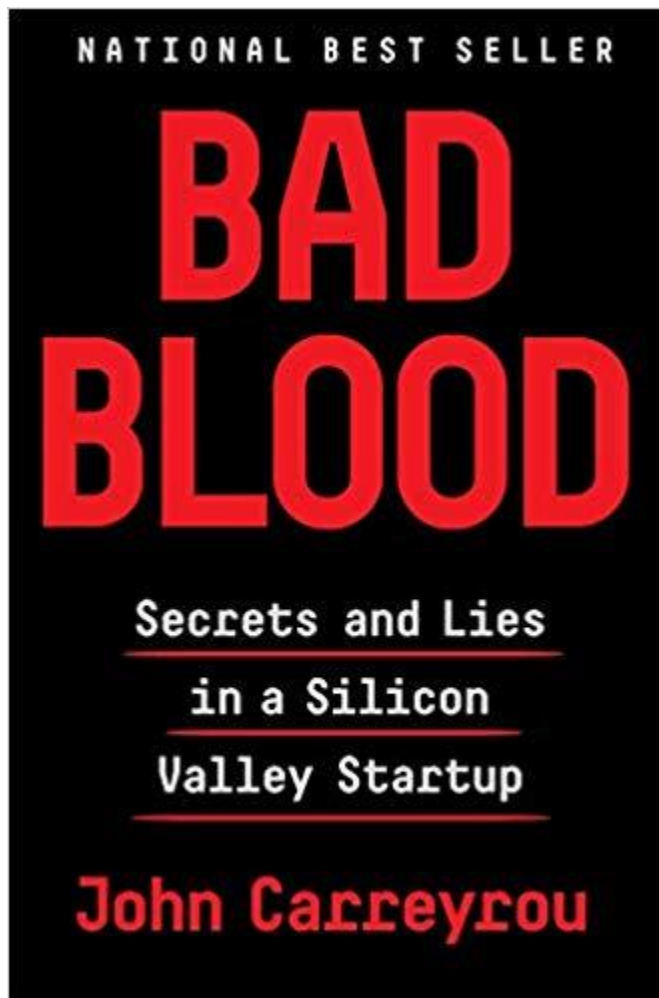


Notes from BAD BLOOD by



Hyping your product to get funding while concealing your true progress and hoping that reality will eventually catch up to the hype continues to be tolerated in the tech industry. But it is crucial to bear in mind that Theranos wasn't a tech company in the traditional sense. It was first and foremost a health-care company. Its product wasn't software but a medical device that analyzed people's blood. As Holmes herself liked to point out in medial interviews doctors base 70 percent of their treatment decisions on lab results. They rely on lab equipment to work as advertised. Otherwise, patient health is jeopardized.

How was Holmes able to rationalize gambling with people's lives? Perhaps she was a sociopath? A sociopath is often described as someone with little or no conscience.

Page 397: *Bad Blood: Secrets and Lies in a Silicon Valley Startup* by John Carreyrou). A scathing critique of Theranos appeared on Glassdoor, the website where current and former employees reviewed companies anonymously. Titled “A pile of PR lies,” it read in part:

Super high turnover rate means you are never bored at work. Also, good if you are an introvert because each shift is short-staffed.

Why be bothered with lab coats and safety goggles? You don’t need to use PPE at all. Who cares if you catch something like HIV or Syphilis? This company sure doesn’t!

Brown nosing, or having a brown nose, will get you far.

How to make money at Theranous:

- Lie to venture capitalists
- Lie to doctors, patients, FDA, CDC, government. While also committing highly unethical immoral (and possibly illegal) acts.

Negative Glassdoor review about the company weren’t unusual. CEO, Balwani, made sure they were balanced out by a steady flow of fake positive reviews he ordered members of the HR department to write.

Page 405: Theranos was by far the single biggest investment Murdoch had ever made outside of the media assets he controlled, which included the 20th Century Fox movie studio, the Fox broadcast network, and Fox News. He was won over by Holmes’s charisma and vision but also by the financial projections she gave him. The investment packet she sent forecast \$330 million in profits on revenues of \$1 billion in 2015 and \$505 million in profits on revenues of \$2 billion in 2016. Those numbers made what was now \$10 billion valuation seem cheap.

Murdoch also derived comfort from some of the other reputable investors he heard Theranos had lined up. The included Cox Enterprises, the Atlanta-based, family-owned conglomerate whose chairman, Jim Kennedy, he was friendly with, and the Waltons of Walmart fame.

The Wall Street Journal’s front page on Oct. 15th, 2015, *A “Prized Startup’s Struggles,”* reported a devastating article that revealed the façade of Theranos. The article revealed that Theranos ran all but a small fraction of its tests on conventional machines and laying bare its proficiency-testing shenanigans and its dilution of finger-stick samples, it raised serious questions about the accuracy of its own devices. It ended with a quote from Maureen Glunz saying that “trial and error on people” was “not OK,” bringing home what I felt was the most important point: the medical danger to which the company had exposed patients. The story sparked a firestorm. (Page 411 *Bad Blood*)

Journalists began asking to ask the obvious questions. Why had Elizabeth Holmes always been so secretive about her technology? Why had she never recruited a board member with even basic knowledge of blood science? And why hadn't a single venture capital firm with expertise in health care put money into the company? For these observers, the story confirmed what they'd quietly suspected.

Theranos immediately reacted as expected by accusing the Wall Street Journal of not having facts.

Case Study on an Ineffectual and Incompetent Board of Directors

Theranos' board: Plenty of political connections, little relevant expertise



Henry Kissinger sits on Theranos' board Photograph by Steve Mack — Getty Images

By **JENNIFER REINGOLD**

October 15, 2015 <http://fortune.com/2015/10/15/theranos-board-leadership/>

“With three former cabinet secretaries, two former senators, and retired military brass, it’s a board like no other.”

So begins *Fortune* Editor-at-Large Roger Parloff’s 2014 piece on the board of directors at Theranos, the blood-testing company that was the subject of a deeply reported story in *The Wall Street Journal* this morning questioning the reliability of its drug tests. Theranos disputes the story, calling it “factually and scientifically erroneous and grounded in baseless assertions by inexperienced and disgruntled former employees and industry incumbents.”

Without taking a position one way or the other, **I think it’s worth noting that this “board like no other” was assembled for its regulatory and governmental connections, not for its understanding of the company or its technology.** That raises significant governance issues at a moment like this one, issues that may bedevil the company in the days and months to come.

Let’s take a look at Theranos’ 12-person board (which is an 11-man team if you don’t include CEO and Chairwoman Elizabeth Holmes—interesting given her stated commitment to women in STEM). We have former Secretary of State Henry Kissinger, former Secretary of Defense Bill Perry, former Secretary of State George Shultz, former Senators Sam Nunn and Bill Frist (who, it should be noted, is a surgeon), former Navy Admiral Gary Roughead, former Marine Corps General James Mattis, and former CEOs Dick Kovacevich of Wells Fargo and Riley Bechtel of Bechtel. There is also one former epidemiologist—William Foege, and, in addition to Holmes, one current executive, Sunny Balwani, who is Theranos’ president and CEO.

It’s quite an impressive group, isn’t it? But here’s what it’s not: an appropriate board of directors for a company that is valued at \$9 billion. There are no sitting chief executives at other companies—a basic tenet of board best practices. There is but one still-licensed medical expert, Bill Frist (Foege, age 79, is retired). And while it’s probably useful to

have a retired government official or two to teach and offer good leadership skills, when there are six with no medical or technology experience—with an average age, get this, of 80—one wonders just how plugged in they are to Theranos’ day-to-day activities. Nor is there anyone with formal accounting or auditing expertise or legal expertise, which may now become an issue, based on the questions raised in the Journal’s article. Says a spokesperson for Theranos: “Theranos’ Board of Directors includes not only Ms. Holmes and Mr. Balwani but also, among others, an epidemiologist and the former director of the U.S. Center for Disease Control and Prevention (CDC), a nationally recognized physician, a renowned engineer, and experienced leaders in business and public policy. Theranos also benefits from the insights of a medical advisory board and several health care leaders who advise on issues such as infectious disease.”

Governance is about what happens when things go wrong as much as keeping things going right. Watch carefully in the coming days to find out whether this board shows leadership in a very difficult moment for Therano

<https://www.wired.com/2016/05/everything-need-know-theranos-saga-far/>

Elizabeth Holmes dropped out of Stanford and founded Theranos in 2003. The company imploded in 2015 after it was revealed that it had misrepresented its blood-testing technology. The SEC charged Holmes with fraud, stripped her of her controlling stake in the company, fined her \$500,000, and barred her from being an officer or director of a public company for 10 years.

GILBERT CARRASQUILLO/GETTY IMAGES

- [BACKCHANNEL](#)
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A New Look Inside Theranos’ Dysfunctional Corporate Culture

When a chemist raised concerns about the blood testing machines' high error rates, she was ignored. So she resigned.

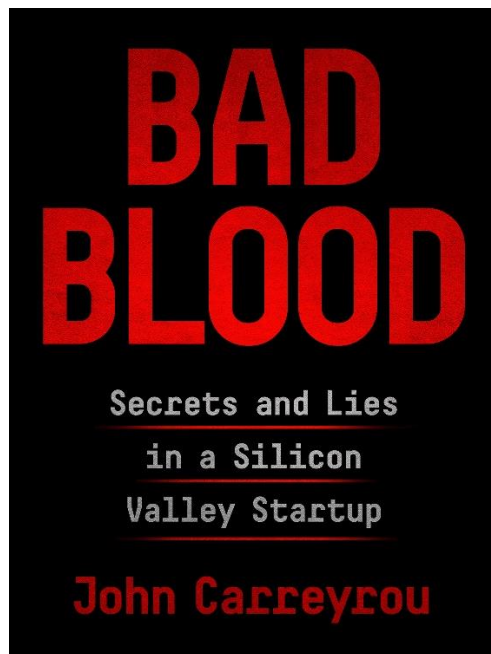
AUTHOR: JOHN CARREYROUBY [JOHN CARREYROU](#)

Alan Beam was sitting in his office reviewing lab reports when Theranos CEO and founder Elizabeth Holmes poked her head in and asked him to follow her. She wanted to show him something. They stepped outside the lab into an area of open office space where other employees had gathered. At her signal, a technician pricked a volunteer's finger, then applied a transparent plastic implement shaped like a miniature rocket to the blood oozing from it. This was the Theranos sample collection device. Its tip collected the blood and transferred it to two little engines at the rocket's base. The engines weren't really engines: They were nanotainers. To complete the transfer, you pushed the nanotainers into the belly of the plastic rocket like a plunger. The movement created a vacuum that sucked the blood into them.

Or at least that was the idea. But in this instance, things didn't go quite as planned. When the technician pushed the tiny twin tubes into the device, there was a loud *pop* and blood splattered everywhere. One of the nanotainers had just exploded.

Holmes looked unfazed. "OK, let's try that again," she said calmly.

Beam¹ wasn't sure what to make of the scene. He'd only been working at Theranos, the Silicon Valley company that promised to offer fast, cheap blood tests from a single drop of blood, for a few weeks and was still trying to get his bearings.



Excerpted from *Bad Blood: Secrets and Lies in a Silicon Valley Startup*, by John Carreyrou

KNOPF

He knew the nanotainer was part of the company's proprietary blood-testing system, but he'd never seen one in action before. He hoped this was just a small mishap that didn't portend bigger problems.

The lanky pathologist's circuitous route to Silicon Valley had started in South Africa, where he grew up. After majoring in English at the University of the Witwatersrand in Johannesburg ("Wits" to South Africans), he'd moved to the United States to take premed classes at Columbia University in New York City. The choice was guided by his conservative Jewish parents, who considered only a few professions acceptable for their son: law, business, and medicine.

Beam had stayed in New York for medical school, enrolling at the Mount Sinai School of Medicine on Manhattan's Upper East Side, but he quickly realized that some aspects of being a doctor didn't suit his temperament. Put off by the crazy hours and the sights and smells of the hospital ward, he gravitated toward the more sedate specialty of laboratory science, which led to postdoctoral studies in virology and a residency in clinical pathology at Brigham and Women's Hospital in Boston.

In the summer of 2012, Beam was running the lab of a children's hospital in Pittsburgh when he noticed a job posting on LinkedIn that dovetailed perfectly with his budding fascination with Silicon Valley: laboratory director at a Palo Alto biotech firm. He had just finished reading Walter Isaacson's biography of Steve Jobs. The book, which he'd found hugely inspiring, had cemented his desire to move out to the San Francisco Bay Area.

about the author

John Carreyrou is a two-time Pulitzer Prize-winning investigative reporter at *The Wall Street Journal*. For his extensive coverage of Theranos, Carreyrou was awarded the George Polk Award for Financial Reporting, the Gerald Loeb Award for Distinguished Business and Financial Journalism in the category of beat reporting, and the Barlett & Steele Silver Award for Investigative Business Journalism.

After he applied for the job, Beam was asked to fly out for an interview scheduled for 6 pm on a Friday. The timing seemed odd but he was happy to oblige. He met with COO Sunny Balwani first and then with Holmes. There was something about Balwani that he found vaguely creepy, but that impression was more than offset by Holmes, who came off as very earnest in her determination to transform health care. Like many people who met her for the first time, Beam was taken aback by her deep voice. It was unlike anything he'd heard before.

At the time, Theranos was on the cusp of becoming a tech darling. Founded by the charismatic Stanford dropout in 2003, its promises to revolutionize blood-testing—and by extension, the vast industry of medical diagnostics—would be swallowed whole by most of the technology press, which would lavish Holmes with glowing coverage. (WIRED was [not exempt](#)). Only later—in October 2015—would the truth come out: Theranos was a fraud built on secrecy, deliberate fabrication, and hype. After I [revealed that fraud](#), the company would begin an implosion that continues to this day.

Beam had no way of knowing any of this when he accepted Theranos' job offer in August 2012. The lab he inherited was divided into two parts: a room on the building's second floor that was filled with commercial diagnostic equipment, and a second room beneath it where research was being conducted. The upstairs room was the federally certified part of the lab, the one Beam was responsible for. Balwani and Holmes viewed its conventional machines as dinosaurs that would soon be rendered extinct by Theranos's revolutionary technology, so they called it "Jurassic Park." They called the downstairs room "Normandy" in reference to the D-day landings during World War II. The proprietary Theranos devices it contained would take the lab industry by storm, like the Allied troops who braved hails of machine-gun fire on Normandy's beaches to liberate Europe from Nazi occupation.

In his eagerness and excitement, Beam initially bought into the bravado. But a conversation he had with Paul Patel shortly after the botched nanotainer demonstration raised questions in his mind about how far along the Theranos technology really was. Patel was the biochemist who led the development of blood tests for Theranos's new device, which Beam knew only by its code name—"4S." Patel let slip that his team was still developing its assays on lab plates on the bench. That surprised Beam, who had assumed the assays were already integrated into the 4S. When he asked why that wasn't the case, Patel replied that the new Theranos box wasn't working.

By the summer of 2013, as Chiat\Day scrambled to ready the Theranos website for the company's commercial launch, the 4S, aka the miniLab, had been under development for more than two and a half years. But the device remained very much a work in progress. The list of its problems was lengthy.

The biggest problem of all was the dysfunctional corporate culture in which it was being developed. Holmes and Balwani regarded anyone who raised a concern or an objection as a cynic and a nay-sayer. Employees who persisted in doing so were usually marginalized or fired, while sycophants were promoted.

Employees were Balwani's minions. He expected them to be at his disposal at all hours of the day or night and on weekends. He checked the security logs every morning to see when they badged in and out. Every evening, around 7:30, he made a flyby of the engineering department to make sure people were still at their desks working.

With time, some employees grew less afraid of him and devised ways to manage him, as it dawned on them that they were dealing with an erratic man-child of limited intellect and an even more limited attention span. Arnav Khannah¹, a young mechanical engineer who worked on the miniLab, figured out a surefire way to get Balwani off his back: answer his emails with a reply longer than 500 words. That usually bought him several weeks of peace because Balwani simply didn't have the patience to read long emails. Another strategy was to convene a biweekly meeting of his team and invite Balwani to attend. He might come to the first few, but he would eventually lose interest or forget to show up.

While Holmes was fast to catch on to engineering concepts, Balwani was often out of his depth during engineering discussions. To hide it, he had a habit of repeating technical terms he heard

others using. During a meeting with Khannah's team, he latched onto the term "end effector," which signifies the claws at the end of a robotic arm. Except Balwani didn't hear "end effector," he heard "endofactor." For the rest of the meeting, he kept referring to the fictional endofactors. At their next meeting with Balwani two weeks later, Khannah's team brought a PowerPoint presentation titled "Endofactors Update." As Khannah flashed it on a screen with a projector, the five members of his team stole furtive glances at one another, nervous that Balwani might become wise to the prank. But he didn't bat an eye and the meeting proceeded without incident. After he left the room, they burst out laughing.

Khannah and his team also got Balwani to use the obscure engineering term "crazing." It normally refers to a phenomenon that produces fine cracks on the surface of a material, but Khannah and his colleagues used it liberally and out of context to see if they could get Balwani to repeat it, which he did. Balwani's knowledge of chemistry was no better. He thought the chemical symbol for potassium was P (it's K; P is the symbol for phosphorus)—a mistake most high school chemistry students wouldn't make.

Not all the setbacks encountered during the miniLab's development could be laid at Balwani's feet, however. Some were a consequence of Holmes's unreasonable demands. For instance, she insisted that the miniLab cartridges remain a certain size but kept wanting to add more assays to them. Khannah didn't see why the cartridges couldn't grow by half an inch since consumers wouldn't see them. Holmes had abandoned her plan of putting the Theranos devices in Walgreens stores and operating them remotely, to avoid problems with the FDA. Instead, blood pricked from patients' fingers would be couriered to Theranos's Palo Alto lab and tested there. But she remained stuck on the notion that the miniLab was a consumer device, like an iPhone or an iPad, and that its components needed to look small and pretty. She still nurtured the ambition of putting it in people's homes someday, as she had promised early investors.

Another difficulty stemmed from Holmes's insistence that the miniLab be capable of performing the four major classes of blood tests: immunoassays, general chemistry assays, hematology assays, and assays that relied on the amplification of DNA. The only known approach that would permit combining all of them in one desktop machine was to use robots wielding pipettes. But this approach had an inherent flaw: Over time, a pipette's accuracy drifts. When the pipette is brand new, aspirating 5 microliters of blood might require the little motor that activates the pipette's pump to rotate by a certain amount. But three months later, that exact same rotation of the motor might yield only 4.4 microliters of blood—a large enough difference to throw off the entire assay. While pipette drift was something that ailed all blood analyzers that relied on pipetting systems, the phenomenon was particularly pronounced on the miniLab. Its pipettes had to be recalibrated every two to three months, and the recalibration process put the device out of commission for five days.

Kyle Logan¹, a young chemical engineer who'd joined Theranos right out of Stanford, had frequent debates with Sam Anekal about this issue. He thought the company should migrate to a more reliable system that didn't involve pipettes, such as the one Abaxis used in its Piccolo Xpress analyzer. Anekal would reply that the Piccolo could perform only one class of blood test, general chemistry assays. (Unlike immunoassays, which measure a substance in the blood by using antibodies that bind to the substance, general chemistry assays rely on other chemical

principles such as light absorbance or electrical signal changes.) Holmes wanted a machine that was more versatile, he'd remind Logan.

Compared to big commercial blood analyzers, another one of the miniLab's glaring weaknesses was that it could process only one blood sample at a time. Commercial machines were bulky for a reason: They were designed to process hundreds of samples simultaneously. In industry jargon, this was known as having a "high throughput." If the Theranos wellness centers attracted a lot of patients, the miniLab's low throughput would result in long wait times and make a joke of the company's promise of fast test results.

In an attempt to remedy this problem, someone had come up with the idea of stacking six miniLabs one on top of the other and having them share one cytometer to reduce the size and cost of the resulting contraption. This Frankenstein machine was called the "six-blade," a term borrowed from the computer industry, where stacking servers on top of one another is common to save space and energy. In these modular stacking configurations, each server is referred to as a "blade."

But no one had stopped to consider what implications this design would have with respect to one key variable: temperature. Each miniLab blade generated heat, and heat rises. When the six blades were processing samples at the same time, the temperature in the top blades reached a level that interfered with their assays. Logan, who was 22 and just out of college, couldn't believe something that basic had been overlooked.

Aside from its cartridge, pipette, and temperature issues, many of the other technical snafus that plagued the miniLab could be chalked up to the fact that it remained at a very early prototype stage. Less than three years was not a lot of time to design and perfect a complex medical device. These problems ranged from the robots' arms landing in the wrong places, causing pipettes to break, to the spectrophotometers being badly misaligned. At one point, the blood-spinning centrifuge in one of the miniLabs blew up. These were all things that could be fixed, but it would take time. The company was still several years away from having a viable product that could be used on patients.

However, as Holmes saw it, she didn't have several years. Twelve months earlier, on June 5, 2012, she'd signed a new contract with Walgreens that committed Theranos to launching its blood-testing services in some of the pharmacy chain's stores by February 1, 2013, in exchange for a \$100 million "innovation fee" and an additional \$40 million loan.

Theranos had missed that deadline—another postponement in what from Walgreens's perspective had been three years of delays. Holmes was determined to launch in Walgreens stores by September.

Since the miniLab was in no state to be deployed, Holmes and Balwani decided to launch with an older device called the Edison. That, in turn, led to another fateful decision—the decision to cheat.

In June, Daniel Young, the brainy MIT PhD who headed Theranos's biomath team, came to see Beam in Jurassic Park with a subordinate named Xinwei Gong in tow. In the five years since he'd joined Theranos, Young had risen up the ranks to become the company's de facto number-three executive. He had Holmes and Balwani's ear, and they often deferred to him to solve nettlesome technical problems.

In his first few years at Theranos, Young had seemed every bit the family man, leaving the office at six every evening to have dinner with his wife and kids. This routine had drawn snickers behind his back from some colleagues. But after being promoted to vice president, Young had become a different person. He worked longer hours and stayed at the office later. He got very drunk at company parties, which was jarring because he was always quiet and inscrutable at work.

Young told Beam that he and Gong were going to tinker with the ADVIA 1800, one of the lab's commercial analyzers. The ADVIA was a hulking 1,320-pound machine the size of two large office copiers put together that was made by Siemens Healthcare, the German conglomerate's medical-products subsidiary.

Over the next few weeks, Beam observed Gong spend hours opening the machine up and filming its innards with his iPhone camera. He was hacking into it to try to make it compatible with small finger-stick blood samples, Beam realized. It seemed like confirmation of what Patel had told him: the 4S must not be working, otherwise why resort to such desperate measures? Beam knew the Edison could only perform immunoassays, so it made sense that Young and Gong would choose the ADVIA, which specialized in general chemistry assays.

One of the panels of blood tests most commonly ordered by physicians was known as the "chem 18" panel. Its components, which ranged from tests to measure electrolytes such as sodium, potassium, and chloride to tests used to monitor patients' kidney and liver function, were all general chemistry assays. Launching in Walgreens stores with a menu of blood tests that didn't include these tests would have been pointless. They accounted for about two-thirds of doctors' orders. But the ADVIA was designed to handle a larger quantity of blood than you could obtain by pricking a finger. So Young and Gong thought up a series of steps to adapt the Siemens analyzer to smaller samples. Chief among these was the use of a big robotic liquid handler called the Tecan to dilute the little blood samples collected in the nanotainers with a saline solution. Another was to transfer the diluted blood into custom-designed cups half the size of the ones that normally went into the ADVIA.

The combination of these two steps solved a problem known as "dead volume." Like many commercial analyzers, the ADVIA featured a probe that dropped down into the blood sample and aspirated it. Although it aspirated most of the sample, there was always some unused liquid left at the bottom. Reducing the sample cup's size brought its bottom closer to the probe's tip and diluting the blood created more liquid to work with.

Beam had reservations about the dilution part. The Siemens analyzer already diluted blood samples when it performed its assays. The protocol Young and Gong had come up with meant that the blood would be diluted twice, once before it went into the machine and a second time

inside it. Any lab director worth his salt knew that the more you tampered with a blood sample, the more room you introduced for error.

Moreover, this double dilution lowered the concentration of the analytes in the blood samples to levels that were below the ADVIA's FDA-sanctioned analytic measurement range. In other words, it meant using the machine in a way that neither the manufacturer nor its regulator approved of. To get the final patient result, one had to multiply the diluted result by the same factor the blood had been diluted by, not knowing whether the diluted result was even reliable. Young and Gong were nonetheless proud of what they'd accomplished. At heart, both were engineers for whom patient care was an abstract concept. If their tinkering turned out to have adverse consequences, they weren't the ones who would be held personally responsible.

As September 9, 2013, approached, the date Holmes had set for the launch, Beam grew worried that Theranos wasn't ready. Two of the assays performed on the hacked Siemens analyzers were giving the lab particular trouble: sodium and potassium. Beam suspected the cause of the latter was a phenomenon known as "hemolysis," which occurs when red blood cells burst and release extra potassium into the sample. Hemolysis was a known side effect of finger-stick collection. Milking blood from a finger put stress on red blood cells and could cause them to break apart.

Beam had noticed a piece of paper with a number on it taped to Holmes's office window. It was her launch countdown. The sight of it made him panic. A few days before the launch, he went to see her and asked her to delay. Holmes wasn't her usual confident self. Her voice was tremulous and she was visibly shaking as she tried to reassure him that everything would be OK. If necessary, they could fall back on regular venous draws, she told him. That briefly made Beam feel better, but his anxiety returned as soon as he left her office.

Anjali Laghari¹, a chemist who headed the immunoassay group, was dismayed when she returned from her three-week vacation in India in late August. Her team had been trying for years to develop blood tests on Theranos's older device, the Edison. Much to her frustration, the black-and-white machines' error rate was still high for some tests. Holmes and Balwani had been promising her for a year that all would be well once the company introduced its next-generation device, the 4S. Except that day never seemed to arrive. That was fine as long as Theranos remained a research-and-development operation, which was still the case when Laghari had departed for India three weeks earlier. But now everyone was suddenly talking about "going live" and there were emails in her in-box referring to an imminent commercial launch.

Launch? With what? Laghari wondered with growing alarm.

In her absence, she learned, employees who were not authorized CLIA lab personnel had been let into the lab. She didn't know why, but she did know the lab was under instructions to conceal whatever it was they were doing from Siemens representatives when they came by to service the German manufacturer's machines.

Changes had also been made to the way samples were being processed on the Edisons. Under Balwani's orders, they were now being prediluted with a Tecan liquid handler before being run through the device. This was to make up for the fact that the Edison could run at most three tests

on one finger-stick sample. Prediluting the blood created more volume to run more tests. But if the device already had a high error rate under normal circumstances, an additional dilution step seemed likely only to make things worse.

Laghari also had concerns about the nanotainers. Blood would dry up in the little tubes and she and her colleagues often couldn't extract enough from them. She tried to talk sense into Holmes and Young by emailing them Edison data from Theranos's last study with a pharmaceutical company—Celgene—which dated back to 2010. In that study, Theranos had used the Edison to track inflammatory markers in the blood of patients who had asthma. The data had shown an unacceptably high error rate, causing Celgene to end the companies' collaboration. Nothing had changed since that failed study, Laghari reminded them.

Neither Holmes nor Young acknowledged her email. After eight years at the company, Laghari felt she was at an ethical crossroads. To still be working out the kinks in the product was one thing when you were in R&D mode and testing blood volunteered by employees and their family members, but going live in Walgreens stores meant exposing the general population to what was essentially a big unauthorized research experiment. That was something she couldn't live with. She decided to resign.

Tina Noyes, her deputy in the immunoassay group who had worked at Theranos for more than seven years, also quit.

The resignations infuriated Holmes and Balwani. The following day, they summoned the staff for an all-hands meeting in the cafeteria. Copies of *The Alchemist*, Paulo Coelho's famous novel about an Andalusian shepherd boy who finds his destiny by going on a journey to Egypt, had been placed on every chair. Still visibly angry, Holmes told the gathered employees that she was building a religion. If there were any among them who didn't believe, they should leave. Balwani put it more bluntly: Anyone not prepared to show complete devotion and unmitigated loyalty to the company should "get the fuck out."

It may not be long before all of Theranos' employees are out. In March the Securities and Exchange Commission [charged Holmes and Balwani with fraud](#), stripping Holmes of her controlling stake in the company, fining her \$500,000, and barring her from being an officer or director of a public company for 10 years. After laying off another 100 staffers, Holmes told investors last month that the company faces liquidation and may have to shut down as soon as July. Meanwhile, the U.S. attorney's office in San Francisco is conducting a criminal investigation that could result in indictments of both Holmes and Balwani.

Adapted from: [BAD BLOOD: Secrets and Lies in a Silicon Valley Startup](#) by John Carreyrou. Copyright © 2018 by John Carreyrou. Published by arrangement with Knopf, an imprint of The Knopf Doubleday Publishing Group, a division of Penguin Random House LLC.

¹*These sources requested that I refer to them using pseudonyms, either because they feared retribution from the company, worried that they might be swept up in the Justice Department's ongoing criminal investigation, or wanted to guard their privacy.*

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- VIRGINIA HEFFERNAN IDEAS 07.19.18

ELIZABETH HOLMES' DOWNFALL HAS BEEN EXPLAINED DEEPLY—BY MEN



BRENDAN MCDERMID/REUTERS

MAYBE ELIZABETH HOLMES, whom a grand jury indicted last month for fraud, never should have asked herself, “What would you do if you knew you could not fail?”¹

The eye-roller slogan adorned a plaque on Holmes’ desk at Theranos, her ignoble blood-testing startup. She seems to have gravely misread it. Rather than goading her to courage, the words blinded her to the obvious. In launching a company with a sub-Edsel product as a keystone, she could fail. And of course did.

In May, the journalist John Carreyrou, who made Theranos his white whale for years, published *Bad Blood: Secrets and Lies in a Silicon Valley Startup*, a potboiler about the company; I devoured it. But it didn’t slake my thirst for enlightenment about that epochal evildoer: Holmes herself. Holmes herself.



Virginia Heffernan (@page88) is an Ideas contributor at WIRED and the author of *Magic and Loss: The Internet as Art*. She is also a cohost of *Trumpcast*, an op-ed columnist at the Los Angeles Times, and a frequent contributor to Politico.

Holmes is no one's maidservant or adjunct. She's not Imelda Marcos or Ivanka Trump or Kellyanne Conway. Holmes is the master puppeteer of Theranos. It's clear in *Bad Blood* that it was she—and no one else—who managed to drive the company's value up to \$9 billion without a working product; and she alone who was able to win unholy investments of trust, as well as a whopping \$900 million from superstar investors, including education secretary Betsy DeVos and her family (\$100 million) and good old Rupert Murdoch (\$125 million). Holmes, in the book and now the indictments, comes off like a cheat, a pyramid schemer, an evil scientist, for heaven's sake.

She's also a woman. And we're not used to self-made young female oligarchs lying outrageously, fleecing the hell out of other billionaires and conducting thunderous symphonies of global deception. There's no American template for a powerful woman gone so gravely wrong. Holmes wasn't insane. She wasn't dissembling all those years to care for a sick child, or pursue another altruistic, if desperate, end. It wasn't men, either. Though some have tried, she can't—as the facts are laid out in Carreyrou's book—be explained away as a victim of her deputy, sometime boyfriend and codefendant Ramesh “Sunny” Balwani. She wasn't caving in to patriarchy.

There's no American template for a powerful woman gone so gravely wrong.

So—how to understand Elizabeth Holmes? Is there a feminist framework for reading her that takes into account her gender and singular experience as a beginning chemical engineer and self-

made female billionaire that doesn't absolve her of traditional moral responsibility—or, worse, agency?

Kira Bindrim at Quartz has nominated Holmes as “our first true feminist antihero” and has even risked admiring Holmes for her deep dark arts. “There is something spectacular about watching her ignore, override, or shout down dozens of male voices,” Bindrim writes. “Her chutzpah does command a certain dumbfounded respect.”

Bindrim has a point. But Holmes' chutzpah—if we're to respect it—must be identified. Bad Blood yields almost no sense of how Holmes saw and sees the world. What made her think she could bluff and bluff and bluff on what must be the lowest hand ever played in Silicon Valley—no cards at all?

Whatever the gender of bona fide blackhats, it takes years to unravel their evil deeds as either banal or outstanding. No doubt Holmes' particular malevolence will elude observers for some time to come. To my mind, Bernie Madoff, the Ponzi virtuoso who was arrested in 2008, only came into focus in 2011, when Steve Fishman conducted a masterpiece jailhouse interview with him. In it, Madoff makes a clean breast of his crimes, but he also describes feeling, as he ran his fraud, ill-used by his clients. He sees himself as the victim of their tyrannical greed. They treated him like a slave, he complains. The clients, Fishman writes, “became giants of philanthropy, happy to take public bows, while, in his view, it was Bernie from Brooklyn who thanklessly drove the engine.”

Is this how Holmes felt, too, old Holmes from Houston, indentured to her would-be partners—Walmart, Walgreens, the US military—and her intimidating investors? Maybe she became a woman in the Scheherazade mode, dazzling her captor with her intelligence lest she stop and be killed. That female archetype is where Madoff evidently sees himself. But Holmes, if you listen

to her, does not seem to see herself as servile so much as preternaturally suspicious—particularly of anyone who would doubt her.

This is hard to tell from the reporting alone. In *Bad Blood*, Holmes is almost always filtered through a man's apprehension of her. As man after man reports it in the book, her signature misdeed was seduction and betrayal. She's described as "hypnotic," and men repeatedly regard her as an enchantress, a blond cipher who spun a mesmeric tale about a world-historical blood-sucking widget. But in these stories the flip side of Holmes is—brace yourself—a bitch who crushed the men who questioned her.

"She had these older men in her life whom she manipulated," Carreyrou said recently on *This Week in Startups*.

That's fun for a cartoon. And each of the guys in Carreyrou's book has a full spectrum of vices and virtues: greed, honesty, irony, arrogance, etc. But while the men get to be flesh-and-blood moral agents, with full subjectivities and rich imaginative lives, Holmes in their telling falls flat.

That's why I decided to listen to Holmes herself. She didn't talk to Carreyrou for his book, understandably; she has no jailhouse ramblings—yet. But she has been giving talks now for a decade. So I watched them all.

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The idiosyncrasy of Holmes' brain was obvious almost from the second she started talking to audiences. It's in her you-gotta-have-faith success creeds. She's relentless with them, has no shame about even the worst speakers-circuit clichés—a combination of curdled prosperity gospel and you-go-girlism from the aughts. They seem to shape her vision of the world and herself during both her rise and her fall, and they put her—as she rose and rose—increasingly out of touch with truth.

In 2009, at 25, she told a small group at Stanford that the ticket to success was "conviction" that you could "make something work, no matter what."

She went on to say, “The worst possible thing in the world is to have someone who doesn’t believe in you.”

Whoa. “Make something work, no matter what” is uncomfortable in hindsight. But the bleakness of that second thought seemed palpable even at the time.

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And I understood Holmes’ young-woman fears of being doubted. American feminists from Charlotte Perkins Gilman to Rose McGowan cite as devastating to women their representation as unreliable, unfaithful, unworthy of being believed—or believed in.

Fundamental to the modernist construction of gender was Freud’s sweeping and devastating decision that women who said they’d been raped as children had no hold on facts. He declared that these patients were delusional, hysterical, perhaps even expressing fantasies that their analysts would rape them. To “recover” for these female patients—in Freud’s scheme—was to realize first that they were sick in the head, cognitively untrustworthy and chronically lying.

No wonder doubt can seem like part and parcel of violence toward women. #BelieveWomen, as an imperative, predated #MeToo in contemporary feminism. But Holmes’ own resistance to being doubted—her conviction that anyone skeptical of anything she said or did wished her harm—seems at times to tilt into terror. Holmes often heard malice in even simple questions about Theranos—and she, as *Bad Blood* illustrates in story after story, went nearly to Weinstein-like lengths to savage and discredit her doubters.

Holmes therefore prohibited due diligence at Theranos, taking it as a personal affront when investors, employees, and board members asked for evidence of her outsized claims about the

company. Skepticism, of course, is the sine qua non of any scientific—or financial—venture. Fear of doubt meant Holmes fired all doubters, thus guaranteeing the failure of Theranos.

Making empirical statements invites questions, so Holmes found ways to switch on a dime to airy platitudes when interviewers asked her for facts. When Charlie Rose asked her how she started Theranos, she looked at a point on the table to the right of Rose.

“I’ve always believed we’re here on this earth to try to make a difference,” she said.

Sometimes she celebrated the idea of asking questions even as she dodged questions.

In 2015, when rumors had surfaced that something was wrong at Theranos, Norah O’Donnell on CBS This Morning gently pressed Holmes on her technology. What if the pinprick Theranos used didn’t draw enough blood to test thoroughly?

“Every time you create something new, there should be questions,” Holmes said. “To me that’s a sign that you’ve actually done something that is transformative.”

On the very day of Carreyrou’s 2015 scorched-earth exposé of her company, Holmes joined Jim Cramer on CNBC by video. What did she think of Carreyrou’s article?

“First they think you’re crazy, then they fight you, and then all of a sudden you change the world,” she said.

Not a good sign. (Trump used a version of that fake Gandhi quote on Instagram last year.)

Cramer pushed: What about the specifics of Carreyrou’s story? Holmes dismissed all of it as sourced by “the people who said to me there was no way I was going to succeed and be able to build this kind of company.”

In dog-and-pony shows for investors and the media, as Carreyrou’s sources remember, Holmes relentlessly reprised a single argument: If you didn’t invest faith and money in Theranos you didn’t believe in the suffering of hundreds of millions dying for want of quick blood tests, and—worse yet—you didn’t believe in her personal capacity to save them.

That doubt, of course, would crush the Theranos market, which in turn would crush Theranos, which was mostly marketing. Holmes, for her part, seems to have believed, even as storm clouds

gathered, that she needed only to suppress doubt more, and generate more faith that she could not fail.

She trafficked, quite literally, in blood; she promised Theranos would save lives in hospitals, in homes, and on the battlefield.

Maybe that works for vision boards—the kind of magical thinking that some women, in the name of empowerment, have adopted as an antidote to self-doubt. Confidence is one thing. An absolute absence of rigor and self-inquiry is, of course, another.

Like many who sell blind faith, Holmes' pitch turned on gravitas, pathos, and invocations of pain and suffering. She trafficked, quite literally, in blood; she promised Theranos would save lives in hospitals, in homes, and on the battlefield. Bernie Madoff would never have sounded so earnest. P. T. Barnum would never have played his con as morally urgent. But that's why Holmes was—for a time—the billionaire they never were.

Eventually Holmes, like so many of us, got what she feared most: a whole universe of people who don't believe in her. Holmes's extraordinary gift was for tragedy. With Theranos, she pulled it off.

¹ Correction appended: July 19, 2018, 7:20 EDT: Updated to clarify the origin of Holmes' indictment.

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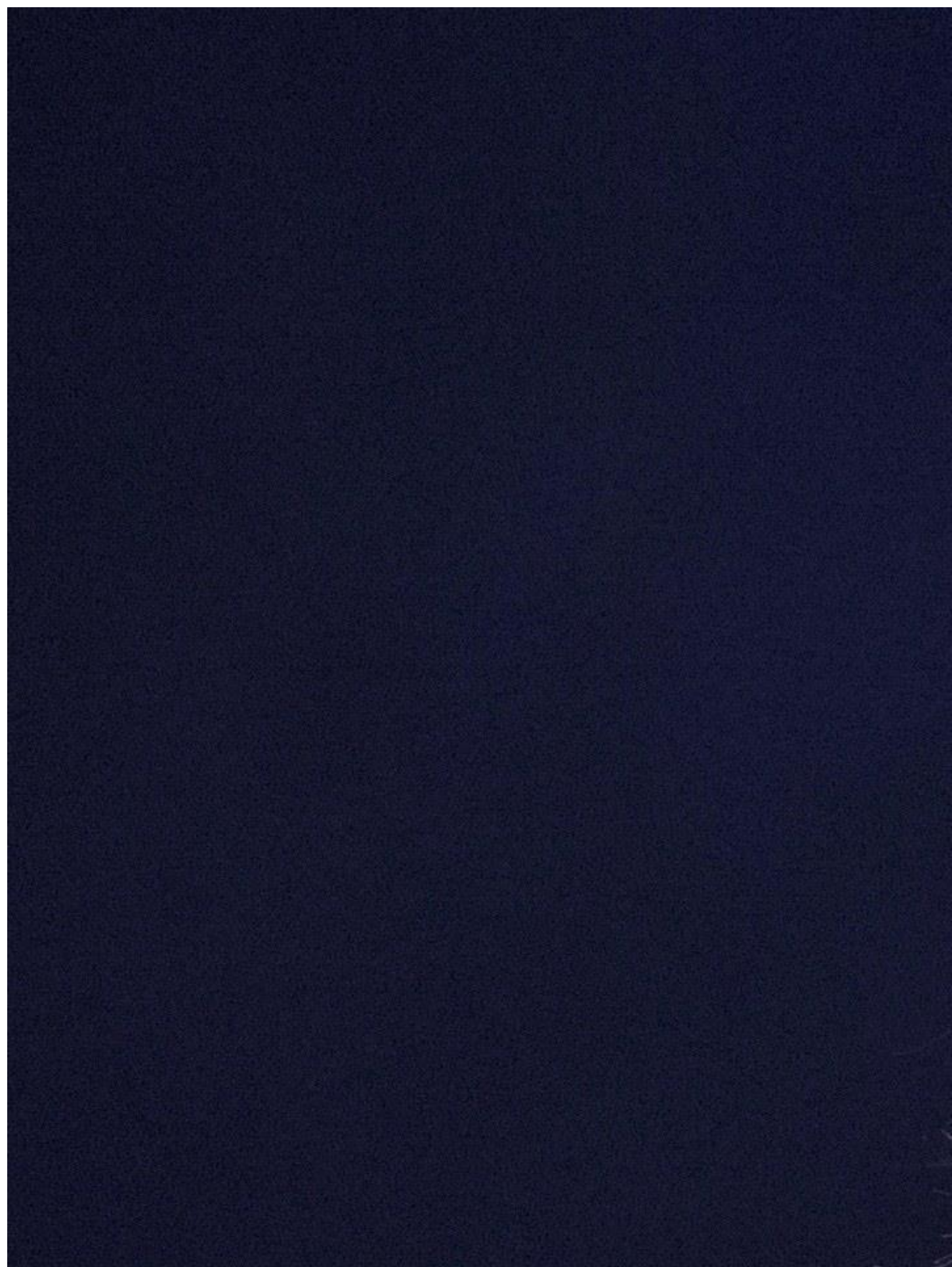
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The Theranos Indictments Expose the Soul of Silicon Valley



Both Elizabeth Holmes and Ramesh “Sunny” Balwani, the company’s former president, reportedly face a maximum of 20 years in prison if convicted, as well as additional fines.

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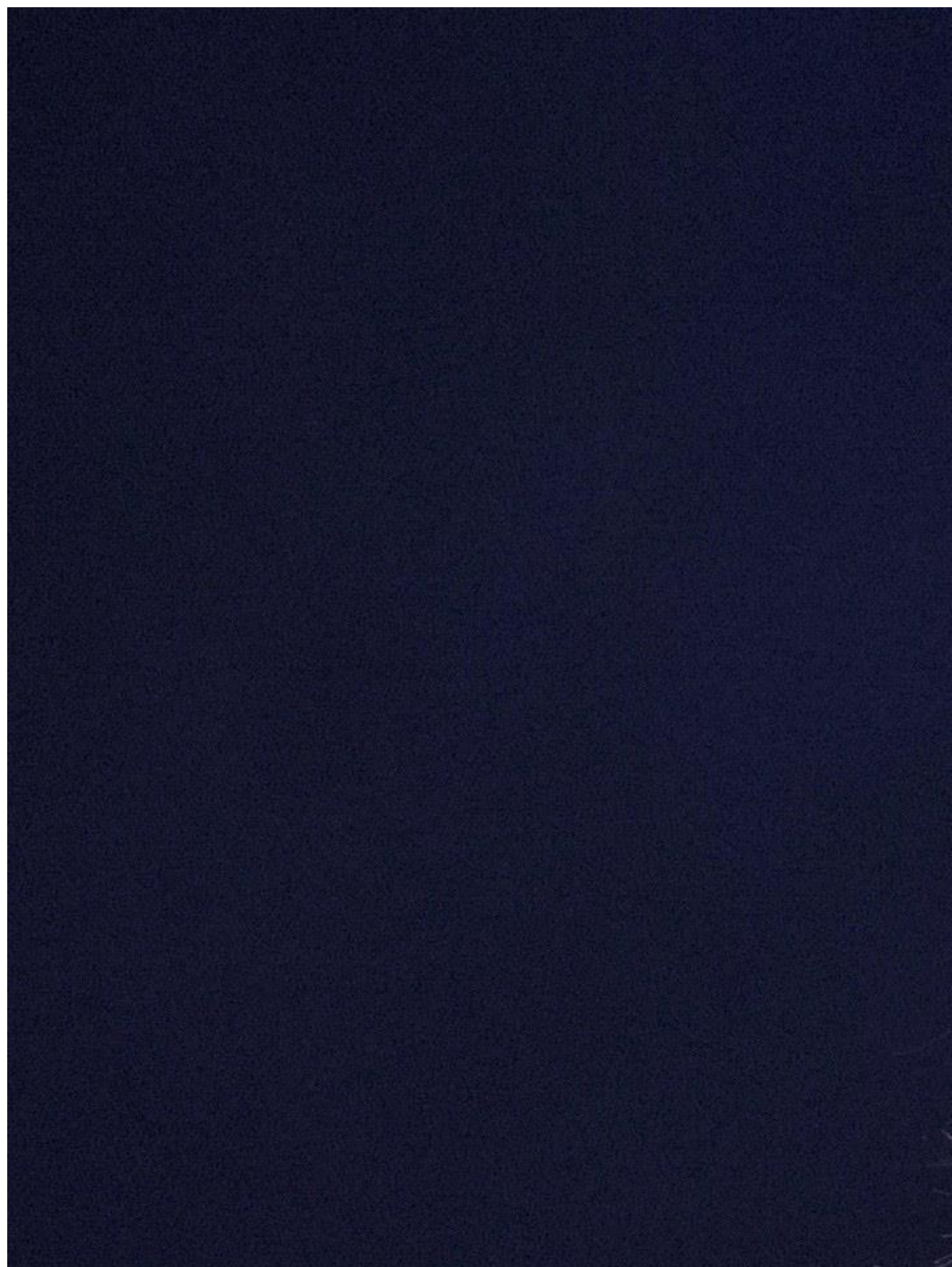
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Brendan McDermid/Reuters

Elizabeth Holmes founded Theranos in 2003 when she was 19 years old. At its height, the company reached a valuation of over \$9 billion on the strength of its claim to have revolutionized the blood-testing industry. Friday, an unraveling that began in October 2015 with a series of Wall Street Journal articles accelerated, as Holmes and her colleague Ramesh “Sunny” Balwani were indicted on multiple counts of fraud. Holmes has also stepped down as CEO.

The indictment, which comprises 11 counts, alleges that Theranos misled investors—one of whom sent Theranos nearly \$100 million in a single wire transfer October 31, 2014—as well as doctors and patients with its promises of a blood test that delivered quick results with a single finger-prick, rather than the more demanding requirements of conventional methods.

“Holmes and Balwani devised a scheme to defraud doctors and patients, through advertisements and marketing materials, through explicit and implicit claims concerning Theranos’s ability to provide accurate, fast, reliable, and cheap blood tests and test results, and through omissions concerning the limits of and problems with Theranos’s technologies,” the indictment reads.

"This office, along with our other law enforcement partners in the Bay Area, will vigorously investigate and prosecute those who do not play by the rules that make Silicon Valley work."

John F. Bennett, FBI

This is not the first legal trouble Theranos has found itself in. The Securities and Exchange Commission filed a civil suit in March, but Holmes and the company quickly settled those charges. Holmes paid a \$500,000 fine, returned 18.9 million Theranos shares, and was barred from serving as an officer or director of a public company for the next decade.

These latest charges may not be so easily brushed aside. Both Holmes and Balwani, the company’s former president, reportedly face a maximum of 20 years in prison if convicted, as well as additional fines. The Department of Justice has also framed the case as a fight for the heart and soul of Silicon Valley.

“This district, led by Silicon Valley, is at the center of modern technological innovation and entrepreneurial spirit; capital investment makes that possible,” said FBI agent John F. Bennett, who led the investigation. “This office, along with our other law enforcement partners in the Bay Area, will vigorously investigate and prosecute those who do not play by the rules that make Silicon Valley work.”

The indictment itself also serves as a sort of CliffsNotes companion to the work of WSJ reporter John Carreyrou, who has spent the past several years reporting on Theranos, along the way unearthing its many alleged misdeeds. It traces Theranos’ pitch to investors and the medical community that it could get results in hours instead of days, as well as the fact that the proprietary device central to those claims “had accuracy and reliability issues, was slower than

some competing devices, and could not compete with larger, conventional machines in high-throughput, or the simultaneous testing of blood from many patients.” To make up for those shortcomings, Theranos used the same commercial devices it had decried as obsolete to complete its testing.

Holmes has been held up as the ultimate symbol of Silicon Valley’s “Fake it til you make it” culture, and for good reason. But the reason the Theranos saga has resonated so deeply, and that Holmes and Balwani face such serious charges now, is that the scandal also transcends the typical tech hype cycle. Theranos wasn’t promising a better juicer or a shift in the human resources paradigm. It had a direct effect on medical diagnoses: The indictment alleges that Holmes and Balwani knowingly passed along test results that were inaccurate and unreliable. You can’t move fast and break things when those things are human lives.

In that sense, look at the Theranos indictment not as an opportunity to avenge the spirit of Silicon Valley, but to expose it. Let whatever reckoning Holmes and Balwani receive serve as an object lesson in irresponsible growth.

Until then? In a brief press release Friday, the company said that Holmes will stay on as the chair of the Theranos board.