Finality vs infinity

Consider a number N that is greater than the number before it – any number big or small, as in the picture below, showing numbers from 1 to N and $N + 1$.

For any number N there must be a successor. This successor is the number $N + 1$, and we can go on and on: 1, 2, 3, 4, 5, 6, 7, … , N, N + 1 … ∞. But what about ∞ + 1? For Infinity, there is no successor. It doesn't make sense. Infinity has no successor or predecessor. There is no connection. It is impossible to connect the real number N with infinity, for example, through the mathematical series 1, 2, 3, 4, 5 … N, N + 1 … ∞. We call such an infinite progression **a potential infinity.**

Actual infinity, however, is a bit more difficult to grasp. It may even be beyond our abilities, although we have been trying to somehow wrap our brains around it relentlessly.

What does infinity actually mean? Beyond all limits ? Forever? Without a beginning and an end? Without finality, always different and unexpected? Without space (dimension), there would be no mathematics or physics. But even empty space is not enough, because it doesn't mean anything. It requires changes – distinguishable changes, ones that are different from each other. These then give rise to mathematics, physics and other sciences such as biology. No two changes are alike.

At the core of mathematics are axioms with attached logical rules. Axioms (such as a point, line, circle, etc.) are results of human abstract thought about the surrounding real world. Instead of a pebble (lat. calculus), there is a point without any dimension.

So what does zero mean? Under all limits? Forever? Without any change, without any subject? Pure nothingness, always empty, always the same?

With the help of derived rules (from axioms), is it possible to explain the origin of the given axioms?

Anyway, what about consecutive numbers? How big can they get? It is not only possible to add or multiply numbers, but also to raise their power indefinitely. Let’s take (1×10^{99}), for example. This is one very pretty big number, isn’t it? But it is very easy to make much bigger still, for example by calculating its factorial: (1×10^{99})! Even more impressive!

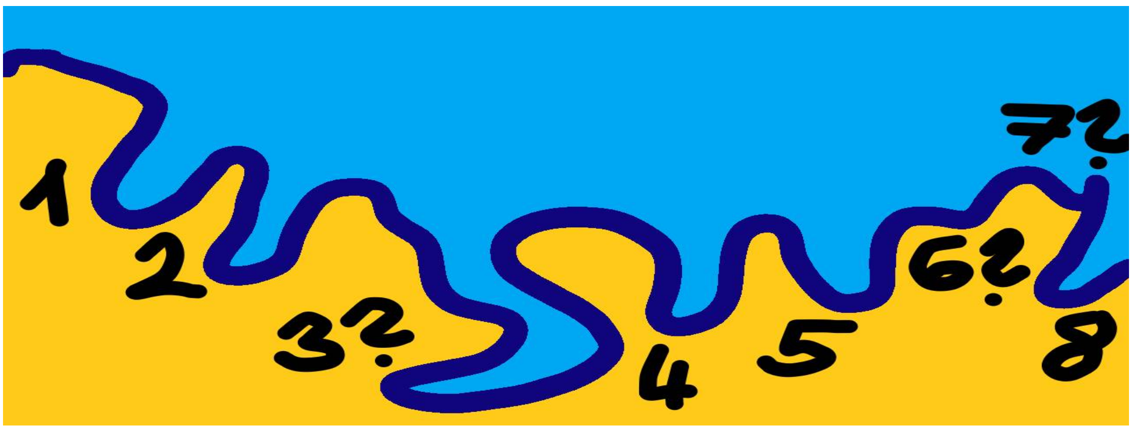
The number (1×10^{99})! is so huge that it does not have any meaning in our universe, yet it is still finite and is far from infinity. We could carry on coming up with bigger and bigger numbers, but this would bring us no closer to infinity. Does that mean forever? What is infinity? How to prove it? How to describe it? **Can we describe infinity with finite elements?**

The world around us is only a reflection of the infinite. Actually, finite elements are only our misunderstanding. Every elementary particle, every atom and every molecule, and even every one of us human beings, is a result of excitations of quantum foam which permeates our universe. Such excitations form structures governed by higher natural laws (chemical, biological, etc.). The meaning of real numbers is taken from the real world around us. Real numbers are only our abstraction – the result of our abstract thinking. **The world is a product (or reflection) of the actual infinity.**

Some mathematicians say that we have to invent infinity to best graft the known final numbers (or theory of numbers) onto our invented infinity. It does not make sense to adapt the source to the product and not adapt the product to the source. Finality as we know it is a product of infinity. Infinity is above all finality or, let us say, our imaginings about finality.

Natural numbers such as 1, 2, 3, … , N, N + 1, defined using the Peano axioms (which can also be derived using set theory), are not the basis of mathematics. These numbers are just a manifestation of a single infinity, one indivisible complexity. The fact that we have attached our concept of one stone or one vessel to the number 1 by our human abstract thinking, that's our business. However, these things are hardwired in our thinking because of how they appear at the level of complexity we experience. The picture below shows changing shapes of different sizes. They form and then they disappear, only to arise and vanish yet again.

How to count the specific shapes? First of all, we must be able to differentiate between them. How many shapes are there? Eight or only five? And what about the numbers with question marks (the numbers three, six and seven)? Can we include such shapes in our set, especially if these shapes are changing all the time?



The concepts of an ideal point with zero size or a line are human inventions based on abstract thinking. Today, mathematicians are still searching in vain for a way how to connect the invented ideal point with logical constructions. **In other words, how to turn nothing into something.**

We have developed theory of thermodynamics based on observations within a given interval. To extrapolate far beyond defined intervals, regardless of the observations or experiments that have taken place, therefore does not make sense. We don't know the nature of phenomena occurring far beyond intervals from which we extrapolate. Take the concept of absolute temperature in thermodynamics: The concept of absolute temperature is based on the expansiveness of the so-called ideal gas. As their density is reduced, all gases converge in their behaviour towards this ideal gas. Different real low-density gases have different tangents, and these different tangents intersect at one point. That point is the temperature of −273.15°C. **It is impossible for us reach such point in the real world. In the same way just like we can't reach the speed of light.**

Go back to Infinity vs. finality. Infinity of final numbers – See Peano axioms. Infinity does not contain finality – limited elements with their beginning and their end. **Limited elements will always remain limited elements regardless of their number, even if this number is infinite. In the same way the discrete elements will always remain discrete regardless of their number.**