Zero and Infinity

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Abstract

Until scholars introduced the zero to Europe there was little consciousness regarding the essence of nothing. As for infinity, there was hardly anything infinite within theocratic consciousness beyond mysticism. It is difficult to evolve physics within cloud castles. Understanding both zero and infinity are needed to help anchor math and physics.

Human consciousness at all levels of sophistication is famous for adhering to specious conclusions. Ancient reflexes among all species have favored simplified models of reality to facilitate quick responses against existential threats. Life forms that misjudged mortal dangers have nearly all perished as individuals and entire species. Pure science is similar, though alone apparently less deadly – but political "applied science" devoid of ethics could be suicidal for us all, as we can become our own existential threats. Generally, what can be done will be done.

With the emergence of scientific "civilization" humans now have the luxury of cogitation at high levels. Still, the easy math path is preferred and rewarded, as long as incorrect math models seemingly correlate with causation, even when they hardly do. Myopia is institutionally structural-functional for collections of cloud-castle thinkers, but not so much for needed emerging wisdom and optimum social progress.

Zero

The intuitive version of zero among species has always been present as the sharp divide between "have" and "have not." We either have food, or we have not; and so forth. The math/physics world of zero becomes interesting where everyday consciousness does not need to go, but science in the service of humanity does.

One of the most interesting versions of zero is what happens when thermodynamic temperature becomes "zero." There are several scales where the expression of zero varies. What lies behind the "absolute" is where things get amazing. (This sub-realm deserves its own deep-dive essay, which is forthcoming.)

In ancient Greece, Zeno of Elea became famous with his paradoxes of infinitesimals, leading to an ever-receding zero space that is never reached. The one most people know is the question if Achilles could catch a slow tortoise before it reaches its nearby goal. Here the absurd catch is that each step of Achilles must be half the length of his previous. This is Zeno's version of negative logarithmic dimensions. The speedy Achilles thus starts out fast from about a hundred meters away, but soon slows down along the original path so much that he never catches that tortoise.

In quantum physics and in astrophysics the challenges introduced by zero and infinity are generally minimized, or "renormalized." The idea of dimensions is corrupted when three dimensions are reduced to ideal Platonic math that is two dimensional. String theory has two dimensions for its strings, which is mathematically absurd and computationally impossible. This idealistic error turned Euclidean plane geometry into something that is divorced from the physical world. Three dimensions, and four with relative vectors, work fine, as zeros do not interfere with the math and actual physics. Euclidean solid geometry was good enough for Newton's worldview.

One of the most egregious 2D errors involves an astrophysical model that Hawking late in life is famous for: two-dimensional holograms directly inside black hole event horizons. Click on the blue link here for this absurd story.

Infinity

As is well known, any positive number times zero is zero. Any positive number times infinity is infinity. We need more than zero and less than infinity to make sense of any one thing in between. Nevertheless, both zero and infinity are essential to framing what we can know.

Quality thinkers for millennia have known about this problem. Their "solution" has been to place both zero and infinity into the realm of mysticism, beyond our logic, and right there with divine omnipotence and omniscience. Saying that something is a deep mystery works in the everyday world of fuzzy/fancy logic, but it can have a surprisingly corrosive influence on pure science.

For example, astronomy enjoys what we can see and perceive. Nevertheless, the idea of zero does intrude when we consider the zero-dimensionality of a pure singularity. The pure math idea of zero dimensions is "neat" when envisioning a local universe's big bang. It also is tidy when contemplating the weirdness of black hole singularities. Nevertheless, to stop there is to minimize the very essence of what happened at our big bang, and what may constitute the ongoing core dimensions of a black hole.

Astronomy also has had to deal with the challenges of infinity, and elemental (quantum-like) infinitesimals when considering expanding limits of our visible universe, especially as they relate to push/shadow multiversal gravity.

Is our local, visible universe equal to The Universe, as today's dominant paradigms would have us believe – or do we live within a 4D multiverse of numerous local universes? Even the idea of a

bubble-bath multiverse does not properly deal with the full dimensionality of infinite time and distance. Why should timid science shy away from what can seem mystical – when there are ways to better frame seemingly infinite dimensionality and infinitesimals therein?

We moderns live in a uniquely fortunate moment when science and philosophy are racing together toward converging brilliant discoveries. The ideas of pure zero and infinity still must never be obscured by any mind cloud of lazy mysticism. Some of today's top experimental science was part of yesterday's mysticism. Today's residual mysticism can also be partially superseded in our not-distant future, if we get there.

Note clearly that none of this pure-science discussion either includes or excludes the psychosocial concept of divinity as it relates to our species. It is only when god, or divinity, or "divine creative force" is modeled as being above time and space that we encounter paradigm difficulties.

It is fair to elegantly simplify our models of Totality, but we must never oversimplify. When there are vectors, there can be myriad relative times and space. It is logically absurd to have a coherent divinity that is simultaneously "above" time and space, and still interacting via directed vectors within the firmament.

It is not necessary to have a personal relationship with one's idea of "divine" power. Nevertheless, a creative and protective "family" relationship is religiously desired and proper, as long as precise limits of zero and infinity are respected within the as-if family model.

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