

A NOVEL
BY THE AUTHOR
OF *EINSTEIN'S
DREAMS*

Mr g

ALAN

LIGHTMAN

Mr g

A Novel About the Creation

ALAN LIGHTMAN



Pantheon Books New York

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Library of Congress Cataloging-in-Publication Data

Lightman, Alan P., [date]

Mr g: a novel about the creation / Alan Lightman.

p. cm.

eISBN 978-0-307-90704-2

1. God—Fiction. 2. Creation—Fiction. 3. Evolution—Fiction. 4. Universe—Fiction. I. Title. II. Title: Mister g: a novel about the creation.

PS3562.I45397M7 2011 813'.54—dc22 2011000095

www.pantheonbooks.com

Cover design by Rodrigo Corral Design

Book design by Virginia Tan

First Edition

v3.1

This book is dedicated to my brother

Ronnie Lightman

(1951–2010)

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Time

As I remember, I had just woken up from a nap when I decided to create the universe.

Not much was happening at that time. As a matter of fact, time didn't exist. Nor space. When you looked out into the Void, you were really looking at nothing more than your own thought. And if you tried to picture wind or stars or water, you could not give form or texture to your notions.

Those things did not exist. Smooth, rough, waxy, sharp, prickly, brittle—even qualities such as these lacked meaning. Practically everything slept in an infinite torpor of potentiality. I knew that I could make whatever I wanted. But that was the problem. Unlimited possibilities bring unlimited indecision. When I thought about this particular creation or that, uncertain about how each thing would turn out, I grew anxious and went back to sleep. But at a particular moment, I managed ... if not exactly to sweep aside my doubts, at least to take a chance.

Almost immediately, it seemed, my aunt Penelope asked me why I would want to do such a thing. Wasn't I comfortable with the emptiness just as it was? Yes, yes, I said, of course, but ... You could mess things up, said my aunt. Leave Him alone, said Uncle Deva. Uncle Deva toddled over and stood beside me in his dear way. Please don't tell me what to do, retorted my aunt. Then she turned and stared hard at me. Her hair, uncombed and knotted as usual, drooped down to her bulky shoulders. Well? she said, and waited. I never liked it when Aunt Penelope glowered at me. I think I'm going to do it, I finally said. It was the first decision I made in eons of unmeasured existence, and it felt good to have decided something. Or rather to have decided that something had to be done, that a change was in the offing. I had chosen to replace nothingness with something. Something is not nothing. Something could be anything. My imagination reeled. From now on, there would be a future, a present, and a past. A past of nothingness, and then a future of something.

In fact, I had just created time. But unintentionally. It was just that my resolution to act, to make things, to put an end to the unceasing absence of happenings, required time. By deciding to create something, I had pressed an arrow into the shapeless and unending Void—an arrow that pointed in the direction of the future. Henceforth, there would be a before and an after, a continuing stream of successive events, a movement away from the past and towards the future—in other words, a journey through time. Time necessarily came before light and dark, matter and energy, even space. Time was my first creation.

Sometimes, the absence of a thing is not noticed until it is present. With the invention of time, events that had once merged together in one amorphous clot began to take shape. Each event could now be enveloped by a slipcover of time, separating it from all other events. Every motion or thought or the slightest happenstance could be ordered and placed exactly in time. For example, I realized that I had been sleeping for a very long time. And near me—but I couldn't say how near, because I had not yet created space—Aunt Penelope and Uncle Deva had also been sleeping, their loud snores rising and falling like something or other, the tossings and turnings unfolding in time. And their interminable bickering could now be

identified with moments of wakefulness, which in turn could be understood as taking place between periods of sleep. I refused to think how much time I had wasted. In fact, we had slept in a kind of pleasant amnesia, a swoon, an infinite senselessness. In various ways, had we not luxuriated in the unstructured Void, unaccountable for our actions? Yes, unaccountable. Because without time, there could be no reactions to actions, no consequences. Without time, decisions need not be considered for their implications and effects. We had all been drifting in a comfortable Void without responsibilities.

See, my aunt complained when it became apparent that we were now conscious of time. She told you that you would mess things up. She shot Uncle a look of disapproval, as if he had encouraged me to act as I had, and then she began an unhappy summary of the various things that she had done and not done during the immediate past, then during the past before that, and so on, back and back through the now visible chasms of time, until Uncle begged her to stop. You should never have created the past and the future, she said. We were happy here. See, now I must say *were*, when before ... Oh! There it is again. It was nicer when everything happened at once. I can't stand to think about the future. But don't you think that we have some responsibility to the future? I suggested. To all the things and beings I might create. Nonsense, shrieked Aunt Penelope. What a foolish argument. You have no responsibility for things that don't yet exist and won't ever exist if you could just keep your big thoughts to yourself. But it's too late now, she went on. I can feel time. I can feel the future. She had gotten herself into one of her states, and the Void twisted and throbbed with her displeasure. Gently, Uncle caressed her. For the first time ever, she responded to his touch. Her ranting diminished. Soon after, she realized that her hair needed combing, and that was the beginning of something and probably all for the best.

The Void

Time trickled by for certain periods and intervals. At other moments, it gushed ahead, flew headlong into the future, then braked and slowed again to a trickle. Having created time, I had not decided whether it should flow uniformly or in fits and starts. But the matter was more nettlesome than that. Since I had not yet created clocks, one could not say what constituted a smooth versus a choppy passage of time. There was nothing to measure it by. Perhaps the movement of time might even be relative to the observer. Or perhaps it could be only perception. At the beginning, all any of us knew for sure was that time flowed. I didn't feel like committing myself right away to one possibility or the other—I had been pondering it as much as it was—so I decided to decide the texture of time at a future date.

Whether smooth or choppy, the creation of time had already altered the Void. Before time, we did not move through the Void so much as we experienced it all at once. Or rather, the Void clung to our beings, the Void contained our thoughts, the Void constituted the nothingness against which our somethingness existed. After time, the Void remained an infinite and unchanging emptiness, but now one could travel through it as well as think it. One could say that one had been at a particular place of the Void at one moment and another place at a later moment. Not that the Void had signposts or markers to designate definite locations—the Void was perfectly smooth, empty, and without any shape—but we understood that such locations existed in principle, and we could pass from one to the other over a period of time. And even though the Void was empty, totally empty, at various moments we could glimpse the faintest of features—wispy draperies, veils, gossamer ridges, valleys of nothingness—that would briefly appear and then disappear. Such elusive structures arose between the seams of the many layers of nothingness packed on top of one another where they did not fit precisely together. If one began moving towards a particular of these evanescent topographies, it would vanish in short order but nevertheless provide a momentary route of travel, a fleeting destination, a temporary break from the complete formlessness of the Void.

I spent great swaths of time moving through the Void. Although empty, the Void constantly beckoned with its infinite wells of possibilities. I would travel in a certain direction for a long time, moving through vapors of nothingness, then suddenly decide I wanted to explore new territory and would turn to the right or to the left and travel for a long period in another direction. Occasionally, I would do an about-face and go back the way I had come, traveling for extremely long durations through one empty place and then another and another. Frequently, I had no particular destination in mind but was merely following a natural curiosity to understand how the Void had been transformed by time. Sometimes, I would play games with myself, pretending to be lost, and I would identify my position not by my innate knowledge but by estimating the amount of time passed in various directions and performing geometrical calculations. I once moved around in a spiral of ever-increasing diameter, passing near places I had passed before, virtually the same emptiness but with the most subtle changes in each repetition, minute alterations in the vacuum brought about by the

lapsing of time. Sometimes I would stop altogether and just admire the quiet beauty of the Void, the serenity, the unending pilasters and balustrades of nothingness. I could never gauge the actual distance traversed in any of these outings, since space didn't exist, but I knew the vast amounts of time had transpired. At various moments, Aunt or Uncle would appear from behind a billowing veil of the Void, we would register surprise at having encountered each other, say hello, and go our separate ways. Such chance meetings, requiring a before and an after, never happened before the creation of time.

I can say that my long treks through the Void were pleasing. I liked being in motion, going from one place to another. With movement, I felt a heightened intensity of existence and being. And the emptiness had a way of accumulating as I traveled, the clouds and vapors of nothingness sticking to me in increasing numbers, so that I had the sensation of being cloaked by an ever-thickening garment of soft cushions. I certainly had an utter vacuum in which to think. Given that the Void was total and complete emptiness, I proceeded to fill it with my thoughts, and those thoughts served as signposts of a kind. Here is where I had the idea of the universal ratio of circumference to diameter, the number π . Over there is where I had the notion of a spectrum of colors. And so forth. The Void served as a gracious receptacle for my thoughts. It was my playground of ideas.

Then there was music. The Void had always vibrated with the music of my thoughts, but before the existence of time the totality of sounds occurred simultaneously, as if a thousand thousand notes were played all at once. Now we could hear one note following another, cascades of sound, arpeggios and glissades. We could hear melodies. We could hear rhythmic and metrical phrases gathering up time in lovely folds of sound. Duples and triples and offbeat syncopations. As we moved through the Void, all of us—Aunt Penelope, Uncle Dev and I—were transfixed by the most exquisite sounds, the tender and melodic and rapturous oscillations of the Void.

Much of the music I devised from a scale with a fixed ratio of frequencies, generally $2^{1/2}$ since exponential powers of that number came closest to ratios of small integers like 3:2 and 4:3. Chords based on these scales were pleasing to hear. But I also experimented with quarter-tone ratios, nonharmonic ratios, and even scales with variable ratios, and these also produced beautiful music as long as two different notes were not sounded together. By varying the intensity of harmonics of each tone, I created an infinite variety of sounds.

In every place and in every moment, we were wrapped and engulfed in music. At times the music poured forth in fierce heaving swells. At other times, it advanced in the softest little steps, delicate as a fleeting veil in the Void. Music clung to our beings as parcels of emptiness had in the past. Music went inside us. I had created music, but now music created it lifted and remade and formed a completeness of being.

Space

I had in mind a great number of things I wanted to make. But with no previous experience with materiality, I could think of these things only in terms of their functions or qualities: the quantification of time, communication, light, shelter, et cetera. Soon I grew tired of these abstractions. I wanted to touch and to feel. After all, I had been sleeping for a very long time. And I might add that I needed something new to interest me, a challenge, perhaps even other beings to surprise and amuse me. My ideas, for both animate and inanimate inventions, required material existence, extension, volume. And for that I needed to create space.

Space did not appear all at once, but in a languorous progression, gradually increasing in length, width, and breadth. (I had toyed with various numbers of dimensions. Two seemed unnecessarily confining, suffocating in fact, while four or more struck me as extravagant and could lead to the misplacing of small objects. I decided my first try should be three.) As I recall, space first appeared in a minuscule round bubble that sat quietly in my mind. Then it stretched slightly in length, humming at a high pitch as it did so. For a time, the universe was a tiny ellipsoid. Slowly, breadth and width began to catch up with length, making a impatient, clucking sound. Sphericity was restored. Then, with a sigh and a low rumble, all three dimensions began to unravel at once, tumbling and sprawling into the Void.

My universe had come into being! It was tiny at first, but beautiful, a lovely little sphere. Its surfaces were smooth and silky, yet infinitely strong. It glistened. It spun slightly. And it vibrated with energy. I found that I could not create space without energy—the two were inextricably bound, as if one gave form to the other. The energy howled and struggled to break out of those smooth, silky walls, but it could not, since those walls contained all that was (except for me, Aunt, and Uncle), and it was a mathematical and tautological impossibility for anything from within to emerge without. Only the Void remained outside those walls. In its continual battle to escape the inescapable, the energy seethed and boiled at a ferocious temperature, it distorted the walls, stretched them first in one direction and then another. And then, as if in frustration, it set about stretching space itself, warping diameters and circumferences, angles and curves—contorting the very mathematics of space. The geometry, responding to the fierce stresses and strains, began to emit its own piercing hum, and the two—energy and geometry—fought with each other in a shrill screech, first the mesas and terraces of space muscling the energy by brute force, and then the energy striking back and reshaping the architecture of space. As the combat ensued, the tiny sphere that was the universe began inflating at an alarming speed.

Aunt Penelope, who in a rare moment had been quietly brushing her hair, was knocked over by the expanding sphere. Save me, she screamed to Uncle Deva, overdramatizing the situation as she often did. Uncle helped right her and steadied her. What was that thing? she shouted. The impertinence! Then, without thanking Uncle, she stomped off into the Void. Even though she had disappeared behind the folds and pleats of the vacuum, I could hear my aunt muttering: What's He done now! There's no end to this, no end. No end to this. No end. No end to this. No end ...

Meanwhile, my universe was growing larger and larger. Once created, it seemed determined to become as fat as it could. I decided to make another. This one, I slightly pricked at the moment it came into existence, just the smallest of flicks to see what a slight alteration would bring. The little sphere began expanding like the previous universe, but after a few moments its expansion coasted to a halt, it briefly hovered in a fleeting equilibrium, then it began contracting and dwindling in size, getting smaller and smaller until it was just the tiniest dot. Then, with a faint pop, it disappeared altogether. I was delighted. I made other universes. With each one, I tried a different variation. To some, I gave a slight lateral nudge. To others, a bit of extra spin. Some I squeezed just at the moment of creation, to add a smidgeon of energy. In some, I even altered the number of dimensions of space: four, five, seven, sixteen, to see what might happen. And why not try fractional dimensions, like 13. Some universes never came into being, unable to accommodate all the initial conditions. Some leaped into existence with a frightening energy and then petered out. Some remained flaccid from the beginning; others careered through the Void, producing high-pitched trills and vibratos. One universe remained constant in size but spun faster and faster until it split apart at its midsection. Several began expanding, then contracted down to almost nothing, hesitated, and expanded again in a kind of frothy rebirth—then repeated the entire cycle: expansion, contraction, expansion, contraction, on and on in an unending series of births, deaths, destructions, and rebirths.

After a time, a gigantic number of universes were flying about—spinning on their axes, throbbing and pulsing, expanding and contracting at fantastic speed. My aunt was nowhere to be seen. Uncle Deva, as sympathetic as he was to my enterprise, had ducked for cover. In short order, as seemed almost inevitable, some of the universes began colliding with others. Each collision made a terrific explosion, sending fragments of worlds hurtling through the Void, oscillating dimensions, fractured energies.

It occurred to me that I had not carefully considered whether I should make one universe or many. Perhaps I should have been more circumspect. One universe would avoid the possibility of collisions, but then again it might become boring. One universe would have one truth. Many would have many truths. There were advantages and disadvantages to both propositions.

I sat down, centered myself, and began mulling over the matter. Then I meditated. I tried to let all thoughts flow from my mind. I breathed in the Void, breathed out the Void. Breathed in the Void, breathed out the Void. Slowly, I grew calm. A peace spread over the Void. Aunt and Uncle appeared as tiny lights, dancing together to a waltz in andante, and the peace descended on them as well, and the Void settled and sighed and drifted in unwinding time. I breathed in and I breathed out and I came to the decision that there should be one. One, one universe, and the myriad temporal universes that I had made faded and dissolved, and the one universe remained.

And then, while still meditating, I decided to create quantum physics. Although I keenly appreciated the certainty of logic and clear definition, I also felt that the sharp edges of existence needed some rounding. I wanted a bit of artistic ambiguity in my creations, measured diffusion. Perhaps quantum physics invented itself. It was gorgeous in mathematical terms. And subtle. As soon as I had created quantum physics, all objects—even though objects at that point existed only in my mind—billowed out and swelled into a haze of

indefinite position. All certainties changed into probabilities, and my thoughts bifurcated into dualities: yes and no, brittle and supple, on and off. Henceforth, things could be hither and yon at the same time. The One became Many. And a great softening blanket of indeterminacy wrapped itself over the Void. My breathing slowed to a sleep of imperceptibility. Listening carefully, I could hear a billion billion tiny rattles and tinkles from all over the Void, the sound of new universes waiting to be. With the invention of quantum, each point of the Void had developed the potential to become a new universe, and that potentiality could not be denied. My creation of time, and then space, had made a universe possible—and that possibility alone, nestled within the quantum foam of the Void, was sufficient to bring into being an infinite number of universes. Soon, new universes were once again whizzing through the vacuum. I revised my earlier decision that there should be only One. Or, more precisely, my creation of quantum physics necessarily required the Many. Peering out into the Void, I tried to find my original universe, the first one I'd made. But it was hopelessly lost among billions and billions of others flying about, throbbing spheres and distended ellipsoids, gyrating cosmoses thrashing with energy. The Void trembled with rumbles and shrieks and sharp popping noises.

By and by, Aunt Penelope emerged from her hiding place, Uncle Deva from his. You've been busy, said Uncle, looking with mild annoyance at the many universes flying about. If you were you, I wouldn't get attached to any of them. You'll just be disappointed. I took Uncle's comment under advisement. Already, I was rather fond of some of the expanding spheres.

What's in those things, anyway? asked Aunt Penelope. Space, I answered. Umph, she said. Well now that we have space, I'd like, please, a chair to sit down on. I've been standing for a very long time. So I made a chair for Aunt Penelope. That chair was my first creation of matter. It had three curved legs and an octagonal back, and I'd designed it to be comfortable but not too comfortable. My aunt sat down on it without comment.

Far more awaited. I wanted to make more matter. I wanted to make galaxies and stars. I wanted to make planets. I wanted to make living creatures, and minds. But for the moment, I sat and I meditated and I gazed with contentment at the empty but vibrating universes I had made.

A Stranger Appears in the Void

I meditated. I did meditate. I am meditating. I will meditate.

Although I had emptied my mind of thoughts, I was still conscious of the new universes flying about. I could feel the presence of the pulsating spheres, I could feel the volume and space within them. More importantly, I could feel the *potential* of space now scattered throughout the Void. While I drifted in my meditative state, I was no longer drifting through a shapeless and timeless Void, but a Void now tessellated with time and with space. The emptiness shimmered with possibilities, each tiny volume trembling with a nebulous version of everything that could possibly be, everything I might eventually create. It was a pressure, a weight, a low humming sound. And I had changed myself as well as the Void. A great *unfolding* had taken place within my being, as if every degree of consciousness had multiplied into a thousand degrees of consciousness, every possible action had branched into a thousand possible actions. With the new quantum reality, I was exquisitely aware of the fantastical number of possible decisions and possibilities at each point of existence, each with its own consequences leading to an infinite chain of potentialities. Henceforth, when I decided to create a thing, I would necessarily need to create not only that thing but every conceivable variation of the thing, each with its own probability. Existence was now multiplicity. These new sensations and realities were not unpleasant, but they did require certain adaptations and allowances.

When I finally emerged from my meditations, a stranger was standing beside me. And behind him, another creature, a fat and squat being whose countenance seemed frozen in a grin. In the unending expanse of existence, there had never been anyone other than myself, Aunt Penelope, and Uncle Deva. I was pleased to have another being to talk to, yet I was not accustomed to meeting things I had not made.

“Good day,” said the stranger. “If I might take the liberty of using that expression. It will come with future creations.”

“I have not invited you here,” I said.

The stranger nodded, an acknowledgment of my comment but without any apology. He was tall and thin, and he held himself both with ease and with a formality. “You have a congenial existence here,” he said. “I have recently traveled through these regions, and they impart a definite tranquility. I imagine that you would want to stay here as long as possible, perhaps forever.” His voice did not enter my mind in the same manner as that of Aunt Penelope and Uncle Deva but seemed to be swept in by a breeze from the Void, even though the Void had been windless for eons of time.

“Not that I envy you,” said the stranger. “But you do have comfortable circumstances.”

“Too comfortable,” said the grinning beast beside him.

“You forget yourself, Baphomet,” said the stranger. The creature suddenly yelped, as if he had been struck a vicious blow, and then bowed three times to the tall stranger without

releasing the sneer on its face.

“Pardon Baphomet,” said the stranger, his gaze fastened on me. “He makes a good traveling companion.” He paused. “I wonder about this emptiness,” he said. “It would seem not to have any existence independent of our perception of it. An interesting substance. One could think it pleasant or unpleasant, strong or weak, and that would in fact be its reality. The mind is in its own place, don’t you agree? Let us take the music, for example. Quite lovely. I congratulate you. I have been listening to it and enjoying it for some time. However, is it not conceivable that to some other mind, to some other sensibility, this same music might sound ... let us say unlovely?”

“I, for one, do not like the music one bit,” said Baphomet, and the beast quickly bowed again and grinned.

The stranger turned and stared at the beast, then turned back to me. “But there is a more serious question I wanted to ask you,” he said. “Do you think it is possible for a thing and its opposite both to be true?”

Despite having been startled by the stranger and his rude companion, I found myself captivated by him, even mesmerized. I decided to answer his question.

“A thing and its opposite cannot both be true in a rational system of thought,” I replied. “But rational thoughts lead only to rational thoughts, whereas irrational thoughts lead to—”

“New experiences.”

“Yes,” I said. “My mind encompasses both the rational and the irrational. But certain things must have logical consistency, and thus rationality.”

“Exactly,” said the stranger. “For example, mathematics. But logical consistency can be misleading. Even in mathematics, the truth or falsity of some theorems cannot be proven. Curious, wouldn’t you say?”

“But that is beside the point. Each mathematical theorem is either true or false, whether it can be proven within the limitations of mathematics or not.”

“Yes, yes,” said the stranger. “I see that we can converse with each other.”

As we were talking, Baphomet was doing flips and somersaults, all the while watching us with his relentless grin. His master paid no attention to him.

“Without knowing for sure,” the stranger continued, “I would think that you are more fluent with the rational. It has its appeal. But the irrational permits a greater exercise of ... shall we say, *power*. If that is your aim, of course. At the moment, you would seem to have no need to exercise your power.”

“I prefer to use only the scope and magnitude of power that is required for each situation,” I said. “But I have unlimited power, if necessary.”

“I would very much enjoy seeing a demonstration of that sometime.” The stranger moved closer. “But the target of power is more interesting than its quantity. In that regard, tell me. Would you say that the end always justifies the means? Or, in attempting to achieve your aims, do you draw the line at some degree of sacrifice and cost, beyond which you would not go?”

“I cannot consider this question in general terms.”

“Ah, you do not believe in absolute principles. We will get along even better than I thought. Your response implies that in some situations you would be willing to accept any price in order to achieve your end, in others not. Depending on the situation. Yes. That is a

important thing to know about one's self."

The stranger unfastened his gaze from me and stared out into the Void. He was apparently occupied by something in particular, a particular one of the cosmoses, misshapen and throbbing as if it were about to explode. He looked at it with fascination. Then he turned sideways. He was so thin that he practically vanished, appearing as only a black line. "Have you wondered," he said, "whether it is possible to imagine everything that will ever exist, or whether some things lie beyond our ability to imagine them?" I nodded. "And the set of all possibilities being infinite, as it is," he continued, "if there is even a fraction of possibilities we cannot imagine, then there is an infinite number of possibilities we cannot imagine. So even with infinite power, we might be surprised by what transpires in the future. Would you agree?" The tall stranger turned towards me again, cocked himself at an angle, and looked at me with an odd expression.

"Yes."

"These universes you've created," he said, and gestured at the quivering spheres and ellipsoids flying about. "Many of them will end in tragedy. Or I should say, the animals and matter you fill them with, the intelligent beings, will twist and suffer and meet unhappy ends." He smiled.

"I have no intention of that," I said. "I would not allow that to happen."

"I am sorry if what I've said disturbs you."

"I command you into nonexistence," I said.

"I'm afraid you cannot do that." As tall as he was, the stranger grew taller, as if he had been crouching. "The glittering multitudes," he said. "So many little lives, amounting to nothing. I ask you: What is infinity multiplied by zero? It is hardly worth our discussion ... Give my regards to your uncle and aunt." The stranger bowed. Then he and his beast, looking back at me with its incessant grin, moved off through the Void.

Second Thoughts

In my anger, I smashed thousands of nascent universes. Some, I strangled the space out of them, leaving dry husks of nothingness. From Void to Void. Others, I spewed in so much energy that they exploded in a soundless catastrophe. Some universes I hurled at other universes, splattered them into each other. I ripped apart space. I scattered geometry. I crushed and destroyed. Never before had I felt such emotion, and the Void seethed with my anger, the Void's music devolved to a screech of clashed chords.

What are you doing? cried my uncle. He stooped to pick up pieces of the fractured universes. You have frightened me, and your aunt as well. The two of them rushed about as if looking for somewhere to hide, then covered a distance away, each trying to shelter the other.

I would, of course, never do anything to harm Uncle Deva and Aunt Penelope, but I found myself behaving without any thought. I was pure action, and I watched myself wreak havoc as if it were another being moving about and crushing alien creations. I was outside myself. How long this went on was difficult to gauge. Eventually, my fury softened. Looking about, I could see that I had annihilated many of the universes I had made. But many more remained growing larger. I had not destroyed everything.

I told Uncle and Aunt about the stranger. The arrogance, said Aunt Penelope. He had no right to come here, and certainly not in that manner. Just let him show up again. You should not be discouraged.

I don't know, I said to my aunt. Perhaps you were right. I should have left everything just as it was, in an infinite nothingness. I do not want my creations to end in tragedies. I should have left things as they were.

Tragedies? said my aunt. Are you referring to the creation of animate beings in your universes? Listen to me, Nephew. First, you have not made animate beings. So far, you have made only empty cosmoses. And secondly, even if you do create animate beings, you do not know that they will suffer tragedies just because that swaggering desperado said so. You forget your power, Nephew. You made those cosmoses. If you choose to, you will make animate beings. And you will make them as you wish. Have faith in your creations. Yes, yes, said Uncle Deva. Have faith. Your aunt and I stand behind you. Don't we, Penelope? Absolutely.

I looked out into the Void, at the billions of cosmoses whizzing about, and I imagined populating each of them with matter, both animate and inanimate. I imagined atoms and molecules. I imagined gases and liquids and solids. I imagined silica and soil, atmospheric chemical elements, oceans and lakes, mountains, forests, great lumbering clouds, electric impulses in space, movements of ions, gelatinous membranes, bacteria. I imagined brains, some made of matter and some made of energy. I imagined intelligent creatures. And *the* creations. Their cities. I tried to picture the future. Would my living creations suffer and writhe in some agony? Was it necessarily so? Or would they have only pleasure and joy? I felt the future, but I could not hear it. I listened. Could I hear the voices of the trillions of

creatures who might come to be? Could they tell me of life? Could they tell me of suffering? But I could not hear them. All I could hear was the soft adagio of the Void. I felt the future but the future did not exist. I gazed at the billions of universes, fraught with their emptiness and possibilities, and I wondered. Perhaps I should make only nonliving matter. That would be simpler, and safe. But could I limit my productions to inanimate matter? I could make whatever I wished, but could I be certain about the subsequent movements of each atom once made? Could I be certain that trillions of dull and dead atoms could never combine and give rise to a thing that had life? And there were so many worlds.

Some Organizational Principles

May I give you some advice, Nephew? said Aunt Penelope. The three of us had been wandering about in the Void for some time, talking about how our existence had changed and sweeping up bits of debris still lying about. Don't give Him advice, said Uncle. He doesn't need our advice. Hush, said Aunt Penelope. I am entitled to give advice to my nephew. If it is not to your liking, then give Him your own advice. I would be careful, said Uncle. Do you really—Aunt Penelope cut off Uncle with one of her looks. But now that she'd been regularly combing her hair, she did not appear nearly so fierce as she once had. Still.

Aunt Penelope took me aside, leaving Uncle by himself. Now, I want you to listen to me, she said. This is no criticism. Your uncle and I have always been impressed with you. But we are your elders, and we do notice what goes on around here ... You shouldn't do things with such haste. You rush into things. Slow down. Take your time with this project.

I hadn't been aware I was rushing, I said to my aunt.

All these things flying about? said Aunt. You made them so quickly. Why don't you concentrate on just *one* of your universes and see if you can do a good job with it.

That's excellent advice, said Uncle Deva, standing some distance away.

Which one would you like? I asked my aunt. It wasn't really a serious question. There were quadrillions of spheres and hyperboloids flying about, by now having inflated to at least 100 times larger than they were just a few moments ago. This one, said my aunt, and she suddenly reached up and caught one of the spheres flying past. Work on this one. We have confidence in you, your uncle and I, and we are certain that you can do well with it. Not that you've started this project. Just take your time, that's all I'm suggesting.

Perhaps my aunt had given me decent advice. The universe in question was nearly spherical in shape, spinning slightly, and it was inflating with a rabid determination. The first thing I did was to slow its expansion. There, said Aunt Penelope, at least now we can examine it. We? said Deva. Let Him examine it on His own.

I should mark this one, I said, so that it will not get lost among the others. I pinched the universe very slightly, making a small dip in its middle. Interrupted in its flight and caught, the thing sat there quietly.

We must give it a name, said Uncle Deva. Everything has a name. Something with a little. Something pretty. Why not call it Amrita. Or Anki. Or Aalam.

Oh mush, said Aunt Penelope. You're being sentimental. And you can't name an entire universe anyway.

Of course you can, said Uncle. A name expresses its essence. A name gives a thing character, personality.

But a universe doesn't have a personality, said Aunt. As I understand it, a universe is a ... well, a totality. A universe is everything that is, as far as the inside of the thing.

But we're on the outside, said Uncle Deva.

If we have to name it, said my aunt, at least call it a number, not one of those mushy

things you said.

A number! cried Uncle. That's so impersonal. Numbers are so remote. What do you say Nephew?

I looked at the pinched cosmos, still held firmly by my aunt as if she were afraid it might go whizzing off any moment. It seemed pretty featureless to me. But perhaps it would grow into its name. All right, I said. I'll call it Aalam-104729. So be it.

104729? said Uncle. What a random number.

It's the ten thousandth prime number in base ten, I said. I won't forget it.

You see why I wanted a name? said Uncle. Now put some spirit into the thing.

Look who's telling Him what to do, said Aunt Penelope. A moment ago, you didn't—

Everything must have a spirit, Uncle said to me. Do it however you want, just give it spirit. And use *feeling*. You've made something grand, but it will be grander if it has feeling and beauty and harmony and—

Deva, I've never heard you talk so much, said Aunt Penelope. This discussion is wearing me out. I'm going to sit. Where's my chair? Where's my chair? Uncle Deva shuffled off and fetched the chair, which he had named Guptachandra. My aunt, clutching Aalam-104729, went over to her chair and sat down. She stretched out and sighed and began mumbling: First it's this, then it's that. If it's not one thing, it's another, not one thing, it's another, not one thing, another. Her mumbling gradually tapered off, and she pretended to fall asleep.

I have to think about this, I said. I'm afraid if I put in spirit and feeling, before anything else, the thing is going to get all jumbled up and confused and end up in chaos. It needs to start off with some *organizational principles*.

OK. OK, said Uncle. It's your project. Organizational principles. OK. We will leave you to it. Do tell us when you are finished with the ... organizational principles. Leave Him to it, he said to Aunt Penelope, who was still pretending to sleep. Uncle walked over and extricated Aalam-104729 from her grip and gave it to me. Organizational principles, Uncle said once more. Take your time with it, said Aunt Penelope. That's all I ask.

I generally try to be everywhere at once, but I moved to a place in the Void where I could be alone. I meditated, and I entered the pinched universe and looked about. It was empty of course. I imagined moving in various directions in space, and I also imagined traveling forwards and backwards in time, and I decided that I wanted my universe to be completely symmetrical in time and in space, so that one place and one moment should be the same as any other place and moment. This was by far the simplest cosmos I could make, and I wanted my first universe to be simple. Symmetry of position and moment. This was my first law. And I remade Aalam-104729 to obey this first law. For a few moments, the universe quivered and murmured, and then it was still. The first law seemed good to me.

But then I began considering future and past. Inside Aalam-104729, I wanted to know clearly that the future was different from the past, so that any intelligent being could tell the *things were happening*. Wasn't that precisely the point of waking from my slumber, to make things happen?

So I remade the energy in my universe so that it was all concentrated in a near-perfect order, a razor-sharp contour of energy. Almost at once, the razor of energy began fraying the edges, loosening, dulling, and diffusing away, and this was good because now there was

definite future and past. At any moment, the past was the direction of time with great sharpness and shape, and the future was the direction with less. I was pleased.

Then I made a second law. There would be no absolutes in my universe, only relatives. In particular, there would be no such thing as absolute stillness in Aalam-104729. I wanted the only point of absolute stillness to be Myself. If something appeared still from one perspective, from another perspective it would be in motion. If a material object changed its motion, going from one motion to another, everything should remain the same, with no reference point of stillness to say that one motion was any different than another. The second law was a principle of symmetry, like the first, and there was an artistic beauty in it and it was good. Or—if a principle could not be deemed good or bad—at least it was satisfying, it seemed in harmony with the music of the Void.

The second law necessarily tied time and space together, since motion involved the two. A particular period of time would signify a particular distance in space, with the proportionality between the two being a fundamental speed of the universe. This relationship between time and space was also beautiful and good.

Was I acting too hastily? I wondered if Aunt Penelope was watching. Even though I was inside Aalam-104729, I could look outside, because I could look everywhere, and I could see Aunt and Uncle far off in the Void, paying no attention to me. Uncle Deva had somehow installed himself in my aunt's chair, stretched out as if he meant to spend quite a long time there. Meanwhile, she was swatting at him, shoving and pushing in an attempt to dislodge him.

With Uncle and Aunt thus occupied, I made a third law: Every event should be necessarily caused by a previous event. I did not want things happening willy-nilly in my new universe. Events without cause would lead to a reckless cosmos, a universe ruled by chance. According to my third law, for every event, there would be a previous event without which it would not have happened. And that previous event would also require and be determined by a previous event, and so on, back through an immense chain of events to the very *first event*, which was my original creation of the universe. This law was also good. It prevented pandemonium. It bestowed Aalam-104729 with causality. It bestowed logic and rationality. And it connected everything. Cause-and-effect relationships would spread out from every event to every other event, even to multiple subsequent events, ripple through the cosmos, and bind the totality of being in a web of interdependence and connectedness. Even the smallest event would be linked to other events. Wasn't this a kind of spirituality? See, I wanted to tell Uncle Deva (who was at that moment still scuffling with Aunt Penelope over the single chair of existence). Rationality and logic can be spiritual.

What's more, there was still plenty of room for the mysterious. Because even if a very intelligent creature within this universe could trace each event to a previous event, and trace that event to a previous event, and so on, back and back, the creature could not penetrate earlier than the First Event. The creature could never know where that First Event came from because it came from outside the universe, just as the creature could never experience the Void. The origin of the First Event would always remain unknowable, and the creature would be left wondering, and that wondering would leave a mystery. So my universe would have logic and rationality and organizational principles, but it would also have spirituality and mystery.

Three laws. I floated about the interior of Aalam-104729, squeezing the vacuum here and there to see if the laws held, and they did. No loose parts or inconsistencies. I was satisfied with what I had done. More than satisfied. In retrospect, creating a principled universe did not seem so difficult. I had been concerned for no reason. I was eager to make a fourth law. Perhaps I'd do a dozen. Or two dozen.

What should I do for my fourth? Uncle Deva wanted harmony. My symmetry principles were already harmonious, but I could do better. I divided the ubiquitous energy into parts, each with its corresponding force, and I ordered the forces in a progression from the weakest to the strongest. All right. Harmony. I decreed that each force in the progression was stronger than the preceding force by a constant ratio, like an even-tempered musical scale. Done. What could be more harmonious! But, almost immediately, the universe began writhing and straining. Space fissured. Pieces of emptiness screamed through the tears. Shortly thereafter the universe turned inside out and was gone, and I found myself standing beyond in the Void. Evidently, the fourth law was not compatible with the first three. The constant ratio of forces, although beautiful, contradicted the even greater beauty of embedded relativity. Looking about, I saw that, fortunately, Aunt and Uncle were nowhere within sight. Quickly, I caught another universe of roughly the same size and shape as Aalam-104729, pinched it slightly at its midsection as I'd done before, and gave it my first three laws. Three it would be, and no more. I wouldn't make that particular blunder again.

A Soul for the Universe

When Aunt Penelope and Uncle Deva saw the cosmos I'd made, with its three laws, they were not displeased.

Well, what we got? said Uncle, looking more ruffled than usual. He held the universe up and squinted at it from all sides. Although it appeared nearly the same as before, it had a new heft, he announced, and it vibrated with a higher frequency. Yes, said Uncle, the three laws seem to be agreeing with the thing.

It's because He's taking His time, said Aunt, like I told Him to do. You take your time, and you can do good work. You rush into things, and you might destroy a whole universe. What a pity that would be.

Uncle Deva passed the new Aalam-104729 over to Aunt Penelope, who began her own inspection. She rolled it over on its side, turned it upside down, spun it around. It was still expanding, getting bigger every moment. She nodded her approval. So, Nephew, she said. What's next?

It's still empty, I said. Perhaps it's time to start putting things into it.

If I may make one last suggestion, said Uncle Deva. You say that your universe has a spirit. I don't follow all of that folderol of causal connections and so forth. You always defeat me with those kinds of explanations. Be that as it may, I would be grateful if you give your universe a *soul*. You need to make sure that everything in the universe is connected not just to other things, but to *you*. You are the Maker, after all.

I don't feel that's necessary, I said. I know I'm the Maker. But there's no reason my creations need to know it. You know it. Aunt Penelope knows it. That's sufficient.

Don't be modest, said Aunt Penelope. For once, I agree with your uncle. You are the Maker of everything. Your creations should understand that. They should have some awareness of you and your infinities. And it's not just about you. It's about our family, all of us here in the Void, our reputation. You're an artist, Nephew. Deva and I appreciate your artistic work, but that's a small audience.

Aunt Penelope, please. I haven't decided whether I'm going to make any living creatures in this period, much less *aware* creatures, much less creatures aware of Me. It might be a comfort to be unaware. I might decide to make only inanimate matter.

What a waste! said Uncle. To make such a beautiful universe filled only with inanimate matter? It would be *boring*. Boring, I tell you. Am I the only one who thinks it would be boring?

It would be boring, said Aunt Penelope.

Yes, I said. It might be boring.

Then we are agreed, said Uncle. There will be animate matter with intelligence, and there will be an immortal soul in each living being, connecting it to you.

Wait a moment, I said. Only we, and the Void, can be immortal. Immortality does not exist in Aalam-104729. The thing has a direction of time, caused by the dulling of its energy, and everything in it will eventually dissipate. Nothing lasts forever in Aalam-104729, or in any

the universes I have created. I will consider a soul, but it cannot be immortal. It must follow the direction of time, like everything else. It must gradually decay and disintegrate. We cannot begin making exceptions to the rules here and there, helter-skelter, or we'll end up with chaos again. Let me consider this ... Maybe in the life of each creature I will allow a brief recognition of something vast, a flash of Me, a hint of the unchanging and infinite Void.

And then those creatures will pass away? said Deva. Dissipate and die? And their souls with them? At least let the souls come back in new bodies. Otherwise, it is so sad.

There you are getting mushy again, said Aunt Penelope. What do you know of sadness? What do any of us know? Sadness may not even exist. Let's take a walk. I feel like stretching a bit.

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