Uncertainty and the Unimaginable

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Preamble

Of Our Curiosity

Our species is a curious one. It wants "to know." Today we talk about our "thirst for knowledge" and our "right to know"; claim that we are building a "knowledge economy"; and equate knowledge with power. Our innate curiosity often manifests itself from a very young age. Many modern parents try to childproof every nook and cranny of their home, aware that their kids will crawl around the entire house, and try to open every reachable door and container to see what's inside.

How much knowledge does our species want to gain? The answer likely differs among individuals, but a hint of the more ambitious side of the curiosity spectrum may be found in Stephen Hawking's *A Brief History of Time*.

"Ever since the dawn of civilization," Hawking writes, "people have not been content to see events as unconnected and inexplicable. They have craved an understanding of the underlying order in the world. Today we still yearn to know why we are here and where we came from. Humanity's deepest desire for knowledge is justification enough for our continuing quest. And our goal is nothing less than a complete description of the universe we live in."

The definition of the word "knowledge" is an enduring if not an open-ended question— one raised by Plato in the *Theaetetus* several millennia ago, and one about which there is still debate. But whatever it means to truly "know," it appears that human beings "want to know," that we're curious, and a question that at least some have raised is this: how much can we know? Can we know "everything" and with that knowledge create a complete description of the universe we live in," to borrow Hawking's words? Or, are there insurmountable "limits" on the resources of our mind—on our ability to know, imagine, conceive, conceptualize, understand, think, anticipate, predict—such that some mysteries will remain perpetually unsolvable?

Of Our (Hypothesized) Limits

Some modern thinkers look out at the natural world, at history, at their own unique experiences, and conclude, not without reason, that we don't know everything—neither as individuals, nor as societies, nor as a species. There are some things that we are perplexed by or uncertain about, even as science continues to make or seems to make progress in acquiring new knowledge about the natural world year after year. There are some mysteries that we haven't yet solved and that may yet be unsolvable. There are questions about topics like the nature of the mind and its relationship with the body, or whether we have such a thing as free will, that we haven't given a satisfactory answer for yet—at least, it seems like we haven't answered questions about these and other questions with the "right answer," with something like a "correct theory," with the seeming certainty of mathematical answers. Moreover, over time and space, the things we as individuals think we know often end up turning out to be wrong, not true. As we grow older, and as we move around the world, we realize that many of the things we once took for granted as true ended up being false, or, at best, partially true. History teaches or tries to teach us a similar

lesson, roughly speaking, that our ancestors had all sorts of beliefs they considered knowledge which to our modern eyes seem blatantly untrue, like the notion that the earth is flat and that the universe revolves around the earth. And if knowledge has any relationship with the truth, then what we once thought we knew does not qualify or seem to qualify as knowledge. Looking back, it seems that we and our ancestors had a plethora of now-defunct beliefs. Sometimes we wonder whether at the present moment we actually "know" anything, or whether we merely think we know, and in the future, our current knowledge will turn out to have been a mirage. Maybe, after meditating on this for a bit, we become uncertain about our present beliefs and perplexed about other, more eternal, and more human questions.

Stepping back and looking or trying to look at "the big picture," we sometimes wonder: how much, if anything, can we "know"? Some modern thinkers argue that the resources of our mind—our abilities to imagine, know, predict, anticipate, conceptualize, think—are "at bottom" limited. Everything in the world has its limits, or so it seems to these thinkers, so why should the mind (seemingly dependent on our physical brain of a certain, limited size and weight) be any different? The reason why we are ever uncertain about some things, ever perplexed by some questions, they argue, is related to those limits, to the human mind's limited capacities to address questions that lie outside "the limited range" or "scope of imagination," "beyond the rim of intellectual competence," on "the other side of the veil of opacity." And those limits—which are sometimes written about as "limitations"—give rise to something like the world of the "unimaginable," and/or the "unknowable," and a whole lot of other "un-ables" ("unthinkable," "unobservable.") In that "un-able" world lie the correct answers and theories to our hard problems, our unanswerable questions, our insoluble mysteries. We want to know what will happen in the future, but our mind's eye cannot see the future, and so we remain perpetually uncertain about this and many other topics.

McGinn

One of the philosophers commonly associated with a school of thought called Mysterianism is Colin McGinn. In "The Problem of Philosophy," McGinn asks, "Are there areas in which we simply lack the capacity to generate the kind of knowledge we desire?" To him, the answer is an obvious yes. McGinn points out that philosophy has a "peculiar addiction to insoluble mysteries." He highlights the "phenomenon of philosophical perplexity," the fact that philosophers have asked questions about some items—including "consciousness and the mind-body problem, the nature and identity of the self, the foundations of meaning, the possibility of free will, the availability of a priori and empirical knowledge"—for ages, and they are still puzzled by them. Why are modern philosophers still trying to figure out the "correct theory" to some of the subjects philosophers raised millennia ago?

In McGinn's view, "the correct theory [about these topics] is inaccessible to the human intellect… since we cannot get our minds around the portion of the intellectual space where the correct theory lies." McGinn brings up the word "limits" or "limitations" 42 different times in his essay, referencing our attentional and memory limitations, the "limits of conscious reason," our "cognitive limits," and the "existence of nontrivial epistemic limits." When we feel puzzled by some questions that "the human cognitive system [was] just not set up to deal with," McGinn suspects that we "run up against the limits of our understanding in some deep way." According to him, "it is better to accept that the world contains things whose ultimate nature we cannot penetrate."

In "Can We Solve the Mind-Body Problem?" McGinn tackles the "mind-body problem," which is, roughly speaking, the problem of explaining how the physical brain gives rise to our consciousness and subjective awareness. "Somehow, we feel the water of the physical brain is turned into the wine of consciousness," writes McGinn, "but we draw a total blank on the nature of this conversion." At the outset, he states that despite our many long-standing attempts to solve the mind-body problem, "it has stubbornly resisted our best efforts," and therefore "the time has come to admit candidly that we cannot resolve the mystery." Again, the concept of cognitive limits, which in this essay is sometimes conceived of as "cognitive closure," is crucial to McGinn's explanation of why philosophers are incapable of providing a satisfactory solution to the mind-body problem. McGinn writes, "There is something terminal about our perplexity [about some philosophical problems…] The mind-body problem brings us up against the limits of our capacity to understand the world."[i] As McGinn writes elsewhere, "I thus believe in an inherently inconceivable (except abstractly) physical reality," which is to say, that, in his view, there are at least some phenomena in our world that we are aware of (like our mind or consciousness) and that do have a physical reality, but that human beings are not even capable of even conceiving what that physical reality might be.

Nagel
The philosopher Thomas Nagel appears to suggest something similar in "What Is It Like to Be a Bat?" In that essay, Nagel argues that we can and often do believe that living creatures other than us humans, such as bats, have a consciousness, a "subjective conscious experience," a "what it is like to be them." But that, even though we can treat the idea that, for example, mammals have a consciousness, we are fundamentally incapable of truly or completely understanding and describing what a bat's subjective experience of the world is like. He points out in trying to answer the question that is the title of his essay, we may try to use our imagination, but it will not take us very far. He writes,

> "Our own experience provides the basic material for our imagination, whose range is therefore limited. It will not help to try to imagine that one has webbing on one's arms, which enables one to fly around at dusk and dawn catching insects in one's mouth; that one has very poor vision, and perceives the surrounding world by a system of reflected high-frequency sound signals; and that one spends the day hanging upside down by one's feet in an attic. In so far as I can imagine this (which is not very far), it tells me only what it would be like for me to behave as a bat behaves. But that is not the question. I want to know what it is like for a bat to be a bat. Yet if I try to imagine this, I am restricted to the resources of my own mind, and those resources are inadequate to the task… Even if I could by gradual degrees be transformed into a bat, nothing in my present constitution enables me to imagine what the experience of such a future stage of myself thus metamorphosed would be like."[ii]

In other words, for human beings (or, at least, for Nagel), the right answer to the question "what is it like to be a bat?" is literally unimaginable. It is outside the limited range of the human imagination. Nagel writes that he believes "in the existence of facts whose exact nature we cannot possibly conceive… facts beyond the reach of human concepts… Humanly inaccessible facts."[iii]

Taleb

The essayist Nassim Taleb is the author of *Incerto* (Latin for "uncertain"), a five-volume collection that he describes as "a philosophical and practical essay on uncertainty." In one of those volumes, *The Bed of Procrustes*, Taleb explains,

"The general theme of my work is the limitations of human knowledge, and the charming and less charming errors and biases when working with matters that lie outside our field of observation, the unobserved and the unobservables… what lies on the other side of the veil of opacity."

"The sighting of the first black swan," he writes in *The Black Swan*, "illustrates a severe limitation to our learning from observations or experience and the fragility of our knowledge." The words "limits" and "limitations" come up dozens of times in the text.[iv] Explaining the thrust of his book, Taleb writes, "*The Black Swan* is about consequential epistemic limitations, both psychological (hubris and biases) and philosophical (mathematical) limits to knowledge, both individual and collective." Explaining what gives rise to Black Swan (or BS for short) phenomena (both BS "things" and BS "events"), he notes that they are "the result of collective and individual epistemic limitations." Taleb harps on the "structural, built-in limits to the enterprise of predicting" and his focus on our species' "limitations" appears to be related to his explicit adoption of what he calls the "Tragic Vision of Humankind," and to his belief that, "We are flawed beyond repair."[v]

Of the Unimaginable, Inconceivable, and Other "Un-ables"

The idea that there are structural, hardwired, insurmountable limits on the resources of our minds gives rise to a world or universe of "real" stuff that exists beyond those limits but is inaccessible to us. This world is conceived of in a variety of descriptions, including as the "world of the unimaginable." For McGinn and Nagel, it appears that the correct theory of consciousness exists, but in a world inconceivable to the human mind.

Taleb

For Taleb, his BS phenomena represent uncertainty, and he describes BS events as having three attributes: "unpredictability, consequences, and retrospective explainability." In his 2015 book *Superforecasting*, the political scientist Philip Tetlock writes, "'Black swan' is… a brilliant metaphor for an event so far outside experience we can't even imagine it until it happens." Tetlock asks, "What is exactly a black swan?" and answers, "The stringent definition is something literally inconceivable before it happens." Notice that the definition of a BS event is something "literally inconceivable" before its occurrence.[vi]

Taleb's examples of BS events include the October 1987 stock market crash, the 9/11 terrorist attacks, and the 2004 Indian Ocean earthquake and tsunami. Using an absurd blend of conditional reasoning and counterfactual thinking, roughly speaking, Taleb argues that the aforementioned BS events were fundamentally unpredictable. If they weren't unpredictable—if people could anticipate or expect or predict the 1987 stock market crash, the 9/11 terrorist attacks, or the 2004 tsunami—they would have taken actions ahead of time to prevent or prepare for them, and those BS events wouldn't have been as tragic as they were, or maybe they wouldn't have happened at all. But those events did happen (at least in our universe) and no one prevented them from happening. Their occurrence, in Taleb's imagination, illustrates our cognitive and epistemic limitations and proves that they were previously unimaginable.

"Think of the terrorist attack of September 11, 2001," explains Taleb. "Had the risk been reasonably conceivable on September 10, it would not have happened. If such a possibility were deemed worthy of attention, fighter planes would have circled the sky above the twin towers, airplanes would have had locked bulletproof doors, and the attack would not have taken place, period. Something else might have taken place. What? I don't know."

Taleb writes about the stock market crash of October 1987: "The occurrence of the event lay outside anything one could have imagined on the previous day." What Taleb is literally arguing about the October 1987 stock market crash is not only that no human being consciously imagined on October 18th, 1987 the possibility that the stock market will crash "tomorrow." Rather, Taleb is claiming something stronger—that this event was literally unimaginable: it "lay outside anything one could have imagined the previous day." Even if someone, anyone, would have wanted to imagine such a precipitous crash as happened on October 19th, 1989, they would not have been able to do so.

Taleb writes, "Consider the Indian Ocean tsunami of December 2004. Had it been expected, it would not have caused the damage that it did—the areas affected would have been less populated, an early warning system would have been put in place." But the 2004 Indian Ocean tsunami (which one of the first editions of *The Black Swan* erroneously called the "Pacific tsunami") did happen, and there was devastating damage, and "ergo" the tsunami illustrates yet again our cognitive limitations. As Taleb writes, there are, "Structural limitations on our ability to predict. These limitations may arise not from us but from the nature of the activity itself—too complicated, not just for us, but for any tools we have or can conceivably obtain."

King and Kay

The former Governor of the Bank of England Mervyn King and economist John Kay write in their 2020 book called *Radical Uncertainty*,

"When we describe radical uncertainty, we are not talking about … imaginable and well-defined events whose low probability can be estimated… We are emphasizing the vast range of possibilities that lie in between the world of unlikely events… and the world of the unimaginable."[vii]

King and Kay provide multiple examples from "the world of the unimaginable." The first is related to Nassim Taleb's BS metaphor and the origin story behind it. To those aboard the First Fleet, they write, "The observation of a black swan was not a low probability event. It was an unimaginable event." They further explain, "True 'black swans' are states of the world to which we cannot attach probabilities because we cannot conceive of these states."

"A century ago," they write, "a telephone that would fit in your pocket, take photographs, calculate the square root of a number, navigate to an unknown destination, and on which you could read any of a million novels, was not improbable; it was just not within the scope of imagination or bounds of possibility."

Notice that King and Kay do not claim merely that a modern smartphone was "unimagined," as in, no one consciously imagined the possibility that such a device might exist in the future. Theirs is a stronger claim. To people a century ago, a smartphone was "just not within the scope of imagination." They include the word "unknowable" over a dozen times as they discuss "the unknowable future" and "unknowable unknowns."[viii]
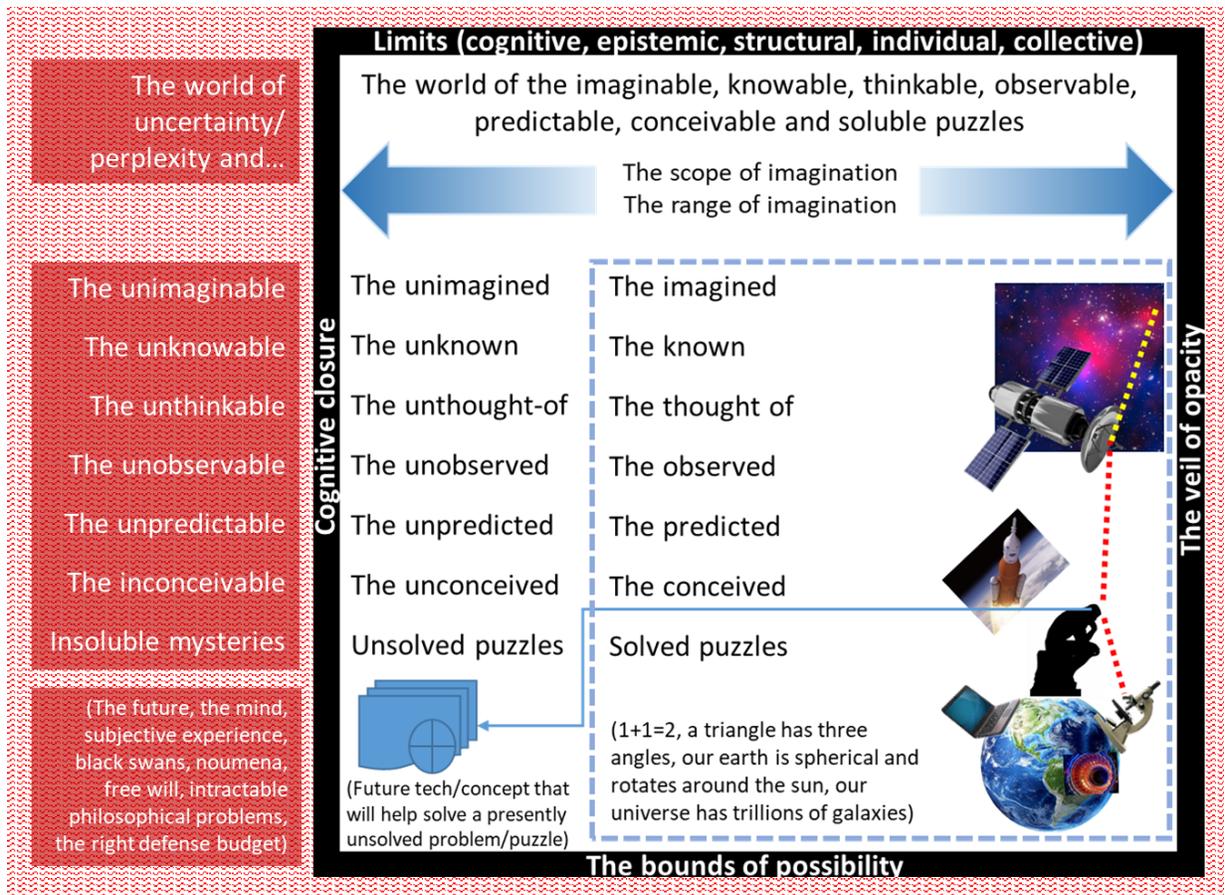
Figure 1: The Worlds of the Imaginable and Unimaginable, as Conceived by Some[ix]

The Meanings of Various "Un-ables"

The word "unimaginable" is often used in figurative or metaphorical language, and sometimes it is used in some artistic expression or in poetry to express a powerful sentiment. For example, one of the most powerful and emotionally moving songs in the play *Hamilton* comes in Act 2, when Alexander Hamilton and his wife Eliza grieve the death of their son Phillip. Passerbys who see them walking on the street sing, "Have pity, they are going through the unimaginable." It is not literally the case that what Hamilton and Eliza are going through in Act 2 of Hamilton is "unimaginable." I'm not a parent, but just reading the lyrics of that song and remembering the scene in the musical "hits me in the gut." I feel their pain even though I've never experienced their tragedy (and pray I never will). Their experience is imaginable, and because it is imaginable, and because I use my imagination to put myself in "their shoes," I am moved by that song—when I listen to it, I "choke back my tears." It appears to me that other audiences who have watched *Hamilton* can similarly imagine what Hamilton and Eliza are going through even if they never went through the experience themselves (even if they never lost someone close to them).

I take and treat the word "unimaginable" as part of our figurative vocabulary. It is part of a collection of figurative words and phrases that also includes words like "inconceivable," "unthinkable," and "unbelievable." I use these words often even though I do not mean them

literally. But, it appears to me that at least some—including the scholars above—use these words quite literally, as in, there is literally a range or scope of the human imagination with its limits. Outside of that scope is the world of the unimaginable, composed of anything a scholar would like to put into that category—be it the subjective experience of a bat, or the correct theory of the mind and the right solution to the mind-body problem, or black swans, and possibly other items like Kant's concept of noumena.

The writings above by McGinn, Nagel, Taleb, King, and Kay posit that in our universe there exist "things" (phenomena, noumena, events) that are literally "unimaginable," "inconceivable," "unknowable," "unthinkable" and "unobservable." The reality of those things, to use McGinn's words, is "beyond the rim of human intellectual competence."

The word "inconceivable" means "not capable of being imagined or grasped mentally," while the word "unimaginable" means "impossible to think of or to believe exists; impossible to imagine." These words and the ideas they symbolize are different from the word "unimagined," which means "not yet thought of or imagined." If something or some event was previously "unimagined," it may imply that no human beings ever consciously thought of it or imagined it before it happened. But the word "unimaginable" implies something stronger. If something was "unimaginable," it implies that no human being could have imagined it beforehand; they were incapable of imagining that "unimaginable" thing would happen until it happened. If someone claims that some things like "the future," "the correct theory of free will," "the physical reality of human consciousness," or "black swans" are literally unimaginable, it implies that human beings are fundamentally incapable of imagining or grasping mentally those items.

The word "unknown" means "not known," as in, not presently known, but "unknowable" implies something stronger, as in, "lying beyond the limits of human experience or understanding," or "that cannot be known." Taleb notes that we often make statements "about things that we will never come to know," and points out that "we are not even good at understanding the unknowable." When King and Kay, for example, discuss the "unknowable unknowns," they are not talking about unknowns that are unknown at present, but ones that are unknowable in a more fundamental, perpetual, and permanent way. "Some mysteries will remain just that," they point out, "because the solution will never be found."[x]

Critique

A Conceptual Critique of Arguments Affirming the Real Existence of Seemingly Unimaginable Things

Unimaginable "To Whom"?

Think the coronavirus pandemic that emerged on the international scene in 2020 was an unimaginable "black swan" that "proves" Taleb's BS theory? It didn't, at least not according to its creator. After it emerged, Taleb himself consistently stated that the Covid-19 pandemic was "definitely" not a BS event. This did not stop many from writing that the pandemic was a "black swan." In February 2020, for example, *Forbes* published an editorial called "Coronavirus: The Black Swan," and the following month it published a piece entitled "COVID-19 is a Black Swan," the first line of which claimed that COVID-19 "is a 'Black Swan' event."[xi]

As *The New Yorker* reported, Taleb was "[irritated](#)" by those who called the Covid-19 pandemic a BS event. Some of those who were sympathetic to Taleb's BS theory, like King and Kay, similarly wrote that the Covid-19 pandemic "is not" a black swan. These disagreements, I think, emerge naturally out of the BS theory and other writings that rest on the notion that there exist fundamentally "unimaginable" or "inconceivable" stuff in the world.

When thinkers like McGinn, Taleb, or King and Kay bring up words like "unimaginable" and "inconceivable" and concepts like "insoluble mysteries," a question emerges: unimaginable, inconceivable, or insoluble to whom? Unimaginable to this particular person or that (to Alice or Bob), or unimaginable across the abroad, to a community of people or the entire human species, to Alice and Bob and everyone else? In McGinn's case, it appears that he is talking about the latter: inconceivable across the board, across the human species.[xii] Similarly, King and Kay appear to use the concept of "the unimaginable" in a collective sense.[xiii]

Taleb is a bit craftier, flip-flopping between the individual and collective. In an early edition of *The Black Swan* from 2007, he simply categorized 9/11 and other events as "black swans." This implied that BS events are, objectively speaking, unpredictable or inconceivable before they happen—not unpredictable to this or that individual, but across the board, collectively. This was an obvious error, since, at the very least, the 9/11 terrorist attacks appear to have been quite imaginable and conceivable by the terrorists who planned and perpetrated them. But Taleb's early description of 9/11 as a "black swan" was also empirically false because there were "third parties observers"—not the victims of 9/11 or its perpetrators, but national security analysts, both inside and outside government, who for years before 9/11 consistently warned of a possible catastrophic attack on the US homeland by terrorists. (I present empirical evidence later in the essay.)

In an updated edition of his BS (published in 2010), Taleb [wrote](#) that he "was wondering why so many otherwise intelligent people have questioned whether certain events [such as] the September 11, 2001 attack on the World Trade Center were Black Swans, on the grounds that *some* predicted them." He [clarified](#) that his book *The Black Swan* was "not about some objectively defined phenomenon, like rain or a car crash," but rather "simply something that was not expected by a *particular* observer." He went on to [write](#), "Of course, the September 11 attack was a Black Swan to those victims who died in it; otherwise, they would not have exposed themselves to the risk. But it was certainly not a Black Swan to the terrorists who planned and carried out the attack." But "of course" this is different from how Taleb presents 9/11 in the rest of the book and other forums, as precisely that: as "definitely" a BS event, objectively speaking. And "of course" he brushed aside the fact that third-party observers were warning of such an attack for years before it happened.

During a [March 2020 interview](#) with *Bloomberg*, Taleb stated that Covid-19 was "not a black swan. It was a white swan. And I'm so irritated that people say it was a black swan. We have had 'black swans.' September 11th was definitely a black swan. This [Covid-19] was a white swan."

Aha! So Covid-19 was a white swan, and not a black swan (nor a pink flamingo nor a dragon king…) Phew… Thank you for the clarity…

Notice that Taleb in his interview said that Covid-19 was "not a black swan," and that he is "irritated" at those who call it a black swan. He did not say, "Covid-19 was not a black swan to me, one particular observer, because in the past I imagined and [wrote](#) about the possibility of future epidemics." He said that Covid-19 is "not a black swan," a declarative statement. But if a

black swan is something unexpected to a particular observer, why is he "irritated" by those who call Covid-19 a black swan? What if it was unexpected to those particular observers?

During the aforementioned interview, he also did not say that "9/11 was a black swan to me, but not to the national security analysts who were warning against such an attack years before it happened." He explicitly said that "September 11th was definitely a black swan," implying that it was a BS event in an objective sense—not just to one observer, Taleb. If Taleb couldn't see it coming, no one could (in Taleb's mind)…

King and Kay's *Radical Uncertainty* came out on March 5, 2020. In that book, they wrote, "We must expect to be hit by an epidemic of an infectious disease resulting from a virus which does not yet exist." Six days after the book's publication, the World Health Organization declared Covid-19 a "global pandemic," and a few weeks later the US President declared a national emergency. At the end of March 2020, King and Kay opined in an editorial that, "Covid-19 has been described as a 'black swan.' It is not." They did not write, "Covid-19 is not a black swan to us, because we studied and wrote a bit about viruses here and there, and we anticipated an epidemic emerging sooner or later." They simply said that Covid-19 "is not" a black swan, implying an objective designation, something true across the board, if all observers were smart enough to see things the way they saw them.

But if as Taleb explicitly says that the black swan is "simply something that was not expected by a *particular* observer," and if he cites as the victims of 9/11 as "of course" being those particular observers to whom the 9/11 attacks were a black swan event ("otherwise, they would not have exposed themselves to the risk"), what about the roughly five million people who died as a result of Covid-19? What about those millions of particular observers—did they willfully, knowingly, and purposefully expose themselves to the risk? What about governments who took half-hearted measures, often too late, allowing the virus to become a pandemic? Following Taleb's strange use of conditional reasoning, we can surmise that if individuals and governments had anticipated or expected the pandemic to break out, they would have taken measures to avoid the pandemic, and lives would have been saved. But the pandemic did happen, and millions died, and hundreds of millions got infected. "Thus," the Covid-19 pandemic was an unexpected or unpredictable or unimaginable "black swan."

No? No, at least not according to Taleb and some of his supporters.

What Is Unimaginable?

The confusion, disagreements, and inconsistencies about what is and is not a "black swan" are related, I think, to a conceptual flaw embedded into Taleb's theory. It also arises naturally in other writings that affirm that there are things in the universe that are literally unimaginable, inconceivable, unknowable, unthinkable, or unobservable.

What is literally unimaginable? What is actually unknowable or unpredictable? If we mean those words literally, can we provide an example or evidence to substantiate claims about the existence of some "unimaginable" things? If someone says something along the lines of, "Well, I can't give you an actual example of something truly unimaginable or truly unknowable, because the concept behind those words entails just that. We can't even know what we don't know," then I think this is a problem. This means that we can't even speak of such things.

A crucial part of human communication is our ability to provide evidence and examples for words and ideas that we use in a literal way. When we study the alphabet as children and learn that the letter "a" appears in the word "apple," we see a little flashcard or some sort of an image representing an apple. Later, as children, if we are hungry, we can tell someone older than

us that we want an apple. They know what an apple is and how an apple looks, and we do as well. They can bring us an apple and we can eat it. Later still, if we go to a grocery store that we've never been to, we can ask a worker, "Where do you keep the apples?" They can walk with us and then point to a section containing all sorts of apples.

Theories—and general, literal, or empirical claims about the world—rely on literal language, on our ability to cite an example and/or provide evidence in the general way described above. We get by in large part because we can say words or phrases that we mean and that others understand. The philosophical writings of McGinn, Nagel, Taleb, King and Kay presumably present empirical claims about us and the world—about things that are "unimaginable" to us. In this very paper, I make many literal claims, and many of my links provide direct examples of and evidence for the claims I make. For example, earlier in the essay, I write that in his book *The Black Swan* Taleb states, "This book is about uncertainty." I mean that literally, and I provide evidence to substantiate my claim. I provide a [link](#) to an online copy of *The Black Swan* showing evidence and an example of where Taleb literally writes that phrase. I claim that Taleb says in an interview with *Bloomberg* that the Covid-19 pandemic was not a black swan and that September 11th was "definitely a black swan," and I provide a [link](#) to a video where Taleb can be seen and heard saying those things. I claim that Taleb is inconsistent about his BS theory, and I show examples of how he says one thing in one place and something contradictory in another.

In communicating with others, we often (though not always) use words, sentences, ideas, and concepts in a literal or exact way, without resorting to metaphors or allegories. For example, when a doctor diagnoses you with some sort of ailment, they provide the information to you in a literal way. They are not messing with you. They're not telling you an allegory. They mean what they say. As evidence to back up their diagnosis, they might show you an X-ray, the result of some CT scan, or some other form of empirical evidence that they believe, in their professional judgment based on years spent at a medical school and experience running a healthcare practice, is true. Similarly, software engineers who design the navigation apps on our smartphones create literal representations of how we can actually reach our destination from where we are; they do not create navigation apps that present us with an allegory or a myth or a cartoon showing the way to Never Never Land (the fictional island in J. M. Barrie's *Peter Pan*). When pilots receive training on how to fly planes, the resources they tap into—textbooks, videos, other pilots— provide them with literal descriptions of the world. In the workplace, much of the communication that is focused on getting the job done rests on the ability to communicate words and concepts exactly, in the ability of individuals to say things that they believe relate to some reality, in the ability of individuals to provide evidence and examples to substantiate their claims.

Creative, inventive, artistic, and imaginative creatures that we are, we also have figurative or metaphorical language that allows us to express things in ways that add color to our world but do not reflect what we believe is true. For example, we may use an idiom like "It is raining cats and dogs outside." This figurative expression implies that it is raining heavily outside, but it does not mean that there are literally cats and dogs falling from the sky. The person who hears what we say will not ask us to provide a photo of cats and dogs falling from the sky, and we do not try to do so once we use that idiom as proof that it is actually raining cats and dogs. We mean that expression figuratively. According to *Webster's New World: American Idioms Handbook*, there are [over 10,000 idioms](#) in American English. For example, the phrase "has one foot in the grave" means that someone is closed to death, not that they are literally standing in a graveyard and one of their feet is in the grave. Figurative language is also frequently used musically or artistically. *The Smashing Pumpkins* sing that "The world is a

vampire." The song is "catchy" and "cool" and audiences go to concerts to enjoy it or listen to it on their smartphones. But physicists do not study the natural world and compose their theories based on the notion that the world is literally a vampire. Tom Cochrane sings that "Life is a highway," and the song is likewise catchy. But biologists and doctors do not operate based on the notion that life is literally a highway. In everyday language, we might speak about a dead person using the figurative expression that they are "rolling in their grave," but we do not mean that the person we're referencing is literally rolling in their grave and we do not seek to provide an example of someone dead presently rolling in their grave. These are non-literal expressions and we do not need to provide evidence that they are true.

The problem is not that theorists and philosophers like Taleb, King, Kay, and McGinn speak of things as being "unimaginable," "inconceivable," "unknowable," or "fundamentally unpredictable." The problem is that they use these words and mean them literally. An additional problem is that theorists who use these words literally imply or sometimes explicitly state that something was inconceivable across the board—to human beings in general. "No one" could have conceived of the type of stock market crash in October 1987 before it happened (according to Taleb), "no one" could have imagined something like a modern smartphone a century ago (according to King and Kay), and "no one" can answer literally insoluble philosophical questions like the mind-body problem (according to McGinn).

But the notion that there are "literally inconceivable" things, I think, is absurd—it is "mindboggling," metaphorically speaking. What is literally inconceivable, or literally unimaginable, or unpredictable, or unobservable, or unthinkable? If we treat those words literally and mean to imply something actual or real about our universe, rather than as part of our figurative language, I think we should be able to provide an example of these words, and evidence that what we say is "inconceivable" is indeed "inconceivable." But in trying to provide an example of something "literally inconceivable," or unimaginable, or unthinkable, or unobservable, we nullify a very standard linguistic convention that we generally abide by when communicating—that is, the convention by which we can provide an example for each word we use if we use it literally.

Two strategies often emerge when individuals use the word "unimaginable" and similar "un-able" words in a literal sense. The first strategy amounts to something like "mind-reading," and the second amounts to something like "time traveling." In other words, they say that some phenomenon or event was unimaginable to someone else in the past—to the victims of 9/11 (who were presumably incapable of conceiving that their plane might be hijacked), or the convict colonists of the First Fleet (who were presumably incapable of imagining that they might observe black swans in present-day Australia), or to people a century ago (who presumably could not conceive of a device like the modern smartphone.) But how would they provide evidence to substantiate such claims? Do they have mind-reading devices and time machines that allow them to look inside the minds of individuals in the past, and discern what was imaginable and unimaginable to them, what was the range of their imagination, what was inside and outside the scope of their imagination? I do not think that they have such devices, and they are using their imagination to imagine that some things were unimaginable to some people in the past. Instead, they use a strange mixture of conditional reasoning and counterfactual thinking to reach their conclusions. McGinn posits that if the mind-body problem was soluble it would have been solved by now, after ages of trying to solve it. But it hasn't (in his mind at least), and that means that the human mind is not up to the task, it has insurmountable limits that it bumps up against when it tries to resolve intractable philosophical problems.

Taleb posits that if 9/11 was predictable then there would have been military planes circling the Twin Towers on the day of the tragedy, presumably to shoot down civilian airliners, and the 9/11 attacks would have been prevented. But those military planes were not there, and the 9/11 attacks did happen, and "thus" this means that 9/11 was an unpredictable event. I think this sort of blend of conditional reasoning and counterfactual thinking is a serious error. Using the same strange blend of conditional reasoning and counterfactual thinking, we can make the following argument:

"If people were incapable of predicting that multiple planes would be hijacked on September 11, 2001, they would have bought a ticket to fly on that day and boarded one of the hijacked planes, not expecting what might happen to them. However, billions of people did not board one of the hijacked planes on September 11, 2001. 'Ergo,' billions of people were capable of predicting 9/11."

The argument above is, I think, as absurd as the sort of conditional reasoning-mixed-with-counter-factual-thinking that Taleb, King, and Kay engage in.

In *Stalking the Black Swan*, former Wall Street analyst Kenneth Posner writes, "The collapse of Fannie Mae's stock [beginning in late 2007] would have been unthinkable just a year or two years earlier. The near-complete loss of value qualifies as a Black Swan, or if you like, it was part of the larger Black Swan that swept through the housing, mortgage, and capital markets." I think the word "unthinkable"—as are other members of this strange but wonderful figurative family, like "unimaginable" and "unknowable"—only hold water as non-literal descriptions of the world. Was the collapse of Fannie Mae's stock and the wider financial crisis literally unthinkable (as in, "not capable of being grasped by the mind") in, say, 2005 or 2006? Well, it appears that Taleb was drafting his BS book between 2003 and 2006, and given what he wrote in it about "Fanny Mae," it appears likely that the thought that Fannie Mae's stock might collapse was very "thinkable" to him during that period. In a section of Taleb's website dedicated to the "imbeciles" who chose to ignore his "warnings," Taleb writes (or rather screams) that the financial crisis that began toward the end of 2007 was "NOT A BLACK SWAN," because it was thinkable to him. But it appears that there were others too for whom the collapse of Fannie Mae's stock was "thinkable" too. For example, in 2006 the economist Nouriel Roubini told the International Monetary Fund that in the coming months and years the US would likely face a "once-in-a-lifetime housing bust [and] ultimately, a deep recession." In early 2006, the hedge fund manager and investor John Paulson bet against the US housing market, in trades that between 2007 and 2008 netted his clients and employees an estimated $20 billion in profits. It appears that a collapse of the US housing market, and a wider recession, were indeed thinkable. Posner's "unthinkable" moniker works, I think, if it is embraced in a figurative or nonliteral way, to express how shocked many (though not all) people were by the collapse of Fannie Mae's stock and the wider financial crisis that began in 2007, much as the expression "It is raining cats and dogs outside" works if we understand that it means that it is raining heavily outside, not if we suddenly claim that dogs and cats are literally falling from the sky.

Ethical Challenges of "Unimaginable" Arguments

Part of the reason why we are capable of holding people to account is that human beings can imagine the consequences of their decisions, actions, and inactions. We are, for example, capable of imagining how it would feel if we punched someone or caused them pain in another way, and how they might respond. We can play that scenario out in our minds and let it die there. Society

can hold us to account through promised punishments aimed at and often capable of deterring us from inflicting harm on others because we can imagine the punishment we would receive, and the harm and pain that we would have to deal with, if we transgressed a law. I think that our imagination is a crucial part of the formation of all sorts of futures, which exist in our "mind's eye," metaphorically speaking. The usage of concepts like "the unimaginable" or "the inconceivable" in literal language raises an ethical dilemma. Broadly speaking, this dilemma can be represented in the form of a question: if there actually exists a category of literally unimaginable things, if futures are literally unimaginable, how do we hold individuals and organizations accountable for their actions and decisions when things fall apart?

  The argument that there exist literally unimaginable things paves the way for leaders to claim that no one "saw" or "could have seen" it coming, whether it was a financial crisis, a terrorist attack, or a natural disaster. This is the crutch senior leaders often use. This appears to have happened after Hurricane Katrina emerged in August 2005.[xiv] Four days after Hurricane Katrina devastated New Orleans, in an interview with *Good Morning America*, then US President George Bush attempted to deflect criticism by saying, "I don't think anybody anticipated the breach of the levees" in New Orleans. In separate remarks, Bush said, "The destruction left by Katrina reaches beyond anything we could have imagined." However, leaked footage showed that worried officials briefed Bush a day before Katrina hit that the coming storm could breach the city's flood barriers. The head of the National Hurricane Center voiced a "very, very grave concern" that the levees could be over-run, and the head of the Federal Emergency Management Agency said, "We're going to need everything that we can possibly muster, not only in this state and in the region, but the nation, to respond to this event." Bush's statements about the inconceivability of breaching of the levees in New Orleans and the destruction of the storm were not literally true. Instead, I think that they were instances of a senior leader trying to wash his hands for tragic outcomes that occurred while he was in charge. If no one anticipated that the levees would be overrun, and if the size and scope of the destruction wrought by Hurricane Katrina were literally unimaginable, then neither Bush, nor his administration, nor other parts of the federal government they oversee (including the US Army Corps of Engineers) could have ever adequately prevented the tragedy or prepared for and responded to it.

  On October 23, 2008, Alan Greenspan (who from 1987 to 2006 was the Chair of the US Federal Reserve) testified in front of the House Committee on Oversight and Government Reform about the ongoing financial crisis and the role of federal regulators. During that testimony, Greenspan said, "In 2005, I raised concerns that the protracted period of underpricing of risk, if history was any guide, would have dire consequences. The crisis, however, has turned out to be much broader than anything I could have imagined." To his "credit," Greenspan was only talking about himself when employing the "unimaginable" concept since he said that the financial crisis turned out to be "much broader than anything I could have imagined." But it appears to me that Greenspan could have imagined such a crisis ahead of time and that he like senior leaders often do, was using the crutch of the "unimaginable" concept to defend himself and to wash his hands of any culpability for the crisis. If he couldn't imagine or conceive of the type of crisis that emerged in 2007, how could he have done anything to prevent it from happening?

  Often, it appears to me, the "tragedy" of some event (a war, a natural disaster, a financial crisis) is not that "no one saw it coming," not that our cognitive or epistemic capacities are limited and that we were incapable of predicting or preventing it. Instead, the "tragedy" is that

we did and often do see the possibility of some disaster befalling us and/or others, and for reasons ranging from indolence to selfishness, do nothing to prevent it, or throw up our hands and accept the inevitability of that future disaster fatalistically.

Empirical Inquiries Into…

… The Previously Unimaginable Sighting of the First Black Swan

King and Kay imply that if you were to travel back in time to say, April 1787 (the month before the First Fleet set sail to present-day Australia), and if you were to interview a million Europeans about whether there exist black swans in nature, none of them would say that black swans exist. If you were to ask a million Europeans whether those traveling on the First Fleet to a land far, far away (back then a land not yet commonly called Australia) would observe a black swan, they'd exclaim, "Impossible!"

There are glaring empirical errors in King and Kay's BS origin story. First, the Dutch explorer Willem de Vlamingh recorded observing black swans off the western coast of present-day Australia in his logs roughly 90 years before the First Fleet set sail, as did other members of his expedition. Their logs do not indicate that this event was startling or shocking for them as we might expect if black swans were literally unbelievable or unimaginable beforehand. Second, the various outcomes of the Vlamingh-led expedition to present-day Australia were shared with other Europeans relatively quickly. For example, Nicolaes Witsen, one of the driving forces behind Vlamingh's expedition, learned many details about the outcomes of the journey, including the fact that black swans were sighted. Witsen shared this information with others, including the British naturalist Dr. Lister. An excerpt of Witsen's letter was published in the Royal Society's English-language journal, *Philosophical Transactions*, in 1698. To little fanfare, the letter included the fact that black swans and other animals were "found there." Over subsequent decades, the excerpt of Witsen's letter was republished many times, and the fact that black swans were observed was mentioned in *Atlas Geographus*, published during the 1710s. During the 1720s, the Dutch minister and naturalist Francois Valentijn published a collection of books containing illustrations of parts of the world that most ordinary Europeans of the time had never traveled to. One of the engravings depicted Vlamingh's expedition in present-day Australia along with black swans, as one can see below. It appears to be empirically false to imply that the observation of black swans in present-day Australia was "unimaginable" to Europeans before 1788.

Figure 2: *Black swans near Rottnest Island*, published in François Valentijn's *The Old and New East Indies* (circa 1724-1726)

If King and Kay mean that Europeans once upon a time, before the First Fleet's voyage, believed that every single feather of all swans must be white and only white, this too is empirically false—since during the 1600s and 1700s Europeans of different stripes (English, French) observed and recorded the existence of black-necked swans. The English naval commander John Narborough observed black-necked swans as early as 1670, and their existence was recorded in English- and French-language books throughout the 1600s and 1700s before the First Fleet set sail to present-day Australia.[xv]

… The Previously Unimaginable Smartphone

Using their magical time machine and mind-reading devices, King and Kay claim that a modern smartphone "was just not within the scope of imagination" to people living a century ago. If it would have been within the scope of imagination, people a century ago would have invented the smartphone. But clearly, they didn't, and so such a device was "unimaginable." In a similar vein, they write, "Before the wheel was invented, no one could talk about the probability of the invention of the wheel…. To identify a probability of inventing the wheel is to invent the wheel." The part about the wheel appears to have been pulled out of *The Black Swan*, where Taleb writes, "If you can prophesy the invention of the wheel, you already know what a wheel looks like, and thus you already *know* how to build a wheel… If you know about the discovery you are about to make in the future, then you have almost made it." He goes on to write that, "We are not easily able to conceive of future inventions (if we were, they would have already been invented). On the day when we are able to foresee inventions we will be living in a state where everything conceivable has been invented."

King, Kay, and Taleb appear to believe that if you are capable of imagining some invention, you're essentially there. If some existing technology was imaginable to people in the past, those people would have already invented that technology. But, that technology was only developed relatively recently and doesn't seem to have existed back then. "Ergo," it was "unimaginable" or "inconceivable" or "unpredictable" to people in the past. But is it the case that when we can imagine some future technology, we already know how to build it and have "almost made it"?

I think that the answer is a self-evident no. For example, in an interview with *Colliers* in January 1926, the inventor Nikolas Tesla was quoted as saying:

"When wireless is perfectly applied the whole earth will be converted into a huge brain, which in fact it is, all things being particles of a real and rhythmic whole. We shall be able to communicate with one another instantly, irrespective of distance. Not only this, but through television and telephony we shall see and hear one another as perfectly as though we were face to face, despite intervening distances of thousands of miles; and the instruments through which we shall be able to do this will be amazingly simple compared with our present telephone. A man will be able to carry one in his vest pocket. We shall be able to witness and hear events — the inauguration of a President, the playing of a world series game, the havoc of an earthquake or the terror of a battle — just as though we were present."

Tesla's quote provides tentative empirical evidence supporting the idea that something like a modern smartphone that can fit into our pocket—with all the features we've come to know and love, like "FaceTime"/video-calling and streaming events live as though we were where the event was happening—was indeed "within the scope of imagination" of at least one person about a century ago.[xvi] But, just because Tesla imagined the sort of features humans will one day

possess in a manner remarkably close to the features embedded into a modern smartphone does not mean that he was close to building a modern smartphone. It appears that human beings are quite capable of conceiving and imagining all sorts of future technologies (and "futures" more generally). That those technologies are not in existence at any point in time is no proof of their unimaginability or inconceivability.

… The Previously Inconceivable 9/11 Attacks

In *The Black Swan*, Taleb writes:

> "Think of the terrorist attack of September 11, 2001: had the risk been reasonably conceivable on September 10, it would not have happened. If such a possibility were deemed worthy of attention, fighter planes would have circled the sky above the twin towers, airplanes would have had locked bulletproof doors, and the attack would not have taken place, period."

No, no period at all. First, the risk of a 9/11-type of attack was reasonably conceivable. Taleb's background is not in national security analysis, and so he was not following some of the writings that were coming out during the 1990s and early 2000s. But national security practitioners and theorists during that period were writing about such a possibility. For example, in 1998, Ash Carter, John Deutch, and Philip Zelikow, three officials who served throughout their careers at the senior-most levels of the Department of Defense, Central Intelligence Agency, and State Department, respectively, published a paper in *Foreign Affairs* called "Catastrophic Terrorism: Tackling the New Danger." In the first section of that paper, entitled "Imagining the Transforming Event," they wrote:

> "Long part of the Hollywood and Tom Clancy repertory of nightmarish scenarios, catastrophic terrorism has moved from far-fetched horror to a contingency that could happen next month…. American military superiority on the conventional battlefield pushes its adversaries toward unconventional alternatives… A successful attack with weapons of mass destruction could certainly take thousands, or tens of thousands, of lives… Such an act of catastrophic terrorism would be a watershed event in American history. It could involve loss of life and property unprecedented in peacetime and undermine America's fundamental sense of security, as did the Soviet atomic bomb test in 1949. Like Pearl Harbor, this event would divide our past and future into a before and after. The United States might respond with draconian measures, scaling back civil liberties, allowing wider surveillance of citizens, detention of suspects, and use of deadly force."

In other words, the three authors above conceived of a catastrophic terrorist attack resulting in the deaths of thousands that would be a "watershed event in American history" and "could undermine America's fundamental sense of security." Such an event, they anticipated, would, like Pearl Harbor, "divide our past and future into a before and after." They further imagined that the US "might respond with draconian measures, scaling back civil liberties, allowing wider surveillance of citizens, detention of suspects, and use of deadly force." For anyone following what happened on 9/11 and how the United States responded, these lines appear remarkably prescient.

In addition, during the late 1990s, FBI analysts were warning "federal officials that terrorists might crash hijacked aircraft into landmarks such as the Pentagon and the World Trade Center." Meanwhile, in 1998, the Federal Aviation Administration (FAA) was briefed by terrorism experts on two scenarios involving terrorists hijacking planes and crashing them into strategic targets, including one scenario in which terrorists "commandeered Federal Express cargo planes and crashed them into the World Trade Center, the Pentagon, the White House, [and] the Capitol," among other targets.[xvii] Of course, for political reasons, after the attack happened, the Bush administration defended itself by signaling that no one could have foreseen such a horrendous attack happening. Condoleezza Rice, the then-National Security Advisor, defended the Bush administration by saying, "I don't think anybody could have predicted that these people would take an airplane and slam it into the World Trade Center, take another one and slam it into the Pentagon—that they would try to use an airplane as a missile."

Rice was speaking in a language similar to the one I pointed out above in the section on the ethical problems of using "unimaginability" arguments. Like Bush after Hurricane Katrina and Greenspan after the 2007 financial crisis, Rice was trying to bin the 9/11 attacks into the fundamentally "unpredictable" category. She was the National Security Advisor for roughly eight months before September 11th. If she could designate that tragedy as something that was fundamentally unpredictable (that nobody "could have predicted"), then she could wash her hands of any responsibility for allowing it to occur—since, if the 9/11 attacks were literally and fundamentally unpredictable, no one could have prepared for them, and therefore that not enough was done to prevent 9/11 was not her administration's fault. But, as two senior counterterrorism officials told the *Washington Post*, "U.S. intelligence and law enforcement agencies had more warning than Rice acknowledged that al-Qaeda might use a hijacked aircraft as a weapon."

So, was the risk of a 9/11-like attack literally "inconceivable" before it happened as Taleb suggests? The empirical evidence above shows, I think, that the answer is no. It was conceivable, and not just to the terrorists who planned it, but to national security practitioners and observers who warned about it in the years prior.[xviii]

… The Previously Inconceivable Indian Ocean tsunami

"Consider the Indian Ocean tsunami of December 2004," Taleb writes about this particular event, which he considers a black swan. "Had it been expected, it would have not have caused the damage it did—the areas affected would have been less populated, an early warning system would have been put in place."

The tsunami was caused by a magnitude 9.1-9.3 earthquake off the west coast of Indonesia, the third-largest earthquake ever recorded and the largest in the twenty-first century. Of the estimated 227,898 deaths across the world associated with the 2004 Indian Ocean tsunami, over 200,000 occurred in Indonesia, where over half a million were displaced.[xix]

According to the National Oceanic and Atmospheric Administration, between 1900 and 2003, there were approximately 100 tsunami events that impacted Indonesia. That's an average of almost one tsunami event per year for a century. In the decade leading up to the 2004 tsunami earthquake, 15 tsunamis struck Indonesia.[xx] Was the massive devastation wrought by the 2004 Indian Ocean tsunami the result of the fact that individuals or societies were incapable of imagining yet another tsunami happening, or could other factors have played a larger role?

Consider that, starting in 1967, Indonesia was ruled by General Suharto, a military leader who came to power through a coup d'état and was only ousted in 1998 after thirty years of dictatorial rule.[xxi] Suharto was one of last century's most corrupt rulers, having embezzled

upward of $35 billion, and was only booted out of office in the wake of the 1997 Asian financial crisis, which decimated Indonesia's economy and led to widespread rioting against his rule.

According to the International Monetary Fund's World Economic Outlook database, in 2003, a year before the tsunami, Indonesia's gross domestic product per capita based on purchasing power parity was lower than Albania, Iraq (a country that at that point was slowly descending into civil war), Belarus (Europe's last dictatorship), Venezuela (then ruled by a socialist dictator named Hugo Chavez), and Iran and Libya (both countries which were under US and UN sanctions for decades leading up to 2003). The United Nations Development Program keeps track of what it calls the Human Development Index (or HDI), which looks at a variety of human development indicators beyond per capita income such as education levels and life expectancy. Each year it ranks countries based on their HDI score. In 2003, countries with high HDI scores were those that we typically think of as "wealthy countries," including Norway, the United States, the United Kingdom, Germany, and Canada. Indonesia scored lower than Belarus, Cuba, Iran, Libya, and Venezuela.[xxii]

The closest land point to the epicenter of the 2004 tsunami and the area in Indonesia hit hardest by it was Aceh province, where an estimated 130,000 people lost their lives. As the tsunami hit Indonesia, Aceh province was in the middle of a brutal, bloody, and decades-long civil war between the local, religiously fanatical government and the central government in Jakarta.[xxiii]

Considering these facts, to suggest that the impacts of the 2004 tsunami were as devastating as they were because of a failure of imagination, because no one expected or could expect that yet another tsunami would strike the country, is an embarrassingly ignorant claim. The "areas affected would have been less populated" in the world's fourth most-populous country and one whose population density is more than four times that of the United States? Who would have moved scores of impoverished people to safer regions? The corrupt central government in Jakarta that was embroiled in fighting forces in Aceh province? The religiously fanatical local government in Aceh? Where would scores of people have gone and where would they have lived—in million-dollar homes in Larchmont, New York? A responsible government that cared about its citizens may have answered these questions and, for decades or more, resolved at least some of the challenges facing a country located inside the infamous Ring of Fire.[xxiv] But, it does not appear either the historically corrupt national government in Jakarta or the fanatical local government in Aceh exhibited the traits of responsible governance. It appears that political, socio-economic, and security challenges faced by countries in the region, including Indonesia, better account for the devastating impacts of the 2004 tsunami than a failure to imagine the possibility of yet another tsunami before it happened.

Conclusions

In this essay, I pointed out what I think are some of the conceptual, empirical, and ethical problems embedded into arguments that the resources of our minds have some insurmountable limits, and that those limits imply that there are literally unimaginable or inconceivable things in our universe. I critique this strain of thought because I view the ideas embodied in it as unwarranted, unhelpful, and extreme, not because I'm an "idealist." Just because someone critiques the notion that we are "flawed beyond repair" and "defective" does not mean that they believe that human beings are "flawless" or "perfect." Just because someone critiques current

conceptualizations of our "limits" and "limitations" does not mean that they believe that humans have "unlimited" or "limitless" capacities. Just because someone critiques the literal usage of words like "unimaginable" and "unknowable" does not mean that they believe that "everything is knowable."[xxv] Human beings often feel uncertain about and are perplexed by many items in the world—from what their personal or individual futures hold (a day, a month, a year, five years from now), to what the nature of the relationship between the seemingly immaterial "mind" and the seemingly material world is, to whether they have free will and if so what that idea even means. We can think and talk about these and other items without resorting to the extreme of saying that the reason why we are still debating these questions is that our minds have hard limits around them, and that outside of those limits there exist things in our universe that have some reality that is literally "unimaginable" to us.[xxvi]

ENDNOTES

[i] McGinn does not appear to be saying that there is no right answer or "correct theory" to the mind-body problem or to other questions that eternally baffle us. "What is closed to the mind of a rat may be open to the mind of a monkey," writes McGinn, "and what is open to us may be closed to the monkey." Similarly, there may be puzzling parts of the universe that are closed to our human minds, but open to other, non-human minds (Martians or gods) and they may have the ability to reach an understanding of the underlying reality of phenomena to which our minds are "closed." Mysteries that are closed off to us are "no less real for not being reachable" by us. They simply lie beyond the limits of our minds.

[ii] It is difficult to understand how Nagel concluded that "our own experience" provides the "basic material for our imagination," and how he leaped to the conclusion (his "therefore") that the "range" of our imagination is "limited." It appears to me that our imagination is a critical part of our imagination, which, I think, is itself a critical part of what we sometimes call our "consciousness" and sometimes call our "mind." Some people imagine and believe in the existence of entities like demons, ghosts, and the afterlife. Others imagine and believe in the existence of omnipotent, omnipresent, and omniscient God who created the universe and who cannot and ought not to be represented in any sort of art form. Others still imagine (though not necessarily believe in the existence of) genies. For example, the creators of the multiple Disney films *Aladdin* used their imagination to conceive the character of the genie. Specifically, what in our "non-imaginative" experience—the everyday experience of conscious, waking life—provides the "basic material" for our imagination to conceive of the entities just described (God, demons, ghosts, the afterlife, genies)? Is it always the case that our experience provides the basic material for our imagination, or is it often the case that our imagination provides the basic material for our experience? In my case, for example, I spend much of my waking life living "in the clouds" or "in my head," imagining wonderful futures, futures wherein I write an essay like this and someone gets what I'm trying to say once I've published the essay. I haven't published this essay, but in my head, there have been innumerable moments across many days when I imagined all sorts of futures where I did publish this essay, and wherein Taleb or King and Kay or Nagel, people I never met, angrily responded to my essay claiming I got what they said "all wrong!" It appears to me that my imagination was and is a crucial part of my experience.

Even if "our own experience provides the basic material for our imagination" (whatever that actually means) why would that necessarily entail that the range of our imagination is "limited"? A traditional piano has a limited number of keys, typically 52 white keys and 36 black keys. But does that mean that there is a limit to the number of musical compositions that a piano can play? The English alphabet consists of a limited number of letters: 26 (as of 2022). But does that mean that there is a limit to the number of words in the English language, or a limit to the number of English-language sentences or books or ideas?

Democritus, who lived between circa 460 BCE and 370 BCE, did not have access to a modern electron microscope or a technique like electron ptychography, and so we may say that these were not part of his experience. Maybe his experience was thus limited (maybe). And yet he was able to imagine, to "see" with his "mind's eye," the existence of indivisible atoms that make up the fundamental building blocks of the natural world. Einstein did not have access to the Laser Interferometer Gravitational-Wave Observatory (LIGO), and yet he was able to imagine in his "mind's eye" the existence of gravitational waves ("ripples in space-time") a century before they were detected by LIGO. What in their "experience" provided the "basic material" for their imagination—unless we include human imagination as a crucial part of human experience, of "what it is like to be human." A question as worthy of asking as "what is it like to be a bat?" is "what is it like to be human?" It appears to me that our imagination is an integral part of what it is like to be human, and, at the grandest, broadest possible level, I do not think that our imagination is "limited"—it is as boundless as the universe and as strange as the multiverse.

[iii] In *What It's Like To Be A Bat*, Nagel argues that we can believe that we and other sentient creatures (humans, bats) have "conscious experiences," and that such experiences have a "subjective character." But the subjective character of experience cannot be adequately explained by using familiar forms of analysis (material, physical, functional, or reductionist). We cannot talk about subjective experiences in "objective" terms.

[iv] Taleb also uses words and concepts like the notion of "limits." For example, he writes, "Our resources (both cognitive and scientific) are limited, perhaps too limited."

[v] As Taleb writes in *Fooled By Randomness*, "There is the Tragic Vision of Humankind that believes in the existence of inherent limitations and flaws in the way we think and act… Needless to say that the ideas of this book

fall squarely into the Tragic category: we are faulty and there is no need to bother trying to correct our flaws. We are so defective and so mismatched to our environment that we can just work around these flaws."

vi Similarly in the praise section before the start of *The Black Swan*, an excerpt of a glowing review by the *New Yorker* writer Malcolm Gladwell states that the lesson of Nassim Taleb's writings is that there is "courage" and "heroism" in "the purposeful and painful steps to prepare for the unimaginable."

vii Similarly, in King's earlier book *The End of Alchemy*, he writes, "Uncertainty… concerns events where it's not possible to define, or even imagine, all possible future outcomes."

viii McGinn, Taleb, King and Kay are not the only ones who have written that are things or facts about the world that are fundamentally "unimaginable" to us, and, perhaps by extension, "unknowable." For example, in *Strategy and Defense Planning: Meeting the Challenge of Uncertainty*, the international relations scholar and strategist Colin Gray writes, "This book insists that one cannot possibly identify the right defense budget, for if no better reason than that such knowledge is unknowable." My aim here is not to argue that anything or everything is knowable, but rather to critique the identification of items (be they "the future," "the correct theory of the mind," or "the right defense budget") as literally "unknowable," "unimaginable," or any of the other "un-able"s pointed out in this essay.

ix The terms on this figure are derived from multiple scholars cited in this essay. For example, "The scope of imagination" and "bounds of possibility" come from King and Kay's *Radical Uncertainty*. The term "veil of opacity" comes from Taleb's *The Bed of Procrustes*; "cognitive closure" comes from McGinn's *Can We Solve the Mind-Body Problem?*; and "the range of imagination" comes from Nagel's *What Is It Like To Be A Bat?* Multiple terms on the figure, like "unimaginable" and "limits," appear in multiple works cited in this essay. The bottom left provides some examples of those "unimaginable" things that scholars provide.

x Similarly, the word "unthought" may mean "not anticipated" or "unexpected," while the word "unthinkable" implies something stronger: "impossible to imagine or accept" or "not capable of being grasped by the mind." The word "unpredicted" may mean "not predicted" or "unforeseen," but the word "unpredictable" implies something stronger, such as, "not able to be known or declared in advance."

xi Writing in *Management & Marketing: Challenges for the Knowledge Society*, Constantin Bratianu noted that "The COVID-19 pandemic is a Black Swan phenomenon by all characteristics defined by Taleb." These sorts of claims persisted into the following year. In January 2021, the *Guardian* published an editorial entitled "The 'black swan' Covid catastrophe shows us just how fragile our world is." In June 2021, in the journal *Knowledge and Process Management*, Krzysztof Zieba referred to the Covid-19 crisis as "a typical Talebian Black Swan."

xii For example, when McGinn talks about the philosophical perplexity of problems such as the mind-body problem, he writes, "the human cognitive system is just not set up for dealing with problems of this general type." Not that Alice's cognitive system was not set up to deal with problems of this general type, or Bob's, but "the human cognitive system" in general. He writes, "The world contains things whose ultimate nature we cannot penetrate." Again, "we," as in a collective, not things whose ultimate nature Alice or Bob cannot penetrate. Similarly, he talks about the limits and limitations of human beings in general and writes, "Humans are constitutionally insensitive where philosophical problems (of a certain kind) are concerned."

xiii Their BS origin story appears to say that, before the landing of the First Fleet in 1788 on the eastern coast of present-day Australia, the observation of black swans was an "unimaginable event" to Europeans in general—not just to this or that particular European, but to Europeans as a community of people. Similarly, when they write that something like a modern smartphone was "just not within the scope of imagination or bounds of possibility" a century ago, they appear to imply that it was "outside the scope of imagination" of the people living in that era. If you were to build a time-traveling machine, travel back in time a century ago with a smartphone, and explain to a million people what that device is, none of them could fathom what you're saying. And if you were to examine a million records by a million people written a century ago, none of them would show that they imagined that one day such a device would exist. As I point out in the empirical section below, the evidence indicates that their claim does not align with the empirical evidence.

xiv Although the powerful storm itself was devastating, what was arguably more devastating and tragic was the lack of preparedness and responsiveness by the federal government. During the hurricane, the US Army Corps of Engineers designed and constructed levees and floodwalls along two of three main drainage canals that pour into New Orleans failed, flooding neighborhoods and drowning many residents. At one point, water covered four-fifths of the city. The US Army Corps of Engineers, part of the federal government and thus under the control of the White House, was later faulted for failing to notice critical warning signs in their studies prior to the construction of the floodwalls that failed during Hurricane Katrina. Ultimately, the natural disaster and, more importantly, the delayed and mismanaged response to it cost over 1,800 lives and $125 billion in damages. Less importantly, it was a public

relations nightmare for the White House, which, along with state and local governments, was criticized for mishandling the response.

xv The following are additional comments on King and Kay's BS origin story. If the reader re-reads King and Kay's origin story above with a critical eye, they might notice that their first sentence concerns in part the supposed beliefs of now long-gone Europeans, while the second sentence is a claim about their imagination and knowledge. The discerning reader might also notice that in the second sentence, King and Kay make a claim about what they imagine was unimaginable to those Europeans based on what those Europeans supposedly knew. A few questions that the curious may reflect upon.

First. Are beliefs the same things as knowledge, for that is what is implied by the combination of the first sentence ("Europeans believed all swans to be white") and the second statement ("given European knowledge of swans")? If so, what about mirages, hallucinations, illusions and dreams we have that we believe are true while we are having them? What about lucky guesses, in which we believe something is true and it is deemed by society to be objectively true but our justification for our belief is in error? In these and other cases, human beings hold some beliefs, but are these beliefs the same thing as "knowledge"?

Second. Are the things we believe in and the things we observe in the world around us one and the same, for that is what is implied in the first sentence, namely, that since all swans in Europe were white, and since those old time Europeans could only have observed white swans, then they must have believed that all swans are white? If so, what about the philosopher, scientist or naturalist who believes in the existence of atoms, gravitational waves, black holes, subatomic particles, or parallel universes years, decades, centuries, or millennia before they and/or other human being declare that those phenomena can be said to have been observed? What about someone who believes that, this time, they've bought a winning lottery ticket, after having observed themselves buying a thousand losing lottery tickets before? What about someone who goes out on a date with new person for the hundredth time in their life, believing that this time it will work out? What about the job applicant who send their resume to a position they believe they're a perfect fit for, one they believe they deserve to hold, one they believe they'll get an interview, even though they've observed themselves believing this sort of thing a million times before and they observed the rejection letter they received or the non-response they got over a hundred times before? What about the abolitionist who, despite observing that slavery is a commonly accepted practice around the globe, believes that every individual should still, nevertheless, be free and that slavery ought to be abolished, even though most others around her believe otherwise or simply do not care to challenge the status quo? What about humans in the modern world who are born with a body whose sex their society designates is biologically female or male, but who believe that their gender is different from their assigned sex? What about our abstract art, our new technologies, our scientific hypotheses, our fantasies, our myths and moneys and morals, paranoias and pathologies, obsessions, ethics, laws, religions, oughts and ought nots, our dos and don'ts? What about time and companies? Are our imagined creations in whose reality we believe at heart the outcome of things we observe in the "objective" world?

What about valkyries, disirs, norns, centaurs, jinns and genies—were those ever observed by individuals who believed in their existence? What about those who today believe in the existence of souls, ghosts, angels, and demons—have they ever observed these phenomena? What about those who believe in the existence of aliens on other planets—have they ever observed them, or is it the case that they believe in the existence of those aliens despite admittedly not having ever observed a single one? To bring it back to what King and Kay say above, could there not have been a single European during the 1600s who, despite having observed only white swans his or her entire life, believed that somewhere else in the world there might be a non-white swan? Were those Europeans conscious humans or mindless zombies?

Third. Are the limits of our imagination and the limits of our knowledge one and the same, for that is what is implied by the sentiment that for Europeans the observation of a black swan was "an unimaginable event, given European knowledge of swans"? For example, we may be inside of our bedroom, and we may observe our bed and the cabinet and the closet door. We may say that we know what things are inside the room, and not know what things are outside of the room. What we can see inside the room is in some sense limited or bounded by the four walls around us. But does the world outside the room disappear in our mind's eye? Are we incapable of imagining the world outside our room simply because we are inside of a room and can only observe with our naked eye what is inside of it?

Figure 3: "Lion-Man" figurine carved between 35,000 and 40,000 years ago, found in present-day Germany in 1939

      Above is a prehistoric ivory sculpture of a "lion-man" that was discovered in a German cave last century. It was carved out of mammoth ivory by human beings using a flint stone knife around 35,000- 40,000 years ago. As far as we are aware, there weren't any literal "lion-men"—that is, creatures with the head of a lion and the body of a man—walking around tens of thousands of years ago that our human ancestors observed with their naked eye. The statue appears to be a depiction of an imagined creature. More recently, there were at least some in ancient Greece who, several millennia ago, believed in the existence of gods and goddesses like Athena, who, among other things, was birthed out of the head of Zeus. As far as we know, there were no births out of the head of anyone that ancient Greeks witnessed with their two eyes, but this did not stop at least some ancient Greeks from imagining and believing that the goddess of wisdom and war (to whom they dedicated a temple called the Parthenon) was birthed out of the head of the god of the sky and thunder, who ruled as king of the gods of Mount Olympus. Why would the existence of black swans have been literally unimaginable and unbelievable to a species that appears to have imagined and believed in the existence of things much more spectacular than black swans?

[xvi] Other appear to have been capable of imagining similar future technologies. One of the most ubiquitous ways of communicating today over the smartphone is via near instantaneous email and text messages. The emails and text messages, sent wirelessly over vast distances and frequently transmitted through cell towers, do not have to be read right away—we can tap on our smartphone to read them whenever we want. They wait for us, as it were. Was this sort of communication inconceivable a century ago simply because smartphones did not exist? In 1923, almost a century ago, the science fiction writer H.G. Wells published *Men Like Gods*, featuring a utopia in a parallel universe. This is how Wells describes the way by which individuals communicate with each other in his imagined "utopia": "For in Utopia, except by previous arrangement, people do not talk together on the telephones. A message is sent to the station of the district in which the recipient is known to be, and there it waits until he chooses to tap his accumulated messages... Then he talks back to the senders and dispatches any other messages he wishes. The transmission is wireless." H. G. Wells did not write about fiber-optic cables or submarine communication cables, but his description above does sound like modern-day wireless communication messaging and at least some of the steps and features involved in it. Even though Wells conceived of the existence of all sorts of possible technologies, he does not appear to have personally brought them about. At the same token, just because he did not create the modern-day equivalent of near instantaneous, wireless communication over vast distances does not mean he could not imagine such a state of affairs.

      What about imagining a small physical object holding many books in it? Could individuals a century ago imagine something like it, or was it literally, structurally, cognitively inconceivable to them? In 1911, well over a century ago, Thomas Edison stated that over the coming century, "A book two inches thick will contain forty thousand pages, the equivalent of a hundred volumes." Sure, not the million books that King and Kay mention in their quote about what was once unimaginable, but does that mean that an imaginative figure like Edison was incapable of imagining that one day in the future a small device could hold a million books?

xvii In 1999, the Federal Research Division submitted a report to the National Intelligence Council on terrorism that included the following sentence: "Suicide bomber(s) belonging to al-Qaida's Martyrdom Battalion could crash-land an aircraft packed with high explosives (C-4 and semtex) into the Pentagon, the headquarters of the Central Intelligence Agency (CIA), or the White House." Following the 9/11 terrorist attacks, a declassified memo from July 2001 revealed that a Phoenix-based FBI agent was warning that Osama bin Laden might be using American aviation schools to train terrorists as pilots. Apparently, that same month Italian officials received similar intelligence and passed it to senior American officials. In fact, FBI investigators had known about the possibility of al-Qaeda-affiliated groups hijacking airplanes and using them in suicide missions as early as 1995 or 1996. One of the plots the FBI uncovered in the mid-1990s was described by a prosecutor as having the potential to kill 4,000 people if executed to lethal perfection.

xviii There are other problems with Taleb's argument. Consider Taleb's argument that had the risk of a 9/11-type airplane hijacking and attack been "reasonably conceivable on September 10 (and) deemed worthy of attention… airplanes would have had locked bulletproof doors." Let us focus on the "bulletproof doors" claim. Taleb imagines that the hijackers shot their way into cockpits with non-bulletproof doors, and believes that the lack of bulletproof doors on 9/11 is evidence that the risk of this event was not "reasonably conceivable." First, according to the _9/11 Commission Report_, "We do not know exactly how the hijackers gained access to the cockpit." Second, the report states that "there is no evidence that the hijackers purchased firearms" and "the cockpit voice recorder gives no indication of a gun being fired or mentioned at any time." From the evidence we have (such as calls made by flight attendants and passengers aboard the hijacked planes and flight data recorders that were later recovered), it appears more likely that terrorists used some combination of knives, mace/pepper spray, and/or bomb threats to either stab flight attendants to get a cockpit key or force them to open the cockpit door, and/or to learn captains or first officers out of the cockpit. Third, the report provides over a hundred pages of recommendations regarding what the United States could do to prevent a future 9/11-type attack. But the words "bulletproof" or "bulletproof doors" do not come up in that part of the report even once, or in fact anywhere on the report. In fact, the report states that "even a hardened cockpit door would have made little difference in a hijacking" on 9/11. Taleb's suggestion that "bulletproof doors" would have made a difference on 9/11 yet again highlights the fact he did not do his homework, and his penchant for grandiose, sweeping statements, including that his BS theory explains almost everything in our world.

Two years prior to the 9/11 terrorist attacks, the aircraft manufacturer Boeing introduced a reinforced door design on its existing planes, but airlines refused to pay the additional costs of the security improvements. Were airline executives "cheap" when they made judgements about security upgrades on their fleets? Yes. Did they make the wrong choice in not taking security seriously enough before 9/11? Yes. But was the possibility of a terrorist organization hijacking their plane inconceivable? No. That most airplanes did not have something like "bulletproof doors" prior to 9/11 is no "proof" that a 9/11-type attack was inconceivable. What may have happened is that airline executives during the 1970s, 1980s, and 1990s looked at the costs and benefits of retrofitting hundreds of old planes with bulletproof doors and installing bulletproof doors on all new planes. Maybe they realized that to do so they would not only have to install new and expensive systems, but would also have to have a host of additional features and requirements, such as making sure that every plane has at least two pilots as well as having additional crew members inside the cockpit at all times. But even in those circumstances, when one of the pilots would need to open the bulletproof door and use the bathroom or check wing surfaces, or flight crew on long trips would need to be changed, hijackers could still exploit those openings to rush the cockpit, rendering the investments in increased security obsolete. And it is not the case that having bulletproof doors would have created a "bulletproof" security system that could prevent any manner of tragedy aboard. In 2015, for example, a Germanwings plane with bulletproof doors went down after one of two co-pilots refused to let the other back into the cockpit. One of the co-pilots was suicidal. He locked himself in after his co-pilot momentarily left the cockpit. The co-pilot was left knocking on the door desperately asking to be let back into the cockpit as the suicidal pilot crashed the plane in the French alps, killing all 150 individuals onboard. We can imagine a scenario in which a commercial plane with bulletproof doors ends up in a dangerous situation whereby hijackers lock themselves in the cockpit and make it exceedingly difficult for potential Federal Air Marshals on board to extricate them.

Taleb also imagines that had the risk of 9/11 was "reasonably conceivable" before it happened, "fighter planes would have circled the sky above the twin towers" on the day of, presumably shooting down the civilian aircraft and killing hundreds of innocent civilians in the process, just like that. The fighter planes Taleb speaks of are military aircraft owned and operated by the US Department of Defense, whose primary and historic mission has been to defend, deter, and defeat adversaries and threats abroad. But by law, a civilian agency called the Federal

Aviation Administration (or FAA), which falls under the Department of Transportation, regulates America's navigable airspace. At 9:42 am on September 11, 2001, within less than two hours of the first hijacking, it was the FAA, not the Department of Defense, which grounded all civilian aircraft across the continental United States and which told all civilian aircraft in flight to immediately land. Ultimately, military aircraft were scrambled on September 11th, but it was wise to first clear or aim to clear as much of the airspace from commercial aircraft if for no other reason than to prevent midair collisions.

Taleb suggestion of military fighter planes "circling above the Twin Towers" misses the complexity of the system created in the United States. For the moment, and on 9/11, and in the years leading to 9/11, the US homeland is and was not a warzone. The system was and remains focused on providing space for individuals to fly anywhere freely and safely, and for private industry to flourish. By and large this system has worked and continues to work, irrespective of our "limits" and "flaws." According to the FAA (2020), every year, its personnel (including over 14,000 air traffic controllers) and assets (including over 500 airport traffic control towers) handle 16.4 million flights and the movement of 44.5 billion pounds of freight. Every day, the FAA handles an average of 45,000 flights that take off or land at nearly 20,000 public and private airports spread out across the United States, enabling 2.9 million passengers to safely fly in and out of US airports each day. According to the Bureau of Transportation Statistics (or BTS), in 2018 US airlines and foreign airlines serving the United States carried a billion passengers on domestic and international flights. The total number of fatal accidents among US air carriers relative to the millions of passengers who fly each year, is consistently low, with a peak point in recent decades being 2001 (the year 9/11 happened). The total number of fatalities in the period between 2010 and 2019 was 16, an astoundingly low number of people dying aboard aircraft relative to the number of passengers who travel. It appears to me that, in the United States, the combination of a strong rule-of-law and civilian control of the military, alongside individual liberty as well as freedom for private enterprise, has allowed, over time, for a powerful aerospace industry to emerge and to serve millions of passengers each day relatively safely. The existing situation described above does work and has worked over the long run, even if it has gaps, such as the one the terrorists exploited using their imagination on 9/11.

[xix] Other countries impacted by the tsunami include Sri Lanka, Thailand, India, Maldives, Myanmar, and Somalia.

[xx] In 1992, a magnitude 7.8 earthquake struck Indonesia, producing a devastating tsunami that claimed approximately 2,500 people. In 1994, a 7.2 magnitude earthquake off the coast off the southern Java coast resulted in a tsunami that killed an estimated 238 Indonesians. In 1996, an 8.2 magnitude earthquake off Biak Island, Indonesia resulted in the deaths and injuries of hundreds.

[xxi] Under the dictatorial system that Suharto created, maintained, and ruled, the country's leader was not voted out of office for any sort of malfeasance. Decision-making at the highest level revolved not around doing what is in the national interest or the welfare of the country's citizens but around the political survival of Suharto's regime and the personal enrichment of those closest to him.

[xxii] Besides Indonesia, there were other countries in the region that were impacted by the 2004 tsunami were as well. They include Sri Lanka, Thailand, India, the Maldives, Myanmar, and Somalia. Most of these countries ranked as low or lower than Indonesia on developmental indexes such as the HDI. When the 2004 Indian Ocean tsunami struck, Sri Lanka, one of the most densely populated countries in the world and almost tied with Cuba on the HDI ranking that year, was in the midst of a civil war that had been going on for over two decades. Myanmar, also one of the most densely populated countries in the world and almost all the way at the bottom of the HDI ranking, was ruled by a military dictatorship under the Burma Socialist Programme Party since 1962. Meanwhile, the government of the Maldives, which would have purchased and had to have maintained on annual basis a tsunami early warning system, has one of the smallest government budgets in the world. The Mogadishu-based government of Somalia, a fragile state in modern times torn by decades of civil war, terrorism, and piracy, had an even smaller government budget and one of the lowest standards of living in the world. Taleb's argument that had the tsunami been expected these countries would have bought early warning systems and "the areas affected would have been less populated" is astoundingly and embarrassingly simple.

[xxiii] Aceh is the only province in Indonesia that today practices Sharia law, and allows for, among other things, public flogging for acts that supposedly transgress strict Islamic laws. It had a history of fighting the central government in Jakarta. Soon after Indonesia's central government in Jakarta declared its independence from the Netherlands in 1945, the province of Aceh rebelled. In 1953, a religious cleric named Daud Beureuh (who served as Aceh's military governor up until that point) began a decade-long rebellion against the central government in Jakarta. The 1970s witnessed the emergence of the Free Aceh Movement, or GAM, a separatist insurgency whose leader proclaimed independence from the rest of Indonesia in 1976. In 1989, Suharto sent 12,000 troops to conduct military operations against the GAM. The 1990s witnessed intense fighting between the Indonesian military and

Aceh-based separatist forces that led to the deaths of somewhere between 9,000 and 12,000 civilians through arbitrary executions, kidnappings, torture, and the torching of whole villages the Indonesian central government suspected of harboring GAM militants. The tense relationship between the central government in Jakarta and the province of Aceh continued past the point when Suhrato left office in 1998. In 2003, a year prior to the tsunami, the Indonesian government declared a state of emergency in Aceh and sent tens of thousands of troops to the province to conduct military operations against GAM rebel fighters, roughly 2,000 of whom were killed. The war between military troops loyal to the central government in Jakarta and rebel forces in Aceh was still going on when the 2004 tsunami began

[xxiv] Indonesia is part of the infamous Ring of Fire, where about 90 percent of the world's earthquakes occur. Earthquakes have the potential to trigger tsunamis. According to the Global Historical Tsunami Database, since 1900 over four-fifths of tsunamis were generated by earthquakes, as was the case during the 2004 Indian Ocean tsunami, which was triggered by an earthquake with a magnitude of 9.1. Indonesia lies between the Indian Ocean and the Pacific Ocean, where collectively about 83% of the world's tsunamis occur.

[xxv] Although, I do think that nothing is unimaginable, and I hope to one day write a longer essay about what I precisely mean by this. In general, I think there is a lack of literature concerning what it means to "imagine," what the word "imagination" means, at least relative to words like "knowledge," which has a branch of philosophy devoted to its study called epistemology, and "reality," which has its own branch of philosophy called "ontology." There appears to be no similar branch of philosophy devoted to studying the nature of "imagination," and I'm not sure if there ever will be. But maybe there should be.

[xxvi] I've often noticed thinkers write about how some item in the world, like the subjective character of a bat's experience—to borrow an example from Nagel's writing—is beyond the "limited range" of human imagination. But, I must ask: is it not the case that the human beings who posit that some items have a "reality" to them that is literally unimaginable to us mortal humans imagined those items in the first place? For example, Nagel first uses his imagination to imagine that a bat has "conscious experience," and that this experience has a "subjective character," and then goes on to write how the nature of a bat's subjective experience is something beyond range of our imagination. Others still write about how some future was "unimaginable" or "inconceivable" to people in the past. But is it not the case that, if they exist anywhere, that futures themselves exist in our imagination?