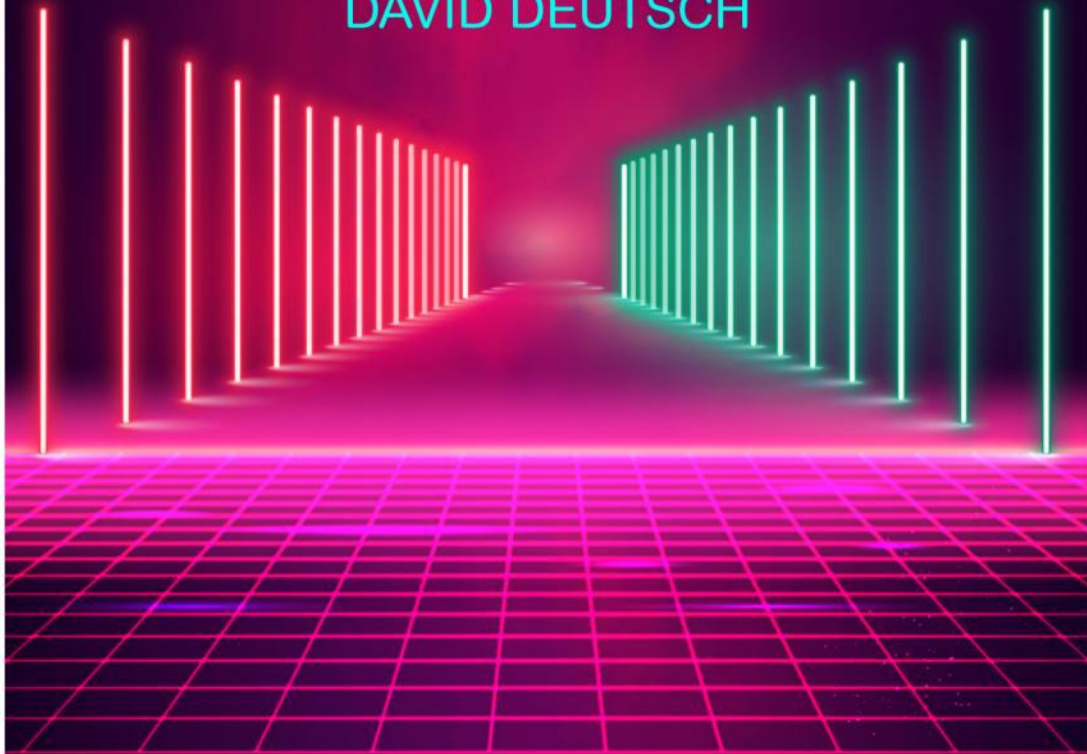


# SUMMARY

## THE BEGINNING OF INFINITY

EXPLANATIONS THAT  
TRANSFORM THE WORLD

DAVID DEUTSCH



# **Summary of “The Beginning of Infinity” by David Deutsch**

Written by: Alyssa Burnette

The Beginning of Infinity invites readers to explore the evolution of scientific thought through a critical study of the human search for knowledge as articulated by leading physicist David Deutsch.

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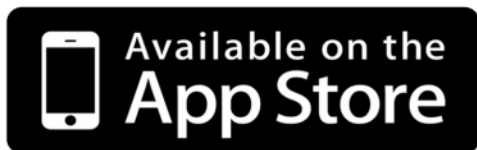


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# Introduction

Why is the sky blue? What does that word mean? Why do we have to do that? You probably asked all those questions and more as a little kid and somebody probably explained them to you. Those explanations formed the basis of your understanding of the world and yourself in relation to it. And if you think really far back, you probably remember that first feeling of discovery— when knowledge made you feel as though the world was unfolding around you and all the pieces of the puzzle were falling into place.

And although you may have lost interest or stopped asking questions as you grew older, that magic of discovery hasn't faded away. And through David Deutsch's study of interview, you can unlock that power for yourself once again as you learn new things like why your senses can't tell you if the sun will rise tomorrow, what a good joke has in common with biology, and how memes define culture.

# We Don't Learn by Experience Alone

That probably sounds really obvious because, after all, that's kind of the entire premise of school. But have you ever thought about how that works? For example, you've never walked on the moon. And in fact, no human has ever physically visited the core of a star. And yet, without experiencing these things ourselves— or, in some cases, without anyone experiencing them— we know quite a lot about both of these things. Why?

That's because knowledge cannot be derived exclusively from personal experience or individual observation. We know that because we can test it in everyday life, with such real-world examples as the fact that, just because you woke up and it was raining outside for 3 days in a row, that doesn't mean it will rain every day forever now. We know that because personal experiences are subjective and appearances can be deceptive. And for that reason, we need a way to measure knowledge outside our own experience.

That source is conjecture. It's comprised of our theories and wonderings about what lies beyond the things we can see. We wonder, we ask questions, and then we attempt to test those theories through hypotheses and experiments.

## Genes and Ideas Spread in the Same Way

That might seem like a preposterous statement, but in fact, both genes and ideas spread by replicating themselves! Think, for example, about one of your favorite jokes. Chances are, someone told you that joke and it stuck in your mind. You, in turn, probably told that joke to someone else, and as long as the idea lives in your head and their head, it's going to be replicated — passed along from person to person again and again.

And as we all know very well, the same thing happens with ideas. Whether it's a system of beliefs, a type of political ideology, or a scientific theory, all ideas are passed along through replication. And when you think about it that way, it's actually a marvelous process, especially when you observe its similarities with the genetic reproductive process. Because just like an idea, genetic evolution is based on the existence of a replicator, or— put simply— anything which contributes to itself being copied. For example, a gene which passes on the ability to digest a certain type of food contributes to the health and well-being of an organism. In so doing, it increases that organism's chances of surviving and generating offspring who will inherit and then spread copies of that gene.

But while both knowledge and genetic traits are spread through replication, there is one important difference: knowledge is only replicated when expressed, while genes can be replicated when dormant. And when it comes to knowledge, keeping this in mind is vital. Because if you have an idea, but you simply keep it to yourself, it can never be shared with— or influence the lives of— anyone else. And when you have the power to change the world with your ideas, as each and every one of us do, allowing your ideas to lie dormant is the last thing you want to do!

# Cultures are Defined by Memes

No, not the kind of memes you share on Facebook. (Don't feel silly, I thought so too!) In this case, we're referring to the type of memes which are defined by sociological terminology and they can be best defined as a set of social norms or behaviors that are held to be appropriate for everyone in a certain social context.

In fact, although you might not have thought of them by that name, social memes are present in every facet of our lives. We know, for example, the memes that bind us at school or at our jobs, in our families or with our friends. We identify and follow these memes firstly because someone introduced them to us, but also because it's what we've come to believe is necessary for our acceptance in a certain social group.

And you've probably observed that memes differ from group to group. If, for example, you were to stretch out on top of your desk and go to sleep during a business meeting at work, you would be transgressing against the acceptable memes of your workplace. However, if you simply flopped on the sofa and drifted off whilst having a casual conversation with your family, no one would bat an eye.

And if the differences between social groups even in the same country are so pronounced, it follows naturally that wide variations in social memes is what creates different customs and cultures. But memes also have another impact on culture in that they change depending on whether their cultures are static or dynamic.

In a static culture, for example, memes either do not change at all or they change so slowly that it's almost imperceptible. This might mean clinging to certain standards or traditions that are outdated, toxic, or even harmful, like female genital mutilation or the criminalization of gay marriage. These memes survive because they directly inhibit change through disabling their followers' critical faculties. After all, if one of your definitive



memes is that you do not question authority or challenge the status quo, the meme will survive through the active discouragement of critical thought. That's why "static memes" are often appropriately termed "anti-rational memes."

Dynamic societies, however, are predicated entirely on rational memes which are cultivated through the development of critical thought. In this respect, dynamic memes bear a strong resemblance to the scientific method and their societies are better for it. Both types of memes are crucial for understanding the spread of ideas and the human development of knowledge.

# Systems of Knowledge Develop Incrementally

Think about the way you learned as a child. First, you learned your alphabet. Then you began putting those letters together to make words until you could make sense of them by reading entire sentences. Well, entire systems of knowledge— like our understanding of linguistics, the English language, or scientific thought— develop in exactly the same way.

Even our understanding of language evolved in increments, from a simple system of pictographs, to rules which modified the system of pictographs, making the written word easier to understand and allowing for added freedom of expression. And each of these increments slowly progressed until they reached a major, fundamental step: the leap into universality. That leap occurred when someone hit upon the idea of converting symbols into a more easily identifiable system of meaning. That's how the alphabet was invented.

The beauty of an alphabet is that it can convey not only every word but almost every experience and every possible word in any given language. An alphabet invites connection and the ability to share one's language with someone else. And the same is true of any other universal system, be it a means of written communication, or a system of measurement or a scientific formula. Because one might have to learn another language or study a new method, but once something becomes universally accepted, the creation of endless new forms of knowledge become possible.

# Democratic Decision-Making is Actually Impossible

At first glance, that statement might give you pause; surely that can't be right! But in fact, economist Kenneth Arrow proved this in 1951. Although his theory appears to deny the very existence of democracy as we know it today, in practice, it proved shockingly true. That's because Arrow theorized that group decision-making— the process by which multiple people agree on one thing for the good of a group— is intrinsically irrational.

Arrow set about proving this principle through the creation of five principles that he deemed necessary for the creation of rational and democratic decisions that accurately reflect the will of the people. One of Arrow's fundamental principles is the assertion that true democracy must abolish dictators. In practice, that means that the preference of any one person should never outweigh that of the group.

So, for example, if you prefer steak but all the other members of your party want chicken, insisting that the group must choose steak is a dictatorial move. However, even if the group's official stance is one of privileging chicken over steak, this is still a fallacious representation because it is not true that all members prefer chicken.

Likewise, Arrow suggested that even the truest appearances of group compatibility are false, because if the members of the group have identical preferences, then the group must have those preferences too. If, for example, every individual wants pizza, the group's preference must be for pizza. However, as Arrow asserted, this example involves no real rational or democratic decision-making because it is simply a collective with identical taste.

And although Arrow ultimately won a Nobel Peace Prize for proving that it is fundamentally impossible to align the group's preferences in a way that satisfies all five of his principles, what does this mean for our everyday

lives? Why should you care about his findings? Deutsch posits that we should care because Arrow's theory hit upon a fundamental flaw in our perception of decision-making. Because if we consider decision-making only as a process of selecting from existing options, we eliminate the inherent creativity that should be present at the heart of our decisions! At its core, decision-making should be about creating new options from which to choose or modifying our existing choices so that we have slightly new and better options. Rather than a simple matter of rational or irrational comparison, decision-making should be an exploration of our options and a bold stride towards the best choice.

# Anything is Possible

Most of us were probably told that as kids and most likely, we all believed it. Most likely, we held and cherished that belief until things like reality or the law of physics forced us to believe otherwise. But Deutsch posits that the brilliance of creative thought lies in its ability to exist as the final frontier in which anything really is possible.

Drawing on the philosophies of economist Thomas Malthus as an example, Deutsch cites Malthus' 1789 theory that, by the nineteenth century, humanity would simply stop advancing. No new inventions, no new ideas, no new explorations; instead, humanity would simply come to a grinding, static halt. He based this conclusion on calculations which, at the time, were considered incredibly sound. He had examined the rapid population growth in relation to the planet's ability to keep producing food, and through this analysis, concluded that the earth simply would not support the advance of humanity beyond the nineteenth century.

However, Deutsch observes that Malthus failed to incorporate one fundamental truth: the fact that we do not yet know what we have not yet discovered. And although that might sound a bit nonsensical, consider the advancements of humanity through the ages. At a time when the world was thought to be flat, exploring the oceans seemed impossible. The Wright brothers and early transportation moguls could never have conceived of the advances in transportation we've engineered today.

And while that doesn't make them wrong or foolish, it does brilliantly illustrate the truth of Deutsch's principle. Because we, at any one point in time, cannot comprehend all that remains to be discovered in the future, all that's still out there, waiting to be known, we have to keep believing in the limitless power of human creativity. We can't say that something can never be known or discovered, but rather that we haven't discovered it yet.

# Knowledge Makes Humanity Significant

The famous physicist Stephen Hawking once said that humans are “just a chemical scum on the surface of a typical planet that’s in orbit round a typical star on the outskirts of a typical galaxy.” And maybe he would have been right, if not for one exception: our pursuit of knowledge. Because regardless of one’s beliefs about the worth and origin of humanity, it must be agreed that our pursuit of knowledge— and our ability to transform the world through this pursuit— validates and gives meaning to our existence.

Put simply, we matter because of our resilient and relentless attempts to create something out of nothing. Because it’s through these attempts that we evolved on an inhospitable planet, made a life for ourselves where the Earth was devoid of civilization, and invented science, language, and technology. Although our contributions may seem insignificant when viewed in light of such spectacular cosmic phenomena as eclipses, shooting stars, and stellar explosions, the simple answer is that we ought not attempt to compare them on an equal plane. And when we consider the boundless possibility of all that we do not yet know, who’s to say we might not discover life on another planet one day? Or conquer another solar system? The possibilities are infinite when we invest in the human pursuit of knowledge:

# The Multiverse Theory is Real

If you've ever watched a Marvel movie, you've probably heard of the Multiverse theory. And through this theory, you're aware of the possibility that multiple separate universes might exist within our own, each with their own laws, timelines, and histories. However, quantum theory – the modern physical explanation of particles on an atomic and subatomic scale – posits that this idea isn't at all limited to the fantastical confines of a film.

In fact, according to quantum theory, the very world in which we live is not the definitive summation of existence, but rather one of many other universes. This is where it gets a little trippy, so stick with me as we try to condense quantum physics into a bite-sized explanation. To make it a little easier, let's imagine we're in Star Trek. So, say there are two universes, exact carbon copies of each other. In each of these identical universes, you have the classic Star Trek ship, crew, and transporter, and each universe has the entirety of the galaxy at its disposal. But let's say that, in one universe, one of the transporters glitches. That glitch could cause anything-- a fall, a misfire of some intergalactic weapon, or something as simple as a spilled cup of coffee. Any one of these possibilities could alter the course of that universe's history in ways that are either cataclysmic or infinitesimal.

Maybe, as a result of that glitch, a planet will be destroyed or two people will fall in love or a new friendship will begin through a shared experience. No matter what happens, this goes to show that every day, in every moment, the future of each individual universe is being written through the smallest of actions. And if we were to really dwell on it, we could lose ourselves in these possibilities, couldn't we? As we imagine the infinite possibilities and futures that might exist, we can see that the universe(s) are as limitless as our capacity for imagination.

# We Don't Yet Know What we Don't Know

Remember our earlier chapter, where we talked about the limitlessness of future discoveries? Well, the cool thing is that that concept only scratches the surface. Because while we don't yet know what's still out there to be discovered and we can't assume we've already learned everything, we also have to remember that even the scientific truths we cling to today are not infallible. Why? Because, operating on the principle that anything is possible, we can't say with certainty that our current discoveries comprise final truths. If we do that, we're no different than the scientists who asserted that the world is definitely flat. Because although we might look back on such statements and laugh, the truth is that those early scientists were simply saying what was true for them in their time. And even in our own day, we can only do the same.

Some day, someone may discover something that disproves a scientific "truth" we've held for years. A law by which we define a principle of physics may suddenly be revealed to be unreliable. Just as Isaac Newton or Einstein's discoveries revolutionized their world and field of study for the future, the same will be true of future discoveries in our own time. So, because the future is unforeseeable, we cannot limit ourselves to dwelling in absolutes or anything that draws on an assumption of our own infallibility. Instead, we must fill our minds with wonder and conjecture as we look to the future, never forgetting that all scientific discovery originated because someone wondered about what they didn't yet know.



## Final Summary

From our first breaths, we spend our lives in pursuit of knowledge. We likewise spend a sizeable portion of our lives in education and internalize the message that we're meant to find the "right" answer, to know laws and rules and formulas. And while the investment of a good education is invaluable, we must never forget the vitality of pursuing knowledge. Because knowledge isn't afraid of getting the wrong answer or not knowing something. In pursuit of knowledge, we stretch boldly toward that which we don't know, and in so doing, we change the world.



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