When it Mattered

Episode 19: Sam Kean

Chitra Ragavan: Hello, everyone. I'm Chitra Ragavan, and this is When It Mattered. When It Mattered is a podcast on how leaders deal with and learn from adversity. This episode is brought to you by Goodstory, an advisory firm helping technology startups find their narrative. My guest today is the New York Times bestselling author, Sam Kean. His latest book is called The Bastard Brigade: The True Story of the Renegade Scientists and Spies Who Sabotaged the Nazi Atomic Bomb. Kean also is the author of other science bestsellers: The Disappearing Spoon, The Violinist's Thumb, The Tale of the Dueling Neurosurgeons, and Caesar's Last Breath. His stories have appeared in The Best American Nature and Science Writing, The New Yorker, The Atlantic, and Slate, and his work has been featured on NPR's Radiolab, Science Friday, and Fresh Air. Sam, welcome to the podcast.

Sam Kean: Hello. Thanks for having me.

Chitra Ragavan: Did you always know that this was what you wanted to do in life, to become a writer, and particularly, a science writer?

Sam Kean: No, actually I, for a long time, thought I was going to be a scientist. When I was going through high school, I was taking all the science classes I could in every subject, and then got to college in Minnesota and was very focused again on science. I was a physics major. It really wasn't until about my third or so year in college when things swerved on me a little bit. I just realized that temperamentally, maybe I wasn't cut out to be a scientist in that I started working in some different labs that were doing research, and I realized that I just wasn't enjoying doing the research as much as I thought I was. I didn't like the fact that you spent all your time building and tinkering with equipment. I was a little clumsy with it, couldn't get it to work right all the time.

Sam Kean: For really the first time in my life, I started to wonder, "Well, maybe I don't actually want to be a scientist anymore." It was a little scary in that I had been focused on being a scientist for so long that I really almost didn't know who I was anymore if I wasn't going to

be a scientist. Basically, what I did was I kind of ran to the other end of campus and got an English major, so I was working on both the science and the English part there, and eventually realized that not only did I like writing, but that you could make a living by writing about science. That was a good fit for me because I got to be sort of involved with science, kind of keep up with science, but I didn't have to be in the lab doing the science either. It ended up being a good fit for me in the end.

Chitra Ragavan: What was kind of the greatest moment of struggle or adversity in moving towards this career would you say?

Sam Kean: Well, it was about 2007-ish or so, and I was working at some publications. It was going fine, but I realized that the kind of writing I wanted to do was more amenable I think to a book, just getting to go a little bit into the history, having a little bit more leeway to be creative and fun with the language, things like that. I think it worked better in a book. So I decided I wanted to write a book and ended up writing my first book, which was about the Periodic Table. I guess the quick premise was to find like a weird or funny or spooky story about every element on there. I didn't write the book in a very smart way in that I was going to have 118 individual chapters, one about every element, which would have been a very sort of choppy, not a very pleasant reading experience, I think.

Sam Kean: When I was trying to get that book published in that format, it was a struggle in that I just kept getting rejected over and over. I think it was partly the format, but also partly because I think a lot of agents when they got the initial letter that I sent were probably thinking, "Oh, yuck. The Periodic Table. I hated that thing," just kind of hit delete. I never heard back from most of them. That was a real struggle, not only having to kind of rewrite the book in different terms in a different format, but also just kind of be rejected like that over and over. Eventually, it did work out. I got a great agent. We've been working together since then, but that did take a while at the beginning.

Chitra Ragavan: Your previous four books were about chemistry, genetics, and neuroscience and the atmosphere, but if I understand it right, you were a physics major in college, but you ignored physics until this latest book, The Bastard Brigade. Why was that, and then what convinced you to write this book?

Sam Kean: Well, I did get that question often, "You're a physics major, why not write about physics?" The short answer was I just never found

a story that I felt like was compelling enough where I really wanted to tackle it in a whole book. I mean, a book's a big investment, few years of your life, spending a lot of time and emotion in it. I just hadn't found a compelling enough story yet until I started what became The Bastard Brigade. I think I really just fell in love with the characters in the book. There were just so many interesting and unusual people, and the stakes of the book, the prospect of the Nazis of all people getting an atomic bomb, the stakes were just so high and the characters were so interesting that I just felt it was a really compelling story and one that I would want to commit to.

Chitra Ragavan: Why was it called The Bastard Brigade? Talk a little bit about some of these amazing central characters that you found to create in the book.

Sam Kean: Yeah, so The Bastard Brigade, the title itself comes from one of the groups that was kind of trying to stop the Nazi atomic bomb. That group consisted of several scientists and a few military people who were kind of running around in Europe trying to spy on and sabotage what the Nazis were doing. This group that was going around, they were very secretive, and they weren't part of the normal chain of command within the military, so they didn't report directly to anyone except people in Washington. They didn't have a parent group, and in that way they were sort of a bastard group metaphorically, but they also were sort of hard charging, a little reckless. They kept getting threatened with court marshals and stuff like that, so they sort of I think embraced this idea that they were a bastards anyway and were salty and found that sort of fun.

Sam Kean: The book has kind of a double meaning, but it does refer to one of these groups. They were called the Alsos Mission. They were, again, one of the groups trying to figure out what the Nazis were doing in terms of building an atomic bomb. Some of the other characters, there was Joseph Kennedy, who was JFK's older brother. He actually died during the war, which I think a lot of people know, but they don't realize that he died on one of these peripheral missions where they were trying to knock out what they thought were Nazi atomic bunkers in Northern France. That was kind of unusual. I hadn't know he had died on a mission related to that.

Sam Kean: I think the original character that really got me excited was the guy Moe Berg. He was a genius, knew something like a half a dozen languages. Some people said a dozen different languages. He

went to Princeton and Columbia, and he started at the Sorbonne in Paris, and he did all this fitting all that around being a Major League Baseball player.

Sam Kean: I just loved this idea of this big lumbering catcher who was from New Jersey who was also a genius, spoke all these languages, and eventually during the war, they trained him to be an assassin. They actually sent him into a lecture that was being given by Werner Heisenberg, the famous German physicist. He was working on the Nazi atomic bomb project, the atomic research there. They actually sent Moe Berg in to potentially assassinate Werner Heisenberg. I'd never heard that story before, and I just thought it was crazy that they would send a Major League Baseball player in to do something like that. As soon as I heard that story, I thought, "I have to write about this in some capacity."

Chitra Ragavan: I love the portrait of Moe Berg too, especially how he used to... he had a lot of characteristics that actually helped him in his spying. Among other things, he was this incredibly avid reader, and he would have these dozens of newspapers he would read. You described how he would have these live newspapers versus dead newspapers, and nobody could ever touch the live newspapers until was done with them. I thought that was fascinating.

Sam Kean: Yeah, he would get a dozen newspapers day in several different languages, and when he was in the middle of him, he, again, as you said, he called them his live newspapers, and he would drape them around his bed and the bathroom, on furniture. They'd be on the road in a hotel room, and his roommate would come in and want to sit down in his room, and Moe Berg would get furious because he had touched one of his live newspapers. The guy was incredibly eccentric, a very strange fellow, but also very smart man. He was probably one of the most famous major league baseball players of his day, hanging out with Babe Ruth and Lou Gehrig, went on an All-Star Tour of Japan at one point, so a real kind of a American original I think, Moe Berg.

Chitra Ragavan: It seemed like because he wasn't as good at baseball as he was at schmoozing and his interest in travel and reading, and so he was being sent on all these goodwill missions including to Japan and then to Germany. On those trips, he was able to... I guess his first self-given spying mission was in Japan when he visited there. Then in Berlin, he was one of those early people to sound the alarm about Hitler and Nazism.

Sam Kean: Yeah. Moe Berg was actually a pretty mediocre baseball player. He was not that good. He was pretty slow, not a great hitter. He was a backup catcher, a bullpen catcher for most of his career, so not exactly setting the baseball world on fire, but people loved having him around. Reporters worshiped him. They loved chatting with Moe Berg for hours and hours. He kind of stuck around the league for a long time because of his celebrity.

Sam Kean: Then, as you said, they would send them on goodwill tours. He actually took some footage with a movie camera when he was in Japan at one point, ended up giving that to the US military, and that was the only video footage we have, or excuse me, the only film footage we had of Tokyo before the war started, so it was incredibly valuable footage. He happened to be in Berlin on the day after Hitler got elected Chancellor of Germany, so he was there. He witnessed that. He started coming back telling people that Europe was headed for war, stuff like that. He was a very astute and good observer of politics and things like that.

Chitra Ragavan: You say in the book that a lot of these heroes were in some ways, and heroines were in some ways flawed because they had, some of them had dark motivations, they had their strengths and their weaknesses. Can you touch a little bit upon some of that in these key characters?

Sam Kean: Yeah. With Moe Berg, he was always a bit of a loner, very secretive, very furtive about what he was doing, and no one could ever quite figure out what was going on inside Moe Berg's head, very strange sort of secretive fellow. The one that really comes to mind here with the dark motivations was Joseph Kennedy, JFK's older brother. About midway through the war, I believe it was 1943, JFK ended up becoming a big war hero, the famous incident with the PT boat that he was on where he ended up basically dragging several people, saving their lives in the water, saving all his men after their boat got destroyed.

Sam Kean: He became sort of a national hero. There were magazine stories written about him, things like that. Joe, his older brother, was kind of furious that his kid brother was getting all of this attention. Joe kept volunteering for these very dangerous missions after that in large part because he wanted to one-up his brother. I mean, he was in the war. He was a patriot. It was a very brave thing of him to do, but his big motivation was wanting to top his younger brother. That's where he ended up volunteering for this dangerous mission where he ended up getting killed because he was trying to beat

out his brother. You do see kind of these dark motivations of people wanting to prove themselves or they had other agendas for going over there and fighting against the Nazis, things like that, yeah.

Chitra Ragavan: There's this very vivid scene in your book where Jack is being feted for his bravery and Joe is actually in a room crying, which seemed amazing.

Sam Kean: Yeah. There was a party where they were celebrating Joseph Senior, the father's birthday. They were making toast to him, saying, "Here's to our good friend, Joseph Kennedy, the Ambassador," stuff like that. At some point someone said, "Here's to the father of our hero," to Jack, and Joe got furious, stomped out of the room. They actually, a family friend found him later bawling behind a closed door in his room because he was just so jealous and so mad. Yeah, that was a very vivid moment and really kind of crystallized that this was a big motivation for it.

Chitra Ragavan: Your book also really speaks at length about the efforts of some very courageous and tough female scientists. Can you talk a little bit about some of those characters?

Sam Kean: Yeah, one of the big characters in the book, especially toward the beginning doing the science here is Irène Joliot-Curie, who was the daughter of Marie Curie. I knew about Irène a little bit. She was a Nobel Prize winner in her own right, and I wrote about her a little bit before, but I didn't realize what a role she had played in atomic fission research at the very beginning, and not only the great science that she did, but she was very active during the war in the underground resistance movement along with her husband, Frédéric Joliot-Curie.

Sam Kean: Again, I never really heard these stories before about not only the great science she did, but about how Irène had a lot to live up to with her mother. Marie Curie was a very great scientist, but she was not an easy woman to be the daughter of, frankly. She had very high standards, very demanding of her. Irène really led an incredible life in both World Wars actually. It was fun to kind of go into her story and kind of bring her alive a little bit. She's one of the big characters in the book, yeah.

Chitra Ragavan: You indicated that World War II was perhaps the first time that scientists were given guns and helmets and dispatched into

combat zones to kind of wage this parallel shadow war, which you describe as a war of ideas and I guess scientific morality, right?

Sam Kean: Yeah. You often hear that World War I is described as the Chemist's War for some of the things they did, especially the notorious gas warfare that was going on, but in this case, in this book, they were actually sending scientists along, and they were the ones kind of on the front lines, which was kind of new that they had a group that was just dedicated to rooting out essentially scientific secrets and trying to find what the Nazis were up to, especially with atomic weapons, but also in a lot of other fields as well. They were really interested in Nazi technology and things like that.

Sam Kean: This idea of going after scientific secrets was kind of a new one, and they were attached to the Manhattan project, so I think those people like Leslie Groves and some of his subordinates who came up with these ideas really deserve a lot of credit for this new innovative unit that they put together to go after the Nazi atomic bomb and other stuff.

Chitra Ragavan: What was interesting was this darkening of their characters over time because they no longer were just scientists. If you look at Irène's husband Frédéric, you say that at one point he was trying to determine who would live and who would die amongst people that were found to be working on both sides, for instance. That's kind of a role that scientists never really had before, right?

Sam Kean: Yeah, it really isn't. Frédéric, earlier in the book, he was, came off as kind of this flighty, kind of happy-go-lucky guy. There's a moment when they make their big discovery, their Nobel Prize winning discovery, and he goes jumping around the lab. He's throwing his arms in the air and whooping and screaming. It's just kind of a carefree, nice moment for him. That was before the war. Then he joined the Resistance, Paris, the underground, and by the end of the war, as you said, he was the one who was kind of in charge of figuring out when they found a collaborator, someone who was betraying the Resistance and working with the Nazis secretly, he was the one who is deciding whether they should execute those people or not, so very hard-boiled tough decision he was making.

Sam Kean: Then during the actual liberation of Paris when it was essentially the people of Paris trying to kick the Nazis out, Joliot ended up making scores and scores of Molotov cocktails, and he used his

science skills to make better Molotov cocktails, handed them out to people, and by some accounts was even throwing the Molotov cocktails at tanks and things themselves. He really did turn into, the times kind of made him turn into someone who was not just behind the scenes, but really on the front lines trying to expel the Nazis from Paris.

Chitra Ragavan: What was striking to me was how these scientists, many of them, brilliant scientists played such a major role before and during World War II to notify the Allies both of the rising threat of Hitler and Nazism because they were seeing these things during their travels and in their conversations with German scientists and their counterparts in Germany. And secondly, their conviction and foreboding that the Germans were not only developing atomic weapons, but that they were like years ahead of the Allies and that the Allies really need to start working on this.

Sam Kean: Yeah. Those scientists do deserve a lot of credit. There were some scientists who were very focused just on the technical side of things, so is it possible to build an atomic bomb and how big would it be and how much Uranium would you need, stuff like that. But there were a few scientists who really saw that not only could we build these weapons with them, but that these were going to be extremely powerful weapons and that the indications were that Germany had a big advantage in that they had the best scientists in the world working there, they had the world's best industry working there, they had, as you said, a big headstart. They founded their version of the Manhattan Project, what they called the Uranium Club. They founded the Uranium Club two full years before we founded our Manhattan Project. They had a big start, a headstart on us.

Sam Kean: The scientists again deserve a lot of credit for not only seeing where things were going, but alerting people, and eventually, they got Albert Einstein on board. I didn't discuss it in the book, but he wrote this famous letter to Franklin Roosevelt saying that certain developments in atomic research make bombs possible, and we need to get on this.

Chitra Ragavan: What was kind of amusing but also striking was how all of these scientists from all these countries, they're running into each other at conferences, they're challenging one another, they're listening to each other, they're kind of leaking about their successes to one another even though they're supposed to keep it a secret and trying to prove each other wrong and one-upping each other. It

was almost like sort of the golden age of radioactivity, dark though, that seems now, and there are like an epic number of Nobel laureates. They're all winning Nobel Prizes at this point in time, and then suddenly the whole thing turns into spy versus spy. Initially, they were racing to win awards and make scientific breakthroughs, and then it morphs into something a lot darker and more dangerous.

Sam Kean: It does. Yeah. There is a moment in the book, especially when they figured out Uranium fission where things went from, "Wow, this radioactivity stuff is so cool and interesting, everyone's winning prizes for this," to a big gulp where they said, "Oh, no, like this could be very bad," and we know that the war is coming very quickly. It was a coincidence that Uranium fission was discovered just a few months before the war, but it was a very dark coincidence, and there were a lot of people quite scared. Yeah, there was kind of this turning moment right before the war or, yeah, right before the war when not only was the war coming, but they had this suddenly potential to build these incredibly powerful and incredibly destructive bombs. Yeah, there was that dark moment there.

Chitra Ragavan: In terms of the antagonists, you focused on a couple of people, Heisenberg being one of them. Talk about the key antagonists you thought were important to the story and how The Bastard Brigade was trying to stop them in their tracks.

Sam Kean: From the Allies point of view, Heisenberg was the one they were obsessed with the whole time for various reasons. The most important reason was that he was the most brilliant scientist. He was the top German scientist. There was a moment during the war where he actually went to Heisenberg, he actually went and visited Niels Bohr in Copenhagen, Niels Bohr, another very famous scientist and who was on the allied side because he was Danish. The two of them had this conversation, and no one's ever quite figured out what happened during the conversation. There was actually a play about it, Copenhagen, a famous play about that conversation that they had.

Sam Kean: No one's ever quite figured out what exactly was said there, but we do know that Bohr walked away from the conversation believing that Heisenberg was actively working on a bomb. When he told the Allies that, that really scared them and really cemented their fears. I focus on Heisenberg in the book because he again was the one that the Allies were essentially obsessed with, and

they were always thinking, "What's Heisenberg up to? What is he doing?" The fact that they were so focused on him and obsessed with tracking him down made him kind of the natural antagonist in the book, yeah.

Chitra Ragavan: You say that the Allies were willing and The Bastard Brigade was willing to play dirty if needed, whatever it took to meet their ends, and some of that involved plots to kidnap Heisenberg or worse, right?

Sam Kean: Oh yeah, definitely. They had several plots to kidnap Heisenberg, and there was kind of no real morality. It never entered into play, like, "Can we do this, should we do this?" This happens over and over because everything they were focused on was what if Adolf Hitler gets an atomic bomb, what if Hitler gets the bomb? Compared to that, pretty much any other thing they were considering, the morality just, it was so much less than the fear of Hitler getting the bomb that they were willing to consider almost anything. Yeah, kidnapping plots, assassination plots, pretty much whatever it took to stop Hitler they were willing to consider. They ended up doing these sort of a nutty, crazy missions that in a lot of cases don't seem like they had any chance of working, but they figured, "We have to do something."

Chitra Ragavan: What did you find to be the craziest plot of all?

Sam Kean: I think there's a couple. The idea that you were going to send in a very famous Major League Baseball player to try to assassinate a Nobel Prize winner that, in a neutral country too. I mean, Moe Berg was I mean, that would be like sending LeBron James and or something to like kill someone, a scientist in another country. It's just a incredibly batty idea, but they decided they were going to do this.

Sam Kean: The mission that Joseph Kennedy died on also was a little nutty in that, essentially, what they were going to do is take these gigantic planes, strip out everything inside them, and then fill these planes back up with Napalm. There were these bunkers in Northern France that they thought were going to house atomic-tipped missiles. They thought that these planes filled with Napalm were going to be the best way to take out these very big, very well-reinforced, well-protected bunkers.

Sam Kean: They were going to fly these Napalm-filled planes over across the English channel with remote control. They were essentially drone

airplanes. They had the technology to get the planes over there. What they didn't have was the technology to take off with the plane, so to get the planes off the ground. Essentially, they needed a pilot to volunteer to get in this plane filled to the brim with Napalm and take off with it, and then eject out hopefully before it exploded. But that was the idea was to have this pilot take off with the plane. Again, Joseph Kennedy was so desperate to top his kid brother that he volunteered to be one of these pilots who was going to go up in this plane. Again, this mission really had almost zero chance of working, but they were so focused on Hitler getting the bomb, they decided to go with it.

Chitra Ragavan: Some of my most favorite chapters and the most tension-filled chapters in the book I think are devoted to the Nazi quest for the so-called heavy water, which the allies nicknamed Juice, a key element which the Nazis needed to build the atomic bomb and how it consumed them and the extent to which the British, French, and Norwegians and others went to sabotage those efforts.

Sam Kean: Yeah, so heavy water was a key ingredient in building atomic reactors and doing the preliminary tests and the preliminary work you would need to do in order to build an atomic bomb later. Especially at the start of the war, Germany was very focused on getting its hands on heavy water. Unfortunately, for them, the only place in the world that was producing heavy water was this remote hydroelectric plant, essentially, in Norway, about 75, 100 miles west of Oslo in the middle of nowhere, I mean, a really desolate part of the world.

Sam Kean: The Nazis ended up taking over this plant, and the British had to decide whether they were going to go after this ingredient because it was a key ingredient in the research. If they could stop the Nazis from having this ingredient, they could really slow their research down, but they were thinking, they had other considerations in that they thought, "Okay, if we go after this key ingredient in the Nazi atomic weapons research, then the Nazis are going to know that we know what it's for. They're going to know that we are all so aware of the prospect of atomic bombs."

Sam Kean: There was kind of this game theory consideration where they're like, "Should we go after it? Should we not go after it? Will we tip our hand?" Eventually they did decide to go after that. They went on a couple of missions, one of them, the first one was a complete disaster. Every single person involved either died or got captured and was executed by the Nazis, illegally executed by the Nazis.

Then the second mission, despite the disaster, they sent in nine more people to do this. It was really one of the bravest, most incredible missions of the war. It was really fun to write about that and the bravery that they showed in going after this kind of obscure ingredient that had nothing to do with anything except scientific research.

Chitra Ragavan: Even before they had to confront Nazi guns and things like that, they had to deal with the weather because the weather there seemed so absolutely terrible that they just couldn't make it. They couldn't land, and then when they landed, they couldn't find their teams, and when they found the team, they couldn't make it to the destination. It just seemed horrendous.

Sam Kean: Yeah, it was just blizzard after blizzard. I mean, there's chapters in the book that are nothing but them sitting through another blizzard because it was just such awful, awful weather there, but those were the conditions that they had to deal with. Again, they were incredibly brave, and they deserve a lot of credit for going after and disrupting that part of the atomic research.

Chitra Ragavan: One of the things that was really interesting was understanding that all of this was happening in the earliest days of military and civilian and scientific intelligence gathering. At the time, there was very little of that going on in an organized, formal, and sophisticated way. I mean, there was no CIA in those early years, and even the Office of Strategic Services had not yet been established in the very early years. A lot of the decisions that were being made on the part of US and Allied governments was kind of fueled by not just information from scientists but rumors and gossip and innuendo and sparse intelligence. That, in many ways, it seems is what led to the evolution of the Manhattan Project and then The Bastard Brigade, and ultimately, the OSS, right?

Sam Kean: Yeah. You do see a lot of cases where there were just these rumors floating around, and sometimes, they're like, "Well, that's probably not very credible," but other times, they said, "We don't know if it's credible, but we have to act on this." Other times, they were convinced that these rumors were true. They were acting on sketchy information a lot of the time, getting contradictory reports and things.

Sam Kean: As you mention, they did have pretty poor especially military intelligence at the start of the war. Great Britain, Russia, France, Germany, they had fairly well-developed military intelligence, but

the US really didn't have anything like that. There was one moment I always laugh about when I mentioned Moe Berg and the film footage that he took of Tokyo before the war. When he gave it to the military, they got back to him very enthusiastically, and they said, "Wow, this is so much better than flipping through travel magazines," which is what they had been doing before to gather intelligence. That was the state of intelligence before that, so they had a lot of catching up to do in order to actually provide useful intelligence. They were, again, scrambling and acting on rumors even then throughout much of the war.

Chitra Ragavan: What happened to all of the members of The Bastard Brigade? We know Joe Kennedy died. What happened to some of the others? How did their stories end?

Sam Kean: Well, a few of them ended up trying to go back to their regular lives. Moe Berg, the baseball player, never got on track after that. I think it's fairly common with athletes and soldiers that the time they were either playing ball or were in the military were the best times of their lives, and there was struggled with what to do with themselves after that. Moe Berg was kind of doubly afflicted there in that afterward, he had offers to coach in Major League Baseball and stuff, but he just never quite got back on track and ended up being a sad figure in that he would just travel around to baseball games, telling the same old stories over and over, again, kind of a loner, and eventually kind of cut off a bunch of his friends and ended his life fairly alone. Kind of a sad ending for Moe Berg.

Sam Kean: As far as the actual Bastard Brigade, some of those characters, they ended up going back into civilian life. Some of them ended up joining the CIA and getting involved in dirty business during the Cold War. Another one of them, the famous scientist named Samuel Goudsmit, he ended up, again, trying to get his life back on track, ended up doing some other scientific research, things like that.

Sam Kean: Irène Joliot-Curie, she, unfortunately, and her husband, got wrapped up in communist politics and ended up being pariahs in France. There were cases where they wouldn't let them sleep in hotel rooms abroad because they had such a reputation for being Marxists, essentially. They ended up being excluded from their world. Things didn't turn out well, unfortunately, for a lot of these people, but that really, that time that they had during the war, they kind of looked back on that as like the high point, like the most important thing they ever did.

Chitra Ragavan: What was your biggest takeaway on leadership and adversity after reading this book and how it changed you as a person and as a writer?

Sam Kean: I would say one thing I really took away from this, and it wasn't really a focus of the book, but it's something I never really thought about before, that the Manhattan Project to build the bomb, as a science person and as someone interested in history, I'd always heard about Los Alamos, which is... Robert Oppenheimer was there, and Richard Feynman was there, and Niels Bohr went there, all these famous scientists were there, and there's kind of a romanticism around that time with all these great scientists. But really, the key person for getting the atomic bomb built was Leslie Groves, was the general in charge of the overall project. He had the vision to be able to pick out Robert Oppenheimer as the head of the weapons lab at Los Alamos. Very few people thought that Robert Oppenheimer was going to work out. In fact, there were many people opposed to picking him.

Sam Kean: He ended up bringing a brilliant choice, but it was only Leslie Groves who was a good enough judge of character to figure out that Oppenheimer had this in him. Groves is a very good judge of character, and also, the organizational skills it took to get the atomic bomb built because, again, the Los Alamos, the weapons lab is the more romantic part of it, but really, most of the people working on the Manhattan Project were involved in enriching Uranium. That was the part that took the most work, the most effort, and was the most difficult part.

Sam Kean: I didn't realize what an incredible job he did. I think he doesn't get as much credit as he deserves for having the leadership to see this through and the incredible risks that he took, frankly, in doing this. They spent something like $2 billion in 1945-money to build this atomic bomb. There were people joking with him that, "If we don't get this bomb built and it doesn't work, you should buy a house in Washington because you're going to get hauled before Congressional committees year after year after year to answer for all this money that you're wasting." It was a real risk that he took, but his leadership was really why we succeeded in building an atomic bomb on such an incredibly short timescale.

Chitra Ragavan: In fact the Alsos unit was named after Groves, I guess because "Grove" in Greek is Alsos.

Sam Kean: Yes, it was sort of a multilingual pun, also, yeah, being the Greek word for Grove. Grove was actually a not a very pleasant person. I just spent a lot of time praising him, and he does deserve credit, but not a very pleasant person, a very humorless, in fact. He was furious when he found out that they had named the mission after him in this pun, even though it was in a different language, and probably no one at that point really knew or took much Greek anymore. But he was furious when he found out because he considered it a security breach. Very obsessed with security.

Sam Kean: One of my favorite pictures, it didn't get in the book, but at Los Alamos, they had Santa Claus come in one day to talk to the kids and give them presents and stuff. There is a picture, a famous picture of Santa Claus being padded down and essentially strip-searched because they wouldn't even allow Santa Claus in without giving him the whole security runaround. Groves had his great moments, but he could be a bit of a pill as well.

Chitra Ragavan: Even though he was paranoid about security, there were many who said that he brought in Oppenheimer who was considered for a period of time to be considered a security risk and was even tailed constantly by the FBI because of his communist students and communist sympathies.

Sam Kean: Yeah, Oppenheimer ran around with a lot of, essentially, fellow travelers. They were kind of a secret or not-so-secret communists, a lot of friends in that movement, things like that. He was a very controversial choice, not only among scientists, they didn't think he had the chops to lead it, but also among security people because of this past that he had, yeah.

Chitra Ragavan: It's been a great conversation. Do you have any closing thoughts?

Sam Kean: Well, I really hope people enjoy the book. I hope they read it. One of the things I really like to do with my books, and I think the big reason I write them, is that I do want to show that science is a human endeavor above all. I mean, we know about the things that we get from science, the technology, the way it opens up our mind about the universe, but there's a lot of great human stories in there as well. There's passions, there's obsessions, there's heroes and villains. This book, especially, the scientists really do become deep, interesting characters that you want to spend time with. If I wanted people to get anything in general out of my books, it's that, that there's really a human element to science as well.

Chitra Ragavan: That's absolutely wonderful. I really enjoyed the book, and I highly recommend it. It's fascinating. It reads like a thriller, but it's true story.

Sam Kean: Okay, well, thank you very much.

Chitra Ragavan: Thank you, Sam, for joining me. Sam Kean is a New York Times bestselling author. His latest book is called The Bastard Brigade: The True Story of the Renegade Scientists and Spies Who Sabotaged the Nazi Atomic Bomb. You should also check out Kean's other books, The Disappearing Spoon, The Violinist's Thumb, The Tale of the Dueling Neurosurgeons, and Caesar's Last Breath.