THE TRANSMITTER

Eve Marder, neural circuits and being heard

The National Medal of Science winner explains why she built her career around the crustacean and what it was like attending high school in a Hudsdon River town.

1 June 2024 | by BRADY HUGGETT

This transcript has been lightly edited for clarity; it may contain errors due to the transcription process.

[opening theme music]

Brady Huggett
Hello. Welcome to "Synaptic," our podcast that looks at the people, the research, and the challenges of the neuroscience field. "Synaptic" is put out by *The Transmitter*. I'm an editor of *The Transmitter*. I host this show, and my name is Brady Huggett.

[transition music]

Brady Huggett
All right, today, let's go back to 1948, and let's go to Waltham, Massachusetts. That year, and in that location, Brandeis University was founded by the American-Jewish community as a way to combat the discrimination that Jews, ethnic and racial minorities, and women faced in higher education. The school was named after Louis Brandeis, the first Jewish justice of the Supreme Court. That first year, the school opened with 107 students. By 1961, the school had earned Phi Beta Kappa accreditation. That's pretty rare. Only about 10 percent of U.S. colleges and universities are awarded this, according to Phi Beta Kappa.

Anyway, the point is, the school had grown into a prestigious private university by the mid-1960s, when Eve Marder showed up. That's today's guest, Eve Marder. She arrived on the campus of Brandeis, and after her freshman year, she declared a politics major. In her sophomore year, she took a class on modern government in Western Europe, a class she described as being awful. It had a big black textbook she had to carry around, and inside the covers, the text methodically went through the countries of Western Europe and listed out the 13 or 14 political parties for each one, she said. Each party had an acronym, and eventually they all blurred together on the page.

She hated the course, she said, found it hideously boring and not very well taught. When it came time for the final, she took down the textbook, read it throughout, and lodged its contents into her brain. When the final was over, she pushed the delete button, she said, on the whole course and promptly forgot it. Then she changed her major over to biology, completely resetting her future. We talked about that on this podcast, how that change led her into a life of neuroscience. We also talked about why she chose to work in crustaceans and stomatogastric ganglion.

Near the end of our interview, she talked, quite movingly, I thought, about why we do science and what it takes to be a leader in one's field, and what it took for her to become a leader in her field. She talked about why it's harder for her to speak her mind now than it was when she was first starting out decades ago, back when she was often the only woman in the room. All that coming up in the next hour and a quarter or so. I interviewed Eve on May 7, 2024, in her home along the waterfront in Boston's North End.

It's a nice day in Boston, sunny and in the '60s. She lives in a condo with views of the water with her husband, Arthur Wingfield, though he was sequestered away while I was there so that she and I could record. I put mics on a table and we got down to it. Let's pick it up here, where she and I are talking about how she's been living in that condo for almost exactly 16 years. That should be enough to get us started. Here is your "Synaptic" episode with Eve Marder, starting right now.

[transition music]

Brady Huggett
16 years yesterday.

Eve Marder
Here.

Brady Huggett
In this spot.

Eve Marder
In this spot.

Brady Huggett
In Boston, you've been here?

Eve Marder
Since 1978.

Brady Huggett
It's a long time. I think that you're actually from New York City. You're from my current hometown.

Eve Marder
Yes. I was born at Columbia Presbyterian, 168th Street. I grew up first in Manhattan, then in northern New Jersey, and then in Westchester, and then I went off to college.

Brady Huggett
The Manhattan part, what did your family do? This is the Upper West Side?

Eve Marder
Yes.

Brady Huggett
What did your parents do?

Eve Marder
My father, at different times, he built a marketing research firm, and so he was based in New York City. It's sort of complicated, but my mother was first a housewife and then she became a very fine peace movement photographer and activist. She left a ton of really beautiful movement photographs from the '60s and '70s and early '80s that, after she died, we gave to the Swarthmore Peace Archive.

Brady Huggett
Was she doing that locally or would she travel the country to photograph?

Eve Marder
She was mostly based in New York. She was a hardcore New Yorker. She traveled some, but mostly she was based in the Northeast.

Brady Huggett
Yes. She grew up in the city?

Eve Marder
She was born in the Bronx. She grew up in the Bronx.

Brady Huggett
What about your father?

Eve Marder
He was born in Vienna, and they left Vienna in 1938. They went to Italy for nine months until my grandfather brought the family to New York in 1939.

Brady Huggett
1939. OK. Do you happen to know how your parents met?

Eve Marder
In college.

Brady Huggett
They did?

Eve Marder
Yes, CCNY.

Brady Huggett
They settled in the city?

Eve Marder
Well, it was a little complicated. My father was doing supposedly engineering. My mother was one of the first women to actually be admitted because CCNY was all male. Then she, I think, was in the first class or one of the very first classes that any women were let into City College. I'm not sure if it was actually Hunter or City at that point. She eventually got pregnant, and then she left school. She later went back.

Brady Huggett
Did you ever talk to her about that, being the first one into the City College?

Eve Marder
Not much, because since she left after her first year, she always viewed it as a bit of a failure. She was one of the most intelligent, articulate and outspoken, well-read people I've ever known. She always had a sense of failure that she hadn't graduated from college. We kept on saying, "Go back to school." She went back to school at the age of 61.

Brady Huggett
61.

Eve Marder
61.

Brady Huggett
The failure was because she got pregnant, right?

Eve Marder
Yes.

Brady Huggett
It's not like she flunked out or something-

Eve Marder
Oh, no.

Brady Huggett
-but she just wanted the degree and was upset she didn't get the degree.

Eve Marder
She felt diminished because she didn't have the degree. It's not that she-

Brady Huggett
Couldn't do the work or anything like that.

Eve Marder
No, and I'm not sure what the politics of the time were, whether a female student who was pregnant was allowed to be enrolled.

Brady Huggett
Oh, I didn't think of that.

Eve Marder
Probably not. If you're a journalist, you might research that. I suspect it was not allowed.

Brady Huggett
Just sort of frowned upon. If you're going to-

Eve Marder
It might have been frowned upon. It might have not been allowed.

Brady Huggett
Wow.

Eve Marder
Remember, those were the days.

Brady Huggett
Yes. She was married, though.

Eve Marder
No. Well, not when she first got pregnant, but she did marry my father, yes.

Brady Huggett
Yes. OK.

Eve Marder
They got married in 1946 because my father was then supposedly draftable, even though the war was over. My mother was pregnant, so they got married because a man with a pregnant wife was now draft-deferrable, and he didn't particularly want to go back to Europe to do cleanup action.

Brady Huggett
Your father, it was his own firm. Was he an entrepreneur?

Eve Marder
He started out in physics, and then he went to a couple of graduate programs in sociology when he was teaching physics to returning GIs. Then he became very interested in decision-making. He left school at the point when he had two small children. He left school and got a job doing research in an advertising agency. He rose in those ranks until he was going to have to leave research and move into advertising, which he didn't want to, so he started his own firm.

He started his own firm in 1960. It was a market research firm. What he did is he developed a lot of the tools that are very common in market research today are tools that he developed because he wanted to turn decision-making into a scientific enterprise.

Brady Huggett
Instead of like, "Here's my gut on this company," but actually- All markets or was there one area he was specifically focused on like the auto market or-

Eve Marder
No, he would work for anybody who would pay him, but he always refused to work or tried to avoid working for anybody in politics. He said his tools were too good; he didn't want to influence elections.

Brady Huggett
That's interesting. Do you have a brother or a sister?

Eve Marder
I have a brother who's three and a half years younger than I am and a sister who's 12 years younger than I am.

Brady Huggett
Do you know the reason why they moved out to New Jersey?

Eve Marder
Yes. At that point, they were living on the Upper West Side in a five-story walk-up. My mother just had my brother, so two small children in a very small city apartment in what was then the slums, the Upper West Side. They were on 86th Street between Columbus and Amsterdam, which was at the time a slum. They moved out to northern New Jersey to have a little more space and to have a little more freedom for us.

Brady Huggett
Yes. This is a tradition of New York. You have children. You need more space. You leave the city. Your mother, was she upset about that, being a lifelong New Yorker?

Eve Marder
I think she probably was, but, at the time, she was doing her best to be a very good mother. She had been orphaned as an infant, so I think, in the '50s, she was doing her best to be a very good mother.

Brady Huggett
She wasn't doing any photography then when you guys were young?

Eve Marder
No.

Brady Huggett
You're out in, I think, was it Ridgefield? Is that right?

Eve Marder
Ridgefield.

Brady Huggett
Yes. OK, but not for that long. A few years, maybe?

Eve Marder
We were there between when I was 4 and a half to 10 and a half, so it was six years. Then we moved to Irvington, New York, which is right on the Hudson when I was 10 and a half. I did kindergarten through fourth grade in Ridgefield. I did fifth grade to the end of high school in Irvington.

Brady Huggett
Irvington. I think I know what Irvington's like because I know those Hudson towns, but I don't know. I'm not sure I've ever been there.

Eve Marder
Irvington was, at the time, a very small town. It was really white, unlike Tarrytown, which was just to the north of it. Tarrytown was a very integrated town, and Irvington basically had some Irish Catholic, some Italian Catholic, working class. Then it had just the very beginnings of a commuter group, of which we were part. Most of Irvington, most of the land, were these really large, rich estates, where rich people from New York had acres and acres with big stone mansions on it.

It was very bucolic. The schools turned out to be very good, and they were very good because there were all these people who paid a lot of money in property taxes who didn't have any children. Most of the kids came from a very small set of housing areas in the town, and then the rest of it was just open fields.

Brady Huggett
How was it formed? Was it formed by people leaving the city who wanted more land, or they got rich and left the city like that?

Eve Marder
I don't know, because it was formed 100 years before. These were the people who were there. They left to get fresh air in the '80s, probably, the last '80s.

Brady Huggett
Yes, the 1880s.

Eve Marder
Probably. I don't know. One could find out.

Brady Huggett
Your dad was still going into the city?

Eve Marder
Yes, he was taking the train. Remember, he was very careful. He took the train down to Grand Central, and when he established his business, he got an office that was one or two blocks from Grand Central. He went in and out on the train.

Brady Huggett
Your neighbors, the kids that you knew, were their parents commuting too, or they were just Irvington? They lived there and worked there?

Eve Marder
We lived in this little development that was built as a planned development that was relatively new for Irvington, and people did all sorts of things. They were not the real townies. The real townies lived on Main Street.

Brady Huggett
Those were blue-collar people, you're saying?

Eve Marder
Those were blue-collar people. Those were the sons and daughters of the people who ran the gas station and the post office and those sorts of places.

Brady Huggett
You had a good school there?

Eve Marder
The Irvington high school, in particular, was spectacularly good. I didn't realize it at the time. I didn't realize how special it was until many years later, thinking back about the high school education that I got, comparing it to, certainly, little Irvington High School, public high school in a small town, was probably better than any high school that any of my students today ever went to.

Brady Huggett
Really?

Eve Marder
Oh, yes. It was spectacular.

Brady Huggett
It was drawing talented teachers from the city or from all over?

Eve Marder
They were drawing talented teachers from wherever, but I think they were paying them.

Brady Huggett
Oh, well, that would draw people.

Eve Marder
I think they were paying them pretty well, because most of my teachers were- My biology teacher later went back and got a Ph.D., and she was so good that- Remember, this is a very small town. My graduating class was 80 students, and the one before had been 60 students. She had three or four sections of biology every year. She had an 800 on the SATs every year.

Brady Huggett
Someone in her class would have an 800 on the SAT?

Eve Marder
Every year.

Brady Huggett
Wow.

Eve Marder
That's out of 60 or 70 kids. That's really unusual.

Brady Huggett
This sounds like a combination of both smart kids, but also teachers that were pulling the best out of them.

Eve Marder
Teachers who did, by today's standards, I realized I wrote probably three 100-page term papers in high school.

Brady Huggett
Are you serious?

Eve Marder
I am, yes.

Brady Huggett
On what?

Eve Marder
In my senior year in English, I wrote a 100-page paper on Whitman's poetry. I wrote a really interesting paper in 10th grade for social studies, where I looked at how the abolitionist movement and the Civil War dealt with- I got a whole bunch of different textbooks, and I read a whole bunch of stuff. I read W.E.B. Du Bois and all sorts of things. I looked at Black history in the textbooks of the time and compared it to what scholars were saying. I wrote this major term paper doing an analysis of how Black history was dealt with in the textbooks that we were studying.

Brady Huggett
Versus what you thought was a more real history.

Eve Marder
At least the history that one read, if one read the scholars of the time and the writers of the time. That was term paper number two. Term paper number three of that was, let's see, I did something about Karl Marx. I used to go down to the library, the New York Public Library, and I read all of Marx. I don't remember what the point of that one was. Those are the three I can remember right off the bat.

Brady Huggett
Did you do anything with them?

Eve Marder
No.

Brady Huggett
Beyond pass them in, you didn't try to, I don't know, get them published?

Eve Marder
No. I was a 10th grader.

Brady Huggett
Still. The one on the history sounds publishable.

Eve Marder
Yes, and they're more- and they're just lost. They wouldn't be now. They were just lost.

Brady Huggett
This sounds like growing up that maybe, was your interest in science growing up?

Eve Marder
I just liked everything. I didn't know what I wanted to do. I told people, and this is a very funny story. When I was about 8, I was reading a science book because what I did in Ridgefield, Ridgefield was a very small town. My mother had taken me to the library, got me a library card. The library was four or five blocks from my house, so I used to walk there. I was a very systematic child. I sat and I read every book in the first-grade shelf, and then I moved on to the second-grade shelf and I read every book, and then the third-grade shelf and I read every book, and then the fourth-grade shelf and I read every book, the fifth grade, regardless. I just read them.

Brady Huggett
When did you start doing this? In first grade, you went through all the first-grade-

Eve Marder
The first grade.

Brady Huggett
-and then just kept methodically moving up the line?

Eve Marder
After I finished everything in first grade, I started on second grade. By the time I had reached fourth grade, I had finished all of the elementary school stuff, and I was starting to read other things. The irony is that that meant that I had read, because one of the things the library had were textbooks for various elementary school systems, I had read most of the textbooks used around the country in all these different fields. I started telling you this story because one day I was reading a science book, and my aunt, who was an opera singer, asked me what I wanted to do in my life, what I wanted to be when I grew up, right?

Brady Huggett
Yes.

Eve Marder
This is one of the most hated questions. I was looking down, and I said, "Oh, I'm going to be a scientist." She said, "Oh, that's nice." From then on, I always said that, because it finished conversation. It was the fastest way to keep people out of your hair, just tell them you're going to be a scientist when you grow up.

Brady Huggett
Yes, but you did become a scientist.

Eve Marder
I did. I really liked science. I really liked English. I really liked poetry. I really liked history. It could have been anything.

Brady Huggett
Even today, looking back, do you find- do you know that that's unique, to have just methodically read through every book that you can find? I liked writing, too.

Eve Marder
I'm sure other people have done that.

Brady Huggett
I'm sure they have.

Eve Marder
It was a very small library, so it was easy. There was a shelf. I just read it. I read all those awful books about explorers and all the history books, and I read biographies of whoever. I read the science books.

Brady Huggett
Was that when your main pastime then was reading, it sounds like?

Eve Marder
It's reading and I'd play outside because we were in a little place. My mother used to throw us out and say, "Go play." This was the day. I used to roller skate. I used to ice skate. I used to jump rope. I used to play outside.

Brady Huggett
OK, yes. It's not like you read every moment of your life.

Eve Marder
No. This was my mother, wouldn't have let that because she didn't want us in her way, right?

Brady Huggett
Yes. All right. When you're finishing high school, you're telling people that you want to be a scientist. Did you really want to do that?

Eve Marder
No. At that point, I wanted to be a civil rights lawyer because I had gotten very involved in high school. This was the story about how I ended up writing that term paper in the local civil rights. We had a Youth for Civil Rights group, which is a bunch of kids who were very early on in the civil rights movement. We had high school kids, and then there were some college-age kids, including a couple of the older guys had gone down to Mississippi in the voter registration. This was in '63, '64, '65. I graduated from high school in 65. No, I was going to go off and become a civil rights lawyer.

Brady Huggett
Can I ask, was your mother into activism yet? Was that any part of your decision?

Eve Marder
It wasn't part of my decision, but she certainly wouldn't have.

Brady Huggett
She wouldn't have frowned on that?

Eve Marder
No. Well, at that point, they were both fairly politically active. She was probably a little more than my father. This was the anti-nuke. It would have been more at the beginning. It was more the anti-nuke protests. When I did a 50-mile walk from Hastings to whatever, she drove me there and picked me up. She was involved with some of the adults in the neighborhood who are doing various essential things. She hadn't started to take pictures yet. She started taking pictures a little bit later.

Brady Huggett
You're thinking about going to law school then?

Eve Marder
I was thinking, but first I had to go to college, right?

Brady Huggett
Yes.

Eve Marder
I was thinking about going to law school.

Brady Huggett
Then-

Eve Marder
What happened?

Brady Huggett
Yes. I know you went to college, but tell me the process.

Eve Marder
I went off to college. I ended up going to Brandeis, which was my third choice, because my uncle had said, "Oh, you have to go to Radcliffe." I went off on the train, and I went and interviewed at Radcliffe. The woman who interviewed me looked down, and she said, "Well, we've never had anybody from Irvington High School. How do we know that your," which were then, of course, spectacular grades, "that they mean anything?" I said, "Well, that's what the SATs are supposed to be for, to level the playing field." She said, "Oh, yes, I suppose so." Then she looked at me, and she said, "Oh, well, I'm sure you'd be able to do the academic work here, but we're really looking for the right sort of young woman."

Brady Huggett
What does that mean?

Eve Marder
I understood exactly what that meant. That meant she didn't need a bright Jewish kid from Westchester County.

Brady Huggett
They weren't allowed at Radcliffe, or no, or they just?

Eve Marder
If I had played the cello brilliantly, I would have been special. I was just a bright Jewish kid from Westchester County. Remember, there was still a tremendous amount of antisemitism, and there were a lot of bright Jewish kids from Westchester County. I didn't have that- I wasn't a world-class ice skater. I wasn't a world-class cello player. I wasn't a world-class something that would make up for the fact that I was Jewish.

Brady Huggett
It wasn't the fact that you were Jewish so much as you were just another smart Jewish kid from Westchester County. You had to stand out in some other way.

Eve Marder
Right. That's the way I understood it. Then I was also a little politically active, and that might have hurt.

Brady Huggett
I'm assuming your SAT scores were quite good.

Eve Marder
Spectacular.

Brady Huggett
Yes, spectacular. Good. OK, so then Radcliffe was your number one choice?

Eve Marder
That was my number one choice. That was because when I went to visit, I walked through Harvard Square, and there are all

these really interesting-looking guys with their green book bags, and it just looked like a cool place to be. My second choice, or maybe my first choice, was Swarthmore, which also, which at the time was the place to go to if you were in my cohort, the bright Jewish kids from Westchester County. The acceptance rate at Swarthmore for us was 1 in 30. It was very, very competitive.

I knew that if I'd come from Oklahoma, I would have gotten in. If I had applied to Radcliffe from Oklahoma, I would have gotten in. I was at a competitive disadvantage. I was waitlisted at Swarthmore, and I was rejected by Radcliffe. I looked at that, and I looked up the numbers, and I said, "Hmm, anybody who got waitlisted at Swarthmore and rejected by Radcliffe, that means Radcliffe was discriminating." I said that Radcliffe had nowhere the same kinds of numbers.

I said, "It's much harder statistically to get into Swarthmore." I knew that Radcliffe had actively discriminated. Then many years later, when I really understood things better, I realized that I was probably in the top 20 percent of the Radcliffe class, the admissions. They really had discriminated. I would have been with the grades, but I had no legacy. I didn't come from a high school they knew. I had no legacy attachment. I had nothing, but I must have been numerically in that top 15 percent, top 20 percent.

Brady Huggett
Brandeis is not like your local state school.

Eve Marder
Brandeis was at the time a brand-new school. When I visited Brandeis, the campus was covered in mud. Brandeis was established in 1948. In 1964, when I was interviewing, they were building. It was all brand new. It was very exciting, but it wasn't the Ivy Leagues. It wasn't the established Quaker school that Swarthmore was. It wasn't Harvard Square, the Harvard Yard. It was brand-new, brash, filled with mud. I walked into the admissions office, and I looked at the guy. He looked down at my folder, and he said, "You're exactly the kind of applicant we're looking for." Translated, "You're a bright Jewish kid from Westchester County." My uncle and aunt had been there. That's how I knew about Brandeis.

Brady Huggett
Oh, they'd gone there? No.

Eve Marder
Yes, my aunt, my uncle, who's my father's brother, married a woman who had gone there as an undergraduate. He was there for a master's. They knew about Brandeis, which is why I knew to apply.

Brady Huggett
That must have felt good to walk in there, and they said, "No, you're exactly what we want," versus-

Eve Marder
I knew, yes. No, it did, but I also rolled my eyes, and I said, "Yes, they want a bright Jewish kid from Westchester." Probably at the time I was there, from '65 to '69, my classmates were probably a smarter and more interesting cohort than I would have found anywhere else.

Brady Huggett
Anywhere else. Yes.

Eve Marder
It was just a really exciting time.

Brady Huggett
My understanding is Brandeis was formed to take in Jewish kids who, because of quotas at other schools, they had not been able to get into those schools, and Brandeis was going to be their school instead.

Eve Marder
It was not only Jews. It was formed for two reasons. It was formed for two reasons. One is to provide faculty positions for the Jewish and other scholars who were unhirable and to create an institution that would take these kids. Brandeis' earliest

faculty included women and Communists and Blacks and gays. It was really very ecumenical from, at the faculty level, and as well at the student level. Yes, it was a very interesting and exciting place from that point of view that at least- Yes, all of the above.

Brady Huggett
Then your classmates are people who maybe felt the way you felt when Radcliffe was like, "You're not quite what we're looking for." Did you feel like these are my people, this is the school for me? Obviously, you've been at Brandeis a long time.

Eve Marder
Yes, it was, certainly as a college student. I was really happy there. There were really a lot of smart kids. People were- they were very quirky, and they were interesting. They were poets and philosophers and artists and dancers and all sorts of things. There were a few of us who were interested in science. I started out intending to be a civil rights lawyer.

Brady Huggett
Yes. I think also, I don't know where I picked this up, but you were young. You were 16 or something like that when you started college, is that right?

Eve Marder
I graduated high school in, I just had turned 17.

Brady Huggett
Not that young, actually.

Eve Marder
I was, I was a year ahead.

Brady Huggett
Then, obviously you do not become a civil rights lawyer. What happens at Brandeis to push you onto this other track?

Eve Marder
What happened is very funny. My freshman year, I had placed out of chemistry. I had placed out of the basic biology course for non-majors, but I took Politics I, which was a very theoretical political science course. I took Psych. I had French. I had five courses each semester, and included in them was this year-long Humanities course, which was wonderful. I had a woman professor who was wonderful, and this year-long politics course. I really loved this politics course, and you have to understand, it was really political philosophy, starting from the way down and going up.

I took Math. They stuck us in a math course that was way over our heads, but anyway, that was fine. I get through it all, and I declare as a politics major. I was worried because I realized that I had placed out of enough science, and I had done Math, I had placed out of Chemistry and Biology, that if I didn't take more, I would never do it again. I said, "I'm going to miss it," so I was saying, "Well, I can always go to graduate school in English if I'm a biology major, but I can't go to graduate school in biology if I'm an English major." I said, "OK, I'll take Biology and Chemistry in my sophomore year."

Brady Huggett
Just in case.

Eve Marder
Just in case. This was a just in case and because I thought I might miss the science. The first semester of my sophomore year, I signed up for a course, one of the next politics courses. It was the Politics of Modern Government in Western Europe. It was taught by a guy who I later called the Toad. It was awful. It was just awful. We had this big black textbook with two columns, and every country had at least 49 political parties, each of them with three or four letters, and they all sounded the same, the Social Republican Democrats, the Republican Socialist Democrats, the Republican Democratic Socialists.

There would be 13 or 14 political parties for each country, and they all had these incredible acronyms, and they all had platforms. We did England and France and Germany and Italy, and I hated it.

Brady Huggett
It was dry.

Eve Marder
It was boring. It was hideously boring and not very intelligently taught. I'm going to class most of the time, and so before the exam, I sat down with this big textbook that I had not really been reading. I read it from start to finish. At that time of my life, I had a phenomenally good memory. I read this entire textbook, and then I walked very carefully to the final exam, making sure that my head didn't move because I didn't want everything to pour out.

Brady Huggett
Pour out.

Eve Marder
I walked in to the final. I wrote the final exam. I looked at the final, and I pushed the delete button on the whole course. I just said, "I'm not remembering this." I changed my major back to biology at that moment. Now you should realize that at the time, I think there were 50 or 60 bio majors in my year, and there were only four or five of us were women. That's when I switched back to being a bio major.

Brady Huggett
You mentioned earlier that you were already thinking about going on to some other degree, whether it's going to be English or biology, but you knew you wanted to go study beyond this.

Eve Marder
Oh, yes.

Brady Huggett
A Ph.D., it was planned.

Eve Marder
It wasn't planned, necessarily. I might have gone to law school.

Brady Huggett
Oh, yes. Right. You're still thinking about that?

Eve Marder
Not so much. Not so much, but I might have had something else happen.

Brady Huggett
You do go on to get a Ph.D. I don't know if you applied roundly or not. I know you went to UCSD.

Eve Marder
I applied to five places. I wanted to go to the West Coast because I was busy trying to get away from my family. I applied to Harvard Neurobiology because my undergraduate thesis adviser had told me it was the best place in the world. I applied there. There's a whole story there, but we don't need to go into that. Then I applied to the University of Oregon. I was applying to where neuroscience was, I thought, even though my professors were saying, "Oh, no, just go do molecular biology. Neuroscience is a flash in the pan. It's not going to be around for very long."

Brady Huggett
That's not correct.

Eve Marder
No, but I didn't listen to them, so it didn't matter. I said, "Oh, yes, OK, fine." I knew I was. I applied to places where I knew there was something in neuroscience. I applied to the University of Oregon, to Berkeley, to Stanford, and to UCSD. Stanford had a known policy to only take two women in a class of 12. They also had a known policy they wouldn't take two undergraduates from the same institution.

I had a pretty good friend who was a molecular biologist who had made arrangements to go to Stanford, so I knew I wasn't going to get into Stanford. I got into Oregon, Berkeley and UCSD. Then I had to decide between those three places. I had a very interesting decision-making process. I knew it rained a lot in Oregon, so I thought that was depressing. That's out.

Brady Huggett
That's out.

Eve Marder
Then I had to decide between Berkeley and UCSD. Berkeley was, at the time, in the midst of all this political upheaval. It was a really exciting place. Berkeley made a mistake. They called me up, and they said, "Please come to Berkeley because you're the strongest person in our applicant pool." I said, "I'm your strongest applicant?" They said, "Yes." I turned them down.

Brady Huggett
Yes, because you don't want to be the smartest person in the room.

Eve Marder
Right. I went to UCSD, which at the time was very much like, I felt like it was a bit of deja vu. A lot of people went to UCSD faculty who had been in the Brandeis biochemistry department. They moved to UCSD to build this brand-new institution. UCSD was brand new at the time. Literally, Brandeis was 20 years old when I got there, or 15 years old, and UCSD was four years old. it was-

Brady Huggett
You could smell the paint, that kind of thing.

Eve Marder
Yes. Everything was brand new. I just felt, "OK, this is the second time I'm doing this, going to a brand-new institution with no tradition, and you make your own way." That didn't bother me at all.

Brady Huggett
No. You studied under Allen Selverston then, right?

Eve Marder
Right.

Brady Huggett
Then you had a paper come out, I think it's '75.

Eve Marder
'74.

Brady Huggett
'74? Actually, just tell me how you started looking at neuromodulation, neurotransmitters.

Eve Marder
I decided I wanted to do neuroscience or neurobiology, I thought of it at the time. UCSD was one of the first places in the country to have rotations. Al Selverston was a brand-new assistant professor. He started at UCSD about three or four weeks after I got there. I was Al's first student, basically, and there were a couple of us in the early days. What happened that is entertaining is he went off that first summer; he went off to Bermuda where he learned the stomatogastric nervous system preparation.

I went off to a summer course on Catalina Island, which is a neurobiology course. I got back a couple of weeks before he did. I just went back to his lab because I had decided that's where I was going to be. I just started reading and sat down at a desk and took it over and just started reading. He got back and found me ensconced in his lab. I never asked him if I could work with him. I just moved in. I don't think he knew how to get rid of me.

Brady Huggett
Did he try?

Eve Marder
No, he didn't really try.

Brady Huggett
You're reading the things that were in his office and you thought, "This is fascinating."

Eve Marder
No, I was reading neuroscience, reading stuff from the library or whatever.

Brady Huggett
Oh, is it? OK.

Eve Marder
Yes, I was just reading. I'd go to the library and find things.

Brady Huggett
This is how you began to look at crustaceans, because Allen was doing it, and you thought, "This is a fascinating space."

Eve Marder
It was the space that was available to me. It was what he was doing, and it was fine. I had fallen in love with transmitters and receptors in my senior year in college. I had been reading neurobiology my whole senior year. I actually started before that. I had decided I was going to be a neuroscientist. My senior year in college, I wrote a paper on denervation supersensitivity, which is processes by which acetylcholine receptors are regulated and localized. I already had this major interest in transmitters. I got into my head after a certain period of time that I was going to figure out what the transmitters in the stomatogastric nervous system were.

This is very important; at the time, there were people studying serotonin, and they were over there; and people studying histamine, and they were over there; and people studying dopamine, and they were over there; and people studying GABA, and everybody. All these groups were separate. There would be somebody studying serotonin and completely different people studying acetylcholine.

I knew it was obvious, that there were many different transmitter systems in the brain. Nobody was asking the question, "Well, what would that do for how circuits worked?" They were busy doing it one by one. I said, "Well, OK, here's a nervous system. If I can figure out all the transmitters present in a circuit, in an entire little ensemble, maybe I'll see organizational principles that will never become clear if you study them one at a time."

Brady Huggett
This ganglion that you're studying, it had 30 neurons, so it became this perfect little circuit that you could study everything, right?

Eve Marder
Right. That's why I chose to do that. I think what's important for you is that, already as a relatively beginning graduate student, I was framing a question that nobody else had framed. It wouldn't have necessarily been alien, but that's not the way people were working.

Brady Huggett
Because science is siloed? Because no one thought to link it all together? What-

Eve Marder
Because at the time, there was so little known about anything that you could only do things one at a time, that if you're talking about the mouse brain or a rat brain or a monkey brain, you can't even conceive of that question because there's nothing you could have done. It would only have been in small circuits that you could frame that question. The problem was at the time,

which made me- there were very few people who cared about the signaling molecules because the small-circuit people were busy trying to, what was called, "crack the circuit." They were trying to figure out the wiring diagrams. They were still living in the belief that the transmitters didn't matter. They were just going to be excitatory, inhibitory.

Brady Huggett
That was it.

Eve Marder
That was it. Even my adviser at the time said, "Oh, that's just pharmacology." Now, he was of the belief that- he came from the tradition where graduate students did independent work, and you just provided them an opportunity. He never tried to interfere with me, but I don't think he ever thought anything much was going to come out of it.

Brady Huggett
He thought you were wasting your time, but that's your decision?

Eve Marder
No, he didn't think I was wasting my time, but he thought that I wasn't ever going to inform anything that he cared about.

Brady Huggett
I see. I see.

Eve Marder
He humored me or- he helped me to some degree, but I don't think he actually expected great enlightenment from it. There were relatively few people doing invertebrate neuropharmacology, and they were doing it in very different contexts. Nobody was framing the question the way I had framed it in my head. I was thinking, here's the circuit, which has to work. Why is it necessary for the brain to have so many different transmitters when everybody knows that synapse is either excitatory or inhibitory?

Brady Huggett
That was your big question? It wasn't-

Eve Marder
What was the organizational principle that drove a circuit or drove an animal to have multiple different kinds of transmitters? Why should some of them be used here, and why should some of them be used here, and why should some of them be used elsewhere?

Brady Huggett
If people think that neurons are just on or off?

Eve Marder
Yes.

Brady Huggett
Yes, got it. OK.

Eve Marder
Right?

Brady Huggett
Yes.

Eve Marder
You have to put it in the context of what people were thinking in the early '70s. That was a day when people were still walking around with electrodes trying to figure out who was hooked to who, what the connectivity was. That was true in leeches, or cockroaches, or locusts, or pleurobankia, or tritonia. Every animal people were studying, they were busy trying to identify

neurons and find connectivity because they were trying to come up with what was then called a wiring diagram, which today we would call a connectome.

Brady Huggett
Connectome, right. You tell me where I'm wrong, but you began to just itemize all these transmitters. You would find them, you would label them so that you understood that it wasn't just on or off for neurons? That was part of the-

Eve Marder
Yes, it was. It took place over a longer period of time. One of the things I did as a graduate student is I bought- I went to the Sigma catalog and bought everything that was called a neurotransmitter, and I just dumped them on the STG. I discovered that they all did something, and they all did something different. I had this notion that they were just all pushing the network around, but they were doing it differently. Then I realized that wasn't going to tell me what neurotransmitter any given synapse was or any given cell was, but I knew that they all did something and they all did something different.

Then, I started saying, "Well, how do I figure out what transmitter is present in each cell?" and so I started doing some single cell biochemistry, and physiology, and stuff like that. That was what was constituted my thesis.

Now, David Barker, who was a young scientist, who had gone to the University of Oregon, had been a postdoc in Kravis' lab, and he was very interested in neuromodulation. He had done work on octopamine as a postdoc, and then he was working on serotonin and dopamine and octopamine, he came and visited while I was a graduate student. I showed him my recordings, and he knew what they meant better than I did. I knew that it meant that those weren't necessarily all neurotransmitters in the ganglion itself, but he had it framed in his head as if it was neuromodulation.

I went to his lab for a year as a postdoc, and then I went to Paris, to JacSue Kehoe's lab because she, and Hirsh Gershenfeld, and Philippe Ascher, but mostly JacSue, had done the absolutely most elegant, beautiful invertebrate neuropharmacology that was- I read these papers, and they were just drop-dead gorgeous, and so- The real insight about neuromodulation writ large really hit in the '80s. David was thinking about it in terms of the amines, but it all came together in the '80s.

Brady Huggett
In France, you're saying, specifically?

Eve Marder
No, it came when I started my own lab.

Brady Huggett
Oh, OK. You came back from France, and-

Eve Marder
I had learned a lot. I had to do a lot of things I didn't know how to do. I learned a lot of biophysics. I think this is an important thing that people don't quite realize. I had come out of an invertebrate circuit lab. The people that my adviser was talking to, and all the- those were all the small-circuit people. They were not biophysicists. I was interested in neurotransmitters, so I read all of the stuff about transmitters, but the lab I went to in Paris at the École Normale, that was a lab filled with serious biophysicists. I got off the plane in Paris, and I didn't really speak French. I didn't speak French at all. I didn't know very much biophysics. That first year, I was struggling to both learn enough biophysics to understand what those guys were really saying and doing, as well as to learn enough French-

Brady Huggett
French?

Eve Marder
-to be able to really handle the lab.

Brady Huggett
That's a big year of growth, then, I would think?

Eve Marder
Yes, it was hard. I used to go off to parties, and after three hours, I'd come back. My head would be so tired.

Brady Huggett
Oh, I'm sure. Oh, that wall of language, you would just be- On top of all? No, I can't imagine.

Eve Marder
Of course, I had studied French in high school and college. When I studied it, I could read French. I could write papers and perfect grammar and everything, but I had- my high school French teacher had a beautiful Brooklyn accent.

[laughter]

Eve Marder
She was very sweet, but she had a Brooklyn accent, and so I never really heard French. I saw it, but I didn't hear it.

Brady Huggett
You get there, and you're like, "This doesn't even sound like [crosstalk]-

Eve Marder
Nine years later, I'm hearing stuff that I didn't know how to hear. I had forgotten all the useless grammar that I had learned. What I didn't do, and in retrospect, I should have done, I never went back to school. I should have gone back to class.

Brady Huggett
For French?

Eve Marder
For French, because I always had the sensation that there were two pieces of French in my brain, and they were just not connected. There was the French I had learned in high school and my first year in college that was over here, and then there was the French I was learning in the lab that was over here, and they just were not communicating.

Brady Huggett
Probably even like a third French on the street that was a little more slangy than-

Eve Marder
No, my lab French was pretty slangy. It was pretty slangy.

Brady Huggett
You decided to come back to the U.S. Obviously, you ended up at Brandeis. Did you look at other places to set up your lab?

Eve Marder
Yes, I applied to a few places. I knew I really wanted to go back to New York.

Brady Huggett
You did?

Eve Marder
I did. My dream job at the time was Columbia, but that didn't work out. I had an offer from Cornell, which I turned down. Largely, I turned it down for two reasons. One is, I couldn't face the idea of being in snowy Ithaca all- as a single kid coming back from Paris to Ithaca? I just couldn't face that.

Brady Huggett
That's fair.

Eve Marder
It was also a more stodgy place than Brandeis was. I turned down a better offer at Cornell to go back to Brandeis.

Brady Huggett
Did that feel like, I don't know, coming home at all? You've stayed since then, so it feels like it must have been a good fit for you?

Eve Marder
It was a good fit, but it didn't feel like coming home. The Brandeis that I left and the Brandeis I came back to were totally different institutions. It was only nine years.

Brady Huggett
What happened?

Eve Marder
What happened is this really exciting place that was intellectually lively became poor and bedraggled and much less selective because the '67 war took a lot of money that might have gone to Brandeis and sent it to Israel. We had this very uninspired president who showed no leadership, and the buildings that were bright and new when I got there had never been maintained. I walked into the first classroom I was teaching in, and there were five buckets capturing leaks with water. Everything was bedraggled and broken down, and the students were, on average, were much less good.

Brady Huggett
They needed to raise- because they opened up to anybody to get more tuition money in?

Eve Marder
Yes.

Brady Huggett
Oh, I see.

Eve Marder
They were taking 70 percent of their applicant pool at that point. They're, obviously, still really bright kids. Right?

Brady Huggett
Yes.

Eve Marder
The bottom half of the class was much weaker. They were more Jewish. They were weaker. The campus wasn't being maintained. It was a different time. It was 1978. It wasn't 1968.

Brady Huggett
It sounds like some vitality had been lost somehow?

Eve Marder
A lot of vitality had been lost. The other thing that had happened, a lot of the faculty who had been there when I was there were still there, and a lot of them were not there. My challenge was to figure out how to negotiate a different kind of relationship with people, relationship as an assistant professor versus a relationship as an undergraduate. In some cases, there were people there who hadn't been there, so it was not a big deal, except some of them, I think, were a little suspicious because I had been there.

Brady Huggett
Oh, like, "Oh, you just got this job because you were an undergrad"?

Eve Marder
Yes, but that's probably- I was the 13th person they interviewed. It wasn't that. Also, I was actually the first real neuroscientist to be hired into the biology department, or for that matter, at Brandeis. There were four or five people there who I called neuroscientists, but they didn't self-identify as neuroscientists. I was the first real neuroscience hire. That was the other piece

of it. I was walking into a department that was known for genetics and molecular biology and developmental biology, but not neuroscience. There was nothing called neuroscience on campus.

Brady Huggett
Obviously, Brandeis did the right thing, because you have done remarkable work at the school since then?

Eve Marder
The field was changing. The field was blowing up too. I played an important role in building the neuroscience programs at Brandeis at a time that the field was blowing up internationally.

Brady Huggett
I want to ask about- this was in '93, so we jumped ahead in time-- you did things like the dynamic clamp, which was- it's just like a tool that everyone then began to use. It really helped the field advance. I think you did that with Larry Abbott, who was a mentee of yours?

Eve Marder
Yes, sort of.

Brady Huggett
Sort of?

Eve Marder
I don't know if you can call a full professor of physics a mentee.

Brady Huggett
I don't know. I had read some things from him where he seemed to be suggesting that you might have led the way on that. I don't know. You tell me.

Eve Marder
When I met Larry, he was a very young full professor in the physics department. He's a year or two younger than I am, so we were peers. We met a little bit by accident because he had a graduate student and I had a graduate student who had the same fellowship, the Gillette Fellowship, Gillette Company had given money, and they always had a lunch for those kids. The two of them went to the same lunch, and they were asked to stand up and say a few words about what they were doing. Tom Kepler, who's a physics student, Larry's student, said, "Oh, yes, I work on memory and neural networks." Jim Wyman, my guy, said, "Hey, I work on the nervous system. What you do has nothing to do with it."

Jim dragged Tom back to our lab. Tom took one look at what we were doing, and he ran across Red Square and got Larry and said, "You have to come look." That's how we basically met. We vaguely knew about each other, but it was when Larry physically saw experiments in motion that he realized that's what he wanted to do. He had become interested in potentially moving into a new area because the work he had been doing was dependent on them building the Super Collider in Texas, and they decided not to. He said, "I'm too young to wait for 15 years for something you're not going to do," so he became interested.

In that first six months, he would read, and then he'd come by and ask questions, and we would talk. He started doing some work with us. Between '90 and '93, he learned a tremendous amount of neuroscience. The dynamic clamp really came about between us. It was a true collaboration.

Brady Huggett
Yes, OK. Just take me through- I have a basic understanding of what it does, but I don't know how you built it. Was that Larry's physics part to make the device itself?

Eve Marder
No, it was my technician. I had a very good technician who's very good with early computers. It's basically, there's no real device, it's just a program that tells a computer what to do. At the time, we were working with very slow, stupid computers.

My then-technician wrote the code for doing the original dynamic clamp in machine language. He actually wrote it in ones and zeros.

Brady Huggett
Based on what you and Larry were saying, "We need to do this." He said, "I can do that"?

Eve Marder
Yes. It's a very simple idea. It turns up at every ion channel, opens and closes as a function of voltage and time. Hodgkin-Huxley first wrote down equations that described the voltage-time dependence opening and closing of ion channels. The idea behind the dynamic clamp was very simple. It was that if you had- those equations were in many computers because people, going back to Hodgkin-Huxley had built simulations of currents.

The idea was that if you had a simulated equation in the computer, if you recorded from the cell, and then the computer could tell you what the current would be through that conductance at that voltage, and then you'd inject that current into the cell. Basically, you're just moving a model of the current into the neuron and giving it that current. Then that current will interact with the voltage of the cell, and then that'll update the- You have to go back and forth between the computer and the cell really quickly. At the time, the boards we had, the computers we had weren't fast enough to do this in DOS, or whatever the hell, or in Fortran. Michael actually took that whole process and wrote the code in machine language.

Brady Huggett
That's amazing. I want to ask you this other thing too about- I think this is based off a 2012 paper from you, where you had written out that not only are neurons in these circuits, but they can be modulated, and also that they can be reconfigured, which I think was a new thought also at the time.

Eve Marder
Circuit reconfiguration? We'll have to go back. We were saying in the early to middle '80s that what modulators did was they reconfigured circuits. Then, it was in the early '90s that Larry and I came up with the first idea of these activity-dependent homeostatic self-tuning models. I think that's what you're talking about. Is that what you're talking about?

Brady Huggett
I'm talking about that versus the connectome, where you've taken almost a snapshot of the brain. Here's the way all the parts of the brain are related, but you would argue that that doesn't stay forever, and these things can be reconfigured. If you actually want to understand the brain, you have to understand both of those things, the way it's connected and also the way that these circuits can be reconfigured.

Eve Marder
Yes, but the problem- There are two parts of that. One is, assume you have a connectome, an anatomical connectome. What I would say today, no matter how stable the anatomical connectome is, it doesn't give you enough information to know how it's going to work, because every single synapse is susceptible to change either via modulation or via use, and every single current is susceptible to change as well. The connectome gives you this backbone, and then you've got all of these little knobs that are changed by experience and modulation. To understand what the dynamics are, you have to know what all those knobs are telling you. That, I think, is the big problem.

Brady Huggett
In that, there's all this connectome work going on, but it is not being melded to the way the neuromodulation will affect things?

Eve Marder
It's not just- it's neuromodulation and prior activity history. Even forgetting neuromodulation, how active a neuron was in the five minutes or the two hours before you look at that moment in time, will change its synaptic strength and the properties of its channels. It's prior history over a whole range of time scales as well as neuromodulation and the way neuromodulation and experience interact. That sets the knobs and the dials that then tell you how that connectome is actually going to be played out. That's a really deep, deep, deep problem. You haven't asked the hard question or the easy question. You haven't asked why I've stuck with this small circuit for all these years?

Brady Huggett
Actually, that's a great question. I should have asked that.

Eve Marder
The reason is, when we record from this circuit, we always know what it's doing. We always know who's doing what to whom in terms of the cells and their interactions. We know when it's got it right and when it's got it wrong. We know. Whereas, if you try and understand cortex, you never know when it's gotten right. You can put as many electrodes as you want in a rat brain or a mouse brain and still not really know how the circuit's dynamics really map onto behavioral dynamics and cognition.

That ambiguity- I stay where I can say, "OK, I do this, and this, and this to the circuit, and I see this behavior. I can do this, and this, and this, and this, and I see no change in behavior or a change in behavior," so I'm anchored in some way in the real world. That's why I stay there.

Brady Huggett
Because the answers you get; you're sure of the answers?

Eve Marder
Yes, or I'm sure of where the ambiguity is. I don't necessarily know for sure, for sure, but I know exactly where the ambiguities are.

Brady Huggett
There's a few things I want to ask you. One is the "Lessons from the Lobster," the book that was written. It was like a biography, but you had a hand in it too, I think, right? You were a main source.

Eve Marder
We talked. I talked to Charlotte a lot.

Brady Huggett
What did you make of that process? Were you happy with the results?

Eve Marder
Yes and no, probably more yes than no because a lot of people said they liked it. Probably I'll probably feel the same way about this interview again. It's a similar sort of thing. I really like Charlotte. She's really smart. She put a tremendous amount of her life into that book. I don't think she did any disservice to me where- What she did, I don't know if you figured this out from the preface or whatever, she just cold-wrote to me. I met her, and I liked her, and so we started talking. More or less everybody who's ever said anything to me about the book says they like it. That said, it's in her voice, not my voice.

Brady Huggett
That was my thought. I think all the things you just said, you liked her, she worked really hard on it, she tried her best, all those things, but it's still your story being filtered through someone else. You're probably never going to think it's 100 percent right. Maybe she can't get it 100 percent right.

Eve Marder
How could she?

Brady Huggett
How could she? Right. It still does this great service to a lay audience or readers who want to know more about your career and your work. You like it for those reasons, but you feel like- if you had done it, it would have been different, of course, because you know exactly every turn of the story.

Eve Marder
Right. She captured- I think she probably got it close to 90 percent. I think she did a really good job. I have to give her enormous credit. She did something that blew me away. She would come to my lab. She sat there for a week at a time, a number of times. She read all my lab notebooks. Now, I still have my lab notebooks from graduate school. She found things in

my lab notebooks. When I was a graduate student, I used to write down all my thoughts in my lab notebooks. She knew what I was thinking. She found things I had forgotten.

Brady Huggett
You mean your general thoughts or just about the science?

Eve Marder
About the science.

Brady Huggett
OK, yes. They weren't journals like that?

Eve Marder
No, they weren't journals.

Brady Huggett
They were lab notebooks?

Eve Marder
They were lab notebooks. They were lab notebooks with plans for experiments, or ideas about experiments, or ideas about the nervous system. It was all there. She read it all. That's why she got it as right as she did. She actually found things I had just completely forgotten. It was really amazing. I have to really give her credit that she approached it more as a historian than as a biographer. She said it was never really a biography of me so much as a history of a story. I think if you think about it that way, it makes more sense. Yes, I have a tremendous amount of respect for her.

Brady Huggett
I want to ask this too. We were talking earlier. You've won the Gruber Prize, Kavli Prize, National Academy of Sciences, National Medal of Science. You were the past president of SFN. You were on Obama's work group for the Brain Initiative, I think. You've had this long career, obviously storied career. I was reading the essay that you wrote for the Kavli Prize. In there, you had mentioned some of the things we just talked about, you did not get into Stanford, you didn't get into Radcliffe, that you had been in France, and sometimes the cabbies were rude and would pretend to not understand your French.

People told you shouldn't go to France, it's going to hurt your career, which it obviously didn't. I had this thought that you may have felt that you were underestimated for a lot of your life. I could think of reasons why. You were young to go to college. They didn't need another Jewish person. You were a woman in a male-dominated field. I wondered if there were times you felt that you were underestimated, or people underestimated your abilities.

Eve Marder
I wouldn't call it underestimated, exactly. I was, I would call it more underacknowledged.

Brady Huggett
Dismissed?

Eve Marder
Yes, ignored. As a young woman in the day, I had the experience that many women have discussed, where you'd stand in a room with you and nine other guys, and you'd say something, and no one would respond. Then the guy next to you'd say the same thing-

Brady Huggett
They respond?

Eve Marder
-and they'd say, "Oh, that's a really good idea." There were always some men who'd say, "She said that," and others who just took credit. One of the things that I learned in those years, which I probably didn't have to go very far to learn, was- I got pretty good at interrupting people and fighting back. That turned- in other words, there were two defenses one had, and women in

my generation had one or the other. One is to be like me and become pretty assertive, which was probably more in my nature. The other defense was just to be so much of a lady, and to do it with politeness. There are people who did that, who had certain class, and they would do it all differently. I just would fight.

I think the irony is that those of us who really came through that time were very stubborn, and it came through in many different ways, but had to be very stubborn. You had to be pretty impervious to certain kinds of dismissal.

Brady Huggett
Otherwise, you'd wash out? If you didn't stake your claim, you'd wash out?

Eve Marder
You wouldn't necessarily wash out, but you wouldn't be heard. You wouldn't necessarily be completely driven out of science, but you'd be underacknowledged. I wrote a piece which didn't get published, but where I said that every young scientist wants to be heard, and if they have a new idea, wants other people to resonate to- You want to speak your mind and change the way people think about something. If you're not heard, then how can you change the way people think about things? It's not so much a fear of washing out; it's a fear of not being heard. The irony is, I actually struggle more today with speaking my mind than I have for the last 30 years.

Brady Huggett
Which you would think someone who's reached your stature, you'd have less trouble speaking out. You'd almost be impervious to it because – well look at your career.

Eve Marder
I'm impervious, but I've been told to keep my mouth shut more times in the last three years than in my whole career. I'll tell you this story, but I'll tell it to you- It's a very nuanced story. I was not so long ago, I was at a Gordon Conference, and they had their professional development session, which are now very- I don't go to them anymore. Anyway. This was just right at the very tail end of COVID or just getting into COVID, I don't remember. I think it was right at the very tail end of COVID.

The young people were saying, "Oh, we don't feel supported." Often I say, "Well, what does that mean?" and then you discover that what they're talking about is an angst. There's nothing I can do about their angst. I can provide real help, but I can't answer their angst.

We were going on, and at some point, and they were talking about they need role models, they need mentoring. I said something. What I said was, "Everyone in this room wants to be a scientist. You do science because you want to be the first person in the world to do something, see something, describe something, think something, say something, convince the world that they should think of something differently." I said, "That means you have to be willing to be a leader. Your willingness to being a leader means-" and implied in what I was saying that you don't need to follow someone, a role model.

You need to say, "I want to change the way people think about something. I want to be the first to know something. Then I want to be the first to tell people what I've learned." That's why you write papers, that's why you give talks, because you think you have something to say that no one has said before, or no one has said quite that way before. Whether it's a little thing or a big thing or a very big thing, it's still the thrill is to be the first person in the world to actually do something no one's ever done quite that way before.

It could be a little thing, but it still it's something that you've done that no one had ever done before. You saw something that no one's ever seen before. I watch it when people in my lab do that. They do something, and they say, "Oh, look at that."

When I said this at this meeting, somebody raised their hand and said, "That's all very well and good for you to say, but it was so much easier when you were young." At that point, I just gave up because anybody to say to a woman in my generation that it was easier when we were starting-

Brady Huggett
Did they mean that there's some different challenges now? They weren't talking about males versus females the way that you had to come through that? They must have been talking about some other challenge, or was it the same challenge?

Eve Marder
I think they just thought that we had it easy. How you could say that to a woman of my generation just shows they had no understanding-

Brady Huggett
Of what it was really like?

Eve Marder
-of what it was really like. They really thought I was just being- that my life was so easy. It was easier in some ways-

Brady Huggett
Harder in some ways? For sure.

Eve Marder
-and harder in other ways. It's not like it was easy. All the people who are today complaining about the lack of role models and mentoring and all that, those people probably all were lost. We probably lost some very good people who needed a little more help than they got. The people who made it didn't make it because it was easy. They made it because they were stubborn and determined and just didn't give up. The stubbornness and determination came through in all sorts of different ways. They all had different styles. They were just very determined.

Brady Huggett
That's why you made it?

Eve Marder
That's why I made it. It's just a certain kind of determination. It made me very sad. That's in the same way. We were taught to expect that if you gave a talk, you'd get challenging questions. You had to be prepared to deal with that. Then for people to tell me that I should never ask a challenging question, I find very dispiriting. I haven't told that in so many words.

Brady Huggett
Stop asking difficult questions?

Eve Marder
Yes.

Brady Huggett
Meaning? You could ask Larry a difficult question? They're saying don't ask younger people difficult questions because-

Eve Marder
How else are they going to learn?

Brady Huggett
I don't know. That's what they're saying?

Eve Marder
Some people say this. That's what they're saying, but they might even say I shouldn't ask Larry difficult questions. He's, of course, nicer than I am. He probably can ask difficult questions in a very friendly way. Part of it is that if you're in the back of a room and you're female, this goes back to the old thing, if I ask a question from the back of the room, it's still heard as challenging, whereas if Larry asks it, it's a male voice, and he's more polite, or whatever, they don't hear it the same way.

Brady Huggett
That still happens?

Eve Marder
I think it still happens.

Brady Huggett
Even though you're you?

Eve Marder
Yes, I think so. I think so. I've learned to be a little nicer, but I'm not sure it serves much function. If the determination isn't there, they're not going to make it.

Brady Huggett
That's the last question I had.

Eve Marder
We're good.

Brady Huggett
We're good. All right.

[transition music]

Brady Huggett
Loved this interview. Loved it. Especially the end, where it felt like we'd gotten down to a certain point of view that I had not ever previously inhabited. When I shut the mics off, I talked with Eve for a little while longer. By then, her husband was reminding her of all the things they still needed to do that day. I packed up and got out of there. Arthur walked me down out of the building and along the streets of the North End until we passed the statue for Paul Revere, and I veered off to read the history.

Later, I got an email from Eve saying that she felt like we could have talked for another hour. I definitely agree with that. Something about her long view on neuroscience and her willingness to speak her mind on science and politics and everything else made me want to keep asking her questions. Thank you, Eve, for a great talk.

This episode will be archived on thetransmitter.org, where we also have a transcript. In the transcript, we have inserted links to the main papers that we discussed, so check that out if you'd like more information. The show can be found wherever you get your podcasts, Apple, Spotify, YouTube, or in whatever podcast app you use. Some of the information on Brandeis for the intro was sourced from the university's website. If you'd like to comment on this show or whatever we do at *The Transmitter*, you can find us on the social media platforms X, Blue Sky, Mastodon, and LinkedIn. Our theme song was written and performed by Chris Collinwood. Thank you for listening to "Synaptic." Until next time.

[ending theme music]

Brady Huggett
Well, let's see. Yes, that's better. OK.

Eve Marder
You got it?

Brady Huggett
Yes.

Eve Marder
Do you want to share this one?

Brady Huggett
No. We'll get two lines going in.

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