

S E C O N D E D I T I O N

WITH A NEW SECTION: "ON ROBUSTNESS & FRAGILITY"

NEW YORK TIMES BESTSELLER

THE
BLACK SWAN



The Impact of the
HIGHLY IMPROBABLE

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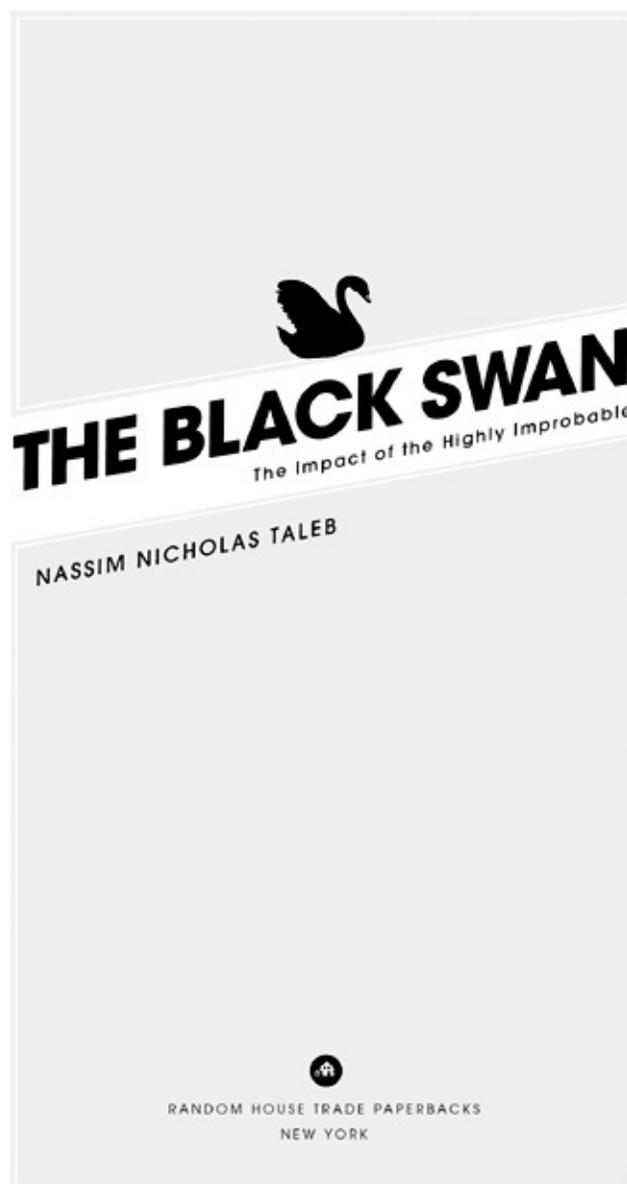
—*The Daily Telegraph* (London)

“Funny, quirky and thought-provoking ... [Taleb is] engaging, lively and intelligent.”

—*The Sunday Times* (London)

ALSO BY NASSIM NICHOLAS TALEB

Fooled by Randomness



*To Benoît Mandelbrot,
a Greek among Romans*

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ACKNOWLEDGMENTS FOR THE FIRST EDITION

NOTE TO THE SECOND EDITION

In order to preserve the integrity of the original text, I have limited the updating of the current edition to a small number of footnotes. I added a long Postscript essay, going deeper into philosophical and empirical discussions of the subject and addressing some misunderstandings of the concept of the Black Swan that cropped up after the initial publication of the book.

PROLOGUE

ON THE PLUMAGE OF BIRDS

Before the discovery of Australia, people in the Old World were convinced that *all* swans were white, an unassailable belief as it seemed completely confirmed by empirical evidence. The sighting of the first black swan might have been an interesting surprise for a few ornithologists (and others extremely concerned with the coloring of birds), but that is not where the significance of the story lies. It illustrates a severe limitation to our learning from observations or experience and the fragility of our knowledge. One single observation can invalidate a general statement derived from millennia of confirmatory sightings of millions of white swans. All you need is one single (and, I am told, quite ugly) black bird.*

I push one step beyond this philosophical-logical question into an empirical reality, and one that has obsessed me since childhood.† What we call here a Black Swan (and capitalize it) is an event with the following three attributes.

First, it is an *outlier*, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility. Second, it carries an extreme impact (unlike the bird). Third, in spite of its outlier status, human nature makes us concoct explanations for its occurrence *after* the fact, making it explainable and predictable.

I stop and summarize the triplet: rarity, extreme impact, and retrospective (though not prospective) predictability.* A small number of Black Swans explain almost everything in our world, from the success of ideas and religions, to the dynamics of historical events, to elements of our own personal lives. Ever since we left the Pleistocene, some ten millennia ago, the effect of these Black Swans has been increasing. It started accelerating during the industrial revolution, as the world started getting more complicated, while ordinary events, the

ones we study and discuss and try to predict from reading the newspapers, have become increasingly inconsequential.

Just imagine how little your understanding of the world on the eve of the events of 1914 would have helped you guess what was to happen next. (Don't cheat by using the explanations drilled into your cranium by your dull high school teacher.) How about the rise of Hitler and the subsequent war? How about the precipitous demise of the Soviet bloc? How about the consequences of the rise of Islamic fundamentalism? How about the effect of the spread of the Internet? How about the market crash of 1987 (and the more unexpected recovery)? Fads, epidemics, fashion, ideas, the emergence of art genres and schools. All follow these Black Swan dynamics. Literally, just about everything of significance around you might qualify.

This combination of low predictability and large impact makes the Black Swan a great puzzle; but that is not yet the core concern of this book. Add to this phenomenon the fact that we tend to act as if it does not exist! I don't mean just you, your cousin Joey, and me, but almost all "social scientists" who, for over a century, have operated under the false belief that their tools could measure uncertainty. For the applications of the sciences of uncertainty to real-world problems has had ridiculous effects; I have been privileged to see it in finance and economics. Go ask your portfolio manager for his definition of "risk," and odds are that he will supply you with a *measure* that *excludes* the possibility of the Black Swan—hence one that has no better predictive value for assessing the total risks than astrology (we will see how they dress up the intellectual fraud with mathematics). This problem is endemic in social matters.

The central idea of this book concerns our blindness with respect to randomness, particularly the large deviations: Why do we, scientists or nonscientists, hotshots or regular Joes, tend to see the pennies instead of the dollars? Why do we keep focusing on the minutiae, not the possible significant large events, in spite of the obvious evidence of their huge influence? And, if you follow my argument, why does reading the newspaper actually *decrease* your knowledge of the world?

It is easy to see that life is the cumulative effect of a handful of significant shocks. It is not so hard to identify the role of Black Swans,

from your armchair (or bar stool). Go through the following exercise. Look into your own existence. Count the significant events, the technological changes, and the inventions that have taken place in our environment since you were born and compare them to what was expected before their advent. How many of them came on a schedule? Look into your own personal life, to your choice of profession, say, or meeting your mate, your exile from your country of origin, the betrayals you faced, your sudden enrichment or impoverishment. How often did these things occur according to plan?

What You Do Not Know

Black Swan logic makes *what you don't know* far more relevant than what you do know.* Consider that many Black Swans can be caused and exacerbated *by their being unexpected*.

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. Something else might have taken place. What? I don't know.

Isn't it strange to see an event happening precisely because it was not supposed to happen? What kind of defense do we have against that? Whatever you come to know (that New York is an easy terrorist target, for instance) may become inconsequential if your enemy knows that you know it. It may be odd that, in such a strategic game, what you know can be truly inconsequential.*

This extends to all businesses. Think about the "secret recipe" to making a killing in the restaurant business. If it were known and obvious, then someone next door would have already come up with the idea and it would have become generic. The next killing in the restaurant industry needs to be an idea that is not easily conceived of by the current population of restaurateurs. It has to be at some distance from expectations. The more unexpected the success of such a venture, the smaller the number of competitors, and the more

successful the entrepreneur who implements the idea. The same applies to the shoe and the book businesses—or any kind of entrepreneurship. The same applies to scientific theories—nobody has interest in listening to trivialities. The payoff of a human venture is, in general, inversely proportional to what it is expected to be.

Consider the Indian Ocean tsunami of December 2004. Had it been expected, it would 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. What you know cannot really hurt you.

Experts and “Empty Suits”

The inability to predict outliers implies the inability to predict the course of history, given the share of these events in the dynamics of events.

But we act as though we are able to predict historical events, or, even worse, as if we are able to change the course of history. We produce thirty-year projections of social security deficits and oil prices without realizing that we cannot even predict these for next summer—our cumulative prediction errors for political and economic events are so monstrous that every time I look at the empirical record I have to pinch myself to verify that I am not dreaming. What is surprising is not the magnitude of our forecast errors, but our absence of awareness of it. This is all the more worrisome when we engage in deadly conflicts: wars are fundamentally unpredictable (and we do not know it). Owing to this misunderstanding of the causal chains between policy and actions, we can easily trigger Black Swans thanks to aggressive ignorance—like a child playing with a chemistry kit.

Our inability to predict in environments subjected to the Black Swan, coupled with a general lack of the awareness of this state of affairs, means that certain professionals, while believing they are experts, are in fact not. Based on their empirical record, they do not know more about their subject matter than the general population, but they are much better at narrating—or, worse, at smoking you with complicated mathematical models. They are also more likely to wear a tie.

Black Swans being unpredictable, we need to adjust to their

existence (rather than naïvely try to predict them). There are so many things we can do if we focus on antiknowledge, or what we do not know. Among many other benefits, you can set yourself up to collect serendipitous Black Swans (of the positive kind) by maximizing your exposure to them. Indeed, in some domains—such as scientific discovery and venture capital investments—there is a disproportionate payoff from the unknown, since you typically have little to lose and plenty to gain from a rare event. We will see that, contrary to social-science wisdom, almost no discovery, no technologies of note, came from design and planning—they were just Black Swans. The strategy for the discoverers and entrepreneurs is to rely less on top-down planning and focus on maximum tinkering and recognizing opportunities when they present themselves. So I disagree with the followers of Marx and those of Adam Smith: the reason free markets work is because they allow people to be lucky, thanks to aggressive trial and error, not by giving rewards or “incentives” for skill. The strategy is, then, to tinker as much as possible and try to collect as many Black Swan opportunities as you can.

Learning to Learn

Another related human impediment comes from excessive focus on what we do know: we tend to learn the precise, not the general.

What did people learn from the 9/11 episode? Did they learn that some events, owing to their dynamics, stand largely outside the realm of the predictable? No. Did they learn the built-in defect of conventional wisdom? No. What did they figure out? They learned precise rules for avoiding Islamic prototerrorists and tall buildings. Many keep reminding me that it is important for us to be practical and take tangible steps rather than to “theorize” about knowledge. The story of the Maginot Line shows how we are conditioned to be specific. The French, after the Great War, built a wall along the previous German invasion route to prevent reinvasion—Hitler just (almost) effortlessly went around it. The French had been excellent students of history; they just learned with too much precision. They were too practical and exceedingly focused for their own safety.

We do not spontaneously learn that *we don't learn that we don't learn*. The problem lies in the structure of our minds: we don't learn rules, just facts, and only facts. Metarules (such as the rule that we have a tendency to not learn rules) we don't seem to be good at getting. We scorn the abstract; we scorn it with passion.

Why? It is necessary here, as it is my agenda in the rest of this book, both to stand conventional wisdom on its head and to show how inapplicable it is to our modern, complex, and increasingly *recursive* environment.*

But there is a deeper question: What are our minds made for? It looks as if we have the wrong user's manual. Our minds do not seem made to think and introspect; if they were, things would be easier for us today, but then we would not be here today and I would not have been here to talk about it—my counterfactual, introspective, and hard-thinking ancestor would have been eaten by a lion while his nonthinking but faster-reacting cousin would have run for cover. Consider that thinking is time-consuming and generally a great waste of energy, that our predecessors spent more than a hundred million years as nonthinking mammals and that in the blip in our history during which we have used our brain we have used it on subjects too peripheral to matter. Evidence shows that we do much less thinking than we believe we do—except, of course, when we think about it.

A NEW KIND OF INGRATITUDE

It is quite saddening to think of those people who have been mistreated by history. There were the *poètes maudits*, like Edgar Allan Poe or Arthur Rimbaud, scorned by society and later worshipped and force-fed to schoolchildren. (There are even schools named after high school dropouts.) Alas, this recognition came a little too late for the poet to get a serotonin kick out of it, or to prop up his romantic life on earth. But there are even more mistreated heroes—the very sad category of those who we do not know were heroes, who saved our lives, who helped us avoid disasters. They left no traces and did not even know that they were making a contribution. We remember the martyrs who died for a cause that we knew about, never those no less effective in their contribution but whose cause we were never aware

of—precisely because they were successful. Our ingratitude toward the *poètes maudits* fades completely in front of this other type of thanklessness. This is a far more vicious kind of ingratitude: the feeling of uselessness on the part of the silent hero. I will illustrate with the following thought experiment.

Assume that a legislator with courage, influence, intellect, vision, and perseverance manages to enact a law that goes into universal effect and employment on September 10, 2001; it imposes the continuously locked bulletproof doors in every cockpit (at high costs to the struggling airlines)—just in case terrorists decide to use planes to attack the World Trade Center in New York City. I know this is lunacy, but it is just a thought experiment (I am aware that there may be no such thing as a legislator with intellect, courage, vision, and perseverance; this is the point of the thought experiment). The legislation is not a popular measure among the airline personnel, as it complicates their lives. But it would certainly have prevented 9/11.

The person who imposed locks on cockpit doors gets no statues in public squares, not so much as a quick mention of his contribution in his obituary. “Joe Smith, who helped avoid the disaster of 9/11, died of complications of liver disease.” Seeing how superfluous his measure was, and how it squandered resources, the public, with great help from airline pilots, might well boot him out of office. *Vox clamantis in deserto*. He will retire depressed, with a great sense of failure. He will die with the impression of having done nothing useful. I wish I could go attend his funeral, but, reader, I can’t find him. And yet, recognition can be quite a pump. Believe me, even those who genuinely claim that they do not believe in recognition, and that they separate labor from the fruits of labor, actually get a serotonin kick from it. See how the silent hero is rewarded: even his own hormonal system will conspire to offer no reward.

Now consider again the events of 9/11. In their aftermath, who got the recognition? Those you saw in the media, on television performing heroic acts, and those whom you saw trying to give you the impression that they were performing heroic acts. The latter category includes someone like the New York Stock Exchange chairman Richard Grasso, who “saved the stock exchange” and received a huge

bonus for his contribution (the equivalent of several *thousand* average salaries). All he had to do was be there to ring the opening bell on television—the television that, we will see, is the carrier of unfairness and a major cause of Black Swan blindness.

Who gets rewarded, the central banker who avoids a recession or the one who comes to “correct” his predecessors’ faults and happens to be there during some economic recovery? Who is more valuable, the politician who avoids a war or the one who starts a new one (and is lucky enough to win)?

It is the same logic reversal we saw earlier with the value of what we don’t know; everybody knows that you need more prevention than treatment, but few reward acts of prevention. We glorify those who left their names in history books at the expense of those contributors about whom our books are silent. We humans are not just a superficial race (this may be curable to some extent); we are a very unfair one.

LIFE IS VERY UNUSUAL

This is a book about uncertainty; to this author, the rare event *equals* uncertainty. This may seem like a strong statement—that we need to principally study the rare and extreme events in order to figure out common ones—but I will make myself clear as follows. There are two possible ways to approach phenomena. The first is to rule out the extraordinary and focus on the “normal.” The examiner leaves aside “outliers” and studies ordinary cases. The second approach is to consider that in order to understand a phenomenon, one needs first to consider the extremes—particularly if, like the Black Swan, they carry an extraordinary cumulative effect.

I don’t particularly care about the usual. If you want to get an idea of a friend’s temperament, ethics, and personal elegance, you need to look at him under the tests of severe circumstances, not under the regular rosy glow of daily life. Can you assess the danger a criminal poses by examining only what he does on an *ordinary* day? Can we understand health without considering wild diseases and epidemics? Indeed the normal is often irrelevant.

Almost everything in social life is produced by rare but

consequential shocks and jumps; all the while almost everything studied about social life focuses on the “normal,” particularly with “bell curve” methods of inference that tell you close to nothing. Why? Because the bell curve ignores large deviations, cannot handle them, yet makes us confident that we have tamed uncertainty. Its nickname in this book is GIF, Great Intellectual Fraud.

PLATO AND THE NERD

At the start of the Jewish revolt in the first century of our era, much of the Jews’ anger was caused by the Romans’ insistence on putting a statue of Caligula in their temple in Jerusalem in exchange for placing a statue of the Jewish god Yahweh in Roman temples. The Romans did not realize that what the Jews (and the subsequent Levantine monotheists) meant by *god* was abstract, all embracing, and had nothing to do with the anthropomorphic, too human representation that Romans had in mind when they said *deus*. Critically, the Jewish god did not lend himself to symbolic representation. Likewise, what many people commoditize and label as “unknown,” “improbable,” or “uncertain” is not the same thing to me; it is not a concrete and precise category of knowledge, a *nerdified* field, but its opposite; it is the lack (and limitations) of knowledge. It is the exact contrary of knowledge; one should learn to avoid using terms made for knowledge to describe its opposite.

What I call *Platonicity*, after the ideas (and personality) of the philosopher Plato, is our tendency to mistake the map for the territory, to focus on pure and well-defined “forms,” whether objects, like triangles, or social notions, like utopias (societies built according to some blueprint of what “makes sense”), even nationalities. When these ideas and crisp constructs inhabit our minds, we privilege them over other less elegant objects, those with messier and less tractable structures (an idea that I will elaborate progressively throughout this book).

Platonicity is what makes us think that we understand more than we actually do. But this does not happen everywhere. I am not saying that Platonic forms don’t exist. Models and constructions, these intellectual maps of reality, are not always wrong; they are wrong only in some

specific applications. The difficulty is that a) you do not know beforehand (only after the fact) *where* the map will be wrong, and b) the mistakes can lead to severe consequences. These models are like potentially helpful medicines that carry random but very severe side effects.

The *Platonic fold* is the explosive boundary where the Platonic mind-set enters in contact with messy reality, where the gap between what you know and what you think you know becomes dangerously wide. It is here that the Black Swan is produced.

TOO DULL TO WRITE ABOUT

It was said that the artistic filmmaker Luchino Visconti made sure that when actors pointed at a closed box meant to contain jewels, there were real jewels inside. It could be an effective way to make actors live their part. I think that Visconti's gesture may also come out of a plain sense of aesthetics and a desire for authenticity—somehow it may not feel right to fool the viewer.

This is an essay expressing a primary idea; it is neither the recycling nor repackaging of other people's thoughts. An essay is an impulsive meditation, not science reporting. I apologize if I skip a few obvious topics in this book out of the conviction that what is too dull for me to write about might be too dull for the reader to read. (Also, to avoid dullness may help to filter out the nonessential.)

Talk is cheap. Someone who took too many philosophy classes in college (or perhaps not enough) might object that the sighting of a Black Swan does not invalidate the theory that *all swans are white* since such a black bird is not technically a swan since whiteness to him may be the essential property of a swan. Indeed those who read too much Wittgenstein (and writings about comments about Wittgenstein) may be under the impression that language problems are important. They may certainly be important to attain prominence in philosophy departments, but they are something we, practitioners and decision makers in the real world, *leave for the weekend*. As I explain in the chapter called "The Uncertainty of the Phony," for all of their intellectual appeal, these niceties have no serious implications

Monday to Friday as opposed to more substantial (but neglected) matters. People in the classroom, not having faced many true situations of decision making under uncertainty, do not realize what is important and what is not—even those who are scholars of uncertainty (or *particularly* those who are scholars of uncertainty). What I call the practice of uncertainty can be piracy, commodity speculation, professional gambling, working in some branches of the Mafia, or just plain serial entrepreneurship. Thus I rail against “sterile skepticism,” the kind we can do nothing about, and against the exceedingly theoretical language problems that have made much of modern philosophy largely irrelevant to what is derisively called the “general public.” (In the past, for better or worse, those rare philosophers and thinkers who were not self-standing depended on a patron’s support. Today academics in abstract disciplines depend on one another’s opinion, without external checks, with the severe occasional pathological result of turning their pursuits into insular prowess-showing contests. Whatever the shortcomings of the old system, at least it enforced *some* standard of relevance.)

The philosopher Edna Ullmann-Margalit detected an inconsistency in this book and asked me to justify the use of the precise metaphor of a Black Swan to describe the unknown, the abstract, and imprecise uncertain—white ravens, pink elephants, or evaporating denizens of a remote planet orbiting Tau Ceti. Indeed, she caught me red handed. There is a contradiction; this book is a story, and I prefer to use stories and vignettes to illustrate our gullibility about stories and our preference for the dangerous compression of narratives.*

You need a story to displace a story. Metaphors and stories are far more potent (alas) than ideas; they are also easier to remember and more fun to read. If I have to go after what I call the narrative disciplines, my best tool is a narrative.

Ideas come and go, stories stay.

THE BOTTOM LINE

The beast in this book is not just the bell curve and the self-deceiving statistician, nor the Platonified scholar who needs theories to fool

himself with. It is the drive to “focus” on what makes sense to us. Living on our planet, today, requires a lot more imagination than we are made to have. We lack imagination and repress it in others.

Note that I am not relying in this book on the beastly method of collecting selective “corroborating evidence.” For reasons I explain in [Chapter 5](#), I call this overload of examples naïve empiricism—successions of anecdotes selected to fit a story do not constitute evidence. Anyone looking for confirmation will find enough of it to deceive himself—and no doubt his peers.* The Black Swan idea is based on the structure of randomness in empirical reality.

To summarize: in this (personal) essay, I stick my neck out and make a claim, against many of our habits of thought, that our world is dominated by the extreme, the unknown, and the very improbable (improbable according our current knowledge)—and all the while we spend our time engaged in small talk, focusing on the known, and the repeated. This implies the need to use the extreme event as a starting point and not treat it as an exception to be pushed under the rug. I also make the bolder (and more annoying) claim that in spite of our progress and the growth in knowledge, or perhaps *because* of such progress and growth, the future will be increasingly less predictable, while both human nature and social “science” seem to conspire to hide the idea from us.

Chapters Map

The sequence of this book follows a simple logic; it flows from what can be labeled purely literary (in subject and treatment) to what can be deemed entirely scientific (in subject, though not in treatment). Psychology will be mostly present in Part One and in the early part of Part Two; business and natural science will be dealt with mostly in the second half of Part Two and in Part Three. Part One, “Umberto Eco’s Antilibrary,” is mostly about how we perceive historical and current events and what distortions are present in such perception. Part Two, “We Just Can’t Predict,” is about our errors in dealing with the future and the unadvertised limitations of some “sciences”—and what to do about these limitations. Part Three, “Those Gray Swans of

Extremistan,” goes deeper into the topic of extreme events, explains how the bell curve (that great intellectual fraud) is generated, and reviews the ideas in the natural and social sciences loosely lumped under the label “complexity.” Part Four, “The End,” will be very short.

I derived an unexpected amount of enjoyment writing this book—in fact, it just wrote itself—and I hope that the reader will experience the same. I confess that I got hooked on this withdrawal into pure ideas after the constraints of an active and transactional life. After this book is published, my aim is to spend time away from the clutter of public activities in order to think about my philosophical-scientific idea in total tranquillity.

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- * The spread of camera cell phones has afforded me a large collection of pictures of black swans sent by traveling readers. Last Christmas I also got a case of Black Swan Wine (not my favorite), a videotape (I don’t watch videos), and two books. I prefer the pictures.
 - † I used the logical metaphor of the black swan (not capitalized) for Black Swan Events (capitalized), but this problem should not be confused with the logical problem raised by many philosophers. This is not so much about exceptions as it is about the oversize role of extreme events in many domains in life. Furthermore, the logical problem is about the possibility of the exception (black swan); mine is about the *role* of the exceptional event (Black Swan) leading to the degradation of predictability and the need to be robust to negative Black Swans and exposed to positive ones.
 - * The highly expected *not happening* is also a Black Swan. Note that, by symmetry, the occurrence of a highly improbable event is the equivalent of the nonoccurrence of a highly probable one.
 - * The Black Swan is the result of collective and individual epistemic limitations (or distortions), mostly confidence in knowledge; it is not an objective phenomenon. The most severe mistake made in the interpretation of my Black Swan is to try to define an “objective Black Swan” that would be invariant in the eyes of all observers. The events of September 11, 2001, were a Black Swan for the victims, but certainly not to the perpetrators. The Postscript provides an additional discussion of the point.
 - * The Idea of Robustness: Why do we formulate theories leading to projections and forecasts without focusing on the robustness of these theories and the consequences of the errors? It is much easier to deal with the Black Swan problem if we focus on robustness to errors rather

than improving predictions.

- * *Recursive* here means that the world in which we live has an increasing number of feedback loops, causing events to be the cause of more events (say, people buy a book *because* other people bought it), thus generating snowballs and arbitrary and unpredictable planet-wide winner-take-all effects. We live in an environment where information flows too rapidly, accelerating such epidemics. Likewise, events can happen *because* they are not supposed to happen. (Our intuitions are made for an environment with simpler causes and effects and slowly moving information.) This type of randomness did not prevail during the Pleistocene, as socioeconomic life was far simpler then.
- * The metaphor of the black swan is not at all a modern one—contrary to its usual attribution to Popper, Mill, Hume, and others. I selected it because it corresponds to the ancient idea of a “rare bird.” The Latin poet Juvenal refers to a “bird as rare as the black swan”—*rara avis in terris nigroque simillima cygno*.
- * It is also naïve empiricism to provide, in support of some argument, series of eloquent confirmatory quotes by dead authorities. By searching, you can always find someone who made a well-sounding statement that confirms your point of view—and, on every topic, it is possible to find another dead thinker who said the exact opposite. Almost all of my non-Yogi Berra quotes are from people I disagree with.



The writer Umberto Eco belongs to that small class of scholars who are encyclopedic, insightful, and nondull. He is the owner of a large personal library (containing thirty thousand books), and separates visitors into two categories: those who react with “Wow! Signore *professore dottore* Eco, what a library you have! How many of these books have you read?” and the others—a very small minority—who get the point that a private library is not an ego-boosting appendage but a research tool. Read books are far less valuable than unread ones. The library should contain as much of *what you do not know* as your financial means, mortgage rates, and the currently tight real-estate market allow you to put there. You will accumulate more knowledge and more books as you grow older, and the growing number of unread books on the shelves will look at you menacingly. Indeed, the more you know, the larger the rows of unread books. Let us call this collection of unread books an *antilibrary*.

We tend to treat our knowledge as personal property to be protected and defended. It is an ornament that allows us to rise in the pecking order. So this tendency to offend Eco’s library sensibility by focusing on the known is a human bias that extends to our mental operations. People don’t walk around with anti-résumés telling you what they have not studied or experienced (it’s the job of their competitors to do that), but it would be nice if they did. Just as we need to stand library logic on its head, we will work on standing knowledge itself on its head. Note that the Black Swan comes from our misunderstanding of the likelihood of surprises, those unread books, because we take what we know a little

too seriously.

Let us call an antischolar—someone who focuses on the unread books, and makes an attempt not to treat his knowledge as a treasure, or even a possession, or even a self-esteem enhancement device—a skeptical empiricist.

The chapters in this section address the question of how we humans deal with knowledge—and our preference for the anecdotal over the empirical. [Chapter 1](#) presents the Black Swan as grounded in the story of my own obsession. I will make a central distinction between the two varieties of randomness in [Chapter 3](#). After that, [Chapter 4](#) briefly returns to the Black Swan problem in its original form: how we tend to generalize from what we see. Then I present the three facets of the same Black Swan problem: a) *The error of confirmation*, or how we are likely to undeservedly scorn the virgin part of the library (the tendency to look at what confirms our knowledge, not our ignorance), in [Chapter 5](#); b) *the narrative fallacy*, or how we fool ourselves with stories and anecdotes ([Chapter 6](#)); c) how emotions get in the way of our inference ([Chapter 7](#)); and d) *the problem of silent evidence*, or the tricks history uses to hide Black Swans from us ([Chapter 8](#)). [Chapter 9](#) discusses the lethal fallacy of building knowledge from the world of games.

THE APPRENTICESHIP OF AN EMPIRICAL SKEPTIC

Anatomy of a Black Swan—The triplet of opacity—Reading books backward—The rearview mirror—Everything becomes explainable—Always talk to the driver (with caution)—History doesn't crawl; it jumps—"It was so unexpected"—Sleeping for twelve hours

This is not an autobiography, so I will skip the scenes of war. Actually, even if it were an autobiography, I would still skip the scenes of war. I cannot compete with action movies or memoirs of adventurers more accomplished than myself, so I will stick to my specialties of chance and uncertainty.

ANATOMY OF A BLACK SWAN

For more than a millennium the eastern Mediterranean seaboard called Syria Libanensis, or Mount Lebanon, had been able to accommodate at least a dozen different sects, ethnicities, and beliefs—it worked like magic. The place resembled major cities of the eastern Mediterranean (called the Levant) more than it did the other parts in the interior of the Near East (it was easier to move by ship than by land through the mountainous terrain). The Levantine cities were mercantile in nature; people dealt with one another according to a clear protocol, preserving a peace conducive to commerce, and they socialized quite a bit across communities. This millennium of peace was interrupted only by small occasional friction *within* Moslem and Christian communities, rarely between Christians and Moslems. While the cities were mercantile and mostly Hellenistic, the mountains had been settled by all manner of religious minorities who claimed to have fled both the Byzantine and Moslem orthodoxies. A mountainous terrain is an ideal refuge from the mainstream, except that your enemy is the other refugee competing for the same type of rugged real estate. The mosaic of cultures and religions there was deemed an example of coexistence: Christians of all varieties

(Maronites, Armenians, Greco-Syrian Byzantine Orthodox, even Byzantine Catholic, in addition to the few Roman Catholics left over from the Crusades); Moslems (Shiite and Sunni); Druzes; and a few Jews. It was taken for granted that people learned to be tolerant there; I recall how we were taught in school how far more civilized and wiser we were than those in the Balkan communities, where not only did the locals refrain from bathing but also fell prey to fractious fighting. Things appeared to be in a state of stable equilibrium, evolving out of a historical tendency for betterment and tolerance. The terms *balance* and *equilibrium* were often used.

Both sides of my family came from the Greco-Syrian community, the last Byzantine outpost in northern Syria, which included what is now called Lebanon. Note that the Byzantines called themselves “Romans”—*Roumi* (plural *Roum*) in the local languages. We originate from the olive-growing area at the base of Mount Lebanon—we chased the Maronite Christians into the mountains in the famous battle of Amioun, my ancestral village. Since the Arab invasion in the seventh century, we had been living in mercantile peace with the Moslems, with only some occasional harassment by the Lebanese Maronite Christians from the mountains. By some (literally) Byzantine arrangement between the Arab rulers and the Byzantine emperors, we managed to pay taxes to both sides and get protection from both. We thus managed to live in peace for more than a millennium almost devoid of bloodshed: our last true problem was the later troublemaking crusaders, not the Moslem Arabs. The Arabs, who seemed interested only in warfare (and poetry) and, later, the Ottoman Turks, who seemed only concerned with warfare (and pleasure), left to us the uninteresting pursuit of commerce and the less dangerous one of scholarship (like the translation of Aramaic and Greek texts).

By any standard the country called Lebanon, to which we found ourselves suddenly incorporated after the fall of the Ottoman Empire, in the early twentieth century, appeared to be a stable paradise; it was also cut in a way to be predominantly Christian. People were suddenly brainwashed to believe in the nation-state as an entity.* The Christians convinced themselves that they were at the origin and center of what is loosely called Western culture yet with a window on the East. In a

classical case of static thinking, nobody took into account the differentials in birthrate between communities and it was assumed that a slight Christian majority would remain permanent. Levantines had been granted Roman citizenship, which allowed Saint Paul, a Syrian, to travel freely through the ancient world. People felt connected to everything they felt was worth connecting to; the place was exceedingly open to the world, with a vastly sophisticated lifestyle, a prosperous economy, and temperate weather just like California, with snow-covered mountains jutting above the Mediterranean. It attracted a collection of spies (both Soviet and Western), prostitutes (blondes), writers, poets, drug dealers, adventurers, compulsive gamblers, tennis players, après-skiers, and merchants—all professions that complement one another. Many people acted as if they were in an old James Bond movie, or the days when playboys smoked, drank, and, instead of going to the gym, cultivated relationships with good tailors.

The main attribute of paradise was there: cabdrivers were said to be polite (though, from what I remember, they were not polite to me). True, with hindsight, the place may appear more Elysian in the memory of people than it actually was.

I was too young to taste the pleasures of the place, as I became a rebellious idealist and, very early on, developed an ascetic taste, averse to the ostentatious signaling of wealth, allergic to Levantine culture's overt pursuit of luxury and its obsession with things monetary.

As a teenager, I could not wait to go settle in a metropolis with fewer James Bond types around. Yet I recall something that felt special in the intellectual air. I attended the French lycée that had one of the highest success rates for the French *baccalauréat* (the high school degree), even in the subject of the French language. French was spoken there with some purity: as in prerevolutionary Russia, the Levantine Christian and Jewish patrician class (from Istanbul to Alexandria) spoke and wrote formal French as a language of distinction. The most privileged were sent to school in France, as both my grandfathers were—my paternal namesake in 1912 and my mother's father in 1929. Two thousand years earlier, by the same instinct of linguistic distinction, the snobbish Levantine patricians wrote in Greek, not the vernacular Aramaic. (The New Testament was written in the bad local patrician Greek of our

capital, Antioch, prompting Nietzsche to shout that “God spoke bad Greek.”) And, after Hellenism declined, they took up Arabic. So in addition to being called a “paradise,” the place was also said to be a miraculous crossroads of what are superficially tagged “Eastern” and “Western” cultures.

On Walking Walks

My ethos was shaped when, at fifteen, I was put in jail for (allegedly) attacking a policeman with a slab of concrete during a student riot—an incident with strange ramifications since my grandfather was then the minister of the interior, and the person who signed the order to crush our revolt. One of the rioters was shot dead when a policeman who had been hit on the head with a stone panicked and randomly opened fire on us. I recall being at the center of the riot, and feeling a huge satisfaction upon my capture while my friends were scared of both prison and their parents. We frightened the government so much that we were granted amnesty.

There were some obvious benefits in showing one’s ability to act on one’s opinions, and not compromising an inch to avoid “offending” or bothering others. I was in a state of rage and didn’t care what my parents (and grandfather) thought of me. This made them quite scared of *me*, so I could not afford to back down, or even blink. Had I concealed my participation in the riot (as many friends did) and been discovered, instead of being openly defiant, I am certain that I would have been treated as a black sheep. It is one thing to be cosmetically defiant of authority by wearing unconventional clothes—what social scientists and economists call “cheap signaling”—and another to prove willingness to translate belief into action.

My paternal uncle was not too bothered by my political ideas (these come and go); he was outraged that I used them as an excuse to dress sloppily. To him, inelegance on the part of a close family member was the mortal offense.

Public knowledge of my capture had another major benefit: it allowed me to avoid the usual outward signs of teenage rebellion. I discovered that it is much more effective to act like a nice guy and be “reasonable”

if you prove willing to go beyond just verbiage. You can afford to be compassionate, lax, and courteous if, once in a while, when it is least expected of you, but completely justified, you sue someone, or savage an enemy, just to show that you can walk the walk.

“Paradise” Evaporated

The Lebanese “paradise” suddenly evaporated, after a few bullets and mortar shells. A few months after my jail episode, after close to thirteen centuries of remarkable ethnic coexistence, a Black Swan, coming out of nowhere, transformed the place from heaven to hell. A fierce civil war began between Christians and Moslems, including the Palestinian refugees who took the Moslem side. It was brutal, since the combat zones were in the center of the town and most of the fighting took place in residential areas (my high school was only a few hundred feet from the war zone). The conflict lasted more than a decade and a half. I will not get too descriptive. It may be that the invention of gunfire and powerful weapons turned what, in the age of the sword, would have been just tense conditions into a spiral of uncontrollable tit-for-tat warfare.

Aside from the physical destruction (which turned out to be easy to reverse with a few motivated contractors, bribed politicians, and naïve bondholders), the war removed much of the crust of sophistication that had made the Levantine cities a continuous center of great intellectual refinement for three thousand years. Christians had been leaving the area since Ottoman times—those who moved to the West took Western first names and melded in. Their exodus accelerated. The number of cultured people dropped below some critical level. Suddenly the place became a vacuum. Brain drain is hard to reverse, and some of the old refinement may be lost forever.

The Starred Night

The next time you experience a blackout, take some solace by looking at the sky. You will not recognize it. Beirut had frequent power shutdowns during the war. Before people bought their own generators, one side of

the sky was clear at night, owing to the absence of light pollution. That was the side of town farthest from the combat zone. People deprived of television drove to watch the erupting lights of nighttime battles. They appeared to prefer the risk of being blown up by mortar shells to the boredom of a dull evening.

So you could see the stars with great clarity. I had been told in high school that the planets are in something called *equilibrium*, so we did not have to worry about the stars hitting us unexpectedly. To me, that eerily resembled the stories we were also told about the “unique historical stability” of Lebanon. The very idea of assumed equilibrium bothered me. I looked at the constellations in the sky and did not know what to believe.

HISTORY AND THE TRIPLET OF OPACITY

History is opaque. You see what comes out, not the script that produces events, the generator of history. There is a fundamental incompleteness in your grasp of such events, since you do not see what’s inside the box, how the mechanisms work. What I call the generator of historical events is different from the events themselves, much as the minds of the gods cannot be read just by witnessing their deeds. You are very likely to be fooled about their intentions.

This disconnect is similar to the difference between the food you see on the table at the restaurant and the process you can observe in the kitchen. (The last time I brunchd at a certain Chinese restaurant on Canal Street in downtown Manhattan, I saw a rat coming out of the kitchen.)

The human mind suffers from three ailments as it comes into contact with history, what I call the *triplet of opacity*. They are:

- a. the illusion of understanding, or how everyone thinks he knows what is going on in a world that is more complicated (or random) than they realize;
- b. the retrospective distortion, or how we can assess matters only after the fact, as if they were in a rearview mirror (history seems clearer and more organized in history books than in empirical reality); and

- c. the overvaluation of factual information and the handicap of authoritative and learned people, particularly when they create categories—when they “Platonify.”

Nobody Knows What’s Going On

The first leg of the triplet is the pathology of thinking that the world in which we live is more understandable, more explainable, and therefore more predictable than it actually is.

I was constantly told by adults that the war, which ended up lasting close to seventeen years, was going to end in “only a matter of days.” They seemed quite confident in their forecasts of duration, as can be evidenced by the number of people who sat waiting in hotel rooms and other temporary quarters in Cyprus, Greece, France, and elsewhere for the war to finish. One uncle kept telling me how, some thirty years earlier, when the rich Palestinians fled to Lebanon, they considered it a *very temporary* solution (most of those still alive are still there, six decades later). Yet when I asked him if it was going to be the same with our conflict, he replied, “No, of course not. This place is different; it has always been different.” Somehow what he detected in others did not seem to apply to him.

This duration blindness in the middle-aged exile is quite a widespread disease. Later, when I decided to avoid the exile’s obsession with his roots (exiles’ roots penetrate their personalities a bit too deeply), I studied exile literature precisely to avoid the traps of a consuming and obsessive nostalgia. These exiles seemed to have become prisoners of their memory of idyllic origin—they sat together with other prisoners of the past and spoke about the old country, and ate their traditional food while some of their folk music played in the background. They continuously ran counterfactuals in their minds, generating alternative scenarios that could have happened and prevented these historical ruptures, such as “if the Shah had not named this incompetent man as prime minister, we would still be there.” It was as if the historical rupture had a specific cause, and that the catastrophe could have been averted by removing *that* specific cause. So I pumped every displaced person I could find for information on their behavior during exile.