Suddenly a tiny universe appears. Expanding at breakneck speed, it thins and cools. Galaxies form and stars flicker on. Around a minor star in an average galaxy a planet congeals. Do you get the picture?

Fast forward about five billion years. God's plan is working. At about the same time that the most advanced nation on Earth produces humanity's crowning achievement—the Golden Arches—physicist Wolfgang Pauli dies. An angel ushers him into God's study. "Wolfgang," God says, "I liked your work about the exclusion principle. You really figured out what I was up to. And I especially admired how you deduced the existence of the neutrino. I did my best to hide it. I gave it hardly any properties at all. I invited you to visit me because I thought that you might have some questions for me."

Pauli asks the question that every physicist would ask given the chance: "I always wondered why the fine structure constant is $1/137.07$."

"A good question." God walks to his blackboard and begins filling it with differential equations and geometric diagrams. Finally he finishes the proof and brushes the chalk dust from his hands and robe. God turns to Pauli and smiles.

"It's a beautiful and clever proof," Pauli declares. "Certainly up to your usual standards. But over there, on the third line from the bottom, I believe that minus sign should be a plus sign. Let's see. That changes the result to 1 over 32 times 42 or $1/144$."

"Gee willikers." God is dismayed. "I wonder why no one ever noticed that before?" Reaching to the control panel, God adjusts the fine structure constant to $1/144$. "At least its a round number. That .07 always bothered me."

But suddenly the universe begins to change. Electromagnetic forces weaken, the stars shrink and their cores heat. The higher temperatures increase the rate of nuclear fusion, heating the stars even more. Gradually they became more brilliant. The Earth, which has already changed radically as chemical forces adjusted themselves to the new value, rapidly roasts to a crisp, barren rock.

Physicists know many numbers like the fine structure constant that seem to have a precisely set value. Even the tiniest change in any one of these numbers would change the Universe so radically that life as we know it could not exist. If there were only a few of these numbers, or if they didn't have to be so precisely tuned, they wouldn't intrigue physicists so much. But there seem to be many of them. Those inclined to seek purpose in the Universe point to these remarkably adjusted numbers as evidence that there must be a plan.

Quantum physics teaches us that observers contribute to the results of measurements that they make. Since the Universe is a quantum system, some distinguished physicists have argued that, in a sense, we create the Universe by observing it.

These two streams of thought converge to produce the Anthropic Principle; that the Universe somehow exists for us and that we are an expression of its purpose. Humans, so some thinkers would have it, are so remarkable that we must be the fruition of some grand design. Of course, a world that contains Geraldo, the OJ trial, Mozart, the Hillside Strangler, Rembrandt, the Bosnian war, Newt Gingrich, Shakespeare, and Einstein seems to some a chaotic madhouse. Seekers for purpose, like the author of *Job*, often propose that God must have inscrutable goals.

Blinded by parochial interests and supposing that what interests them must also interest God, proponents of the Anthropic principle have, nevertheless, almost got it right. They suppose that our wonderful achievements in art and science, our vast numbers, our large brains, our major effects upon the Earth are proof of our importance. I announce here, for readers of *Skeptic*, the true principle, the Ant-thropic Principle.

During the age of dinosaurs, our ancestors were small insignificant creatures. Fortunately, a passing asteroid wiped out the competition, creating ecological space for our development. Can that asteroid have been a random event? Think of how carefully it must have been aimed. What if it were slightly too big and wiped everything out, or too small and too many lizards survived? It may surprise you to know that during the age of dinosaurs, ants were relatively insignificant. There were only a few primitive species. The asteroid didn't smash into the Earth to allow the evolution of primates and humans, but to allow for the evolution of ants. How do I know this? Well, look at the results.

There is only one species of humans and even counting all of the primates we have only a few dozens of relatives. There are at least 9,000 species of ants and entomologists are still finding new ones. Entomologists estimate that there may be 10 quadrillion ants in the world, more than a million ants for every man, woman, and child. Many of you, no doubt, believe that you have met your personal ants.

Now, a million ants only weigh a few kilograms, so we outweigh them, but no ant ever needed liposuction. Do we want to claim superiority based upon adipose tissue?

Some humans might claim superiority based upon our achievements such as agriculture, civil society, architecture, and art. We should not feel so confident.

Consider architecture and urban planning. Long ago ants achieved things that we have reached only recently. Their houses are air cooled, well-drained, structurally sound, and clean. They don't burn

and they don't collapse in earthquakes. The streets don't need traffic lights and they don't have pot holes. They are safe for females at night.

What about agriculture? Some ants remain in the stage of primitive hunter-gatherers, but others have highly specialized agricultural or garden societies. These ants gather leaves as nutrients to grow a specialized fungus or mushroom. Other ants are herders. They tend aphids. They herd them on my orange tree leaves, protect them from enemies, and milk them for food. Ant agriculture is all natural, renewable, and does not pollute the environment.

I don't want to make ants out to be saints. They raid one another's nests, steal food, carry off babies, and take slaves. They form vast armies that march cross country destroying everything in their paths. But in a final analysis, ant pluses far outweigh ant minuses.

Do humans create the Universe by observing it? Maybe ants do the job. They are known to navigate by guiding on the sun and they can use polarized sky light to help them locate it.

Ants communicate by taste. They send chemicals back and forth to recognize nestmates or interlopers, express their feelings, and guide their sisters to food. Ants spray noxious chemicals on their enemies.

Ants share many other interests with humans. Some like eating out at picnics and restaurants, while others prefer cocooning at home.

Ants have achieved remarkable social organizations by assigning each to the tasks for which they are most appropriate. Males eat and make love. Females run the show and do all the work. Perhaps that's why things run so smoothly in the ant world.

All of us would like to know the meaning of life. In Kurt Vonnegut's *The Sirens of Titan*, a distant galactic civilization created humanity so a spare part for one of its rocket ships would get to Titan, a moon of Saturn. In *The Hitchhiker's Guide to the Galaxy*, the crucial answer to the question is 42. Why do we require that our existence have a cosmic significance? What if ants are the answer? Are we to fall into despair and nihilism? Or should we find our own purpose? The ability to create our own purposes is what sets us apart from all other creatures. And it is by our choices that our peers and descend-ants will judge us. **S**