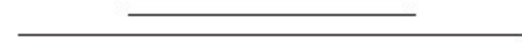


ELON MUSK

HOW THE BILLIONAIRE CEO
OF SPACEX AND TESLA
IS SHAPING OUR FUTURE

ASHLEE VANCE



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About the Book

THERE ARE FEW INDUSTRIALISTS IN HISTORY WHO COULD MATCH ELON MUSK'S RELENTLESS DRIVE AND INGENIOUS VISION.

Musk is the man behind PayPal, Tesla Motors, SpaceX, and SolarCity, each of which has sent shock waves throughout business and industry. In this lively, investigative account, veteran technology journalist Ashlee Vance offers an unprecedented look into the remarkable life and times of Silicon Valley's most audacious businessman. Written with exclusive access to Musk, his family, and his friends, the book traces his journey from his difficult upbringing in South Africa to his ascent to the pinnacle of the global business world.

Since arriving in the United States in 1992, Musk's roller-coaster life has brought him grave disappointments alongside massive successes. After

being forced out of PayPal, fending off a life-threatening case of malaria, and dealing with the death of his infant son, Musk abandoned Silicon Valley for Los Angeles. He spent the next few years baffling his friends by blowing his entire fortune on rocket ships and electric cars.

Cut to 2012, however, and Musk had mounted one of the greatest resurrections in business history: Tesla, SpaceX, and SolarCity had enjoyed unparalleled success, and Musk's net worth soared to more than \$5 billion. This is a brilliant, penetrating examination of what Musk's career means for a technology industry undergoing dramatic change and offers a taste of what could be an incredible century ahead.

About the Author

ASHLEE VANCE is one of the most prominent writers on technology today. After spending several years reporting on Silicon Valley and technology for the *New York Times*, Vance went to *Bloomberg Businessweek*, where he has written dozens of cover and feature stories for the magazine on topics ranging from cyber espionage to DNA sequencing and space exploration.

ALSO BY ASHLEE VANCE

Geek Silicon Valley:

The Inside Guide to Palo Alto, Stanford, Menlo Park, Mountain View, Santa

Clara, Sunnyvale, San Jose, San Francisco

ELON MUSK

HOW THE BILLIONAIRE CEO OF SPACEX AND
TESLA IS SHAPING OUR FUTURE

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For Mum and Dad. Thanks for Everything.

ELON'S WORLD

“DO YOU THINK I’m insane?”

This question came from Elon Musk near the very end of a long dinner we shared at a high-end seafood restaurant in Silicon Valley. I’d gotten to the restaurant first and settled down with a gin and tonic, knowing Musk would—as ever—be late. After about fifteen minutes, Musk showed up wearing leather shoes, designer jeans, and a plaid dress shirt. Musk stands six foot one but ask anyone who knows him and they’ll confirm that he seems much bigger than that. He’s absurdly broad-shouldered, sturdy, and thick. You’d figure he would use this frame to his advantage and perform an alpha-male strut when entering a room. Instead, he tends to be almost sheepish. It’s head tilted slightly down while walking, a quick handshake hello after reaching the table, and then butt in seat. From there, Musk needs a few minutes before he warms up and looks at ease.

Musk asked me to dinner for a negotiation of sorts. Eighteen months earlier, I’d informed him of my plans to write a book about him, and he’d informed me of his plans not to cooperate. His rejection stung but thrust me into dogged reporter mode. If I had to do this book without him, so be it. Plenty of people had left Musk’s companies, Tesla Motors and SpaceX, and

would talk, and I already knew a lot of his friends. The interviews followed one after another, month after month, and two hundred or so people into the process, I heard from Musk once again. He called me at home and declared that things could go one of two ways: he could make my life very difficult or he could help with the project after all. He'd be willing to cooperate if he could read the book before it went to publication, and could add footnotes throughout it. He would not meddle with my text, but he wanted the chance to set the record straight in spots that he deemed factually inaccurate. I understood where this was coming from. Musk wanted a measure of control over his life's story. He's also wired like a scientist and suffers mental anguish at the sight of a factual error. A mistake on a printed page would gnaw at his soul—forever. While I could understand his perspective, I could not let him read the book, for professional, personal, and practical reasons. Musk has his version of the truth, and it's not always the version of the truth that the rest of the world shares. He's prone to verbose answers to even the simplest of questions as well, and the thought of thirty-page footnotes seemed all too real. Still, we agreed to have dinner, chat all this out, and see where it left us.

Our conversation began with a discussion of public-relations people.

Musk burns through PR staffers notoriously fast, and Tesla was in the

process of hunting for a new communications chief. “Who is the best PR person in the world?” he asked in a very Muskian fashion. Then we talked about mutual acquaintances, Howard Hughes, and the Tesla factory. When the waiter stopped by to take our order, Musk asked for suggestions that would work with his low-carb diet. He settled on chunks of fried lobster soaked in black squid ink. The negotiation hadn’t begun, and Musk was already dishing. He opened up about the major fear keeping him up at night: namely that Google’s cofounder and CEO Larry Page might well have been building a fleet of artificial-intelligence-enhanced robots capable of destroying mankind. “I’m really worried about this,” Musk said. It didn’t make Musk feel any better that he and Page were very close friends and that he felt Page was fundamentally a well-intentioned person and not Dr. Evil. In fact, that was sort of the problem. Page’s nice-guy nature left him assuming that the machines would forever do our bidding. “I’m not as optimistic,” Musk said. “He could produce something evil by accident.” As the food arrived, Musk consumed it. That is, he didn’t eat it as much as he made it disappear rapidly with a few gargantuan bites. Desperate to keep Musk happy and chatting, I handed him a big chunk of steak from my plate. The plan worked ... for all of ninety seconds. Meat. Hunk. Gone. It took awhile to get Musk off the artificial intelligence doom-and-gloom

talk and to the subject at hand. Then, as we drifted toward the book, Musk started to feel me out, probing exactly why it was that I wanted to write about him and calculating my intentions. When the moment presented itself, I moved in and seized the conversation. Some adrenaline released and mixed with the gin, and I launched into what was meant to be a forty-five-minute sermon about all the reasons Musk should let me burrow deep into his life and do so while getting exactly none of the controls he wanted in return. The speech revolved around the inherent limitations of footnotes, Musk coming off like a control freak and my journalistic integrity being compromised. To my great surprise, Musk cut me off after a couple of minutes and simply said, “Okay.” One thing that Musk holds in the highest regard is resolve, and he respects people who continue on after being told no. Dozens of other journalists had asked him to help with a book before, but I’d been the only annoying asshole who continued on after Musk’s initial rejection, and he seemed to like that.

The dinner wound down with pleasant conversation and Musk laying waste to the low-carb diet. A waiter showed up with a giant yellow cotton candy desert sculpture, and Musk dug into it, ripping off handfuls of the sugary fluff. It was settled. Musk granted me access to the executives at his companies, his friends, and his family. He would meet me for dinner once a

month for as long as it took. For the first time, Musk would let a reporter see the inner workings of his world. Two and a half hours after we started, Musk put his hands on the table, made a move to get up, and then paused, locked eyes with me, and busted out that incredible question: “Do you think I’m insane?” The oddity of the moment left me speechless for a beat, while my every synapse fired trying to figure out if this was some sort of riddle, and, if so, how it should be answered artfully. It was only after I’d spent lots of time with Musk that I realized the question was more for him than me. Nothing I said would have mattered. Musk was stopping one last time and wondering aloud if I could be trusted and then looking into my eyes to make his judgment. A split second later, we shook hands and Musk drove off in a red Tesla Model S sedan.

ANY STUDY OF ELON MUSK must begin at the headquarters of SpaceX, in Hawthorne, California—a suburb of Los Angeles located a few miles from Los Angeles International Airport. It’s there that visitors will find two giant posters of Mars hanging side by side on the wall leading up to Musk’s cubicle. The poster to the left depicts Mars as it is today—a cold, barren red orb. The poster on the right shows a Mars with a humongous green landmass surrounded by oceans. The planet has been heated up and transformed to suit humans. Musk fully intends to try and make this

happen. Turning humans into space colonizers is his stated life's purpose. "I would like to die thinking that humanity has a bright future," he said. "If we can solve sustainable energy and be well on our way to becoming a multiplanetary species with a self-sustaining civilization on another planet—to cope with a worst-case scenario happening and extinguishing human consciousness—then," and here he paused for a moment, "I think that would be really good."

If some of the things that Musk says and does sound absurd, that's because on one level they very much are. On this occasion, for example, Musk's assistant had just handed him some cookies-and-cream ice cream with sprinkles on top, and he then talked earnestly about saving humanity while a blotch of the dessert hung from his lower lip.

Musk's ready willingness to tackle impossible things has turned him into a deity in Silicon Valley, where fellow CEOs like Page speak of him in reverential awe, and budding entrepreneurs strive "to be like Elon" just as they had been striving in years past to mimic Steve Jobs. Silicon Valley, though, operates within a warped version of reality, and outside the confines of its shared fantasy, Musk often comes off as a much more polarizing figure. He's the guy with the electric cars, solar panels, and rockets peddling false hope. Forget Steve Jobs. Musk is a sci-fi version of P. T.

Barnum who has gotten extraordinarily rich by preying on people's fear and self-hatred. Buy a Tesla. Forget about the mess you've made of the planet for a while.

I'd long been a subscriber to this latter camp. Musk had struck me as a well-intentioned dreamer—a card-carrying member of Silicon Valley's techno-utopian club. This group tends to be a mix of Ayn Rand devotees and engineer absolutists who see their hyperlogical worldviews as the Answer for everyone. If we'd just get out of their way, they'd fix all our problems. One day, soon enough, we'll be able to download our brains to a computer, relax, and let their algorithms take care of everything. Much of their ambition proves inspiring and their works helpful. But the techno-utopians do get tiresome with their platitudes and their ability to prattle on for hours without saying much of substance. More disconcerting is their underlying message that humans are flawed and our humanity is an annoying burden that needs to be dealt with in due course. When I'd caught Musk at Silicon Valley events, his highfalutin talk often sounded straight out of the techno-utopian playbook. And, most annoyingly, his world-saving companies didn't even seem to be doing all that well.

Yet, in the early part of 2012, the cynics like me had to take notice of what Musk was actually accomplishing. His once-beleaguered companies

were succeeding at unprecedented things. SpaceX flew a supply capsule to the International Space Station and brought it safely back to Earth. Tesla Motors delivered the Model S, a beautiful, all-electric sedan that took the automotive industry's breath away and slapped Detroit sober. These two feats elevated Musk to the rarest heights among business titans. Only Steve Jobs could claim similar achievements in two such different industries, sometimes putting out a new Apple product and a blockbuster Pixar movie in the same year. And yet, Musk was not done. He was also the chairman and largest shareholder of SolarCity, a booming solar energy company poised to file for an initial public offering. Musk had somehow delivered the biggest advances the space, automotive, and energy industries had seen in decades in what felt like one fell swoop.

It was in 2012 that I decided to see what Musk was like first-hand and to write a cover story about him for *Bloomberg Businessweek*. At this point in Musk's life, everything ran through his assistant/loyal appendage Mary Beth Brown. She invited me to visit what I've come to refer to as Musk Land.

Anyone arriving at Musk Land for the first time will have the same head-scratching experience. You're told to park at One Rocket Road in Hawthorne, where SpaceX has its HQ. It seems impossible that anything

good could call Hawthorne home. It's a bleak part of Los Angeles County in which groupings of run-down houses, run-down shops, and run-down eateries surround huge, industrial complexes that appear to have been built during some kind of architectural Boring Rectangle movement. Did Elon Musk really stick his company in the middle of this dreck? Then, okay, things start to make more sense when you see one 550,000-square-foot rectangle painted an ostentatious hue of "Unity of Body, Soul, and Mind" white. This is the main SpaceX building.

It was only after going through the front doors of SpaceX that the grandeur of what this man had done became apparent. Musk had built an honest-to-God rocket factory in the middle of Los Angeles. And this factory was not making one rocket at a time. No. It was making many rockets—from scratch. The factory was a giant, shared work area. Near the back were massive delivery bays that allowed for the arrival of hunks of metal, which were transported to two-story-high welding machines. Over to one side were technicians in white coats making motherboards, radios, and other electronics. Other people were in a special, airtight glass chamber, building the capsules that rockets would take to the Space Station. Tattooed men in bandanas were blasting Van Halen and threading wires around rocket engines. There were completed bodies of rockets lined up one after the

other ready to be placed on trucks. Still more rockets, in another part of the building, awaited coats of white paint. It was difficult to take in the entire factory at once. There were hundreds of bodies in constant motion whirring around a variety of bizarre machines.

This is just building number one of Musk Land. SpaceX had acquired several buildings that used to be part of a Boeing factory, which made the fuselages for 747s. One of these buildings has a curved roof and looks like an airplane hangar. It serves as the research, development, and design studio for Tesla. This is where the company came up with the look for the Model S sedan and its follow-on, the Model X SUV. In the parking lot outside the studio, Tesla has built one of its recharging stations where Los Angeles drivers can top up with electricity for free. The charging center is easy enough to spot because Musk has installed a white and red obelisk branded with the Tesla logo that sits in the middle of an infinity pool.

It was in my first interview with Musk, which took place at the design studio, that I began to get a sense of how he talked and operated. He's a confident guy, but does not always do a good job of displaying this. On initial encounter, Musk can come off as shy and borderline awkward. His South African accent remains present but fading, and the charm of it is not enough to offset the halting nature of Musk's speech pattern. Like many an

engineer or physicist, Musk will pause while fishing around for exact phrasing, and he'll often go rumbling down an esoteric, scientific rabbit hole without providing any helping hands or simplified explanations along the way. Musk expects you to keep up. None of this is off-putting. Musk, in fact, will toss out plenty of jokes and can be downright charming. It's just that there's a sense of purpose and pressure hanging over any conversation with the man. Musk doesn't really shoot the shit. (It would end up taking about thirty hours of interviews for Musk to really loosen up and let me into a different, deeper level of his psyche and personality.)

Most high-profile CEOs have handlers all around them. Musk mostly moves about Musk Land on his own. This is not the guy who slinks into the restaurant. It's the guy who owns the joint and strides about with authority. Musk and I talked, as he made his way around the design studio's main floor, inspecting prototype parts and vehicles. At each station, employees rushed up to Musk and disgorged information. He listened intently, processed it, and nodded when satisfied. The people moved away and Musk moved to the next information dump. At one point, Tesla's design chief, Franz von Holzhausen, wanted Musk's take on some new tires and rims that had come in for the Model S and on the seating arrangements for the Model X. They spoke, and then they went into a back room where executives from

a seller of high-end graphics software had prepared a presentation for Musk. They wanted to show off new 3-D rendering technology that would allow Tesla to tweak the finish of a virtual Model S and see in great detail how things like shadows and streetlights played off the car's body. Tesla's engineers really wanted the computing systems and needed Musk's sign-off. The men did their best to sell Musk on the idea while the sound of drills and giant industrial fans drowned out their shtick. Musk, wearing leather shoes, designer jeans, and a black T-shirt, which is essentially his work uniform, had to don 3-D goggles for the demonstration and seemed unmoved. He told them he'd think about it and then walked toward the source of the loudest noise—a workshop deep in the design studio where Tesla engineers were building the scaffolding for the thirty-foot decorative towers that go outside the charging stations. “That thing looks like it could survive a Category Five hurricane,” Musk said. “Let's thin it up a bit.” Musk and I eventually hop into his car—a black Model S—and zip back to the main SpaceX building. “I think there are probably too many smart people pursuing Internet stuff, finance, and law,” Musk said on the way. “That is part of the reason why we haven't seen as much innovation.”

MUSK LAND WAS A REVELATION.

I'd come to Silicon Valley in 2000 and ended up living in the Tenderloin

neighborhood of San Francisco. It's the one part of the city that locals will implore you to avoid. Without trying very hard, you can find someone pulling down his pants and pooping in between parked cars or encounter some deranged sort bashing his head into the side of a bus stop. At dive bars near the local strip clubs, transvestites hit on curious businessmen and drunks fall asleep on couches and soil themselves as part of their lazy Sunday ritual. It's the gritty, knife-stabby part of San Francisco and turned out to be a great place to watch the dotcom dream die.

San Francisco has an enduring history with greed. It became a city on the back of the gold rush, and not even a catastrophic earthquake could slow San Francisco's economic lust for long. Don't let the granola vibes fool you. Booms and busts are the rhythm of this place. And, in 2000, San Francisco had been over-taken by the boom of all booms and consumed by avarice. It was a wonderful time to be alive with just about the entire populace giving in to a fantasy—a get-rich-quick, Internet madness. The pulses of energy from this shared delusion were palpable, producing a constant buzz that vibrated across the city. And here I was in the center of the most depraved part of San Francisco, watching just how high and low people get when consumed by excess.

Stories tracking the insanity of business in these times are well-known.

You no longer had to make something that other people wanted to buy in order to start a booming company. You just had to have an idea for some sort of Internet thing and announce it to the world in order for eager investors to fund your thought experiment. The whole goal was to make as much money as possible in the shortest amount of time because everyone knew on at least a subconscious level that reality had to set in eventually. Valley denizens took very literally the cliché of working as hard as you play. People in their twenties, thirties, forties, and fifties were expected to pull all-nighters. Cubicles were turned into temporary homes, and personal hygiene was abandoned. Oddly enough, making Nothing appear to be Something took a lot of work. But when the time to decompress arrived, there were plenty of options for total debauchery. The hot companies and media powers of the time seemed locked in a struggle to outdo each other with ever-fancier parties. Old-line companies trying to look “with it” would regularly buy space at a concert venue and then order up some dancers, acrobats, open bars, and the Barenaked Ladies. Young technologists would show up to pound their free Jack and Cokes and snort their cocaine in porta-potties. Greed and self-interest were the only things that made any sense back then.

While the good times have been well chronicled, the subsequent bad

times have been—unsurprisingly—ignored. It’s more fun to reminiscence on irrational exuberance than the mess that gets left behind.

Let it be said for the record, then, that the implosion of the get-rich-quick Internet fantasy left San Francisco and Silicon Valley in a deep depression. The endless parties ended. The prostitutes no longer roamed the streets of the Tenderloin at 6 A.M. offering pre-commute love. (“Come on, honey. It’s better than coffee!”) Instead of the Barenaked Ladies, you got the occasional Neil Diamond tribute band at a trade show, some free T-shirts, and a lump of shame.

The technology industry had no idea what to do with itself. The dumb venture capitalists who had been taken during the bubble didn’t want to look any dumber, so they stopped funding new ventures altogether.

Entrepreneurs’ big ideas were replaced by the smallest of notions. It was as if Silicon Valley had entered rehab en masse. It sounds melodramatic, but it’s true. A populace of millions of clever people came to believe that they were inventing the future. Then ... poof! Playing it safe suddenly became the fashionable thing to do.

The evidence of this malaise is in the companies and ideas formed during this period. Google had appeared and really started to thrive around 2002, but it was an outlier. Between Google and Apple’s introduction of the

iPhone in 2007, there's a wasteland of ho-hum companies. And the hot new things that were just starting out—Facebook and Twitter—certainly did not look like their predecessors—Hewlett-Packard, Intel, Sun Microsystems—that made physical products and employed tens of thousands of people in the process. In the years that followed, the goal went from taking huge risks to create new industries and grand new ideas, to chasing easier money by entertaining consumers and pumping out simple apps and advertisements. “The best minds of my generation are thinking about how to make people click ads,” Jeff Hammerbacher, an early Facebook engineer, told me. “That sucks.” Silicon Valley began to look an awful lot like Hollywood.

Meanwhile, the consumers it served had turned inward, obsessed with their virtual lives.

One of the first people to suggest that this lull in innovation could signal a much larger problem was Jonathan Huebner, a physicist who works at the Pentagon's Naval Air Warfare Center in China Lake, California. Huebner is the *Leave It to Beaver* version of a merchant of death. Middle-aged, thin, and balding, he likes to wear a dirt-inspired ensemble of khaki pants, a brown-striped shirt, and a canvas khaki jacket. He has designed weapons systems since 1985, gaining direct insight into the latest and greatest technology around materials, energy, and software. Following the dot-com

bust, he became miffed at the ho-hum nature of the supposed innovations crossing his desk. In 2005, Huebner delivered a paper, “A Possible Declining Trend in Worldwide Innovation,” which was either an indictment of Silicon Valley or at least an ominous warning.

Huebner opted to use a tree metaphor to describe what he saw as the state of innovation. Man has already climbed past the trunk of the tree and gone out on its major limbs, mining most of the really big, game-changing ideas—the wheel, electricity, the airplane, the telephone, the transistor. Now we’re left dangling near the end of the branches at the top of the tree and mostly just refining past inventions. To back up his point in the paper, Huebner showed that the frequency of life-changing inventions had started to slow. He also used data to prove that the number of patents filed per person had declined over time. “I think the probability of us discovering another top-one-hundred-type invention gets smaller and smaller,” Huebner told me in an interview. “Innovation is a finite resource.”

Huebner predicted that it would take people about five years to catch on to his thinking, and this forecast proved almost exactly right. Around 2010, Peter Thiel, the PayPal cofounder and early Facebook investor, began promoting the idea that the technology industry had let people down. “We wanted flying cars, instead we got 140 characters” became the tagline of his

venture capital firm Founders Fund. In an essay called “What Happened to the Future,” Thiel and his cohorts described how Twitter, its 140-character messages, and similar inventions have let the public down. He argued that science fiction, which once celebrated the future, has turned dystopian because people no longer have an optimistic view of technology’s ability to change the world.

I’d subscribed to a lot of this type of thinking until that first visit to Musk Land. While Musk had been anything but shy about what he was up to, few people outside of his companies got to see the factories, the R&D centers, the machine shops, and to witness the scope of what he was doing firsthand. Here was a guy who had taken much of the Silicon Valley ethic behind moving quickly and running organizations free of bureaucratic hierarchies and applied it to improving big, fantastic machines and chasing things that had the potential to be the real breakthroughs we’d been missing.

By rights, Musk should have been part of the malaise. He jumped right into dot-com mania in 1995, when, fresh out of college, he founded a company called Zip2—a primitive Google Maps meets Yelp. That first venture ended up a big, quick hit. Compaq bought Zip2 in 1999 for \$307 million. Musk made \$22 million from the deal and poured almost all of it into his next venture, a start-up that would morph into PayPal. As the

largest shareholder in PayPal, Musk became fantastically well-to-do when eBay acquired the company for \$1.5 billion in 2002.

Instead of hanging around Silicon Valley and falling into the same funk as his peers, however, Musk decamped to Los Angeles. The conventional wisdom of the time said to take a deep breath and wait for the next big thing to arrive in due course. Musk rejected that logic by throwing \$100 million into SpaceX, \$70 million into Tesla, and \$10 million into SolarCity. Short of building an actual money-crushing machine, Musk could not have picked a faster way to destroy his fortune. He became a one-man, ultra-risk-taking venture capital shop and doubled down on making super-complex physical goods in two of the most expensive places in the world, Los Angeles and Silicon Valley. Whenever possible, Musk's companies would make things from scratch and try to rethink much that the aerospace, automotive, and solar industries had accepted as convention.

With SpaceX, Musk is battling the giants of the U.S. military-industrial complex, including Lockheed Martin and Boeing. He's also battling nations—most notably Russia and China. SpaceX has made a name for itself as the low-cost supplier in the industry. But that, in and of itself, is not really good enough to win. The space business requires dealing with a mess of politics, back-scratching, and protectionism that undermines the fundamentals of

capitalism. Steve Jobs faced similar forces when he went up against the recording industry to bring the iPod and iTunes to market. The crotchety Luddites in the music industry were a pleasure to deal with compared to Musk's foes who build weapons and countries for a living. SpaceX has been testing reusable rockets that can carry payloads to space and land back on Earth, on their launchpads, with precision. If the company can perfect this technology, it will deal a devastating blow to all of its competitors and almost assuredly push some mainstays of the rocket industry out of business while establishing the United States as the world leader for taking cargo and humans to space. It's a threat that Musk figures has earned him plenty of fierce enemies. "The list of people that would not mind if I was gone is growing," Musk said. "My family fears that the Russians will assassinate me."

With Tesla Motors, Musk has tried to revamp the way cars are manufactured and sold, while building out a worldwide fuel distribution network at the same time. Instead of hybrids, which in Musk lingo are suboptimal compromises, Tesla strives to make all-electric cars that people lust after and that push the limits of technology. Tesla does not sell these cars through dealers; it sells them on the Web and in Apple-like galleries located in high-end shopping centers. Tesla also does not anticipate making

lots of money from servicing its vehicles, since electric cars do not require the oil changes and other maintenance procedures of traditional cars. The direct sales model embraced by Tesla stands as a major affront to car dealers used to haggling with their customers and making their profits from exorbitant maintenance fees. Tesla's recharging stations now run alongside many of the major highways in the United States, Europe, and Asia and can add hundreds of miles of oomph back to a car in about twenty minutes. These so-called supercharging stations are solar-powered, and Tesla owners pay nothing to refuel. While much of America's infrastructure decays, Musk is building a futuristic end-to-end transportation system that would allow the United States to leapfrog the rest of the world. Musk's vision, and, of late, execution seem to combine the best of Henry Ford and John D. Rockefeller.

With SolarCity, Musk has funded the largest installer and financier of solar panels for consumers and businesses. Musk helped come up with the idea for SolarCity and serves as its chairman, while his cousins Lyndon and Peter Rive run the company. SolarCity has managed to undercut dozens of utilities and become a large utility in its own right. During a time in which clean-tech businesses have gone bankrupt with alarming regularity, Musk has built two of the most successful clean-tech companies in the world. The

Musk Co. empire of factories, tens of thousands of workers, and industrial might has incumbents on the run and has turned Musk into one of the richest men in the world, with a net worth around \$10 billion.

The visit to Musk Land started to make a few things clear about how Musk had pulled all this off. While the “putting man on Mars” talk can strike some people as loopy, it gave Musk a unique rallying cry for his companies. It’s the sweeping goal that forms a unifying principle over everything he does. Employees at all three companies are well aware of this and well aware that they’re trying to achieve the impossible day in and day out. When Musk sets unrealistic goals, verbally abuses employees, and works them to the bone, it’s understood to be—on some level—part of the Mars agenda. Some employees love him for this. Others loathe him but remain oddly loyal out of respect for his drive and mission. What Musk has developed that so many of the entrepreneurs in Silicon Valley lack is a meaningful worldview. He’s the possessed genius on the grandest quest anyone has ever concocted. He’s less a CEO chasing riches than a general marshaling troops to secure victory. Where Mark Zuckerberg wants to help you share baby photos, Musk wants to ... well ... save the human race from self-imposed or accidental annihilation.

The life that Musk has created to manage all of these endeavors is

preposterous. A typical week starts at his mansion in Bel Air. On Monday, he works the entire day at SpaceX. On Tuesday, he begins at SpaceX, then hops onto his jet and flies to Silicon Valley. He spends a couple of days working at Tesla, which has its offices in Palo Alto and factory in Fremont. Musk does not own a home in Northern California and ends up staying at the luxe Rosewood hotel or at friends' houses. To arrange the stays with friends, Musk's assistant will send an e-mail asking, "Room for one?" and if the friend says, "Yes," Musk turns up at the door late at night. Most often he stays in a guest room, but he's also been known to crash on the couch after winding down with some video games. Then it's back to Los Angeles and SpaceX on Thursday. He shares custody of his five young boys—twins and triplets—with his ex-wife, Justine, and has them four days a week. Each year, Musk tabulates the amount of flight time he endures per week to help him get a sense of just how out of hand things are getting. Asked how he survives this schedule, Musk said, "I had a tough childhood, so maybe that was helpful."

During one visit to Musk Land, he had to squeeze our interview in before heading off for a camping trip at Crater Lake National Park in Oregon. It was almost 8 P.M. on a Friday, so Musk would soon be piling his boys and nannies into his private jet and then meeting drivers who would take him to

his friends at the campsite; the friends would then help the Musk clan unpack and complete their pitch-black arrival. There would be a bit of hiking over the weekend. Then the relaxation would end. Musk would fly with the boys back to Los Angeles on Sunday afternoon. Then, he would take off on his own that evening for New York. Sleep. Hit the morning talk shows on Monday. Meetings. E-mail. Sleep. Fly back to Los Angeles Tuesday morning. Work at SpaceX. Fly to San Jose Tuesday afternoon to visit the Tesla Motors factory. Fly to Washington, D.C., that night and see President Obama. Fly back to Los Angeles Wednesday night. Spend a couple of days working at SpaceX. Then go to a weekend conference held by Google's chairman, Eric Schmidt, in Yellowstone. At this time, Musk had just split from his second wife, the actress Talulah Riley, and was trying to calculate if he could mix a personal life into all of this. "I think the time allocated to the businesses and the kids is going fine," Musk said. "I would like to allocate more time to dating, though. I need to find a girlfriend. That's why I need to carve out just a little more time. I think maybe even another five to ten—how much time does a woman want a week? Maybe ten hours? That's kind of the minimum? I don't know."

Musk rarely finds time to decompress, but when he does, the festivities are just as dramatic as the rest of his life. On his thirtieth birthday, Musk

rented out a castle in England for about twenty people. From 2 A.M. until 6 A.M.,

they played a variation of hide-and-seek called sardines in which one person runs off and hides and everyone else looks for him. Another party occurred in Paris. Musk, his brother, and cousins found themselves awake at midnight and decided to bicycle through the city until 6 A.M. They slept all

day and then boarded the Orient Express in the evening. Once again, they stayed up all night. The Lucent Dossier Experience—an avant-garde group of performers—were on the luxurious train, performing palm readings and acrobatics. When the train arrived in Venice the next day, Musk's family had dinner and then hung out on the patio of their hotel overlooking the Grand Canal until 9 A.M. Musk loves costume parties as well, and turned up at

one dressed like a knight and using a parasol to duel a midget wearing a Darth Vader costume.

For one of his most recent birthdays, Musk invited fifty people to a castle—or at least the United States' best approximation of a castle—in Tarrytown, New York. This party had a Japanese steampunk theme, which is sort of like a sci-fi lover's wet dream—a mix of corsets, leather, and machine worship. Musk dressed as a samurai.

The festivities included a performance of *The Mikado*, a Victorian comic opera by Gilbert and Sullivan set in Japan, at a small theater in the heart of town. “I am not sure the Americans got it,” said Riley, whom Musk remarried after his ten-hour-a-week dating plan failed. The Americans and everyone else did enjoy what followed. Back at the castle, Musk donned a blindfold, got pushed up against a wall, and held balloons in each hand and another between his legs. The knife thrower then went to work. “I’d seen him before, but did worry that maybe he could have an off day,” Musk said. “Still, I thought, he would maybe hit one gonad but not both.” The onlookers were stunned and frightened for Musk’s safety. “That was bizarre,” said Bill Lee, a technology investor and one of Musk’s good friends. “But Elon believes in the science of things.” One of the world’s top sumo wrestlers showed up at the party along with some of his compatriots. A ring had been set up at the castle, and Musk faced off against the champion. “He was three hundred and fifty pounds, and they were not jiggly pounds,” Musk said. “I went full adrenaline rush and managed to lift the guy off the ground. He let me win that first round and then beat me. I think my back is still screwed up.”

Riley turned planning these types of parties for Musk into an art. She met Musk back in 2008, when his companies were collapsing. She watched him

lose his entire fortune and get ridiculed by the press. She knows that the sting of these years remains and has combined with the other traumas in Musk's life—the tragic loss of an infant son and a brutal upbringing in South Africa—to create a tortured soul. Riley has gone to great lengths to make sure Musk's escapes from work and this past leave him feeling refreshed if not healed. "I try to think of fun things he has not done before where he can relax," Riley said. "We're trying to make up for his miserable childhood now."

Genuine as Riley's efforts might have been, they were not entirely effective. Not long after the Sumo party, I found Musk back at work at the Tesla headquarters in Palo Alto. It was a Saturday, and the parking lot was full of cars. Inside of the Tesla offices, hundreds of young men were at work—some of them designing car parts on computers and others conducting experiments with electronics equipment on their desks. Musk's uproarious laugh would erupt every few minutes and carry through the entire floor. When Musk came into the meeting room where I'd been waiting, I noted how impressive it was for so many people to turn up on a Saturday. Musk saw the situation in a different light, complaining that fewer and fewer people had been working weekends of late. "We've grown fucking soft," Musk replied. "I was just going to send out an e-mail. We're

fucking soft.” (A word of warning: There’s going to be a lot of “fuck” in this book. Musk adores the word, and so do most of the people in his inner circle.)

This kind of declaration seems to fit with our impressions of other visionaries. It’s not hard to imagine Howard Hughes or Steve Jobs chastising their workforce in a similar way. Building things—especially big things—is a messy business. In the two decades Musk has spent creating companies, he’s left behind a trail of people who either adore or despise him. During the course of my reporting, these people lined up to give me their take on Musk and the gory details of how he and his businesses operate.

My dinners with Musk and periodic trips to Musk Land revealed a different set of possible truths about the man. He’s set about building something that has the potential to be much grander than anything Hughes or Jobs produced. Musk has taken industries like aerospace and automotive that America seemed to have given up on and recast them as something new and fantastic. At the heart of this transformation are Musk’s skills as a software maker and his ability to apply them to machines. He’s merged atoms and bits in ways that few people thought possible, and the results have been spectacular. It’s true enough that Musk has yet to have a

consumer hit on the order of the iPhone or to touch more than one billion people like Facebook. For the moment, he's still making rich people's toys, and his budding empire could be an exploded rocket or massive Tesla recall away from collapse. On the other hand, Musk's companies have already accomplished far more than his loudest detractors thought possible, and the promise of what's to come has to leave hardened types feeling optimistic during their weaker moments. "To me, Elon is the shining example of how Silicon Valley might be able to reinvent itself and be more relevant than chasing these quick IPOs and focusing on getting incremental products out," said Edward Jung, a famed software engineer and inventor. "Those things are important, but they are not enough. We need to look at different models of how to do things that are longer term in nature and where the technology is more integrated." The integration mentioned by Jung—the harmonious melding of software, electronics, advanced materials, and computing horsepower—appears to be Musk's gift. Squint ever so slightly, and it looks like Musk could be using his skills to pave the way toward an age of astonishing machines and science fiction dreams made manifest. In that sense, Musk comes off much more like Thomas Edison than Howard Hughes. He's an inventor, celebrity businessman, and industrialist able to take big ideas and turn them into big products. He's employing

thousands of people to forge metal in American factories at a time when this was thought to be impossible. Born in South Africa, Musk now looks like America's most innovative industrialist and outlandish thinker and the person most likely to set Silicon Valley on a more ambitious course.

Because of Musk, Americans could wake up in ten years with the most modern highway in the world: a transit system run by thousands of solar-powered charging stations and traversed by electric cars. By that time, SpaceX may well be sending up rockets every day, taking people and things to dozens of habitats and making preparations for longer treks to Mars.

These advances are simultaneously difficult to fathom and seemingly inevitable if Musk can simply buy enough time to make them work. As his ex-wife, Justine, put it, "He does what he wants, and he is relentless about it. It's Elon's world, and the rest of us live in it."

AFRICA

THE PUBLIC FIRST met Elon Reeve Musk in 1984. The South African trade

publication *PC and Office Technology* published the source code to a video game Musk had designed. Called Blastar, the science-fiction-inspired space

game required 167 lines of instructions to run. This was back in the day when early computer users were required to type out commands to make their machines do much of anything. In that context, Musk's game did not shine as a marvel of computer science but it certainly surpassed what most twelve-year-olds were kicking out at the time. Its coverage in the magazine netted Musk five hundred dollars and provided some early hints about his character. The Blaster spread on page 69 of the magazine shows that the young man wanted to go by the sci-fi-author-sounding name E. R. Musk and that he already had visions of grand conquests dancing in his head. The brief explainer states, "In this game you have to destroy an alien space freighter, which is carrying deadly Hydrogen Bombs and Status Beam Machines. This game makes good use of sprites and animation, and in this sense makes the listing worth reading." (As of this writing, not even the Internet knows what "status beam machines" are.)

A boy fantasizing about space and battles between good and evil is anything but amazing. A boy who takes these fantasies seriously is more remarkable. Such was the case with the young Elon Musk. By the middle of his teenage years, Musk had blended fantasy and reality to the point that they were hard to separate in his mind. Musk came to see man's fate in the universe as a personal obligation. If that meant pursuing cleaner energy

technology or building spaceships to extend the human species's reach, then so be it. Musk would find a way to make these things happen. "Maybe I read too many comics as a kid," Musk said. "In the comics, it always seems like they are trying to save the world. It seemed like one should try to make the world a better place because the inverse makes no sense."

At around age fourteen, Musk had a full-on existential crisis. He tried to deal with it like many gifted adolescents do, turning to religious and philosophical texts. Musk sampled a handful of ideologies and then ended up more or less back where he had started, embracing the sci-fi lessons found in one of the most influential books in his life: *The Hitchhiker's Guide to the Galaxy*, by Douglas Adams. "He points out that one of the really tough things is figuring out what questions to ask," Musk said. "Once you figure out the question, then the answer is relatively easy. I came to the conclusion that really we should aspire to increase the scope and scale of human consciousness in order to better understand what questions to ask." The teenage Musk then arrived at his ultralogical mission statement. "The only thing that makes sense to do is strive for greater collective enlightenment," he said.

It's easy enough to spot some of the underpinnings of Musk's search for purpose. Born in 1971, he grew up in Pretoria, a large city in the

northeastern part of South Africa, just an hour's drive from Johannesburg. The specter of apartheid was present throughout his childhood, as South Africa frequently boiled over with tension and violence. Blacks and whites clashed, as did blacks of different tribes. Musk turned four years old just days after the Soweto Uprising, in which hundreds of black students died while protesting decrees of the white government. For years South Africa faced sanctions imposed by other nations due to its racist policies. Musk had the luxury of traveling abroad during his childhood and would have gotten a flavor for how outsiders viewed South Africa.

But what had even more of an impact on Musk's personality was the white Afrikaner culture so prevalent in Pretoria and the surrounding areas. Hypermasculine behavior was celebrated and tough jocks were revered. While Musk enjoyed a level of privilege, he lived as an outsider whose reserved personality and geeky inclinations ran against the prevailing attitudes of the time. His notion that something about the world had gone awry received constant reinforcement, and Musk, almost from his earliest days, plotted an escape from his surroundings and dreamed of a place that would allow his personality and dreams to flourish. He saw America in its most clichéd form, as the land of opportunity and the most likely stage for making the realization of his dreams possible. This is how it came to pass

that a lonesome, gawky South African boy who talked with the utmost sincerity about pursuing “collective enlightenment” ended up as America’s most adventurous industrialist.

When Musk did finally reach the United States in his twenties, it marked a return to his ancestral roots. Family trees suggest that ancestors bearing the Swiss German surname of Haldeman on the maternal side of Musk’s family left Europe for New York during the Revolutionary War. From New York, they spread out to the prairies of the Midwest—Illinois and Minnesota, in particular. “We had people that fought on both sides of the Civil War apparently and were a family of farmers,” said Scott Haldeman, Musk’s uncle and the unofficial family historian.

Throughout his childhood, boys teased Musk because of his unusual name. He earned the first part of it from his great-grandfather John Elon Haldeman, who was born in 1872^{[1](#)} and grew up in Illinois before heading to

Minnesota. There he would meet his wife, Almeda Jane Norman, who was five years younger. By 1902, the couple had settled down in a log cabin in the central Minnesota town of Pequot and given birth to their son Joshua Norman Haldeman, Musk’s grandfather. He would grow up to become an eccentric and exceptional man and a model for Musk. ^{[fn1](#)}

Joshua Norman Haldeman is described as an athletic, self-reliant boy. In

1907, his family moved to the prairies of Saskatchewan, and his father died shortly thereafter when Joshua was just seven, leaving the boy to help run the house. He took to the wide-open land and picked up bronco horseback riding, boxing, and wrestling. Haldeman would break in horses for local farmers, often hurting himself in the process, and he organized one of Canada's first rodeos. Family pictures show Joshua dressed in a decorative pair of chaps demonstrating his rope-spinning skills. As a teenager, Haldeman left home to get a degree from the Palmer School of Chiropractic in Iowa and then returned to Saskatchewan to become a farmer.

When the depression hit in the 1930s, Haldeman fell into a financial crisis. He could not afford to keep up with bank loans on his equipment and had five thousand acres of land seized. "From then on, Dad didn't believe in banks or holding on to money," said Scott Haldeman, who would go on to receive his chiropractic degree from the same school as his father and become one of the world's top spinal pain experts. After losing the farm around 1934, Haldeman lived something of a nomadic existence that his grandson would replicate in Canada decades later. Standing six feet, three inches, he did odd jobs as a construction worker and rodeo performer before settling down as a chiropractor [fn2](#)

By 1948, Haldeman had married a Canadian dance studio instructor,

Winnifred Josephine Fletcher, or Wyn, and built a booming chiropractic practice. That year, the family, which already included a son and a daughter, welcomed twin daughters Kaye and Maye, Musk's mother. The children lived in a three-story, twenty-room house that included a dance studio to let Wyn keep teaching students. Ever in search of something new to do, Haldeman had picked up flying and bought his own plane. The family gained some measure of notoriety as people heard about Haldeman and his wife packing their kids into the back of the single-engine craft and heading off on excursions all around North America. Haldeman would often show up at political and chiropractic meetings in the plane and later wrote a book with his wife called *The Flying Haldemans: Pity the Poor Private Pilot*. Haldeman seemed to have everything going for him when, in 1950, he decided to give it all away. The doctor-cum-politician had long railed against government interference in the lives of individuals and had come to see the Canadian bureaucracy as too meddlesome. A man who forbade swearing, smoking, Coca-Cola, and refined flour at his house, Haldeman contended that the moral character of Canada had started to decline. Haldeman also possessed an enduring lust for adventure. And so, over the course of a few months, the family sold their house and dance and chiropractic practices and decided to move to South Africa—a place

Haldeman had never been. Scott Haldeman remembers helping his father disassemble the family's Bellanca Cruisair (1948) airplane and put it into crates before shipping it to Africa. Once in South Africa, the family rebuilt the plane and used it to scour the country for a nice place to live, ultimately settling on Pretoria, where Haldeman set up a new chiropractic practice.

The family's spirit for adventure seemed to know no bounds. In 1952, Joshua and Wyn made a 22,000-mile round-trip journey in their plane, flying up through Africa to Scotland and Norway. Wyn served as the navigator and, though not a licensed pilot, would sometimes take over the flying duties. The couple topped this effort in 1954, flying 30,000 miles to Australia and back. Newspapers reported on the couple's trip, and they're believed to be the only private pilots to get from Africa to Australia in a single-engine plane. [fn3](#)

When not up in the air, the Haldemans were out in the bush going on great, monthlong expeditions to find the Lost City of the Kalahari Desert, a supposed abandoned city in southern Africa. A family photo from one of these excursions shows the five children in the middle of the African bush. They have gathered around a large metal pot being warmed by the embers of a campfire. The children look relaxed as they sit in folding chairs, legs crossed and reading books. Behind them is the ruby-red Bellanca plane, a

tent, and a car. The tranquility of the scene belies how dangerous these trips were. During one incident, the family's truck hit a tree stump and forced the bumper through the radiator. Stuck in the middle of nowhere with no means of communication, Joshua worked for three days to fix the truck, while the family hunted for food. At other times, hyenas and leopards would circle the campfire at night, and, one morning, the family woke to find a lion three feet away from their main table. Joshua grabbed the first object he could find—a lamp—waved it, and told the lion to go away. [And it did.^{fn4}](#)

The Haldemans had a laissez-faire approach to raising their children, which would extend over the generations to Musk. Their kids were never punished, as Joshua believed they would intuit their way to proper behavior. When mom and dad went off on their tremendous flights, the kids were left at home. Scott Haldeman can't remember his father setting foot at his school a single time even though his son was captain of the rugby team and a prefect. "To him, that was all just anticipated," said Scott Haldeman. "We were left with the impression that we were capable of anything. You just have to make a decision and do it. In that sense, my father would be very proud of Elon."

Haldeman died in 1974 at the age of seventy-two. He'd been doing practice landings in his plane and didn't see a wire attached to a pair of

poles. The wire caught the plane's wheels and flipped the craft, and Haldeman broke his neck. Elon was a toddler at the time. But throughout his childhood, Elon heard many stories about his grandfather's exploits and sat through countless slide shows that documented his travels and trips through the bush. "My grandmother told these tales of how they almost died several times along their journeys," Musk said. "They were flying in a plane with literally no instruments—not even a radio, and they had road maps instead of aerial maps, and some of those weren't even correct. My grandfather had this desire for adventure, exploration doing crazy things." Elon buys into the idea that his unusual tolerance for risk may well have been inherited directly from his grandfather. Many years after the last slide show, Elon tried to find and purchase the red Bellanca plane but could not locate it.

Maye Musk, Elon's mother, grew up idolizing her parents. In her youth, she was considered a nerd. She liked math and science and did well at the coursework. By the age of fifteen, however, people had taken notice of some of her other attributes. Maye was gorgeous. Tall with ash-blond hair, Maye had the high cheekbones and angular features that would make her stand out anywhere. A friend of the family ran a modeling school, and Maye took some courses. On the weekends, she did runway shows,

magazine shoots, occasionally showed up at a senator's or ambassador's home for an event, and ended up as a finalist for Miss South Africa. (Maye has continued to model into her sixties, appearing on the covers of magazines like *New York* and *Elle* and in Beyoncé's music videos.)

Maye and Elon's father, Errol Musk, grew up in the same neighborhood. They met for the first time when Maye, born in 1948, was about eleven. Errol was the cool kid to Maye's nerd but had a crush on her for years. "He fell in love with me because of my legs and my teeth," said Maye. The two would date on and off throughout their time at university. And, according to Maye, Errol spent about seven years as a relentless suitor seeking her hand in marriage and eventually breaking her will. "He just never stopped proposing," she said.

Their marriage was complicated from the start. Maye became pregnant during the couple's honeymoon and gave birth to Elon on June 28, 1971, nine months and two days after her wedding day. While they may not have enjoyed marital bliss, the couple carved out a decent life for themselves in Pretoria. Errol worked as a mechanical and electrical engineer and handled large projects such as office buildings, retail complexes, residential subdivisions, and an air force base, while Maye set up a practice as a dietitian. A bit more than a year after Elon's birth came his brother Kimbal,

and soon thereafter came their sister Tosca.

Elon exhibited all the traits of a curious, energetic tot. He picked things up easily, and Maye, like many mothers do, pegged her son as brilliant and precocious. “He seemed to understand things quicker than the other kids,” she said. The perplexing thing was that Elon seemed to drift off into a trance at times. People spoke to him, but nothing got through when he had a certain, distant look in his eyes. This happened so often that Elon’s parents and doctors thought he might be deaf. “Sometimes, he just didn’t hear you,” said Maye. Doctors ran a series of tests on Elon, and elected to remove his adenoid glands, which can improve hearing in children. “Well, it didn’t change,” said Maye. Elon’s condition had far more to do with the wiring of his mind than how his auditory system functioned. “He goes into his brain, and then you just see he is in another world,” Maye said. “He still does that. Now I just leave him be because I know he is designing a new rocket or something.”

Other children did not respond well to these dreamlike states. You could do jumping jacks right beside Musk or yell at him, and he would not even notice. He kept right on thinking, and those around him judged that he was either rude or really weird. “I do think Elon was always a little different but in a nerdy way,” Maye said. “It didn’t endear him to his peers.”

For Musk, these pensive moments were wonderful. At five and six, he had found a way to block out the world and dedicate all of his concentration to a single task. Part of this ability stemmed from the very visual way in which Musk's mind worked. He could see images in his mind's eye with a clarity and detail that we might associate today with an engineering drawing produced by computer software. "It seems as though the part of the brain that's usually reserved for visual processing—the part that is used to process images coming in from my eyes—gets taken over by internal thought processes," Musk said. "I can't do this as much now because there are so many things demanding my attention but, as a kid, it happened a lot. That large part of your brain that's used to handle incoming images gets used for internal thinking." Computers split their hardest jobs between two types of chips. There are graphics chips that deal with processing the images produced by a television show stream or video game and computational chips that handle general purpose tasks and mathematical operations. Over time, Musk has ended up thinking that his brain has the equivalent of a graphics chip. It allows him to see things out in the world, replicate them in his mind, and imagine how they might change or behave when interacting with other objects. "For images and numbers, I can process their interrelationships and algorithmic relationships," Musk said.

“Acceleration, momentum, kinetic energy—how those sorts of things will be affected by objects comes through very vividly.”

The most striking part of Elon’s character as a young boy was his compulsion to read. From a very young age, he seemed to have a book in his hands at all times. “It was not unusual for him to read ten hours a day,” said Kimbal. “If it was the weekend, he could go through two books in a day.” The family went on numerous shopping excursions in which they realized mid-trip that Elon had gone missing. Maye or Kimbal would pop into the nearest bookstore and find Elon somewhere near the back sitting on the floor and reading in one of his trancelike states.

As Elon got older, he would take himself to the bookstore when school ended at 2 P.M. and stay there until about 6 P.M., when his parents returned home from work. He plowed through fiction books and then comics and then nonfiction titles. “Sometimes they kicked me out of the store, but usually not,” Elon said. He listed *The Lord of the Rings*, Isaac Asimov’s Foundation series, and Robert Heinlein’s *The Moon Is a Harsh Mistress* as some of his favorites, alongside *The Hitchhiker’s Guide to the Galaxy*. “At one point, I ran out of books to read at the school library and the neighborhood library,” Musk said. “This is maybe the third or fourth grade. I tried to convince the librarian to order books for me. So then, I started to read the *Encyclopaedia*

Britannica. That was so helpful. You don't know what you don't know. You realize there are all these things out there.”

Elon, in fact, churned through two sets of encyclopedias—a feat that did little to help him make friends. The boy had a photographic memory, and the encyclopedias turned him into a fact factory. He came off as a classic know-it-all. At the dinner table, Tosca would wonder aloud about the distance from Earth to the Moon. Elon would spit out the exact measurement at perigee and apogee. “If we had a question, Tosca would always say, ‘Just ask genius boy,’” Maye said. “We could ask him about anything. He just remembered it.” Elon cemented his bookworm reputation through his clumsy ways. “He’s not very sporty,” said Maye.

Maye tells the story of Elon playing outside one night with his siblings and cousins. When one of them complained of being frightened by the dark, Elon pointed out that “dark is merely the absence of light,” which did little to reassure the scared child. As a youngster, Elon’s constant yearning to correct people and his abrasive manner put off other kids and added to his feelings of isolation. Elon genuinely thought that people would be happy to hear about the flaws in their thinking. “Kids don’t like answers like that,” said Maye. “They would say, ‘Elon, we are not playing with you anymore.’” I felt very sad as a mother because I think he wanted friends. Kimbal and

Tosca would bring home friends, and Elon wouldn't, and he would want to play with them. But he was awkward, you know." Maye urged Kimbal and Tosca to include Elon. They responded as kids will. "But Mom, he's not fun." As he got older, however, Elon would have strong, affectionate attachments to his siblings and cousins—his mother's sister's sons. Though he kept to himself at school, Elon had an outgoing nature with members of his family and eventually took on the role of elder and chief instigator among them.

For a while, life inside the Musk household was quite good. The family owned one of the biggest houses in Pretoria thanks to the success of Errol's engineering business. There's a portrait of the three Musk children taken when Elon was about eight years old that shows three blond, fit children sitting next to each other on a brick porch with Pretoria's famous purple jacaranda trees in the background. Elon has large, rounded cheeks and a broad smile.

Then, not long after the photo was taken, the family fell apart. His parents separated and divorced within the year. Maye moved with the kids to the family's holiday home in Durban, on South Africa's eastern coast. After a couple of years of this arrangement, Elon decided he wanted to live with his father. "My father seemed sort of sad and lonely, and my mom had