

"*Sum* is terrific. The inventiveness, the clarity and wit of the prose, the calm air of moral understanding . . . add up to something completely original."

—PHILIP PULLMAN, author of *The Golden Compass*

SUM

FORTY TALES FROM
THE AFTERLIVES

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DAVID EAGLEMAN

SUM

Forty Tales from the Afterlives

David Eagleman



VIKING CANADA

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In the afterlife you relive all your experiences, but this time with the events reshuffled into a new order: all the moments that share a quality are grouped together.

You spend two months driving the street in front of your house, seven months having sex. You sleep for thirty years without opening your eyes. For five months straight you flip through magazines while sitting on a toilet.

You take all your pain at once, all twenty-seven intense hours of it. Bones break, cars crash, skin is cut, babies are born. Once you make it through, it's agony-free for the rest of your afterlife.

But that doesn't mean it's always pleasant. You spend six days clipping your nails. Fifteen months looking for lost items. Eighteen months waiting in line. Two years of boredom: staring out a bus window, sitting in an airport terminal. One year reading books. Your eyes hurt, and you itch, because you can't take a shower until it's your time to take your marathon two-hundred-day shower. Two weeks wondering what happens when you die. One minute realizing your body is falling. Seventy-seven hours of confusion. One hour realizing you've forgotten

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someone's name. Three weeks realizing you are wrong. Two days lying. Six weeks waiting for a green light. Seven hours vomiting. Fourteen minutes experiencing pure joy. Three months doing laundry. Fifteen hours writing your signature. Two days tying shoelaces. Sixty-seven days of heartbreak. Five weeks driving lost. Three days calculating restaurant tips. Fifty-one days deciding what to wear. Nine days pretending you know what is being talked about. Two weeks counting money. Eighteen days staring into the refrigerator. Thirty-four days longing. Six months watching commercials. Four weeks sitting in thought, wondering if there is something better you could be doing with your time. Three years swallowing food. Five days working buttons and zippers. Four minutes wondering what your life would be like if you reshuffled the order of events. In this part of the afterlife, you imagine something analogous to your Earthly life, and the thought is blissful: a life where episodes are split into tiny swallowable pieces, where moments do not endure, where one experiences the joy of jumping from one event to the next like a child hopping from spot to spot on the burning sand.

Descent of Species

In the afterlife, you are treated to a generous opportunity: you can choose whatever you would like to be in the next life. Would you like to be a member of the opposite sex? Born into royalty? A philosopher with bottomless profundity? A soldier facing triumphant battles?

But perhaps you've just returned here from a hard life. Perhaps you were tortured by the enormity of the decisions and responsibilities that surrounded you, and now there's only one thing you yearn for: simplicity. That's permissible. So for the next round, you choose to be a horse. You covet the bliss of that simple life: afternoons of grazing in grassy fields, the handsome angles of your skeleton and the prominence of your muscles, the peace of the slow-flicking tail or the steam rifling through your nostrils as you lope across snow-blanketed plains.

You announce your decision. Incantations are muttered, a wand is waved, and your body begins to metamorphose into a horse. Your muscles start to bulge; a mat of strong hair erupts to cover you like a comfortable blanket in winter. The thickening and lengthening of your neck immediately feels

normal as it comes about. Your carotid arteries grow in diameter, your fingers blend hoofward, your knees stiffen, your hips strengthen, and meanwhile, as your skull lengthens into its new shape, your brain races in its changes: your cortex retreats as your cerebellum grows, the homunculus melts man to horse, neurons redirect, synapses unplug and replugin on their way to equestrian patterns, and your dream of understanding what it is like to be a horse gallops toward you from the distance. Your concern about human affairs begins to slip away, your cynicism about human behavior melts, and even your human way of thinking begins to drift away from you.

Suddenly, for just a moment, you are aware of the problem you overlooked. The more you become a horse, the more you forget the original wish. You forget what it was like to be a human wondering what it was like to be a horse.

This moment of lucidity does not last long. But it serves as the punishment for your sins, a Promethean entrails-pecking moment, crouching half-horse half-man, with the knowledge that you cannot appreciate the destination without knowing the starting point; you cannot revel in the simplicity unless you remember the alternatives.

And that's not the worst of your revelation. You realize that the next time you return here, with your thick horse brain, you won't have the capacity to ask to become a human again. You won't understand what a human is. Your choice to slide down the intelligence ladder is irreversible. And

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just before you lose your final human faculties, you painfully ponder what magnificent extraterrestrial creature, enthralled with the idea of finding a simpler life, chose in the last round to become a human.

Spirals

In the afterlife, you discover that your Creator is a species of small, dim-witted, obtuse creatures. They look vaguely human, but they are smaller and more brutish. They are singularly unintelligent. They knit their brows when they try to follow what you are saying. It will help if you speak slowly, and it sometimes helps to draw pictures. At some point their eyes will glaze over and they will nod as though they understand you, but they will have lost the thread of the conversation entirely.

A word of warning: when you wake up in the afterlife, you will be surrounded by these creatures. They will be pushing and shoving in around you, rubbernecking, howling to get a look at you, and they will all be asking you the same thing: *Do you have answer? Do you have answer?*

Don't be frightened. These creatures are kind and innocuous.

You will probably ask them what they are talking about. They will knit their brows, plumbing your words like a mysterious proverb. Then they will timidly repeat: *Do you have answer?*

Where the heck am I? you may ask.

A scribe faithfully marks down your every word

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for future record. Mother and daughter creatures peer out at you hopefully from observation decks.

To understand where you are, it will help to have some background.

At some point in the development of their society, these creatures began to wonder: *Why are we here? What is the purpose of our existence?* These turned out to be very difficult questions to answer. So difficult, in fact, that rather than attacking the questions directly, they decided it might be easier to build supercomputing machines devoted to finding the answers. So they invested the labor of tens of generations to engineer these. We are their machines.

This seemed a clever strategy to the elders of their community. However, they overlooked a problem: to build a machine smarter than you, it has to be more complex than you—and the ability to understand the machine begins to slip away.

When you wear out and stop functioning, your software is re-uploaded into their laboratory so they can probe it. This is where you awaken. And as soon as you make your first sound they crowd around you to learn one thing: *Do you have answer?*

They don't realize that when they dropped us into our terrarium, we didn't waste a moment: we built societies, roads, novels, catapults, telescopes, rifles, and every variety of our own machines. They have a hard time detecting this progress of ours, much less understanding it, because they simply can't follow the complexity. When you try to explain to them what has happened, they cannot keep up with your rapid and unfathomable speech, so they set about

their dim-witted nodding. It makes them sad, and the most insightful among these creatures can sometimes be seen weeping in the corners, because they know their project has failed. They believe we have deduced the answer but are too advanced to communicate it at their level.

They don't guess that we have no answers for them. They don't guess that our main priority is to answer these questions for ourselves. They don't guess that we are unable, and that we build machines of increasing sophistication to address our own mysteries. You try to explain this to the creatures, but it is fruitless: not only because they don't understand you, but also because you realize how little you understand about our machines.

Death Switch

There is no afterlife, but a version of us lives on nonetheless.

At the beginning of the computer era, people died with passwords in their heads and no one could access their files. When access to these files was critical, companies could grind to a halt. That's when programmers invented death switches.

With a death switch, the computer prompts you for your password once a week to make sure you are still alive. When you don't enter your password for some period of time, the computer deduces you are dead, and your password is automatically emailed to the second-in-command. Individuals began to use death switches to reveal Swiss bank account numbers to their heirs, to get the last word in an argument, and to confess secrets that were unspeakable during their lifetime.

It soon became appreciated that death switches provided a good opportunity to say good-bye electronically. Instead of sending out passwords, people began programming their computers to send emails to their friends announcing their own death. "It appears I'm dead now," the email would begin. "I'll take this as an opportunity to tell you things I've always wanted to express . . ."

Soon enough, people realized they could program messages to be delivered on dates in the future: "Happy 87th birthday. It's been twenty-two years since my death. I hope your life is proceeding delightfully."

With time, people began to push death switches further. Instead of confessing their death in the emails, they pretended they were not dead at all. Using auto-responder algorithms that cleverly analyzed incoming messages, a death switch could generate apologetic excuses to turn down invitations, to send congratulations on a life event, and to claim to be looking forward to a chance to see someone again soon.

Today, building a death switch to pretend you are not dead has become an art form. Death switches are programmed to send a fax occasionally, make a transfer between bank accounts, or make an online purchase of the latest novel. The most sophisticated switches reminisce about shared adventures, exchange memories about a good escapade, swap inside jokes, brag about past feats, and summon up lifetimes of experience.

In this way, death switches have established themselves as a cosmic joke on mortality. Humans have discovered that they cannot stop Death, but at least they can spit in his drink.

This began as a good-spirited revolution against the grave's silence. The problem for those of us still living, however, is the increasing difficulty in determining who's dead and who's alive. Computers operate around the clock, sending out the social intercourse of the dead: greetings, condolences, invi-

tations, flirtations, excuses, small talk, inside jokes—codes between people who know each other well.

And it is clear now where this society is going. Most people have died off, and we are some of the few remaining. By the time we die and our death switches are triggered, there will be nothing left but a sophisticated network of transactions with no one to read them: a society of emails zipping back and forth under silent satellites orbiting a soundless planet.

So an afterlife does not exist for us per se, but instead an afterlife occurs for that which exists between us. When an alien civilization eventually bumps into Earth, they will immediately be able to understand what humans were about, because what will remain is the network of relationships: who loved whom, who competed, who cheated, who laughed together over road trips and holiday dinners. Each person's ties to bosses, brothers, and lovers are etched into the electronic communiqués. The death switches simulate the society so completely that the entire social network is reconstructable. The planet's memories survive in zeros and ones.

This situation allows us indefinitely to revisit shared jokes, remedy lost opportunities for a kind word, and recall stories about delightful Earthly experiences that can no longer be felt. Memories now live on their own; no one forgets them or grows tired of telling them. We are quite satisfied with this arrangement, because reminiscing about our glory days of existence is perhaps all that would have happened in an afterlife anyway.

Encore

Although the concept of the afterlife is quite old, its full-scale implementation has only gotten into swing in the last century. The afterlife existed before then, but only barely.

To understand this, you need to be aware that your Creators are talented at just that—creation—but they're not involved with the observation and judgment of our actions, as we had previously supposed them to be. The Creators watch none of the details as our lives unfold. They could not care less. Only afterward do they become interested again, when they have the opportunity to do what they do best: create. At this second stage, they are called Re-Creators, and their goal is to find all available records of your life and create a simulation of you, reconstructing all your days. They take it as their challenge to see if they can recover a good likeness of you from the piles of evidence you've left behind.

They begin by tracking down your birth, marriage, and death records. For most people, the afterlife started only a few hundred years ago, when record keeping began. They then take account of the phone company records: every call you made and to whom. Every credit card purchase is retrieved and

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analyzed for time, location, and purchase. The Re-Creators analyze every existing frame of video footage on the planet for your every appearance: buying coffee at a convenience store, standing in front of an ATM withdrawing money, clutching a diploma, walking unwittingly in the background of other people's home videos, eating a hot dog in the bleachers during a basketball game.

They're artists of information, and each data point adds a bit more pigment to their accumulating portrait of you. Each detail is marked with a confidence rating for the source and checked for consistency against the other data points. Millions of facts are gathered, facts so richly structured and interconnected that they constitute a hard shell that retains your shape when you disappear from the middle of it.

From school records, the Re-Creators closely approximate what pieces of knowledge you had at a particular moment in your life. This information is neatly dovetailed with detailed historical records. They re-create what you were likely to have seen around you each day and, by examining your newspaper subscriptions, they model the world events that would have affected you.

From deep within this jungle of data they can deduce the exact dates of your various relationships: when they began, when they ended, and whether they overlapped. The Re-Creators come to understand you from every form you filled out, every word you typed on the Internet, the mail you received from others: why people thank you, who chastises you, what advice your lovers seek, what

favors your friends ask. Which mailing lists you're on. Your tax returns.

In previous generations, when you awoke in the afterlife, it was easy to tell that you were merely a simulation, because your details were so sparse. The feeling of emptiness on most days allowed you to know that you were a cheap reproduction of your former self. But with today's rich data, the Re-Creators can reconstruct you so seamlessly that your afterlife is essentially a perfect replica of the original. It feels so much like the real thing that in the afterlife you only rarely wonder whether you've lived all this before, haunted occasionally by *déjà vu*, holding a book in your hand and not knowing whether this is the first time or a replay from aeons past.

Narcissus

In the afterlife you receive a clear answer about our purpose on the Earth: our mission is to collect data. We have been seeded on this planet as sophisticated mobile cameras. We are equipped with advanced lenses that produce high-resolution visual images, calculating shape and depth from wavelengths of light. The cameras of the eyes are mounted on bodies that carry them around—bodies that can scale mountains, spelunk caves, cross plains. We are outfitted with ears to pick up air-compression waves and large sensory sheets of skin to collect temperature and texture data. We have been designed with analytic brains that can get this mobile equipment on top of clouds, below the seas, onto the moon. In this way, each observer from every mountaintop contributes a little piece to the vast collection of planetary surface data.

We were planted here by the Cartographers, whose holy books are what we would recognize as maps. Our calling is to cover every inch of the planet's surface. As we roam, we vacuum data into our sensory organs, and it is for this reason only that we exist.

At the moment of our death we awaken in the debriefing room. Here our lifetime of data collection

is downloaded and cross-correlated with the data of those who have passed before us. By this method, the Cartographers integrate billions of viewpoints for a dynamic high-resolution picture of the planet. They long ago realized that the optimal method for achieving a planet-wide map was to drop countless little rugged mobile devices that multiply quickly and carry themselves to all the reaches of the globe. To ensure we spread widely on the surface, they made us restless, longing, lusty, and fecund.

Unlike previous mobile-camera versions, they built us to stand, crane our necks, turn our lenses onto every detail of the planet, become curious, and independently develop new ideas for increased mobility. The brilliance of the design specification was that our pioneering efforts were not prescribed; instead, to conquer the unpredictable variety of landscapes, we were subjected to natural selection to develop dynamic, unforeseen strategies. The Cartographers do not care who lives and dies, as long as there is broad coverage. They are annoyed by worship and genuflection; it slows data collection.

When we awaken in the giant spherical windowless room, it may take a few moments to realize that we are not in a heaven in the clouds; rather, we are deep at the center of the Earth. The Cartographers are much smaller than we are. They live underground and are averse to light. We are the biggest devices they could build: to them we are giants, large enough to jump creeks and scale boulders, an impressive machine ideal for planetary exploration.

The patient Cartographers pushed us out onto a

spot on the surface and watched for millennia as we spread like ink over the surface of the planet until every zone took on the color of human coverage, until every region came under the watchful gaze of the compact mobile sensors.

Estimating our progress from their control center, the mobile camera engineers congratulated themselves on a job well done. They waited for humans to spend lifetimes turning their data sensors on patches of ground, the strata of rocks, the distribution of trees.

And yet, despite the initial success, the Cartographers are profoundly frustrated with the results. Despite their planetary coverage and long life spans, the mobile cameras collect very little that is useful for cartography. Instead, the devices turn their ingeniously created compact lenses directly into the gazes of other compact lenses—an ironic way to trivialize the technology. On their sophisticated sensory skin, they simply want to be stroked. The brilliant air-compression sensors are turned toward the whispers of lovers rather than critical planetary data. Despite their robust outdoor design, they have spent their energies building shelters into which they cluster with one another. Despite good spreading on large scales, they clump at small scales. They build communication networks to view pictures of one another remotely when they are apart.

Day after day, with sinking hearts, the Cartographers scroll through endless reels of useless data. The head engineer is fired. He has created an engineering marvel that only takes pictures of itself.

Blueprints

We look forward to finding out answers in the afterlife. We're in luck. In the afterlife we are granted the ultimate gift of revelation: an opportunity to view the underlying code.

At first we may be shocked to watch ourselves represented as a giant collection of numbers. As we go about our normal business in the afterlife, in our mind's eye we can see the massive landscape of numbers, stretching to sight's limit in all directions. This set of numbers represents every aspect of our lives. Across its vast plains we spot islands of sevens, jungles of threes, branching rivers of zeros. The size and richness are breathtaking.

As you interact with a lover, you can see her numbers as well, and her interactions with yours. She endearingly sticks out her bottom lip for attention, and your numbers cascade into acrobatics. Digits flip their values like waterfalls. As a result, your eyes lock on to hers, and amorous words form on your lips and travel from your throat in air-compression waves. As she processes the words, her numbers flip, waves of change rippling through her system. She returns your affection, as dictated by the state of her numbers.

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My goodness, you realize on your first afternoon here: This is totally deterministic. Is love simply an operation of the math?

After watching enough code, a new notion of agency and responsibility dawns. You watch and understand all the signals that lead to a driver stomping on her brakes as her numbers are changed by the numbers of the cat walking in front of the wheels; you can even see the code of the fleas that leap off when the cat leaps. Whether the cat is struck or not struck, you now understand, was not in anyone's control; it was all in the numbers, married together in a gorgeous inevitability. But we also come to understand that the network of numbers is so dense that it transcends simple notions of cause and effect. We become open to the wisdom of the flow of the patterns.

If you assume this gift of revelation is received in Heaven, you're only half right; it is also the punishment designed for you in Hell. The Rewarders originally thought to offer it as a gift, but the Punishers quickly decided they could leverage it as a kind of affliction, drying up life's pleasures by revealing their bloodlessly mechanical nature.

Now the Rewarders and Punishers are in a battle to determine which of them gets more benefit out of this tool. Will humans appreciate the knowledge or be tortured by it?

The next time you are pursuing a new lover in the afterlife, perhaps sharing a bottle of wine after what appeared to be a chance encounter, don't be surprised if both a Rewarder and a Punisher sneak up

behind you. The Rewarder whispers into one of your ears, *Isn't it wonderful to understand the code?* The Punisher hisses into your other ear, *Does understanding the mechanics of attraction suck all the life out of it?*

Such a scene is typical of the afterlife, and illustrates how much both parties have overestimated us. This game always ends in disappointment for both sides, who are freshly distraught to learn that being let into the secrets behind the scenes has little effect on our experience. The secret codes of life—whether presented as a gift or a burden—go totally unappreciated. And once again the Rewarder and the Punisher skulk off, struggling to understand why knowing the code behind the wine does not diminish its pleasure on your tongue, why knowing the inescapability of heartache does not reduce its sting, why glimpsing the mechanics of love does not alter its intoxicating appeal.