



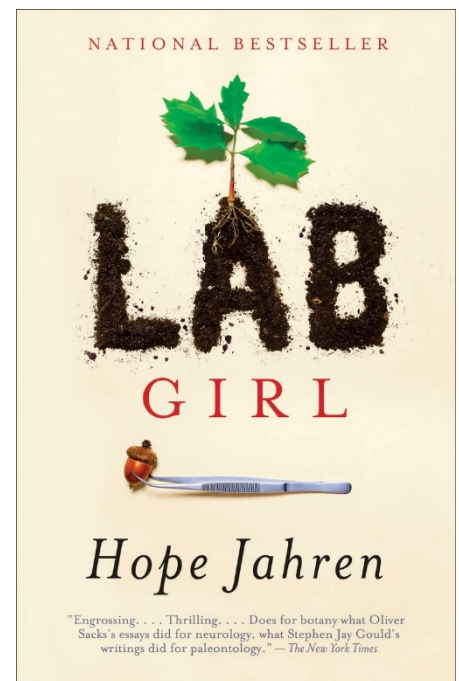
NATIONAL ENDOWMENT FOR THE ARTS

Reader Resources

Lab Girl

by Hope Jahren

Jahren is a geobiologist from rural Minnesota who not only knows her trees and flowers, but “has some serious literary chops” (*The Washington Post*). Her award-winning, bestselling memoir *Lab Girl* tells the story of a young woman who finds friendship in odd places, battles bipolar disorder, perseveres through setbacks and relishes hard-earned triumphs, and becomes a respected scientist and passionate observer of the natural world. Called one of the best books of the year by, among others, *Entertainment Weekly*, *Elle*, *Time*, and NPR, the memoir “does for botany what Oliver Sacks’s essays did for neurology, what Stephen Jay Gould’s writings did for paleontology” (*The New York Times*). It’s “Immediately engrossing and extremely readable” (*The Guardian*). Cheryl Strayed, bestselling author of the memoir *Wild*, describes it as “deeply inspiring” and award-winning author Ann Patchett says it “makes me wish I’d been a scientist.” “From the prologue on, a reader itches to call out fun facts to innocents nearby,” writes the *Seattle Times*. “Jahren writes with such flair that a reviewer is tempted to just move out of the way and quote her.”



What is the NEA Big Read?

A program of the National Endowment for the Arts, NEA Big Read broadens our understanding of our world, our communities, and ourselves through the joy of sharing a good book. Managed by Arts Midwest, this initiative offers grants to support innovative community reading programs designed around a single book.

For more information about the NEA Big Read, visit www.arts.gov/partnerships/nea-big-read

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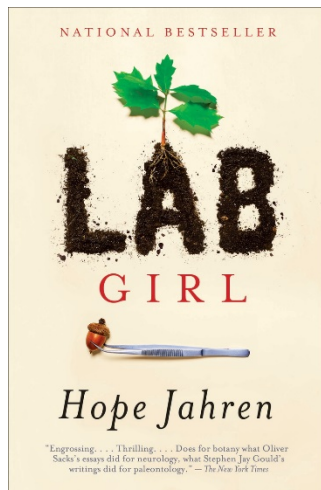
About the Book

"Science has taught me that everything is more complicated than we first assume, and that being able to derive happiness from discovery is a recipe for a beautiful life." — from *Lab Girl* (p. 29)

Lab Girl is a nature lover's story about digging in dirt and discovering new things about old growth. It's a scientist's story about running experiments and waiting and wondering and asking for funds and fending off doubt. It's a Midwesterner's story of moving south and east and west and noticing the differences. It's a girl's story about growing up to be what she wants to be. And it's a woman's story about fighting stereotypes, sacrificing, feeling vulnerable, trusting in friendship, getting sick, getting help, finding love, and writing it all down. "I used to pray to be made stronger," Jahren writes in *Lab Girl*. "Now I pray to be made grateful" (p. 256).

The prologue to Jahren's memoir is an invitation to the reader: to look out the window; to see something green; to hone in on that vision of green—a tree, say; to look more closely at a leaf; and to ask a question about that leaf. "Guess what?" she then writes. "You are now a scientist. People will tell you that you have to know math to be a scientist, or physics or chemistry. They're wrong.... What comes first is a question, and you're already there" (p. 4).

Jahren's own questions have led her to learn fun facts about trees and plants. She shares some of these facts throughout her narrative in short sections that are strategically placed so that they resonate with other parts of her story: "A seed knows how to wait" (p. 30); "No risk is more terrifying than that taken by the first root" (p. 52); "The life of a deciduous tree is ruled by its annual budget" (p. 120); "A vine makes it up as it goes along" (p. 126); "A cactus doesn't live in the desert because it likes the desert; it lives there because the desert hasn't killed it yet" (p. 144). The book is "a fascinating portrait of her engagement with the natural world: she investigates everything from the secret life of cacti to the tiny miracles encoded in an acorn seed" (*Entertainment Weekly*). "My laboratory is like a church because it is where I figure out what I believe," she writes (p. 19).



In one of the sections on plant life, she writes: "Something so hard can be so easy if you just have a little help. In the right place, under the right conditions, you can finally stretch out into what you're supposed to be" (p. 31). Though she's talking about a seed, she could also be talking about her closest friend, Bill, who provides that help and plays a key role in her life.

Jahren first meets Bill in 1994 when she's a graduate student assistant instructor on a field trip through the Central Valley of California. "It took me about a week to notice that one of our... students—the one who looked like a young Johnny Cash and was perennially clad in jeans and a leather jacket even in 105-degree heat—always somehow ended up several meters away from the edge of the groups, digging his own private hole," she writes (p. 55). "Looking for gold?" she asks. "I used to live in a hole," he answers (p. 56), eventually explaining that he moved out of his parents' home when he was 12 and into an underground fort for a time. "I'm Armenian," he also tells her. "We're most comfortable underground" (p. 60). Jahren realizes later that "he was making a dark joke about his father who, as a child, had been hidden in a well during the massacre that had killed the rest of his family."

Bill moves with Jahren from job to job to work alongside her in her labs in Georgia, Maryland, and Hawaii and often when they travel to do field research. At Georgia Tech, he lives in his van and then moves into one of the offices at the lab, where he works 16-hour days and becomes "everyone's counselor and confidant" (p. 139). He remains with her when, in 1998 in Atlanta, bouts of mania take hold and send her spiraling into insomniac periods of extreme highs and lows until she's finally diagnosed and treated for her bipolar condition. And he stays with her, as her friend and lab partner, when she falls in love with another scientist she meets at a barbecue in Washington, D.C. Of love, Jahren writes: "it's better than a movie, because it doesn't end, and we are not acting, and I am not wearing any makeup" (p. 207).

Jahren endures a complicated pregnancy and gives birth to a son that has her ruminating at the end of her story on the connection between mature maple trees and their saplings. "No parent can make life perfect for its offspring, but we are all moved to provide for them as best we can."

"I'm good at science because I'm not good at listening," writes Jahren. "I have been told that I am intelligent, and I have been told that I am simple-minded. I have been told that I am trying to do too much, and I have been told that

what I have done amounts to very little.... I have been admonished for being too feminine and I have been distrusted for being too masculine. I have been warned that I am far too sensitive and I have been accused of being heartlessly callous. But I was told all of these things by

people who can't understand the present or see the future any better than I can. Such recurrent pronouncements have forced me to accept that because I am a female scientist, nobody knows *what* the hell I am, and it has given me the delicious freedom to make it up as I go along" (p. 277).

About the Author

Hope Jahren (b. 1969)

"I was never going to turn into one of these bearded professors with the pipe, walking around campus, that everyone thinks is the world expert....I had to learn how to reward myself and I think I am better off for that. All I have ever wanted is one more day in the lab with the people I care about. And every day that I get that, I am grateful."



Photo by Erica Morrow

— from an interview with *The Guardian*

Hope Jahren grew up in the small town of Austin, Minnesota, a hundred miles south of Minneapolis and five miles north of the Iowa border, where her family has been for three generations. Her great grandparents "had come to Minnesota as part of a mass emigration from Norway that began in about 1880," she explains in her memoir, *Lab Girl* (p. 11). That's about all she knows of her ancestors, she claims, describing her Scandinavian family as prone to long silences and vast emotional distances. "I suspected that [my great-grandparents] hadn't relocated to the coldest place on Earth and then taken up disemboweling pigs because things were going well in Europe, but it had never occurred to me to ask for the story."

Jahren's father taught physics and earth science for 42 years and had a lab at a local community college, where Jahren and her three older brothers loved to hang out. "I grew up in my father's laboratory and played beneath the chemical benches until I was tall enough to play on them," says Jahren (p. 7). Though her mother had showed an early aptitude for science, she'd had limited opportunities to pursue it, and instead raised a family, grew a garden, and took correspondence courses in English literature, often discussing the books with her daughter. "She set her hair in curlers while listening to records of Carl Sandburg's poems

over and over, and instructed me on how to hear the words differently each time," says Jahren. (p. 16). In school, Jahren was punished for reading ahead of the class, which she turned into a learning experience. "Tiny but determined, I navigated the confusing and unstable path of being what you are while knowing that it's more than people want to see" (p. 16).

She completed her undergraduate education in geology at the University of Minnesota in 1991 while holding a variety of different jobs. "I worked as a proofreader for the university's press, a secretary to the dean of agriculture, a cameraperson for the long-distance learning program, and a machinist polishing glass slides," she says. "I taught swimming lessons, fetched library books, and ushered rich people to their seats within Northrop Auditorium. But none of it compared with the time I spent working in a hospital pharmacy," an experience she elaborates on in her memoir (p. 32).

She went on to earn her PhD in 1996 at the University of California-Berkeley in the field of soil science. Shortly after, she moved to Atlanta, Georgia, where she taught geology and geochemistry at Georgia Tech and opened her first lab with the help of her close friend Bill Hagopian. She lived on the outskirts of town in a rented trailer in the woods with a "geriatric mare named Jackie" (p. 130). During this time, she struggled with bipolar disorder until she was able to get help and proper medication. In 1999, she and Bill moved her lab from Georgia to the basement of the John Hopkins University geology department.

Jahren worked at Johns Hopkins University from 1999 to 2008, and then moved to Honolulu where she became a tenured professor at the University of Hawai'i and built the Isotope Geobiology Laboratories. She moved again in 2016 to Norway where she is currently a professor at the University of Oslo's Centre for Earth Evolution and Dynamics and runs her own lab. (Bill, her friend and lab partner, has moved with her to each new location.) She has received three Fulbright Awards; is one of four scientists, and the only woman, to have been awarded both of the Young Investigator Medals given in the earth sciences (the

Donath and the Macelwane medals); was profiled by *Popular Science* as one of its "Brilliant 10" scientists; and was named in 2016 by Time magazine as one of the world's "100 Most Influential People."

As for writing, Jahren says it's a skill scientists must master. "No writer in the world agonizes over words the way a scientist does," she explains. "When documenting our work, we 'hypothesize' but never 'guess'; we 'conclude,' not just 'decide'" (p. 25). It has perhaps served Jahren well that she began honing her writing skills early in life. "I remember writing stories and poems and comic strips for my teachers and parents and friends from very young," she says. "I remember writing plays in third grade, and trying to get my girlfriends to perform them. I wrote copious letters to pen pals through school, and still keep up written correspondence with many people who are very dear to me." It helped, too, that she was also an avid reader. "The great books that I have read have furnished me with the tools that I use to understand my life, similar to how the math and chemistry courses that I took furnished me with approaches for solving problems in the lab. When you read a great book, it stays with you, though you may not understand the import of some of its messages until later in life" (*The Refresh*).

Jahren published her debut book of creative nonfiction—the memoir *Lab Girl* (Knopf)—in 2016 to widespread critical acclaim. It won the National Book Critics Circle Award for Autobiography, among other awards, and was named a best book of the year by a number of prominent magazines. "People ask me about my process," Jahren tweeted in 2017.

"I wrote for 6.5 hours today. I produced 880 words, probably 850 are keepers. This is pretty standard."

Today, one might find Jahren in her lab with her friend Bill in Oslo, or writing, or spending time with her husband—Clint Conrad, a fellow scientist—and their son. "I have returned to Norway, almost a century after my great-grandfather left, and made it my home. I even have a little land to my name, and, by my rough calculations, more than one million individual flowers bloom upon my overgrown quarter-acre every year," she wrote in *The New York Times*. She also clearly has fun on Twitter. "Did u want a copy of #labgirl and not get one?" she asked shortly after one holiday season. "Tweet me a photo of the awfulest thing u got instead. The awfulestest get a signed copy." Winners included a pair of used socks, a second-hand crowbar, and a mug in the shape of a toilet.

With her memoir now an international bestseller, Jahren has become a strong public advocate for women and girls in science. When *Seventeen* magazine came up with #ManicureMondays, encouraging girls to post photos of their painted fingernails, Jahren encouraged female scientists of all ages to post photos of their fingers conducting scientific experiments. "If you are interested in science, my advice to you is to Enjoy It!" Jahren told *ScienceNetLinks*. "Have fun with it, and then afterwards, think very carefully about the fun: Why do you like it? Which parts do you like? What parts are harder? Then do some experiments: If I do this, will it lead to something fun? How can I make this more fun?"

Discussion Questions

1. Jahren begins her memoir with the message that being a scientist is "not as involved as people make it out to be" (p. 4). Before you read the book, what was your impression of what a "scientist" is? Did your impression shift or expand after reading *Lab Girl*?
2. *Lab Girl's* first chapter opens with a detailed description of her father's laboratory, where she loved to spend time as a child. What feelings and messages did she embrace during this period? How did they set the stage for how she felt and acted in her adult life? Is there a setting from your childhood that has played a significant role in your life?
3. Jahren writes of the emotional distances between members of a Scandinavian family, of "growing up in a culture where you can never ask anyone anything about themselves" (p.11). How does Jahren respond to this cultural attribute she describes? Can you think of cultures or cultural attributes that have played a part in shaping your personality and/or adult pursuits?
4. Does Jahren's observation that "being mother and daughter has always felt like an experiment that we just can't get right" capture something you have experienced, either as a parent or child (p. 16)? Why do you think Jahren dedicated *Lab Girl* to her mother?
5. Jahren quotes from the novel *David Copperfield* by Charles Dickens throughout Chapter 4, as well as other books in subsequent chapters, challenging a common perception that science and literature exist in separate realms. What does she glean from Dickens's novel? What might literature lovers gain from learning about science? What might scientists learn by reading literary works?
6. Jahren's relationship with Bill is a sustained theme in *Lab Girl*. Why do you think they became friends? What sustains their friendship? What aspects of their

relationship—both personal and professional—help each of them through their toughest periods? Was there a scene involving both of them that was particularly moving to you or that you felt captured the essence of their friendship?

7. In recalling her first scientific breakthrough, Jahren writes, “On some deep level, the realization that I could do good science was accompanied by the knowledge that I had formally and terminally missed my chance to become like any of the women that I had ever known” (p. 71). What were the emotional and practical effects of this moment for Jahren? Can you think of a moment or realization in your life that marks a line between who you are and who you might have been?
8. How would you describe some of the obstacles Jahren has faced as a woman in a male-dominated field? Have you experienced or witnessed others experience similar obstacles? What other obstacles does Jahren face in her career as a research scientist?
9. Jahren describes her struggles with mental illness in a gripping and vivid interlude (pp. 144–47). Are you familiar with bipolar disorder? If so, did Jahren’s descriptions resonate with you? If not, did you find her description of her illness illuminating?
10. Throughout her memoir, Jahren juxtaposes descriptions of human life with that of plant life. Did you find any of the facts she provided about plants particularly interesting? Did you find any parallels between these descriptions and your own life?
11. Jahren writes of her pregnancy, “I know that I am supposed to be happy and excited.... I am supposed to

celebrate the ripening fruit of love and luxuriate in the fullness of my womb. But I don’t do any of this” (p. 217). Why do you think she says this? What factors do you think affect her experience with pregnancy?

12. On page 198, Jahren describes ancient Arctic ecosystems that are “better characterized as ‘resilient’ than ‘stable.’” What do you think she means? Can you think of situations in your own life that have called for resilience instead of stability?
13. “Upon gaining new resources, a plant may perform one of four actions: it will either grow, repair, defend, or reproduce itself,” Jahren says (p. 259). Can you think of any circumstances in your own life to which this statement might apply? If so, what decisions did you make, and what factors do you think influenced these decisions?
14. Jahren chose to keep certain details about Bill’s life out of her narrative. What might some of these details be and why do you think she didn’t include them? Why do you think Bill ultimately gave his permission for Jahren to write about him? If you were him, would you have given your permission? If you were Jahren, would you have felt that you needed it?
15. Take a few moments to stop and look at a tree. What do you see? What might you want to know about what you’re seeing? Is there a tree from your childhood that you remember? If so, why do you think you remember it? What are some actions that we—as individuals and as a society—can take on behalf of a plant or plants?

Source material for these questions provided by Penguin Random House.



The National Endowment for the Arts was established by Congress in 1965 as an independent agency of the federal government. To date, the NEA has awarded more than \$5 billion to support artistic excellence, creativity, and innovation for the benefit of individuals and communities. The NEA extends its work through partnerships with state arts agencies, local leaders, other federal agencies, and the philanthropic sector.



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