NOAA Heritage Oral History Project
An Oral History with William “Bill” Hooke
Interviewer: Mona Behl, PhD.

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Session 1 - April 25, 2023

Interview Summary: Dr. Hooke provides insights into his personal and family history, as well as his career in academia and weather modification. The interview covers various topics, including his childhood experiences in his grandparents' salon, his father's career as a mathematician and professor, and his own educational journey. Additionally, the interview touches on his father's involvement in teaching military personnel during World War II and his own work with John Tukey at Princeton University. The interview also mentions his father's research on cloud seeding and the connections he made in the field of weather modification later in his career.

Mona Behl: All right, so this begins an oral history interview with Dr. Bill Hooke for the NOAA 50th Oral History Project. This interview is taking place on April 25, 2023, with Bill in Alexandria, Virginia, and I'm in Athens, Georgia. My name is Mona Behl. I am the interviewer, and Bill is the narrator. Bill and I have been in a mentoring relationship for over a decade now, and I feel incredibly grateful and humbled to begin this interview. Bill, because this is a remote interview, I just want to make sure that I have your permission to record this interview. Although I did hit record.

William “Bill” Hooke: Yes.

MB: Perfect. Fabulous. So, we'll start right from the beginning. Bill, tell us about when and where were you born?

BH: Yes, okay. Well, that's pretty straightforward. I was born in Raleigh, North Carolina, April 23, 1943. That was in the middle of the war. I didn't realize that at the time, but the circumstances played into things that would develop later.

MB: Okay, well, wish you a very belated happy birthday again, Bill.

BH: Thank you.

MB: Yes. So, I'd love to learn more about your family history. Perhaps we could begin with your dad's side. Tell us about your dad's name, where he was born, more details about your dad's side of the family.

BH: Yes, okay. Happy to do that. There are a couple of things that are important about that. My dad was born in 1918. He was born in Chattanooga, Tennessee, which is a Southern town. My grandfather was from that area originally. I'm not sure I know the exact date of my grandfather's birth, but I actually came from a family that had scientists in it. Most scientists that

you and I both know, if you ask them, they'll tell you, oh, I was the first person who went into science in my family. Or maybe not so much these days, but certainly when I was younger, that was the answer you get. But I had a terrific advantage. My dad was a mathematician. His father was a French professor. My grandfather was a French professor, but sort of by accident because my great grandfather was the city engineer for Chattanooga, Tennessee. I had an ancestor on my grandmother's side who was an astronomer back in the 1800s. So, a fellow named Burleigh Annis. Burleigh is B-U-R-L-E-I-G-H Annis is A-N-N-I-S spelled the same way as my mother's first name, actually. So, there were scientists. My grandfather was an experimental error. He was told when he was seventeen that he only had a year to live, and so he dropped out of school and knocked around a while, and he was still alive after that year. And he thought, well, maybe he was going to live longer than that. He lived for another sixty years or so. But in that one year period a couple of aunts had taught him a little French, and he got interested in French, and he actually wound up getting a PhD from the Sorbonne in the translation and explication of French prepositions into English. It's about a five-hundred page thesis. It's real soporific. If you have trouble going to sleep, that's perfect. He did that, and then he came back and taught in Greensboro, North Carolina, at what was then called Women's College. It's now the University of North Carolina at Greensboro (UNCG). My dad was born in Chattanooga kind of early in the history of this, my grandmother – so, I said, my dad was born in 1918. He weighed thirteen pounds when he was born, and he was twenty-seven inches long. And the doctor told my grandmother afterwards, he said, "Mrs. Hooke, that's the biggest baby I ever delivered whose mother lived.". And in fact, the only reason probably my mother lived, my grandmother lived. Or maybe one of the reasons, or the reason I'm alive today, is that while the doctor was getting ready to tell my grandfather that he had to choose between my grandmother and my dad, my grandfather was nervously walking around outside the hospital, around the block. By the time he came back in for that consultation, my dad had been born. I've reflected a lot, particularly since this was 1918, the year of the pandemic flu, that all of us represent just this accident of history. Why was that egg chosen, and that month, and all the rest of that? We're all lucky to be here. I think about that all the time. Sorry for belaboring that, but that's maybe what you're – if we have about a century of these half hour interviews at this level of detail. Okay, so anyway, that's a little bit of the picture on my mom's side, she was born in 1920, and let's see, what will I say about her? Her dad was the managing editor of the Greensboro Daily News – she was born in Greensboro, North Carolina. So, he wasn't a print editor. He was kind of running the business side. He actually introduced live TV newscasts to the state of North Carolina. The Greensboro station was the first station to do this. And when my grandfather died, there was a moment of silence in all the TV stations all over North Carolina for his passing, at the time. He was a powerful force in my life for a whole set of different reasons. He knew how to shoot guns and fish and things that my scholarly grandfather on the other side didn't know how to do, and my dad certainly didn't know how to do. So, my brother and I had a lot of exciting times on vacations, visiting him and learning some of these dark arts of childhood. Okay, so that maybe gives you a little bit of flavor. The one other thing I would add is that my dad was a graduate

student. He went to North Carolina during the depression. University of North Carolina, and he was a graduate student at Princeton in Mathematics. When he met my mom, he had gone home to North Carolina, to Greensboro, North Carolina, and was bowling with a friend of his. There was a guy in the alley next to him who he knew slightly with a pretty girlfriend. My dad was the kind of person who, in eighty-five years, never intruded on any other person's life, never injected himself in any way. But he did something that day he never had done before or since, which was force an introduction. And that was my mom. Anyway, she was a math major at UNCG at that time, and she got married before she finished. She had to leave Women's College, and she finished up at Meredith College in Raleigh, North Carolina, where he was teaching after he got his PhD from Princeton, and where I was born.

MB: What an incredible background, Bill.

BH: Everybody has a story like that. I know this is supposed to be about me, but I think your story is far more interesting.

MB: I think it's really interesting, Bill, that your dad was born in 1918. I had no idea that he was born during the year of plague and how I can only imagine the circumstances at that time, and given the difficulties –

BH: My parents and my grandparents never talked about that much. The main thing, as I said, was this idea that he was thirteen pounds, that baby. Everybody asked me what was my grandmother diabetic or something. Well, she wasn't, but that's the kind of thing that happened a little more often back then.

MB: Yes. This is fascinating. Could you tell us the name, your dad's name, and talk a little bit more about his occupational history. You did mention that he was a mathematician. So, what kind of experiences led him to be a mathematician? Of course, he had family, it seems like –

BH: I'm not sure. We never talked about what made that choice at North Carolina, but I think he just had a knack for it. Wound up doing – back then, being a mathematician was like being a poet. People didn't see it as necessarily a pathway to anything useful. Or certainly in the culture that my dad grew up in, coming from an academic family, it was a little different for him. I should mention that my grandmother was a Northerner, and my grandfather spoke nothing but French to my dad during the first twelve years of my dad's life. And my grandmother was his only source of English. So, he wound up without a southern accent, even though he was Southerner all this time. And there are a lot of other stories about that. So, he went into science, again, for reasons that are embarrassingly obscure to me, but he was very good at it. Princeton. He got his PhD in three years at Princeton, and he actually wrote two PhD theses. His first thesis was a proof that something couldn't be proved using the rules of algebra. I forget what the

theorem was, but it was an important result, people thought. But his advisor said that's a kind of negative result. He should do something positive for his thesis. So, he wrote a thesis on linear p-adic groups and their lie algebras, whatever that is. I still don't really know. The family story is, I got this from my uncle who's a plasma physicist – that's another story – my dad's younger brother,who said that dad could have gone to MIT [Massachusetts Institute of Technology] after he got his PhD. But my mom wanted him to be closer to home and that's why he went to North Carolina State. I always felt like he was so bright. It seemed to me, this is really unfair to him, that he was kind of what we call an underachiever in his career. I mean, he did great things, and I'm very proud to be his son. But one of the things parents do for their kids is not accomplish too much. You look at the children of people who become president or leaders in their fields and so on, you find a lot of bitter kids, a lot of bitter adults, and frustrated adults because they could never–and my dad because he got his PhD in three years. My mother used to always say, "your dad got his PhD from Princeton in three years. You'll never do that because you've got my genes in you as well as his." She had a low self-esteem, but in fact, both my brother and I got our PhDs in three years.

MB: That's amazing.

BH: Which was more luck than brains, and we'll get into that maybe down the road. So dad got that PhD thesis. Could have gone anywhere but didn't. One of the things I'll just say about him is – and my mother was my main source of information about my dad – he really kept to himself. She said dad had a reputation at work for being very wise and having good counsel and all of that stuff. That was something that was held in high esteem for my brother and me. One of the miracles in my life down the road here is having always seen that as something admirable and so on, to find that maybe a little bit of that rubbed off somehow. The events of last January–that was just such an incredible day for me.

MB: Anyway, I want to come back to that.

BH: Well, we're a long way off from that at the pace we're going now.

MB: It will take us a little time, it's all right.

BH: By the way, because my grandfather got his PhD at the Sorbonne, when he came back to the University of North Carolina at Greensboro. He and my grandmother used to have a salon. The alcohol would start flowing about 5:00 PM or so, the bourbon, because this was the south. People would smoke cigars, and faculty members from the university would come over, and there was just this great conversation and a lot of laughter and so on. As a kid, every time I visited, we'd get to see this scene and participate in it and actually come to like the smell of cigar smoke, although I never smoked. Then some of the faculty members, the single ones, they

would try to hang on until my grandmother was forced to invite them for supper. It was just quite a scene. A spectacular thing to see growing up.

MB: That's insightful, Bill. So, did you say your dad worked at Princeton as well, all his career, yes?

BH: He got his PhD from Princeton. He went to NC [North Carolina] State, and he started teaching there on the eve of World War II. This was September of 1941, and the war broke out. One of the things he was doing, he taught during the war, he didn't serve in the military. He taught a lot of military people. He actually got an ulcer from the stress of that. He was teaching trigonometry to military people. He had one class, I remember, of students who had been declared 4F [unfit for military service]. They were just waiting to get their orders and be sent home. But he had been ordered to teach them mathematics, and that didn't go well. He told one story about coming into the room, and the class was quiet, which was unusual, and he wanted to seize the opportunity. He looked for chalk, and there was no chalk on the board, but there was the box of chalk on the desk, and two sticks of chalk were sticking out of it. He looked at the class, and he opened the box and took out a third stick, and there was this big groan because it all made book [took bets] on which piece of chalk he would take. That was the extent of their interest in mathematics. But he taught there until I was about three years old. He then took a job offer at what was called the University of the South. It's still called that. It's a big name for a very small college. It was all male at the time he went there. It was founded before the Civil War in Tennessee. Sewanee, Tennessee, very rural town, and he taught there. Then after five years, he took a one-year job at the Pentagon as a civilian employee. He had taught himself some statistics in the meantime, probability and statistics. There was an operations evaluation group that was doing operations research. Then he went back to Princeton, kind of as a postdoc for three years, and worked with a guy named John Tukey, who is very famous. Tukey is famous for the fast Fourier transform [FFT] and also a lot of statistical analysis. One of the things my dad did there when he was a postdoc with Tukey, they wound up investigating whether there was any real success to this thing called cloud seeding. And years later, when I got a job at NOAA that involved running a write-in program on weather modification, it turned out that people in that group knew my dad. They thought, oh, Lord, Hooke's son is coming to work in this field. We're doomed. One of them was a statistician, as it turned out, like my dad. Anyway, my dad worked at Princeton for three years. That was when I was in 5th, 6th, and 7th grade. I was in 4th grade here in DC. Then he went to Pittsburgh, where he was a mathematician for Westinghouse Electric, and then chair of the math department for Westinghouse, which he did until he retired in the early 1970s.

MB: I see. That is a fascinating life, Bill. So did you –?

BH: It got me to all these different school systems, which had an impact on me, my brother and me. Yeah, I'm sorry, I interrupted you. Maybe you had a question there. One thing that happens when you move around like that a lot, is you take social studies at different times at different places. And so, when I was first becoming aware of these things in New Jersey, I learned that New Jersey won the Revolutionary War. Then when I moved to Pennsylvania, I learned that Pennsylvania won the Revolutionary War. That created a healthy urge to do a little more critical thinking about what I was being told in life.

MB: That is so fascinating, Bill. I had no idea about your father's career trajectory, that you moved so much with him, so you lived in many different places as well with him. This is really fascinating. I'm also looking at the time–

BH: We're approaching the drop dead time. We can stop, if you'd like, and be disciplined, and you probably need to get on to things, so maybe that's the thing to do.

MB: So, with your permission, Bill, I'm going to stop the interview. Will that be all right?

BH: Yes.

----------END OF INTERVIEW----------

Transcribed by Samm Newton 7/10/2023
Reviewed by Molly Graham 7/13/2023
Reviewed by Bill Hooke 7/18/2023
Reviewed by Molly Graham 8/25/2023

Session 2 - May 2, 2023:
Interview Summary: Hooke explores his family history and the influence of his grandparents on his life. The interview delves into the details of his family background, including stories passed down through oral tradition and a long list of ancestors provided by his father. Hooke discusses the settlement of his grandparents in Chattanooga and Greensboro, as well as anecdotes about their relationships and personalities. The interview also touches on Hooke's experiences with his grandparents as a child and young adult. Additionally, Hooke shares insights into his family's involvement in word puzzles and writing, including his father's membership in the National Puzzlers League and his own interest in compiling lists of words.

Mona Behl: All right. Good morning, Bill.

William "Bill" Hooke: Good morning, Mona.

MB: Yes, I too have my tea here. [laughter] So, it is May 2nd [2023], Tuesday. I'm once again in Athens, Georgia, at my house, and Bill is in Alexandria, and we're just going to take off where we left last week. Bill, I was actually so intrigued by all the details of your family that you shared. I'm curious how you came to know so many details of your family. Were they passed down to you through your dad? Family stories? How did that happen? So many details.

BH: I think it was orally. The family was a great bunch of talkers, particularly on my dad's side. Good conversation was important to them in many ways, and they all enjoyed it. They liked to talk about their relatives and so on. On my mother's side, I know we'll talk about that later, but one time I got a long list from him of all my ancestors going back to 1643 when the first folks came from Ireland to North Carolina. So, it was different on that side.

MB: I see. You mentioned where your mom and dad were from and your grandparents; they came and settled into Chattanooga and Greensboro, correct?

BH: Correct.

MB: How did they come in and settle there?

BH: My grandfather was, of course, born in Chattanooga, so he was returning to his roots. I think my grandmother was along for the ride. I'll tell you just a couple of quick stories about them. When she met him, he was polishing a car, which was kind of a rare thing to have in those days. She said, "That's a nice car. Would you give me a ride?" He said, " Well, if you help me polish it." [laughter] Then sometime later, when he asked her to marry him, she looked at the wedding ring he gave her for the proposal, and inside someone had scratched by hand the word

“fickle,” which meant that this person was not to be trusted. He changed his mind. So, she can only assume that that was the last person he had asked to marry, but she married him anyway. That's the sort of high minded, noble ancestry that I come from.

MB: That was very interesting, Bill. You mentioned also it was your dad who was told that he was going to live only one year, correct?

BH: No, it was my grandfather.

MB: Your grandfather. Sorry.

BH: So, he dropped out of school and that was when he learned a little French from his aunts. I don't have any idea how they taught him or what their names were. Then when he looked up anyway, he decided he was going to study French. The next thing led to this trip to the Sorbonne. That kind of thing was easier in a way, in those days. My dad went to college during the Depression, and he had a friend of his from Greensboro, North Carolina, who was deciding the week before school started whether to go to the University of North Carolina or Harvard. Harvard was desperate for students then. There was none of this three percent of applicants stuff.

MB: I see. So, do you know French, Bill?

BH: No. It's a minor peeve that I have with my dad. I don't know whether my brother shared it or not. I told you that my grandfather spoke nothing but French to my dad for the first twelve years of his life. That would be a painless and wonderful way to learn a language. My dad failed to pass it on.

MB: I see.

BH: That led to a lot of problems when I had to do languages in graduate school.

MB: I see. So, Bill, I'm curious to know more about the relationship and the dynamic that you had with your grandparents. You did mention that if I remember correctly, you said your grandfather was a powerful influence in your life. So, were you close to your paternal and maternal grandparents? And what stories from their lives did they share with you?

BH: Yes. So, one important thing they did was live until I was an adult. [laughter] I got to know all four of my grandparents, both as a kid and at least as a young adult. I've always been thankful for that. A lot of people have just the opposite. They never met their grandparents. I would say they were all involved in our lives in different ways. My mother's parents were more

important when my brother and I were little. I think as we got a little older, about ten years old, we began to recognize that it was kind of more fun at my maternal grandparents. The only vacations we ever had when I was growing up were visits to the parents. We did that twice a year, and usually for about a week. We were sort of shuttled back and forth between the two homes, which are both in Greensboro at those times. A lot of contact hours. My dad's mom would take my brother and me places. A favorite was the Guilford Dairy because attached to the dairy was an ice cream parlor. Guilford is the county that Greensboro is in. We'd get ice cream there. My dad's mom had a really wry sense of humor. My mother's mom not so much, but my dad's mom was a lot of fun to be around. She and my dad and his dad – so, she and her husband, Lucy was her name, and Malcolm was his name, and my dad Robert, they belonged to something called the National Puzzlers League. What this league did was they composed word puzzles, anagrams and transposals and deletions and rebuses. They had a little journal. There were very few members of this. My dad at one point, there were only one-hundred-and-thirty members, and my dad was president of this outfit. Later on, everybody had a nom de plume [a pen name]. My dad was called A.B. Ginner, and my grandfather was called A. Bizdad, namely A.B.'s dad. And my grandmother took the name Lena Ginner, lean against her, and they wrote these puzzles and so on. My dad, in addition to being a mathematician, wrote crossword puzzles that only had words that were considered out of use by Webster's Second International Dictionary. They used the big unabridged dictionary, which included a number of entries termed archaic or obsolete. When he worked crossword puzzles, he tended to just use one set of the definitions, either the across or the down, because otherwise it was too easy for him. He compiled lists and hard bound books of all the three letter words in the English language, all the four letter words in the English language, all the five letter words in the English language. He kind of stopped there mercifully. He had these around. Words were a big deal for the family – and writing. They had friends who were writers who would come over to the salons I mentioned last time. They weren't well known writers outside the south, really, but a couple of them had a little bit of a reputation, and they were colorful characters.

MB: This is all very fascinating, Bill. I had no idea.

BH: You made a big mistake asking me about all this. I got a lot of gray cells that are apparently all tied up remembering all this stuff. [laughter]

MB: [laughter] So, you said your grandparents lived for a long time. Do you mind if I ask, how long were they alive for?

BH: Well, I think my dad's mom was the first to die, and she died when she was seventy-four. She had a form of cancer. My grandfather, her husband, was so used to having her take care of him that he couldn't take care of himself after she died. They had an eighty-eight year old come in and take care of him, at the age he was about in his late seventies, and he died about eighteen

months later. They talk about broken hearts and stuff. I don't know whether that was true. Anyway, there's probably a little more family history there, but that's chasing a rabbit. On the other side, my grandmother and my grandfather in their eighties, went into a home, which you'd call a nursing home, I guess, today. Everybody thought my grandfather, her husband, who was blind and so on, would be the first to die. But he fell on her once when she was trying to help him get from point A to point B in this place, and broke her arm, and the doctors reset her arm, but she kept tearing the bandages off. She died about twenty-four hours later. Then he lived a couple more years after that. So, they were both in their late eighties. My dad lived to be eighty-five. He died in 2003. My mom lived to be ninety-one. She died in 2012.

MB: Great, thank you. Thanks so much for sharing.

BH: Last week, I just passed the big eight-zero, so I'm in the zone.

MB: Belated happy birthday, Bill. You are going to live to hundred years or more, and that's my wish for you.

BH: It's not obvious that people who live to be a hundred or more enjoy it very much. They enjoy the day they turn a hundred.

MB: A healthy and happy life, that is what I wish for you.

BH: There you go. Thank you. Back at you.

MB: So, Bill, another question that I had is--all of this is so interesting. So, you tell a great story of how your parents met. I wanted to know a little more, so how did their relationship develop? When did they get married? If you could go into those details, that'd be great.

BH: Sure. Yeah. Okay. I think I can do a little bit of that, and it's mostly stories rather than a nice timeline. My mother was voted the best all-around in her high school, and they actually gave her a silver trophy. That tarnished trophy is sitting in my dresser drawer in the bedroom there. I could go get it. Because she was so proud of that. She talked about that all the time, that she was not only the most popular one, but the best student, blah, blah, blah. She was a social queen and all of that. It wasn't until after my dad died, the sort of ten year period there – well, maybe we'll get to that in a little bit. But, the social life in Greensboro, North Carolina, at that time there was sort of an in crowd and they all went around together, and it was sort of mix or match, kind of. The relationships came and went, and nobody made the mistake of waiting until the last minute to ask anybody out. So, my dad knew nothing of this, and would always call her after she had made other arrangements. But she quickly learned that he was just clueless socially. So, she would sort of not allow herself to get entangled with somebody else and started

keeping that day open for him. That was the only way they would have gotten to know each other. He was just the opposite of this crowd she was hanging around with. I think what must have worked for him, they didn't discuss it, he was incredibly smart. I think I told you maybe that our mother told my brother and me every day we were growing up, that our dad was incredibly smart, and we were not as smart as he was because – she didn't use the DNA language then, but we had her DNA mixed in with his was basically the idea. So that was our parenting. Dad was God, and mom was his deputy. Somehow, she decided – they got married and she went back with him to Princeton for the year that he was finishing up, and she dropped out of school. She was a math major at UNCG [University of North Carolina Greensboro], and she dropped out of school and then finished up in Raleigh, where he got his first teaching job (NCSU), at a less prestigious college called Meredith College. It's still around today. She also used to talk all the time about how she wished she had had the degree from women's college in North Carolina. As I said, until my dad died, she functioned really as his deputy. We always knew exactly what dad wanted and what was great about dad and how we should be like him and so on. We didn't know much about what she thought about things. That came out a little bit later. Part of it, at least for me, was somewhat sad because I could tell – I think maybe she might have had some regrets over time because he didn't change. He was still kind of an introverted guy and not much of a social guy and didn't like to travel, things she really wanted to do. I think she realized that if she had married some of the other kids in her high school, some of them were from pretty wealthy families, she might have had a different kind of life. I'll just give you one anecdote from that. I said that my grandfather got a PhD from the Sorbonne. My dad was alive then. He was a little kid, and every story about my dad was that he was born an adult. At one point in Paris, both his mom and his dad were sick, and he was doing all the, at the age of five or six or seven, running around doing the things that they needed to keep the household going. And when my mom expressed many years later that she would like to go to Paris. His answer was, I've been there. Try that in a marriage today. [laughing]

MB: It speaks volumes about the depth of their relationship, Bill. I think you've mentioned this before also in living in the real world, about your mom being your dad's first and foremost supporter and just the steady and unwavering support that she provided to him all throughout his life.

BH: They really had closed ranks. I think I could probably remember a time or two when they disagreed about something and we knew about it, but it couldn't have been more than one or two times, and they must have disagreed about a lot more, but we didn't see it.

MB: That's incredible. So, another question that I had was, last time during our interview, you mentioned that your dad's younger brother was a plasma physicist.

BH: Yes.

MB: Do you mind talking a little bit more about your uncle? Because I've heard you talk about your uncle a few times.

BH: My Uncle Bill. I was named after him. He was very important in my life. He still is. He was probably everything my brother and I wanted to be because he was smart like my dad. He didn't see himself as smart in fact, I think he'd have been quick to tell you the opposite. Yet I realized later on, I keep seeing a lot of, we all see these citation things passing our desk. "Are you the author of this paper?" And a lot of them are papers he wrote, plasma physics papers he wrote. My dad went back for a postdoc at Princeton, and then my uncle-who was about ten years, or I guess he was about thirteen years younger-he was halfway between me and my dad in age. He arrived at Princeton to be a graduate student in plasma physics. My dad, by that time, had bad knees. He couldn't really play sports with my brother and me much, but my uncle didn't have kids at the time, but he was married, He jumped in, played football with us, and did other things. He was always joking and laughing and having a great time and making time around him great. Then, as time went on, he got his PhD. He stayed in Princeton. He worked in the Princeton plasma physics lab. When Rush Holt, who was a congressman from New Jersey, from that district and worked at that lab, spoke at the Colloquium, I asked him if he knew my uncle, and he said, yes, he did. My uncle was big in the non-fusion applications of plasmas. He worked on Tokamak, which was the big plasma heating facility and the big plasma fusion facility. But he kept telling me over and over, he said, don't believe the plasma physicists when they tell you it's the energy source of the future, that it's almost at hand. He said it's nowhere close. It's nowhere close. Late in his career – there's a place in Bellagio, Italy, there's a conference center that the Rockefeller Foundation runs. He organized a couple of meetings over there, Lake Como, for the non-fusion applications of plasmas. People came from all over the world to attend these meetings. He told me, he said, "It's the first time plasma physicists could hold their hands high." [laughter] He just was like that. He liked to chew tobacco because he loved to go into these big deal plasma physics meetings with all the hotshots and so on and be sitting around the table and watch their facial expressions as they begin to realize what he was doing. That's the kind of person he was. A big football fan and a sports fan, and just an incredible guy. He married his girlfriend from fifth grade, and they had probably the most loving relationship that undoubtedly the most loving relationship I've ever seen. Well, that's not quite true. They were maybe tied with my dad's sister and her husband, but my uncle and his wife, they just loved each other to pieces. She was so gentle and sweet. She was a piano teacher. She worked in the development office at Princeton when he was there. Then she got dementia. She got Alzheimer's when they were elderly. My uncle "retired" in his fifties and moved back to North Carolina. But at the age of eighty-something, he was still getting research grants from DARPA [Defense Advanced Research Projects Agency] to do these non-fusion applications of plasmas. He was part owner of a drugstore on the main street in North Carolina. It was actually a street where a shooter came down the street one day and disrupted things. Commonplace thing

today, but back when that happened, it was very rare. He was in the drugstore diner when that happened. He would do his physics there in the diner and kind of go over to the university and he had some graduate students, and they did some things. He worked, as I said, until he died, really. So, the whole time I had this family of people who retired early, but he was the inspiration to me. I kind of felt as long as my uncle was still working, who was thirteen years older than I was, I ought to be working, too. Only I did it in a more formal way and I'm just tremendously happy I did. These last twenty years or so of my career were the best by far.

MB: That's lovely, Bill. That is fantastic to hear. So, I also see that we're at the top of the hour.

BH: Molly [Graham] is going to take off the gloves after the next one of these sessions and say, Mona, you have to pick up the pace. You have to get him to give shorter answers. Don't let him roam.

MB: Do I have your permission to stop the recording?

BH: Yes.

----------END OF INTERVIEW----------

Transcribed by Samm Newton 7/10/2023
Reviewed by Molly Graham 8/14/2023
Reviewed by Bill Hooke 8/15/2023
Reviewed by Molly Graham 8/25/2023

Session 3 - May 9, 2023:
Interview Summary: In this interview, Bill Hooke discusses his father's research in p-adic numbers and statistics, his uncle's influence on his life, and his family dynamics. He talks about his experience with religion, his mother's reaction to his church attendance, and the complicated relationships within his family.

Mona Behl: Good morning, Bill.

William "Bill" Hooke: Good morning, Mona.

MB: It is May 9, [2023], Tuesday. It's my happy Tuesday. Thank you so much, Bill, for taking the time to meet me. As I was just mentioning to you, I'm so inspired by the story of your father. I think he was a remarkable person. What a genius. What a brilliant guy. You had mentioned that he worked with John Tukey, and just for the record, I wanted to note that John Tukey was a renowned statistician –

BH: Very much so,

MB: – who worked at Princeton. Your father worked as a postdoc with John Tukey, and I learned that he got to work on a variety of different projects, including a thorough analysis of weather modification science that was done in the 1950s. So, Bill, what can you tell me about your father's research? You mentioned that he got his PhD in three years from Princeton, and he focused on p-adic numbers. What can you tell us about p-adic numbers and your father's work on that topic?

BH: Nothing. It's very much a dark part of my background. I knew that's what he did, but I never was able to grasp it. I think he despaired of success. He was having so much trouble teaching us simpler mathematics that I think he despaired of getting us into the delights of his thesis. By the time I was aware of these things, he had moved on. I'm afraid that subject is going to have to be unpacked by somebody else.

MB: No problem, Bill. The other thing that you mentioned, and this is particularly taken from The Living on the Real World, you had mentioned as you were providing a review of Tim Palmer's book, The Primacy of Doubt, you mentioned about annealing algorithms and your father's – do you remember?

BH: Yes. My father moved from algebra to statistics. I think I told you that he got out of college teaching just when it was getting to be a good thing. Maybe I told you that when he got his first job at NC [North Carolina] State, they had two positions open. One was for $1,700 a

year, and one was for $1,800 a year. And my dad said, "What's the difference?" And the dean gave him kind of a funny look and said, $100 a year. So, he knew which one to take. I figured out later in graduate school, allowing for inflation, I was making more as a graduate student in geophysical sciences than he was making as a PhD mathematician. But he went from NC State to the University of the South in Sewanee, Tennessee. He kind of thought his two children were too expensive to raise on the teacher's salary there. And he taught himself statistics, got a job at the Pentagon, and then after that year went up to Princeton. Well, life as my dad always used to tell me – he was very interested in problems that were tough to solve. He said if you put three mathematicians in a room and they can't solve a problem in an hour, it's a tough problem. He thought most of the interesting problems in the world didn't have solutions. He used to say things like, "Linear problems are all the same. Nonlinear problems are always different." When he worked for Westinghouse, the job he took after the Tukey postdoc, they were full of engineering problems. A lot of them had to do with Queueing Theory because Westinghouse built elevators. And the question was how many elevators do you need to serve a building? He got involved – the one patent he ever got was for something called Direct Search, which was looking for optima when there was no formula for them. The example that he gave at the breakfast table, or the dinner table, was you have an airplane and you're trying to minimize its fuel consumption, getting from point A to point B. You can choose various altitudes and various speeds and various settings and so on. How do you do that? He had a device. They had a demonstration for it. They had a little section about as big as our laptops that was contoured. The idea was to try to find the highest spot on this contoured terrain, on this thing. What the machine did was look for a local optimum and maybe stick around there for a while. But after a while, it might go look and see – it might just go off in different directions and see if it could find anything higher than that and pursue that. The whole strategy for doing that was very much related to what Tim Palmer was talking about. Anyway, that paper has a lot of citations to it. Now, I wrote a paper back in the '60s about this and got the patent on it and it's got thousands of citations. I was shocked to see that.

MB: Yes, I looked up the paper as well. I believe it's called "Direct Search Solution of Numerical and Statistical Problems" –

BH: That sounds right,

MB: – in The Journal of the Association for Computing Machinery. And you mentioned that this paper did get cited over six thousand times in the AI [artificial intelligence] world. That's remarkable, Bill.

BH: Yes, and he would have gotten a big kick out of that if he had been alive to see it.

MB: I also wanted to ask you about a book that he wrote. What can you tell us more about the book that he wrote?

BH: Well, he wrote a few of them, so I'll just mention the titles briefly and you can tell me which one you want to pursue. Westinghouse had a very interesting program when I was a high school student when we were living in Pittsburgh. They produced a series of books that were kind of introductions to different branches of science. He wrote a book entitled Math and Aftermath for them. Then there was a book he wrote, a little thin book, Introduction to Scientific Inference, which was a pretty serious book. Then after I'd been talking with him about books that Lewis Thomas had written, The Lives of a Cell and so on, my dad said, "Oh, I never realized you could actually write a book like that." So, he wrote a little book called How to Tell the Liars From the Statisticians. In a way, it was not quite a knockoff, but it was also inspired by another book that had been out for a while, called How to Lie with Statistics. But his How to Tell the Liars From the Statisticians was a series of vignettes illustrating some of the peculiarities of statistics. Some of them were humorous, and some of them were cynical, and they were different, sort of popcorn sized essays, usually just a few pages.

MB: That's remarkable, Bill. I'm very much looking forward to reading that book. I did find it on Amazon yesterday.

BH: My brother and I, rain or shine, we each get about fifteen dollars a year in royalties from that book. You help make me a wealthy man. [laughter]

MB: That's fabulous, Bill. Thank you again for sharing that. What a remarkable man and what a remarkable life. You were also mentioning about your Uncle Jack.

BH: No my brother Jack, my Uncle Bill.

MB: Yes, your Uncle Bill.

BH: Uncle Bill was the plasma physicist. My brother Jack followed in my dad's footsteps. He went into operational research and queuing theory.

MB: I want to talk more about your Uncle Bill first. We talked a little bit about him. He was a plasma physicist. You mentioned he was as smart as your dad. I was very intrigued by the fact that he was midway between you and your dad's age. So what kind of relationship did you have with your uncle? As a friend? What was his influence in your life?

BH: Very much. I think I told you that my brother and I were kids in Princeton. My dad was doing a postdoc there, and my uncle and his wife were very young. They showed up as a PhD

graduate student in plasma physics, and instantly – he'd come over and play football with us and things of that sort. My dad had a very wry sense of humor. My Uncle Bill was more jocular, and he was always having fun with things. I'll give you one example from later in life. When I got my PhD and started doing work in atmospheric science, we were talking about the citation index, which is now Google citations or whatever. He said, "Bill," he said, "if somebody comes to you and says, oh, did you write this paper in plasma physics," because his name is also William Hooke, he said, "Don't tell them no, that's my uncle. Say, Yes, that's just something I don't talk about very much in this crowd.'" And he said, "And I'll take credit for your papers in atmospheric science." That just shows you the high moral standard that the Hooke family had.

MB: You also mentioned he used to chew tobacco, and at the physics conference that he hosted in Italy, you mentioned how he loved watching the facial expressions of his colleagues when they saw him do that.

BH: Yeah, chewing tobacco and offending people. He was that kind of person and probably very much in the mold of my grandmother, who had kind of a sly sense of humor like that – his mom.

MB: It feels like your dad and your uncle, personality wise, they may have been very different people. Is that right, Bill?

BH: Yes, everybody in our family said that my dad was born an adult. He never really had a childhood, and my uncle probably died a child. [laughter] I'm probably more on his path, it seems to me. Anyway, that just was the way he was. He was always a kid at heart, and he was very interested – he wasn't a religious person exactly, but in his later life… if you're a plasma physicist, you're interested in stars, and cosmology is not far away and so on. He just got very interested in the origins of the universe. I think he was beginning to believe there was kind of a higher power out there. You get into this whole question of ultimate causation and so on. So, he was wrestling with notions like that right up until the end, and as I said, doing plasma physics for DARPA [Defense Advanced Research Projects Agency] and guiding postdocs himself and graduate students and technicians and so on.

MB: So, Bill, I hope you don't mind me asking you – your dad is mathematician statistician. Your uncle is a plasma physicist. Did they come from religious and spiritual backgrounds?

BH: No. Not really. People tended to go to church more often as a matter of course back in those days. I think my grandparents on my dad's side were sort of loose church goers. On my mom's side, they were very serious. But my dad's father actually taught Sunday School for a while. I can't imagine how they asked him to do that. But he would have contests for people. He was a big sports fan, and so they would compete for little trophies in class. That was his way

of passing that kind of time. I don't know how they'd characterize themselves as Christian or as agnostic or whatever. We just didn't get very deeply into those things when I was a kid. It's a little different on my mom's side, but that's another story.

MB: Yes. So, let's come to your mom's side in that case. You have mentioned your mom. Her name is Annis.

BH: Yes.

MB: And she was a math major, and she dropped out of high school when –

BH: Dropped out of college.

MB: Dropped out of college. So, what else about your mom? She was your dad's biggest supporter. You've mentioned she was the deputy.

BH: Yeah, she kind of acted as his deputy, and more and more so as the years went by, until he died. And then the side of her that I remembered from being a very small child before she had really mastered the whole deputy thing, kind of came back into the fore a little bit, and she was more herself. Her environment was I guess what you'd call a strong Christian environment. Her dad and her mom were from rural North Carolina in some kind of farming community in the vicinity of Greensboro and Raleigh. They had known each other for church socials for seven years before they got married. That was their only kind of contact. My grandfather did get off the farm. He wound up being managing editor of the Greensboro Daily News. He was the person who did the business part of it, I think we discussed that. But he was very much a pillar of his church. In the south at that time Baptists were sort of the most numerous denominations, but he was a Presbyterian and he was an elder of this huge Presbyterian church. Not huge in present day standards, but a church that I remember looking much like a cathedral, actually, in Greensboro, the First Presbyterian Church of Greensboro. His faith was very strong, and my mother's faith was strong. One of the things that she told me, this was one of the rare times when she suggested that she and my dad weren't on the same page, she said she really regretted the fact that when they were dating, he had taken her to church every Sunday, but after they got married, he pretty much stopped going. When they'd move around to Princeton, to Raleigh, to Sewanee, to D.C., back to Princeton, he would say, "Oh, we're not going to stay anywhere long enough to belong to a church." And when we got to Pittsburgh, that changed a little bit. We started going to church every other Sunday, and my mom hated this. That became my attitude towards church. So, she said people were just critical of them because they only came every other Sunday. My whole picture of church at that point was hypocrites and judgmental and all of the things that are true of the population at large, and also true of Christians or Buddhists or Hindus or whoever. The church never took hold. I had a good experience during these Sunday mornings when I

would go. I had good friends in my little Sunday School class, and the pastor was a really nice guy, an older grandfatherly type. Then years later, and we'll get back to this I'm sure, by the time – when I was in college, I very much started seeing myself as an atheist and carried that all the way through until I was in my early thirties. When I did go back to the church, or into the church really for the first time, because I finally understood what it was all about, I expected my mom, at least, to be pleased, and she wasn't. She said, "Well, you and your brother talked us out of all of that when you grew up." She said, "We sent you to church so you could make your own decision." Anyway, it was kind of a blow to me, actually. I was surprised to hear that. As you could tell, it still registers today. But my grandfather, by contrast – I think maybe I told you this story. My mother didn't tell me this story until just a couple of years before she died. But my grandfather fell in love with somebody else after the seven years of courtship with my grandmother. They were engaged, but he asked her permission to break it off, and she said no. And he married her anyway. And they stayed married for their entire lives. I'm still processing that probably ten years after hearing that from my mom, because it just causes a whole reset in terms of my attitude towards my grandparents and my parents, for that matter. That's a big digression down this road, but there you have it.

MB: Well, thank you so much for sharing that, Bill. I also see the time so, just very briefly, would you mind talking a little bit about your maternal grandmother? I have heard about a maternal grandfather.

BH: She was extremely judgmental, and by the time I got old enough to really understand what adults were like and how they thought and the differences and all that, rather than just seeing them as a generic class, I could see that, and she wasn't much fun to be around. Part of the processing was, I tie up to this thing that she and my grandfather were making everything look okay, but I'm not sure it was. I don't know how to describe this. I still remember one occasion we were living in Pittsburgh and visiting them in Greensboro and getting ready for church, which, as I said, my parents didn't go to it very much, but when they were with my maternal grandparents, they did. I heard my mother yelling at my grandmother upstairs. I was about fourteen. She said, "Mother, the only time I feel like a child is when I'm at home with you." And that connected a lot of dots for me. I began to realize that my mother's attitude towards me was nothing personal. It was just the way mothers were. It took me a long time to figure that out. I'm sure you and everybody else on the planet figured that out much earlier, but that helped me get through my teenage years, not necessarily – but my grandmother was judgmental, and she got more and more that way as time went on. You've probably heard me say that as we age, we become exaggerations or caricatures of our younger selves. That's where I saw that. I thought to myself – I've been fighting the tendency, because I can see aspects of my character that reflect my mom and her mom, and I've been desperately trying to avoid this as I get older. Some of what you see is probably overcompensation for that. Some of what you see is probably a failure to get over that. All of it shows way too much attention to that, versus just being myself.

MB: What an incredible story, Bill.

BH: Well, everybody's mother has a big influence on them, I think. I hope this is useful to you. It's certainly therapeutic for me. I should probably pay you fifty dollars an hour or something for these sessions.

MB: It is most definitely useful, Bill. This is the story of your life. It speaks about where you came from and the influences that your parents and grandparents have had on you. So, again, thank you so much.

BH: One aspect of this, where I do think it's relevant is a lot of careers are based on just stellar science, the ones that are worth noting, and mine is kind of devoid of that. I've got little bits of science here and there that were okay, but mostly my whole career was about relationships. Again, that's something I see more in the rear view mirror than I saw at the time. A lot of it was shaped, some by this, some by just the fact that I'm describing these people, and I've been realizing after talking with you, I had very few friends growing up. So these few – the parents and the grandparents and my brother and so on – loomed large in my sort of universe of possibilities. It wasn't until getting to college and becoming an adult that I started seeing a broader range of far more interesting and pleasant people in many ways. Anyway, thank you for helping me see that now, at the tender age of eighty.

MB: Thank you so much for sharing this, Bill. This is, again, incredible. Do I have your permission to stop the recording, Bill?

BH: Yes.

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Transcribed by Samm Newton 7/28/2023
Reviewed by Molly Graham 7/31/2023
Reviewed by Bill Hooke 7/31/2023
Reviewed by Molly Graham 8/25/2023

Session 4 - May 23, 2023:
Interview Summary: This discussion primarily focuses on the personal and professional life of Dr. Hooke's brother, John Allen Hooke, who was born in 1945 in Raleigh, North Carolina. The interview also delves into the history and significance of operations research, with Dr. Hooke providing examples from World War II to illustrate the practical applications of this field. He further discusses the role of science and engineering in warfare, highlighting how military needs have often driven scientific advancements and investments. The conversation also touches upon the recruitment of European scientists and engineers during and after World War II and their significant contributions to the U.S. space program.

Mona Behl: All right. It is May 23, [2023]. Hello, everyone. My name is Mona. I am with Dr. Bill Hooke today. I'm in Atlanta, Georgia, and Bill is in Alexandria. So, Bill, we'll continue where we left off. I'm delighted to learn more about your parents and your grandparents. I now wanted to focus on your brother, and I'd love to learn more about your sibling if you could tell me his name, where he was born, his profession, and we can go from there.

William "Bill" Hooke: Yes, sure. His formal name is John Allen Hooke. He was named for John Allen, Colonel John Allen, who is some family ancestor who fought in the Civil War, I think. He was born in 1945, two years after I was, also born in Raleigh, North Carolina.

MB: Okay, fabulous. Now you've mentioned before that he got his PhD in operations research.

BH: Yes, from Cornell. And let's see, it would have been, I guess, about 1969.

MB: Bill, I didn't know that fields like this, disciplines like this, exist. Do they still exist?

BH: Sure.

MB: [laughter] I mean, I didn't know that you could go get a PhD in operations research.

BH: Well, I might be a little vague on the details, or he might tell me the department had a different name or the discipline within the department had a different name. Operations research has an interesting history. So just very quickly, in World War II – and this is sort of an example of the problem – the Allies were trying to blow up German submarines, and they were always looking for them. The submarines, because they were diesel powered, would travel on the surface. At the same time, an aircraft that was hoping to drop depth charges on the submarine would see them. The submarine would see the airplane, and so they would dive. Then the airplane would turn around and then have to come back and try to drop depth charges to hit the submarine. They could set the depth charges to go off at different depths. They weren't having

much success, so they consulted a scientist or two. I think it wasn't long before somebody said, "Well, do you have any data on what you set the depth charge for and when it's successful?" As soon as they started collecting data, actual data, they found out that they tended to hit the submarines when they set the depth charge at zero. So, the submarine was just going beneath the surface, and all this setting up for fifty feet or a hundred feet was useless. Operations research has always asked simple questions like that. I remember one time my dad was telling me about a problem at Westinghouse that had come up. Westinghouse had an outfit here in Baltimore that was doing an experiment. My dad was based in Pittsburgh. They needed some help. So, my dad sent one of his people down to Baltimore here to help out. Here's what Doug Schaefer came back to report. He said, "they told me that they were doing different experiments." And he said, "Experiments?" And he said, "Well, if you get outcome A, what are you going to do?" And so they told him what they do if they got outcome A from the experiment. And then he said, "Well, if you get an outcome B, what are you going to do?" And I think there were maybe a couple more, so C and D. He said, if you listen to them, they were going to do the same thing regardless of how the experiment came out. We saved them a quarter of a million dollars. My dad looked at me when he was telling me this at the dinner table, and he said, "It's hard to brag about that in the company [laughter] because you're really throwing somebody else under the bus." He didn't use that expression, but he said, "It's hard to show people your worth." But they saved them a quarter of a million dollars, which was big money in the '50s. There's a great book I'm trying to remember. Somebody at AIP [American Institute of Physics] wrote it, and they had looked at a number of other World War II cases. One involved aircraft and shooting ammunition at other aircraft, and the armament came in different flavors. Some of it was heavy armament and could fire a few rounds of ammunition. Some of it was lighter armament [and] could fire many more at a given time interval. Because the environment was crazy and the target was moving around and so on, there was this trick – if a heavy bullet hit the target, it would do some real damage. A light bullet, because there were many more of them, might be much more likely to hit the target, but maybe not do so much damage. What should they do? They kind of gathered – warfare did that. The National Academy got started in the Civil War trying to answer questions like that. It was the first time that ships were ironclad, and so there were some questions like, does iron float? [laughter] And some questions about – the Union cannons were blowing up. That was another one. The question was, why? And the answer turned out to be because the gunpowder had advanced, and the iron wasn't strong enough to contain the explosion of the gunpowder anymore. So, they couldn't rapidly come up with different, stronger metals. They just made the back ends of the cannon very fat. If you look at Civil War cannons, they all have this big, fat back end, lots of iron there to keep them from blowing up. That's how the National Academy of Sciences got its start.

MB: Wow. That is fascinating, Bill. I'm reading an article in Physics Today, and it talks about how many scientists and engineers were recruited from Europe and other countries, and they were enlisted. There were special arrangements made to bring them to the United States. So, the

article not only talks about the international kind of workforce that made [up] the workforce of that time, but it also talks about how war became a way to fund science –

BH: Oh, big time. Yeah.

MB: So, this is, again, fascinating.

BH: A. Hunter Dupree's book [Science in the Federal Government: A History of Policies and Activities] on the history of science in the US points out that one of the first US Investments was in West Point. So, a military academy was one of the first things we did. And ever since then, a lot of the great expeditions like Lewis and Clark and Zebulon Pike and John Wesley Powell and a lot of research voyages had military purposes and connections. You mentioned World War II and getting European scientists after the war. The big one, of course, was Wernher von Braun and all the German scientists who built the missiles and got the U.S. going in the space program.
MB: Absolutely, yeah. I also learned that several people who were hired, a lot of talent that was hired, these were engineers who probably may have been mistaken for physicists. The article also talked about how a lot of engineers were hired at that time from around the world, and they may have been categorized as physicists for their contributions to world wars and research and development. Well, thanks for sharing that context, Bill. I want to learn more about your brother. He got his PhD in operations research, and then he had a fantastic career in Bell Laboratories until his retirement at the age of fifty-three. So please do tell a little bit more about him.

BH: Yes, okay. Most of his accomplishments, I think, were really so he did queuing theory. And queuing theory applies to things like elevators. For example, how many elevators do you have to have in a one hundred story building or something to keep wait times below a certain level? By the way, there's some social science there. It turns out that people are much more willing to wait a long time for an elevator if there's a mirror.

MB: Is that right?

BH: That's an important piece of social science. The best way to amuse yourself is focusing on yourself while you're waiting for that elevator. That was big when my dad worked at Westinghouse and did queuing theory related to elevators, said my brother. Queuing theory dealt with things like the big flux of telephone calls on Mother's Day and how you have enough infrastructure to handle peak loads like that, but you're not wasting money the rest of the time when you're not using all that. The same kind of thing carries over to cell phones. Early on in Bell Labs, the big thing was they used to bill you for every call, and it took a certain amount of time for the computers of that time to bill you before they would let you talk. The question was, how long did you have to wait for the computer to get around making sure they were charging

you before they would let you start talking. But he was like me. I think he was probably an average scientist, but somebody decided early on he would amount to something if they put him in a management position. Bell Labs was much more disciplined about that than the government is. He said his first management job was to run a group of cast offs doing work that nobody cared about very much. And the idea was, if he turned out to be a bad manager, they wouldn't lose much because they weren't getting much out of these people anyway. And win, lose, or draw, everybody who started out with that assignment was transferred after six months either back to a bench scientist position or to a real management job where the stakes mattered a little bit. He was in the latter group. He got transferred to a real job and at the end, I think he was managing a group of, I don't know, several hundred people. So big responsibilities. All again in this area of queuing theory.

MB: That's fabulous, Bill. Thank you so much for sharing that. Bill, how similar are you and your brother? Or how different? It seems like a lot of those dinner table conversations shaped your career trajectories and the way –

BH: Well, he was always a little better. I think I told you when I went to high school, I didn't even know there was such a thing as a valedictorian kind of thing based on getting the highest academic score. I might not have been that interested anyway, but when he came along, that's what he did. He got a perfect 4.0. That was back when you didn't get extra credit and so on for all these things. It was just A equals four. He was valedictorian of his class. I had a much rougher assignment because I wasn't anywhere in that top tier. I had to read the names. Maybe we talked about this. I had to read the names of a third of the graduating class. There were two other people that also each read names of a third of the class. I had not done enough preparation. [For] a lot of these people, high school was the highest amount of schooling they were going to get. So, if I mispronounced their name, it wasn't a good thing. I remember feeling kind of bad about it afterwards. I'd much rather haven given a valedictory talk. But he did that. He also got his PhD in three years, like my dad. Because he retired early and he managed a bigger group, I'm fond of telling everybody that he's my smarter, better looking, richer, younger brother. Now, I think I have to say he's also my taller, younger brother because I think I've shrunk a little more than he has. But the years have not been as kind to him. I think I told you he has Parkinson's, and he has dementia associated with that. He has a lot of memory problems now. It's very painful to see, but at his peak, he was a rising star in Bell Labs. He didn't have as good an experience with his supervisors as I did. He wound up working for one guy named Joe Nacchio who drove people excessively and set unrealistic goals and demanded that they sacrifice family values and so on for everything else. Joe Nacchio would eventually leave Bell Labs. He was featured in AT&T TV commercials for a while as a rising star, along with another boss that my brother had by the name of Carly Fiorina, who went on to run for governor of California. Joe didn't turn out quite so well. He wound up being indicted for executive kind of crimes at his next job, and he served some time in prison. But my brother and a coworker, another manager, were

reporting to Joe and Joe told them at one point, “Here, I want this achieved in ten months,” or something like that. And Jack said, “I'm not going to do that.” And Joe said, “Why not?” And Jack said, “Because it's an unrealistic goal and you're going to destroy the family lives of all the people who have to work on it.” My brother thought that this coworker was going to support him in this and make the same stand, but Joe Nacchio turned to my brother's coworker and said, “Will you do that?” And the coworker said “Yes.” I'm surprised my brother kept his job at that point, but he did, and eventually, he took early retirement because he was just kind of tired of that stuff.

MB: Thank you for sharing all of that, Bill. I'm sorry to hear about your brother's health situation now, and I hope he feels better. In some of the blog posts in Living on the real World, you've mentioned that your brother never compromised what he believed in.

BH: The example with Joe Nacchio was one of the prime examples of that. Stakes were high. Jack never compromised with our parents either. I tended to give the appearance of compliance and maybe not be so compliant. Jack would take them on right at the beginning and win them over most of the time. Some of that was because I had prepared the ground for him two years earlier, but he had a good relationship with our parents.

MB: That's terrific. It seems like all four of you have a very good relationship with each other. It seems like you're very close to your brother too.

BH: Yes, well, we had moved around a little bit when we were kids, and we were frequently each other's only friend. Worked out well.

MB: That's fabulous. Thank you so much, Bill. You mentioned that he retired in his fifties, isn't it? What did he do thereafter?

BH: Well, he and his second wife had been married for a few years, and they went about choosing where they were going to live in retirement in a very organized way. They took three or four vacations a year, every year, and they would go to different parts of the country. These different parts included the Ozarks, they included Michigan, they included all these different places, and Arizona. And eventually they decided that they would retire – and South Carolina. They decided to retire in South Carolina to a golfing community. So, he played golf. This is his older brother speaking, his jealous brother probably saying – I've never played much golf – a few rounds. But the best part of golf is it's a forbidden pleasure. When you're picking your ball out of the poison ivy, you say to yourself, “I could be in the office.” But when you're picking your ball out of the poison ivy and you say, “I think this was the same patch of poison ivy I was in yesterday,” where's the joy? Retirement really isn't in, I think, our life's plan, or the way we're wired. It was held in high regard by my family. My dad retired probably when he was about

sixty, sixty-two. My Uncle Bill retired when he was in his – the plasma physicist – retired when he was in his fifties. Although he retired in the sense that he left the Princeton plasma physics lab. But he was still doing physics, as I explained to you, until the day he died. He was just doing it in North Carolina. The family maybe had more interest in North Carolina and South Carolina than I did. Anyway, that's another story.

MB: Thank you so much, Bill. Anything else that you would like to add about your brother?

BH: Let's leave it at that for now. I'll apologize if I've left out some big piece of the story. I guess another thing I just mentioned, because it was important, was he never had children. He never wanted children. That's certainly a fair life choice and people can make it for different reasons. One of the things that I think it leads to in some people, and it did in him, was that you tend to exaggerate the problems you're having in life. If you have kids, you know the difference between real problems and pseudo problems. Pseudo problems are problems at work. And real problems are problems with the people you love. The same thing, I think, is true, maybe – so that's unfair. Thinking about you and you're taking care of your mom and your solicitous care of your dad and so on – so, it can work that way. And Jack, in some respects, was a much better son than I was because he had retired twenty-five or so years ago, he was there for my parents. I was out of the country when my dad died. My brother saw a lot more of my mom before she died than I did. He was a better son.

MB: Thank you, Bill. My last question for today is, did you have any relatives that served in the military?

BH: Yes. They were rare, and I thought about that a lot. I thought that my family probably didn't do as much service as it might have. My Uncle Kirby, who married my dad's sister, he was her next door neighbor. He was a Quaker, but he fought in World War II in the Navy. My Aunt Janice, who is one of the most wonderful people in the world, married him while the war was still going on. She was going to Quaker meetings. When we dropped the atomic bomb on Hiroshima and Nagasaki, my uncle was one of the people stationed in ships off the coast of Japan that were going to be involved in whatever kind of assault on Japan was going to be necessary. Everybody thought it was going to be just a hugely costly invasion, hundreds of thousands of people dying and so on. The Quaker ladies at my aunt's sewing circle or whatever were pretty negative about the use of the bomb. Everybody was just discovering it and processing it. All my aunt could think of was that Kirby might well have been killed. When he came back from the war, they joined the Presbyterian Church. So, that's one. My Uncle Pete, my mother's brother, joined the Navy. He was young, and so he joined the Navy. He was in training to go overseas when the war ended. He was a Navy pilot, but he was still working in Pensacola, Florida, I think, when hostilities ceased. Those were the two in recent wars, you'd have to go back to the Civil War to find others who were combatants. On my mother's side,

there were one or two combatants in the southern side. On my father's side, there was a southerner who was twelve years old when the war was going on and the sole support of his mother. When General Sherman from the Union Army came in on his march to the sea through Atlanta and Savannah, all those parts of Georgia, this ancestor signed up as an aide de camp. He was a boy serving General Sherman as the Union Army kind of brought things to a close down there. They were opportunists, I think, more than people who had profound convictions, and they just found themselves getting caught up in the war, like most people do.

MB: Thank you so much, Bill. Do I have your permission to stop the recording?

BH: Yes.

----------END OF INTERVIEW----------

Transcribed by Samm Newton 8/1/2023
Reviewed by Molly Graham 8/1/2023
Reviewed by Bill Hooke 8/1/2023
Reviewed by Molly Graham 8/25/2023

Session 5 - May 30, 2023:
Interview Summary: Dr. Bill Hooke discusses various topics, including the founding of the National Academy of Sciences, his membership with the American Philosophical Society, the role of scientists in society, and his experience as a graduate student at the University of Chicago. He reflects on the challenges of scientific education and the pressure to finish his thesis on time.

Mona Behl: It is May 30, 2023. My name is Mona. I am in Athens, Georgia, and it's my happy Tuesday. I'm joined by Dr. Bill Hooke, who is in Alexandria. Hello, Bill.

William "Bill" Hooke: Hi, how are you? Mona?

MB: Great.

BH: Good to see you on these weekly meetings.

MB: Yes, like I said, it makes my whole week. This is the best day of the week. Thank you again for sparing time for me. I wanted to pick on a couple of things that we talked about last time. Every time we talk, Bill, our conversations are filled with so much information that I go back and look at various bits that you share. One of the things that I learned was – so we were discussing the impact or the influence that the war had on sciences and how it led to the National Academy of Sciences. I went to the National Academy's web page to learn more about the founding of NAS and all of that. That was a good lesson in science policy because I realized that the American Philosophical Society was probably one of the first professional and scientific societies.

BH: 1743.

MB: 1743. And you're a member of the APS, isn't it, Bill?

BH: Right, yes. They take people who matter and then every once in a while, there's experimental error.

MB: [laughter] I don't believe that. But could you talk a little bit more about your professional association with APS? You've been a member of the APS for some time now if I reckon.

BH: That was something I never expected to be a part of anything quite like that. It's a remarkable organization, and it's affected me in a number of ways. Experimental error or not, their main purpose – they hold meetings in Philadelphia for their members twice a year, they run for about three or four days, and they bring in the most remarkable speakers. The speakers are

Nobel Prize winners and so are many of the APS members. They're former astronauts. They're everybody you could think of. Supreme Court justices – Ruth Bader Ginsburg spoke once when she was elected a member. I was elected a member before she was, [laughter] and that's because she was elected in the class of people who actually matter on the world scene. I was elected in the class of physical scientists, which has kind of a lower bar. But anyway, so you're walking around with these people who have won Nobel Prizes and other recognition. If you think the impostor syndrome is bad under normal circumstances, you should be in that room. That's all I got. But they have guests. People bring their spouses, and you can bring guests. People bring their children from time to time. Everybody has equal status. Anybody can ask a question of the speakers and all the rest of that. The thing that's profound about it, the thing that made a big difference on me is very simple, and that is its tagline. Its tagline is, "Held in Philadelphia for the promotion of useful knowledge." That was an idea that was almost a given back in Benjamin Franklin's days. He was one of the founders. Today it's been lost a little bit. I think everybody has kind of a subconscious idea that of course science is useful, but they don't put it foremost in their minds. Like, the reason I'm doing this is for its utility. I put that together with a quote by Francis Bacon that also just means the world to me. And that's that quote; I haven't memorized it, but we've talked about it before. It's the idea that you shouldn't pursue knowledge for enjoyment or to make yourself more effective at arguments or fame or power or money or any of these inferior things. Bacon says, but for the benefit and use of life. He doesn't say human life, he doesn't say human society. A lot of ecologists today talk about how we overrate the value of human beings on the Earth and all the rest of that. Here's Francis Bacon saying right then around 1600, the same thing. He says, and they should perfect and govern it in charity, which was the Elizabethan word for love. The highest form of love, the most altruistic, the Greek word actually, is agape. They have three levels of love: eros, phileo and agape. Agape is this highest love. He says that's because he said it was from the lust of power that the angels fell. It was from the lust of knowledge that men fell, but of charity, there could be no excess; neither man nor angel ever came to harm by it. I always thought, okay, here is the American Philosophical Society. It's an extension of ideas that were put on the table by Francis Bacon, who not only introduced a modern era of science, very empirically-based and so on, really influenced Galileo and Newton and all those guys, but also the top politician of his day. He had a position higher than the position of prime minister. He was between the prime minister of the Parliament, such as it was at that time, and the kings or queens of his time. I think he made a transition from Elizabeth to James and so on. This whole idea of science and policy and human benefit and so on was just all tied together. To be in this crowd of people, it's a small group. It's not like the National Academy. The National Academy is about five thousand people or so. It's all science. The American Philosophical Society has science classes. It has one in physics, one in chemistry, one in biological sciences, one in social sciences. Then they have humanities. This public affairs kind of one that Ruth Bader Ginsburg and Obama and the others are in. It's very small. It's just about a thousand members total, eight hundred or so. And it's international. It's got international members. Well, I'm sorry that was a little bit of a harangue, but you get the idea of

it. It's just a window into a totally different world. It expanded my horizons and it sort of made me set my sights higher. You can't go to these meetings without feeling like an incredible underachiever. Chris always enjoyed those meetings, and she got to ask questions when she could go. I can't go anymore. The meetings were virtual during COVID, but with Chris and her problems now, I can't make it to the meetings yet.

MB: Thank you for sharing, Bill. I've always wondered about your membership with the APS and obviously I can see it in your writings. That's amazing. That's a lot of context. I know that I will have follow up questions. You've written extensively about Francis Bacon as well in Living on the Real World. I will need to come back to more on that. I also learned, reflecting on the National Academies of Sciences, I didn't realize that the National Academies of Sciences actually made recommendations for the U.S. Geological Service [USGS]. It was responsible for the formation of USGS. There were several other societies that were already formed before the National Academies. It seems like National Academies, as you mentioned last time, was a result of civil war probably.

BH: Yeah. There were other attempts. The AAAS, the American Association for the Advancement of Science came along prior to that. In fact, there's a guy named Dallas Alexander Bache, B-A-C-H-E, who I think was a grandson or something like that of Benjamin Franklin's, who was another one of these consummate science politicians who really made a difference in things. He was involved in the Coast Survey, which became NOAA's national ocean survey today. I think that was his sort of technical background. But he was pivotal in the formation of the AAAS and the influence of science and scientists on American government and policy. I think he's one of the people – if you look at the National Academies, have you seen the picture, the painting of Lincoln and so on? Bache is one of the people in the background of that picture someplace.

MB: That's fabulous. I did look at the picture yesterday and I also learned about all the different committees, and I learned about the first committee that the National Academy set up on weights, measures and coinage. What was interesting to me was that the committee came to feel that the United States should adopt the metric system of weights and measures. [laughter] Thank you again Bill. My horizons are expanding in so many different directions with all the information that you provide to me. Another thread that I wanted to pick up was I was kind of quiet when you referred to General Sherman. You were talking about your family, and I just wanted to take a moment to reflect on that because we just came out of the Memorial Day weekend, and I was thinking about your Uncle Kirby and Uncle Pete. I learned more about General Sherman. I didn't realize that one of his brothers, actually John Sherman, was the founder of the Republican Party. Of course, I learned more about General Sherman himself and his influence in [the] American Civil War and thereafter, too.

BH: Well, now you're the teacher, because these are new facts to me that you're going to send me scurrying to the library or the Internet to do remedial reading.

MB: No, this was, again, so interesting. It also made me reflect on some of the Living on the Real World blog posts that you have written about on Memorial Day. Actually, this links back to the idea of purposeful, useful knowledge that we started off the conversation with. In some of your writings, you've hinted that we scientists might see a day coming when we would have to think a bit more like soldiers. Do you mind expanding on that idea a little bit? What did you mean by –? You've written about Memorial Day environmental intelligence and scientists, the role that we should play. Could you reflect a little bit more on that, please?

BH: Yeah. Okay. This is the problem that you have dealing with an eighty year old. I'm not sure that these posts are the freshest in my mind. But I think the thing is, scientists, we might be unique in our difficulty at understanding that we're not pure. [laughter] We struggle so much to work on the objective part and the experiments in the lab and have a reality outside of human beings and so on, that we forget that science is a human construct, and we have stereotypes of soldiers. I remember one of them came up. I had to confront it at a time when I was on the subcommittee for Natural Disaster Reduction in OSTP [Office of Science and Technology Policy], and I was trying to do things on the importance of the military and recovery from disasters. Somebody, might have even been a friend of mine from church or something, in the military versus somebody I was working with on a daily basis. But he said, "You know, Bill," he said, "our job is to create disasters, not to recover from them." But then he said something very insightful, I thought. He said, "You want to win the war, but you don't want to destroy the people or the country or whatever you're warring against." He talked a lot about C3I: command, communication, control and intelligence. He was talking about knocking out the sort of ability of your enemy to see and communicate internally and all the rest of it because if you did that, you were destroying a kind of infrastructure that it was easy and quick to replace after the combat was over. It's in a way, sort of the exact opposite of what we see happening in Russia and the Ukraine right now. The Russians – I'm sorry if this timeless video contains a political comment, but it seems like the Russians have been really trying to destroy a society versus just make some other kind of point. So, again, going back to scientists, you have to think a lot more about the human purposes and the human goals and so on. We're coming up on a great moment of that right now with artificial intelligence. I think we're all seeing in a vague sort of way, "Wow, this has so much potential for both good and evil." I don't think there's been a moment since the construction of nuclear weapons that people have been apprehensive about the steps we're now taking. These are steps that have nothing to do with science as we understand it; it has everything to do with humanity. We don't trust ourselves to be good enough, in the best sense of the word good, to control this science for the benefit and use of life versus those inferior things – fame and power, money and so on – that Bacon spoke of. Great question.

MB: Sorry, I had to mute myself.

BH: It let us all tie everything together here a little bit.

MB: Yeah, that was great, Bill. I do want to reflect, take a deeper dive into this idea, with your permission, just a wee bit more. I continue to also think that we as scientists need to train ourselves or be educated enough to think beyond the benefits of science to the immediate research team and pushing the frontiers of knowledge and our understanding, this sense of responsibility, this public good that you talk about. Do you think that our education – undergraduate, graduate education – adequately covers and provides students the opportunity to think about their role as scientists in society and how can they better contribute to that public good?

BH: Great question. I think that's in a lot more peril and a lot more difficult to achieve than it was when I was going to school, going back to my dad. My dad was big in talking to my brother and me about going to a liberal arts college. He thought that was important and for a couple of reasons. One was not everybody wants to be a scientist or knows really what they want to do at an early point in life. But the idea was the very simplistic idea was that you learned these broader things in liberal arts, and we both know that, and you much more than I from your experience in academia, there's so much to quote, "to be learned these days," that in any kind of major field, the requirements of what you need to know in that field crowd out the time and the margin that students might have for exploring other things – going back to Feynman. I will say I don't know when we're going to cover this or whether we've missed the chance. But at the University of Chicago, in the physics department, which was the department where I entered, it was expected that you would know all of physics. And it's actually the reason I was recruited because that was such a nasty requirement nationally that students weren't applying to Chicago. I didn't realize this; I was too naive. But what happened, basically, I'll try to do this quickly. A lot of the scientists who were working on the bomb had been working at the University of Chicago at what's now Fermilab, the nuclear reactor under the football field, stadium and all the rest of it. And they all went to New Mexico during the war, and they were doing thesis level research at a very intense pace to build a bomb. They came back after the war, and here were all these students who were already doing at a PhD level, and the university faculty decided, and this is probably not real history, but legend that was passed down, decided that not all these people were going to get PhDs. Instead of saying, oh, well, we know from the experience in the war that they all deserve it. There was a culling of just the brightest among the brightest here. So, a lot of deserving people failed to get their PhDs from the university after they came back. So, nobody wanted to go to Chicago. They started recruiting and they found people like me who hadn't heard the rumors. They came out there, but they wanted you to know all of physics. People were taking seven years on average to get through at the University of Chicago, that was the average. There's more to that piece of it. I switched to geophysical sciences, and that's

another long story. But in geophysical sciences, there was much less quote "to learn," or much more, in a sense, but they had a totally different requirement. They wanted you to prove that you could learn something if you had to. They said, "Here's all of geophysics: solid Earth, oceans, atmosphere. Pick three topics that you want us to examine you on." They were kind of big topics like plasma physics or hydrodynamics or something. But "Three topics, and we'll examine you on those. If you pass those, we'll assume that if you had to, or as you go through your career, you'll be able to identify what you know, and you'll be able to learn it" kind of. That was huge and civilized. And the thing is, in principle, it gives students more margin to do what we're talking about, to learn something about the context in which they're doing their science and be better scientists and contributors to society for it.

MB: I have a couple of follow up questions, Bill. What were your three topics?

BH: Wow, now you're really pushing it. So, I know one of them was hydrodynamics. I know one was what we called magneto hydrodynamics, which are also called hydro magnetics or plasma physics. And what was the third? Maybe I slipped by with only two.

MB: No problem.

BH: It wasn't radiative transfer. It might have been meteorology in some sense. I'm just trying to think of what the other categories were. I'm at a loss.

MB: That is perfectly all right.

BH: Maybe somebody watching these will purge me of my advanced degree and say, "Aha."

MB: This is perfect. It wouldn't be surprising if you had meteorology. I was trying to think about, obviously, geophysical fluid dynamics as the fundamental science for all atmospheric [inaudible].

BH: There was some piece of that that I had to know. I remember in the hydro magnetics, the person they brought in to examine me on it was a guy named Eugene Parker, who was in the physics department, who was the person who discovered the solar wind and the whole idea of the way the corona interacts with the Earth's magnetic field and all the rest of it. A really, really bright guy. And in the exam, particularly the oral part of the exam that followed the written part, he and I talked at cross purposes for about twenty minutes. I really saw my whole career flash before my eyes. He wanted to hear me make general statements, but in the specific words that he had in mind. A few months later, when my advisor decided that I actually made a lot of progress on my thesis and so on – we're getting ahead of ourselves. This was just a few months after the qualifying exam, and I've been working on my thesis, and I was giving my advisor what I

thought was a progress report. He said, “This is really good.” He said, “It looks like you've broken the back of the problem.” He says, “I'm going back to Canada this fall, and I suggest that you finish up this spring semester, this spring quarter,” and to sugar coat that, even give it more incentive, he says, and “Parker is on sabbatical in Greece. We'll have to get somebody to replace him on your thesis committee.” He didn't need to tell me that twice. There was one period where I stayed up forty-eight hours without going to sleep and so on. I moved heaven and Earth to finish on time, and I did. David Atlas, who was a radar meteorologist and who just joined the department there at the University of Chicago, did eventually wind up being head of a big part of NCAR [National Center for Atmospheric Research] and then NASA [National Aeronautics and Space Administration] Goddard, was on my thesis committee and a pleasure to work with for the next fifty years. [laughter]

MB: Bill, that is fascinating. I cannot wait to dig more into your [inaudible].

BH: I take too long to answer each question and so on. But you're bringing back a lot of memories.

MB: Please don't apologize. This is exactly the purpose. Actually, Bill, our conversations are reminding me of the influences that I've had in my life, some formative experiences and such. So, I have nothing but gratitude. Thanks again for taking the time to answer all these ancillary questions that I had related to our conversation from the previous week. I think we'll stop here for the moment.

BH: Let me just get one more thought in before you stop. You triggered something. I think I had a very light experience in graduate school, and ever since, I've had some version of what people call survivor's guilt because of it. Actually, talking with you reminds me of that a little bit because we shared some of what you went through in your university experience, and I think that was more typical and a lot tougher. One of the things I've done for my whole career is admire anybody who got a PhD other than mine, and you're one of those people. Okay. Thank you, Mona.

MB: Thank you for saying that, Bill. I can't wait to pick up from where we're leaving today. I can't wait to learn more about your schooling and your influences and such. So, with your permission, I'm going to stop recording right now.

BH: Okay, thank you.

----------END OF INTERVIEW----------

Transcribed by Samm Newton 8/1/2023
Reviewed by Molly Graham 8/2/2023
Reviewed by Bill Hooke 8/2/2023

Reviewed by Molly Graham 8/25/2023

Session 6 - June 6, 2023:
Interiview Summary: In this interview, Dr. Bill Hooke reflects on his journey from elementary school to his involvement in the Summer Policy Colloquium. He discusses his interest in weather, electronics, and physics, as well as his struggles with socializing.

Mona Behl: Good morning, Bill.

William “Bill” Hooke: Good morning, Mona, or good afternoon, since it's afternoon where you are.

MB: Yes. It's June 6, 2023. I'm in Majorca, Spain, here for the 2023 Aquatic Sciences meetin, and I am with Dr. Bill Hooke in Alexandria, Virginia. Thanks again for taking the time to see me this morning, Bill.

BH: What a wonderful world that we could do this wherever you and I might happen to be. That's great.

MB: Exactly what I was thinking this morning. All thanks to technology that we're able to connect across the world. Bill, I've heard so much about the University of Chicago. I want to hear about your journey as to how you got to the University of Chicago all the way back to your elementary school. Why don't we begin there?

BH: Okay, well, that's a good place to start because I don't really remember the first few years I was born. When I was born, I was born in Raleigh, North Carolina, and when I was three, my dad moved to Sewanee, Tennessee, which is a little town in Franklin County in Tennessee. The nearest big towns are Cowan and Winchester, Tennessee, which give you some idea of how remote it is. It's a hilltop in the Appalachians that has a small college on it called, very pretentiously, the University of the South. My dad was teaching mathematics there, but it was surrounded by rural and farming country, and the schools were, frankly, not very good. Most kids today go to kindergarten. There was no such thing at this place. I went to first grade, and I started a year early because my parents kind of thought, “Hey, he's ready for it. He's big for his age.” I always felt like that was a gift of an extra year of life. What it meant was I'd graduate from high school when I'm seventeen instead of eighteen. This was great, but the school wasn't that wonderful. Being a kid, I didn't realize that. What I did realize was that I was going to school with a few faculty kids from the college. I was vaguely aware of this, but the majority of the students were these country kids, and I had no idea of this setting or whatever. But I remember school came easily and the other kids didn't like that very much. So, we'd go to recess, and they'd say, “Let's play football.” What football consisted of doing was pounding me into the ground until the bell rang and we could go back to class. I never did kind of really get

the idea, but I knew I didn't like recess very much and I didn't like the food. The education was not that great, and that was probably true of every school I went to until I got to college. That was made up for by my parents. Learning was held in high regard in the home. We were always reading books and encouraged to read more, and my mom would take us to the library. When I was about to enter fourth grade, my dad stopped teaching at the University of the South, and he took a civilian job at the Pentagon here in DC. So, I went to fourth grade over in Arlington. I don't remember much about that either. I'm just dimly aware of school, except I do remember, I think maybe we talked about that, that in social studies or whatever it was, I kind of learned that Virginia was responsible for America winning the Revolutionary War. Then we moved to Princeton. My dad went back there and did what you might call a postdoc or something. So, fifth, sixth, and seventh grades were in Princeton. That was probably a pretty good school. One of the things I learned there was that New Jersey won the Revolutionary War. [laughter] That helped me a great deal in my attitude towards life and what I was learning about. I guess one of the things I was conscious of was that most of the kids were richer than we were. That's not exactly an educational thing, but school was probably good, and the social life was kind of advanced. These fifth, sixth, and seventh graders, we had girlfriends and boyfriends, we had parties, and my mom sent me to dancing class. I'm not talking about education. It just was a blur. What I remember about education was in arithmetic, like in first grade, you learned how to add one digit numbers. Then in second grade, you learned to add two digit numbers, and in third grade, you learned to add three digit numbers. That continued until ninth grade, for me. That shows you how bad the system was by ninth grade. Most kids are getting calculus these days or something. Finally, in ninth grade, I got introduced to algebra, but that didn't occur until I left Princeton. We moved to Pittsburgh, where I entered middle school, sort of eighth and ninth grades in this middle school. There, I think I told you, it was kind of a tough school. My ambition was to graduate with all my teeth, and I didn't do that. But it turned out that the threat was not my fellow students, who included a lot of tough kids, but the orthodontist. I had braces, and he pulled four teeth because I had too many. But I learned that Pennsylvania was responsible for winning the Revolutionary War. I learned that there was a thing called college, sort of my last year. I learned that there was this thing called valedictorian. I had a B, I think, in journalism. Journalism was a very important class for me. It was an elective, but a little bit of writing, and it got me my first job, actually. I wasn't good enough to play basketball on our high school team. I loved basketball. We had a basket in our backyard of our house in Pittsburgh. We had a TV for the first time there. I was in eighth grade. It was different. But I was a manager of the basketball team, so I was going to all the games. The local paper, the Wilkinsburg Gazette – I was going to Wilkinsburg High School just outside of Pittsburgh – offered me ten dollars a week to report on the basketball games, which I did, and I really liked it. Yet there was a problem. The players were always upset with whatever I said. They'd say, "What do you mean? We were cold in the third quarter." I would say, well, we were outscored in the third quarter, twelve points to two or something. Then they would throw all their dirty sweatsuits, and worse, at me because I was the manager and had to clean up. I learned that

journalists in any society were at risk. But in high school, I took Latin because my dad thought it was very important for anybody interested in academic work or whatever to have Latin. I took German because he said a lot of mathematics is written in German. You really want to know German. What I should have taken was Spanish and Chinese and typing. I did not take typing. I should have taken typing. All my life I've used the Christopher Columbus system of discover and land on the keys. My typing is awful. The one advantage of it is, since I just use the two fingers and have to look at the keyboard, I haven't had carpal tunnel stress syndrome that so many good typists get. I'm sorry. I dimly knew – math came easy. Physics came easy. Chemistry was little – it came easy, but chemistry wasn't a great subject for me. Maybe that'll come up again in college. I don't know whether this is useful to you or not, but you're getting it. I was dimly aware of the whole process of applying to college and all the rest of it. We had a guidance counselor, but they were kind of useless. My dad basically said – it was a simpler time. He said, "Apply to three colleges." He says, "Two that you might want to get into and one insurance college." I applied. He said, "You want to go to a small liberal arts college." His main reason for doing that, in addition to you didn't know what you might want to become, was you'd be taught by actual professors instead of graduate students. I applied to Swarthmore and Oberlin and got into both of them. My insurance school was the University of North Carolina because that's where he had gone. I got into that also. I had a bit of scholarship aid. I won a National Merit Scholarship, but that was based on need, and it was only going to pay one hundred dollars a year. But my dad worked at Westinghouse, and in addition to their national talent search, which was a really competitive scholarship process, they had four scholarships they awarded annually to employee's children, and I won one of those. It paid twelve hundred dollars a year. But tuition, room and board at Swarthmore, one of the most expensive schools in the country at that time, was twenty four hundred dollars a year. I was getting half my education paid for. Just as a parenthesis, my brother came along two years later, and he did well in the competition for the same scholarship for employee sons. There was a big argument about whether he should get one since I had one and finally, they decided it was for the student and not the family, and so he got one too. We took care of a big fraction of our college education. It was a lot cheaper then. My dad was probably making twenty, twenty-five thousand dollars a year, that figure would have been ten percent of his salary. But today the Swarthmore fees and tuition are more in the fifty to seventy thousand dollar a year range, and that would mean that equivalent, he'd have to be making half a million dollars a year or something to be in the same economic position. College is too expensive today.

MB: Very much so. Bill, that is [inaudible].

BH: I don't know what other questions you might have about education, but that is our start.

MB: That was a great start, Bill. I can see since your dad moved a lot in the previous years, and I can see how you two moved from one school to the other. Did you have any teachers who had

an indelible mark on you during those formative years? Or was it during dinner table conversations, what you got from your dad and mom and your conversations with your brother, that kind of inspired you?

BH: There were a few teachers that made an indelible mark. In junior high we had a science course. When I was in eighth grade, or ninth grade rather, it focused on weather. We started out with weather superstitions in this first semester of ninth grade. "Red skies in morning, sailors take warning. Red skies at night, sailors delight," or whatever the sayings were. We never got past that point. I remember one experiment we did involved putting some steaming hot – boiling some water in a sort of gallon can and then putting the lid on it and letting it cool off and watching it collapse because the pressure outside was greater. The teacher referred to it as a phenomenon of nature. That was all I learned about weather from that class, and every moment since then, I just think about that. That was weak. But there was this line in the book that said, "Scientists are a community of scholars engaged in a common search for knowledge." That has stuck with me in the same way, and it's guided a lot of decisions, you know, that from our association, but we'll get into that a little. But that was always kind of a guiding star for me. I just thought that was such a great statement. I might say, through all this period, I read some Time life book about weather, and that gave me a little – probably about the same time in ninth grade there. In New Jersey, we'd had one hurricane come through while I was a kid there. I remember we had a house with a grape stake fence, about six feet tall, and during the first part of the storm, our neighbor's fence like that blew down. During the eye of the storm, he came outside and tied his fence to ours. Then when the rest of the storm came through, our fence blew down, too. There was vacuum tube technology then, and I'd gotten interested in electronics and repairing things because much of repair back in those days was like putting in a new light bulb. You could use logic. If there was no sound in the TV, you knew it was from the audio part of the electronics. If there was no video, you looked for other things that were wrong. I would fix things for neighbors. I kind of felt that physics was going to be beyond me. When we were in Princeton in the middle of all the education, we were walking down the street one night, and my dad said, "Look, there's Albert Einstein." It was nighttime, and there was a little bit of a halo around the hair. I remember that vividly. But that doesn't really count as education, does it? But I kind of knew that physics was going to be tough, and I thought I would go into electronics. I thought I would do that. They had engineering at Swarthmore, but I got interested in physics and did okay there. Not great, but okay.

MB: What a great journey. What a great journey, Bill. Was it in the late 1950s, early 1960s, that you went to high school?

BH: No, I graduated from high school in 1960.

MB: Okay.

BH: Yes, because I was only seventeen. I was a year younger than everybody else, and that also played a part in the education. I had hardly any friends, and at least that's my impression of it. A lot of high school kids think that, I'm sure. Because I was younger than everybody else, I didn't know how to drive. If there was a question of a date, it was sort of like, hey, let's go to the movies, and my mom can drive us, was not a real babe magnet. This was not working for me. My first real date was to the prom of my senior prom in high school just at the end of my high school year. That part socially was tough. Maybe we talked about this. If a girl approached me in high school, I knew she had a math problem. Most of the time they probably wish they could have a bag over their head so their friends couldn't see them talking with me. But they'd come up and ask for help with a trigonometric identity or something and then move on with the rest of their lives.

MB: I bet they enjoyed dancing with you. Not only learning amazing [inaudible] skills.

BH: No, they did not. It was like the shame walk, the walk of shame for these girls. There were a couple of girls who were smart enough to figure out the trigonometric identities on their own. My senior year, some of that began to come into focus. None of that came into focus until – I was a slow learner, still am. I sort of really had a very poor grasp of what life was all about. At every stage of my life, it feels like I'm sort of backward in figuring it out. Still learning.

MB: Yet you were the youngest in your class to graduate high school and do so much. So, I don't believe what you just said, Bill.

BH: Well, I do things. I was good at taking tests, so I got an eight hundred on the math achievement test for the college boards, and all my scores on all the SATs and stuff were above 750, and a couple were in the 790s. But perfection was something I didn't really focus on. It happened accidentally. I'm very poor at proofreading. I hate proofreading and inspecting my work. It's boring compared with doing something new. That reminds me of a life choice that was in the high school there. The first assignment in biology, which was something everybody took in tenth grade – we're running out of time here; I'll finish this up with just this one anecdote – was to collect twenty different kinds of leaves, I think. The first assignment of the second semester was to collect twenty different kinds of insects. Somehow, that chore didn't appeal to me. I took mechanical drawing instead of biology in high school. In mechanical drawing, you work through a series of drawings and learn different perspectives. I did more of those drawings than anybody else in the class, but I also had zillions of errors, and my teacher would just get frustrated with me. He'd say, “You can't get a job in mechanical drafting with all these errors.” But each one was kind of a puzzle and that was the part that was interesting to me. The errors took care of themselves. Okay, I need to let you go to your meeting.

MB: That is no problem, Bill. May I ask you one last question?

BH: Yes, sure.

MB: Bill, as a young boy, what were the things that you thought about? What were some challenges? You mentioned how the social dynamics worked at school and in college. But what were the kind of things that you thought about? I want to get to know that better, that aspect of your life better.

BH: Well, it's embarrassing because it seems to me I'm surrounded – all my life, I've been surrounded by highly intelligent, thoughtful, deep people. I'm not that way. I've always been interested in the humor in situations. There wasn't much profoundly spiritual about my youth. That's just another whole subject. The social thing, there'd be the occasional conversations my brother and I would have with my mother. She'd sit us down and try to explain to us the realities of social life. But it just kind of went over my head, maybe tearing out a few hairs as it went by. I feel like I was really sleepwalking through my youth. It's a horrible thing to confess, but that's the way it felt. It seemed to me that I was maybe good at observing what was going on but didn't process it too deeply. I was interested in sports. It wasn't like today where you can spend time on the computer with computer games. There was none of that. My brother and I would always play whatever pickup sport was in season: football, baseball, or basketball. Basketball sort of suited a person who was going to be over six feet tall and spindly. I weighed one hundred and forty pounds when I graduated from high school, and I was my present height. We knew the Hookes had a skeleton in their closet, but we didn't know they were educating it. It was that kind of thing. You could play basketball if you were as thin as a rail back then. These days, you know, things that would be called fouls [laughter] are sort of regarded as incidental contact. The Shaquille O'Neill's and the Charles Barkley's of the world just muscling people off the court; that didn't exist when I was playing basketball. That doesn't really answer your question. I remember one other thing. There was a guy who did a one-man show called In Defense of the Caveman. It was politically incorrect, and it was about gender differences between men and women. He described a husband and wife going to meet with another couple that evening. On the way home, the wife is saying, "You know, Joan was telling me that she and her husband are having a spot of trouble because of finances and some of the stress of their adolescent kids, and so-and-so was ill." Then she said, "Well, what did you and John talk about?" He said, "John got a new drill." She said, "But what did you talk about?" He said, "John got a new drill." That was kind of my growing up experience. [laughter]

MB: That is funny. But that also speaks to how men and women think differently, right?

BH: Yours is the superior gender. I know that's politically incorrect to say. It's not the thing that should be in a lasting oral history. But I felt ashamed of my gender progressively more so with

every passing year and seeing all the injustice and the inequity and the patience of women. Just women have endured much prehistory, during history, and the rest of it, and it's outrageous what's going on today. Other than that, I'm neutral on those things. But that's one where I've been slow to wake up, but there's too much evidence. I used to be impressed with a coffee mug that said on it, "A woman has to work twice as hard as a man to look half as good," or something like that. Then the other side says, "Fortunately, it's not difficult." [laughter]

MB: Bill, you've mentored, and you've lifted women up all your life. You talked about the American Philosophical Society, and I was just reflecting on some of the blog posts that you'd written about APS. You had mentioned Maria Mitchell. I learned about her once again. I learned about Jane Lubchenko being a member of APS. And through the Summer Policy Colloquium, many of us have gone through that tremendous experience in which you've provided us with mentorship, and you've given and made space for us. I defer [to] you on this thing. I think you've lifted us up.

BH: I've had plenty of opportunity. We'll get to the Colloquium eventually. But over the history of it, more than half the applicants and the successful applicants have been women. It's not because of any effort to select them. It's just they were the superior candidates on average. Okay. I've got to let you get to your meeting, but this is a real treat, and looking forward to next week. Thank you so much.

MB: Thank you, Bill. Thank you so much.

BH: All right.

----------END OF INTERVIEW----------

Transcribed by Samm Newton 8/3/2023
Reviewed by Molly Graham 8/4/2023
Reviewed by Bill Hooke 8/4/2023
Reviewed by Molly Graham 8/25/2023

Session 7 - June 13, 2023:
Interview Summary: Dr. Bill Hooke reflects on his journey from elementary school to his involvement in the Summer Policy Colloquium. He discusses his interest in weather, electronics, and physics, as well as his struggles with socializing. He also expresses his support for women in science and acknowledges the injustice and inequity they face.

Mona Behl: Good morning, Bill.

William "Bill" Hooke: Good morning, Mona. Or afternoon, whatever it is there. Must be right around – what is it? In the evening, right?

MB: Yes, it's actually 04:00 PM, June 13, 2023. I am in India, in my hometown, Patiala, Punjab. I'm connecting with Dr. Bill Hooke in Alexandria, Virginia.

BH: Yes. Wow.

MB: One of the best things about technology. This is amazing.

BH: It is wonderful. Yes. It's great to be getting back to a world that is doing that with a little more facility than it did during the pandemic. Yes.

MB: Definitely. Most definitely, Bill. Bill, I was reflecting on our conversation last week and from several weeks ago. You had mentioned when you were talking about your mom, you said that she took you and your brothers to the library and how books have been such a big part of your life. I want to ask you about some of your favorite books as you were growing up. What kind of books did you read?

BH: Growing Up. Okay. All right. That's pretty tricky. I think a lot of them were books about history. My parents told me that they were afraid I was going to become a historian when I became an adult. They didn't see that as a pathway to making a living. But I'd read particularly American history, colonial history, the American Revolutionary War, and the conquering of the West, and all of these things. I must confess that my ignorance of European history and particularly Asian history was pretty much complete. I really feel that lack today. It's clear. It's probably a lack for American school kids, particularly still. Yes. I read a lot of history, a lot of biographies. A lot of biographies. Maybe that shaped me a lot, because when you hear a famous name like Einstein or George Washington or Marie Curie or whoever you might think of, you think their life was some kind of linear progression from height to height. But when you read the biographies, particularly the ones that are written for adults, you see much more the ups and downs and the vagaries of it all. Just talking with you. I remember one of the biographies that

fascinated me was that of the Wright brothers because people were spending a lot of money trying to invent aviation, and here were two guys in a bicycle shop that sorted it all out. It was the kind of story that would mean more to you as you grew up. First you just were kind of conscious of that simple fact, and then you got hold of the underlying fact that they saw the problem was not energy and propulsion; it was control. It was about how to trim the wings of the airplane a little bit and achieve stability. I read a little science. That was always fascinating, particularly because that was in my family. Let's see what other reading made a big impression? I read a lot of fiction, but it was probably trashy kind of fiction, adventure kind of stuff. I think maybe I mentioned that I read some serious fiction. I think I mentioned that I read War and Peace in a single day, but that was a special case, and it didn't really stay with me except my strategy for dealing with all the names. That's maybe too much on that question. I'll just say this about later reading, maybe you're going to get into that, but I've been thinking about that a bunch since we started talking. When I was an early career scientist, the library was essential. After I got my Ph.D. I was working out in Boulder for what was then the Environmental Science Services Administration. I'd go to the library and there'd be all these new books, and there would be books on upper atmospheric physics, which is my background, and there would be books on atmospheric dynamics, or ozone chemistry or whatever it was. I was interested in those. But I was really fascinated by the books that dealt with management and leadership and policy. It wasn't strategic, but those books just were more interesting and more friendly and fascinating, and they just made a big impression on me. I misused the science library in Boulder.

MB: Those books were there for a reason. That's fabulous, Bill. I think you're so much better than – you were obviously well-read as a student. I never was interested in history. I'm grateful to all the Netflix documentaries on historical figures and events. Now I feel history teaches you so much. I became interested in history much later in my life, and it seems like history biographies, all of these books have shaped you. Did you ever read letters? I think along with biographies, letters are quite telling. Did you ever read letters that authors wrote?

BH: I think I missed the word. What was the word? Did I ever read letters?

MB: Letters by… letters? Yes.

BH: No, I've never been a big fan.

MB: Letters, I see.

BH: Or diaries or things of that kind. I think I read someplace that Jefferson wrote 20,000 letters or something like that. I thought, "Wow." But of course, emails are the modern equivalent of that. You and I have probably each written 20,000 emails. No, but you've read letters? You've read a bunch of letters?

MB: I have not. I'm only now more interested in reading biographies. As I read biographies, I feel letters tell you just a different – it is like a blog, but it tells you what that individual might be thinking at a particular instant of time and their connection with someone.

BH: Well, now that you mentioned it. One of the most prolific writers in twentieth-century history was Winston Churchill, and he wrote a six-volume set history of World War II, which I read from beginning to end. It was different in the 1960s and 1970s; you had time to read books, and books were more of a thing. It was basically a series of letters to his generals, to members of Parliament, to the King. He was a journalist. He had written other books. He'd won a Nobel Prize for a four-volume set of books that I read called The History of the English Speaking Peoples, which was kind of a history of England conjoined with America. I guess I did read letters also.

MB: I knew it. [laughter]

BH: Winston Churchill was a unique individual. We all are. But he had a style. It really appealed to me.

MB: That's great, Bill.

BH: Not as a role model for doing life, but he was just an interesting character.

MB: When you read these books, I'm just wondering, did you come and discuss these books with mom and dad, your brother, during dinner table discussions? How do books inform or shape us?

BH: Yes, that's a great question, and I have a feeling that too much of it is just stuck up here in the brain and not at a very high level. I mentioned that I read Winston Churchill, and I was so impressed with him and his role in prosecuting the war against Hitler and all the rest of that. I had a British friend. He was a good colleague of Franco Einaudi's and mine. He had done a postdoc with Colin Hines, my thesis advisor, a guy by the name of George Chimonas. I was mystified. I asked George one time, "Well, why did the British people reject Churchill after World War II?" He looked at me. He had a tendency to look down on me, which I deserved richly. He was a very smart guy, and he said, "Well, Churchill was our answer to Hitler, and when the question disappeared, then it was no longer necessary to put up with the answer," implying it was no longer necessary to put up with that guy. I thought I'd read these hundreds, maybe thousands of pages, and it sort of hadn't occurred to me that Churchill wasn't a saint, [laughter] that he had imperfections. One of the problems with my reading is I love to read, but I take a lot of it at face value, and I don't spend enough time criticizing it. If I had, I'd probably

have read a lot less, and I'd probably have been a better scientist and a whole bunch of things, but I tended to read and believe. [laughter] I've had to rejigger a lot of my thinking over the eight decades.

MB: That's fabulous. Will, was your brother into reading books as well? Did he discuss books?

BH: Not at all.

MB: Not at all? Really?

BH: Yes, I used to kid him. I still kid him about that. I got this list of one hundred books you should read before college, and I made a dent in that, a pretty significant dent. Jack never – I accused him of reading only one book before he graduated from high school, and it was a teenage book called The Rookie from Junction Flats. It was a baseball story. He would laugh like you're grinning now. But he was unburdened by a lot of reading. Now, as he grew older, when he retired at the age of fifty-three, after that career of Bell Labs, he read a lot, but mostly it's The Wall Street Journal. Just as I've taken the wrong lessons from Winston Churchill, I think Jack has taken a lot of the wrong lessons from The Wall Street Journal. He and I have difficulty discussing politics.

MB: What about your discussions with Mom and Dad, Bill? It seemed obvious that you discussed physics with your dad. Were there other books that you discussed with Mom and Dad? Did your mom read as well?

BH: They both were avid readers. My mother was kind of channeled by the culture of the time, and she read a lot of murder mysteries. I read a lot of murder mysteries because of my mother, Agatha Christie, and things of that kind. My dad also – he read a lot of mathematics, but he also read other books. There was a book that was a favorite of his called Men of Mathematics. Let's see. Yes, okay. My dad had two books on his bookshelf. One was called Men of Mathematics. He had many books, but two of them were right next to each other. One was called Men of Mathematics, and the other was called Short Stories for Men. The reason he had those was that during World War II, when my Uncle (Kirby?) was serving on a warship off the coast of Japan, and my dad was a mathematician, my grandparents had gotten these two books for their son and son in law, and they'd sent them to the wrong person. My Uncle (Kirby?) of that warship got the copy of Men of Mathematics, and my dad got the copy of Short Stories for Men. After the war, my uncle gave his copy of Men of Mathematics to my dad. [laughter]

MB: That's such a great story.

BH: But my dad used to talk about things. He was the origin of something that's always meant a great deal to me. I think he got it from this book. I think it's written by Thomas Bell [Eric Temple Bell]. He said if the Greeks and Arabs had been in communication with each other, we'd have either plane geometry or Algebra, but not both. Talk about diversity and talk about inclusion. Of course, the big lesson I took from that is that when it comes to science that matters, if there's science or technology that's urgent, you want multiple paths to it. You want redundancy. One of the things I fought all my career was this bureaucratic tendency to try to reduce duplication in science and overlap, and I kept thinking, "No. On innovation, you want to be doing as much as you can afford." And this continued to the present day. The last issue of The Economist talks about the implication for the world of a declining population. One of the big ones that they cite is the decline and the aging of the population. I guess it's more the aging of the population and the decline – the likely reduction in innovation, particularly disruptive innovation, innovation that isn't just incremental. They cite this as a big risk for humanity. I think that's right on. It plays into this idea that it's not that we've got too many people, eight billion people, it's just that we haven't equipped them, either with resources or with education, to be spending their time in innovative thought, solving problems, making the world a better place.

MB: I want to follow up on that, Bill. I think what you're referring to, I also think about that as a systems-thinking approach to the world, and I struggle with that. I think maybe it's because I started to read very late in my life, and I haven't been able to connect various dots and disciplines together. Is it better now with the IT [information technology] age that we live in? Do you think there's more cross-disciplinary collaboration? Do you think the kind of innovation, the disruptive innovation that you're talking about, is happening now, given that we're connected, we're in such a connected world, or is it not happening enough?

BH: Just picking on one small piece of the really big important questions you've just asked is if you think about artificial intelligence [AI], one of the concerns that seems to be pretty clear is a concern that if AI increases our ability to see a diverse set of information from diverse sources and perspectives and explore consequences, that's one thing. But if it zeroes in, if it channels human thought to a few well-worn paths, we're in big trouble, particularly in certain respects. I'm not sure that exactly answers your question, but it touches on it at least.

MB: It definitely does. Bill, do you think it also has something to do with civic engagement? I think people have stopped talking to one another in a civil manner and agree to disagree and be respectful. I see we live in a very polarized world, and that's said over and over again. But I often wonder, is this related to that loss of civic engagement, civic discourse, that we ought to have the diversity of perspectives and be able to critique them in a respectful manner?

BH: Yes. That's a profound question also. Somehow, it's like a lot of profound questions. It's sort of easy or tempting to see both sides of it. I'll mention another quote that my dad used to use

in the 1960s. He said, "If you're in a town of a thousand people, a murder is a very rare thing. But if you're in a world with a few billion people, many murders are inevitable." Picture all the conversations you could have and the differences of opinion you could have, and there's kind of a bell-shaped distribution. But when you get large numbers of people, that tail is very extreme. On the one hand, you don't want to abandon the tail. What you need precisely for the future may be someplace in that tale of perspectives, but it also brings up all these other perspectives that have people pointing guns at each other and deciding that others are evil and there are sinister forces trying to take over the US. Which side is the sinister force and all that? It's a spiritual problem, kind of. Again, you want to encourage this diversity of opinions, and you want respect for each other to prevail. Going back to these great people who accomplish great things, respectfulness wasn't necessarily Einstein's forte, Galileo's forte, or whomever – AOC's [Alexandria Ocasio Cortez] forte. [laughter] Yet you want those perspectives out there. It's somehow incumbent on each of us to be in command of – but to do that, we have to be feeling good about some things. At least we know where our next meal is coming from. We see more fairness in our society than I think we all tend to see today. There's a sort of chicken-egg thing with fairness and trust, and we've got to deal with that a little better than we are.

MB: Yes, I think in the age of IT and information technology and AI, I feel there's also a lot of misinformation and disinformation. Bill, as you're talking about how you acquired your knowledge of the world through these books, I think we live in a changed world where perhaps we can cherry-pick the kind of information that we need. I just wonder about the kind of schooling or the kind of way you grew up or your thought process was formed. It seems like it was a lot of different subjects without necessarily having the luxury to cherry-pick what you wanted. Is that right?

BH: That's interesting. Yes, that's correct, certainly. I think the primary example of that is media. For much of the Cold War period, the country had three major networks, and they were all centrist. Now, you get to cherry-pick what you'd like for your source of information. I try my best to look at information from the other side. I'll turn on one of the news channels from the other perspective, and I just struggle to keep up with it. I realize I'm so invested in the sources. It's just such an alien. All I can think about the whole time is how did people talk themselves into this corner? [laughter] So, I'm the wrong person to talk to. I haven't transcended the culture that I'm in. Most philosophers talk about that; we're like fish swimming in the sea. You take the sea for granted; you can't do much about it.

MB: Did you ever have debates when you were growing up, Bill, in your school?

BH: They had debating, but I didn't inhale. [laughter] Again, it just sort of passed over my head. There were all these activities that people did. The closest thing I ever saw to debate was the conversations that people used to have at my grandparents' house. I think I told you about that.

My dad's dad and my dad's mom had these evening events where people would come over, and there'd be a lively conversation. It'd be all kinds of topics, but it would be conversation. It rarely got into argument. It was more fun. But I wasn't familiar with debate very much. People tell me I'm confrontation-averse. I used to hear that from New Yorkers. Now I hear it from a lot of people. Again, it would be a shame if nobody was like me, but it would also be a shame if everybody was like me.

MB: The reason I asked, Bill, was, once again, reflecting on the tail ends of the bell curve that you are talking about. I'm wondering, what is the solution to this problem? How do we all become better thinkers? Better listeners? How do we instill that systems-thinking approach in K [kindergarten] through twelve [twelfth grade], probably students, I think, because probably in the formative years.

BH: Well, there's a movement to try to stamp out any attempt to teach those things. Civics isn't taught the way – I really think in a democracy, it's important – the importance of education, in addition to the subject matter, is a set of things that help you be productive in society. Some of those have to do with encouraging you to actively engage in it. Then, some of it has to do with instilling ideas, like the importance of the rule of law. Kind of basic ideas that aren't held in as much favor anymore. We've gotten much better at picking apart anything that we used to stand for than trying to figure out what pieces of it we want to keep.

MB: Yes. Bill, when you read books, do you take notes? Do you reflect? Do you write?

BH: Yes. Okay, that's a great question. The answer is when books were hard copy, I read them and took notes. That was why it was hard for me to part with one hundred linear feet of books I had in my office when I had to retire last year. I've got a Kindle here, and I've learned to highlight, and that helps some. I noticed that particularly, I'm reading a book by a guy named Owen Gingerich, who is an astronomer who just died a few days ago. I used to see him at American Philosophical Society meetings, and I didn't realize that, in addition to being a world-famous astronomer, he was also a Mennonite. He was a strong Christian, and he was really pushing those ideas. He incorporated that in a book entitled God's Universe, which he wrote in 2014. I downloaded it on my Kindle, and for some reason, the highlight function is not working on this book. It's killing me because I want to highlight about thirty percent of it, actually. So, taking notes, the hand-eye connection – hand-brain connection is important. Just the act of underlining things has helped me retain stuff, yes.

MB: That's fabulous. This is my book. Living on The Real World. It's highlighted in many different places.

BH: I could do the same with another book. We may get around to talking about it. This is a copy of the Bible, and if you just look at all the margins, you see notes scribbled in it and more notes. Notes all up and down the side margin. Yes, one of the things. You take notes as well, right?

MB: I do.

BH: What do you do with IT kind of media? How do you take notes?

MB: When I listen to Audible, I'm taking notes on my phone. Well, there is actually in Audible you can clip, I believe, but I am not technologically savvy, as you said. Again, I've learned this from you. There's something to be said about the hand and brain connection. When I write something, it sticks longer. I'm able to pause and reflect on it more and able to reread it. That is incredibly important to me. Just again, to write down things. I also have a Kindle; I do tend to highlight. I completely understand what you say about highlighting not working. It takes the charm out of reading the book when I have to go back to it. That's fabulous, Bill. I have several more questions, but I also see we're almost out of time. But I wanted to follow up once again on this civic engagement and reading books. I feel there's a spiritual component to it. I don't have a good question right now, but I think maybe I'll follow up on this line of thought next time about – I think when you're in a spiritual setting, why is it that we listen better? Why is it that we're able –? We're much more open and forgiving, I believe, and perhaps even though we're also objective, we're asking questions. But I think the kind of discourse that I have seen take place in that kind of a setting is way more inclusive and responsive and open compared to outside of that. I was just reflecting, trying to tie those pieces together about reading books, about systems-thinking approach, about this disruptive innovation that you talked about.

BH: Part of it, I think, when there were fewer ideas and fewer people and less writing, you keep hearing these statistics: about ninety percent of all the words ever written were written in the last three days or something. [laughter] That wasn't the way it was when I was starting out. I think the idea is when there's less, you can kind of really focus on it. I think today's challenge is in sort of the fuzzy way that knowledge is presented to each of us each day, is to learn how to deal with that ambiguity and the lack of ability to follow through and all the details and to pluck signal out of noise and to decide what signal for you might be different from what signal for me and actually affirm that. This gets back to the importance of having eight billion minds to work on things. I can imagine you have a lot more questions, and I've got to learn how to compress my answers a little bit. You get me started.

MB: No, Bill. I've got to learn how to ask good questions. But I'll revisit this recording and be better prepared next time. But thank you again, Bill, for your time and for sharing the wealth of your knowledge and so much about books. I know that books have been – you're a reader. I'm

sorry that this entire conversation was more about books and the influence that some of the books have had on you.

BH: Books are increasingly yesterday. It seems like we're all dealing with quanta of information now versus merging them. Gingerich's book talks about the number of synapses in the human brain and how there are more of them than there are stars in the galaxy just in one brain. How do you make those connections? Okay. Thank you again. I'm looking forward to our next session.

MB: Thank you, Bill. Do I have your permission to stop the recording?

BH: Yes, you do.

----------END OF INTERVIEW----------

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Reviewed by Bill Hooke 8/18/2023
Reviewed by Molly Graham 8/25/2023

Session 8 - July 3, 2023:
Interview Summary: Dr. Bill Hooke discusses his reading habits, influential books on management and leadership, the importance of understanding politics and policy-making, and the need for scientists to engage in the policy process. He also talks about the difference between urgent and vital matters, his education at Swarthmore College, and his experience in graduate school at the University of Chicago.

Mona Behl: All right. It is Monday, July 3 [2023]. My name is Mona. I am connecting with Dr. Bill Hooke, who is in Alexandria, Virginia. After a few weeks thank you much for taking the time, Bill. I have three follow up questions from the last time where we left off. I'll begin with something fun and then move on to some of the harder questions. One thing that you mentioned was you had a strategy for remembering all the names in War and Peace. What was the strategy?

William "Bill" Hooke: Well, I had a strategy for not wasting time trying to memorize the names that weren't going to matter. I had a strategy for reducing the number of names, and that was to just keep reading the book willy-nilly, and eventually I would know who was important and who wasn't. Rather than think, "Oh, who the heck is this person?" I would just soldier on. I've used the same strategy now with worldwide events. About twenty years ago, I started reading The Economist, which changed my life mainly because it helped me make me much more aware of news worldwide. Well, news worldwide is full of who would have thought it? People worldwide. The heads of other countries, the opposition parties in other countries, the [Mukesh] Anbanis of the world who are the billionaires in India, and things like that. It takes a while to learn all that stuff. It's been a useful life skill not to obsess about what you don't know, but press on in kind of the information soup that we've got these days and just allow it to shape your thought process. Everybody does it, I think. I just took time out to have some awareness of it.

MB: Awareness is the key. Thank you for sharing that, Bill. You also mentioned how you were drawn to books on management, leadership, and policy.

BH: Yes.

MB: Some examples I personally am aware of, a couple of examples that you've shared. But I would love to listen to you share some examples of those books that have really been influential.

BH: Wow, okay. That's tough. Particularly when it comes to the early ones. There are probably some very early ones that I can't remember. I do remember one book that I picked up in the library. It talked about Operation Hindsight, which was a military study. Everybody thought in the 1960s, or everybody was saying in the 1960s that there was this linear progression

from basic research and science to application – that things worked that way. What this book was suggesting is – the Pentagon looked at technologies that were introduced into warfare – that the opposite was happening, that they were doing things, and then the scientists would come along later and sort of explain why it was useful and why it worked. That simple idea probably played a big part in how I reacted to things I saw and learned the next forty years. I've read a lot of books about presidential politics and there were authors – there was a guy named Neustadt, N-E-U-S-T-A-D-T, and others who write books about presidential power and the evolution of the presidency. The presidency was intended to be weaker than it is today and in fact, everybody talks about the founding fathers and their wisdom. But the reason we have a strong presidency is that all the people writing the Constitution figured that George Washington was going to be the first one and if they had known that John Adams was going to be the second one, we might have had a parliamentary form of government. Ideas like that were kind of floating around in these books and I thought they were magical. I just read things about Franklin Delano Roosevelt and the British people were asking him to enter World War II and he was waiting for the American political environment to be supportive of that, and just all the complexities that presidents were dealing with. There was just a series of these books. One that mattered – Peter Drucker wrote a book called Management Tasks, Responsibilities, Practices. He was sort of the guru – this book was thick, and at the same time it came out, there was a little thin paperback by the president of Avis, the rental car company, called Up the Organization, which was about how things worked at Avis and why Avis was successful at challenging Hertz. This was ancient history for anybody listening to these things. I remember being enamored by this book, by [Robert] Townsend on up, the organization. I was taking a management course, and I shared the fact that I thought this book was crisp and wonderful, and the Peter Drucker thing kind of left me a little cold. The teacher of this small course said, "Well, Bill, it's the difference between comic books and the Bible." I was shamed by that. I went home and I read the big book and I really was glad I did. I read some of Drucker's shorter books after that and he had a big impression on me. One of the things he emphasized was that managers spend eighty percent of their time on problems and twenty percent on opportunities and they ought to reverse that ratio. That's been kind of a guiding star mostly in the sense of Paradise Lost. I constantly bring myself up short and realize, boy, I'm living the bad side of that. Maybe that gives you a little bit of the flavor of this kind of stuff. I could go on, but we'd tie up a thousand hours of conversation on these books. We don't want to do that.

MB: That's really helpful, Bill. I was just reflecting on the fact that you were interested in historical books, and you've read a lot of books about presidential politics, evolution of presidency, and you're a scientist. I bet that kind of reading has probably shaped the way scientists should and could interact with policymakers. Is that true?

BH: I wish I could say something that strong, but it probably was slow learning. I just was fascinated by it and kind of the abstract, and I wasn't really conscious of how it affected my

thought process, and it was later – I'll tell you one problem that came from that is I was interested in presidential politics, and it was so much big personalities and all the rest of it that I was a little short when it came to knowledge about the other two branches of government, Congress and the Supreme Court especially. And in the future years, particularly when I started doing the Colloquium, looking into it, and working for the AMS. If you work for the government, you're encouraged not to think at all about talking with Congress or having anything to do with Congress. All of that came late, and I kind of wish I'd had a richer appreciation for Congress. I think still I'm too ignorant of the Supreme Court. Certainly, events of recent days have kind of brought that home. Some of the recent decisions and the realization of just what the political process, how the political process does shape the courts, and I think the country's waking up to that too. I don't think Congress was as adept in sort of hijacking the process for selecting justices at every level of the court system as they are today. I think that my dad, again, the baseball fan and the mathematician, used to say something all the time. He said, "People play the rules of the game. They don't play the spirit of the game." This was in an age when sportsmanship was held in some regard and things of that sort, and I just kept thinking it was kind of a cynical statement, but that's what we see. So, let's just take a big one: public education. The spirit of the game is that parents are engaged in public education, and they work to make public education better. But when they realize the rules of the game, they decide, "Oh, I'm just going to let people who have to deal with public education fend for themselves. I'm going to see that my children get into private schools and just wash my hands of the down and dirty part of really making a public school system where I live good. I don't know for sure that I can do that. I don't want to waste my time doing that. I want to look after my kids." That's a terrible thing for us, and that's just one example. But you see this all the time. I mean, one party can decide, "Oh, we can keep the other party, even though it's nominally in power, from selecting a Supreme Court justice. We can paralyze that process for two years and then choose one of our own." That wasn't the spirit of the game. The spirit of the game was, "Oh, it's time to choose one. Let's choose one using the tools we have." Anyway, we chased that rabbit down a very big hole.

MB: That was beautiful, Bill. It actually made me think of a message that you have emphasized in some of your blog posts, which is that none of us has the luxury of being on the sidelines. If we truly want to engage, scientists want to engage in the policy process, it's important to learn how to do it responsibly, ethically, and efficiently and then do it and be part of the change that we want to see in the world. Another thing that you've emphasized in your blog posts is the quote by Peter Drucker about managers spending eighty percent of their time on problems and how we should [spend] twenty percent on opportunities and how that ratio ought to be reversed. I also was struck, and I've been reflecting on what you said about unnecessary duplication and redundancy in science. I wonder if you could elaborate a little bit more on that idea. You had mentioned that when it comes to science and technology that matters most, when it comes to disruptive innovation, you want redundancy. Could you talk a little bit more about that?

BH: Yes, let's see. I was thinking of something you said earlier, and I think maybe I'd like to get into that in a little more of a backhanded way. But going back to the 80/20 rule and how you spend your time, there's a tyranny of the urgent. That was another sort of management principle that people would mention, and it applies to all eight billion of us. We've got far too many people who are so poor that their time is spent – their problem that they work on instead of opportunities is finding enough wood to build a fire and finding enough food to cook on it to keep their children alive another twenty-four hours. The problem is not that we have too many people, but they're forced to spend ninety percent of their time on problems, or ninety-five, or ninety-nine percent of their time on problems, and have very little time, corporately as well as individually, to spend time on solutions. But now to go back to this more major concern about where you spend your resources. Resources are always scarce. That's what economists teach us. I think a great example is AI [artificial intelligence]. It's very important, I think – it's adoption – the people who are thinking about it be the majority of us, and not a small sliver of people who then shape everything that happens. Certainly, a small sliver of them will be very influential no matter what you do. They'll be the most creative, they'll be the most dynamic, they might be the most forward-looking, they might be the richest. But all of us. One of the things that I saw a headline just before you and I came on the air that was saying, a driver's license for using the Internet. I thought, now that's getting someplace. That metaphor struck me as, yes, that's beginning to get to where we need to be. In the blog I've talked about, instead of training on driver ed because the cars were going to be automated, you should have courses on how to use your cell phone. But I like this idea that if somehow there's a licensing associated with that, you've got the wrong retinal scan or the wrong thumbprint because people have realized you've abused the Internet. Whoa. Okay. So, I have yet to read that article, so I'm unburdened by any substance behind the headline, but that's the kind of thing, again, a digression from your question about putting all your resources and the things that matter. There was a time very early on when I was also interested in the stock market. I had a coworker who had put himself through graduate school by playing the stock market on a daily basis. He got a Ph.D. from Dartmouth in electrical engineering, but he went down to the local broker's office every day, there was no Internet then, and watched the tape and made trades and supported himself through graduate school that way rather than through any fellowship. He got me interested in stocks, and I read a little bit about that. One of the things that people would tell you is sometimes they say you should have a lot of eggs and you shouldn't put all your eggs in one basket, was the metaphor. But there were others who said you want to put most of your eggs in one basket and then watch the basket. That was what they said. That's what the world needs to do a little bit. We need to focus and keep an eye on the few things that matter. To me, it seems that there are two right now, and they're not new things, particularly. One is stewardship of the planet, and the other is the social responsibility to do the right thing and to be trustworthy and fair and share, so that you can do that first task. Everybody has to pull together to do the first task, but if we don't have some degree of unity, we won't be able to do it. So those two things matter. They're not new things. They're actually in the first chapter of the Old Testament. God creates this Garden of

Eden, and he says to humanity, “Do these two things.” One thing is whether God said that or whether the people who thought, “Gee, we're starting to write books; what should we write about?” That was what they came up [with]. If that's what we invented, we were saying at the time, those are the two things that matter. This idea that those are the two things that matter, whether handed to us or whether they're our own creation, they've been around forever, and our whole history, we're basically looking at those two things and saying, “We only have two things to do, and we're making a hash of both of them.” And we need to put more resources into those two things. Everything you see going on in the world right now reinforces that, it seems to me.

MB: Thanks again for sharing that, Bill. I recently reread your blog post in which you mentioned the tyranny of the urgent that I realized that it was a small booklet by Charles Hummel. One of the ideas that truly resonated with me was this difference between urgent and vital. One of the things that you mentioned is urgent is almost always driven by a deadline, whereas vital is something that we often don't think about. I think this, again, goes back to what you –

BH: The vital never has a deadline. The urgent just to give you an idea of how simple it is, if you hear the ringtone on your cell phone, you have no idea whether it's somebody who wants to sell you a new roof for your house or put solar panels on it, or steal your identity, or whether it's your dad calling from India. But you know there's a deadline; you know that after the fourth ring, you will have missed it. You drop whatever you've been working on to answer that Really. People kind of wised up to that. If you called somebody cold rather than sending them a text message first or something like that, you have a good chance of going straight to voicemail these days. We might be waking up to at least a certain range of urgent things and ignoring them.

MB: And vital are the two things that matter the most, and those big problems – how to address global warming, how to steward the planet, and how to do it in a socially responsible manner. Great. Well, I want to return back to your education, Bill, now. You mentioned that you had applied to Swarthmore, Oberlin, and University of North Carolina, and you got into three of those. All three of those. Which college did you actually end up in?

BH: Well, I went to Swarthmore. My dad had encouraged both my brother and me to apply to small colleges. We talked about that. Those were the two. Oberlin and Swarthmore were the two I cared about. My parents had taken me to visit Swarthmore, so I knew it. It was just at the other end of the state of Pennsylvania. Oberlin wasn't that far either, but just never made it there. I kind of went there. That was not a particularly well thought out – I thought I was bad at that. I remember one guy in my class telling me – he lived a few miles from Swarthmore, and he had no idea of its reputation at the time, which was pretty stellar. But he decided he might as well just go to the college down the road. I think we all make decisions well, too many of us make

decisions like that, and I'm in that crowd that's just kind of sleepwalking through life. That was how I chose Swarthmore. It's kind of the path of least resistance.

MB: What after that, Bill? What kind of classes did you take, and how did that lead you to graduate school?

BH: Well, okay, first of all, I went to a high school that had fourteen hundred people. Swarthmore as a college had nine hundred people. I thought I was going to be the smartest person there and also be an athlete. The answer turned out to be none of the above. [laughter] There were many students who were much more athletic than I was, and most of the people there were much smarter than I was. I just hung on by my fingernails for four years. I took just the basic courses during that first couple of years. I'd never really been introduced to philosophy before. I had a semester of philosophy that was transforming. If you read the book [Living on the Real World], one of the things that I say in the book is that I had a professor at Swarthmore by the name of Monroe Beardsley, and he taught us that an artist is not necessarily the best judge of the impact of his or her work. I start out the book that way, and that made a big impression on me. He was my freshman philosophy teacher, and I was impressed with philosophy. I knew I didn't have the discipline for it. The great thing about physical science is it's like bowling with those guardrails that come up on the gutters that you never throw a gutter ball. One guardrail is called experiment, and the other guardrail is called mathematics. Physics is easier than the humanities or social science. It's easier and not harder. It seems very peculiar to me that in life, a lot of people think the opposite. I noticed that in college. I took economics my freshman year, and I flunked one test. I did so badly, the professor called me in to talk about it. He said, "You noticed that you got zero credit on this one question?" I said, "Yes, that was because I didn't know the answer to it." He said, "Well, you should have written something." I said, "You mean if I write something, anything, I would get points?" He said, "Well, if it had the word economics in it, you might." [laughter] That made an impression on me. But I did very badly at Swarthmore. The first semester, I was terrified. I made an A, three B's, and a C. The second semester, I discovered girls, and I played baseball. I was on the junior varsity baseball team, and I wasn't getting my work done. I left with an A and four Cs. It was so bad that this company scholarship that I had was in danger of being revoked. They didn't take allowances for the fact, well, you got four C's in a place like Swarthmore, good for you. They somehow were expecting A's and B's no matter where you were. I realized my sophomore year, I had to do better. I think my first semester of my sophomore year, I made an A, three Bs, and a C again. My second semester, I made four A's and a B. Swarthmore had something called the Honors Program. We talked about that, I think, or maybe we didn't. I got into that the last two years. That was transformative also.

MB: Fascinating, Bill. I thought you were a straight-A kind of student. This is great that you really had to work to the honor school. I absolutely love the analogy that you shared about

physics and the guardrails of experiments and mathematics. That is true. It's difficult to [inaudible] social science.

BH: It's so much easier to think – so, for a long time, I'd tell people, suppose you had a cow on the farm, and it wasn't delivering very much milk, and you said, "Gee, I wonder what we could do." So, you consult with a physicist, and the physicist said, "Yes, I'm going to write the Hamiltonian of a cow, and we're going to figure this out." The physicists come back. In six months, you haven't heard from them. You ask, "Well, how's it going?" They say, "Well, to the extent that the cow can be approximated by an electron in a potential well…". That didn't work. Then you go to the chemist and the biologist, and you have the same problem, and you consult your spouse, and your spouse says, "Well, why don't you feed it more hay?" That was what I saw as the difference between physics and the rest of the world, kind of. Yes.

MB: Lovely, Bill. Wonderful. Your book actually begins with the quote that you mentioned by –

BH: Yes, by Beardsley.

MB: – Beardsley and W. K. Wimsatt in 1954. "The design or intention of the author is neither available nor desirable as a standard for judging the success of a work of literary art." Lovely. Anything else that you want to add, Bill? How were the last two years of your Honors Program at Swarthmore?

BH: Well, it was brilliant and difficult. I can't remember whether I explained it before, but in those days, it was in a pure form that it doesn't exist in today. You took two seminars a semester. Each seminar met for one afternoon a week. If you took physics or chemistry or something like that. In addition, you had a full-day lab, you were only tied up two afternoons of the week. Maybe you had a lab. The humanities people, every other week, had to write a paper every week. One week, it would be for the one course, and the other week, it would be for the other course. The classes consisted of the students teaching each other, and the teachers were just on the sidelines. You'd write a paper about something if it was your week to do in that class, and you would stand up. There would only be about eight people max in the room with you and the professor, and you'd take turns doing the teaching, and you got things [inaudible] that way. The result was – and there were no exams. No exams for two years. At the end of two years, examiners would come in from other colleges, Dartmouth and Princeton and Penn and Yale, and they would give you a three-hour written exam on each of the eight seminars. Then they would actually come to the campus, and they gave you a twenty minute oral exam on what you had said on your written exam. That was the system. Now, there was a little bit of a hedge to this. At the end of your first year, you'd taken four of these seminars. While the seniors were taking their exams in those subjects, you took the same exam in those two subjects. Only your own faculty

member looked at it and said, this student is in trouble or not. Your transcript was blank the last two years. What Swarthmore would send to graduate school interested in your application was, "Hey, this student is in the honors program." We put that as kind of a B plus. Eighty percent of Swarthmore students went to graduate school. The program was well respected by other colleges and universities. But when you took the exam, you took it on carbon paper, and you turned in the exam, and you kept the carbon, and that was how you prepared for your oral. Some students did really well on the written, and they had very difficult oral exams. Other students – I was one of those – did very poorly on the written. The oral exams were mostly spent discovering whether you knew anything. I got by by just the slimmest of margins. There was one exam I had on mechanics of solids, and it was an engineering course because Swarthmore had an engineering department, and it was something I could take instead of symbolic logic, which was a very difficult math seminar in something else. I was taking this oral exam, and there are several professors in the room, not just the professor who wrote it, but other professors from that discipline, from these other universities, and they're questioning you. The twenty minutes came up just when the one professor was asking a really difficult question, and he turned to the host faculty member and he said, "Does the student have time to answer this question?" My whole life hung it past before my eyes, and the faculty member said, "No." [laughter] I wanted to go up and hug the guy. But then the professors, the visitors, they sit around, and they decide whether you should graduate in honors or high honors or highest honors or flunk. If you flunked, your own faculty decided whether you would get a degree in course. I remember in my year – first of all, the dropout rate in this nine hundred people student body was twenty-five percent. About a quarter of the people failed to graduate, and only about half of the people who were still around in the junior and senior year went into this honors program. Out of that handful – we're down to a hundred people or something like that – there were two people who got highest honors, one in humanities and one in the sciences. There were maybe six people or so who got high honors, and the rest of us got honors. Actually, out of the twelve physics majors, I think two of them flunked, and they graduated in course. That was kind of the scheme of things, and it was tough. I got to graduate school. I'd only had eight courses my last two years. There were people there from MIT [Massachusetts Institute of Technology] and everywhere else who had dozens of very sophisticated courses on astrophysics and plasma physics and solid state. I hadn't had any of that stuff. I just had the basics. But I knew how to learn on my own better than most of them did. I remember in college, in graduate school, that was when I first came across open-book tests, and I'll tell you one story because I remember it. We had open book tests, and I can't even remember whether I brought – I might have brought a book or two. But I'll just say this. You'll maybe appreciate this coming from your culture. There were a couple of guys in my class – I think they were all men. There were about a hundred and twenty of us who were in the physics department at Chicago. Ten times as many physicists as I'd had at Swarthmore. A couple of them were from India, and they came in – they actually had grocery carts to hold their books. I realized, "Boy, I'm not in Kansas anymore." [laughter] One of my professors was [Subrahmanyan] Chandrasekhar, who not only had a thousand publications and

all these prizes but huge books on hydromagnetics. The Indian culture was richly represented at Chicago. But we're getting ahead of ourselves a little bit.

MB: That is so insightful, Bill. What an interesting model of examination and study as well where students were made to teach and learn.

BH: Yes. I should mention one other feature of this. When these faculty members came from the other schools, they didn't know what textbook you used. All they knew was a two or three-sentence paragraph that had been an old-fashioned thing that doesn't exist anymore called the college catalog. So, electricity and magnetism would say, "Covering electrostatics through Maxwell's equations" or something like that. That's all they'd have. Your professor wasn't in the conflict of interest position. Your professor was trying to prepare you for this, just as you were trying to prepare for this. The emphasis was on figuring out what was generally important because who knew what questions the visiting examiner was going to ask?

MB: Yes.

BH: It was just a much better way to learn. Much better. It was a nightmare at the end. [laughter]

MB: For the student, for sure. I think also probably –

BH: [inaudible] the faculty because they have a lot riding on it.

MB: Okay, well, I'm going to stop the recording, Bill.

BH: Okay.

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Session 9 - July 11, 2023

Interview Summary: This conversation revolves around Bill's experiences during his college days at Swarthmore College and his time as a graduate student at the University of Chicago. Bill discusses the competitive nature of science, the challenges he faced as a graduate student, and his switch to studying ionospheric irregularities. He also mentions the support he received from his advisor and the influence of physicist Eugene Parker.

Mona Behl: Good morning. It is July 11, 2023, Tuesday, my happy day. I'm here with Dr. Bill Hooke, who is in Alexandria, Virginia. My name is Mona Bell. I am in Washington, DC, this week. Bill, welcome.

William “Bill” Hooke: Well, thank you very much. It's my happy day, too. Good to see you.

MB: Likewise, Bill. So, Bill, you talked about your schooling and your college days at Swarthmore College. It was fascinating to learn about your years at Swarthmore, the small number of people that you went to school with, and the kind of classes that you took. Anything else that you would like to add? Were you part of any organization, any student body, or any other piece of information that you would like to add to your college education before we go to your graduate school?

BH: No, I could go on about all that stuff, but let's do the graduate school bit. In fact, the thing that I first thought of when you went back to Swarthmore was a very important visit from a Chicago physicist by the name of Leopoldo Falicov. He was a solid-state physicist, I think. He was going around the country recruiting people for the University of Chicago. Up until that point, I think I'd applied to the University of Illinois and to the University of Pennsylvania for graduate school. But he came through talking up Chicago, and his pitch was that Chicago was where Enrico Fermi was a physicist, and during World War II, everybody kind of adjourned to New Mexico, where they built the bomb and in the course of that did a lot of Ph.D. research. Then, after the war was over, they all had to come back to Chicago and finish their PhDs He said it was kind of rough to get your Ph.D. in that period because instead of thinking to themselves, well, everybody who's been working on the bomb practically deserves a Ph.D. almost immediately, they decided to kind of do it on a curve. It'd be very tough, and it’d only take the best. It was kind of hell on earth for graduate students. Apparently, and I didn't know this because I was oblivious to just about everything that mattered in those days, the University of Chicago had a very bad reputation regarding its treatment of students, and graduate students were no longer applying to it. He was talking it up, and it sounded good, and I thought to myself – and my girlfriend, who was my fiancé, who was going to be my first wife, was also looking for a place to go to graduate school, and she wasn't interested in the University of Chicago. She had already applied to Illinois and Pennsylvania. I did her application for Chicago, and she got one

of their most prestigious fellowships. She got a full ride for three years. That was important. We got married the day before commencement, and we were married by a Unitarian minister who was also the night watchman for Swarthmore. In those days, the night watchman would go around to all the buildings and put a detex key into a clock to just verify that they'd been there. But he was a Unitarian minister. We got married in the Quaker meeting house. Gee, there must have been – our parents were there and our families, but that was about it. There was maybe a dozen people, and it took a few jokes on commencement day. It was Swarthmore's 100th commencement, and the President of Swarthmore had been a friend of John Kennedy's at Harvard, so he had arranged – this was 1964, our graduation. In 1963, he had arranged for Kennedy to come and be the commencement speaker for this important event. Well, Kennedy was assassinated in November of 1963, so they invited Lyndon Johnson, but they weren't really expecting him to come. So they also invited U Thant, who was the Secretary General of the United Nations then. They invited W. H. Auden, the poet. They invited a Greek by the name of Constantinos Doxiadis, who is a worldwide famous city planner, and they also invited a guy who was big in Mendelian Genomics, hoping that one of them would say yes, and everybody said yes, including Lyndon Johnson. All these people who were expecting to give the talk and the commencement speech just sat there on the podium, and they got their honorary degrees, but they listened to Lyndon Johnson deliver the commencement speech. It was quite an event. Beforehand, my wife and I took a little ribbing because our wedding night had been the night before commencement. So, straight from that event, we drove out to my parents' house in Pittsburgh and picked up everything to go to Chicago, where both my wife and I had gotten in. I started out that summer working on an assistantship in a solid-state physics lab called the Institute for the Study of Metals, which was associated with Chicago and was right across the street from the football field where Fermi had done his nuclear experiments, and we kind of got started. Physics was no better at Chicago, despite what Leopoldo Falicov said about everything: "It is different now; it's just paradise on earth for graduate students." It was still hell on earth for graduate students, and the first year was really ugly. My first wife wasn't very good at getting ready on time, and Chicago had a lot of snow, and she didn't want to walk to campus even though we weren't that far from it. I drove her every day and was just barely able to get her to her class on time. Then I had to find a parking place, which meant I was always late for my first class. I had classes in the morning, and I was on a research assistantship, so I had to put in four hours a day in the lab. I spent most of that building vacuum systems and growing thallium crystals for study. We were studying something called the De Haas-Van Alphen effect. In order to see it, you had to have crystal and metal structures that were very free of dislocations. Thallium was an extremely weak substance in its pure form without – dislocations in crystal structure are what give metals a lot of their strength. So, we were growing crystals that were about the size between my thumb and finger here, and if you cantilevered that if you held that at one end, just the weight of the little bit of the metal would introduce dislocations in it. It was very sensitive, and it was taking a lot of time to grow these crystals. I'm not a guy who could work indefatigably. I would get tired after four hours of class and four hours of work in the lab,

and I was expected to come home and do probably another four hours of study. My wife, on the other hand, had a fellowship, and she was through studying in the evening, and she wanted to do other things. So, it wasn't going very well for me, and it was depressing in a fundamental way. You hear a lot about – I think I told you in my ninth-grade science book, there was this line that said scientists are a community of scholars engaged in a common search of knowledge. Chicago was my introduction to the reality that a lot of science in a lot of places is dog-eat-dog. It's very competitive. The De Haas-Van Alphen effect was pretty picked over territory, and there was a lot of competition to do a few things that were very difficult to do, and people were struggling to do it. I was watching other graduate students in the lab. Most of the work that we did was low temperature, near absolute zero, as well as in vacuum systems and everything else. I was seeing students take seven, eight years to get their PhDs. They'd spend five years building a piece of equipment. Here's a guy, a graduate student right next to me, who's building a turntable that weighed at least a ton so he could rotate this entire vacuum/cryogenic system at some speed to study whatever it was that he was studying at the time. The faculty members were saying things like, "It took me eighteen months to grow this metal crystal. I'm damned if I'm going to show anybody how I did it until I milked it for all it's worth." Which didn't sound like cooperation to me. I remember one time – I was getting paid about four thousand dollars a year for my assistantship, and the faculty member came in and said, "Well, this two thousand dollar volts meter was cheap, I bought two of them." I was thinking, "I would touch electrons to my tongue and give you voltage readings for that amount of money." [laughter] Again, part of the better lucky than – I've told a few people this story, better lucky than smart kind of story. This one you may decide to terminate the whole discussion after this, but one of my professors was Chandrashekar for Quantum Mechanics. The guy came in dressed like somebody who had been a model for Gentlemen's Quarterly. He just was always – just tailored suits and so dignified and up on a pedestal, a thousand publications and huge books and everything from astrophysics to hydromagnetics. He lectured, and he didn't give any exams, and everything was kind of up to the final, which started at – there were one hundred and twenty of us taking it. Of course, quantum mechanics was pretty fundamental to what we were all doing. A hundred and twenty people, I think they might have even been all men in this physics class, shows you where we were. It shows you where Chicago was at the time. The exam was scheduled to last three hours, and it started at 3:30 on Saturday afternoon. There were something like twelve problems on the exam, and nobody was finished at the end of three hours, so they gave us another hour of this excruciatingly painful event. After it was all over, and after Chandrashekar had had a chance to give the grades, he came in, and his eyes were darting fire. All one hundred and twenty of us were assembled there for this rump session. Remember, this is a class that we had to get a B in. He said, "Two of you got As." He said, "Twelve of you got Bs. Then he said, "There are about thirty or forty who got Cs, another thirty or forty who got Ds." I was one of the Ds, and the rest of the people got Fs. Then he looked up at the group, and he said, "Everybody got a grade higher than he deserved." [laughter] Then he proceeded – it took him an hour and a half working from notes to do one of those twelve problems for us. He looked up at the end; he had this five

by five determinant, and he said, “The two of you who got this far,” we're all mentally thinking the two As, “failed to see that there were some zeros in this determinant.” A lot of terms canceled, and this was the result you got. I remembered that – thinking about it. Well, something happened to me at that time. I was discouraged for a bunch of reasons, as you could see there. I had a friend from Swarthmore who was in the mathematical biology program. He was also recruited. He really went on to get a Ph.D. in philosophy from Chicago later on. That was his real love. I was looking for something else to do. He had a fluid dynamics class that he was taking because they were studying the dynamics of blood in blood vessels. But the teacher of it was from the Geophysical Sciences department. He said, “Hey, there's this guy, George Platzman, who's teaching this interesting course on fluid dynamics. Maybe you should talk with him.” So, I went across campus, and I did. Platzman was interested, and I was interested. He said, “Let me look around and see who's got support.” He came back after a week or so, and he said, “There are two people who would be delighted to support you.” One is a guy named Roscoe Braham, who does cloud physics, and another is a guy named Colin Hines, who does ionospheric irregularities.” Roscoe Braham's name would be particularly familiar to a lot of geophysicists of a certain age. So, I thought to myself, “Well, clouds are something you can see. That sounds pretty interesting.” Again, you can tell the great strategic thought process I was going through. I said, “Well, that sounds good.” Well, Platzman went off, and he came back after a week or so, and he said, “Roscoe Braham doesn't have any support after all.” So, I developed an instant interest in ionospheric irregularities and ionospheric dynamics, and I went to work for Colin Hines. And just to show you how it went, I found out after I'd made this decision that Roscoe Braham had yet to graduate his first Ph.D. student. In fact, it was somebody who had sat in the rear of an airplane for a number of years collecting hail samples that were coming through ports of the plane. It took them seven or eight years to get their Ph.D. But this guy, Colin Hines, I was on an assistantship for him, and I'd been working for him for about three weeks and hardly seen him. I went in, and I said something to him like – he'd given me a thesis of a student of his who'd just gotten his Ph.D. to read, and I'd read that. I said, “I've got this assistantship with you, twenty hours a week.” He looked at me, and he said, “I'm happy to support you, but I don't want to spend my time thinking of things to keep you occupied.” [laughter] I essentially had a fellowship, and the waters parted, and all of a sudden, I had four hours a day during the time the sun was up to study. It was amazing. There was another difference between geophysics and atmospheric science and physics. In physics, in the department, the expectation was you needed to know all of physics to take your qualifying exam. They could ask you anything. The idea was you needed to know all of physics. Well, there was quite a bit that people knew about physics, even in the 1960s when I was going to graduate school. But in geophysical sciences, they said, “You can't learn everything, so you'll work with your faculty to pick three topics, and we'll examine you on those. If you prove that you can learn what you need to know about those three topics, we'll assume that you could learn what you need to know about anything else. You're then free to go on and work on your thesis.” I picked three topics. I think one of them was fluid dynamics. One of them was plasma physics. I kind of

forget what the third one was. It was probably something to do with the physics of the upper atmosphere or something. It was good. This qualifying exam consisted of a written part and an oral. One of the members of my committee was a guy named Eugene Parker, who was in the physics department working with Chandrashekar and all those people, and he discovered the solar wind. He was really famous for that. We had a conversation after the written part of the exam, where we talked at cross purposes, which is a horrible thing for a student to be doing in a qualifying exam with a professor about plasmas and how they worked because he was interested in plasmas where everything was ionized, and the ionosphere was a mix of plasma and neutral gas. We didn't do very well together. I had this qualifying exam, and I kind of squeaked by. I was supposed to turn in a progress report on my thesis, which I did. My advisor, Colin Hines, looked at it, and he said, "I think you've broken the back of the problem." He said, "I'm going to the University of Toronto this fall." [laughter] This is in spring. He says, "It would probably be a good idea for you to try to finish up during this spring quarter while I'm still here." Well, I worked night and day. There was one stretch where I worked about forty-eight hours without sleep. To show you how sober I was, I remember thinking toward the end of that period, nobody else has discovered this, but there's actually a sleep barrier, and I've broken through it. There's a point beyond which you don't get any more tired. About fourteen hours later, I woke up, [laughter] but I got the thesis done. The other thing Colin Hines said was, another reason he wanted me to finish up in the spring. He said, "You had a lot of trouble with Eugene Parker on your oral, but he's in Greece now on sabbatical. We would have to get a substitute for him if you took your thesis defense in the spring." A new guy showed up on the Chicago faculty by the name of Dave Atlas, who was a famous radar physicist and went on to NCAR [National Center for Atmospheric Research] and then ran the Goddard Earth Sciences division for quite a while. I think he has an award named after him in the AMS [American Meteorological Society] now. But he was new. It was just very slick. I got my Ph.D. in the spring. Hines supported me for the summer and said, "Why don't you go give this talk at a meeting in St. Gallen, Switzerland." My wife and I had the first honeymoon that we had ever really had. We'd gone straight from Chicago to start this work that we were doing. We spent a month in Scandinavian countries before the meeting in Switzerland and a month in England and Scotland afterward. Then, that's another part of the story. I realized that I've talked non-stop, and you haven't asked a question. But I just thought I'd get it all out there while I had the courage to do it. Because people ought to hear those stories and say, "Bill, if we had only known, you'd have been on the street years ago." [laughter]

MB: What a fascinating story.

BH: But there is my graduate story and stream of consciousness. I got my Ph.D. in three years, from beginning to end. That's important in our family because my dad got his Ph.D. from Princeton in three years in mathematics. The whole time my brother and I were growing up, my mom said to us, "Well, your dad got his Ph.D. in mathematics at Princeton in three years, and he

wrote two Ph.D. theses." He wrote one, and his advisor says, "That's proving a negative result. You ought to prove something positive for your thesis." And so my dad did. My mother said, "You and your brother won't be able to do that because you've got my DNA mixed in with his," which was a real kind of encouragement from your mom. She was a product of the culture that we're all trying to fight. So, I got my Ph.D. in three years, and so did my brother. My younger brother did from Cornell a few years later. But I'd still be in graduate school, or I'd have washed out if I had stayed in physics. I just don't think that was in the cards. If I'd had any other advisor at the geophysical sciences department, I might have been stuck there as well. It was amazing. But all around me, when I'm having this experience and sailing through in three years, I'm hearing the screams and cries of the wounded and dying graduate students who are having a more typical experience. My wife, remember I said I applied for her fellowship, and she got it. It was a three-year fellowship. What they were doing in the Russian department, where she was a graduate student, was they had very limited funds for support. So they would fund first-year entering students, and then they would cut them off after one year and use that fund for the next group. They would expect these students who were stuck there with one year invested in it to get jobs waitressing or doing whatever they could to take more. That kind of experience was going – Chicago at the time had a four hundred million-dollar-a-year budget, and tuition was five percent of that. It was very radicalizing. I thought to myself, they could make tuition-free and cut a little waste, fraud, and abuse. A lot of their support was from Argonne National Lab. They could make tuition free, and it just wouldn't be such a nightmare for graduate students. I've been a firm supporter of Swarthmore and the appeals for money from alumni for all these years, but I've hardly given the University of Chicago anything. It was radicalizing. Sad to say. You might have to censor parts of this interview, but that's kind of the story.

MB: What a fascinating story, Bill. What a great trajectory. I do have follow-up questions, obviously, but I'm also looking at the time.

BH: We can take a few if you've got time.

MB: That would be fantastic.

BH: I'll try to make the answer shorter than that answer to the first question.

MB: No, this is perfect, actually. I'm so glad that you went through the entire journey. A couple of questions come to my mind. You came from a family of statisticians. Your father was a statistician. Your mom graduated with a degree in mathematics, and your uncle was a plasma physicist. I bet all of their backgrounds probably influenced your decision in going to graduate school and picking up geophysical fluid dynamics.

BH: The whole thing was a lack of imagination. Here I was in this tribe of scientists, and it never occurred to me to be anything else. I told you my dad was deficient in real-world skills, so that was obviously not going to work for me. I needed something academic. It really was the low – I woke up with a Ph.D. and thought, "Now what?" There's the part of the first job, which we can get to in another one of these, but I just sleepwalked through that entire experience.

MB: What were the years when you were in graduate school, Bill?

BH: I graduated from college in 1964, and I was there from 1964 to 1967.

MB: I see.

BH: There was a little thing called the Vietnam War that was going on at that time, which was kind of a backdrop to this story as well.

MB: Bill, you mentioned you had taken some humanities and philosophy classes in Swarthmore. How was the coursework in University of Chicago? Was it only geophysics-based, or did you take some [inaudible]?

BH: Well, the first year was all physics. There were three or four courses in addition to the quantum physics course I was taking, and those went fine. I got Bs and As in those courses. It was just this one course that was a tragedy for everybody, and I don't know what happened. I'm assuming that the other hundred-some people who had also failed to do this probably did it again the next year. Maybe a different professor taught it. Chandrasekar's back was turned, and they went on to something else. By the way, I paid for that. I'll just tell one other quick graduate school story. After I'd been in geophysics for a year, the Dean of Physical Sciences stopped me one day, and he said – oh, there was a fellowship called The Fanny and John Hertz fellowship, Hertz rental car, and it was for support in physics and things that were strategically important. It paid tuition. It paid five thousand [dollars] a year fellowship money versus assistantship money and a three hundred dollar allowance for books. How could you not apply? I applied, and a few months later, the Dean of Physical Sciences stopped me and he said, "Edward Teller, the inventor of the hydrogen bomb, is going to be here at the Pick Congress Hotel downtown in Chicago to interview applicants for this fellowship. You are first up." My appointment was at 9:30 in the morning. He says, "And you're to give him this list of the people he will see for the rest of the day." I needed to get a letter of recommendation. I got that from this guy, George Platzman, who had introduced me to the department. I did the usual kinds of things and showed up in January for this interview at the Pick Congress Hotel with Teller at 9:30. There was no Teller. At about 10:00, still no Teller. I called his room, and the phone rang and rang and rang. They didn't quickly go into voicemail in those days. Finally, he answered it. He said, "You'll excuse me. I was in the shower." He said, "I'm still on California time. I'll be right down." We had

breakfast together. I was his first appointment. Here was this guy who had done all this work, and I was so nervous that I had breakfast long ago. I had a cup of coffee, and I drank it while it was still scalding hot. My mouth was just burning for most of our interview. In his accent, which I can't imitate, he said, "Let's look at your transcript." He said, "Oh, I see you have a D in quantum mechanics." He says, "What's passing at the University of Chicago." I said, "B." He said, "Who taught the course?" I said, Chandrasekar. He said, "That's a good name." I didn't tell him I'd gotten a grade higher than I deserved. He went on to my letter of recommendation, and the letter was blank. He said, "How do you explain this?" Of course, I didn't have an explanation. Later, I sort of confronted Platzman about it, and he apologized. He said the secretary gave him some letters to send out, and he had just signed it or something instead of writing anything. He had meant to write something, but they just sent it in by air. But you're telling Edward Teller this – I didn't know this. Teller's looking at the D in quantum mechanics and the blank. He'd been involved with bomb tests, and he knew something about acoustic gravity waves generated from bombs but not internal gravity waves generated by bombs. I was studying the latter. He and I talked at cross purposes on that subject for a while, and then he excused me, and he went on to the next person. I'd like to say that despite all that, I got the fellowship, but I did not. [laughter] I'll just tell another story in case I forget. Years later, I was an adjoint on the faculty at the University of Colorado when I was working for NOAA, and they were all excited because Teller was retiring, and they were thinking they could maybe get Teller to come to Colorado to be on the faculty there. I had my mustache by that time, but I was sort of picturing that Teller was going to come and look at me and have a quizzical look on his face and wonder where he had met me before and all of a sudden, in some faculty meeting, he was going to say, "You!" [laughter] Fortunately, he didn't get the job there. But that's another story. I promised you a short answer, and you didn't get it.

MB: I love it. I absolutely love it. Thank you so much. Thanks so much for all those stories, Bill. I think I'm going to –

BH: You're going to have to call it quits now.

MB: Yes.

BH: I'll have mercy on you and let you go.

MB: Do I have your permission to stop the recording?

BH: You do.

----------END OF INTERVIEW----------

Transcribed by Samm Newton 8/9/2023
Reviewed by Molly Graham 8/21/2023

Reviewed by Bill Hooke 9/18/2023
Reviewed by Molly Graham 9/20/2023

Session 10 - July 25, 2023

Interview Summary: This interview provides insights into Hooke's education in geophysics, his professional journey, and his experiences working at the Ionospheric Telecommunications Lab and the Wave Propagation Lab. Hook talks about his mentor Dr. Colin Hines, his transition into management, and his reflections on leadership and organizational culture. The interview also delves into Hooke's career progression, including his role as a branch chief at the Wave Propagation Lab and his involvement in the National Oceanic and Atmospheric Administration (NOAA) Development Program.

Mona Behl: It is Tuesday, July 25 [2023]. My name is Mona [Behl]. I'm in Athens, Georgia. Hello, Bill.

William “Bill” Hooke: Hi. Good morning, Mona. Good to see you.

MB: Good morning, Bill. Great to see you, Bill. There were a couple of things that really stuck with me, Bill, after our last conversation. The first was simply the differences between the physics and geophysics departments at the University of Chicago and how different the education was. In the physics department, people expected you to know everything about physics compared to the three topics in geophysics. Something else that struck me was the fact that there was so much competition. Obviously, there's competition in science departments, but it felt like it was more competition for fewer things to do, fewer big things.

BH: Right. The intellectual grounds had been pretty picked over in some of the subjects where people were working, and it was tense.

MB: Yeah, I was also impressed by – I read a lot about your mentor, your professor, Dr. Colin Hines.

BH: He was a very special person.

MB: He made some impressive and lasting contributions. That’s amazing. So, Bill, you graduated in 1966 with a Ph.D. in geophysics from the University of Chicago.

BH: ’67.

MB: ’67.

BH: ’64 from college, ’66 for a master's degree from Chicago.

MB: I see.

BH: Because Colin Hines was a Canadian, he farmed his graduate students out for the summer because he would go back to Ontario to a cottage he had on a lake there. So, he got me a job in Boulder, a summer job in Boulder, working in their Aeronomy Lab out there at that time. It was a government job. And they could pay me as a GS-7, or, if I had a master's degree, they could pay me as a GS-9. So, I just signed up for the master's degree. I didn't have to take an exam or anything. I'd met all the qualifications that they had in Chicago for that, so I can make a little more money over the summer. I signed up so late that I had to go to the graduation ceremony because I couldn't sign the thing that said, "Oh, gee, shucks, I can't be there." So, I went to my master's degree commencement but not my Ph.D. commencement.

MB: For real, Bill?

BH: Yeah.

MB: Okay. So what was the first job? So, in 1967, you graduated. Let's talk about your professional journey.

BH: Okay. I was finishing up rather suddenly, but it was a gentler time. And Colin had worked – because he was Canadian, he had worked for the Defense Research Establishment in Canada for a few years at one point. He suggested I apply there, and he suggested that I apply back to the Boulder labs, where I'd worked the prior summer. And he knew people in both of these places, and that was a time when all of that kind of worked. I didn't get any offer from the Canadians. And the Aeronomy Lab, having seen me for the one summer, I guess they weren't interested. But there was another lab in Boulder called the Ionospheric Telecommunications Laboratory, and they offered me a job. And I took it. I think I've told you repeatedly that I never got the job I applied for, and I never turned down one that was offered. Yeah. So, I took this job at the Ionospheric Telecommunications Laboratory. They worked on things that weren't particularly interesting to me. One of them was over the horizon radar. Very low radio frequencies are reflected by the ionosphere. The radars that are like weather radars just pass right through with very little scattering or attenuation or anything. But long wavelength waves, three megahertz or something like that, which is like hundred-meter-long wavelengths, bounce off the ionosphere, and so you can look a long way off. You could learn a few things about the ionosphere. But if you were interested, you could also see, say, a missile that was coming from a long distance over the horizon, as it were, because you could kind of look around the globe. So, a lot of the work they did was quasi-military. I got into some classified work at that time, not on that particular aspect of things, but another process known as ionospheric heating, where you'd use strong radar to heat the ionosphere and change the ionosphere composition. Another feature of the lab was it was not exactly – it wasn't a cutting-edge lab. It was dealing with technologies

that only had a few niche applications; everything was moving to microwaves and all the rest of it. So most of the staff were older than I was. And I was only twenty-four years old. I was thinking, "Okay, this is the way the workplace is. It's older people. The work isn't particularly interesting, but that's why they call it work." I was a PhD by that time. And by then, if you had a PhD, by the way, you had a GS-11 or GS-12 possibility. A GS-11 for a Ph.D. and GS-12 if you were somehow in the top half of some group, which somebody arranged for me to do. So, I was a GS-12 at this point. I was doing some computer programming to support my research and so on. I had a boss by the name of Les [Leslie] Berry. He came in after a few weeks and very gently informed me that they had other people to write software. They found out quickly I wasn't very good at it. So this is Fortran. I could program in Fortran, but it was it was pretty awful. There were two workers, Jan and Jill, and they did all the programming for me and provided adult supervision. So, that was nice. I liked that part of it. Let's see. What else should I say about the first job?

MB: Bill, if I remember correctly, the Ionospheric –

BH: Ionosphere, yeah.

MB: – Laboratory. It was a NOAA lab, but [inaudible] –

BH: No, NOAA did not exist. These laboratories were part of what was called the Central Radio Propagation Lab. It was established right after World War II, the Boulder Labs. The reason was that the US government was concerned that a nuclear strike on Washington, DC, would knock out all federal labs. So they created this Central Radio Propagation Lab out in Boulder, and it had a couple of things going for it. One was that since it was at five thousand feet, it wouldn't need air conditioning in the buildings. What a lie. [laughter] So you go out and see this building – by the time I saw it in the '60s, everybody had room air conditioners, so they were just peppering all the windows because even pre-global warming, you needed that in Boulder in the summertime. The other thing is a notion that's really quaint by today's standards. The lab existed in Boulder because it was a radio-quiet area. There was very little radio interference. These days, you could take a hot dog out in any city intersection and hold it up, and the microwave from all the cell phones can cook it, [laughter] and the noise from people talking to people a world away is deafening. But in those days, that wasn't a thing. You really didn't want radio interference, and they had that quiet in Boulder, at least for a while, or they had it when the lab got started. I think even by the time I showed up, that was a quaint idea.

MB: That is so interesting. You said this was central radio.

BH: I was going to explain about the lab. It was part of the Department of Commerce at that time. It was called ESSA, E-S-S-A, the Environmental Science and Services Administration.

Many people have said over the years that that was a much better name than the NOAA that was tacked on in 1970. But in 1967, when I was out there, the lab was part of the Department of Commerce. It was part of something called the Institutes for Environmental Research, which was part of ESSA, the Environmental Science Services Administration, and included many of the labs that are familiar to NOAA scientists of today. At that time, they already had the Norman, Oklahoma lab. They had the Princeton Geophysical Fluid Dynamics Lab. So, they had a couple of other labs scattered around the country. But the Ionospheric Telecommunications Lab was there. There was a Tropospheric Telecommunications Lab, an Aeronomy Lab, [and] a Space Environment Laboratory, which became the Space Environmental Prediction Center. It became operational as well as research, and probably had some other pieces that are escaping me at the moment.

MB: I see. So up until 1970, you were working there, Bill. Is that right?

BH: Yes, in the Ionospheric Telecommunications Lab, that's right. I stayed in Boulder after that, but I switched labs. I'll digress for a second. I said I wasn't very interested in research, and it wasn't cutting edge. And another scientist wrote about a twenty-page – harangue is the only word I can use – a rant, pointing this out to our superiors and sent it up the chain. They were as delighted to see this as you can imagine, and so they sat on it a while. Our boss sat on it for a while before passing it on to his boss, and his boss sat on it for a long while. And one of the reasons he sat on it for a long while was he knew, and we sort of didn't, that Nixon was about to form NOAA. In forming NOAA, he was going to, at the same time, set up something called the National Telecommunications and Information Administration, which would include this Tropospheric Telecommunications Lab and the Ionospheric Telecommunications Lab. He had a plan that rather than dealing with this other malcontent and with me, he would transfer them both to another guy who was running a remote sensing lab. It was called the Wave Propagation Lab. That was cutting-edge. We can get to that in a little bit. They thought it would quiet us down, and it sort of did.

MB: That's very impressive, Bill. Did you do basic research at these laboratories, at the Ionospheric Telecommunications Lab? I'm eager to hear about your time at the Wave Propagation Lab.

BH: Let's talk about the word basic because basic physics to me actually means that kind of thing my advisor Colin Hines did because he did look in fundamental ways at Maxwell's equations and other things while he was doing his ionospheric research. I'd say all of us were doing research that didn't have immediate application necessarily, but I wouldn't call it basic. We weren't rewriting the laws of physics or chemistry. We were using those to understand how the atmosphere worked. The Wave Propagation Lab had an interesting history in itself. It was run by a guy named Gordon Little. Gordon was a Brit, but he was a US citizen. He was a member

of the National Academy of Engineering. I used to be flippant in those days. I said, "He combined vision and integrity, and I would be happy to work for somebody who had either one." Because I kind of felt, from my cynical days in the Telecommunications Lab, it hadn't been so much that way. I said a lot of things that I probably wouldn't be saying today. He did something highly unusual. At that time, there was a book called Peter Principle that was kind of floating around that talked about the reason nothing worked in the world is that people would rise up in an organization to a level where they were no longer very effective. And then, instead of being put down one level to the last level, where they were effective, they'd just kind of stay there, and nothing would work because everybody was at their level of incompetence. The only reason things worked was actually because of racial and gender bias. This book was very blunt on that. It said, "Hey, we've got women and ethnic minorities in positions that are held below their level of – I mean, they're still doing great work, but nobody's promoting them. And that's why the system works." And I thought, "Boy, that's really true." But Gordon was head of all of the institutes for Environmental Research. He stepped down from that. He was deputy head. He stepped down from that to form this Wave Propagation Lab. He realized that remote sensing was the key to learning about the Earth, the atmosphere, the oceans, the solid Earth. You couldn't do it by just putting local in situ sensors out; you'd never have enough. So he started this whole lab. He didn't have those names, but they kind of had a catechism. There were the four pillars of remote sensing. There were the seven benefits of remote sensing. There were a hundred or so employees who knew all of those things by heart. We can quote that book chapter and verse. The great thing for me, as an atmospheric scientist, was – this was a lab that was primarily engineers. And it was primarily engineers because all of these technologies – acoustic sounding, weather radar, Doppler lidar, other techniques, radiometry – were in their infancy, and nothing worked. So, when things started to work, they'd start seeing atmospheric phenomena that nobody had ever seen before. It was kind of like manganese nodules floating on the bottom of the ocean. If you had half a brain, you could wander around and you were seeing things that nobody had seen and applying simple ideas to them, and they worked. I was still doing a little ionospheric physics, finishing up some things that I started, and I started looking at the wave motions, the gravity wave motions that I'd been studying in the ionosphere that were all over the place in the planetary boundary layer and the troposphere. That was great. What else should I say about this?

MB: So, the Wave Propagation Laboratory was under NOAA in 1970, correct?

BH: Right. It was in NOAA, and it stayed at NOAA. The people in the propagation labs waved goodbye to me as I went from NTIA [National Telecommunications and Information Administration], where they were going, to NOAA, where everybody else was going. And that was 1970. Nixon set that up along with the EPA [Environmental Protection Agency] because he hated Wally Hickel, who was the Secretary of Interior. He scratched out the decision that had been made to put NOAA in Interior. He scratched that out by pen and just wrote in Commerce.

He put it under his good friend, Maurice Stans, who was Secretary of Commerce at that time and would later be indicted for his role in the Watergate break-ins. The rest is history. Sorry. Thank you for bringing me back to the real point of your question. Yeah.

MB: No, all of this is great, Bill. You have spoken about Gordon Little. Do you mind expanding a little bit more about him? You've written about him in the book, too. How was it to work with a person like him, especially when he started the Wave Propagation Laboratory? I mean, it was starting something right from the get-go and bringing all of you along with it.

BH: It was a wonderful time and a wonderful experience. I'm not sure whether I mentioned this last time, but when I had the summer job in Boulder the year before, so '66, the guy I worked for was a guy named Bob Cohen. He said he had three Chinese bosses. His highest boss, was Ernie Smith, who was head of the Institute for Environmental Research. His second highest boss was Gordon Little, who was head of the Institutes for Telecommunication Sciences and Aeronomy at that time. Ernie Smith was the child of missionaries and was born in China. Gordon Little was the Chinese boss because he was a son of English missionaries and also born in China. And then Bob Cohen's wife, (Carolyn?) was the daughter of Chinese missionaries, and she was born in [China]. So, Bob just loved telling everybody he had three Chinese bosses. So, that was part of Gordon's background as this son of missionaries – very bright guy. He survived the whole English academic system and got his Ph.D. in that system before coming to the United States. But also, he had this integrity and these values from this missionary upbringing. He was very much a global kind of person. His wife was Lebanese. He was aloof, and people didn't like that. We had Christmas parties, and one of them got wild, so he canceled Christmas parties from then on. People didn't like that. But I kept thinking, "We're getting all this attention and money and making progress. I can put up with a lot of bad Christmas parties for a boss that's getting things done." He had structured the management work. I got into management. Maybe I should say a little word about that. When I first joined the lab, they had a program called Geoacoustics; it was funded by the military. It was funded to detect atmospheric nuclear tests that would occur worldwide. People say that the pressure wave from Krakatoa could be heard worldwide. Well, that's true of all these atomic tests also; they could be heard worldwide. So, there was a big array set up by the military and Israel. There was another one in Argentina. There was one in the US. You could triangulate with these big arrays. They were infrasonic arrays. They were trying to detect acoustic waves that were like a tenth of a hertz or something, not in the range of human hearing. So, long pipes with maybe a kilometer, half a kilometer long arrays of pipes with pressure sensors on them, and you would detect the progress of the waves, the low-frequency waves across these arrays. It was a military contract. Gordon wasn't impressed with it as a remote sensing technique. It did have some interesting features. One of the things people found was that there was a very strong wintertime signal of air blowing across mountain ranges. So, like blowing across the top of a Coke bottle, you can make a little bit of a sound, and that was happening as the Jetstream would go over the Himalayas or whatever. The second big source

was the summertime source, and that got pinpointed to thunderstorms. And not just any thunderstorm, but most of the signals were coming from tornadic storms. So, it was a way of detecting tornadic storms. Now, you got to remember that it was competing with radar at the time, so people were beginning to realize you could see rotation on the radar and all these other things. You could see that right away where, with the acoustic signals from the storms, you had to wait while the sound wave chugged along at this very slow speed and eventually arrived at your sensor. Then, chances were good, the tornado would be gone. But that kind of noise had to be removed if you were going to be detecting the bomb blasts because atomic tests were still going on at that time. The other groups in the lab were doing really interesting [things] and interesting things with weather radar, laser, and so on. We were about to lose our chief of the radar group; he went to the Miami lab. So, Gordon needed a replacement for that. The guy who was my boss, as head of Geoacoustics, was a fellow who also knew radars; his name was Earl Gossard. Gordon decided that he could solve his management problem by replacing Roger (Lhermitte?), the radar guy, with Earl Gossard. And then, since he didn't care much about the Geoacoustics group, he could put anybody in charge. So, he put me in charge. That was how I got my first management job. It was the largest group in the lab because it was funded by the Air Force. We had seventeen people: sixteen white males and one secretary. I'd been in the job two months when the Air Force pulled out its funding. They had just developed a capability for detecting bomb blasts by a set of satellites. This acoustic network was no longer necessary. Well, Gordon Little looked at me a long time, and he thought to himself – I mean, I can hear the wheels turning. He never shared this with me, but I think it went something like this: "I don't think even Hooke – Hooke might not be the best, but I don't think he's so bad that he could have single-handedly lost this funding in two months after taking the job." But two months after taking the job, I had to cut funding by two-thirds. We wound up letting most of the people go. So we were down to a group of six people: six white males and a female secretary. The reason for pointing this out a little bit is I'm going to fast forward just a year or two when affirmative action came in. We were told that – they'd been EEO [Equal Employment Opportunity] for a little while, but now we were supposed to have affirmative action. I was a manager, so I was getting management training on this. Because I was young, I was only – let's see. How old was I? So I was maybe twenty-seven by this time. Most of these federal managers taking this course were twice my age, and they were not happy with affirmative action. There was a guy who was sent out from NOAA headquarters named Tony (Mackle?). He was African American, and he showed up delivering this message about affirmative action and how it's going to work. There was some grumbling from some of the older people in the room. He looked at the group – he was a great guy. I was very impressed with him. He said, "Look, I'm just a milkman." That was a thing back in those days. He said, "My job is to bring the milk to the door. It's up to you to take it in." Basically, he said, "This is how it's going to work. You're going to have to live with this." To me, it made sense. Okay. I mean, I just thought – and one of the reasons it makes sense – I'll just mention that now, in the light of the last fifty years – was, I thought to myself, it was risky. It's risky to hire somebody for a job if you know very little more about them than

their resume or whatever. People didn't want to do that. So there were a lot of people hiring their friends. Of course, in a racist society, your friends are all of your race. I thought to myself, "Yeah, a real problem here is we don't have a big mix of friends." And I thought to myself: We put affirmative action in for a while, and we'll all have a better mix of friends. Anyway, that was not exactly what they were hoping for. But that was my twenty-seven-year-old mindset. I have a better view of all that now. But I do think there's a little bit of that, that you need a culture where we're all accepting each other for who we really are versus some stereotype that we come up with right away. But to go back to Tony (Mackle?), we each had to provide a write-up for our management responsibilities. Tony didn't know who we were. There was a room of about twenty or thirty of us managers taking this course. He's going through the write-ups, and he gets to this one – mine. He gets to this one where I had this group of seventeen people [inaudible]. He said, "Well, anybody who fires ten white guys can't be all bad." [laughter] I thought, "Wow." He and I talked a little afterward. I just loved the guy. I thought he was great. It was an important thing for me to see how my peer group saw guidance from DC. I don't think scientists were the best. When I was a first-line supervisor – Harry Truman had a sign on his desk that said, "The buck stops here." I would tell the group – I'd say, "I need a sign that says, 'The buck starts here.'" One of the technicians actually made me one; it was a little wooden block with a little dollar bill on it, and said, "The buck starts here." I had my desk for a while. Something happened to it. Gordon Little – I said he was aloof. He thought the best way to announce this management change that Earl Gossard was going to have the radar group, and I was going to head Geoacoustics was to keep it secret right up until the last minute. So, he announced it at a laboratory-wide seminar. At the beginning of the seminar, he said, "By the way, I've got some announcements to make. Earl Gossard's moving over here. Bill Hooke is moving up here." Well, in our group, we always had a brown bag lunch every day. There wasn't a cafeteria in the building or something. I was the twenty-seven-year-old in the group. There were seventeen people. Remember I said that. They'd just chatter, and I tried to put in a word edgewise. The conversation would usually move on, oblivious to whatever I was trying to say. But that lunch, I went to that lunch, people were talking, and I said something. There was this hush that fell over the group. Wow. I realized from now on, I'm walking in a hall of mirrors. People are only going to show me the side that they think I'm going to like. It was a very important moment for me, which I've carried all the way through management. One of the things that you learn is the higher you go at the different levels, it's even more so. So you have to get gentler and gentler and gentler if you really want people to open up to you and for the group to be vibrant the way it should be as you go up. That was that moment. I got to see a lot of management styles in this effort. There was one guy who headed the acoustics group who had been in the military. He said his greatest responsibility was a platoon with thirty-nine enlisted men and one second lieutenant. He was a sergeant, so he said he had to be responsible for the thirty-nine, plus his boss. And he ran his group like that. They were kind of a precision drill team. There was another guy who would put his feet up on the desk, the laser guy running the laser group. His name was Bob Lawrence, and he said, "I have a group of super-starters. They need no help from me."

Everybody thought, “Modest, old Bob,” but they didn't realize that he asked himself each time his feet came off the desk, which one of my employees caused me to have to do something? If you've got three strikes against you, he helped get you to another group in the laboratory. He did have a group of self-starters; they were the only ones who were left. Then, there was a guy who came into the management meetings, and he said, “I've got a group of [inaudible]. You're lucky that I'm managing them because I'm the one that gets production out of this group.” He didn’t quite say it like that, but that was his body language. That was the tone. Then, one day, he came into my office and said, “Hooke, you're trying to get my job. I'm going to fix you for that.” He was taking over – we needed to build a tall tower. Okay. I'm going to ramble a little bit, but try to bring this home quickly. I said that Colorado was kind of a quiet area for radiofrequency. We studied tropospheric propagation, among other things, going back to that other lab, and we had a tower on Table Mesa just outside of Boulder and another tower at Haswell, Colorado, that was about a couple hundred miles away, a five-hundred-foot tower. We did propagation experiments on those towers. Well, we needed a tower that was closer to home that we could instrument. It wound up being the Erie Tower. It was going to be a thousand feet tall in Erie, Colorado, which is just a little bit north of Denver. This guy was going to be in charge of the group that was going to run that tower, but he began to hear rumblings that something else was going to happen. He accused me of trying to weasel in there. I didn't think much of it, but shortly [after], my boss Gordon Little assigned that whole activity to our group. We went from those six people to forty people. We were going to do all this boundary layer research and run that tower and everything else. And Brad, this other guy, was kind of removed from his operational responsibility. So, he was right. But I think it was this business of telling us that he was the only one holding the group together. He had superstars in his group; several of them went on to become the who's who of the lab and science generally in other areas once they got out from under his thumb. So, that was also a big life lesson. None of this has to do with the equations of motion or Maxwell's equations, but you get the idea.

MB: Very impressive, Bill. Thank you so much. I'm looking at the time. Should we adjourn now, or should we continue? I know that you rose up the ranks and went up to be the branch chief at the Wave Propagation Lab.

BH: That was the job I was just describing.

MB: Okay, so that was that. Until what time and what year did you work as the branch chief?

BH: I worked as the branch chief from – must have been ’72 or ’73, a couple of years after joining the lab until – gee, it was probably about 1980. But what happened along the way in 1978 or so was that a guy named Hugh Heclo came out with a book called A Government of Strangers. What he talked about was what led to or what was leading to the formation of the Senior Executive Service. They basically noticed that you had a couple of million government

employees who were managed at some level by a set of – well, the top level is, of course, the President and a thousand elected people. But, there was a level of career management that worked for the political people directly. This required certain skills, experience, and aptitude. The career people had been there at that top level; they'd worked for the government for twenty years. The appointees who were coming in worked for less than two. There was a lot that had to be sorted out at that interface. So, they created the Senior Executive Service to be disciplined in the way those two meshed, the political and the career people. They decided that instead of just having old people involved, they would look for younger people and start preparing them in advance to do this. So they created something that usually has a name like Leadership Development Program or something. It still continues today. But I was in the first group that got set up at NOAA. About a hundred people applied, and they chose about ten of us or something. So, I had a couple of developmental assignments for a couple of years, and I stepped back from being a branch chief. Then, when I came back from that, I was a branch chief again. That's probably a good place to pick up next time. Yeah.

MB: That sounds great. Thank you so much, Bill. With your permission, I'm going to stop recording now.

BH: Sounds great. Thank you for your patience.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 8/26/2023
Reviewed by Bill Hooke 8/26/2023
Reviewed by Molly Graham 10/22/2023

Session 11 - August 2, 2023
Interview Summary: Bill Hooke delves into his experiences in government and nonprofits, highlighting the significance of working with exceptional individuals in fostering creativity and innovation. Hooke reflects on his tenure at NOAA, challenges in securing funding, leadership development initiatives, and establishing trust between political and career staff, as well as the recruitment of top scientists for his projects.

Mona Behl: It is August 2, [2023]. My name is Mona Behl. I'm calling from Washington, DC. I'm connected with my mentor, my friend, Dr. Bill Hooke. Good morning Bill.

William "Bill" Hooke: And a member of your fan club, Mona.

MB: [laughter] It's just the other way around. Thank you so much, Bill, for your generosity, for the gift of your time and your perspectives. I am thoroughly enjoying this. I learned so much about what NOAA was before it became NOAA. You talked about Gordon Little's leadership. That was incredible. You've also posted blog posts on Gordon Little and how it was to work in the Wave Propagation Laboratory. You've written about it in your book, Living on the Real World. All of that is really fantastic. You talked very briefly about the SES [Senior Executive Service] Candidate Development Program. You were talking about the difference between career federal employees and political appointees. I was just intrigued. How do you bridge that gap? What are some strategies that you learned, especially as you were a young man of twenty-seven or probably in your early thirties?

BH: Oh, no, no. I wasn't that young.

MG: But you were still in your thirties.

BH: I got into management, but the Candidate Development Program, which is today usually a leadership development program in most agencies, started in – I think they went through a selection process that might have started in '78 or '79. It started around 1980. I was an old man of thirty-seven by then.

MB: Yeah, by that standard, I mean,

BH: Yes. A geezer in waiting.

MB: It was quite remarkable. You went from leading fourteen people; that was downsized to about six and then to two hundred and this newer kind of setting. So please do share more. We

last left at – you had mentioned you were a branch chief. I think we can pick it up from there and continue with your professional journey.

BH: Okay, yeah. [laughter] So I had an early – let's see. Where do I want to begin? I think I told you that in my very first management job, I managed to lose the Air Force contract that was two-thirds of our funding in the first couple of months. I carried that skill on to the larger management job that I had when I was running the atmospheric studies program area in the Wave Propagation Lab. We had been using – we needed to calibrate remote sensing instruments. For that, the ones we were developing, the instruments we were developing, were good for studies in the boundary layer. There was an old five-hundred-foot tower at Haswell, Colorado, which was quite a distance from Boulder, that we were using until two of the technicians nearly had an accident on it. I think I described that. So we built a thousand-foot tower in Erie, Colorado, within easy access to Boulder, and I was in charge of running that. It was a spectacular tower in many ways. Because of the near accident with the cable elevator on the old tower, this one had an elevator gearing cog. Gordon was concerned about icing and high winds because Boulder was subject to high winds. So, it was designed to withstand the 150-mile-an-hour wind and half an inch of icing on all the exposed surfaces. These were two conditions that never occurred together. [laughter] But this tower was rigid, and it was the tallest structure in Colorado [and] might still be. The thing I'm hesitating about is that it was referred to by some people as "Little's Erection." You might have to edit that out, but that was a name that some people had given it at the time. The view from the top of the tower was spectacular. I was up there a couple of times. It was just an amazing facility. I think maybe I mentioned that for the first time, the remote sensing instruments that were under development in the lab started working and started, and we could verify that they worked. That was in part because we had the tower, but in part because of something else that was very important that happened about that time. The Air Force Cambridge Research [Center] laboratories in Boston had been the world's foremost boundary layer experimental group. One of the things they had done – they did a very famous set of Kansas experiments. They traveled out there, and they set up their own instruments; their main instrument of choice was sonic anemometry. It's particularly good for studying turbulence. The group consisted of several atmospheric scientists and was led by a guy named Duane Haugen. But the real brains was a fellow named Chandran Kaimal. That's the kind of name you might recognize. He was just really brilliant in all sorts of ways, including his interpersonal skills. Maybe I've mentioned those, but I might repeat that. Anyway, they also had a very bright young scientist named John Wyngaard. They had a technician who could do magic with the sonic anemometers by the name of Jim Newman. Air Force Cambridge decided it was going to get out of the boundary layer work. So, this group was looking for a home at the same time that we had this tower. Then, in one of those very rare occurrences in the annals of science, Bob White, who was head of NOAA at the time, managed to get Air Force Cambridge to give us all the equipment, plus the scientists and the technician to instrument and run this tower, and they were all put in my group. And things started working for the first time mainly because we

finally got the ground truth right. The engineers had always done a great job with the acoustic sounders, radiometers, and radars. But they didn't know how to measure turbulence in situ. And this was the Boston group's real skill. So, we made a lot of progress. But at the same time, we had a funding crisis. We ran out of money. The fiscal year at that time ran from July 1st to June 30th as it was supposed to. That's another story of the history of science funding. Now, everybody thinks it's always been October 1st to September 30th. But that was just something that happened. It's an early failure of Congress to develop the budget on time. They had a temporary three-month fiscal year that they put in there to bridge the gap. We were scheduled to run out of funding on October 1st. We had nine months more to go in the fiscal year. Gordon Little kept looking at me sternly. He thought that because we had this tower and this unique facility, the world would be standing in line to use it and pay us for it. I found out very early on – I went to Washington to speak to an interagency group on atmospheric science. It included a guy named Elbert ["Joe"] Friday, who was then still in the Air Force. It included a guy named (Gene Bierly) at the National Science Foundation. Sitting in a room, I was this starry-eyed kid talking about all the wonders of this tower. They weren't as impressed as I was, this group. I found out later that they felt like Gordon Little had invested so much in this it was too big for him to allow it to fail. So, they didn't need to give him a dime. He would scrounge around and find the support somehow to support this. My boss, Gordon Little, was always in the habit of going to his boss, a guy named Bill Hess, and we should explore that at length also sometime soon. He kept saying, "You need to hire the Wave Propagation Lab." He would say to Bill Hess, "We're your best lab, and we're only fifty percent supported by NOAA, and you should give us more funding." And Bill Hess didn't do this. [laughter] He had another lab called the Air Resources Lab that was ninety percent external funding and never complained to him about lack of funding. They were getting their funding from EPA [Environmental Protection Agency] and DOE [Department of Energy], and it was steady as a rock. He wasn't listening to this. But finally, Gordon Little went up to him. I wasn't in the room, but I think the conversation went like this: "My Branch Chief, Bill Hooke, has done such a poor job of financial management. He's not only going to ruin his group but bring down the whole lab with him." So Bill Hess bailed him out. He had extra money because one of his other lab directors, a guy named Joe Smagorinsky, who was the legendary head of the Geophysical Fluid Dynamics Lab, drove a hard bargain when it came to his big mainframe computers that he was using to run his global atmospheric models. Texas Instruments won the bid to provide one of these, and they never quite met the specs. The computer was good enough for all the calculations that Joe Smagorinsky needed, but because it didn't meet the specs, he stiffed them on the three million dollars worth of the payment that they were supposed to make for this operation in this computer. So, I was the recipient of largess. Bill Hess had all this money handy that he didn't know what to do with, and he used it to bail out my group. So, Texas Instruments paid for our work for a year or so. That's a long discourse. I mentioned a lot of things that probably need more follow-up. I'll just say a word –

MB: Go ahead.

BH: – about Bill Hess. Bill Hess had been head of NASA's Lunar Receiving Lab. That was the lab that was built in Houston to handle all the rocks that the first astronauts brought back from the moon. The idea was this should be a lab that would contain the rocks without allowing them to contaminate the environment and vice versa. You wanted whatever was lunar to stay lunar [laughter] and not be contaminated by earthly minerals, dust, and things like that. Similarly, on the odd chance that there was something dangerous in that lunar rock, you didn't want it to get to the outside. This thing was a big NASA project in the 1960s. Hess came from that to running the Environmental Research Labs of NOAA, which was a much smaller operation. I remember in his first meeting, all-hands meeting to all the laboratory staff, he was going through the ERL budget – Environmental Research Lab budget – and he says, "These numbers are in thousands." He says, "When I was at NASA, they were in millions." [laughter] He was entirely comfortable running the labs. He was a great boss. He went from the NOAA job, eventually – that's a long way down the road here – to being in charge of the DOE Superconducting Super Collider project until that went belly up. So, he had some big jobs in his career, and he did a good job of most of them. The Superconducting Super Collider failed mainly because of the cost of the thing, the opportunity to participate internationally with the CERN [European Organization for Nuclear Research] activities that were getting ramped up in Switzerland, and the sense that Congress had that maybe they weren't going to get a lot of payback out of this very fundamental research.

MB: That's remarkable, Bill. You were there when Gordon Little and all of these other people basically modernizing the National Weather Service as we know it.

BH: Yeah. That's another part of this story. You want me to get into that a little bit?

MB: Please do. Yes, absolutely.

BH: We were doing great with the Boulder Atmospheric Observatory – great except for everything financially. Then, this whole Candidate Development Program came along. It was going to take two years. It was going to be a series of developmental assignments and so on. Most of the other – there were about a dozen of us who were in this initial group. Most of them had an acting person take their place, and they kind of retained their jobs. But I told Gordon – I said, "You really need to keep this operating full-time; you should put Chandran Kaimal in charge of it permanently. And when I'm done with the two years, we'll kind of see what's available." The two years were remarkable. I did learn a lot. You asked that question at the beginning. I think the thing that I learned can really be summarized in understanding that there really is a difference between the career – being aware of the difference rather than just oblivious to it and wondering why things didn't work at the interface between career and political people. So there was a lot of consciousness-raising and all the rest of that. I was going through this program at a time when Ronald Reagan was coming into the office. One of the developmental

things I did was I took a three-week course at the Federal Executive Institute in Charlottesville, Virginia. It's on the University of Virginia campus. This was right when Reagan was coming in. I remember some guy, one of the Reagan political appointments, coming down and talking to us about the importance of never giving in to career civil servants, no matter what. [laughter] Boy, let's see. I found some way to alienate him. He sort of described the importance of this, and I said, "Well, that's a way to chase all the good people out of the system and be stuck with people that fit your profile of mediocrity working." Anyway, he wasn't thrilled to hear that. But I was sort of anonymous in my class of thirty or whatever there were who were hearing from these guys. But the developmental assignments really came down to this kind of idea. It was something I used to tell my political bosses all the time, which was that they own the car, the federal car. They get to drive it wherever they want. They're in charge. But I have the operator's manual, and it says that you should use unleaded gas, you should change the oil every three months, and you should never downshift more than one gear at a time. Sometimes that worked, and sometimes that didn't. [laughter] But that was the basic idea that you were trying to build up trust and get across the idea that they were in control. The political people got elected; they deserve to be in control. But one of the things you'd find was that every political person in the government tends to think there should be another political level below them. They don't want to be that level that's mostly dealing with career people. It's sad but true. It's a generalization, but it's something you have to overcome. You have to overcome because people – I hold government service in high regard. Words like "civil" and "service" mean a lot to me. But a lot of people, particularly from the outside, don't see it that way.

MB: Fabulous. Thank you so much, Bill. By the way, the story that you mentioned about that tower and all the developments, I just wanted to point out for the viewers and listeners of this segment that you've written about this in Living on the Real World. In the blog post, in particular, you also mention how you were able to recruit the best minds from around the world, including two people by the name of John Finnigan from Australia and Julian Hunt from the UK.

BH: Yes, yes.

MB: Yes, it was remarkable. You've written this blog post, I think, in August of 2016. I just wanted to point that out, too. Bill, in the last five minutes, I want to start a new segment in our interview. This is called AB-anything. This segment is called "Ask Bill Anything." So, I'm going to share a question that one of your colleagues and friends has shared. You're welcome to guess their name. But the question is this. They ask, "From chairing the White House's National Science and Technology Council Subcommittee on Natural Disaster Reduction to serving the AMS [American Meteorological Society] as Senior Policy Fellow along with the creation of a highly successful summer policy colloquium, NOAA acting chief scientist and senior scientist in the office of Secretary of Commerce, you have left a footprint that continues to guide the

weather, water, climate community. Of these roles that you have had in government and nonprofits, what do you consider your most fulfilling achievement?"

BH: Wow. [laughter] I have a very dim view of my achievements. I feel a little bit – I'm probably misinterpreting the whole thrust of Forrest Gump, but there was a guy who was sort of present. There was a great book written by a guy named Thomas Merton. I think it was entitled [Conjectures] of a Guilty Bystander. I think those few words kind of captured everything. I had the very good fortune to work with just brilliant people. They just kept coming for a variety of reasons. So the greatest accomplishment – to try to pursue this question of greatest accomplishment, somehow, it's all about the people. I mean, not just somehow. I mean, at the root, it's about the people. I've had to do a reset a little bit in my thinking of impact and so on based on this Hooke symposium that happened this January. For my whole career, I've meant what I've said; I've really been in awe of the people I worked with – I've always known. We talked about how the best managers are the ones that are sort of mediocre at whatever they're doing, baseball or science, getting the most out of average performers and not being in the way. There's so much you can do to stifle creativity and innovation, but trying to stay out of the way of people who are in that business. That means working up the ladder to make that possible for those people. But just hearing the kinds of things these great people said on that particular day made me think, "Yeah, that's what I was hoping for." Just a quick word about compliments. Insincere compliments are terrible. The person who's receiving them kind of recognizes, "Oh, I don't deserve this. It's not me. It's somebody saying this thing." But what you want to look for in people is what are they really hungering to do, to stand for, what are they hoping their lives will mean, and showing them that this thing they hunger for, they're really doing it. I mean, they kind of know it, but they don't think anybody else knows it, and you show them, "I see this in you." That just means the world to people. You need to just be saying thank you and encouraging people day in and day out, hour in and hour out, and you add it up after forty, fifty years, and it has an accumulated effect. That's a terrible answer to that question, but that's the ramblings that you prompted. And you have to get going now, I think. We have to actually terminate this interview promptly, as I recall.

MB: Bill, this interview means the world to me. You're satiating my hunger. This is the best thing I could do in my job, and I am so grateful for your time. Thank you again.

BH: Back at you. I'm really enjoying the chance to relive some of this and remember some of the great people I've met in every one of these decades. Thank you, Mona, and have a great meeting there at the Academy.

MB: You too, Bill. Do I have your permission to stop the recording?

BH: Yes, you do. Yeah.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 8/29/2023
Reviewed by Bill Hooke 8/29/2023
Reviewed by Molly Graham 10/22/2023

Session 12 - August 9, 2023

Interview Summary: Bill Hooke reflects on his diverse experiences at NOAA, discussing his roles in the NAPAP program, the ocean drilling program, and as the deputy chief scientist. He highlights the challenges he faced in managing various scientific programs and navigating the political landscape within the organization. Hooke also acknowledges the influence of key figures like Jim Mahoney during his tenure at NOAA.

Mona Behl: It is August 9, [2023], 8:30 in the morning. My name is Mona. I'm calling from Athens, Georgia. I'm here with Dr. Bill Hooke. Hello, Bill,

William "Bill" Hooke: Hi there, Mona. How are you?

MB: Good. Thanks, Bill. So, Bill, we were talking about the ocean drilling program and your experiences and your perspective about how it started. Do you mind talking a little bit about it?

BH: Yes, okay. What I remember was largely anecdotal and intersects with a period when I worked for NOAA as the deputy chief scientist. The chief scientist was a presidential appointee – started out as a presidential appointee position subject to Senate confirmation. It was created out of a sense that if NOAA was going to have nonscientific leadership, there should be science represented at headquarters at the very highest level. So, they created this position. The first head of NOAA was a guy named Robert White; he was a consummate scientist and [had] a strong reputation in our field and the policy of science. I'm trying to remember the name of the second head of NOAA. It may occur to me in a minute, but Tony Calio followed these appointees. He was a NASA employee. He ran a big Division at NASA, but he wasn't considered much of a scientist. Some folks felt that NOAA needed this position, so they put it into law. The Reagan Administration spent quite a bit of time trying to fill the Chief Scientist position and struggled. One of the first choices was an oceanographer by the name of Bob Corell. For reasons which I won't go into, he wasn't considered. There were political reasons. Somebody had it in – they were trying to send NOAA or the administration a message, and they just didn't want to see that appointment go through. It was just sitting there as an office that had been created with no incumbent. Finally, they settled on the name of Mel Peterson, who was at Scripps at the time and running the deep-sea drilling project. Scripps was the contractor to the National Science Foundation that was running this. The contract had just been taken away from Scripps and awarded to Texas A&M. This was bad for Mel. He kind of lost his job. But he had a mentor by the name of Roger Revelle, who was a famous oceanographer at Scripps. Roger suggested that NOAA should name Mel to be the first chief scientist of NOAA. So he and I worked together. I was the first deputy chief scientist. We kind of arrived in the office at the same time; that's probably another story. But to go back quickly to the deep-sea drilling project, nominally, it was to look at drilling down to the Earth's mantle at the point where the Earth's crust was the thinnest. But in fact, it had origins that were related to national security. In fact, it

had the capability of raising – the Glomar Challenger, I think was the name of the vessel, could, in principle – and maybe he did in practice – raise a Russian submarine that had been sunk, had an accident, and recovered in such a way that maybe the Russians might never know that we had recovered it. That was kind of the idea. I don't know how much of that story is known today. I certainly hope it's not still classified. I could wind up with Trump's problem. [laughter]

MB: [laughter] I had no idea about that story, Bill.

BH: There are several stories like that. I think maybe I mentioned that the Arecibo Observatory, which was designed to look at the ionosphere and even do some radio astronomy, was also funded in part because the CIA [Central Intelligence Agency] was hoping this – there was a new technology called radiotelephones at the time, and the CIA was hoping to get the radiotelephone signals from Moscow radiotelephones, bouncing off the moon – echoes bouncing off the moon – and transcribing what the Russians were saying to each other in their vehicle. So there was a lot of that kind of dual-purpose, multipurpose stuff going on during the Cold War.

MB: That is fascinating, Bill. Through these stories, I often reflect on the fact that even though science is objective, the pursuit of science is so political.

BH: Oh, absolutely.

MB: Several of the stories that you've shared demonstrate that idea.

BH: Yeah. Science should be useful. We've talked about that in earlier interviews. It should be for the benefit of society, and people, being people, have different ideas about what benefits society.

MB: That is so true. I think the ocean drilling program is probably at those crossroads at the moment, too. I do want to go back to your career, Bill. Before you became the deputy chief scientist at NOAA, you were the director of the Environmental Sciences group. Could you briefly talk about your time with that group? Also, I was intrigued that you held two branch chief positions of two different programs. I'd love to know the differences between the Atmospheric Studies Program and the Sea State Studies Program and how a geophysicist was able to manage both those programs during your time with the predecessor of NOAA.

BH: Yeah, so those programs – let's see. I managed both those programs after the establishment of NOAA. Both of these were in NOAA. The atmospheric studies branch was something in the Wave Propagation Lab that I was probably qualified for, to some extent. What happened was, as I told you, I knew I was going to be on detail with this leadership development program, the Candidate Development Program for the Senior Executive Service, for a couple of years, and I

didn't want somebody to be stuck with the acting job, knowing that I would come back. There was a person who would be better at that job than I was, Chandran Kaimal, and I recommended that he get the job permanently and trusted they would have something for me afterward. The trusting was just barely justified. So, I came back after the two years, and there wasn't that much available. But there was a group called the Sea State Studies Program. It was developed by and founded by a guy named Don Barrick, who was an expert in ocean remote sensing and a particular technology which he had really pushed and forwarded called CODAR [COastal raDAR], Coastal Ocean Development and Application Radar, or something. Coastal Ocean Detection-something. I apologize for not knowing what the acronym of the program was. It was the use of a single radar and a lot of algorithm development to try to map out a two-dimensional surface current state of the ocean. If you had two radars, you could do that from first principles. But to try to infer both components of the surface velocity of the ocean was a lot trickier, but he'd done this. For some reason, he was located at Boulder. That was where our Remote Sensing Lab was. He decided that he would go private with this technology. He went private and started his own company and was trying to get money from the same government sources where our government program, which he had started, was getting its money. What he tried to do was – anyway, he left the program. He had left an opening at the top of the program, and they thought, "Well, Hooke has all this training and thinks he's not supposed to know anything leading a big group at a high level, so let's put him in there." Because waves was in my background and atmospheric and oceanic waves have a lot in common, they thought, "Oh, this will work." And it sort of did, mainly because there were still good people who Don Barrick had hired, and I had enough sense to not interfere with them a lot. It was very educational for me to do that program. It was a huge thing from the standpoint of my career later on because it was my introduction to the ocean side of NOAA. I remember in marketing this program, which was a little difficult, I used to tell people that while we were at Boulder, we were equally distant from all oceans, or I would say, during the Cretaceous, parts of Colorado were underwater, or whatever. So that was a little tricky. But we would go places and do experiments. Our big problem was a financial one, and it was one created by Don Barrick, who had gone off and was struggling to get money and thought he would help his cause by criticizing what the group he left behind was doing. He didn't understand that when he did that, it turned everybody off on the field in general, not just the work we were doing. He did make things tough for us. But he really sank his own prospects at the same time. I ran that Ocean Studies Group for a couple of years. And my boss, two levels above me, the head of the Environmental Research Labs, had a problem with a bunch of small groups that were reporting to him directly that weren't the size of a lab. One was a group that was developing a profiler technology, a radar technique for providing windsonding sort of like radiosonde balloons did. Another was a group that did mesoscale atmospheric processes. Another was a group that was trying to digitize old nautical records of sea surface temperature for use in climate studies. Another one was a congressionally mandated earmarked program for funding weather modification research. He had this stuff bag of programs that were causing him a lot of management headaches, yet not looming that large in the

scheme of things, and they said, “Well, we've got this new SES candidate guy. We could put him in charge of this. We could give this set of programs a name: the Environmental Sciences Program Group. It wasn't a lab; it was a group. It turned out to have a larger budget than any of the labs. It turned out to have more people than any of the labs. It turned out to have a more diverse range of funding than any of the labs. Some of the work was funded by this earmark. Some was funded by the National Weather Service, FAA [Federal Aviation Administration], and so on. It's a very complex, very big group with a lot of potential. Gee, it was great running this group. In fact, it also included PROFS, not just the profiler program, but the Program for Regional Observing and Forecasting Services, which was developing AWIPS [Advanced Weather Interactive Processing System], which became the computerization of the National Weather Service's offices. I was in charge of all this. All the other lab directors were SES. I was only a GS-15. This turned out to really work well for me because, as I said, I had the biggest group, bigger than any of these SES labs. I had the biggest budget. I had the most complex, not only sources of funds but contracting out of funds to the states that were doing the weather mod program and to the profiler groups and so on. So, when it came to performance review time, I automatically got outstanding ratings because here was this GS-15 doing all this work. Instead of being frustrated that I was at SES, I sort of enjoyed – and I had great people working for me. Sandy MacDonald, who became the head of Research for NOAA for a while, ultimately was running PROFS. Bob Maddox, who played a big role in mesoscale meteorology at the National Severe Storms Lab later on, was in the group and running a mesoscale group. These were big programs. Furthermore, I wasn't really in charge of anything. The climate work with the old ship data, the nautical ship data, was the favorite toy of Joe Fletcher, who was the head of the Office of Oceanic and Atmospheric Research. The weather modification work was in the province of the members of Congress who were insisting that the money go to the four states that ran that program. PROFS was so important to the future of NOAA that a troika of managers – the head of Research, the head of the Weather Service, the head of Satellites – ran that program, and I was just the middleman for doing that. So, I had this job with so much potential. Yet, there was so little – I learned then that just because you're the manager of a group doesn't mean you're you really have any authority. You have to learn how to negotiate with all these people to get things done and make it sustainable. That was a real, great opportunity to do that. But that was this big group. I ran that group for several years.

MB: Fascinating, Bill. You were basically in charge of this group that led the National Weather Service modernization. Was this group the two-hundred-people-large environmental sciences group –?

BH: The largest portion of them were in that group, that's for sure. PROFS was the big group, and Sandy MacDonald was in charge of it. I guess this will be okay by the time he hears about it on the tape. He knew that he was a better manager than I was. He really wanted my job. Our relationship improved a lot when I got the deputy chief scientist job, and he took over

Environmental Sciences Group, which stayed behind in Boulder, and I moved here to DC. I think Sandy and I have talked about that, and we both grin about that. But he was definitely the right choice for that job.

MB: Great. Bill, could you tell us about the dates? When were you the branch chief for the Atmospheric and Sea State Studies Programs and then the Environmental Sciences Program?

BH: Yeah, that's a good thing to know. So I ran the Atmospheric Sciences branch of the Wave Propagation Lab from about – gee, it must have been ’72 or something to about ’78. I was in the Candidate Development Program from about ’78 to ’80. I ran the Sea State Studies Program from maybe ’80 to ’84. I've got a CV, which would probably be some tentpole on this oral tradition that has these numbers right. Then, I ran the environmental sciences group from 1984 to ’87. ‘87 was when I came to Washington.

MB: So what does the deputy chief scientist of NOAA do, Bill? What were you tasked to do?

BH: Okay. Remember I said that the Republicans were having trouble getting an appointee confirmed by Congress? It was probably a situation similar to the Tommy Tuberville story that we're enduring today, where one senator is keeping all the military appointments from going through. I think there was one senator who didn't want to see this one appointment go through, and he was stopping the process. And so after three years of going through this, Tony Calio, who was the head of NOAA, had, again, a stuff bag of four or five disparate programs that were supposed to constitute the Office of the Chief Scientist. There was the National Marine Pollution Program Office. There was the Office of Research and Technology Applications, which was a small business support program. There was an Ecology and Conservation Office that looked at things like endangered species, sea turtles, spotted owls, all of that stuff; NAPAP, the National Acid Precipitation Assessment Program; the National Climate Program office; and let's see – I think there were probably one or two more. But these had no central focus. They were all small. They were mostly politically charged. The head of NOAA was finding it very frustrating dealing with them and very frustrated there was no chief scientist to take care of all this for him. So he decided there should be a deputy position, and that should be a career person. Then he could appoint that, and that person could manage this collection of entities until a real chief scientist showed up. I think I explained in maybe one of the earlier interviews that this head of NOAA had a fierce reputation; nobody wanted to work for him. So, when they put out the call for this job, nobody was applying. A couple of people from Research headquarters in Rockville at the time – this was before they moved to Silver Spring – came out to my office and said, “Bill, we know that you want an SES job.” I'd applied for a bunch of SES jobs in some of the labs and hadn't got them. “How would you like to come to Washington and sort of vault over all these steps and be the deputy chief scientist of all of NOAA?” They said, “Of course, you'd have to apply,” because you did have to apply. “What do you think about that?” I thought that sounded

good. Miraculously, Chris, my wife, thought it sounded good. I thought she was going to put her foot down and say, "Why would we leave Boulder?" But she didn't. She seemed kind of attracted to the idea of Washington. I had survived an encounter with Tony Calio. I had given him a briefing and gotten away with my skin, so I thought, "I could do this." And so I applied. It turned out they had about a two-week application process. The position was open for two weeks. There was one other person that applied. I got the job. It was then about ninety days before I could actually move to DC and get started. In that ninety days, my wife Chris had no trouble getting a private sector job. [laughter] So she was kind of committed to that. Also, in that ninety-day period, they finally got this fella Mel Peterson, confirmed as the chief scientist of NOAA. He and I arrived in Washington, totally naïve, on the very first day. We had a secretary by the name of (Ann Sagawa?), a Japanese surname, but she was as Irish as she could be. She had married a guy with a Japanese surname. She was our secretary to get things started. We all started business in about November of '87. I remember the first day (Ann?) brought us coffee. And Mel Peterson said after we'd been having this coffee for about half an hour – he said, "Bill, we've been poisoned." And I said, "What do you mean?" He said, "This is decaf." [laughter] And I realized we had both been waiting for the caffeine buzz to kick in. (Ann?) had taken it upon herself to provide decaf. We fixed that pretty quickly. [laughter] It was probably our only accomplishment as chief scientist and deputy chief scientist for a while because we were too busy learning the ropes and trying to figure out how Washington worked to really accomplish much. People were eating from our rice bowl. It was awful. [laughter] But we got through that. One of the things that happened – NAPAP was a big program at this time. This was 1987. The NAPAP program was designed to look at acid rain, understand its environmental impacts, and make suggestions about what to do about it. It was the program that was getting a lot of flak from environmentalists, from the Canadians. This was a big problem as far as those two groups were concerned. The program was supposed to last ten years. It had reached the midpoint in 1985. The midterm report only came out in 1987. It came out just a few weeks before I moved to DC. It had been written by a guy named Larry Kulp, who was head of the program. He had come from Weyerhaeuser, based in Washington State. He had not bothered to send it to any other agencies to be peer-reviewed. He just submitted it to Congress. It was representative more of his personal views than anything else. The agencies were furious. Congress was furious. The Canadians had their minds blown by the intensity of this report and all the rest of it. And Larry had breakfast with me on my first day at DC and said, "I wish you well with this program. I'm retiring. I'm moving to Hawaii with my new bride. Good luck." [laughter] It was tough, tough going to try to figure out what to do with that program. It was so toxic that the National Academy of Sciences refused to even review it. They said, "We're not going to review it." That was a huge problem for everybody. But the problem was solved by a guy named J.R. Spradley, who was one of the – J.R. Spradley was a protege of Jim Watt, who was the very – how do I want to describe it? – very controversial Head of Department of Interior that Reagan had put in place over there. J.R. Spradley had been moved over to NOAA to make us more political, I guess. But while I was having trouble getting any traction on replacing Larry Kulp, J.R.

Spradley went to the people up in the office of Commerce headquarters and got them to accept a guy named Jim Mahoney. Jim was awesome in this job he had. You maybe recognize the name. He made a big reputation, creating the first big private sector Weather firm; it was called Environmental Research and Technology. They had realized that with the 1970 Act that set up EPA [Environmental Protection Agency], there was a call for environmental impact statements. If you were going to do a project, you had to explain what the environmental impact of that project was going to be. People were going to need private consultants to help them develop those statements. So, Jim had created a company that had about eight hundred employees that were doing this. This was a transition for most private sector weather companies up to that point [who] just might have a handful of people working for them. AccuWeather might have been an exception. But Jim had stepped down from that ERT job, and he was actually involved in consulting with Bechtel to look at the cleanup of Three Mile Island, the nuclear reactor that was compromised during the ’80s. They brought him over to run this program. I'm sorry, I've gone on a long time about that. I can tell you more about Jim and that program, but I'll give you a chance to get a word in edgewise.

MB: Thank you so much, Bill. That sounds fascinating. I am looking at the time.

BH: Yeah, I forgot about that.

MB: Do you mind if we close out with another AB [ask Bill] anything question?

BH: That sounds great. Yeah.

MB: I have a question from one of your colleagues and friends, and they ask: Who at NOAA influenced you the most during your career there?

BH: Wow. Okay, I'd have to acknowledge a bunch of people. I’ll try to do it very quickly. My very first boss – well, he was actually my boss when I was at ESSA [Environmental Science Services Administration]. He was a gentle, easygoing boss. He pretty much let me pursue the research I wanted to pursue. He was always good-natured about it. Remember, I told you that a colleague and I wrote this memo criticizing the Institute for Telecommunications Lab. He could have really put his thumbs down on that, but he helped us navigate the process of making our views known. Gordon Little was remarkable just in terms of the breadth of his intellect, his integrity, his vision, and his management style. He just was so good at inclusiveness. I think maybe I told you. He had us – 130 people in his lab – rank all of ourselves in terms of our net contribution to the lab. We all thought that would be a disaster. He furthermore had the managers rank their inputs separately from the rank and file. People thought that would be a disaster. It turned out that the standard deviation and where you placed in this ranking, out of 130 people total, was about plus or minus one slot. There was no significant difference between

the management ranking of everybody and the rank-and-file ranking of everybody. That really solidified us. That was so miraculous. Gordon Little had many other features that were remarkable. Joe Fletcher was a maverick and not maybe the best scientist ever. But he was so clever about making things happen at NOAA and working with the operational people. I could go on for an hour or so about Joe and what he contributed. Joe would be on that list. Ned Ostenso. When we were in the Candidate Development Program for SES, we were all supposed to have mentors. I wanted very much for Ferris Webster to be my mentor. He was the head of OAR; Ned was only the deputy. And they said, "No, there's a guy in oceanography who works for Ned, who needs a mentor. He needs to be working for Ferris Webster, and you, Bill, need to work for Ned." I was disappointed in that choice. But it just turned out to be heaven-sent. I could just tell stories about Ned and the ways he's influenced my life for hours again. That's not exactly a short list, but those are – I'm probably leaving out some very important people. Kathy Sullivan, who was my boss when I was deputy chief scientist for a while when she first arrived at NOAA, was also very important to my thinking and learning process. I learned a lot from her, including a lot after I left NOAA, and she returned in the NOAA leadership again and eventually [inaudible].

MB: Many thanks, Bill. I have several questions related to your term. I think we will still continue to talk about your term as deputy chief scientist at NOAA. I have some questions about the NAPAP program because you've blogged about it as well. It was fascinating to learn more about it. And then, of course, I'll ask you more questions next time about Jim Mahoney, too. But thank you so much.

BH: I should have listed him as somebody who was also very important. Even though he worked for me nominally, he had a huge influence on the lives of a lot of people. Thank you so much for your patience, Mona. I'm hoping by now you're beginning to wonder why you ever decided to get involved in this, but it's been great.

MB: The best thing I'm doing in my life, Bill. So, with your permission, I'm going to stop the recording.

BH: Okay, thank you.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 9/14/2023
Reviewed by Bill Hooke 9/19/2023
Reviewed by Molly Graham 9/20/2023

Session 13 - August 16, 2023

Interview Summary: Dr. Hooke discusses his involvement in environmental assessment programs and policy development, highlighting the challenges faced, the importance of accurate information for policymakers, and the role of scientists in shaping policy decisions. He also reflects on his experiences in federal programs and the significance of understanding diverse perspectives in Washington, emphasizing the need for effective leadership in addressing environmental issues. Additionally, he touches on the role of trust, forgiveness, and faith in addressing environmental challenges and the difference between being driven and being called in one's work.

Mona Behl: It is August 16 [2023]. My name is Mona. I am connected at my house in Athens, Georgia. And with me, I have Dr. Bill Hooke, who is in Alexandria, Virginia. Hello, Bill.

William "Bill" Hooke: Oh, good morning, Mona. It's so great to see you.

MB: Likewise, Bill. I was reviewing our conversation last week, and my goodness, it had so many names. Of course, the people that you worked with – Melvin Peterson, who I learned more about. You mentioned he was the mind behind the large-scale scientific ocean drilling program. You mentioned Roger Revelle, who was also the first president of the Scientific Committee on Ocean Research and actually quite instrumental in creating the International Geophysical Year.

BH: Roger Revelle was a big guy in our field.

MB: Yeah, definitely a well-known name in oceanography. I definitely will, at some point, get into more conversation about Ned Ostenso and Kathy Sullivan. I was intrigued by the fact that you said that they had such a great influence on your life. Then I keep noting the names of staff members, like (Ann?) and Jane, and all these wonderful people who had worked with you. One of the questions that I wanted to ask you was about the NAPAP [National Acid Precipitation Assessment Program] program. You mentioned that the academies refused to review the program. Could you talk a little bit more about that? And then also, if you could reflect on Jim Mahoney's leadership of that program?

BH: Yeah. That would be a good place to start. I think people know the whole background of NAPAP. When the Industrial Revolution got going, and people started burning a lot of fossil fuels and all the rest of it and really cranking up smelters, they noticed that there was a lot of local air pollution. There were a lot of local pollution problems and a lot of local ecological damage around smelters, power plants, and all sorts of things like that. Some bright person had the idea that "Oh, well, the problem is the smokestacks are too short. And so we'll put these tall smokestacks on all these units, and then the pollution will be put at such a high level in the

atmosphere, it will disperse over a wider area, and that'll solve the problem." They did that for decades. And then they started noticing subtle change, ecological damage on a much larger scale now. [laughter] Because many more of these plants were coming in, and everybody was trying to pile on to the advantages of using more energy and building more stuff. Suddenly, they realized that these smokestacks had just transformed a local problem, which created towns like Ducktown that were famous, iconic, for the damaged landscapes, to regional areas. They began discussing this phenomenon of acid rain and the impact it was having on lakes and rivers over regional areas, particularly here in the US, in the Northeast, and also in southeastern Canada. It wasn't long before people, the Canadians particularly, noticed that the US is exporting all this air pollution into our pristine environment. It was important to do something about it. The Reagan Administration set up this National Acid Precipitation Assessment Program to study the problem, and it was widely regarded abroad and by environmentalists as a delaying tactic. Instead of really doing something about a problem that people thought had obvious causes and obvious solutions, they would study it and delay any kind of appropriate policy action. But the idea was the program would run for ten years starting in 1980, it would terminate in 1990, and there would be policy prescriptions. And they proceeded on along that line. By 1985, the midterm report was due. The NAPAP office, which was housed administratively at NOAA, didn't turn it in. There was a guy named Lawrence Kulp who had come from the lumber industry, from Weyerhaeuser, who was in charge of the program by that time. You and I would feel nervous about being a week slow in turning in a term paper to our advisor. But Larry had no problem being two years late, turning in the report to Congress. When he did turn in the report, he wrote the executive summary personally. He didn't have any agency review of this report. He simply turned it into Congress. He announced his retirement. He married a new wife and went off to retirement in Hawaii in 1987. I think I've mentioned all this before. And everybody went nuts. The environmentalists were angry. Congress was angry. The thousands of people who had been involved in NAPAP were hanging their heads in shame. The Canadians were grumbling and all the rest of it. This program was part of the Office of the Chief Scientist, and I walked in, a kid from Boulder taking over the deputy chief scientist responsibility, and pretty naive about most of this. I'd heard rumblings, but that was all coming from Washington, and I was doing my science in Boulder and focused on other things. I had to come up to speed quickly and did it poorly. I remember having a breakfast meeting with Larry Kulp, where he announced all this to me almost on my arrival in DC. I struggled a lot with what to do about it, but against the odds, we got Jim Mahoney to come in and take over the program. I said the Academy turned up its nose at this program. It felt that the premise of the program, this idea of doing research to delay action, was not that great to begin with. To be late in the reporting and to have all this other stuff going on, it just was – they just weren't going to touch it. It was a very interesting stance on their part. There's probably some people still around who could give you a better feeling for what their rationale was. But anyway, they ignored it. Jim Mahoney could have said, "Well, I'm here late. The midterm report was two years late. It needs to be redone. And this program is going to be delayed five years." Instead, he said in late 1987, when he came in – it might have even been

early 1988 that he was going to finish the program on time. He was going to get the report to Congress. The first thing he did was they were going to have an assessment of the science. That assessment turned out to be four volumes that took up about this much space, probably a foot and a half, eighteen inches or so of space on your bookshelf, a four-volume set, thousands of pages written by these hundreds of authors. Really just a very exhaustive treatment of the problem scientifically, with a rigorous peer review. He got a peer review of the individual contributions. But also, since the Academy wouldn't touch this program, he set up his own advisory group called the Oversight Review Board. It had a former chair of the Council on Environmental Quality on it. It had Roger Revelle on it. It had a guy named John Bailar, that's B-A-I-L-A-R, who was big on the public health aspects of acid rain. And John Tukey, who was the foremost statistician of the time and one of the people you could count on to vouch for the quality of data or find flaws in it. They were of such stature that the NAPAP program, big as it was, was small in their purview. None of them was conflicted. I think I was telling you, by contrast, the US Global Change Research Program, which got launched in 1987, also quickly set up Academy panels to evaluate it. When you looked at them from the outside, which I did at the time, you saw that all the people on the advisory panels had careers that would be affected by what was the fate of this program. So they couldn't really be – they could provide expert advice; their advice would be credible, but it might not be legitimate in the sense that Bill Clark referred to saliency, credibility, [and] legitimacy in terms of assessments, it might not be legitimate because of all these conflicts of interest. The Academy did what it usually did in such cases; it resolved all this by having individual members state their conflicts in a very affirmative way – as an Academy panelist yourself, now you know what that's like – and relying on the fact that this smear or average of all these conflicts of interest would average out and not interfere with the whole process. But really, they were going to be all in favor of the US Global Change Research Program and all the rest of it. And they were. By contrast, it was a surprise when the oversight review board said this is a great program, [that] the technical part of the program was great. Then, Jim worked on the recommendations for policymakers. The big challenge was to provide input to the reauthorization of the Clean Air Act in time, which the timeframe was 1990. In the literature, you'll see the program NAPAP faulted for not delivering its final report prior to that legislation. But the fact was that Jim Mahoney had worked with Senator [Daniel Patrick] Moynihan's office and a couple of staffers there to make sure that the policy conclusions were widely and clearly available to the Congress before the time of publication of the NAPAP annual report. So he did an extraordinary job. He felt that he had so much spare time during this two-year period that he took on the presidency of the AMS [American Meteorological Society]. He succeeded in giving himself a serious bacterial infection, letting it get out of hand to the extent that it plagued him really for the rest of his life. He lived for about another thirteen years or so. He was constantly having to battle this infection that they could never get rid of in Jim's body. When he became the assistant secretary of NOAA, under the – which administration would that have been? I guess that was Bush II. He was dealing with these health issues. By that time, he was walking with a cane. He continued to provide tremendous impact, gravitas, and

leadership to our science in a broad way. When he was wrapping up NAPAP in 1990, he tried to work with the interagency groups in the White House to set up a similar process or carry out evaluations of the Global Change Research Program but failed. He didn't have the political clout to really carry the day, although intellectually, I thought at the time, he had a bunch of good ideas, and the whole setup of the IPCC [Intergovernmental Panel on Climate Change] and the arrangement that followed took a lot longer than it might have if people had listened to his suggestions at the beginning. Long-winded answer.

MB: What a fascinating –

BH: It raises more questions than answers, and you can get other perspectives.

MB: This is a fascinating perspective, Bill, about, of course, the key actors in relation to the NAPAP program, but also how science and policymakers work and engage with each other. It seems like, again, the report that was necessary to be delivered to Congress before the reauthorization of the Clean Air Act – I was reflecting on the important role that scientists play in making sure that Congress [and] the policymakers have the right information and in a timely manner and what an incredible leadership of the program Jim had. Thanks so much for sharing that.

BH: He really turned around, I think, the opinion of policymakers in Congress and the Canadians. The environmental people are never pleased with how you [inaudible]. They shouldn't be, in a way, but I think there was grudging respect for what he accomplished there.

MB: Well, thank you for that. I want to go back to a couple of people that you mentioned in your previous interview. Before actually I get into that, let me ask you, you mentioned your experience for those two years in the SES Candidate Development Program. It seems like, Bill, you were engaged in providing assistance to a series of NOAA chief scientists, basically. How did that program prepare you to serve in that role, where you were assisting these political appointees and balancing that with [inaudible] employees?

BH: It did the best it could, but I'm a very slow learner. I probably could have taken better advantage of the program. I did learn a lot. They had us meet with the heads of NOAA, and we worked with people and other agencies. I entered that program – let's see. There is a phrase I used to use at the time; I'm trying to remember what it was. Oh, yes. We called it the SES-Pool. I also had some courses at the Federal Executive Institute. I got to meet scientists and professionals from a number of federal agencies. I guess going into that series of programs that the Candidate Development Program provided, I had been proud to be an employee of the Wave Propagation Lab of NOAA. But I kind of bought into what Gordon Little led us to believe, I think, that we were an island of excellence in a sea of mediocrity. I came out of that really proud

to be a civil servant and a federal worker. I met people from the Railroad Retirement Board. I still don't know exactly what they do, but I remember thinking, if that person works for the Railroad Retirement Board, they must be doing great things. I met a State Department employee whose only job was to track the whereabouts and the circumstances of the some twenty-thousand Vietnam veterans who had never come home, who were just kind of rocking around Asia with all sorts of mental and physical difficulties that kind of kept them from really coming back for one reason or another. I mean, just dozens of people like that, sitting in classes with them, and so on. I just realized, "Wow, a better model …". Gordon Little was a terrific guy, but he should have thought more like an ecologist. This was the thing I learned. I don't think I waited to learn it from Paul Higgins, but Paul Higgins certainly reinforced it because he was an ecologist, and we'll probably get to him down the road someplace. There's a tendency to think when other people don't think like you or sound like you that there's something wrong with them. But the ecologist doesn't go into the jungle and look at the jaguar and the lemur and the poison toad and say, "Two of you must be wrong." The ecologist goes in and says, "What is it about this ecosystem that means that you are all ideal for what you do?" So, the better model for Washington – Gordon Little had a lot of disdain for what went on in Washington and the people doing it. But a better model for Washington is the people there are as high-minded as you and me. They're as smart as you and me, probably smarter. What is it about their circumstance that makes what they're doing – their behavior, and their speech, and their ideas, and so on – ideal? That actually applies to every other human being on the planet when you think about it. That was hugely valuable to me, but I don't know whether that came from church, from ecologists, or from the program, or whatever. But that was what happened during that period, in the sort of late '70s and all through the '80s. That was a huge thing to bring with me to Washington. Carrying the ecological thing one step further. You hear a lot about the jungle of Washington and the predatory nature of things that go on here, and you can pick up the media coverage every day and see new evidence of that. But I took comfort from another ecological reality, which is to survive in this jungle, you don't have to be the apex predator; all you have to be is an unappetizing meal. So the skunk, the porcupine, that poison tree toad – [laughter] – you go back to those things. They go through life in the jungle minding their own business, meaning no one does any harm, particularly, and just making it clear that there's not much joy. You can kill me, you can weaken me, you can limit me, but there's not going to be any joy there. To my amazement, that sort of worked because every day that I was in that deputy chief scientist position, I thought, "Everybody around me is just so talented, and they've got an agenda, and they've got the knives out. They were so smooth. They could cut off your head, and you wouldn't know it until you bent over to tie your shoe, [laughter] and then your head would go rolling along the floor someplace, and you try to figure out how to find it." But if you just kept – and when I was running interagency meetings, I used to tell them that. I used to say, "We're mice running with the elephants, and we don't want to cause any of these elephants to trip. We've got to worry about the elephants and not the fact that we're in this humble interagency

circumstance, and we're trying to move a much larger enterprise." There's still room for the apex predators. But there are other ways to go about it.

MB: Wow, Bill, you are an ecologist.

BH: No, not really.

MB: Yes, yes.

BH: I'm unburdened by any biological training.

MB: Yeah, I think ecology, the mindset – I love what you said, that analogy, the ecological link, if we were to have that. But what you said also has a deep spiritual component to it. I feel the world would be a better place if we were okay surrounding ourselves with people who thought differently. I think our biases would be low, and the world would be better off. Do you mind reflecting on that from a spiritual lens for a moment?

BH: Oh, we're certainly fumbling with that, aren't we? And I'm thinking about it more and more and trying to organize my thoughts. Just to put on a totally spiritual lens for a second, there are a lot of religions around, and they all have different approaches and some similarities and some differences. The one I know best, and I don't know any of them well, but the one I know best is Christianity, the Christian Judeo tradition that's focused on a book called the Bible. The very first book in the Bible is the book of Genesis. It has the story of creation. A lot of people say, "Well, the trouble with people who are religious is they think the Bible is inerrant, but it's contrary to science." And I would tell people the Genesis story is like an interview with an FBI [Federal Bureau of Investigation] agent. The thing that happens when you're interviewed by an FBI agent, and I was a number of times for security clearances for people – the very first thing they do is flash a badge or an ID card. And that ID card is inerrant. It's totally authentic; there is nothing wrong with it. But it is not a history of the FBI. It's not an organization chart of the FBI. It doesn't describe the FBI mission. It's totally to establish relationship. The relationship is I'm an FBI agent, and you will answer those questions. You're not an FBI agent, and you will answer those questions truthfully. Or else. [laughter] There'll be consequences. And the Book of Genesis is like that. It basically is not about how the world was created; it's basically saying, "I'm the creator. You're a created thing. Now that we've got the relationship settled, let's talk about things I want to talk about, namely, love and hate, sin and redemption and forgiveness, all of those things." Well, in this book – and you can question whether it was inspired by God or human beings wrote it – clearly, human beings wrote it. There are two ideas in it. There are only two ideas. One is that the earth is perfect, and human beings' job is to take care of it. The other one is we really shouldn't be too interested in tasting evil, sort of sampling evil, and figuring out what's good and what's bad. We should be more interested in just doing what's

good. Two ideas. And the human race, basically, whether these ideas came from God or from the human race itself, is oh-for-two. We're not taking good care of the earth, and we're not very loving. We don't obey the golden rule, which everybody kind of has in there; it's part of natural law. Whether there's a God or not, you do to others what you would like to have them do to you. We're oh-for-two. To get out of the pickle that we're in with regard to climate change and broader environmental issues, like our vulnerability to extreme events and some of our resource problems, we have to be good as much as we have to understand the science of things. I think there's a temptation to think, "Oh, if we know the science of things, then we can work our way in the policy process, put our thumb on it, and force compliance to do the good stewardship part." But unless we're fair – everything in game theory points to the fact that if I think you're unfair, and I'm willing to take actions that will hurt me more than you just to hurt you, that's what game theory teaches. That's what's going on. We've got eight billion people playing some version of that – lack of trust, lack of forgiveness, lack of tolerance. On the other side, the aggressor side, there's a lot of complacency about all the aggression that we're visiting on others. It's not going to work for us. I've been very interested in the whole rise of the diversity, equity inclusion kind because it seems to me it's getting at this, and it's trying to get at it at the level that it really needs to get at it. These two things have to be integrated. This stewardship thing that we need so desperately to take care of our resources, protect the environment, build resilience to extreme events and goodness are not two separate things that you can jam together. There are two things that we have to work out simultaneously. That book I wrote tried to get it this, but not with the intensity that it would today if I tried to rewrite it. I'm sorry, that was kind of a long-winded answer. But I hope you see what I'm getting at. The human challenge right now is to put these two things together and somehow find ways to trust, find ways to forgive, find ways to share. Sharing needs to be a much bigger part of all this. I'm wrestling with these ideas.

MB: Bill, that is wonderful. Thank you again for sharing these perspectives. I was constantly thinking about Francis Bacon, somebody that you've mentioned in this context. In particular, you've mentioned how science should be useful and for the benefit of society. So that benefit of society part is –

BH: Actually, he says the benefit of life. The benefit and use of life. Our ecologist friends like Paul Higgins say, "Oh, well, human beings shouldn't think they're more valuable than any other creatures or plants or whatever." I think it's significant that here during – anyway, he says the benefit and use of life, which is amazing. [laughter] I'm sorry I interrupted you. That was wrong because you were making a great point. So keep going.

MB: No, I think I just said what I had to say, Bill. But I want to come back, perhaps next time, to Francis Bacon and some of these ideas that you talked about. Do we have time for one AB [ask Bill] anything?

BH: Yes.

MB: Okay, fabulous. Oh, first of all, I wanted to say, Bill, your colleagues and friends are absolutely generous in getting me these questions. They're enthusiastic, and I have everyone's blessings. Everyone seems very excited about the idea that we're having this conversation. So, I just wanted to put that out there.

BH: That's encouraging.

MB: So one question that I have because you've been talking about your term as deputy chief scientist of NOAA and all this experience that you had with NOAA – this may be a longer answer. "What did your years at NOAA inform and prepare you in developing and sustaining the AMS Policy Program," is what a colleague of yours asked. This colleague was the past president of AMS; they were also a woman.

BH: Repeat the question. It sounded like a great question. I want to be sure I answer it carefully. Yeah.

MB: How did your years at NOAA inform and prepare you in developing and sustaining the AMS policy program?

BH: Well, it's hard to be organized about that in a way that the question deserves. But I'd start with one idea. We have stereotypes about most things in life. If you're outside the government, you have a stereotype about government. And if you're in it, that helps you to understand at least government. The government's a big player and all the things we've been discussing. It's a big player in the affairs of humanity. I got rid of the stereotypes. I must say that my Boulder years were largely insular, as I described. When I got into this Candidate Development Program and started working with other agencies and when I moved here to Washington and worked at the interagency level, that whole understanding expanded. Particularly, one of the areas where it was deficient is in relating to Congress because you're proscribed from doing too much of that. You're supposed to get permission from people, and it's supposed to occur at a higher level. I would say that NOAA did not prepare me as well as it might have. Let me put it another way. As a slow learner, I didn't take fullest advantage of what I could have learned about Congress growing up. The second thing is because I made the transition from scientist to manager and from manager to leader in NOAA, I learned a lot about management and the people side of science. I was inclined to find out more about that as I've gone along. But I've really learned by making a lot of mistakes and by being harder on people – I've been reflecting a lot on if you had people from my first managerial job weigh in on this, they'd probably be a lot less enamored of me than some of these other people might be. [laughter] I learned a lot by making mistakes and was able to make it. I had a series of bosses that let me make mistakes and that encouraged me

to let others make mistakes the rest of my career. That was an important thing. I learned that the work we're engaged in is a high calling. I got interested in science because I was good at it, and it was fun. It became serious business, particularly after I got into the hazards work, starting with that Academy panel I was on in 1986, the one that set up the International Decade for Natural Disaster Reduction. That's an answer to that question, I guess. The people were just high-minded people. I saw a lot to admire in the people I was involved with. I found that out in talking with others since then – I keep saying, "Oh, government workers are really high-minded. It's a real calling." Even some government workers try to push back on me on that. They think, "Oh, there's a lot of bad stuff going on, and people being lazy and all the rest of it." I guess I don't buy into that so much.

MB: Thank you so much, Bill. It's not just one job, I think, or one place, probably that prepares you to do something later in your life.

BH: It was the whole trajectory.

MB: Yes. I could also see – as you were sharing your reflections, I also thought about the influence that your mom and dad might have had in the way you did what you did and how you established the AMS Policy Program and accomplished everything during your term with the federal government. It's not just one agency. [laughter]

BH: Let me just say quickly, with response to that – you mentioned my mom and dad. Really, when I moved from science into management, they should have cut my salary in half. When I moved from management in Boulder to management in DC, they should have cut it in half again because, by the time you got to DC, it was all about the things you learned from Mom and Dad: Say the same thing about Jane in public that you said about her in private. Keep your promises. Be fair. Don't be judgmental, whatever. They're so basic.

MB: This is amazing, Bill. Next time, I also want to pick up where we left off. I do have a number of follow-up questions. I do want to hear from you about the role that your faith played in this kind of mindset, too, because somewhere in the background, you also mentioned Chris. I know that in the past, you've shared the big role that Chris has had in your life in terms of bringing you closer to faith. And it seems like your thought process, the way you interact with people, the mindset with which you went to Washington, DC, and how you played those roles in the federal government was also probably influenced by faith and spirituality.

BH: Absolutely. Happy to do that.

MB: That would be a fantastic place to start next time. Once again, thank you so much, Bill, for your time. Did I have your permission to –?

BH: No, thank you. Every one of these triggers a whole bunch of thoughts for the whole week until the next one shows up. You've been making me confront things and think about things that I haven't in a long time. Thank you.

MB: And you make me reflect on my calling every day, Bill. So, thank you again.

BH: Calling. That's an important notion we should talk about because there's a big difference between being driven and being called. So let's not forget to go into that.

MB: Most certainly, Bill. Thank you.

BH: Thank you.

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Reviewed by Molly Graham 9/17/2023
Reviewed by Bill Hooke 9/17/2023
Reviewed by Molly Graham 10/22/2023

Session 14 - August 23, 2023

Interview Summary: Dr. Bill Hooke reflects on his career journey within NOAA, discussing his roles as deputy chief scientist and acting chief scientist. He emphasizes the importance of management styles, values, and personal connections in leadership. Hooke also highlights the significance of consensus in decision-making processes and praises the leadership of Kathy Sullivan during transitions between administrations.

Mona Behl: It is August 23 [2023]. My name is Mona Behl. I am connected at my home in Athens, Georgia. And with me, I have Dr. Bill Hooke, who is in Alexandria, Virginia. Hello, Bill.

William "Bill" Hooke: Good morning. How are you, Mona?

MB: Doing okay, Bill. I was revisiting our conversation from last time, and I was reflecting on what you said about the difference between being driven and being called. I thought maybe we can start with that and then go back to your journey.

BH: We're really getting into the deep end of the pool. There was a very popular book by a Christian author a few years ago entitled The Purpose Driven Life. I wasn't really a big fan of it when it came out, or at least not a big fan of the title, because driven to me means something different from called. Called is much more relaxed. It's something that's external to you. We talk about our vocation, and our vocation is really a Latinized word meaning our calling. If we can have an awareness of the fact that, in some mysterious way, virtually all of us were called to live the life we're living and the things we're doing and so on, instead of being constantly restless. Instead of constantly feeling a sense of inadequacy and competitiveness with others – a striving – we are relaxed, and we're actually far better able to contribute and do the things that make the world a better place and satisfy us at the same time.

MB: That's beautifully said, Bill. Thank you so much. It's so difficult to cultivate those values, though. I feel it's easier said than done to remind yourself when you go to the job, and it feels the same thing all over again the next day – to remind yourself that you're actually doing the work of God, the work of the universe.

BH: When I say that to you, I'm actually giving myself a pep talk because I constantly need to refresh that awareness myself. You brought up the notion of God, and particularly, if you have a kind of concrete notion of a God who is loving and all-powerful, it also adds a lot of substance to those ideas. Instead of being a kind of self-help, do-it-by-your-bootstraps kind of approach, you're actually getting help from a much higher power. It helps with the humility part, too,

because the sooner and the more completely you and I realize we bring so little to the table, the better off we are and the people around us as well.

MB: These values, these thoughts are quite outstanding, Bill. You were so young when you started with NOAA in the late 1960s in Boulder, and it seems like you cultivated these values and took them to Washington, DC. You've explained how your managerial experience to becoming a leader in DC was – all this managerial experience in Boulder was so helpful and probably pivotal in that transition to your federal job in Washington, DC.

BH: Actually, an important part of it was it did happen in Boulder, but not right away in Boulder. When I talked about reading management books, and some of the first ones I read – I remember reading a book called The Gamesman by a fellow named Michael Maccoby, and he talked about different styles of management. There was the jungle fighter. That was the person who saw everybody as a competitor and had to be the apex predator. He pointed out you build up antibodies in that approach. People look for ways to do you in. There was the corporate person. There was the craftsman. He talked about the inadequacies of these for management. His ideal manager was the gamesman. And I'm going to take time out for an extended digression. I went to a management course in 1970. And there was a speaker there, an HR [human resources] guy from Texas Instruments, which was a much bigger, more well-known company than it is today, but from the world of IT [information technology]. He gave us a talk on people and their value systems. He had seven value systems. The first one was reactive. He characterized this as you remember your phone number, but you don't know why it's important. The second one was tribalistic. You didn't care how bad conditions were as long as they were equally bad for everybody. He gave an example of somebody who was running janitorial services for their Texas Instruments research labs, and the guy had tried all kinds of management techniques. First, he'd said, "Okay, you're going to do blackboards in every office. You're going to do the wastebaskets in every office." Gave each person a different assignment. And then that didn't work. So he tried saying, "You're responsible for this whole office, every aspect of it. And you're responsible for that whole other office." That didn't work either. But when he just went down the hall talking with everybody and schmoozing with them while they got their work done, they were all doing much better. That was tribalistic. Then, there was egocentric. There was the person who worked because he had to. And that person – he had an example of a guy who was sitting in front of equipment that was testing integrated circuits. That was back in a day when they were very precious, and you did it one by one and manually. The gadget that was putting each integrated circuit in front of this fellow was crumpling them up and making them useless at the time they were going through. But he didn't care; the pay was the same. That was egocentric. The next person was the organization man. He said, "You could encounter this person at any level in the organization." He talked about going to work one day, and there was this big traffic backup. He realized it was because the light was out. The traffic light was out at the intersection that was ahead. Not only was the light out, but everybody was having to go

around the person who was the first in line because that person refused to turn, refused to make the turn. Everybody was picking their way through. When he got to the front, he saw that this fellow that was causing all the problems was the vice president. [laughter] He couldn't believe that. The next category was manipulative. That was the person who was always looking for ways around the system. So, he described a guy who wanted to buy a microscope, and it was too expensive; it exceeded the five-thousand-dollar limit that he could spend without having to get higher approval. So he wrote a whole bunch of purchase orders for the microscope bits and then said, "Vendor will assemble before delivery." That was his example for that. The next category, six, was sociocentric, and that was a sort of flower child kind of person. The last category was existential, the person who is living life at the highest, most meaningful plane. He pointed out that the even numbers and the odd numbers had a lot in common. So, tribalistic, organization man, and [sociocentric], and then reactive, egocentric, manipulative, existential – they all had characteristics in common. I looked at that, and that was like a Rosetta Stone for me. I decided I was in the manipulative existential category. I just was so happy and proud of that fact. So, I operated on that level for a long time. I think this is hard on the people who worked for me. I thought of myself as a jolly guy, but I wasn't. I'm not sure I really came across that way to my first cohort of people I was managing. By the way, to go back to Maccoby for a second, he decided that this gamesman category wasn't good enough, and he actually wrote a sequel to the book called The Leader. And it was somebody who led with a lot more integrity and not just out of a sense of "Master of the Universe" kind of thing. But then the real change came when I met my wife, Chris, who was a single mom and a Christian. She wound up having a pretty easy time convincing me that I really missed something by overlooking Christianity and what it had to offer. That was what changed [and] got me all these things that you were talking about in the people in the DC area. Maybe you remember. That happened maybe eleven years before I moved to DC. It was an awkward time for me at work because I had always thought I want to get as far in life as I can by being myself. I don't want to be a chameleon. I don't want to keep changing and so on. There was a guy named George Romney. He was Mitt Romney's father. He was governor of Michigan, and he was going to run for President of the United States. This was during the Vietnam War. He went out and met with the generals in Vietnam. Then, he came back and told everybody, "I was brainwashed." And that was not what people wanted to hear. So, they rejected him. They went in another direction. But I thought to myself from that Romney story, if that's the price – and I had that sort of Romney experience when, in a very short period of time, I went from this gamesman, manipulative kind of manager to thinking that life was – it was a call life versus a driven life and operating a different way. It was very awkward at first, being in the office, because there were people who knew me from the former way. Sorry, that was kind of a long deal. By the way, the guy that you should be impressed with is that HR manager from Texas Instruments because he was telling those stories – man, that had to be forty years ago. I kind of remember every one of them, not only the category but the little squib that he would give. He should be patting himself on the back right now.

MB: [laughter] That's amazing. Not only the fact that it's something that – I mean, obviously, that HR manager was a great storyteller because his stories stuck, but I'm going to weave in an AB [Ask Bill] anything. One of your colleagues and friends asked, Bill, how is it that you remember everyone's names and these meticulous details? How does that happen?

BH: Okay, well, I think it's an illusion. I think I forget everybody's names. I think I forget a lot of details. But I talk a lot, and I only talk about the ones whose names I remember. [laughter] The people thing – that's one that's sort of based out of desperation. All of us want people to remember us. We're all sitting here – again, am I called, or am I driven? Does my life have meaning, or am I trying to wrestle something out of a hostile universe? We hunger for anything that shows that we're recognized at some basic level. So people's names – people say they don't matter, but they matter a lot. And one of the big things I remember about my whole career was that at the beginning of it – I was young. The organizational pyramid wasn't nearly as big as it is today. I mean, agencies doing environmental work were in their youth. You just had to remember a few names at the top. You were in full possession of your faculties. Then, as I got older, the organizational pyramid had risen out of the ground. The names that mattered were the thousands of new people who were coming into the system at the bottom of the pyramid. My brain had turned to Jell-O just in terms of remembering their names. And so, particularly with a colloquium, I used to sit in the back of the room, and from the backs of people's heads, I would try to go through the catechism with their names. I would try to learn – and then, when we started doing those alumni functions, and the number kept getting bigger and bigger – it's a huge challenge. I see it here at the retirement community where I am because I'm around this geriatric set, and I'm trying to remember people's names. They've gotten kind of oblivious to that. Joe Friday, who was the former head of the Weather Service and many other things, used to say the great thing about Alzheimer's is that you meet a lot of new friends every day. I always kind of like that. I used to tell myself that, okay, this period of going through is temporary. Because one day, I'll still have forgotten everybody's name, but I won't remember that I've forgotten. I'm looking forward to that day. So that's what you get when you ask me anything. You get anything back. [laughter]

MB: It's quite amazing, Bill. All of us – your colleagues, your friends – are in awe of the names and the stories that you remember. I think you know more about me than I know about myself.

BH: Oh, no. No, no.

MB: That is most impressive. [laughter] I want to go back to your career journey. We were talking about how you basically assisted and collaborated with a suite of chief scientists and prepared them for their jobs. This was in the late 1980s, early '90s.

BH: Oh, Lord. This is going to be a very sensitive set of discussions. Okay.

MB: No, no, I actually wanted to go – so, you served as deputy chief scientist of NOAA, and that's the last position that we discussed that you had. We discussed all the things and the kind of interagency initiatives you were able to initiate in that position. I wanted to go beyond that. After serving as deputy chief scientist of NOAA, what was the next position that you had within the Department of Commerce?

BH: Well, for a while, I was the acting chief scientist. I got that position in a kind of strange way. I'm trying to think how much I should tell of this story. Excuse the hesitation, but I'm really trying to think about this. Wow. There's a good story there. But let's just say that it was sudden that management decided that the person who was encumbering the job had to go and had to go relatively immediately. Something had come up. The guy who was the deputy undersecretary of Commerce, who was another career position that had been created, came into my office one day, and he said, "Bill, you're the acting chief scientist. I want you to move into that office before the end of the day and start doing the job." And I did. So, that was interesting. There have been several people who had been the chief scientist, and they varied in their abilities. We may get to Kathy Sullivan in a bit. This was before Kathy Sullivan. I think we'll make this clear that all these things happened – because I think the world of her. Let's see. How do I want to put this? Anyway, I took that job. It was interesting on a whole bunch of levels. One was that I'd had an office as the deputy chief scientist about the size of the room I'm in now. I was a career person. The chief scientist at that time was the number three appointment at NOAA. They had a room that was – gosh, I'm trying to think of a comparison for it. It was like a large living room, really. It was a pretty big office. It had a twelve-person conference table at one end of it. It had a wall-to-wall map of the world on the one end of it. My deputy chief scientist's office had views of other offices in the rabbit's warren that is the Department of Commerce Building interior. But this looked out on the Washington Monument and the mall. Gosh, it was one of the best offices I ever had. It was one of the three best offices I've had. It was palatial, and I just never got over it. Let's put that aside. That was the immediate juvenile kind of reaction to this. But then there was the job itself, which required – by that time because I'd been deputy chief scientist, I picked up a few skills, but not nearly enough to have that kind of position. It was very interesting. John Knauss was the head of NOAA at that time, and what a great teacher, what a great guy to learn from – a wealth of information. He had his own peculiar story. He had been nominated as the chief scientist of NOAA back at the beginning of – that would have been the Bush Administration, Bush I. While they were going through all the figuring out how that was going to work and so on, they had never gotten settled on a head of NOAA. Finally, they realized they could make John the head of NOAA, and they did. Anyway, it was a great position to be in. The guy who eventually would come in and tell me I was the acting chief scientist was a guy named Ray Kammerer. He was an English major. But he had risen to a position of great responsibility in NIST, the National Institute of Science and Technology. He was really skilled at the art of getting things done in Washington and what

makes Washington work. I learned a lot from him. That was my next job after being chief scientist. And then, Kathy Sullivan was going to be Bush's nomination for chief scientist. She was already kind of on the scene and all the rest of that. Bush went and lost the election to Bill Clinton. Normally, that would have been the end of Kathy Sullivan's chances, but because she was who she is and an astronaut and all the rest of it, the Democrats were just as interested in having her be the chief scientist as the Republicans had been. And so, she was very quickly the nominee for the Democratic position. She and I started working together. Because I love her so much and because she's so important in my own formation and so on, I have to say, we did not hit it off at the beginning. We did not hit it off at the beginning. Just to give you an idea of how this went – so, she's an astronaut. I was kind of a cud-chewer, and she was frustrated with my ways of making decisions or not being very good at it. I remember she said to me – one time, she said, "Bill, I fly jets. In jets, when the emergency light comes on and says, 'Eject, eject,' you maybe only have a fraction of a second to do that." And with the survival instincts of a lemming, I said, "Well, you know, the Office of the Chief Scientist isn't like that." I sorted parodied John Knauss's words. "Our job is to ensure that NOAA is as relevant fifteen years from now as it is today." I don't know when it started, but around that time, she decided she could use a different deputy. [laughter] So the Clinton Administration then started trying to figure out what to do with me. At that time, out of my hip pocket, I was running something called the US Weather Research Program. So, Jim Baker, who was the head of NOAA at that time, said, "Well, you can keep that job. We'll make that an SES [Senior Executive Service] job. You can go out to Silver Spring and do that job out of the Office of Oceanic and Atmospheric Research." That was my next job. I went out there for a while. Let's see, how did that go? Well, there are a whole bunch of stories [laughter] in there, again, about the transition of leaving the NOAA office. I was quite relieved at the time because when you're in SES, you can be reassigned to another SES job in about thirty days' notice. There's a good reason for that. You're supposed to be carrying managerial skills at such a level, including working with political people, that they can be applied anywhere. One of the options at that time was to put me in as head of the National Severe Storms Lab in Norman, Oklahoma. My wife, Chris, is a California girl. She was quite happy to move from Boulder to DC. But I didn't think – I never really asked her about it. But I didn't think she would be thrilled with maybe moving to Norman. It turned out that they gave me the Silver Spring job, and that was a lot friendlier kind of thing. And down the road, it wasn't long before Jim Baker, who was head of NOAA at the time, came back to me and said, "The Secretary of Commerce needs help with Kyoto." This was 1996. That was a big deal. It was a big climate change conference. I think they wanted to put a climate change person in that job. But the climate change people were all busy with the run-up to Kyoto, so they settled for somebody who had the phone numbers of climate change scientists. They sent me downtown to be the senior scientist in the Office of the Secretary of Commerce. That was supposed to be for three months before Kyoto, but I was there for about eighteen months. I think maybe we talked about the fact that most people don't realize that NOAA is fifty-five percent of the Department of Commerce. They think it's more like one percent. That includes secretaries of

Commerce. And secretaries think they're going to be dealing with a balance of trade and things of that kind, and they aren't. They're also dismayed to find out that sixty percent of their correspondence as Secretary of Commerce is not just NOAA but the Fisheries part of NOAA. Sixty percent of their correspondence and ninety percent of their lawsuits come from the Fisheries part of Commerce. That may not be true today. The world is much more contentious today. But it was true then in the late 1990s. So, I was handling all the Fisheries correspondence and all of that stuff in the Office of the Secretary. Those were the next couple of jobs, and we could probably explore those in a lot more depth.

MB: Yes, most definitely. Thank you, Bill. There's so much information, so much knowledge packed into what you just said. I was also reflecting on what kind of times those might have been where Democrats were okay with choosing Kathy Sullivan, who was originally Bush's choice to lead the agency. Such different times. I wish we lived in those kinds of times right now, where there was more consensus.

BH: Yeah. That reminds me, I want to mention something quickly before we [inaudible], and it's lost in this conversation. It's very important. It relates to Kathy. Kathy served as chief scientist of NOAA for a while. Then, at the end of the Clinton administration, she went – she was friends with John Glenn, and so he wound up going to Ohio State and running a Science and Technology Museum in Columbus, Ohio, for a while. She came back into government, or maybe she'd moved in government before while Clinton was still there over to the Defense Department. She had a job over there for a while. But then, when Obama came in, she came back to be the Assistant Secretary of Commerce under Jane Lubchenco. And I remember she sent me an email at the time. She said, "I'm back." [laughter] We just had a super relationship during that time, or at least, it was super, from my point of view. The things that she had found very frustrating with me as her deputy, she could tolerate if I was sitting over there in the American Meteorological Society, which is where I was at the time. I think I was useful to NOAA in some small ways then. And I'm just a huge fan. I thought she did a great job of running the agency. She has much more to offer the world still. She's out there writing books and going on different adventures. I keep track with that antique social media known as Facebook. I'm a big fan.

MB: Terrific. Thank you so much, Bill. I do have some follow-up questions, but I'm also looking at the time. I weaved in an AB anything there. So I think, with your permission, I'm going to stop here if that's okay.

BH: Okay.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 9/23/2023
Reviewed by Bill Hooke 9/25/2023

Reviewed by Molly Graham 10/22/2023

Session 15 - August 30, 2023

Interview Summary: Dr. Bill Hooke discusses leadership, collaboration, and mentoring in this interview with Mona Behl. He highlights the importance of listening, sharing ideas, and adopting a "Go-Giver" mentality. Emphasizing the role of a leader in fostering collaboration and a positive mindset, he draws on his government experience to stress the value of creating neutral spaces for cooperation.

Mona Behl: It is Wednesday, August 30, 2023. My name is Mona. I'm in Athens, Georgia, and with me is Dr. Bill Hooke in Alexandria. Hello, Bill.

William “Bill” Hooke: Hi. Good morning.

MB: Good morning, Bill.

BH: Good to see you, Mona.

MB: It's fantastic to see you, Bill. I have a few questions related to our conversation last time. I wanted to start with this question about this vision thing, Bill. You have mentioned leaders have vision. Within NOAA, within the Office of the Secretary [of] Commerce, you were successively in these leadership positions that required you to facilitate collaboration across multiple sectors with multiple people. Every morning when you went to work, what did you think? Did you have a vision? What was the outcome that you wanted to pursue at that time in those leadership positions?

BH: Well, it was probably way too vague. I mean, each day, there’d be something specific depending on the meanings, but my fantasy, as opposed to a vision, was that I was going to get a lot accomplished that day. What I remember about the 20th-century/21st-century workplace is that each day, you fall far farther behind, but in such a way that you're relieved when it's time to go home. [laughter] I don't know how that all works. I mean, the world moves forward while that's happening. But that's the perception on the ground, I think, for all of us. During the day, your vision and your horizons kind of expand; you get all kinds of ideas and ambitions about things that could be done or should be done. What happens, I think, overnight is some of that disappears, and then you rebuild it during the next day, and so on. But you talked about vision. And people talk a lot about leaders being visionary, but they have the wrong idea of it. Most people think, or many people think, or too many people think that the leader has a vision and imposes that on a world that doesn't see the vision. And dictators do that. Tyrants do that. Despots do that. You could find those in the public sector and the private sector, NGOs [non-governmental organizations], and so on, as well. But real leaders go around and listen a lot. They identify broad, very powerful, very deep concerns that people have. They give them focus.

So, by listening to a lot of people, separate the signal from the noise and what's common and can we do something about it? So, it's not that you or I or anybody is sitting there not knowing what needs to be done to make the world better. We just despair of being able to do it. We think if we try, the best we're going to achieve is becoming bitter and burned out. What leaders do is, by articulating it, they do it in such a way that they provide a framework, and people think, "Wow, instead of burning out or being disappointed, if I plug into this framework, it'll be very satisfying and will really accomplish something together." That's what leaders should be doing or are trying to do. Each day is an opportunity for doing that in a number of small ways to a number of things.

MB: Fabulous, Bill. That is such an insightful perspective because I did think that every morning when a leader goes to work, they do have a big-picture vision of where they want to get to, but what you're talking about is also in the spirit of collaboration. It's listening and, as you mentioned, recognizing the deepest concerns that people have and providing them with that focus.

BH: The leaders are going to work thinking about these concerns that people have. Also, it's important, I think – so, leaders have a dream, which is this dream that they've sort of gotten from outside. Two things about that dream. One is it has to be a big dream. If it's a small dream, if it's like, "Hey, we're going to do this, and a small number of us will get rich." [laughter] Or in this giant game that we're playing in our company, or the government agency of King of the Hill, or Queen of the Hill, we're going to get to the top. That's a small dream. It can't be a shabby dream. People are put off by that. The second thing is it's got to be a shared dream. I used to see people who'd have an idea that was pretty good, but they'd feel very possessive of it; they'd hold it close to them, and they'd say, "I'm not going to share this idea with you because then I lose it." And just the opposite happens if you don't share your ideas; they get smaller and smaller and less relevant and really kind of a grotesque version of what they were meant to be. But if you share your ideas, then other people riff on them, and they just have much better ideas, and it actually generates ideas. And instead of losing things and missing your chance to really make a name for yourself because you let some good ideas slip out – if that happens, they'll be better ideas, and your reputation will grow as – you're a person to be around. People want to be around you. You're not a sink for thought; you're a source of it.

MB: Bill, along those lines, giving the gift of your ideas to others, presenting it, you've often talked about being a "Go-Giver" as well. Could you expand on that a little bit since we're talking about leadership?

BH: Oh, you sly person, you. You know I'm very eager to quote this story for maybe the hundredth time or the five hundredth time and so on. So you're hitting on one of the great epiphanies that I had, and it came from going to a commencement at Boulder High School,

where my stepson was going. I'll just mention that – gee, I can't even remember the politician's name. I'd gone the year before to this Boulder High commencement. This was in the early '80, and the guy speaking was a guy named Gary Hart, a senator and he was going to run for President of the US. It was a terrible speech, just awful. It was very political, and it was all about him. The next guy that spoke the next year for my stepson's graduation was a guy named Mo Siegel, and Mo was a hippie. He and his buddies lived in the mountains above Boulder, and they walked through the meadows up there, and they would pick wildflowers and weeds and put it in boiling water, drink it, and see what would happen. He wound up founding Celestial Seasonings, which was an herbal tea company, and that made him a worldwide reputation and a millionaire many times over. He was still pretty young. He was probably in his late thirties, early forties, or something. He was speaking to this high school group. It was one of the greatest commencement speeches I can ever remember because he related to the young people, but the parents heard these eternal truths that they wanted their kids to hear. He said to the young people, "You hear a lot about being a go-getter. I'm here to tell you to be a go-giver. He says as long as you have something to offer the world, you will never go hungry." That was in 1981 or something like that. It was a thought that has never left me. I think I inflicted it on virtually every summer policy colloquium, and I don't know how many early career scientists because if you're an early career scientist, you live in a world that encourages you to be anxious and stressed and to feel insecure, maybe even fearful. Again, going back to the idea [that] if I have ideas, I should keep them to myself because otherwise, people will steal them from me. If I'm applying for a job, I'll never get it because there are three hundred other people applying for this job. The world is saying, "You're anxious, and you should be." This idea of Mo Siegal's is just the opposite. It basically says, if you and I are people talking about this subject, we're in the favored one percent or something like that of the world population. We're getting the best education. We've had the best chances to rise up. I mean, I had an easy ride of it. You came from India, and I don't think you necessarily came from the most favorable setup for being where you are today. But I certainly did. I mean, for me, it was easier to be where I am today than it was not to be. [laughter] And most people are kind of in that position. I mean, they may think they're having hardship, but they aren't really. What this does is it reminds us [that] the world is hungry for talent. We just have unlimited needs for brain power right now. Brain power is in very short supply, and if you have any, if you have something to offer, people are standing in line to harness it and to work with you. It's just a message that young people need to hear, and they can't hear it enough. It ought to be repeated. That's something that probably ought to be repeated at the start of every day.

MB: I need to hear that more often, Bill. I was only reflecting yesterday on how easy it is to go down into a whirlpool of self-pity. On the other hand, it's also so selfish in one way to let yourself drown in that whirlpool of self-pity because it hinders us from taking any action, any rising to our calling, as we've been discussing in the past couple of conversations. What strategies or what thoughts might you have to mitigate that? How do I know that what I have to

contribute really is useful and matters? What advice do you have for young people, especially early-career professional students? It's easy to doubt yourself. It's easy to have those bad emotions. How do you shake that off and rise to your calling?

BH: Well, there's sort of a whole bunch of cheap philosophy that I can apply to this that I've used, again, mostly in the recent decades of my life. I did want to make one point that a good starting point comes from faiths that are more in your part of the world. In Asia, these thoughts are to the extent that you're unhappy, usually only because you're striving to get something that you feel you don't have. If you spend time in that posture of need versus that posture of abundance, which is I've really got everything I need at this moment. I may be worried that the next moment, I don't. But at this moment, I really do. You can relax quite a bit. We've talked about relaxation in that spirit. I was so eager to get that first thought out that I've now forgotten some of the basic things that I wanted to say. So, hopefully, they'll come to me in a second here. One thing, I think, is to practice – maybe we talked about this. Again, this psychology of stress and anxiety. This culture tells you that you need mentors. One thing that's very useful to do is to take stock of your life and realize that you're mentoring others the whole time you're going through life. We tend to have kind of an exalted version of that vision or idea of that term. When you're with a peer in a class, and you have a cup of coffee afterward, or tea or something, or if somebody's going through a personal difficult time, or a troubling patch, or having trouble with homework or something, you help them out in a small way. That's mentoring. If you examine how you feel when you do that and when you have awareness of it, rarely do you feel drained by the experience. We hear stuff about not being around negative people and their negative energy, and there's probably something to that. But a lot of times when you're having a constructive conversation, when you're really helping somebody in some way, you have a good feeling about it, it's energizing, and you actually feel like you're able to do more rather than less of that. Once you get in touch with the idea that instead of needing a mentor, you're already a mentor, and once you start being a little more intentional about that, you won't really be needy again. [laughter] And that's an oversimplification. We all backslide on that one, and so on. But you can catch yourself, and you can realize life is more positive than that. I think I've still left out one or two other techniques I use, but maybe they'll come to us when you ask me another question.

MB: Absolutely. So my next question was going to be related to your job, Bill. When you were senior scientist in the Office of the Secretary, you had very briefly mentioned how you were pulled into that role. And from working on, it seems like national issues – you went global with Kyoto, and you were facilitating interagency collaboration. I want to get into the mind of that young Bill Hooke, who is now in this position and is having to facilitate this kind of work at a national and global scale. Tell me what was going on in your mind. How did you manage to foster collaboration among such diverse people? It's the most difficult thing to do and to sustain that over such a long period. So, I'm eager to hear your thoughts.

BH: Well, people are probably better at figuring out who they want to collaborate with and why they want to collaborate with them than we tend to give credit to them for. So, one thing you're doing is not standing in their way. Another thing is not trying to horn in on it. That struck me as very important in the AMS [American Meteorological Society] role. Here's the AMS; it's a professional society, and you're in the policy program and all the rest of it. And I used to just – the big thing is a self-awareness thing, which is the agencies that you're working with – the USGS [United States Geological Survey], Corps of Engineers, NASA [National Aeronautics and Space Administration], NOAA, NSF [National Science Foundation], and so on – they don't like brain power. In fact, they've got orders of magnitude more brain power in their organization than you have in the AMS. So they're not looking for you to solve their problems. They're looking to you for help, helping them work with others to harness that brain power. So, there were things that a non-governmental organization could do like invite other agencies to the table in a neutral space. It was more about hiring a hall, really, and making sure there was coffee or something than your intellectual prowess and just creating an atmosphere where people could relax and think and the rest of it. Actually, that came from a lot of my government jobs. It turns out if you're in the office of the Secretary of Commerce or in the office of the head of NOAA or whatever, you're not the head of NOAA, you're not the Secretary of Commerce, and all you're doing is really helping people help themselves every day versus substituting for them. The image that always used to be in my mind was a marriage counselor because marriage is an ultimate kind of cooperation, and it's founded – the thing that makes it special is you commit to each other rather than to a certain ideology. [laughter] You sort of find yourself in that – and then, to your amazement, you work out a lot of the ideological things, or you recognize them for what they are. I mean, some of them are truly important, and some of them aren't, and all the rest of that. Marriage counselors can help couples who want to help their marriage; they can't substitute what needs to be there for couples that are adamantly irritated with each other or unwilling to work together. You can help them get in touch with their desire to cooperate. That's what you're really doing. They have that somewhere in their head, and you help them bring it up to the forefront.

MB: Wonderful. Bill, could you briefly touch upon these interagency programs that you did facilitate, including – something that we touched upon very, very briefly last time around was SESAME [Severe Environmental Storm and Mesoscale Experiment]?

BH: Oh, yes. SESAME.

MB: Could you talk about these programs a little bit? I would love to learn more.

BH: Yeah, okay. I'm struggling to remember what the acronym SESAME stood for exactly. But we were trying to study summer weather in the middle of the US and do it by combining

research observing efforts with operational observing efforts and research modeling efforts, with operational modeling efforts on a number of institutions; both academic and government were involved. At the SESAME level, there was a lot of interest in doing this; people just needed a forum where you could make actual plans and commit resources. Most of this was a bring-your-own-resources kind of thing to the table. Somebody might have two or three research aircraft. Some other people might have a mesonet of some kind. Some other people might have access to computer time, people [or] whatever. So, just an amount of planning. A lot of people really liked fieldwork or still do like fieldwork. And the tricky part was always in the follow-up. You'd have a lot of enthusiasm for getting together and work out how we're going to coordinate and think about how to run operations day to day. But then, when it came to the analysis of those data over the next two or three years versus focusing on the field phase of another new and exciting bright object, a lot of people wanted to run off and do the latter, that next thing. I think SESAME was no exception. It had some shortcomings. One of the problems with doing something like that for a period of a few weeks is you can pick a special period of a few weeks. You can pick a period with no thunderstorm activity, or you can pick just – all sorts of things can go wrong. So, we needed experiments that were longer duration. That's when the National STORM program got going, and STORM was STormscale Operational and Research Meteorology. It got formulated in the early 1980s. It was building off the SESAME idea. I still remember Bob White, who was a former head of NOAA and former head of UCAR [University Corporation for Atmospheric Research] and then was currently the head of the National Academy of Engineering, came into a meeting over at the Academy's (legacy?) building on Constitution Avenue. He had a bunch of mesoscale meteorologists there; I was one of them – 1980, '81. He said, "The time has come for mesoscale meteorology." And I remember thinking to myself, "No, Bob, the time has been here for a decade, at least, maybe three decades. You're finally getting it to the top of your list." [laughter] Because he was involved with the Global Atmospheric Research Program and FGGE [First GARP Global Experiment] and all the rest of that, the way Louis Uccellini described it to you the other day. It finally was something that was on his list. But anyway, we were all excited about it. The Weather Service was getting ready to do a big modernization. They were going to replace the NEXRAD [Next Generation Weather Radar] radars. They had a whole bunch of surface sensors that meteorologists read manually and then entered the data manually; they wanted to replace those with automated networks. Their thought was we would do this storm scale experiment, again, using research networks of radars and things of that kind, and demonstrate the value of this work, and then the country would fit the bill of modernizing the radar network and all the rest of it. Okay, that was the idea. And STORM, in that vision, never happened. There was a director of STORM, and the planning went on for a long time. We were going to have networks of profilers, research radars, and so on. This had all been languishing. Then, the Republicans were coming in the late 1980s. The Weather Service radars were freezing up on the pedestals. They were WSR-57 radars; the '57 stood for 1957, so they were thirty years old, but the design was from ten years before that because it had taken so long to implement this thing. Suddenly, there was a crisis about

replacing all this operational equipment. The National Institute for Standards and Technology did a cost-benefit, which showed that you could pay for the new radar system with the savings you got from the reduced maintenance – the current levels of maintenance on the old one. So, on that cost-benefit analysis alone, the country decided to go ahead with all this modernized equipment. Well, so the researchers looked at this, and the program had been languishing, and I was actually running the program by that time. This was in the mid-1980s. I was the STORM director in addition to my job as head of the Environmental Sciences Group in NOAA. We tried to reformulate the program, saying that this new operational network itself would have research value and that we would piggyback on the modernization to do the experiments that showed best how to use it. So, we had this reformulation. About that time, they asked me to come be the deputy chief scientist of NOAA, and they said, "Oh, this is great. You can take this program back with you to NOAA headquarters, and it'll be very visible, and you'll be doing this interagency coordination from there, and a thousand flowers will bloom." This is the kind of approach. Well, what happened was, while this was going on, NAPAP [National Acid Precipitation Assessment Program] was in the disarray that I described earlier. We had the emergence of the US Global Change Research Program, and that got formulated. There was a Global Habitability program that NASA was trying to start in the mid-1980s, and it kind of morphed into this US Global Change Research Program. That just got everybody's attention, and it sucked all the oxygen out of all the mesoscale efforts. So, all of a sudden, I was back in Washington, people were expecting great things because I was the deputy chief scientist, and I was having to run this program. So, let's see. What really happened next? [Recording paused.] We were discussing how the Global Change Research Program was just consuming all the interagency attention, all the budgetary excitement, and all the rest of that. We were coming up on the Rio Conference, which I think was 1992. Countries were starting to get ready for that, and the US was a big leader. This was under President Bush I. For all the talk about how climate change has always been this liberal issue, it was a Republican administration – just like a Republican administration set up EPA [Environmental Protection Agency] in 1970, under Nixon, a Republican administration was setting up the US participation in Global Change Research. Mesoscale kind of ran into a difficult slog. The money in mesoscale was being needed to fund these operational procurements for the radar for the AFOS [Automation of Field Operations and Services] surface network and for the overall restructuring of Weather Service's offices. If you talk to the people who were in the Weather Service at the time, they'd say, "Yes, this modernization wasn't just about technology; it was about going from 450-some offices down to about 120 offices." They had sort of a two-tiered office structure, and they were doing away with the observing stations in favor of the stations that were also doing forecasts as well as observing. Those were going to be the sites of the new NEXRAD radars and all the rest of it. That's kind of a long-winded answer to that. The program later – and this is after the US Global Change Research Program got going – was morphed into the US Weather Research Program, trying to emulate that [and] was taken to task by the Weather Service director at the time for eliminating the word operational services or services from this. He claimed that's why we never

got much traction. But the main reason we didn't get much traction, and this was throughout the '90s, was that when the Clinton administration came in, and Al Gore was vice president, the whole name of the game was climate change and climate change research.

MB: Yeah. Everything that came with the modernization of the weather program and the attention that climate might have drawn at that point of time, Bill, how did it feel to you as a leader who was leading these programs? What was going on in your mind?

BH: Well, I suppose I could say that when I started banging my head against that wall, I had a full head of hair, and look at me now. [laughter] One danger with pounding your head against the wall is you start accepting that not just as a reality but as a desired reality. You have to worry. We had a whole bunch of interagency committees doing science and technology. The National Science and Technology Council had kind of come into being, and I was chair off and on of a Subcommittee on Natural Disaster Reduction for about a decade during that period. We always were in the shadow of the Global Change Research Program. I used to tell everybody we're like the football fullback who is always blocking for somebody else or running straight into a line of opposing players. Every once in a blue moon, you run straight into that line, and there's no opposition there, and you have a few choices. One is that you can stumble over your shoelaces. Another one is that you can say what happened to everybody, and if you stand there for a second, they'll show up. But you could run to daylight. So I used to say when natural disaster reduction gets its chances, we're going to run to daylight. And that would happen because nature was providing plenty of things going on – Hurricane Andrew, Hurricane Hugo, Hurricane Katrina. The disasters kept coming, and earthquakes and all the rest of it. That's another whole chapter. We should probably compartmentalize the natural disaster reduction stuff for another session. Anyway, the weather piece of it, the mesoscale weather piece of it, and the modernization was a real joy and a real challenge for decades. And thanks, again, to strategic leadership by Weather Service people – Dick Hallgren – in visualizing how things should go, and Joe Friday for carrying them out after Hallgren became the director of the AMS – were vital to the progress of the program.

MB: Thank you so much, Bill.

BH: Yeah. Go ahead.

MB: Sorry, I didn't mean to interrupt at all.

BH: No, I'm trying not to just go on and chase rabbits down the deep holes forever.

MB: I recognize we're way past time, but if you could indulge me for one moment, I can ask you one AB [Ask Bill] anything?

BH: Sure.

MB: Okay. This one comes from, again, one of your colleagues and friends. And they ask, what is one piece of advice that you would give every NOAA employee right now?

BH: Wow. Only one, huh? Well, I think – wow. One piece of advice that I'd give every NOAA employee. There's a lot of advice that would cover a lot of different points, and we've covered a bunch of different topics that would be good advice for NOAA employees. But I'd say a big one that we haven't covered is you should have a high sense of – how do I want to put this? You should take a lot of satisfaction from your role as a civil servant in NOAA and what you're contributing to society. It's very easy to see all the things and all the dysfunction and the budget problems and the upcoming possible shutdowns of the government and freezes and all of these interagency squabbles and the rest of it. It's a high calling to be a federal employee. And not just one at NOAA. I think I told you that I had a boss that sort of encouraged me to think that my workplace was an island of excellence in this sea of government mediocrity, but if you meet people from other agencies, you begin to realize there's a lot of good work going on across government. I would really encourage people – particularly since you don't always get that encouragement from the leadership. I think the current leadership makes it pretty clear, but the previous [Trump] administration and the comments they're making about what would happen if they come back in terms of reducing long-standing federal traditions or the social contract that federal employees work under notwithstanding. You should just be strong about the value of what you're doing. I've made a hash of that, but in there, hopefully, is some idea about being proud of what you do.

MB: Surely. I, too, thank our federal colleagues, especially in this kind of environment where we're talking about government shutdowns almost every year. I think it's important to remind yourself how important –

BH: Let me just add one detail to that. It's not really a detail, but instead of vaguely thinking, "I'm proud to be a federal employee," if you make sort of a daily exercise of thinking about two or three examples from the previous day that make you proud and focusing on that a little bit every day, particularly at the start of a day. There was this meeting or that RFP [request for proposal] or whatever happens – this phone call or whatever – that made me proud yesterday that I was fed. And really focus on the words civil service.

MB: Outstanding. Thank you so much, Bill.

BH: Thank you. This is great. Looking forward to doing this again soon.

MB: Same. Do I have your permission to stop the recording?

BH: Yes.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 9/26/2023
Reviewed by Bill Hooke 9/26/2023
Reviewed by Molly Graham 10/22/2023

Session 16 - September 6, 2023

Interview Summary: In this interview, Dr. Hooke discusses faith, marriage, global issues, and natural disaster risk reduction. Personal stories, reflections on influential books, and the importance of sharing information globally are key themes. The significance of social scientists in the weather enterprise, challenges in policy-making diversity, and leadership in natural disaster reduction are also highlighted.

Mona Behl: It is Wednesday, September 6, [2023]. My name is Mona. I am in Athens, Georgia, and with me is Dr. Bill Hooke in Alexandria, Virginia. Hello, Bill.

William "Bill" Hooke: Good morning, Mona. Happy to see you again.

MB: This is my happy day, Bill. Thank you. It's going to set the tone for the entire week to come.

BH: There you go. Back at you. The same thing happens here.

MB: Bill, I was reflecting. Every time we have a conversation, it gives me food for thought, and I go out on these walks every afternoon and I reflect on what you said. You talked so much about leadership and mentorship in our last conversation. It almost made me think as though there is a toolbox that each one of us has access to; it's within. It's the tools that we draw from the toolbox to walk in the world, to energize oneself, to give to others. Do you think that's an okay analogy, this toolbox of abundance?

BH: I think that's a great analogy. You just triggered one thought that maybe will kind of embellish our discussion last time around. There's no one right way to manage or lead, and there are a whole bunch of different styles that work. In my first management job at the Wave Propagation Lab, I had a chance to see that in my fellow branch chiefs. One of them was the guy that said, "I have this group of self-starting individuals," and I explained how that worked. He just sort of kept weeding his garden until that was all he had left. There was another guy who had been in the military. He used that approach, and that worked fine for his group, too. My boss, at the time, before I'd taken over this group, was such a nice guy. He had a way of being just appalled by bad news. His mouth would kind of open, and he would sag. He was so nice you'd do anything to avoid having Earl confront some bad news, and that worked for him. But the one thing that doesn't work is to be out of tune with who you are and what your style is. So, if you think you're a hail-fellow-well-met, and you're not, or if you think you're – you need to know. The 360-degree reviews came along – I always just missed having to endure one of those. I never got to subject myself to one of those. It seems to me, in the abstract, a pretty good idea,

sort of finding out what your peers, the people who work for you, and the people you report to think.

MB: Bill, you've talked about this idea of self-awareness. How does one cultivate self-awareness? Is it something that comes through occasional self-reflection, mentorship, listening to others? What are some strategies, some really practical strategies, that I can use to cultivate that in me?

BH: Well, this will be a huge oversimplification. But you talked about listening. The thing is, it takes more energy to lack self-awareness than it does to have it. If I just get the feedback – maybe we talked about the – I think it's in one of these tapes someplace – the woman who hears on the news after her husband's left for work that there's somebody going the wrong way on the interstate. She's concerned, so she calls him up and says, "Honey, there's a person going the wrong way on the interstate." He says, "A person?" He said, "There are hundreds of them." [laughter] It takes more energy to be – we have to work to create these dysfunctional self-images and maintain them. Somehow, we get started in that early enough so that we tend not to recognize it. It may start when you're a little kid. I mean, it probably started somehow when you're a little kid, and then it becomes such a part of your person. I always felt that people, as they age, become caricatures of their younger selves. When I was a manager and starting out, I thought to myself, "I've got a lot of weaknesses; I need to correct these." And then I thought to myself, going back to this managerial style, "No, I've just got this style. It's not the perfect style, but it's the style." And then, as you get older, you start thinking this is actually an endearing quality of mine, [laughter] and you let it take full possession of you.

MB: That's terrific, Bill. A follow-up question that I had there, which I completely forgot. My train of thought is completely lost. [laughter]

BH: I get us off the rails pretty periodically. If you think this conversation is running the rails, I feel very sorry for you. It's more of an off-road, all-terrain vehicle kind of experience.

MB: I am so glad that I'm in this vehicle with you. I couldn't ask for a better driver. This is great, Bill. I want to go back to something that you said about your job. It is the 1990s, and you are the director of the US weather research program. You've talked a number of times – the NSTC [National Science and Technology Council] Subcommittee on Natural Disaster Reduction has come up. I would love to learn more about your role. Obviously, you were the chair. I want to learn more about that committee. How was it formed? What were the circumstances that led to its development? What was it like to chair that subcommittee?

BH: It's probably hard to do justice to the – when the Clinton administration came in – well, I think the committee had existed before that. There was a coordinating body in the White House

for coordinating science. It was broken into different branches. When the Clinton administration came in, they reorganized it into something called the National Science and Technology Council. It was the government parallel to PCAST, the President's Council of Advisors on Science and Technology; that was an outside group, and this was the inside group with all the agency representation for the different portfolios. There was a Committee on the Environment and Natural Resources. There were other technology committees and so on. The Subcommittee for Natural Disaster Reduction was under this Committee on Environment and Natural Resources. The eight-hundred-pound gorilla was the group that worked on the Global Change Research Program. The Natural Hazard Group was – I'm not sure. It wasn't exactly an afterthought. It had been around, I think, before. One key feature of it that we were all very happy with on this subcommittee was it was the subcommittee not on natural disaster research; it was natural disaster reduction. We felt that our goal was really to try to build US resilience. Resilience was not the word that people were using at that time. We wanted to reduce vulnerability. We were kind of serious about that. The chairmanship actually rotated a little bit. There was a guy named Bob Hamilton, who was in the USGS [United States Geological Survey] and who had been part of the – oh, yeah. Okay, now, it's coming back to me a little bit. You may remember that I said in 1986 that I was on an academy committee to set up the International Decade for Natural Hazard Reduction in the United Nations. The Subcommittee for Natural Disaster Reduction was the US entity that coordinated once Frank Press and his idea got traction in the UN, and the UN set up this committee. This US group, operating out of the White House with the different agencies, was essentially the coordinating group for playing the US role in the UN committee. That was how it got started prior to the Clinton Administration and why it was around when the climate change folks got going. Bob Hamilton, who was chair of the subcommittee at that time, was also detailed to Geneva for a year to help set up the International Decade. It might have even been a couple of years. They needed a chair to take his place while he was gone. I was good at being nominated for people to temporarily do something. Well, somebody that really mattered was otherwise occupied, so they put me in this job. It was interesting. One of the things about all management and leadership jobs is you fantasize when you don't have such a job that you have power, but you don't really. Power is something that people give to you. Influence is something people give to you. Maybe we talked about this. If you're telling your child to get off the railroad tracks, and the child says, "Why," and you say, "Because a train is coming." The child looks up, and all he or she can see is a train; the rails are shaky, the noise is deafening, and the trees are swaying; they jump, and they thank you. But if you say, "Get off the railroad tracks," and the child says, "Why," and you say, "Because I said so," and they look up and down the tracks, don't see any train, and put their ear to the rail and don't hear anything, then they turn to you, and they say, "Nothing personal, dad or mom, but come and make me." [laughter] Management and leadership have that same quality. People have a common external goal, and you help them reach it. So this subcommittee, I think, got on a lot of people's last nerves – the subcommittee and the different variants of it in the White House office. People were frustrated. They were just conversational kinds of groups and hadn't really

accomplished anything. We tried to do a little more, but we accepted the fact that it was about conversation and coordination and influencing each other's thinking, sharing the best from each other's thinking. I would say that all the members of the group, the representatives, all felt privileged to be there for our meetings. Bob Hamilton came back from his time at the United Nations, and people were kind of hoping he was the most likely internal candidate to become the next head of the US Geological Survey. People wanted to give him a position. So, he took this role back on for a couple of years. Then he got frustrated; he saw he wasn't going to get the USGS job, and he moved on. I took it back over, and I kind of ran it for the rest of the time period there. I forget just how the – I was probably involved with that for about ten or twelve years and probably ran it for about eight or something. Yeah. Does that make sense?

MB: It sure does, Bill. So, a couple of questions I have. When you were working on these global committees – you mentioned the UN International Committee on Natural Disaster Reduction – how did it feel? What kind of observations did you make? I'm intrigued by how often you bring up equity issues with developing world nations. What were some of the observations? How was that moment in time insightful in your professional experience?

BH: Okay, that's a great question, and it played a big role. Mainly what happened because I was involved with that – I told you after going to that first organizing committee, in 1986, for the International Decade, there were a lot of social scientists there and only one meteorologist. Maybe there was one seismologist, or there might have been two because Frank Press, who was head of the National Academy of Science, was a seismologist himself, an MIT seismologist. I was just listening to whatever everybody said, and you start getting this message through your thick skull that, yeah, it's really people who were disadvantaged, to begin with, who are hurt most by natural disasters when they occur and so on. After a while, it's such a compelling argument and becomes ingrained in your thinking. I was just around so many great people who had that message. In fact, the decade had a little bit of a rocky history related to that. When Frank Press first tried to set it up, he put a guy named Gilbert Fowler White in charge of the committee. White and that committee turned out a report that Frank Press didn't like. This was in the early ’80s. So, he set up the second group to try again, and he put a fellow named George Housner in charge of the committee. He was, I think, a seismologist from Caltech or one of the Los Angeles universities. That report was more to Frank Press’s liking. It had a really serious flaw. We were sort of pushing this idea that you could reduce the cost of natural disasters by fifty percent in ten years. And Gilbert White was one of the people who just poured gallons of cold water on that idea from the sidelines. Again, he was very compelling. I mean, it was obvious that goal was just such a fantasy. It permeated the decade itself at the international level, and it caused a lot of problems. Anyway, Gilbert White had a simple idea. He said, “Well, let's make a goal to make all schools” – and he might have thrown in hospitals – “resilient in a decade.” It was a wonderful goal in two ways. That was the goal that was rejected. But the goal was wonderful because it's simple. It reflects a small part of the economy. Yet, after you think

about it for five minutes, you realize you can't make school resilient and life resilient for kids without affecting the whole community [laughter] and every aspect of it that they're involved in. So it was perfect, but it was not what was chosen.

MB: That's wonderful, Bill. I want to ask more about Gilbert White also. Obviously, his name is so well known. He is the founder of the Natural Hazards Center. Your association with him, I know, has been very tight. I would love to learn more about Gilbert White and your friendship and professional relationship.

BH: He had a godlike stature within the community. I was a latecomer to this community. I kind of participated in things starting in 1986, even though I lived in Boulder all those years, and these meetings were going on every year, right under my nose. He was very patient with me. That's about all I could say. He was a Quaker. Just to give you an idea of how far back in the history of things he went, when he was in his twenties, or so, he was working in the White House for a President by the name of Franklin Delano Roosevelt. They actually had film footage of him at some flood site with President Roosevelt dated back to that time. When World War II broke out, he was a member of the Society of Friends, as I said, a Quaker. He went to France to help people with the relief effort, and he was actually interned by the Germans in France for the entire war. When he came back, he was the president of Haverford College, which was right down the road from Swarthmore. None of this I knew at the time, of course, but he was the youngest college president in the country then. Then he went to the University of Chicago, and he got wired crosswise with them about the Vietnam War, and he wound up going to the University of Colorado and set up the institute there, looking at social science and hazards and the rest of it. He's just such a leader in the field. He worked a lot with Ian Burton and Bob Kates. Burton was a Canadian – University of Toronto, I think. And Bob Kates, I think, was at Rutgers. They wrote a book entitled The Environment as Hazard, which was a classic in the field. Anyway, the book I wrote, Living on the Real World – I had tried to write a book earlier. I wrote a little bit of it, and I tried it out on Gilbert. His distaste was palpable. [laughter] I still remember I'd been getting up at three o'clock most mornings working on this manuscript. The title of it was A New Apocalypse. I was sort of looking at where the world was going and hazards and their role in it and starting to do some of the things that crept into the approved book. [laughter] Anyway, that project aborted. Chris comforted me for years, saying, "Well, Bill, it wasn't a waste of time. You really formulated a lot of thoughts that made its way into the subsequent book." But I'll never forget that conversation with Gilbert. It was in private. He wasn't broadcasting my shame to the entire community. Anyway, he was special. And he was a Quaker. Different people identify with a faith. Anyway, years later, when we had gotten all over all this stuff, Gilbert decided that it was time for him to stop keeping himself alive. He was ninety-three or something of that sort. He just told everybody, "Hey, I'm going to start taking liquids now. It's time." Life was not getting very satisfying. I didn't get a chance to see him after that, but I wrote him a letter. And I said, "Dear Gilbert. I'm looking forward to seeing you

in heaven. The good thing about heaven is it's going to be filled with extreme events because that's what makes the world and life interesting, but there won't be any disasters." His caregivers told me that he got that letter out and reread it several times because he liked that idea. What a guy.

MB: And what profound ideas. That's fantastic, Bill. Who knew that Living on the Real World had started way back in the 1990s? [inaudible]

BH: I had those ideas, and things got in the way. It's happening to me again, only I realized that my sell-by date has arrived. If I don't finish this second book soon or get really started on it. I've blogged about it – partly related to my wife's health and other things. So, we'll see what happens. Just one second. Can we interrupt for a second?

[Recording paused.]

MB: Thanks for letting me know more about Gilbert White, Bill. Of course, I also learned that he's called the father of flood plain management. That's amazing. Going back to your work on a global scale, Bill, you were learning all these things. How did you bring it back to the subcommittee's work, these experiences, this knowledge? I think you mentioned social scientists. Was it at that point that you recognized the important role that social scientists play in the weather enterprise? Was it a realization all along, it got amplified, and you understood it even better in the context of the global world?

BH: Well, if it was there prior to that, it was only a seed that somebody sprinkled some water on, and it finally became the plant that it was intended to be. When I was in college, I took a psychology course because you had to have some social science and because my girlfriend at the time was taking a psychology course, so I thought maybe I should do that. I learned a few things, not nearly as much as I should have. So it was really – the whole hazard thing was really responsible for awakening – I think I told you I've always been interested in political science and things of that kind. But it just got to be a much richer thing after that. I think I told you that I went from feeling excited about what I was doing because it was just so interesting to feeling each day that I could help make the world a better place from that work. That all really came from 1986. It probably had its roots also in becoming a Christian in 1976 and connecting those dots. Because, again, I called myself a Christian for those ten years. I still call myself a Christian today. But if you've pondered any of those things – my thinking on all those subjects is so pathetic. I mean, it's hard even to claim any depth. I'm constantly being surprised by – depth, as opposed to superficiality, is probably my big lifetime discovery. "Oh, there's such a thing as depth. Oh, there's such a thing as depth."

MB: Bill, I hope you don't mind me asking. But was it 1976 that you got married with Chris?

BH: Yes.

MB: Can we talk about her for a brief moment?

BH: Yeah, I'll try to be quick with this. So when I met her, I had been divorced for about a year. I left my first wife and a couple of kids. I was taking a course for federal managers that was being put on by the University of Colorado, and she was organizing the course. She wasn't teaching it, but she did the logistics for the group there at the University of Colorado. On our very first date, I said, "Tell me about yourself." Maybe we covered this. She claims it wasn't this blunt, but she [said], "I'm a Christian. I'd never marry anybody who wasn't a Christian." And I said something like, "Well, religion is just a crutch for people who are too weak to face death or do the right thing on their own." Meanwhile, I was making a mess of my life at that time just in all sorts of ways. Then she said, "Well, Christianity isn't a religion. It's a personal relationship with Jesus Christ." I don't remember what I said to that. But I remember thinking to myself, "That's the hokiest thing I ever heard, but she seems nice. Give me a couple of months, and I'll talk her out of that nonsense." That was what I thought. I went to church to humor her. There was one sermon that I heard the second or third time I did that that really stuck to me. It's sort of a long story, but it's a conversation God has with Abraham, as recorded in the Bible. The pastor looked up and said, "You know, God gives us a lot of rope. But one day, he says, 'That's enough.'" It was that statement, rather than any of the particular kinds of pieces of Christian theology, that made me think, "Yeah, that's right. I'm not master of the universe. I'm not the smartest guy I know. I'm in kind of a wrestling match with God, and I'm going to lose." That was what I thought. In the church I was attending, to humor Chris – it was her church – they have altar calls. Without a full understanding of what I was doing, I went forward. Chris was in the church choir. Afterward, she says, "Well, that's really great. Now that you're a Christian, why don't you get back with your ex-wife?" That was a non-starter for different reasons. I probably made some pathetic effort to do that. But then I realized that since I was a Christian, I was eligible. So I asked her to marry me. She said yes. And then she went and made a phone call and came back and said, "The pastor has an opening in thirteen days." In that same two months, where I said, "Give me two months, and I'll talk her out of that nonsense," I became a Christian, and we were married. That was forty-seven years ago and a real triumph of God's grace over brains. [laughter] I used to tell people, "Don't try this at home." [laughter] Then there's been forty-seven years of exploration of that. One of the things as a scientist – and I wound up giving a sermon on this a few years ago. We had a pastor in our church who believed in inflicting pain on the congregation, so he thought, "I'll let Bill give a sermon." Here's the thing that strikes me. If you're a person of faith, a Christian, and you have trouble believing in the size of the universe, the age of the Earth, or evolution, your picture of God is way too small. It's not that you need to battle these things; you need to increase your faith that a God who is too small to accommodate all of those realities is not worth worshiping. By the same token, if you're

a scientist and you have trouble with the idea that Jesus was a real person or that he was resurrected because a lot of people really changed their behavior after seeing him resurrected. The same people who were weak and flighty really became quite disciplined after that. If you have trouble with those things, you need to be more scientific. It's not that you need – so, that, to me, is the issue. One of the things I read about in a recent issue of The Economist or somewhere – maybe it was The Washington Post. It was an article about how the James Webb Telescope is revealing features of the universe that are making people think the unthinkable: that the laws of science might actually be changing somewhat in order to try to explain some of the questions about the size of the universe, its rate of expansion, and things that are going on closer to home. Anyway, I just think – a lot of people think, "Oh, well, science is squeezing out – there's less and less room for God as we learn more and more about things." Rightly or wrongly, I find it just the opposite. I encourage anybody who has gotten this far in all these interviews – God bless you, you need to get a life – to be open to those ideas. One of the things that happened – I remember this from college in my atheist years – was that you learn in school that you should never critique a book or a paper that you haven't actually read. The one exception of it, at least in Western culture, is the Bible. Everybody in school and in the academic community seems perfectly comfortable to attack the Bible. But I've met very few people who have actually read it. It's kind of the Wikipedia of its time. It's got a lot of stuff in there about science, census, and the politics of the Middle East region, and self-help, and all the rest of it. And then it also says the things that we don't understand – there are a few things we don't understand – somehow, they seem to be maybe the most important. It's got all the genealogies straight, and why you don't eat certain kinds of meat and what to do about mold, and so on. But, gee, there were some things we couldn't explain, and these seem to really matter. That's a pretty long digression on that. But anyway, there you have it. It's a long digression, but there's so much more. I'm hesitant. I'm sure when I read the transcript of this, I'm going to be pretty dissatisfied with this piece.

MB: I am sure that it's going to come up again, too, Bill. Over the weekend, I was reading a book, and the author was reflecting on religion. One of the things that resonated a lot with me is that they said that religion is spirituality with rigor because religion and faith command you to bring about some discipline in your life. It's about that self-awareness that you were talking about, cultivating that self-awareness. I think it asks you to rise to something larger than yourself. It's different than spirituality, I feel. If you have a certain set of principles and a framework within which you work, and you walk that line with morals and values, it just is different because it asks you to do something that often puts you in a very uncomfortable situation. Forgiveness is not easy, for example. Changing yourself is not easy.

BH: That's terrific, Mona. I love that. In the context of social science that we've been thinking of, I think you were asking me about books that influenced me, and I forgot one that influenced me a lot. I'm trying to write a blog post on it, actually. It was a book that was written in 2003 by a vice president of the World Bank by the name of [Jean-francois] Rischard. The book was

entitled High Noon: 20 Global Problems, 20 Years to Solve Them. The title was grand, and the subject was big. Immediately, I found it off-putting. I thought no book can really tackle this subject. But it turned out to be one of the best books I'd ever read. Here was the point. He said the economy is globalizing, population is increasing, especially in places that aren't equipped to handle it. Meanwhile, governments are flatlining. He said this has given rise to these three sets of problems. One he called sharing our planet. The next one he called sharing our humanity. And the third he called sharing our rulebook. One of the refreshing things about this was he didn't say each of these has this twenty-year deadline, and they're exactly these three categories, and these seven bins or so in each one of these categories. He said you can come up with your own description. He said the deadline might be ten years for some of these and fifty years for others. But this was his book. The thing that I keep coming back to is the word sharing. You were talking about the difficulties of thinking a certain way. And sharing is a real sticking point for all of us. I'm coming to realize that that's the starting point for solving all these problems. But where does the willingness to share come from? I don't think we're going to find the answer in "Oh, we can appeal to this or that piece of social science and get there." Although there is one piece of social science that gets you there in a way. It's game theory. Basically, these experiments that show that – it's one of these things – what's the game where they give you twenty dollars, and they ask you to share some fraction of it with me. If I accept what you offer me, I get to keep it. But if I don't, I don't get to keep anything. It turns out that if you don't offer me fifty percent, I'm reluctant to share. I'm reluctant to take my money. I guess the thing is you would also lose your money if I turned down my money. So instead of saying, "Oh, I'm happy with the two dollars you gave me of the twenty," I say, "You're not even going to get the twenty, and I'm not going to get my two." That's social science, in a way, maybe. But connecting those two things as it applies to eight billion people instead of just two people, it's pretty clear that we've got to think through sharing. The people who need to share need to be less complacent about their failure to do so. The people who aren't being appropriately shared need to be more forgiving – to use your word – than they are. There's something in there for everybody to hate and work on. [laughter] But we've got to figure that out. And if we do that, all of Rischard's twenty problems go away – protecting the environment, terrorism, poverty – you name it. By the way, the tricky one is the rulebook because what he says is if you've got two hundred countries with two hundred sets of rules on intellectual property, innovation, and taxes, and all of that, you've got a hopeless muddle. And yet, it seems to me if we don't have some diversity somewhere in the system, where you can see the emergent effects or the unanticipated consequences of this or that policy, you can be stuck in a real blind alley somehow as a species, or, in this case, a planet. Anyway, all that, by the way, is stuff to try to feed into this other book. [laughter] I've got the outline for it, but those are the pieces of it. But sharing is a big deal. I've been thinking a lot about it and trying to figure out this Rischard piece and how to acknowledge the fact that time is up for his twenty years, and we look to be in worse shape than we were before and primarily because we don't know how to share.

MB: I just read your recent blog post on "Living on the Real World," Bill. You reflect on free and the need to share weather-related information and data on a global scale and to do that collaboratively. It's so important, especially for countries like mine, where we don't have the infrastructure for weather prediction, basically.

BH: Yeah. And India's in a much better shape than, say, Niger, or some other countries where it's pretty clear that getting weather data from Niger or Mali, or any of those countries, have much more value to Indians and to Americas and so on than it is to the people from those countries. So, they're doing us a huge favor. But even if we say, "Oh, well, your weather tomorrow is going to be such and such," meanwhile, we're thinking about their crop futures and all this other stuff and taking advantage of it. Artificial intelligence, as I was saying yesterday, will only widen that gap.

MB: I definitely want to dive deeper into these ideas, Bill, but I'm also looking at the time. In the interest of time, way past my time, may I ask you one, AB [Ask Bill] Anything?

BH: Yeah, sure.

MB: If you want the president for one day, what changes would you make to NOAA? This is what one of your colleagues and friends asked.

BH: What would I do?

MB: What changes would you make to NOAA?

BH: To NOAA if I were president for one day? [laughter] That's such a good question. The federal budget is two or three trillion dollars. The NOAA budget is five billion or so, so there's a factor of forty there. In an eight-hour day, I might have an hour to devote to NOAA. That's actually a pretty large amount of time. It turns out to be larger than I thought it would be. Have I done the math wrong? I'm going to worry about that afterward. No, that's not right. It's a five hundredth. It's about ten minutes, or six minutes, that I would have to devote to NOAA. That's more like it. Boy, what would I do? What changes would I make? We could kill the six minutes. You could say Bill just screwed up his forehead for six minutes, and it's apparent he was too dumb to – I wasn't sitting there thinking so much about what changes I would make in NOAA. I might make some outside changes that would allow NOAA to be more useful to the country. I think that we've got to start thinking about resources and environmental protection hazards in a more integrated way. So, the changes would probably involve somehow creating a more integrated entity. One thing I would not do is take NOAA out of the Department of Commerce. That seems to be a popular idea – "Oh, independence would be so much better for us." But, in fact, it's connecting us in a way that we could improve. Maybe that's the change I

would make. I would try to make NOAA a more integral part of the Department of Commerce and vice versa. I would try to help Commerce realize that NOAA was actually its biggest – well, it's half the department in terms of staff when the Census isn't going on. It's tied to all sorts of goals that we have for foreign policy and all the rest of it. I would just try to make changes that would allow those things to happen more organically and effectively. The starting point would be to have a better integration of NOAA across the department in areas of innovation, in areas of export control, in areas of – tying it to the Census, for example, and who the vulnerable populations are and how they could be helped or impacted by environmental events. That's a mush of an answer. My six minutes are gone. I think you can all breathe a sigh of relief that I wasn't President for a day.

MB: NOAA is still within the Department of Commerce, and definitely based on what you said, Bill, it will always stay relevant because all those functions are not going to go away – the way that NOAA accelerates innovation, and you said export control and tying it to everything else. So, thanks for that answer. I'm sure that your colleague – I very much enjoyed that. [laughter]

BH: Well, you like to see people suffer. "Oh, you thought you were so smart. Try answering this pretty simple question: why is the sky blue?"

MB: I think it's important to recognize what cannot be, what are not the options. I think it's more important. This is fantastic, Bill. Thank you so much for giving me so much food for thought. There are so many different directions in which we can go next time around. I think I'm going to come back to your work on the subcommittee and talk a little bit more about natural disaster risk reduction.

BH: Thank you for your general leadership because you embody what I was trying to say. You're managing to lead this conversation without perhaps as much power as you might really need. So, you're doing a great job. Thank you.

MB: Thank you for you –

BH: Talk to you next week.

MB: Thank you so much, Bill. Do I have your permission to stop recording?

BH: Yes, you do.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 9/28/2023
Reviewed by Bill Hooke 10/10/2023
Reviewed by Molly Graham 10/23/2023

Session 17 - September 13, 2023

Interview Summary: The interview Dr. Bill Hooke delves into the significance of prioritizing disaster resilience and equity in communities, especially in the face of climate change. He highlights the importance of looking towards the future, balancing hindsight and foresight, and fostering awareness and transparency to tackle these challenges effectively. The conversation also touches on the role of public-private partnerships in disaster response and the necessity for local communities to be well-prepared for potential disasters.

Mona Behl: Hello, Bill.

William "Bill" Hooke: Good morning or good evening since you're in Guam.

MB: Yes. So, my name is Mona Behl. I am in Guam, United States of America. It is the farthest-most US territory in the western Pacific, I believe. It is September 13, [2023], 10:30 p.m. in Guam, and I am connected with Dr. Bill Hooke in Alexandria, Virginia. Bill, I want to pick up on something where we left. You talked about your role as the chair for the NSTC [National Science and Technology Council] Subcommittee on Natural Disaster Reduction. Since we talked last week, I did a little research, and I found a number of reports that the subcommittee produced. One of the reports that really piqued my interest was the Natural Disaster Reduction Plan for the nation. That was the document that provided an inter-agency approach for dealing with disasters in the country. Could you talk a little bit more about that report and the ideas mentioned in that report, please?

BH: Well, we can give it a start. As I acknowledged to you just briefly when we were starting to ready this report, it's been a while since I've looked at it. I think you made an encouraging comment that I thought about these things a lot over the last twenty years, and that's certainly true. So the things are generally on my mind, but the specifics of the report are a little vague. Full disclosure to people listening to this: I've got a screen where I'm going to try to refer back to it a little bit. One of the things I remember was this came out at a time when the US Global Change Research Program was putting out reports that had a similar look and feel. One of the general points that we were trying to make with this report was, okay, a lot of interest in the government – this was the Clinton Administration. Al Gore was Vice President, and Al Gore was focused like a laser on climate change and had been for a number of years and was using his office – a lot of people referred to him as the chief scientist of the Clinton Administration. I'll just give a tangential example of that. In the run-up to Kyoto, which was 1996, a couple of years before this report that you and I are looking at came out, the White House held an event for broadcasters. The event was an all-day event. Television weather broadcasters came from all over the country to this event. There was a morning of lectures by scientists like Dan Albritton and others in Silver Spring, kind of giving the folks a deep background. Then, there was a White

House event; we all got into buses and went down to the White House. President Clinton and Vice President Gore had a photo op with every single attendant. We all got our picture taken with the President and the Vice President. Then, the President made a few remarks, and his remarks lasted about five minutes. This was in the White House – what is it? It has to be – I always get the West Wing and the East Wing confused, but it was the big conference room where presidents hold press conferences and so on. The President said just a couple of things. He said, "We're in the country that is producing twenty-five percent of the carbon emissions, and we have about four percent of the population. That suggests that we ought to be doing something about this." [laughter] He made a couple of other remarks at that level of understanding that, at the time, I thought were brilliant. I thought they were brilliant. And then Al Gore followed, and Al Gore had about a forty-five-minute talk with charts and data. It was Professor Gore. It kind of got away from the leader of the Western world feel to the event and was great in many respects but lost a little something as the minutes turned into tens of minutes, and all the rest of it. But, again, it was the focus of the world at that time. If you were working on natural hazards, you were struck by a couple of things. One was that there was an international decade for Natural Disaster Reduction going on, but it wasn't getting much traction. The other was that the planet really did much of its business through extreme events. These averages that were of so much concern were the averages of extremes of heat and cold, extremes of precipitation and drought. And it was those extremes that were having the societal impact, not the averages so much. That statement is still just as true today. You're in Guam. I can't remember whether we talked about it in this report or not, but we were certainly thinking along these lines that if you put an island nation underwater for twenty-four hours, that's just as bad as a creeping rise in sea level, average sea level, over a fifty year period, maybe a lot worse. And yet, people weren't looking at the presentation of hazards in that way. Actually, by the late 1990s, they were starting to do it more because they realized that people weren't really responding to the threat posed by climate change the way it was normally expressed and the desire to do something about mitigation and reduction of CO2 emissions. They began to realize if they started talking about interannual and seasonal variability and hurricane tracks and make a connection between those two, there would be more public push to do something about this. So, that was just starting during this period. I think from the perspective of 2023, we could say, if anything, that's building. We see people putting those two things together. In our report, we tried to make the case for spending equal time/equal attention to dealing with extremes and navigating those well and making the point that if we got better at that – and those presented a lot of opportunities for learning from mistakes and so on – we would, in the course of that, get more resilient to climate change. So that's kind of a long-winded picture of the background for the report. As I said, we tried to make the format look like the global change reports that people were reading. I would say it had a great benefit – the thinking process – for all the people who put the report together, but I wouldn't say that it had a big impact on the world as we knew it. This gives too much credit to us and not enough credit to Galileo, maybe. But I remember thinking, working on this report, that dealing with hazards in the White House in the late 1900s was like Galileo in the Vatican, trying to get some of his ideas

across. There was benign neglect until you got their attention, and then there was irritation. The thesis was that if we spent too much time talking about adaptation and resilience to extremes, it would reduce the pressure to do something about carbon emissions. I think that was absolutely wrong. Subsequent White Houses tried to correct that with varying degrees of success.

MB: That's very helpful, Bill. How can we shift the attention from reaction to anticipation on the basis of long-term risk assessments?

BH: Well, one thing we tried to do didn't really work. I've been thinking about some of that this morning, actually. Your position in Guam also reminds me of that. When the President looks at a certain number of disaster declarations over the year, the President can see a whole bunch of those. But for each of the local officials, it's life-changing. The President can only say, "Well, there's going to be more disaster declarations where these came from and more needs for action." But if you're a mayor of Lahaina, or if you're dealing with the aftermath of the flooding of the Burning Man event, or you're in Morocco – I mean, that's not a climate change event, but it's the same kind of thing – the incentives for thinking ahead locally for events like this are just so much stronger than the incentives for a President of the United States to look at these matters. I continue to feel that the best thing to do would be give people at the local level more tools for dealing with this. One of the things that that report long ago talks about is a national risk assessment. We were kind of vague in the description of that. But I think today, we have much better tools for dealing with that. I just noticed the newspaper article yesterday talking about mapping the floods that have occurred in Libya that killed so many people. The article was making the point that you can tell from these maps why the flooding was so serious. Well, you ought to be able to tell, in principle from the maps ahead of time, that if something like that happened, the flooding would be serious. I think artificial intelligence and some of the tools that we either have or will be coming online in the next few years really expands the capabilities for local leaders in different communities to work out their hazard risk at a far more sophisticated level than they're able to do now.

MB: It's been very inspiring, Bill, to be here in Guam and just reflect and learn about the various ways in which local government and the governor here in Guam are taking action to make the island more resilient.

BH: Maybe you could say a little more about that, turn the tables on you, and ask you anything. [laughter]

MB: Everything is happening at a local level with community engagement. There seems to be a lot of emphasis on education on community-based projects, all the way from restoration to doing things that build the resilience of the community. It also seems that there is a lot of coordination among small islands. For example, here, Guam is working with Saipan and other Micronesian

islands to think about ways in which they can tackle extremes and, at the same time, advance their sustainable development goals. They're doing it in coordination, not only here with the Micronesian islands, but they're also trying to coordinate with Puerto Rico, for example, and other US-based islands. Again, everything is happening at a community level. But I think because it's so visceral, these impacts are felt. They're so real, and there's no place to go. It seems like the local government is working hand in hand with the federal government to take some of those actions. It's also very intriguing that Guam is very strategic in terms of – there's a huge military installation. There's a lot of US military presence here on the island. Again, learning how the military engages with the community has been very interesting. So it seems like whether it is preparing for extreme events – the military is working hand in hand with the local government. So, those are some things that we learned today. But I think that's also something that you emphasized in your report, this kind of coordination that is needed with local, state, [and] federal governments. Also, I think one of the most intriguing and compelling aspects was how local community leaders and community members are engaged in sustainability. A lot of things get – obviously, it's a small island. Most of everything gets imported, including food. The governor has a priority of increasing and promoting aquaculture, for example, so that the island is not dependent on other nations for its food, is more sustainable, and is able to produce everything at home. And how they're partnering with the private sector is compelling. Anyway, I was reflecting on one of the things you mentioned –

BH: Can I ask a follow-up question? That was brilliant. So, I'm thinking about aquaculture, and I'm thinking about hurricanes. I'm thinking at the precise moment when you'd be hoping that aquaculture could deliver, the whole aquaculture infrastructure might be destroyed by the hurricane. Then there's a question of ports – both seaports and airports – and their viability in the first month or so after something happens. Have you all been able to get into that? What kind of help do the folks in Guam think they still need? They're thinking about all these things, but their ability to handle everything on their own, even with cooperation with other islands, is a little bit limited.

MB: It is. I think the distance and isolation definitely adds a lot of pressures to the local economy. I'll just give one example. Our colleague here in Guam Sea Grant took us on a site review today. One of the things that they mentioned was that there is no plastic recycling capability on the island. So what they're doing is fascinating, Bill. They're working with a company that is based in California that somehow compresses all the plastic waste into these cubes that vary in size, but they can be used as building materials. I held today a twenty-two-pound slab all made of compressed plastic. That could be used for local shelters. I don't think it's at a stage where it could be used to build houses at the moment. So that is one way in which the local communities actually – that's a challenge, obviously, that there is no recycling facility for plastic. But it's also very interesting to see how the university is working

with the local government and the private sector basically to come up with solutions to, again, address that circular economy. So it's very, very interesting to see that,

BH: Very cool.

MB: Going back to the report, I do want to ask you, one of the things that you mentioned and emphasized in the report that you drafted back many, many decades ago was this emphasis on public-private partnership. Could you talk a little bit more about that?

BH: Yeah, so a couple of things. Throughout the '90s there, we saw in the Committee's work and in the people we worked with that – and I'm trying to remember. There was a kind of catechism we had for private role in these events. So, the private sector is kind of a victim like everybody else when a disaster occurs. Any businesses in the floodplain are affected by what goes on and so on. It's also a vector. I'm not sure we used that terminology then. People depend on the private sector for a whole bunch of things. This occurred later, but I'm thinking when the tsunami in Japan in 2011 [inaudible], the nuclear facility and kind of put Japan out of – Japanese suppliers to automobile plants in Tennessee weren't able to deliver the sub-components for a while. The effects of a globalized private sector propagate these events. The private sector is a partner, even in emergency response. A lot of emergency ops centers are supported in part with private sector infrastructure. The private sector is responsible for the communication across the US. So there were all these roles that the private sector – and one that we didn't include but has become important later – I've been thinking a lot about this over the last year or two – is the private sector can trigger, really exacerbate the hazard. I'm thinking particularly of electrical utilities, which played such a big role in the forest fires and wildland fires in California a few years ago and then again in Lahaina. It's pretty clear that failure of the private sector to – well, we've got a vulnerable infrastructure for delivering electrical power. So, there's a lot of problems associated with turning it off, but you kind of have to turn it off under certain situations. I feel that that's one that should be given additional attention now. I have a feeling I've maybe left out – it seemed to me there were a couple of other roles for the private sector that I've left out, but maybe they'll occur to us as we move on.

MB: That's very, very helpful, Bill. This is a short conversation. So I'm going to ask you a related AB [Ask Bill] Anything if that's okay.

BH: Yeah, sure.

MB: Through your work, whether it has been Living on the Real World or through your life and experiences, you always seem to be thinking so far ahead. You are a nonlinear everyday seeker and influence who combines your genuine honesty and humility and seems to draw people toward you, those that desire the latest thinking on a wicked problem. Do you have any process

that you employ to see around the next corner before so many others do? That report that you chaired, how is that still so relevant? What made you think and foresee?

BH: Boy, there's a whole bunch of answers to that. Let me just try to handle that stream of consciousness. One is a lot of these interviews, I think, are with scientists who made some terrific contribution to the science; much of the emphasis is, "When did you get this seminal idea that changed the miracle weather prediction or helped us understand more the function of chlorofluorocarbons and ozone chemistry or whatever?" I don't have anything like that. It was apparent to me I was unlikely to ever get anything like that, so you look for the unoccupied space. One of the depressingly unoccupied spaces for the human race is thinking very far ahead. [laughter] It has a certain appeal because nobody is particularly good at it. I would say I'm not particularly good at it. In fact, one of the rules of thumb that made a big difference to the way I handled the book and so on was something that came from Joe Fletcher, who was my boss for a brief period there and who I've talked about many times. Joe, one time, asked me a question. He said, "Bill, how do we know that there's not going to be a fleet of SST aircraft – supersonic transport aircraft – ten years from now?" This was in, I don't know, 1988 or something like that. I mumbled something. He was, once again, struck by how dumb I was, I think, and so finally, he growled something like, "Well, none of the steps that are necessary for that are in place. The designs for these planes are not in place, the aircraft manufacturers are not doing the things they have to do to factories and plants to start producing them, airports aren't ready for them – blah, blah, blah." So in the book Living on the Real World, where I talk about how to make this forecast for the future, it's very much tied up in that simple idea that we've had this success in the human race in a very short period of time – short compared with what? – and kind of listing those things. So, in a way, because this look at the future is so murky, and there are very few rules for it, almost any time that you spend thinking about that is useful somehow. That's kind of the stupid answer to the question. The other thing is it's about the most important thing we can do, and yet, hardly any of us are ever doing it. We're all trying to get a promotion, or the next job, or meet a sponsor's requirement or something, and our work is athletic instead of intellectual – we've talked about that. So we're always working on a very short timeframe, and that isn't helping. It's just something that I always felt comfortable doing it. It always was interesting. We've talked a little bit about faith. I've been very conscious that I'm not a great visionary. But I just try to pay attention to things that are going on. We talked about leadership, and leadership is about vision, but it's about putting together a preexisting popular vision, more what a mass of people are thinking, rather than thinking of some reason why you should go in a 180-degree different direction from what millions of smart people are thinking makes sense. That's where politicians can go wrong.

MB: Terrific, Bill. So, a follow-up question that I have is how do you balance hindsight with foresight, learning from experiences?

BH: That's a great question. Well, hindsight provides a lot of guidance about foresight. Everybody says, "Oh, past results are no guarantee of future results," but they are to some extent. The best we can do in thinking about the future is sort of linear trends into that future. Linear trends are defined almost by definition by hindsight. It's really hard to break loose from that. When you start getting into the nonlinear parts of the future – anyway, I can't explain. Oh, one thing I'd say is that if everybody thought a lot about the future, the world would probably be in big trouble. You and I have a colleague we both know real well, Gina Eosco. The whole time she was working for me, the poor soul, she used to say just – it wasn't quite on a daily basis, but usually I'd do something where she'd say, "Feet on the ground, Bill." It had to do with thinking about what was going on and what we needed to do in the immediate rather than some long-term, fuzzy kind of dream about what might be. I think I was very lucky to always have plenty of people who could think short-term around me. Then you have the luxury of thinking long term, provided you don't try to micromanage or second guess the people who are dealing with the immediate part. It's very important that you get people who are good at that and let them do it. By the way, I mentioned Gina, but she and you both are a lot better at having one foot in each of these two realities: the present reality and the future reality. I'm kind of missing that foot in the present reality. I'm among the urgency-impaired. [laughter] But that doesn't mean that brighter people aren't able to do both. There are a lot of people out there who do both. I do think they get stuck with giving short shrift to the longer-term things.

MB: We draw inspiration from you, Bill. And by we, I'm sure that Gina would agree, too. Bill, if I may, in this [inaudible] actually, I do have another follow-up question, and this may be in the context of building disaster resilience – hindsight and foresight. I was actually reflecting on the Justice40 Initiative, for example, to confront the decades of underinvestment in disadvantaged communities. Now, there's legislation, IRA [Inflation Reduction Act], and BIL [Bipartisan Infrastructure Law] funding that is available to address some of the injustices and inequities that disadvantaged and vulnerable communities have faced in the United States. This seems like a one-time investment at the moment. What are your thoughts on that? Once again, how can we balance hindsight and foresight, and – I don't know if inspire is the right word, but urge governments, especially at the federal level, to work with local and state governments to address some of these issues on a more consistent basis, so that these actions are not subject to change in administration, but we're consistently moving forward in building resilience of our communities, all communities, and in particular, the ones that are most vulnerable to extremes.

BH: That is a great question. I don't think there's an answer. But let's just superficially try to deal with some stuff. I'm very interested in the idea of having something for natural disasters that's analogous to the National Transportation Safety Board, [which] really focuses on learning from experience and has been very successful at making commercial aviation safer for the last half-century. But the challenges of trying to do that in this natural arena, where it's not like you have a whole generation of airplanes that can constantly be modified and readily be modified,

and new airplanes are coming online all the time. You've got cities that were built where they were in the floodplain because that was close to rivers that made commerce accessible or coastlines that made commerce accessible, or on fault lines because nobody knew much about the earthquake history of this or that place. [It's] very hard to actually move those communities. I think the answer, the first step, the step that really matters the most, is awareness, and it's cheap. The thing about building awareness compared with reconstructing a whole town or a city is you can build awareness of the fact that – "Oh, our city is sitting on a fault line. Our city is below sea level. Our city is in an area where we're using the groundwater unsustainably." What's happening is those things are all at the fringes of awareness, but we're not really focused on them the way we might be. I have a feeling that with artificial intelligence, with social media, with a bunch of things, and with people just becoming aware in general about inequity and how inequities perpetuate themselves, I think that's going to be a good thing. Right now, it makes for a lot of turbulence and frustration, and hate even. But I think out of it, if we get more transparency, and if we start being a little more clever about what really matters to us versus what we're trying to spend so much time doing, we'll get better at it.

MB: Terrific. So, on that positive note, Bill, do I have your permission to stop recording?

BH: Oh, shucks. Yeah, I guess so. I love these sessions and really appreciate your patience with them. Thank you. Yeah.

MB: Likewise. Thank you so much, Bill.

BH: Until next time.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 9/30/2023
Reviewed Bill Hooke 10/10/2023
Reviewed by Molly Graham 10/22/2023

Session 18 - September 27, 2023

Interview Summary: This interview delves into the significance of failure in science, his career journey from NOAA to the American Meteorological Society (AMS), and the creation and evolution of the successful Summer Policy Colloquium program. Hooke emphasizes the importance of learning from failures, utilizing strengths in management roles, and addressing flaws in the educational system while reflecting on his experiences and contributions to the weather, water, and climate community.

Mona Behl: All right. Iit is Wednesday, September 27, [2023]. My name is Mona [Behl]. I am at the Airlie House in Warrenton, Virginia. I'm here with Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi there, Mona. It's good to be with you again.

MB: It's so fantastic to see you, Bill. Thanks for your forgiveness and grace as I slept through my alarm last week. [laughter] I have so many questions, Bill. We last left at discussing your career as the Chair for the NSTC Subcommittee on Natural Disaster Reduction and Director of the US Weather Research Program. You've often mentioned that the last over two decades have been the best phase of your career. I'm super excited to transition to that part of your career now. Unless you have anything else to add with respect to your position at NOAA, I think I'm going to ask for you to elaborate. What was your next job? How did that transition take place?

BH: Okay. Maybe I've mentioned this before, but my whole career trajectory is I've never gotten the job I applied for, and I never turned down one I was offered. I was minding my own business. In the year 2000, I was thinking I had about ten or fifteen more years to go in government, and I was good with what I was doing. I got invited downtown to the DC offices of the American Meteorological Society by Ron McPherson, who was the executive director at the time, and Dick Greenfield, who was standing up this new thing called the AMS Policy Program. They said they had some things they wanted to talk about with respect to climate change. I should have done what I usually do: say, "I'm not an expert in that. I'm an expert in other things." But instead, because I knew them well, I went down there. It turned out they'd lied to me. I walked into Ron's office. The first thing he said to me was, "Well, Brother Hooke, what's keeping you from coming over here to the AMS and working for the AMS Policy Program?" I just said, "Nothing. Nothing is keeping me from doing that." Our conversation kind of went on from there. They said, "We need somebody to come in and work here." I think they knew enough about me to know that from the standpoint of being a federal employee, I was over fifty-six years old, and I'd worked my thirty-some years, thirty-two, I think, by that point. I could retire from the federal government painlessly. I think they were counting on that. So, we went on from there. I think I'll just say – then, they asked me, "Well, when Could you start?" And I said, "Two weeks." [laughter] Dick Greenfield said, "Well, maybe you should take a – you worked for NOAA for thirty years; maybe you should take a little longer than that." This was in

May or something, or beginning of May, and we agreed on June 1st. It gave me time to use a little bit of annual leave. I took Chris on an automobile tour the last couple of weeks. So, I really only gave two weeks' notice. An interesting story about that that I'll put in here. So, I went back to my boss at NOAA. I had a new boss at NOAA, a great person. But he really wanted to make some changes. I had applied for a job that was the next level up within the Office of Oceanic and Atmospheric Research. He wanted to bring in somebody from outside for that job, and I was going to be an obstacle because I was already SES [Senior Executive Service]. He would have found a way to dismiss me anyway, but I was qualified for the job. I went in and told him that I was going to retire and go to the AMS, and so on. He had this look of just unrestrained joy on his face for a fraction of a second. And then he got a grip on himself, and he said, "Oh, I'm so sorry to hear that." [laughter] He was pretty happy that I was leaving. Anyway, I took two weeks of vacation. So, I really only gave two weeks of notice. Chris and I did a little driving trip around my home state of North Carolina. We went to the shore. I showed her that part, the Outer Banks, and all that wonderful stuff. And then we drove through the middle of the state, where I still had a lot of relatives. Then, we drove to the western part of the state, the Appalachians, Asheville, and so on. She got to see there, and then we kind of drove back through the Smoky Mountains and the highway over there, 81 or whatever it is, and got back to DC. I started on June the 1st, and on June the 3rd, I think they had a workshop on hurricane preparedness, and I participated in that.

MB: Thank you, Bill. Well, NOAA's loss is AMS and the entire society's gain. So, thank you, Bill, for making that transition. What was the title of your position at AMS?

BH: It was just a senior policy fellow or something like that. They were kind of making up titles as they went along. I don't think I had particular responsibilities, at least at the very beginning. But at some point, rather soon, they were doing Hill briefings, and they were doing meetings trying to bring the community together to discuss topics like hurricane preparedness. They wanted some help in formulating and putting those together. But Ron McPherson said to me one day pretty soon after that – he said, "Brother Hooke, I want you to start something here in the policy arena." He said, "I don't know what it'll be exactly, but you're going to call it the Summer Policy Colloquium." He was basing that on a good experience he'd had at NCAR [National Center for Atmospheric Research]. NCAR had a tradition of every summer having a summer colloquium on some technical subject. I think in Ron's case, he had been to one 4-D data assimilation or something like that and a variety of technical topics that changed year to year. He thought there should be an analogy and a tradition of someplace you would go, and the focus would be on policy rather than science, per se. As it happened, I thought I knew exactly what that should look like, and it should look like some of the management courses I'd taken as a federal manager at either the Executive Seminars Centers or the Federal Executive Institute in Charlottesville. These had a number of features. They had speakers from a high level in the federal government. They had a lot of Q&A. The speakers would come in and give short talks,

and then there was a lot of give and take with the group, which was usually the size of about thirty people. I thought that was the kind of format that something like this should have. That was still in [2000]. I had basically a year to kind of get that ready and got it started in [2001]. The first year, we had some financial support from UCAR [University Corporation for Atmospheric Research]. Jack Fellows, who had been an AGU [American Geophysical Union] congressional fellow from years before and worked at OMB [Office of Management and Budget] and had other responsible jobs as a result of that, was enthusiastic about something like this for folks. So, he provided a small amount of support for the first two years. And then NSF [National Science Foundation] allowed me to apply for a grant, and we went on from there.

MB: Thank you so much, Bill. That's a program that has changed so many of our lives. Thanks for talking about the Summer Policy Colloquium. I'd love to learn a little bit more [about] the initial classes and the format of the Summer Policy Colloquium.

BH: We had to work out some stuff. One issue was what time of year to have it. We happened to get lucky. We were lucky more than smart. We thought the summertime would be the right time from an academic participation point of view, particularly graduate students. We thought it should be either early in the summer or late in the summer. I think we decided on early in the summer because DC [in] August is kind of a terrible place to be. Not only would it be a terrible place for the participants to be, but they'd be coming at a time when all the senior people had evacuated for last-minute vacations before jumping into the fall. We happened to pick a week starting the Sunday after Memorial Day that just dovetailed so nicely with the congressional calendar because it turned out to always be the first week that members of Congress and, therefore, their staffs were coming back into the office after a little bit of a Memorial Day break. So, they were available, but they hadn't really gotten swamped with stuff yet. We didn't realize that, but it made a big difference for the next twenty years when we were asking people to meet with us. Let's see. I'm trying to remember. I had a few contacts. Bob White, who was [the] former head of the National Academy of Engineering, former head of UCAR, former head of NOAA for about four terms or something. He had a bunch of contacts. Dick Hallgren had contacts. Dick Greenfield had contacts. So, we kept knocking around ideas, and we found people to participate. That worked out. There was still some fumbling around. Over time, we would get some speakers who would come back and participate with us for many years. They made a huge difference. One of the things I found out pretty early was all the congressional staffers, policy officials in the government, and so on – they were looking for something like this, too, and they were skeptical that maybe the AMS could deliver on something like this with a format that would be useful and so on. I would usually have a lot of trouble persuading people to come and work with us the first time. But after they came the first time and saw how bright the colloquium participants were, we had kind of a mix of graduate students who were supported by UCAR, some people from government agencies and from the private sector, and academia who were supported by their host institutions. The speakers just thought, "What a great group.

What a great format. All this time for discussion and so on." Sometimes, they'd come early and hear their colleagues' lectures or stay late for another colleague's lecture. That added kind of to the vibe. They'd ask questions as part of the discussion. It was, thanks to the participants, really lively.

MB: That's outstanding, Bill. Summer Policy Colloquium – it's such an outstanding professional development program that brings together students and professionals from academia, private sector, public sector. I participated in 2011 during the final –

BH: [inaudible]

MB: – during the final year of my PhD, and that changed my career trajectory. I also recognized that it was probably one of the few professional development programs that included a lot of people, a lot of women, and a lot of people who looked like me. So, was that something that you had planned going into the program? Even in 2001, the first class of the Summer Policy Colloquium, if you look back, it's quite diverse. So, it has a lot of women who participated given that geosciences is such a – we're still struggling with diversity. Is that something that you planned? Is it something that happened naturally?

BH: Well, we hoped for it, but we didn't plan for it. I think everybody for a long time has recognized what an important issue this is: the underrepresentation of women and different minorities in science generally and leadership of science, in particular. But again, it was sort of better to be lucky than smart. We put out these notices. We were among the marketing-impaired. We did a very poor job of marketing. We tried our best to do a good job of selecting the candidates, particularly – we didn't try to select people who are funded by their host institutions. The tuition was expensive enough – five thousand dollars. It was kind of the equivalent of getting a NOAA Administrator's Award, which only goes to two or three people a year. So, we felt like the organizations sending their participants would be the best judge of who had the potential and who, really – but for the students, we tried to do a little better than that. From the get-go, as you say, we were very fortunate that we had a kind of broad representation. Gee, it meant a lot. I think the main thing was we didn't – actually, really, over the twenty years, I'd say my general impression was women particularly had stronger applications than men. I don't know the reason for it. There was something about the maturity of their applications that stood out. Particularly in the early going, we got some things from guys about, "Hey, this looked interesting. I thought I'd bring my Harvard background to bear on it," or something like that. But women would usually, in their statements of purpose, come up with something not just a little stronger but a lot stronger. So, by taking the best applicants, we kind of got the balance we did. Yeah.

MB: That's fantastic, Bill. Thank you. Bill, from 2001 all the way until 2023, the Summer Policy Colloquium is still strong. What were some of the lessons that you learned early on in the program that helped evolve [or] may have informed how the program has evolved in the past two decades?

BH: Yeah. One of the lessons was to listen to people who had ideas for the program. We had a person you know by the name of Genene Fisher, who was working with us as a postdoc for a year or two at the beginning. I think we'd had a certain speaker provide an overview of the policy process. She said very quickly, "You should have Toby [Tobin] Smith come in and do this. He's writing a book with Homer Neal, who's at the University of Michigan and former NSF director." That was the book that turned out to be Beyond Sputnik: [U.S.] Science Policy [in the 21st Century]. So, I listened to her. Because Toby knew her, he agreed to do it the first time. He was doing something similar for AAAS [American Association for the Advancement of Science] Congressional Science Fellows for their program, and he migrated that over. That hour, to start things off, was huge. Then somebody else suggested a person by the name of Judy Schneider, who worked for the Congressional Research Service and had been former Brookings [Institute]. She was also part of the AAAS program. Against the odds, I asked her to do it, and she agreed. She really reamed me out the first few years. Every time she would show up, she would say something about, "I don't even know why I took your invitation. You didn't have the decency to call me. You just sent me an email. Blah, blah, blah, blah, blah, blah." I used to cringe and hope that she wouldn't call on me when she came in. But she was responsible for a couple of days' course for freshmen members of Congress to keep them from embarrassing themselves when they first appeared on the floor of Congress. They'd come in from a state legislature here or there and then not have an idea of how things worked. She was part of whipping them into shape. So, graduate students and scientists were just putty in her hands. [laughter] It was a profound emotional event for most people who experienced Judy as the second speaker of the day. Some things like that kind of crystallized along the way. The first year, we decided we wanted to go to Capitol Hill to meet with congressional staffers on their own turf. We tried to do both the Senate and the House in the same afternoon, and we spent much of our time in the logistics of just getting from the House side to the Senate side, trying to navigate all the tunnels under the big building over there. I still remember going up one escalator and watching some of the participants going down the escalator on the other side. I think the second year, we realized we can take two afternoons to do this. This is worthwhile. We do a house side, we do a Senate side. Again, we had contacts with the House Science Committee. Dick Hallgren was a good friend of Bob Palmer, who, with David (Goldson?), was switching back and forth, depending on House majority or minority, Chief of Staff for that committee, depending on which party was in power. So, we did both flavors over the years. There were a number of people who came in through accidents like that. We realized we need to build a program around them. We had the introduction to policy on the morning of the first day. We'd go to the Senate side on the afternoon of the first day. We'd do the White House because that was terra incognita for most

scientists. Scientists know a lot about the agencies, but they didn't know much about CE2 [Corporation] or OMB or Office of Science and Technology Policy and so on. We spent time on that on Tuesday mornings. Then, Tuesday afternoon, we'd go to the house side. Then, the next thing that kind of fell into place in the program was science and diplomacy. We've kind of built up a State Department piece of this. The other pieces just kind of fell into place. We made a point of spending seven workdays on this. So, we included the weekend. That, again, was a feature of my experience in the government – Executive Seminar Center. They'd have us stick around the weekend or two weekends, depending on the program, and we would make field trips. I remember in one of those, it was energy, natural resources, and environmental quality or something. We were at the executive seminar center in Tennessee. One morning, we went to a hydroelectric plant, we went to a coal-fired plant, and we went to a nuclear plant under construction, all in one afternoon on the weekend day. It was just really mind-expanding. I still remember being in the nuclear plant and realizing nobody knows how a nuclear reactor works. There's a person at the top who's got a cartoon, a block diagram. There's a person in the basement who knows the difference between the red pipes and the white pipes. But nobody knows how it works. And yet, we're building these things. Anyway, we carried that over. We fell into a schedule for that, too. Chris and I invited them out to our place, which was on the way to Mount Vernon, and we'd have brunch outside. We only had one day of bad weather over the twenty years; we probably had about a half inch of dew. [laughter] Everybody was in ponchos. We wound up eating in the basement of our house. We had the waffle station in the computer room, and other things were being cooked in other parts of the basement. A couple of tables scrunched together. But apart from that, we would eat outside, and then we'd get on the bus that brought them downtown again and go the rest of the way to Mount Vernon. The excuse was that George Washington was also a farmer, and farmers were kind of natural scientists, many of them in that day. So, we had science and policy all in one person. So, they'd tour Mount Vernon, and we'd get them back on the bus and get them downtown about mid-Saturday afternoon, and they could explore downtown DC and the monuments and whatever they wanted to see until we met again on Sunday night. We had dinner speakers on Wednesdays and Sunday nights. Then we'd go two days into the second week. That was usually a week where we'd have specialized topics, and these would vary. Sometimes, we would do hazards. Sometimes, we'd do environmental quality. Sometimes, we'd do international water. We had different topics that we'd do. But the spinach, the basic core stuff, was the first week. I think Paul has cut it back to one week since I left.

MB: The ten-day experience that I participated in was transformative. You mentioned Judy. I still remember that was the first time I had heard how sausage is made, how a bill is made. She's so direct and just so pointed and so concise. It was fantastic. That was my first experience understanding ways in which science can be useful to policy making and how decision-makers use science for their decision-making. So, thank you, Bill. What were some earlier successes

that you had started to see that inspired you to continue doing and reforming the program and to make it what it is today?

BH: Well, I'm probably guilty of not having enough cool metrics on that. The great thing about starting with a group of bright people – I used to tell them this – was we only slow your trajectory down for ten days. They were all going to amount to something no matter what. I think I also gave them the guarantee that it wouldn't be the biggest waste of ten days of their career, even to that point. I think people felt like we delivered on those two promises. People were going on to – I mean, they were just all rising up their different organizational ladders. The students were getting degrees and getting faculty positions. Faculty members, some of them were getting department chair positions, and so on. The managers, agencies, and companies were rising up their organizational chain. So you could see that even in the first year or two. Another metric was, as I said, that the people who would come and talk to the group wanted to come back. The quality kept going up. One of the things that happened that didn't happen very quickly – only started happening, I think, in the last ten years of the twenty years – instead of having faculty members writing recommendations for graduate students and saying things to us like, "Well, so-and-so isn't likely to be a great researcher, so maybe a policy program would be a good escape route for him or her." We used to think, "What are they thinking?" But we learned to calibrate the professors that would do that and not to hold it against these bright students. The students initially had very little guidance on campus about this was something – they were mostly almost furtive about it. "Oh, wow. I didn't know this existed." But as time went on, we had faculty members who had been through the colloquium who were recommending to their students that they do it. That changed the dynamic a lot. Again, it probably didn't fit in exactly the super best way with – we probably should have done enough advertising so that that group was overwhelmed by the much larger group of applicants, but that's not really the way it worked. I lost some other point I was going to make about the nature of the transition. The funding got to be more regular. I should mention that an important person in this was Dave Verardo at NSF, who took over the funding from UCAR after the second year and worked with AMS closely to shape the program. He came and spoke a number of times. One of the features of the program was we'd get people who didn't start out as scientists who were in positions of science leadership. (Grace Hu?) at OMB started out as a schoolteacher and wound up suddenly running big science programs at OMB, looking at NSF and NASA. There was one English teacher who was running USGS [United States Geological Survey]. So, these nontraditional things. Sandra Cauffman came and talked. She was a deputy director of the Earth Sciences Division at NASA. She had started out life in Costa Rica as the daughter of a single mom. She watched the astronauts land on the moon in 1969, and she told her mom, "When I grow up, I'm going to be an astronaut." And she said, fortunately, her mom didn't poo-poo that idea. Eventually, her mom wound up marrying somebody who had enough money to send Sandra to school at George Mason. She wound up getting a summer job out at NASA Goddard. She'd never made it to the astronaut corps, but she wound up being this figure in Earth Science and Acting Earth Sciences Director

for an interim period even. So, they all have these narratives that were just so powerful. The participants really, when they'd see these – we started getting members of Congress, who would come speak to the group, not just the staffers. We had James Woolsey, who was the CIA director, who spoke to the group. We got a couple of Presidents' science advisors to speak to the group – former Presidents' science advisors. Jack Marburger spoke when he was Bush's science advisor. I've really got to hand it to him. He was, I think, the only active Presidential Science Advisor we had. But he spoke to us one year when he was taking chemotherapy for the cancer that eventually would kill him. It was the only appointment he took was to come in and be an evening speaker to our group during that time. He lived out in Bethesda. I gave him a ride home after the dinner talk. I still remember this. I was planning my little elevator speech. What would Jack and I talk about on the ride home? But Chris had come to the lecture. We got in the car, and she said, "Well, what do you think about corn-based ethanol?" And she said, "I don't think much of that." He said, "Well, I don't either." They had a great conversation with each other while I just drove him back to Bethesda from downtown. But that was the way the colloquium was. I think I lost your main question in there. You were talking about changes and early success and how we knew all of these small things, just continuing to get the funding. I would go every year, and every year, I just learned so much that was new and be so impressed with the people. There's a stereotype about Washington that people are power-hungry, small-minded, and opportunistic. And these people were all so high-minded. Some members of Congress who made a big difference – Rush Holt, who is a plasma physicist. I still remember he came into the group for the first time, and I introduced him and said that Rush Holt was a former Jeopardy champion. He had been on Jeopardy for five days and retired undefeated. I think he was pretty happy that I mentioned that. I said to him, "Of course, we have a member of our colloquium group here who's also a Jeopardy champion," and that was Russ Schumacher, who was a graduate student at CSU [Colorado State University]. So, they talked with each other for about five or ten minutes, and the rest of us were just scum. [laughter] But things like that were always happening. It was a wonderful cross between a science policy [and] jam session. The environment on Capitol Hill got a little more toxic as the twenty years went on. You'd start to see some of that evidenced in the strain that some of these staffers and the participants in the policy process were under. But they still came and spoke to the group and inspired them to join in. A number of them did. If I just think about some of the more successful – so Laura Furgione came to – in the 2002 group, Laura Furgione was there from the Alaska region. She went on to be the deputy director of the Weather Service. We had Kelvin Droegemeier in that class, who would become President Trump's science advisor and just an extraordinary individual. He's now at the University of Illinois, which is part of his background. He was there at the start of his career, but an amazing person. I went to his confirmation hearing. He was in the 2002 colloquium group. I went to his confirmation hearing probably in 2017, I guess it was, whenever Trump finally got around to appointing somebody. I still remember him when – Senator [Edward] Markey was there from Massachusetts, and Senator Ted Cruz was there from Texas. You knew that there was no way he could please more than one of them, and he somehow

overcame both of them just with sheer energy in his testimony. I still remember being very impressed with that.

MB: Bill, you're so right about – thank you, again, for sharing the entire program and the influence and the impact that the program has had and how the program has also evolved in the past twenty years. I, as a participant, can attest to the fact that when I participated, I didn't know that policy was a career track that one could follow. It was most certainly the impression that if you're somewhat lesser of a geoscientist, you end up being in a nonacademic career track. I'm amazed that several emerging leaders who are hardcore physical and social scientists do want to make a difference in that science-policy interface. The Summer Policy Colloquium has just been an incredible opportunity for several of us. I owe it to the Summer Policy Colloquium for changing my career trajectory and introducing me to the world of science policy. I still boast about the fact that I got to have dinner with Kathy Sullivan, all thanks to you, because she was the invited speaker during the evening dinners. I think that was also the first time, as a foreign national, I got a chance to visit Capitol Hill and understand how professional staffers and policymakers are using science for decision-making. For some reason, it made me think the work that I'm doing matters, and it can influence these national welfare decisions that are important to the country and to our planet. So, thanks so much for the introduction. Over the years, it's fantastic. Geosciences happens to be a small field. It has been so wonderful to chat with colleagues who have been alumni of the Summer Policy Colloquium. You have this entire army of colloquium alumni. How does it feel, Bill, to prepare to have nurtured all of us and to have played a role in our career choices and career growth?

BH: I really think the whole thing was a tribute to, again, just the passion that the science leadership of this country, government agencies, and staffers on the Hill had for it and the quality of the participants that were coming in, more than anything we did. We just kind of said, "Hey, there's refreshments here and a place to stay for ten days." The people made it all work. I'll just mention a couple of other things. One of the graduate students we had was a guy named Aaron Goldner. Aaron Goldner came in from Purdue, and he applied for congressional science fellowships. He applied for three and was selected by all three – AGU, AMS, and AAAS. He took AGU, I think because it paid the most or whatever. But after he'd been on the Hill for a couple of years, we were having him come back and talk. I was able to get – increasingly, I was able to get speakers from the early years to come back and talk. Aaron, after a year or two, said, "I'm working for Senator [Sheldon] Whitehouse. I think the Senator would like to meet with your group." So, for the next several years, every year, Senator Whitehouse would also speak with a group. Tegan Blaine was in the first group as a graduate student and a former Peace Corps volunteer who was going to Scripps. She went on to work at McKinsey and then at the State Department in USAID [United States Agency for International Development]. She started coming and speaking. I remember one year she came in and spoke when she was pregnant. I thought that was above and beyond the call, but she did so much to get that science diplomacy

thing roped in. We had a lot of science journalists come in, including Andy Revkin and Juliet Eilperin, who started out doing science at the Washington Post. Juliet came in one time when she had a two or three-month-old. My job was to keep the bottle in her baby's mouth in the back of the room while she was talking to the group. So, you can say how it feels – it was just a privilege to be part of it for two decades and to just watch this sweep of intellect, energy, and talent go by. That was more what it was like than anything else. Yeah.

MB: And what a privilege to have participated in that program, Bill. So, I see the time. Do we have time for one quick ABA [Ask Bill Anything]?

BH: Sure. There's no such thing as a quick – you can ask a quick question, but you're learning there's not really often a quick answer.

MB: Which is a treat. So, Bill, one of the things that often comes up in my interaction with emerging leaders is that in science, we don't talk about failures. CVs are a resume, and CVs are for accomplishments. I really wanted to ask your thoughts on failure. If you could reflect a little bit on the importance of failure and also follow up with an answer to this question, which is, what is your most memorable failure?

BH: My most memorable failure? Wow. I hardly know where to start with that one. That's a rich field. In the colloquium, going back to the colloquium, because it's part of the answer to this question – when I'd invite speakers, they'd get a letter that would say something like this – either thank you for agreeing to do this, or we hope you'll agree to do this. If you participate, you've got about ninety minutes or something. About a third to a half of that should be informal but prepared remarks. Two-thirds of it should be dialogue with the group. In the informal but prepared remarks, we would like you to address three questions: the series of strategic plans and strategic decisions that got you to your current job and happy accidents. And the second question was, what keeps you up at night? And the third question was, what's your advice to young people, early career people who want a job like yours someday? Those three questions kept them in this zone where they could say something about failures, and so many of them did. I told you I'd never got a job I applied for and never turned [inaudible]. I would say that's more the usual experience for most successful people. That's the way they see it, than the other way around. They may have had some idea. You have to have some idea about the difference between success and failure, the difference between an opportunity and a distraction. But in terms of failure, I think most people weren't too weighed down by it. One thing you hear particularly from salespeople is, don't think of [being] turned down as a failure or whatever. Think of it as you're one day closer to success. I think a lot of people kind of have – that's a little bit of a healthier attitude. Big failures? I mentioned one. I mentioned the whole one about being a graduate student and talking with (Teller?) and my experience with Chandrasekhar in quantum mechanics. I'd say another one was the failure to get many of the jobs that I applied

for. I felt like I was a utility infielder, to use a baseball analogy. I could be of mediocre quality at a number of things, but I wouldn't be the best at any one of those things. I'd applied for a job as the head of – I'm trying to remember which lab it was – well, the Space Environment Lab, because I'd had a background in upper atmospheric physics. I applied for a job at the Earth Sciences Division of NASA Goddard and several other jobs. We'd get to the interview stage but never get any one of those jobs. It was only jobs that nobody else wanted that I'd wind up getting. I'm not sure that really answered – there were some personal failures. I think my divorce was a huge personal failure. But that was it. The second part of that question was?

MB: What is a memorable failure for you?

BH: Okay. Well, I think I've covered that. I thought that was maybe the first question, and the second question was something else.

MB: We don't talk about failures very often.

BH: Oh, yeah. Okay. That was it. That was the first question. Yeah. Okay, so I've answered both parts.

MBH: Thank you, again, for those insights, Bill. I also think that you mentioned the jobs that you could not get but were lucky that you did get. Those failures also steered you in a direction where you are today. So, we are lucky that you have been part of AMS and the Weather, Water, Climate community and have contributed in so many ways. I sometimes feel that there is a spiritual aspect to failure, which is it brings you closer to something that you probably are destined to do as well. That doesn't mean sitting back and not taking action. But I do think that there is another spin to looking at –

BH: There is such a thing as creative waiting. One of the things that Dick Hallgren taught me – I'm pretty sure I learned that from him rather than somebody else was this idea that the people who work for you come in three categories was the way he said it. There's a category of people that don't need any help from you. You just need to stay out of their way. And then there's a category of people who just will never be useful or fit in. Those are two small categories. Most people fit in this category that they're great if you can keep them doing the things that they're best at. The task of managers and leaders was to make sure that most people are working on those things rather than other things. By the way, another guy who thought about that was Peter Drucker. He said that's the way the workplace goes. But if you look at education, he says the opposite happens. He really faulted education for this. He said if you're terrible at math, the educational system makes you spend more time in math. And if you're terrible at English, the education system makes you spend more time at that. He says they'd be better off if you were good at math, letting you run to – and you'll pick up English and writing. If you're good at the

humanities, run toward that a little bit, and you might get better along the way at critical thinking and evidence-based thinking. Anyway, he thought educational systems were backward.

MB: Stupendous, Bill. I think what you just said also makes me think that success probably comes [from] different failures. It's probably after failing over and over again that you declutter and focus on what you're good at. So, thank you again. I've taken way more time.

BH: I feel sorry for the transcribers.

MB: I bet it's a treat for them, as well, as we know. Thank you again, Bill. Hope you have a lovely week. I know this week is going to be glorious for me because I am connected to you now. So very much looking forward to our conversation next week. Do I have your permission to stop the recording?

BH: Yeah, and I'll start my timer that says it's only 167 hours until we get to do this again.

MB: [laughter] Thank you so much, Bill.

BH: Thank you. Have a great day.

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Reviewed by Molly Graham 11/13/2023
Reviewed by Bill Hooke 11/14/2023
Reviewed by Molly Graham 11/26/2023

Session 19 - October 4, 2023

Interview Summary: This interview delves into the intersection of science and policy-making, highlighting the importance of scientists engaging with policymakers at the local level. Hooke stresses the significance of listening, responsiveness, and problem-solving in addressing community issues and influencing decision-making. The conversation also touches on the global implications of local policy decisions and the potential for organizations like the Summer Policy Colloquium to amplify these efforts.

Mona Behl: It is Wednesday, October 4 [2023], around 8:30. My name is Mona [Behl]. I am in Athens, Georgia. With me, I have my mentor, Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi there, Mona. It's good to be with you again.

MB: It is lovely to be with you, Bill. I've been reflecting a lot on the Summer Policy Colloquium [SPC] that we talked about last week. So let me ask you this one question. Where do you see SPC, the Summer Policy Colloquium, going over the next decade? In other words, if you were still leading the program, where would you have liked to see SPC go over the next decade?

BH: So, those are two quite different questions. The program is totally out of my hands. That's how you keep programs alive, I think. We have all kinds of examples, when we look around the world, of what happens if one person stays too long in a position or controls something for too long a time. The results generally aren't good. So, I think this is good that the program will probably go in much more creative directions. One question that I think needs to be asked is – and we can probably dispose of it in the negative. You could say, well, maybe this was a program that wasn't intended to go on forever. When the program was started, the people who were really interested in getting it going – and I was involved, but Dick Greenfield was involved, formerly from NSF [National Science Foundation], Dick Hallgren, who had been a prior director of the Weather Service, Bob White, who had run NOAA for a while, Jeff Kimpel at the University of Oklahoma. I think they were all saying there was a demographic problem with leadership in the environmental sciences, that a number of the leaders who were still around in the year 2000 were World War II veterans. They'd been around a long time, and there wasn't really a group coming up of young leaders behind them. The leaders, particularly the younger people, weren't getting this training that people in the war had gotten, the on-the-job training in a very difficult situation and putting science to practical use and all the rest of it. So, how to fill that void? The colloquium was a way of showing people that the real world wasn't operating on the basis of the Navier-Stokes equations, or the rules of radiative transfer, or plasma physics, or whatever – it was working on heuristics, conjecture, power and courage, and trust and faith, and a whole bunch of things on which all those equations are silent. It wasn't that students – I mean,

scientists, everybody, we're all people. We're used to those things. But we're not used to being as disciplined in our approach to the policy process as we are to the science. This was an effort to overcome that. One thing I'd say, looking at the future, is the bar is being raised. So, in the start, a lot of the students, I'm sure, weren't even happy that their faculty advisors knew they were doing the work because many faculty members in the year 2000 were still thinking, "Oh, that's the dark side. Any student worth his or her salt wouldn't be going deliberately into that arena." In the early going, it was pretty simple because what you were doing was trying to break down stereotypes and show people a bright new world, that really high-minded, intelligent people who were working already along those lines and what they were accomplishing and how satisfying it was. You have a guy like Jack Fellows coming in, and he got the – he was working in OMB and got the billion-dollar a year or 1.5 billion-dollar a year Global Change Research Program through the budget process back in the '90s. Well, that program has contributed fifty billion dollars or sixty billion dollars to science since then. You got to write a lot of papers. A billion a year supports how many scientists? Maybe ten thousand scientists or something like that full-time. You have to write a lot of papers before you have that kind of impact. [laughter] And they better be pretty good papers. Few of us can achieve that. But somehow, these days, there's much more awareness of the importance of this. There are, I think, other efforts that are growing that provide people, early career people, such opportunities – you're involved with one in AMS [American Meteorological Society], the Early Career Leadership [Academy], ECLA, program. So, there are many different ways to go at this, and I'd say that moving from something that's only ten days to curricula that incorporate this over a semester, finding ways to get practitioners in front of the students instead of just their faculty – those are directions things should be going.

MB: Thank you, Bill. I feel that SPC is actually more relevant today than ever before, and I'd love to hear your thoughts on this. But something that I'm trying to learn is the important role of science policy in advancing diversity, equity, inclusion [DEI], and justice via policy is a tool to promote those values and integrate those values into our science and the impact that science has on society. I'd love to hear your thoughts on that, Bill. Do you think it's appropriate to say that DEI, justice, and accessibility have a role to play in science policy, and science policy can be used as a tool to promote some of those values?

BH: Well, not just science policy, but the whole business of life on the planet. I've gone through a change in my own thinking from thinking DEI was kind of an important add-on to what people are doing to thinking it's the fundamental starting point. It's as fundamental as the Navier-Stokes equations or the radiative transfer equations, the chemical reactions, and so on because science is a trust enterprise. Hardly any of us have first-hand experience with the things that really prove the science we're using. We trust the people who've done it a world away or twenty years ago to have gotten it right. We try to make as much progress as we can. And we only grudgingly admit, "Gee, they didn't have it right because we're running into trouble here or trying to apply

that." I'm not sure that scientists have been particular leaders in diversity, equity, and inclusion. I might be more inclined to say we've been laggards. The apprenticeship system doesn't lend itself to inclusiveness and the kind of regard for other people the way that it should. I think some people get that, and they were applying that all along. I just remember, particularly in some of my graduate school days, just being so turned off by what I saw as the lack of cooperation, the competitiveness, the arrogance, and so on. But that's the perspective of somebody who wasn't succeeding, particularly in that environment. I got to keep mentioning that a lot of that might be sour grapes on my part. But I think these principles are vital. I think somehow they have to be part of – people would say, "Oh, family values, that used to be the way people were brought up." Well, it wasn't really. It could still be improved. But in every aspect of our lives at home, at schools, and the public, we're certainly seeing evidence of it. You and I are talking on the day [Kevin] McCarthy has been deposed as Speaker of the House. We've just seen what happens when you don't operate on the basis of trust and cooperation and remembering the job that you're doing, which is supposedly making governments run and people enjoy life, liberty, and the pursuit of happiness.

MB: That is very helpful, Bill. So, a follow-up question that I have there is, what are some fundamental science policy questions that scientists should be asking when they pursue their research? I personally benefited a lot from the Summer Policy Colloquium. As I've mentioned before, it changed the trajectory of my life. Just reflecting on what you said about the demographic problem in leadership in science policy, I think the Summer Policy Colloquium was one way in which you're enabling diverse leaders to enter this space. I share the many benefits of participation in the Summer Policy Colloquium and engaging in science policy with students at different institutions here in Georgia and beyond. How can I provide them with some guidance to get started with thinking about policy questions about the scientific research problems that they're solving? What are some benefits also?

BH: Well, this may not directly answer your question. I'm wondering, maybe we should pause for a second. I'd like to bring up a quote from Francis Bacon that I think covers just what you're asking in a much better way than I could. But I'd like to maybe share the screen or get it up in some way. It might take me a minute. Can we go off?

MB: Yes.

[Recording paused]

BH: Thank you, I apologize for the slight delay. You were asking me a question about how to talk to scientists about what matters. I'm not capturing it. But it seemed to me the piece that all scientists would do well to keep in mind is this piece of advice that came from Francis Bacon around 1620. Just a quick word on Francis Bacon. He was really the first scientist to kind of

push the idea of empiricism and do experiments and kind of see what's going on. So that was a great step forward for science. Scientists give him a lot of credit for that. But at the same time, he was an advisor to kings and queens. He was an advisor to Queen Elizabeth. He had a position under Queen Elizabeth that was above what we would consider to be the Prime Minister appointment today. He was between the parliament and the Queen, if you can imagine such a thing. But he was a naturalist [and] supposedly died conducting an experiment. He had the idea that cold would help preserve meat. In the middle of some kind of winter storm, he was out there putting meat in the snow and stuff, and he managed to get sick and died at the age of sixty-something. But anyway, this is what he said at the end of a major piece that he'd been writing – he said, "Here's a general piece of advice. Think about [inaudible] the true ends of knowledge and don't seek knowledge. Don't do science just because it pleases you; it's fun. Don't do it because you like to use it in arguments. Don't do it because it makes you feel superior to others, for money, for fame, power, or any of these inferior things." And then he says, "You want to do science for the benefit and use of life." And this is where the [diversity] and inclusiveness and all the rest of it come in. The benefit and use of life. And notice he says something very advanced for 1620. He says life. He doesn't say human life. So, my ecologist friends, like Paul Higgins, say, "Well, maybe it's not so important that mankind survive." Bacon was humble in that way back in 1620. He says, "So you want to do science for the benefit and use of life. When you're doing it, you want to improve on it, and your governance should be based" – it says here charity, but that's an Elizabethan word for love and the highest form of love. We can go into definitions of love. The Greeks had several words for that one idea. So, you want to do your science and perfect it, and the whole enterprise should be ruled by love. He says, "It was from the lust of power that the angels fell." That's a reference to passages in the Bible. "From lust of knowledge that man fell" – that's also other passages in the Bible. But of love, of charity, you can't have too much of it. Neither angels nor men – or women, okay – because inclusiveness had its limits, even though he was working for a queen. Nobody ever came into harm by too much love. That's kind of captured by this apron that you can buy that says, "No man was ever killed by his wife while he was doing the dishes." [laughter] Anyway, we can take that off. I can stop sharing my screen now, I guess. But that quote, I think, has yet to be improved on four hundred years later. I think we should just – I used to have it on my wall in my office. I came across that very early in my career; it's always been a guiding star. I'll just make one infomercial kind of comment. The person who pulled that out of the morass of Francis Bacon's writing and brought it to my attention was another Swarthmore graduate, a guy who was a much smarter guy than I was. He had come and gone by the time I got this Swarthmore. His name was Jerry [Jerome] Ravetz, and he wrote a book; I think it was called something like [Scientific Knowledge] and Its Social Problems. That's how he closes the book and summarizes it. Boy, he made a great choice. I owe him – we all owe him a lot for keeping that passage from just sort of disappearing into historical oblivion.

MB: And we owe you a lot, Bill, for sharing that passage and talking about science and policy and the responsibility of scientists in the policy world. The idea of love is a high-minded idea. How is it played out in science and public policy? We hear both sides, scientists and political decision-makers, talk at each other at times. You also said the need for scientists to be disciplined in their engagement with policymakers. So, could you speak a little bit more about cultivating that love and having a disciplined conversation that leads to some good societal outcomes?

BH: Okay. So, first, I said that there are different words for love. The Greeks distinguished between three kinds of love. One was eros, which was a desire of one person for another. The next word is phileo, P-H-I-L-E-O – philosophy. A [bibliophile] is a person who loves books, and so on. That's a love, meaning a kind of appreciation for and respect for. And the third word is agape, A-G-A-P-E, which is a kind of sacrificial love. So, when the Bible talks about God so loved the world that He gave His Son, that no one should perish – it's that kind of love. We're all capable of all those bits, and sometimes they get all merged together. So, I think it's easy to think politicians live in a love-free zone. But I think the opposite is true. One of the things that people would say after coming to the colloquium, especially the first few years – they'd say, "I had no idea that politicians were getting along as well as they are, and they're working together so much." We were all kind of taught by Mom and Dad to make the world a better place, somehow. Our main problem is we just forget that others were taught that same thing and that we're really in a support group. We'll really accomplish great things if we can. I think politics works best – there's political advantage that exists for a moment and then quickly dissipates at the next election or when circumstances change or somebody new comes in. But the things that survive probably have more than a little bit of this love in them, the things that lead to a society that can work together and make compromises and have a rule of law and all the rest of it. That's not a good answer to your question.

MB: It is. It surely is. One of the ways in which federal science policy is played out, Bill, is the budget that the federal government makes for science. By that measure, I think we do owe it – I feel responsible that science is funded by taxpayer dollars. So, scientists should think about responsible ways of engaging with the government. Are there other ways in which science gets manifested or played out in the policy world?

BH: Well, yeah, you're bringing up a point. You're trying to get me – you should be interviewing Roger Pielke, Jr. or somebody like that to talk to you about – you're hinting gently at the idea that there's policy for science, and a big part of that is how much money should science get when there's only a finite amount of it. The other is the science for policy. And certainly, science informs policy a lot. A big example right now is the climate change issue. Another one, which was really riddled with controversy, was the COVID science. We've just seen that the Nobel Prize was awarded to two scientists a couple of decades ago, who thankfully

sorted out a lot of the techniques that were used to rapidly create antivirals, vaccinations, and so on for the human race. I'm not sure that addresses your question, but just about every policy issue has a science basis on it. If you're deciding to build more highways, there's science about cars that will be more efficient on those highways and trucks. There's science about mass transit as an alternative to highways. There is science about people's urge to travel and other ways to reduce the need for travel and so on. I mean, it's everywhere now, and more is coming. I just keep reading about artificial intelligence. It's going to be bringing more and more – even though supposedly, it's not scientific – much of what it does is empirical – the basis for that empiricism is scientific. So, science is really the name of the game. It's the best way of knowing about things that yield themselves to science. It's worth the effort to spend ways to bring more and more of human activity under the examination of science, seek to understand it, and benefit life as a result.

MB: So the AMS Policy Program, Bill, also was my first introduction to the fact that professional societies have a public policy and advocacy function. So, could you talk about all the other things that you did as part of your job and how that advanced the public policy and advocacy function of the American Meteorological Society?

BH: Yeah. So, that's an interesting one. Maybe I wish I'd had more time to reflect on some of the – one thing we thought – so we used to hear a lot that we should advocate more from particularly young scientists, early career scientists, and so on, that AMS wasn't nearly as vigorous as some other science societies, and we ought to get better at it. But it looked to me – one of the things we would hear from the colloquium speakers, particularly the congressional staffers, was when they get a whole bunch of formulaic emails from members of this or that science society saying increase the funding for this or that science, they just blow it all off because they know that that was generated by a few people working in some policy office for that science society and a whole bunch of scientists almost unthinkingly just a few key clicks to put in their member of Congress and send it off. The other reality that was part of this, as far as I was concerned – AMS had 10,000 members or so. We'd like to think it was a few more than that, but not three or four times that. The AARP, the [American] Association of Retired People, or whatever it is – they have a million members just in Virginia. [laughter] The AMS has about ten million dollars of unrestricted net assets, and the AARP has several billion dollars of assets. So, they're perfectly happy to be in a contest to see who yells the loudest. They've got millions of members, and they're all codgers like me, which means that they vote. They do this antique thing of religiously voting. So, they've got a powerful voice. If you're the AMS and you want to have an impact, you have to try something else. You can't do what even a larger science society might be able to do, or a larger professional society, or a richer professional society – the American Bar Association, American Medical Association, or the AAAS [American Association for the Advancement of Science], IEEE [Institute of Electrical and Electronics Engineers] – they've all got more voices to bring to the table and all the rest of it. So, what we did, and the

colloquium was part of this – not only were we introducing our early career people to the policy process, but we essentially said for this twenty-year period to the congressional staffers and the others, "We want to hear from you. We want to understand how the world looks to you. We want your advice on how to be relevant and useful in this important and ugly process that you're involved in because it's not for sissies." I mean, one of the things that Hallgren and Kimpel and those guys kept pushing was [inaudible] courage. In addition to love, just plain courage plays a bigger role in this than most scientists understand. So, personal relationships, love, and also courage. They wanted us to see this. When we have the speakers in front of our early career people, that certainly would always come across – and commitment and so on. So, we would build up relationships, and they would think to themselves, the staffers would think, "Well, the AMS isn't coming in here with the shrill voice and saying, 'We want more money for AMS scientists to do …'" I wrote an op-ed [on] this for the AGU [American Geophysical Union] once, which I don't think was their favorite op-ed, but I basically said, "Our marketing message – scientists tend to go in with a message: the world is going to hell in a handbasket. But as it goes to hell in a handbasket, the complexity of the devastation and the speed of the devastation is growing. So we need more money to better document the devastation." [laughter] That's not an enduring message. There ought to be something there about [how] we're going to help solve this problem, but not the problem that we think you have, the problem that you say you have. We would go up there and listen to that, and we built relationships. There's a difference when congressional staffers hear from you that you need to do X or Y or Z, when your timing is off, and when your understanding of the subject is off, and when they have a genuine question, and they call you up, and you're there to answer them. It took twenty years, but we kind of got in that latter mode a lot more than the former mode. That's the place to be.

MB: I feel super proud to be affiliated with a professional society like that. It is quite amazing, Bill. It also speaks to a question that I was about to [ask], but you did answer that already: how can scientists cultivate trust in their work with politicians and policymakers? And you talked about staying neutral and listening more. It seems like any other relationship, a personal relationship in life. These things take time, and they also require, it seems, authenticity, which you do talk about in that AGU op-ed that you wrote. So, all of those reflections were incredibly helpful. I'm looking at the time. I have one ABA [Ask Bill Anything] for you.

BH: Oh, yeah. Great.

MB: One of the things that you just mentioned is how scientists should seek to be relevant and useful. So, for all the SPC alumni that have gone through the program, what advice do you have for us to stay relevant and useful? What should we be doing to ensure that we are useful to policymakers and the broader public at large?

BH: Well, we're sounding like a broken record here. But so much of it comes back to listening to what you're being asked to do. I'm hesitant to even say this because I'm guilty of that in every one of these interviews. You start out with a question that is wonderfully crisp, succinct, and practical. And instead of really answering that in an equally crisp way, I go into some paroxysm of reflections that have very little to do with it. But I think part of it is listening and being responsive. I keep feeling like because of the relationship thing, spousal relationship, the partnerships that are closest to us, are really our best example of how to do that. One of the things that you find out very quickly once you're married is your partner is not a perfect person. [laughter] Usually, you don't find that out in advance, but you have to deal with that. And you have to see in that, oh, well, it might be that he or she is not the one whose perfection we have to worry about. It might be my selfishness and laziness that is the real issue here. So, a lot of self-examination and reality is important. But I think it's a question of really trying to help people deal with their problems as they see them more than saying, "Oh, that's not your problem. Your problem really is something else." That's not what people need to hear most of the time. Most of the time, they have a pretty good idea of what their problem is. We need to understand that science might not be the solution to their problems. Just reflecting on that and saying, Well, you know, we can't really help directly with that, but we can be a voice for saying here's why it isn't.

MB: Can I ask you one short question if you have a moment?

BH: Oh, no. You can ask me [inaudible] long questions. I'm bitterly disappointed that this session is coming to an end. [inaudible]

MB: So, one of the questions that I do have, Bill, is how can scientists participate in decision-making and inform policymaking right where they are? So, instead of having to go to Washington, DC, what can I do right here in Athens, Georgia, to use my science?

BH: So, that bothered me a lot. That's a great question, and it speaks to one of the things that – people say, "Oh, I wouldn't change anything about my life if I could," but this is an area that I would probably try to change. From time to time, I've thought that what we need is something like a policy colloquium at a local level. So, the whole idea with the colloquium was, instead of having a shrill voice and advocating for a point of view, [to] create a forum where you can learn about this process that's going on. So, what I'd imagined was something that wouldn't take two weeks, but you could do it on a long weekend on a campus, for example, and instead of congressional staffers, you would have people from the mayor's office or from the county office come in, or state legislature, whatever. You'd have emergency managers instead of federal policy officials, or the local regulators, journalists, and you'd be asking them the same kinds of questions about what it's like running the county, the state, and where does science play-in and where is it kind of irrelevant, or what do we wish scientists would do for us? There would be

several good advantages to this. One is that the local level policymaking is where innovation and policy occur. As we know from not just the United States, policy at the national level is a gridlock most of the time, but innovation comes from a state like – California does something – or Massachusetts, Texas, Florida, or whatever. Other states look at that and do it. Pretty soon, there's national legislation on that subject, and you make a little progress. The other thing is that politicians move up through the system, starting locally and making it to the federal level. So, they make their mistakes at the state and local level, where they don't matter so much, and they're not so visible. And scientists engaging in the policy process, we'd be doing a lot better. The policy at the local level is much more accessible. "Well, let's not build new developments along the creek because it floods every once in a while," or "Did you know that this area is an earthquake zone or fault line or something?" Or some answer about some pollution questions or just education and jobs and the role of science in preparing people for better jobs. People at the local level, it's jobs, it's healthcare, it's school. Scientists could find out how to plug into that, and it would be a great thing. Now, I would talk to certain people about this. Paul Higgins was one, and Paul Higgins would always say, "Well, you should only do that if people want to do it. You shouldn't try to make people want to do it." I would think that's true. This is Bill's idea of what would be good. But I still think that having a bunch of experiments and working through AMS chapters, I thought would be a way of doing this. Because the AMS chapters, if you worked at a little bit, you've got broadcasters to shine a spotlight on what's going on, you've got K through 12 educators, you've got Weather Service forecasters, you've got academics, you've got students. Instead of having a pizza party once a month, you could get something a little more substantive going in the chapters and maybe get more chapters and more active chapters. Anyway, that's maybe not the answer you were looking for.

MB: It's exactly the kind of answer that I was looking for. My experience at the AMS Policy Program and participation in SPC, Bill, quite honestly prepared me for my role in Sea Grant, where we do act on local problems.

BH: [inaudible] mentioning Sea Grant because you all are a perfect example. Yeah, exactly. That's how to do it. More Sea Grant –

MB: Again, reflecting on what you just said, it's hard to move away from these local issues once you start seeing the impact that potentially science and research can have on decision-making. I'm inspired by several colleagues who serve on city councils and school boards, really making a difference in terms of lending their knowledge for sound decision-making in the places where we live, which are most impacted by weather and climate impacts as well. There's also a global component to this. I was thinking of this term that I recently heard called "Glocal," global and local. So, there's probably a role that SPC has in scaling up or making more visible these local decisions at a global scale. Is that appropriate to say, Bill?

BH: Yeah. Something like that ought to be there. Yeah. So, you certainly look around the world, and you see different countries are making different levels of progress towards use of renewable energy, recycling, building resilience to hazards, and so on. So there's a lot to be learned. It seems to me the global UN Millennium [Development] Goals, the sustainable development goals, and things they've done over the years try to work on this. There's a lot of room for more progress there.

MB: Okay. Well, with that, Bill, I am once again so grateful for your time. I'm sorry I keep asking you one question after the other. I'm just super thrilled to learn more about your work at AMS next week. So, do I have your permission to stop the recording?

BH: Yes, you do. Thank you. Looking forward to the next session.
----------END OF INTERVIEW----------
Reviewed by Molly Graham 11/15/2023
Reviewed by Bill Hooke 11/19/2023
Reviewed by Molly Graham 11/26/2023

Session 20 - October 20, 2023
Interivew Summary: Dr. Bill Hooke discusses the importance of innovation in policy at the local level, highlighting examples such as gas mileage standards and state-level climate initiatives. He emphasizes the value of in-person meetings and neutral platforms for engaging with policymakers, as well as the significance of public education and democracy in advocacy efforts. Additionally, Hooke reflects on his professional purpose at AMS, aiming to make effective science policy possible for the larger world and help build resilience to hazards. He stresses the importance of fostering creativity and innovation, enabling others to contribute, and expresses gratitude for the collaborative opportunities that have allowed him to learn and grow.

Mona Behl: All right. So it is October 20, [2023], around 8:40. My name is Mona. I'm calling from Athens, Georgia. I'm connected with Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi there, Mona. It's good to see you. Good to be with you again.

MB: It's fabulous to see you, Bill. Like I said, I'm starving for some spiritual and intellectual inspiration. So, here we go.

BH: You encountered a dry hole, but let's go on.

MB: One of the things that you mentioned during our last conversation, Bill, was innovation in policy takes place at the local level. When I think about innovation, I usually associate it with the private sector and technological and scientific innovation. What kind of innovation in policy were you alluding to? Could you provide some examples, please?

BH: Yeah, I think the world has provided a lot of them, and probably a lot of people who may be watching this video in future years will think they've got many better examples. But one example that has been around a long time is gas mileage standards for vehicles. California is famous for leading the way. They've had notable air pollution problems that they've had to solve, and they've had enough wealth as a state to feel they have some margin for being pretty tough about that. They've always been kind of a leader in pushing manufacturers because they represent such a big market for those manufacturers – pushing them for better highway mileage and gasoline mileage, and then other states follow suit. Another example: during the Trump years, when climate change wasn't considered very much of a national priority, even though it's a global problem, individual states, notably the state of Washington, Governor Inslee, and the state of Massachusetts, state of California – they all proposed initiatives during that time that were climate policy initiatives. I guess what I meant by that [is] we see that the policy process in Washington is pretty much gridlocked. A lot of times, you'll read from political scientists that that's by design. We remember Judy Schneider talking in the Summer Policy Colloquium and

pointing out that Congress is not intended to pass legislation; it was intended to avoid bad legislation and kill bad legislation, and she had all the statistics about the small percentage of bills that actually are enacted. But the state level [and] the local level is where people can try different things. They can try efforts that are novel at the time, like recycling, reduced gas mileage, issues about water use, and other things, too, like the makeup of legislators and the drawing of political boundaries, and just a whole raft of things. It's actually a wonderful thing that the states can try all these things. For years, New York has had a welfare policy that was notably different from a lot of other states. There was always a big fuss about were people in need going to move preferentially to New York. Same thing happens with health care and so on. So when you have opportunities for arbitrage, where people can move around to try to get the best deal on some of these things – one of the things we just saw in the paper here recently – I think it was the actual physical paper – was that families are now picking up stakes and moving from where they live to go to cities where their vote politically will count more or be more satisfied, associated with wins versus losses. That's maybe a bad thing. Hopefully, that's an experiment that will fade, but maybe not. Anyway, that's a lot of talk about that kind of thing. I think if you tried to legislate and stop it, that wouldn't work. The reasons for the innovation are so compelling, the place-based situations are so different. It's a wonderful thing that is occurring, that place-based diversity of policy is occurring locally at state levels, internationally across governments and continents, and the world is constantly fidgeting, trying to sort out the best approaches to things.

MB: You highlighted such great opportunities, Bill, for aspiring scientists who want to make a difference in the policy and decision-making world to start where they are because there's room for innovation, there's room for translation, there's room for growth, and real impact.

BH: Well, at the same time, the effect of mistakes is small. You don't want to be making your mistakes on the global stage. [laughter] You want to be making them locally and then recovering from that and developing more sensible approaches.

MB: Bill, what are some other activities? What are some other things that you did, in addition to leading the AMS [American Meteorological Society] Summer Policy Colloquium, when you started back in 2000 at AMS?

BH: Well, one of the things we used to do was – and we don't really do it so much anymore – we used to have congressional briefings. We'd go up on Capitol Hill, get a room, bring in some speakers, and invite staffers to come and hear about topics that were timely. This was particularly potent in the first, I'd say, first decade of the policy program. It was at its best when Paul Higgins finished up his tour, a one-year Congressional Science Fellowship, and joined the AMS Policy Program. We worked with a guy at the Yale School of Environmental Sciences. I'm trying to remember his name now; I'm gonna have to work on that. Let's pause for a second.

[RECORDING PAUSED]. Thank you, Mona, for coming up with the name. The name was Bud Ward, and Bud, I think, may have been important in founding the Society of Environmental Journalists and was so important to climate change reporting and environmental reporting for decades. He, Paul, and I would have discussions about once a month about topics that would be good for briefing Congress, and they had to be significant, they had to be timely, they had to be something that would interest staffers, that would be related to legislation, they might be pondering at the moment and so on. Bud, Paul, and I had such different perspectives; we'd do a pretty good job of getting a set of speakers, and we had just a number of Hill briefings. I think they may be all still on the AMS website, at least by title. It was a useful program; we used to get fifty or so people there at a time. We felt like we were making a real contribution. I can probably be a little more organized now. There was sort of a three-legged stool approach to the Policy Program. One was we were trying to make scientists smarter, more disciplined, and wiser about the policy process and, more effectively, plugged in. The second was we tried to help staffers, and there was some disagreement about this; I think one member of our triumvirate thought our job was to teach Congress, and I kind of felt that it was more to keep Congress current on things that were rapidly changing. So, one part was make scientists more effective players. [The] second part was keep Congress current. And the third is, so what? You got those two things going but now try to bring people together to make a little progress on problems. So, we ran two-and-three-day workshops on different problems to shine the light on them and come up with a few recommendations on policy actions and research priorities. It varied from topic to topic. We did a range of those. Over time, it sort of became – people have sort of moved away with Zoom calls and everything else – virtual meetings and people's calendars kind of filling up – so, it's been a lot harder to convene actual physical workshops with people together. We tied some of those workshop – this was maybe a bridge too far, but we've made an effort to say, "Okay. If we did a two [or] three-day workshop, how about a couple of hours at the end of each workshop, take a couple of the participants, the leads up on the Hill, and do a briefing while everything was kind of fresh." We did some of that. So, those were the three main things that we tried to do. Also, this obviously didn't take a lot of my time, but it was something that we had to get going. We started a journal, Weather, Climate, and Society. So that was another thing. We wanted an outlet for social scientists interested in environmental issues and doing research in that area, an outlet for them to publish their scientific work and not just in the – the Bulletin is a science journal, but it's got a little bit of a different flavor. We were trying to get something that was in line with what the other journals were doing. We started a couple of specialty conferences and workshops at AMS annual meetings. So, we felt that the AMS annual meeting is really a colony of special meetings that – I don't know whether you've heard of a Portuguese man o' war. It's not quite a jellyfish, but it's a colony of organisms. You're talking to a non-biologist here, so I probably don't have it straight. I always thought that was a good metaphor for an AMS meeting, that you have people coming because it's got climate change, tornadoes, atmospheric chemistry, or whatever. There are a couple of dozen of these meetings, but there were some holes in this. One of them was societal impacts. And Genene Fisher was a

big instigator in getting that going and also a big instigator in getting the journal going. Then, Gina Eosco weighed in and said, "It's really not about the policy alone. It really is about societal impacts and stuff." That's why we have the board on societal impacts at that annual meeting. Wendy Marie Thomas, when she was part of the program, got very interested in public health issues. So, we wound up having a board on that topic and specialist sessions. The benefits of these were that we were able to attract some leading people in these fields into AMS activities, and people like Kris Ebi served on the AMS Council as a result of things like that. I'm trying to remember. Those were the basic elements of the policy program, at least during the time that I was running it.

MB: That's amazing, Bill. Congratulations. You started the Weather, Climate, and Society journal. That journal is so impactful in its reach and sharing of information. So thank you for all your work there. I got a chance during my visiting fellowship with the American Meteorological Society Policy Program to see through the process of the Earth System Science and Services study, and it was fantastic. It followed the chain of events that you said: a workshop followed by Hill visits and a study report that is up online. I still refer back to those reports so much. I think there's something to be said about those in-person meetings and in-person convenings that you did with staffers, followed by Hill visits. I feel the reach of those policy studies that had all those elements in it was far wider and far more intense, in my humble opinion. So, thank you.

BH: Well, the whole was greater than the sum of the parts, at least in my opinion. So, I think we talked about how the colloquium, instead of having scientists go up on the Hill – these congressional visit days, I apologize to everybody who – let me make some statement at the beginning. Congressional visit days are just such a terrific idea. Okay, now, let me dismantle that a little bit. [laughter] The plus side of it is that you bring young scientists, early career scientists, and they're the most "adorable," in quotes, from the standpoint of staffers, and so on. They don't want to see the geezers so much because the geezers have a tendency to be kind of full of themselves. You're talking with one example of that right now. So, the idea was you'd bring early career people there; you'd give them a quickie afternoon or something briefing about the Hill and what the purpose of the visits was. I think this was bad in the sense that it somehow supported the mistaken idea that this was something you could learn quickly [and] that there wasn't much to the political process when precisely the opposite was true. The best, most effective people in the political and policy process are the ones who've been at it the longest, don't get burned out, and stay passionate and engaged. The people who are getting these quickie briefings, like, "Oh, we'll teach you all the basics in an hour, and then you'll be ready to go in and sell congressional staffers or maybe even members on these terrific research ideas we have. The whole idea of it is you, the congressional staffer, thought you might be interested in X, but we think you should be interested in Y, and here's what's nifty about Y. So, going back to the idea of the colloquium, we would say, "Oh, we want to actually listen to you all. We want to get it right before we start. Seek first to understand you and then see what we might have to offer on your

problems, or maybe change what we're doing so that your problems, the problems of the American people, get answered." So, we'd do that for a little bit. Then that would inform the kinds of things that we want to brief the Hill on that build up relationships, and people would want to participate in the workshops, and the nature of the workshops, and the topics would change based on all this feedback. It just was a rolling conversation, and built up a lot of trust along the way. One other small thing we did – we didn't do much of it, but we did it intermittently, and I think it worked out pretty well. During the twenty years or so that I was doing this, it got a little tougher to go into federal buildings. Also, it got tough sometimes for – one of the things that I started out not believing but came to believe later on – every time I'd get involved with an Academy panel, they'd say, "Oh, well, if you want to engage the public, business sector, and other sectors, government can't lead the effort." As a former government employee, I thought, "That's nuts. We're good people in government. People trust us, and so on." But more and more, I began to realize that they were right, that NGOs [non-governmental organizations] [and] civil society kind of are the catalysts for getting these things going and organizing them and creating a level playing field and inclusiveness and trust. So, we find ourselves in situations where the Corps of Engineers, USGS [United States Geological Survey], and NOAA [National Oceanic and Atmospheric Administration] would say, "Gee, we'd like to talk with each other. But we want some neutral site." If they come to the AAAS [American Association for the Advancement of Science] building where we were housed at the moment, it's right by Metro Center, we don't have to go through security, and you can moderate this discussion lightly if you insist. But really, we were just providing a venue. It's not so much that a few people in a policy office at AMS have anything to really offer, but we can help other people release their own creative energies, their innovation, and their desire to try new things by bringing them together in settings like that. We did a fair amount of that. We could have done more, I think.

MB: I believe this is one of the reasons why AMS is so effective in engaging with policymakers because we do provide that neutral platform to convene discussions on topics that could potentially be contentious.

BH: That also is a reason for restraint when it comes to advocacy. The things you can advocate for are education, public education, particularly, and democracy. I think Paul Higgins has been effective in articulating both of those ideas. If he were on the conversation, he'd probably bring up some additional detail, but you get the idea.

MB: Thank you so much. I am also looking at the time, so in the interest of time, may I ask you an ABA [Ask Bill Anything]?

BH: This will be good, yeah.

MB: Okay, so this one comes from one of our colleagues, a very good colleague, and they ask, "What do you think is your professional purpose? What were your goals in your career at AMS?"

BH: Wow. Okay, so I think we've actually been discussing that a lot. So, a lot of it was to make effective science policy possible for the larger world. So, AMS was very small and wouldn't be allowed to – wouldn't excite people with policy prescriptions, saying, "Oh, we introspect. We think the world would be better if." But we can help the world by creating environments where such discussions would be effective. I just wanted to do that. I wanted to help. So many people expose people to this and make it possible for them to then make connections with each other and not worry too much about how that would go and try not to impede it. [laughter] Maybe we talked about – I read a book that was produced by some Stanford professor about thirty years ago or so called Conceptual Blockbusting. The message of that book – there were several messages, but one of them was it's a lot easier to stifle creativity and innovation than it is to foster it. But that's what I really wanted to do. Eight billion people just have so much creativity and problem-solving ability to offer, and just helping that all work. That was the idea. I think a large part of that was I wanted people to build resilience to hazards rather than just redistribute risk. I wanted people to recognize that sustainability is not something you ever realized, but you're always in the business of buying a little more time for the world. That applies to both resources and protection of the environment. So, those were the things.

MB: That's incredible, Bill. So, this individual also had a follow-up question for you. They ask you, "How did you balance your individual contributions and contributions that you helped others make?"

BH: Well, I solved that problem by not really having any individual contributions. [laughter] There are just so many –

MB: You're so thoughtful, Bill.

BH: Again, I'm just a spectator. I'm just trying to not be in people's way. When I see opportunities here and there, I try to put people together a little bit. I wish I could say, "Oh, well, this whole field of science owes it to my groundbreaking paper on X and my raft of graduate students who then proceeded to milk that research area for all that it's worth." I just didn't have that kind of intellect. There were people I was associated with my whole career; Francis Bretherton was one of them. We were talking about UCAR [University Corporation for Atmospheric Research] before we started recording. Francis Bretherton took over UCAR, which was about seven hundred people. His only experience was being a university professor running about five graduate students versus five hundred researchers. People wondered how he was going to do it. But he had such a great intellect. He ran it like a professor with five hundred

graduate students. He would walk around the building up there at NCAR, talk with researchers, and basically assign them problems. [laughter] That was a little tough on the high-level managers [who] realized they were irrelevant; a couple of them left. But he could do it. When he died, I wrote a column about it in Living on the Real World, and I heard from his graduate students, Peter Rhines and Michael McIntyre, and others. They were just also thrilled because Francis was just such a huge presence in their lives. So, there are people like that around. Magnificent vision – a guy like Verner Suomi doing the whole thing with satellite meteorology and Susan Solomon doing just amazing things with ozone chemistry, larger sustainability issues, and so on. That's for them.

MB: Well, Bill, whether it was through the Summer Policy Colloquium, the policy studies, Weather, Climate, and Society journal, or Living on the Real World, I think you have enabled hundreds of us to make our work more meaningful in small and big ways. So, thank you so much for everything that you've done and continue to do for us. [laughter]

BH: That's hugely charitable. Thank you so much. There are so many people that I've worked with, and you're at the top of that list. It's just so energizing to be around you all, to learn what your ideas are on subjects, and to see the growth. There was a woman, an Indian graduate student named Radhika Khosla, who was in the 2007 Colloquium. I got a LinkedIn request from a totally different Radhika last week, so I got curious and Googled today's resume for the Radhika I once knew. What had she done after the University of Chicago? Well, she went back to India, and she wound up doing a lot of things on cooling and how to have green – what was involved in policies and science that would lead to green and air conditioning, essentially, and she's now at Oxford, a place that some people might've heard of where she's doing research and that work. As I told you, all the colloquium participants, we only slow you down for ten days. [laughter]

MB: You improve our efficiency forever. So, thank you again. [laughter]

BH: Okay, well, thank you.

MB: Thanks, Bill. Do I have your permission to stop the recording?

BH: Yes.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 1/1/2024
Reviewed by Bill Hooke 1/3/2024
Reviewed by Molly Graham 1/8/2024

Session 21 - October 25, 2023

Interview Summary: In this interview, Mona Behl and William Hooke discuss sustainability and the writing process behind Hooke's book *Living on the Real World*. Hooke also shares insights on his career transition to a higher position within the AMS and his subsequent decision to move to part-time work. Additionally, Hooke reflects on his time at the AMS policy program, highlighting the differences in organizational culture between federal government agencies and organizations like AMS.

Mona Behl: All right, good morning.

William Hooke: Good morning, Mona. Good to see you.

MB: Good morning, Bill. It's 5:40 in Portland, Oregon. I am super excited, Bill, to be connected to you, to draw that inspiration, spiritual and intellectual, to learn more from you, and to walk in the world. I was reflecting on our discussion from last week. You reflected on the three things that the policy program did, which were to prepare scientists, to keep Congress current on scientific matters, and then to bring people together to make some progress through recommendations and policy studies. You also mentioned how, with others in the AMS Policy Program, you were able to start a new journal, Weather, Climate, and Society, the AMS Symposium on Socio-economic Impacts and Policy Research. All of those things have made the world a better place, Bill. Thank you. One of the things that you mentioned when you were reflecting on your goals was that idea that you just spoke to me about, which was sustainability as an oxymoron. So, if you don't mind, can we start there? Could you expand on that idea a little bit and share what you mean by that?

BH: Well, I probably obsess about this too much, but when the word sustainability started getting tossed around a lot and used, there was this sense that you could find a way of living on the planet that you wouldn't have to change that would take care of your needs forever. The first thing you start thinking about is, well, there's the second law of thermodynamics, and there's the fact that the sun goes extinct eventually. There's a limit out there of some billions of years. And then you start coming closer to other limits. One of the things that struck me, particularly during the time I was writing the book Living on the Real World, was that – [Telephone rings.] Just a second, I'm going to have to at least look at this call. [RECORDING PAUSED] So, in addition to the fact that sunlight won't always be available [and] the second law of thermodynamics is always working to kind of wind things down, it struck me that a better way to look at things was how much time did we think we had for each of these things. It's kind of like the way you look at your household budget. You look at your bank statement. And you think, "Well, how much time does whatever is in my bank account buy me, and what am I counting on in other sources and so on?" You could do that for supplies of metals, you could do that for water resources, you

can do that for food, you could do that for different energy sources. The world is already doing that. But we need to just be much more aware of the complexities of all that and the way some supplies and the calculation of those supplies depend on things like substitutability that economists talk about come into play. But there's no such thing as a, quote, "solution" to living on the real world; there's only a question of coping strategies and constantly improving them. One of the things in very simplest terms – let's say you think you've got a hundred-year supply of nickel. If each year you can be something like one percent more efficient in your use of nickel, you wind up with a lot less nickel at the end of a hundred years, but you still have a hundred years to go. [laughter] That's the idea.

MB: That's fabulous, Bill. Thank you so much. Because Living on the Real World came up, let me actually interject with an AB [Ask Bill] anything. One of your colleagues – so, bear with me. This is a couple of sentences long, but one of your colleagues mentioned this. So, here goes. With his new position with the AMS, Bill grew into the global component of the Weather, Water, Climate Enterprise and became probably the most knowledgeable person dealing with the interdisciplinary knowledge and skills linked to, number one, his brilliant effort to connect all of these related physical aspects across scales of government policies and decisions, accounting for the science and societal perspectives, along with, number two, his communication and logic skills, and number three, combined with his unbelievable abilities to work collaboratively with everybody positioned Bill to become the global leader in the AMS and the WMO dealing with the issues related to climate change and extreme weather and water events. So, this colleague wants to know, how did all of this lead to your crowning achievement, Living on the Real World?

BH: Oh, boy, I don't know about any crowning achievements. Whoever wrote that last piece, if my mother were still alive, I'd suspect her, but I don't think she had such a favorable opinion. [laughter] So, I'm not sure. I'm not sure where that came from. But let's ignore that first part and try to think about where Living on the Real World came from. So, I think we all go around with a whole bunch of thoughts in our head and different levels of ambition to writing them down or making them more public or sharing them or testing them, or whatever. I always despaired – I've been involved in writing one technical book. I co-authored it, and my co-author did some of the heavy lifting in terms of – he had a vision for what the outline would look [like], and he sort of said, "Gee, you can write these parts, and I'll write these other parts," and that really simplified things. But I thought to myself, particularly on big subjects that are interconnected, it's hard to find a starting place and all the rest of it. I could never write an outline. The whole time I was in school, teachers would assign us essays and reports and stuff to write. And they'd say, "I want you to turn in your outline at such and such a time, and then you report a few weeks later." Since I didn't know how to do an outline, I would write the report, and then I'd make an outline from what I'd written. That's what I would turn in for my outline, and then I'd count to ten. When the report was due, I'd hand that in. I didn't think that was going to work too well for a book. I was

behind on these other trends, so in about 2010, or something like that, a friend of mine from church said, "Bill Hooke, you should write a blog." By that time, blogs were already passe. I think I found out there were something like two hundred million of them for eight billion people, so kind of a surplus of blogs. But I thought to myself, "I could do that. Those are seven hundred words, eight hundred words. I'd try that." So, I tried that. I started writing down some of these things. I thought to myself that even though I couldn't write outlines, I could do PowerPoint presentations. So, I tried to do a PowerPoint presentation of what I thought the book should be. Then I found that it had about seventy or eighty bullets to it. I thought if I wrote a blog post on each of those seventy/eighty bullets, I'd have my book. Well, I was wrong by about an order of magnitude on the number of blog posts it took, and books have a lot of connective tissue in addition to the substance of them, so it took a little longer than that. But I organized my thoughts through this PowerPoint that I kept to myself – these posts. As I was doing the blog, I got into a lot of other subjects, and writing down things helped me think things through a little more clearly. I got a lot of encouragement from Ken Heideman, and from – oh, boy – I was using her name just the other day. Just a second. She was the book editor for the AMS. [I] got a lot of encouragement from the two of them that was undeserved. That helped me keep things moving. I had the help of – gosh, what was her name? Sarah Jane Shangraw. She was really encouraging. I think Ken looked at the first material I sent him and said it was kind of depressing. So, I tried to improve it a little bit. You also have somewhere in these recordings – I think I told you – years earlier, I tried writing a book, and Gilbert White had, with whatever cold water he could find, splashed as much on that effort as he could. So, there was this big, failed effort. Thank you for asking that question, but that was a long digression. I apologize for it. It's very much a work in progress. I've looked at the book since then because I'm trying to write some other things. There are parts of it I like, and there are parts of it I think I could improve a lot. Yeah.

MB: That's very helpful, Bill. Thank you so much. So, if you don't mind me asking, who are Ken and Sarah Jane? I don't think I've heard their names before.

BH: So, the AMS has a publications office – a publications program. In addition to the dozen journals or so, they used to have a book program. They've cut that back, maybe even eliminated it entirely. Ken ran the publication's program at that time, and Sarah Jane was his book editor; she did the book piece. So, it was AMS, and that made it a lot easier; I didn't have to go looking for a publisher. I probably never would have found one. You read these stories about authors who send their manuscripts to hundreds of places, and nobody works out.

MB: Amazing. Thank you so much for letting me know, Bill. I'm happy that I got to understand and learn more about the prelude to Living on the Real World. I think you had mentioned A New Apocalypse. Was that the name? If I remember correctly?

BH: Yeah, that was the title of the book that I was hoping to write in the ’90s. There's a poem by William Butler Yeats entitled “The Second Coming.” Christians really look forward to the second coming of Jesus, and Yeats decided that the world was just in such a bad shape that instead of Jesus coming, there was going to be this great beast that came and finished the job of the destruction of things. That was kind of my starting point. [laughter] I'm glad that never saw the light of day, but I think about that poem often.

MB: Did it take you four or five years, Bill, to actually draft the book because you started the blog, I believe, in 2010?

BH: In 2010. The book came out in 2014. I think the 2014 date – I think I'd have gotten the book done by about 2013, sometime early in 2013, and they delayed it a little bit, so it would have a 2014 publication date. I might not remember that exactly. It probably did take – I did have a day job, and I did try to do that job. So, this was a little bit of a test of the marriage because prior to that, I'd gotten involved in working with ICSU, the International Council of Scientific Unions, which is now the International Council for Science. I think it's UNESCO [United Nations Educational, Scientific and Cultural Organization] related. This involved going to meetings in different places in the world, and sometimes Chris would come along. I gave up that activity because I thought I needed to spend more time writing the book. So, the trade for Chris was less travel and more time looking at me sitting in the dining room at the laptop [laughter] instead of being available to do things with her. I think I said something about that in the acknowledgment. What did I say? Yeah. I said, “Finally, there's one person whose help and support eclipses that of all the others: my wife, Chris. Writers, especially struggling ones, don't make the best company, and their scratch work doesn't make the most scintillating reading. Chris has read and commented on much of the material, graciously putting aside much friendlier literature beckoning on her Kindle. She's amiably and patiently tolerated the sight of a distracted, oblivious husband crouched over the computer, evening after evening and weekend after weekend for months on end. Thank you, honey.” By the way, one of the reasons – I loved writing the acknowledgment, and one of the reasons I was looking forward to this, was something Juliet Eilperin, who was a reporter for The Washington Post, said about one of her books. She said, and I quote, “I'll confess at the outset that I wrote this book mainly in order to write an effusive set of acknowledgments.” [laughter] One of the things I did when I finished the book [was] I gave her a copy and pointed out that I quoted her, and she kind of loved that. I said that she had gotten it right. I said that when you're an older person writing a book, there are a couple of hazards. One is you've got a larger collection of people to thank. You were one of them. And two, you have more time to reflect on and truly appreciate the great debt you owe each of them. So, I tried to write a good acknowledgment. It might be the best part of the book.

MB: You wrote an outstanding book, Bill. We are all so grateful obviously to you for writing that but also to Chris for being there, your support, and your inspiration. I know that you start

the book by acknowledging her and dedicating it to her and Jesus Christ. So thank you again for reading that and sharing that with us.

BH: The acknowledgments to her were bookends; they were at the beginning and the end. You're good to notice that.

MB: I just wanted to note the other book that you had written was Waves in the Atmospheric: [Atmospheric Infrasound and Gravity Waves]. You had written with Earl Gossard. Is that right?

BH: Earl Gossard, yes. He was the senior author both in age and in terms of vision. I don't know if you remember it or not, but in the book symposium there, Kelvin Droegemeier started his remarks by saying he had come across that book, and he said, "I've got to meet this guy." [laughter] It was an interesting way to kick things off.
MB: In 2013, you moved to a position of even higher responsibility within the AMS as Associate Executive Director. How did things change? What did that look like? How did that transition take place?

BH: This is a great chance to be perfectly clear about that. In 2013, I had a guy working for AMS for about eight years, Paul Higgins. Paul is a good communicator. One of the things that he communicated without ever using any words, I think, was that he thought he could do a better job of running the policy program than I could. Fortunately, I'd had prior experience with this when I was out in Boulder and running something called the Environmental Sciences Group, and Sandy MacDonald, who would eventually be associate administrator of Research for NOAA, was working for me. Sandy, again, without using words, made it clear that he thought he could do a better job of running ESG than I could. And I thought Sandy was right, but I didn't really have a good exit strategy for that. Fortunately, the people in Washington came and said, "Oh, we can't find anybody who's willing to be a Deputy Chief Scientist. So, would you do it?" And I said, "Yes." I got out of Sandy's way, and I had a chance to see that, yes, he did do a better job, and so on. I was equally happy. So I thought to myself, "Okay, I really need to step aside and let Paul do this." Chris was kind of telling me that I should cut back my hours at AMS anyway. So, I went to Keith Seitter, our Executive Director, and I said, "Look, Paul's ready to take over this program, and he really wants to do it. Why don't we have him do it, and I will step back to part-time? I'll work four days a week as just a fellow in the program." Keith said, yeah, he'd do that. And then he came a week later or something and said, "Well, we're going to make you an Associate Executive Director of the program." So that's what they call being kicked upstairs. I just want you to know that "kicked upstairs" is a really pleasant workplace. By the way, Keith and I both applied for the job of Executive Director of the AMS back in 2003. I was doing the policy program. Keith was doing publications, and Susan Avery was running the search committee. Susan Avery and the search committee made the right decision; they put Keith in charge. Let's see. There was a reason why I wanted to tell you that. Just a second. One of

Keith's points that he made in selling himself as the executive director – he had been the deputy executive director – he said, "If you choose me, you won't need a deputy executive director." So, when he made me an associate executive director, and he had no deputy, I thought to myself, "Oh, okay." It took him ten years or whatever, but he still did – it was a figurehead job. It really was a figurehead job. Keith, if he were on there, would say, "Well, Bill, you and I talked all the time." We did. We talked all the time. I think I was at least minimally useful to the process at the time. One of the things Keith decided towards the end, a few years later, was he really did need help. So, he appointed two real associate executive directors, namely, Stephanie Armstrong, who was associate director for personnel and development, and Brian Papa, who was a deputy in charge of the publications and membership and meetings and keeping all that going. So, they morphed into real positions, but it was basically kicking me upstairs and making room for Paul to take over. So, it wasn't promoted to even higher responsibilities.

MB: Bill, it talks about your greatness.

BH: Oh, there's one appendix to this, which is eventually, Chris said to me, "You're not working part-time." I'd always talk to [Richard] Hallgren about this; he was at the AMS. He kept saying, "You should retire gradually and work part-time." I kept saying in the 21st century, there's no such thing as part-time work. There's part-time pay." So, I went back to Keith – this was after a year or something – I said, "Chris says I'm not working part-time." Keith kind of laughed and said, "Yeah, I've been meaning to do something about that." So, we prorated my salary again for working full time. Okay, sorry. You were going to take us someplace sensible.

MB: I was just about to say, Bill, it speaks volumes about your greatness, your thoughtfulness, and your foresight to be able to create room and make space for other junior scientists to lead.

BH: And he did a great job. Paul did a great job. It was the right thing to do. All managers tell supervisors that you should be grooming your successor. I did even better. I would get successors going and get out of their way.

MB: That's amazing, Bill. Thank you again for sharing that. So one of the things that I wanted to ask you, Bill, was what the most memorable moment in your time at the AMS policy program was, in particular, those thirteen years where you led the program.

BH: Wow. I'm not sure there was such a thing as a moment. What happened was there was a sort of transition, particularly with regard to the colloquium. It was fragile, needed nurturing, and could disappear at any moment into something that began to have a little more life of its own. The NSF [National Science Foundation] funding felt a little more robust. The people who had been participants in the early years had moved up the corporate, university, and government agency ladders, and they were starting to send people to the colloquium and so on. So, the

inertia that had been our enemy became our friend. That was probably the best thing. Maybe the best thing now is seeing that it's continuing to some extent. If you have ideas, and they're only implemented because you're implementing them, that's one thing, but if other people keep things going, that says something a little better.

MB: Thank you, Bill, for sharing that. There must have been differences in the culture of the federal government, NOAA, where you came from, and AMS in all these years. Could you talk about some of the organizational and political differences? This is also getting into "AB Anything." This was actually a question that somebody asked of you.

BH: Okay. We've talked about this, I think, before in a different context. The ecology metaphor kind of comes into play. So, I think I told you that my boss at the Wave Propagation Lab in Boulder, Gordon Little, used to refer to our lab as an island of excellence in a sea of mediocrity. He particularly had little use for the people in Washington. When I started going to these management courses and meeting more people from Washington and meeting people from [inaudible] occasionally from the legislative branch, and so on, I realized that they come from different cultures; they are different because they're highly adapted or naturally fit into the culture. They're ideal for their purpose in whatever organization they're in. I began to apply that in NOAA. Remember, when I was still in NOAA, I used to realize – again, researchers would tell me the Weather Service is just too stiff and [inaudible]. But if you actually listen to the Weather Service, you realize they had clients who were depending on the delivery of products at a certain format at a certain time of day every day without fail. There was a rigor to services that was totally absent from Research. So, in Research, you have all these happy-go-lucky, irresponsible people. In the Weather Service, you have to have responsibility, structure, planning, and stability. You can carry that over to other agencies – the Geological Survey, the Federal Aviation Administration, or State Department. Each of these was interfacing a different universe and had to work differently. Then, when I got into the NGO [Non-governmental organization] world – same thing. Every day at AMS was like a cross between a great science policy jam session and a bankruptcy proceeding. In the federal government, you don't have to worry about bankruptcy unless you can't elect a Speaker of the House. But I digress. Maybe today is going to be the magical day. [laughter]

MB: I was about to say, timely comment, Bill. Thanks for that. [laughter]

BH: [inaudible] anybody who looks at this tape twenty years from now is scrambling to figure out just what was going on on that day. So, world, if you're listening to this video, the Republican Party has been working for about three weeks to name a Speaker of the House to replace [Kevin] McCarthy.

MB: Bill, what you just said actually makes me also think the skills, the competencies, the knowledge that we gain in one job, one position, are also scalable to other positions. This particularly may be relevant to early career scientists and students who often think, well, if I'm in academia, how can I work in a different sector? Or how can I use the skill set that I used in the university setting in the research setting and apply it to policy problems? So, do you think that scalability is something that we can all learn from and acquire?

BH: I think it's possible. I think some people are more attuned to that than others. One of the things – running the colloquium, or even before running the colloquium, you realize that there are a few people who you really want just doing science. [laughter] They're the handful of remarkable people who are going to make real breakthroughs. This other part is really a distraction. And you see that in all kinds of endeavors. I remember a famous Babe Ruth quote. Babe Ruth hit more home runs than anybody did back in the 1920s. There was a guy also playing baseball at that time, Joe Sewell, who never struck out. And Babe Ruth said to reporters once – because he struck out all the time – he said, "I strike out because I'm trying to hit a home run." He says, "If I stand in the betting box like Joe Sewell does, I'll never strike out either, but I'll never hit any home runs. And I'm paid to hit home runs." And that's what goes on here. You have to recognize what you're good at and where you can really contribute. I think we also covered in one of these talks Dick Hallgren saying that the task of management and leaders – you have a few percent that need no help from you, you just say out of their way, a few percent that you really need to move on because they're not helpful at all, but eighty percent of the people, your main challenge is keeping them mostly doing what they're good at instead of what they're not good at.

MB: Well, thank you so much, Bill. Those are the questions that I –

BH: [inaudible] I sense we're coming to the end of things a little bit. We're getting close to running out of career to talk about. But these are great. Do enjoy your Academy meetings there in Oregon. One of these days, people will say, "Gee, that guy always had the same background, but she never had the same background twice." I wonder if we could look and figure out where she's been.

MB: Well, you are the constant in my life, Bill. Thank you so much for being so generous with your time. I know that there are many demands on your time. I wish we could go on and on. You said, "Living in the Real World," the blog post being like connective tissue, and you think it's going to be one, and it's several. I feel the same thing about these conversations.

BH: That's true, a little bit, about this.

MB: So, thank you again for your generosity and time, Bill. Until next time, I hope you take good care, and with your permission, can I stop the recording?

BH: Reluctantly, yes. [laughter]

----------END OF INTERVIEW----------

Reviewed by Molly Graham 1/18/2024
Reviewed by Bill Hooke 1/18/2024
Reviewed by Molly Graham 4/28/2024

Session 22 - November 1, 2023

Interview Summary: Behl and Hooke emphasize the significance of collaboration and the integration of traditional ecological knowledge in meteorology to address humanitarian aspects. They stress the importance of intergenerational knowledge transfer and respecting diverse perspectives. The interviewee underscores the value of selflessness, generosity, and prioritizing the well-being of others, drawing parallels from nature . Additionally, the conversation delves into the impact of AI and technology on society, advocating for adaptive policies that benefit all through evidence-based decision-making and dialogue.

Mona Behl: Hello, Bill.

Bill Hooke: Hey, Mona. How are you?

MB: Good, thanks. It is November 1, [2023]. Wednesday. I'm still saying my name. I'm Mona Behl, and I'm connected with Dr. Bill Hooke. It's my lucky Wednesday. Bill, I am thrilled that every time we talk about Living on the Real World, I get the opportunity to reflect on what a gift it is to the world and what an expansive set of ideas you have shared for our consideration. One of the things that comes up over and over again that I noted in Living on the Real World is meteorology as a humanitarian work. Could you expand upon that idea and share what you mean? Why is the [inaudible] post How Thinking and Acting like Meteorologists Will Save the Planet? What is it about meteorology that is humanitarian and that is so worldly?

BH: Yeah. That question catches me cold, and it's been a time since I've thought about that. One piece of it, one starting point, is humility. Maybe you've heard the old expression – and would go like this to personalize it – "Bill is a humble person. But then again, he has a lot to be humble about." I think one of the things that happened was that meteorologists watched the progress being made in many other fields of science while not making any themselves. There's that French academician who said, and I can't quote this exactly, I'm going to butcher it, but in the middle of the 1800s, he said, "Never will people who value their reputation make predictions about the weather." [laughter] That was just a fool's journey. Actually, about the time he was saying this, the invention of the telegraph made it possible to make a big start on that because instead of writing letters to each other that would take days or weeks to get to their destination, talking about what the weather was like and comparing notes, telegraph operators could make a few simple observations about weather, temperature, wind, and cloudiness, and share that at the beginning of their shift. You could put together a picture, and you could watch it change day to day. That, more than any insight – was the parent to an insight rather than the result of an insight. When people did that, they saw patterns, and they saw changes and the movement. So, weather as a study began to take off a little bit. Even today, people make jokes about meteorology; it's the only field you can work in where you can be wrong half the time and still

have a job and things of that sort. One starting point is you watch all the things happening in nanotechnology or biotechnology or renewable energy, or you name your field – AI [artificial intelligence] – and they're making radical progress. Meteorology and the environmental sciences are kind of galumphing along. A second thing that I think is important is it calls for cooperation. Going back to that idea of the telegraph operators, if one telegraph operator every day started putting weather information on the system, it would be useless. But when everybody does it, and when they do it across national boundaries – this was particularly important in a place – in the US, it wouldn't be so important because a lot of the territory is under one country. But in Europe, if you want a weather forecast that's good past an hour or so, you need to know what's happening in Luxembourg, Belgium, Holland, and Germany. You just need to know what's going on. So, cooperation was really necessary. And, again, as early as the 1800s, people were making that a fundamental feature of how the field worked. Another part of it was, because you were dealing with a chaotic system, you had to find ways of – I don't want to say living in the moment, but you had to find a stepwise – again, going back to this gathering of data that were synoptic, putting together a stepwise kind of forecast of how things were evolving and resigning yourself to it was going to be a very short time horizon over which that'd be useful. And then you'd have to reinitialize. You'd be reinitializing constantly as you went along. So, there's this business of considering prediction that is a practical application, and that's another piece of it. Meteorology was very much driven by practical use and benefit to society and life in ways that we've talked about, but it proved very challenging. It could only be done piecemeal, and we've had to work very hard to get even minimal kinds of improvements in that. Let's see. I have a feeling I'm missing some big ones here. So, we might have to return to that. There's more to this, I think, just in the – how do I want to say it? I guess, again, going back to the essentials, it's got a lot to do with – well, okay, here's one. It used to be that meteorology was something that everybody knew something about because nobody knew anything. Everybody would wake up in the morning and be making his or her assessment of what to wear and what sort of things would be possible or useful to do, particularly in an agricultural setting, and most people were in that. But then, when it became a specialized field, people were kind of expelled from the process, and then they had to be reintroduced. So, meteorologists discovered people. [laughter] Again, you could give a warning of a hurricane or tornado or winter storm or this or that or the other thing, and people might not respond to that. So, they had to get very interested in risk communication and people's agendas, the fact that in your audience out there, there a lot of single moms trying to get their kids to school and to work and so on. It was hard for weather warnings to penetrate all that. All of that generalizes to larger problems of the world, recognizing that whatever problem you're working on, even something as fundamental as energy or agriculture or whatever, it's not the center really of people's universe. Having some application in mind – social benefit – is a thing to do, and not having a kind of knowledge deficit model, where you say to yourself, "As a scientist, I know more about this topic than anybody else. Therefore, if they don't do what I say, maybe they're hard of hearing, maybe they're ignorant, or maybe they're evil," and quickly jumping to that kind of attitude. I don't think meteorologists do that so much – or they shouldn't.

Part of it was it's something I said to kind of make people wake up and think a little bit about the science and the subject and what it meant to be a human being. Part of it is really defensible in terms of working together, working for human benefit, and having a good sense of the limits of what you're doing.

MB: Thank you, Bill. Living on the Real World so beautifully encapsulates that idea of collaboration and cooperation that you just mentioned. Thank you for sharing that. I'm going to jump into a bunch of "Ask Bill Anything" questions because they're related to Living on the Real World. And these questions have been waiting for some time. One of your colleagues asked, "How can we recognize and honor indigenous traditional ecological knowledge as a valuable contribution to meteorology and climate science?"

BH: Okay, let me get the ecological part. How can we value –?

MB: And honor? How can we recognize and honor indigenous traditional ecological knowledge?

BH: Indigenous and traditional. Wow. Okay, that's a great one. [laughter] Recently, because I'm trying to work on something related to Living on the Real World – build a sort of complimentary book off that – I was asking myself about ways of knowing. I realized I was really ignorant of this subject. You Google it a little bit, and some people have four ways of knowing, and some people have seven, and so on. I'm not sure I can even give you the catechism right now; there's heuristics, there's experiential, there's the scientific method, which is sort of a mix of empirical and theory and some other things. Oh, there's also logic, I guess. Our forebears, people like Aristotle, make statements like, "Porcupines threw their quills," and they reached this conclusion by intuition. Or Galen, the physician, would say, "The function of the heart is to heat the body." Sure enough, that's consistent with facts; when the heart stops beating, the body cools off. So, there are these various things. Going back to this, the indigenous experience is the longest experience almost worldwide, and all of these are environments that we find themselves. I still remember the Indonesian earthquake and tsunami of 2004. A lot of people in Banda Aceh and some of those other places remembered long stories from the long past about tsunamis. It helped them a little bit in surviving what happened out there. The question of honoring it. For me, just going back and saying I'd always been taught the scientific method and waded into that, I'm thinking, for about fifty years or something like that, and then, in the last twenty years or so, thanks to social scientists, think more clearly about it or think at all about it, instead of taking for granted that the science thing that my parents taught wasn't the only thing. You have this classification, and most people, most of their lives, are not operating on science at all but on experience. So, classified knowledge about where to hunt, what to hunt, where to gather, what to gather, how to read the signs of changes in the weather and climate, and so on all are enriching and say a lot about how people became the way they are. One thing I keep thinking about,

particularly with indigenous cultures here in the Americas, you get to thinking about property rights and how they're useful in some regards but not very helpful in others, and the indigenous knowledge about how the world worked and how you made a living from other resources on the world and so on, were tied to things like property rights, or the fact that humans didn't really have any such rights innately. We just aren't spending enough time thinking along those lines. So, it's very welcome, I think, that certain graduate schools and certain curricula and certain people in those curricula are noodling into those things. It's kind of remedial work. We're trying to recapture something that once had a lot more currency for us. That's not a great answer. So, it reveals I'm still learning in this area, and I'm behind.

MB: Bill, I would actually argue that you've mentioned all of these concepts in Living on the Real World, both in your blog as well as the book, the idea that responses to all impacts happen to take place most effectively at the local level. These are the people who have the knowledge of, like you said, the Indonesian tsunami. They remember the vulnerabilities in the systems and in the infrastructure, and they're best positioned to perhaps come up with effective solutions for weather and climate-related issues.

BH: That's important. The local knowledge also integrates – if we're going back to a societal benefit – so, it's going to rain. Why does that make a difference? Locally is where all that knowledge about what the difference is resides. The decision-making normally works out. We don't regulate. We don't say to people, "Oh, there's a tornado warning in your neighborhood. Anybody who's not in his or her basement over the next hour will be fined fifty dollars a minute or something like that." We don't do that. If you want to go out on your porch and take pictures of the tornado as it goes overhead, that's for you to do. By the way, this is chasing a rabbit a little bit, but one of my favorite stories, going back to that tsunami, is about – I think it was a British schoolgirl who was about ten years old. The thing was happening there on the coasts of whatever Indonesian community she and her parents were visiting. She said to her parents, "I'm worried. This looks like a tsunami. We should go inland." Not only did she save her parents' lives, but the lives of everybody at the hotel. She had learned about tsunamis in school in Britain, and she saved all of these lives that day. I remember telling my daughter that story. She said, "Well, the real miracle of that story is the parents listened to her." [laughter] And that's maybe a kind of indigenous knowledge. Maybe that's one way to respect it. When your child comes in and says the kitchen's on fire, [laughter] you have a couple of choices: you can either respect indigenous knowledge, or you can be dismissive. I don't remember leaving the kitchen on fire; it must, therefore, not be on fire.

MB: That's actually a very good segue into the next question, Bill, that I have for you here. So, last week, I participated in the National Diversity in STEM Conference that is held –

BH: That sounds interesting.

MB: It was a very interesting conference, [with] over 6500 participants, but it is focused on the nurturing and professional development, primarily of Native Americans, Chicanos, Hispanics, in STEM fields, one of the only conferences that brings together so many disciplines. In addition to earth sciences, they were experts as well as students from medicine and other disciplinary areas. There were generations that were represented at this conference. My question to you is, basically, how do we do intergenerational knowledge transfer activities to advance the understanding of our earth system and actually come up with solutions? So, it goes back to the example that you just gave, how elders listen to the young ones and, at the same time, young people listen to the advice and wisdom of elders. So, how do we bridge that gap, which is more urgent than ever before, I feel, to bridge?

BH: Two things. First of all, a technical note: I realized I had my volume pretty low, and I'm turning it up a little bit. I don't know whether that's horrifying or ruining the recording or how that all works, but I've done that. Secondly, I wanted to ask you a little bit – let me ask you a question first. So, in your own meeting, what conclusions did you all reach about bridging this gap? Did you discuss that as an issue in and of itself at all? Was it just on the side of it?

MB: It didn't come up as an issue. It was just an observation that I made that compared to some of the – a couple of observations that I made at this conference, compared to some of our mainstream conferences that the American Geophysical Union hosts or AMS [American Meteorology Society] hosts or any of the larger scientific conferences. The environment at this conference was much more congenial. There was a lot of sense of belonging. I also felt there was an overwhelming openness and receptiveness to ideas coming from different disciplines, different people, and different generations of people. So, this was one of those places where young people really did listen to the elders when they said something, and the elders seemed to be learning and listening from young people as well. So, I think it goes back to something that you've always emphasized, which is to seek first to understand and then to be understood.

BH: I was going to say that I think this particular problem, the solution is in that general context there. That needs to be part of the culture, listening a little better, listening a lot better. Listening intentionally, particularly at first, until it becomes a habit and ingrained in your way of living. We all need to work on that. There's probably another element about respect and openness and bias in favor of – well, first of all, people who talk about listening remind us that we're not supposed to be thinking about what we're going to say next. That's not listening. That's tied into the idea of respect for what you're hearing. I don't think I generally had respect for what my parents were telling me. But one thing that I really had more respect for than anything else was how it felt to be older because I felt they had no vested interest in telling me how that felt. I mean, they were just trying to say, "Hey, when you're older, this is how you feel," and I thought, "Okay, I'm going to remember all these things," and a lot of what they told me verified. I think I

should have carried that attitude over to much more in life. That doesn't mean you should be unquestioning somehow. But it does mean that your first stance ought to be, "Okay, these people are telling me something that they believe to be true, they believe to be useful, they believe it will be helpful, not just to me, but to them." It's not just do as I say, but it's this is the way the world is working or whatever.

MB: Bill, do you think we should also be using traditional ecological local knowledge more rigorously to ground truth the data and observations that we make through Western ways of doing science?

BH: Sure. [laughter] I agree with that.

MB: Okay, that is great. Would you like to expand on that idea? [laughter] In particular, I'm also reflecting on ways in which AMS, in particular, professional societies – what role do professional societies have in facilitating that kind of knowledge exchange and knowledge integration across disciplines? You mentioned many different ways of knowing. So, how can professional societies facilitate that exchange and integration?

BH: That's a great question. I'm not sure I have a nifty answer to that. I agree that should be a goal. Maybe awareness of that as a goal is about all we could hope for. It's certainly a first step, but I'm not sure how to do it. It gets back to some of the things we've talked about earlier. I told you about the one book I read on innovation and creativity and how it talked about [how] it was much easier to stifle creativity than to foster, and this falls in that category a little bit. How do I want to describe it? So, I'm trying to remember another example [which] is probably an apocryphal story about somebody who had advised a woman to write about what she knew about. She was a cleaning woman or something like that. She noticed some ants in the house that she was cleaning, and she started learning more and more about ants. She eventually became an expert on ants and entomology from observation, what she was doing at the time. I think so much of that – if we can find ways to be encouraging and say yes to people when they come up with something that's a little bit off the beaten track, instead of saying, "Oh, nobody else thinks that," or "That's not where the center of gravity of the field is at the moment," or whatever, but being more open to those things, that's a start.

MB: It reminds me of the things that I learned in improv, which was saying yes and then building up from there. So, thank you for sharing that, Bill.

BH: I was going to mention improv. But I thought maybe we've covered that before. But that's a [inaudible] example. When somebody says, "Gee, it's great that pigs can fly," you don't say, "Oh, they can't fly." You have to build on that. I keep thinking, maybe we've talked about this – I'm not sure we talked about this part, but it seems to me that science might have advanced just

as quickly if, instead – we get told by scientists particularly, one of the things we're good at is being very critical of the work of others. It's important to be self-critical most of all. I've heard people tell me that more than once, and I've kind of thought to myself in the last twenty years or something that, again, because of the improv example, maybe if instead of being critical of it, we tried to build on whatever we heard. We just got as far as we could until we couldn't build on it anymore, then people would sort of naturally reject that stuff, and we'd be building on science as rapidly as we have been. But the other magical thing that would happen was that scientists wouldn't be regarded by the larger population as just a bunch of arrogant scolds and narrow-minded in this idea that there's only one way to work on a problem. Then, maybe science and innovation would have – well, science would work its way more rapidly into innovation and to societal uptake of good ideas and so on. I think I tried to get at that a little bit in Living on the Real World, that one of the problems with policy is it's not innovative enough, and the way you find the innovation and policy is local-level experimentation with ideas. If we could just get to the idea that we want it to be adaptive – we wanted our policy to be adaptive as well as everything else. The strength of policy is its emergent property. The idea that you can have a policy like everybody should drive on the right-hand side of the road or the left-hand side just as long as it's only one side of the road. The emergent properties pop right up from that – traffic actually flows, there are fewer accidents, and tempers aren't flaring. We need more of that.

MB: That's very helpful, Bill. I was thinking about this idea of innovation this morning as I heard about the summit that is taking place in Britain on AI. They're talking about balancing innovation with regulation, how and where to put the boundaries. So, this next question is actually related to that. This is your colleague asking, "How does Bill see AI and mechanization of human behavior affecting weather, climate, and society?"

BH: [laughter] So, people say, "Well, let's fix Bill by asking him impossibly big questions." That's a great question. We both had a colleague who worked at AMS, Andy Miller – Andreas Miller. He was from Germany. One thing I know about myself and how Bill sees things is I'm too quick to think, "Oh, this is going to be a game changer." I think particularly self-driving vehicles came to mind. I would rhapsodize about this with Andy, and he would say, "Oh, it's going to be tougher than that." Sure enough, we see accidents, we see lawsuits being developed, and things of that kind. I realized that's going to come along a little more slower. So, I'm a bad guy to ask about AI because I'd say, "Wow, the potential is just amazing, it's limitless, it's going to be coming at us really rapidly, and so on. That would be my bias. Having said that, I think, "Wow, it's amazing. It's going to be coming at us really rapidly." That is particularly short compared with the time for us to learn how to manage it. I think the internet has been a great example, as the rise of social media and so on. We've clearly gotten ourselves into a pickle a little bit. The internet has not only made us much more aware of what people are thinking much quicker but much more aware of how shabby that thought process is. One of the things they

talked about in the beginning of the internet, email, and so on was that people were likely to be more blunt and say what they were thinking. Again, going back to the marriage example, I used to think that my marriage had rocky spots because I actually was open about my point of view instead of keeping it to myself, and then I realized that's not the problem. The problem is my point of view was shabby. It was self-interested; it was lazy. It was not thinking in a collaborative way. Only then would my openness about what I was thinking get me into trouble. Social media has been the same thing. We've just been ugly to each other, and it's led to this breakdown of trust, and everybody's on edge a little bit. AI will probably exacerbate this to some extent. We'll be able to do these things more quickly, some of the bad things, troublesome things that we're now trying. I'm not sure we're really going to be able to legislate or find orderly ways of regulating very well. I think we're in for an extended period of a Wild West kind of frontier-like period, where horrible things are going to happen, as well as wonderful things. Wonderful things and horrible things are going to happen at a higher rate of speed than usual. Human beings are going to have a period of trying to deal with that. I think that's why, to me, it's getting more and more important that we learn how to be forgiving, we learn how to control ourselves – we learn a lot more about self-control. There's a line in Galatians [where] the Apostle Paul is talking about fruits of the Spirit, the Spirit of God, the third part of the Trinity that, in some way, resides inside each of us. There are seven of these – there's actually a little song about them. But there's love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, self-control. Paul says there's no law against any of these things. These are things that, if we concentrate on being vessels for those attributes in what we do, it's going to improve the chances that AI will be useful, but it's something that each of us is going to have to do individually. It's pretty clear: the great thing about AI is also the hazard, which is people with very limited means are going to be able to harness it to do incredible things relatively quickly, whether they're doing that to break the security codes that protect our individual finances, or whether they use that to develop cures for various forms of cancer, depends a lot on love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, self-control. [laughter] It's going to be a morally and spiritually challenging time. By the way, there are a lot of people that think human beings have to rise to that occasion. I keep thinking, like members of Alcoholics Anonymous, another source of indigenous knowledge, that we might need help from a higher power.

MB: Thank you, Bill, for sharing that. I was also reflecting on the idea when growing up social media had not bloomed and blossomed the way it has. I felt my own speech was much more restrained, and now, a fool like me says things that are unverified and shabby, as you mentioned, without any restraint, and I think that self-control – being able to make bold statements, but then also being able to ground those statements in evidence and having the humility and self-regulate and check your own biases is so critically important in the world that we live in today. So, thanks so much for mentioning that.

BH: No, that's well said. Part of it is the speed at which we're having to do this. You're taking shortcuts at every step because there's another problem [or] email interaction you have to deal with waiting while you take care of each one of those. So, we're all operating at a higher speed. When we do that, again, our truest selves come out more quickly, with all their shortcomings. What we want to focus on is the part of our truest selves that looks at the core of things and focuses on getting that core out in the response to everything and then putting the refinements aside.

MB: I'll ask one last question, Bill. This is a follow-up question to what you just said. Given that technology is moving at the pace it is, and you talked about the need for policy to be more adaptive, what does good policy look like for N-number of things in science? How does good policy incorporate those unknown unknowns, those future things that may arise that we are not aware of? Could you expand a little bit on this idea of adaptive policy?

BH: I'll try. That's a great question because you could make an argument that it should be stabilizing also. So, one thing you want from policy is it should leverage your puny intellect. Again, suppose you had to make a decision every time you were driving about – is it better for me to be on the left-hand side of the road now or the right-hand side of the road? There'd be circumstances under which you could make a lot better progress, maybe. But if everybody's trying to do it, your intellect gets kind of overwhelmed. So, policy is one way of helping us do things that are smarter than we could really do individually. A second part of it is that it enables us to put some handcuffs on ourselves. So, we're complacent about how much energy we use, how much water we use, or how much food, considering the constraints on these worldwide. Regulations, taxes on carbon use, sales taxes on consumption, and things like that – we're sort of putting the handcuffs on ourselves. We know that's a better thing to do, and we can bring ourselves to limit ourselves in the abstract by putting into place these policies. But then, if the world around us weren't changing, if we died in the same world we were born in, policies could stand alone for a long time. The US Constitution and the Declaration of Independence, for all their flaws, held up well until things started changing rapidly. In order to deal with that, they have to have a little more adaptive flavor. Maybe this is a scientist speaking. You can measure things. Let's take gun laws. It might take a while, but you start to see that, oh, in England, they have only ten percent of the number of guns per capita that they have in the United States, and oh, by the way, they only have ten percent of the murder rate. Gee, I wonder if those two things could be related. So, if you can collect data so your empiricism is a little better than what you and I remember, you might be on a good track toward supporting adaptive kinds of governance. So, those are just some of the ideas.

MB: The end goal of policy, Bill, again going back to Francis Bacon, is the benefit of all. So, do all policy decisions need to –? When we think about policy for any area, do we ought to be thinking about that end goal? What does this policy do?

BH: I think so, yeah. We want to have as much dialogue about that as possible. You hear this idea that we should be seeking the greatest good for the greatest number. That's a wonderful thing to kind of roll off the tongue, but then to figure out what that really means. The greatest good for the greatest number today. The greatest good for the greatest number, including all people unborn. So, we just can't discuss that enough. We used to have – in simpler times, you'd have town hall meetings, you'd have discussions. People were actively involved in all these things at a local level. So, there was constant discussion, and there was also building relationships while you had that discussion. With eight billion people instead of eight hundred million people, it's gotten tougher to do that. Again, I think what that means is all of us have to exert greater quality control on our own thoughts. Right now, we've got this great income inequality worldwide. But history tells us in America, for example, the robber barons of the late 1800s, the Vanderbilts and Rockefellers, created a number of depressions and economic shocks because their appetite for milking the American public and the American labor force was unlimited. They didn't put handcuffs on themselves. They didn't say, "We can actually make more money for ourselves if we were just a little less grasping in the short term." I think we're getting back to some of that now. I think AI is going to have the same kind of flavor to it; it's going to make it possible for small numbers of people to become very rich quickly. There are a lot of arguments about the big tech companies, Microsoft, Amazon, Apple, Facebook – Meta, or whatever it is – are they going to be swept aside with this AI revolution, or are they going to do what they're already showing signs of doing, which is just hoovering up that innovation at the very early stages to try to keep things going? The people who most need to put limitations on themselves may be the least interested in doing it. We're all uninterested in doing it. Let's face it. Somehow, we need to have a culture of – I can't say to myself, "Oh, well, I've got a little bit gathered together. I'm one of the most fortunate people on the planet. I sure hope nothing upsets that apple cart." I've got to think to myself that as long as there are billions of people out there who are tied up in poverty in Africa, in the kind of prison almost that they're in in Gaza at the moment, that they're going to fight back, and that the biggest threat to any person's continued well-being is the lack of well-being on the people around him or her. So, we got to keep thinking, "It's in my self-interest to share. It's in my self-interest to be generous. It's in my self-interest to listen. It's in my self-interest." And identify that rather than, "Oh, to do all those things, I'm competing with my self-interest." That's so wrongheaded.

MB: That is very profound and very, very thoughtful.

BH: It's something that comes from every major faith in the world. It comes from people's common sense. I'm trying to say what I hear other people thinking.

MB: But it's also so easy to hoard in the world of excesses and to be self-centered. This calling that you have for all of us, I think we should be reminded of this every – I'm thinking of bumper stickers – that we should be reminded of this every single day, every single moment.

BH: Every single hour. [laughter] It should be ingrained, and it is ingrained in creatures like ants. Ants don't ask themselves when an invader comes into the anthill, "Why should I be the one to die? Let's take a vote among ants. Let's see if we can't have some soldier ants up here at the frontline." They just respond to what they have to do. It's ingrained in their DNA to do those things.

MB: I love that the ecologist in you has shared that ant analogy with us through "Living on the Real World" a few times in your blog post. So, I am really grateful, Bill, for all your remarks. I'm also looking at the time, so with your permission, may I stop the recording?

BH: Have mercy on the people who are watching.

MB: [laughter] Thank you so much, Bill. Can I stop the recording?

BH: Yes, you may. Thank you, Mona. You're such a patient listener.
----------END OF INTERVIEW----------
Reviewed by Molly Graham 1/27/2024
Reviewed by Bill Hooke 1/27/2024
Reviewed by Molly Graham 4/28/2024

Session 23 - November 8, 2023

Interview Summary: The interview with Dr. Bill Hooke delves into the importance of maintaining a positive and forward-thinking mindset, emphasizing the value of experimentation, youth, and hope in problem-solving and addressing global challenges. Hooke stresses the significance of stimulating thought and improvement, advocating for a focus on sharing hope rather than cynicism in tackling issues. He also touches on the responsibilities that come with initiatives like his blog, "Living on the Real World," highlighting the need for action and cooperation in creating a better future.

Mona Behl: Hello, Bill.

Bill Hooke: Good morning, Mona. Good to see you.

MB: Great to see you, Bill. So, it's Wednesday, November 8 [2023]. It's almost 6:00 AM where I am in San Diego, California. With me is Dr. Bill Hooke. He's in Alexandria, Virginia, and we will continue speaking about some of the things, Bill, that you brought up last time. One of the things that I wanted to ask you is how you manage to be non-cynical about everything that is going on around you. It's very easy, I find, as I get older, to become cynical about things, and I feel – that's not the impression that I get from you. How do you manage to be non-cynical?

BH: That's a great question. I haven't thought about it very much. I'm not particularly cynical. It just seems to me that the world has a lot of signals that it's sending, reasons to be hopeful. Cynicism is something we have to work on to achieve. [laughter] Let me put it that way. It's more relaxing to not make an effort to become cynical. I think cynical requires work rather than the other way around. A large part, again, is probably faith-based. In the Christian faith, one of the things we're taught is we're all sinners. We really have to own that. We do selfish things, we do lazy things, and we're not just forced into it; we do it because we're selfish and lazy. We hurt other people, and a lot of the time, that's deliberate. So, when we get hurt, or when somebody withholds something from us, or somebody's unfair, one of the things we're invited to do – Jesus talks about removing the log from your own eye before you complain about the speck in the other person's eye. I think a lot about what I've been forgiven in my life, all the mistakes I've made, all the times that I've done things I shouldn't have and failed to do things I should have. There's just so much of that. I had a pastor once who talked about [how] a lot of people go around, spending all of their time feeling guilty, and that's because they are. [laughter] I think if more people – if we relax and own that and say, "If we're going to get out of that jam, we have to look to some higher power to do it." I've been very taken over the years by the AA [Alcoholics Anonymous] twelve-step program. Alcoholics Anonymous started out by saying, "We realize, number one, our lives are out of control, and we're not going to be able to do anything about it by ourselves, probably. We've proved that over and over again. But maybe a higher power, as we

understand it, can help us." I'm actually struck by – that's the key to getting through the climate change problem. A lot of us think, "Because we're that way [and] because everything's so polarized, we need to politically gain some advantage, and then quickly install a lot of things that will climate-proof our world and our activities," versus thinking to ourselves, "If we can just lighten up on the polarization, we can solve all these other things." But it has to do with when you see somebody wronging you, say, "Oh, the reason I'm good at seeing this is because I know how to do it myself. I've done it myself, and therefore, I recognize myself in what this other person is doing." Again, [inaudible] Creator God has taken care of the sin problem and is in the business of restoring and renewing our world. We all, all eight billion of us, get to play a part in that. That turns out to be a hugely powerful thing. Cynicism, as I said, doesn't have much place in that.

MB: Thank you, Bill. Along those same lines, comparison – it's so easy. I find myself comparing myself to others, and comparison, I feel, more often than not, leads more and more to that polarization. Is there any remedy for that?

BH: Is there a remedy for the polarization?

MB: For the comparison that we do with others. When we look at people, when we interact with people, we immediately categorize them on the basis of their race, gender, wealth, age, and N-number of things. When we do that, I feel –

BH: [inaudible] If you say you're a Christian, people immediately flash on religious leaders who, particularly in this country, have allowed themselves to get politicized, are taking a position that a person who in no way resembles Jesus should somehow be our Savior. That's not what Jesus taught. He said it really begins with the individual. As scientists, I think we have a particular problem; it's the knowledge deficit issue. I think climate change is a problem, and here's what we should do about it and people aren't doing that. First of all, you think because they're ignorant. So then you try to explain it to them a little more in the frame that you have, and they still don't agree with you, and so you say, "Well, they're not ignorant because they just explained it to them. They must be dumb." Then they show you a third time or something; you explain it even more simply or whatever. And then you're quick to say, "Oh, they still disagree with me. They must be evil." That's just a progression. There's a video where somebody – antique video now, it's got to be ten or fifteen years old; I don't think I could get my hands on it – where a guy explains all that. It's never left my mind since then. Just a second. Let me stop and see what that … [Recording paused.] So, we were discussing polarization and how to avoid it and confrontation. You might ask yourself, or people might ask themselves, "Well, what would Jesus be saying about the climate change issue right now?" I picture he might be saying something like, "Well, it sure looks like it's more important than ever for everybody to cooperate and be fair, doesn't it?" [laughter] In fact, he had a lot to say about that at the time he lived. So, one of the

things – he just had a lot of comments that he threw out in passing. One was, he said, "If you find yourself about to go to court with somebody else, you should really try to settle on your way there rather than allowing this thing to come to trial because you might be thrown in jail." [laughter] He was just saying, "Really, you should do that." He seemed to be very much at ease about different forms of government and Roman oppression and much less at ease with things like hypocrisy and judgmentalism and [laughter] those things – and lack of fairness – which interfere with cooperation, trust, and unity. I keep thinking a great tragedy of this country is we have a tagline or a logo on our currency that says "E pluribus unum." It's Latin for "Out of many, one." It's saying, "Out of great diversity, unity," basically. So, it's all staring there right in front of us, and we've lost that vision to some extent. We have periodic elections. I've got to say I was cheered a little bit in a small way by the results of yesterday's elections. Now, people who watch this in future years can go scurrying to look up that day to try to figure out what the heck was going on if anything. Let that be a challenge to the viewer. [laughter]

MB: Bill, thanks for sharing that idea. The way you describe Jesus and what he teaches us, it feels like you are alluding to the fact that religion is somehow a shepherding force that brings people together. I feel maybe because we don't believe or allow ourselves to reflect and latch on to some of those religious ideas, it's leading to that comparison of you and I, us and them, and the polarization. Because fundamentally, be it Hindu culture, be it Christianity, I think it deals with forgiveness.

BH: The moral part of various [inaudible]. The moral part in Buddhism or Confucianism, you can find much to love about all of that in terms of the basic ways that we treat each other. That's right. I'm just talking about Christianity. I apologize for that, everybody who's going to watch this from now on. The problem is that's the only one of all of these faiths I know a little about. So, we need to turn the tables, and I need to interview Mona on the Hinduism part. Then, we need to get some people in here who can talk to us about Buddha, Muhammad, and all the rest of it. Anyway, that's probably for another day. The main thing is, all of these people would say, "Gee, it looks like we've got to cooperate." Part of that is being trustworthy and true. Part of it is also about forgiving people. Again, going back to one of these things that faiths teach, particularly the Christian faith, it should be easier to forgive other people because you've been forgiven yourself. If you've been forgiven a great deal, as all of us have, then you should be particularly willing to forgive people [for] little problems. Microaggressions come to mind. One of my great concerns about microaggressions – well, I don't understand it because I haven't been a victim of it the intensity the way that some people have. We've all been a victim of it, to a small extent, but not to this grand extent. The thing is, if you get sensitive to microaggressions, you can worry about nano-aggressions. That just leads to a path that I don't think is one we want to go down. We just can't get more sensitive and tread ever more lightly on every issue that affects [inaudible]. We've got to be able to prevail on forgiveness from each other at some pretty robust level.

MB: Bill, what you said also makes me think about cancel culture. Actually, that makes me very sad, in particular, that many young people, many people who were younger than me, fall into that trap of canceling others very, very soon. What are your thoughts on that?

BH: Well, somebody with a background from India really has a lot more to offer than I do on that because you've had to deal with both Muslim and British culture. So, there's a lot to cancel. [laughter] I've been reflecting on that a little bit. One of the things that Shakespeare says is that the world is a stage, and we're merely players. I'm trying to write something that reflects on that a little bit. His actor then launches into a little bit of talk about the seven ages of human beings: you start out being unable to tie your shoes, you walk through youth and adulthood, and old age. But to me, the outstanding thing about that is the world is a stage; we're only players, and we haven't arrived at the first rehearsal or at the script reading. The play is underway, and the stage is chaos. And it's confusion. You don't realize that until maybe you're ten years old or something like that. Up until then, it's your family and the stability of the family, hopefully. And then you start to realize, "Man, there's a lot going on here." A lot of it, even to a ten-year-old brain, might be thought of as nuts. So, you spent a lot of time trying to learn around – "Okay, what is the script? Who wrote it? What's my part in it? Am I a villain? Am I a hero? Somewhere in between? How do I know?" The problem is there's more and more of this script being written very rapidly as we go on. People are saying, "Oh, well, most of the things that are written have been written in the last three days, or three years compared with all of the history previous, and it's all on disks and disk farms. So, you can spend your whole life trying to come up to speed on where you are, whereas it didn't feel like that to our ancestors, I don't think. I mean, they realized, in an academic sense, that they were getting more wise as they grew older, but they kind of thought they had the facts under control. Now, you just realize, going back to the cast, there's a lot. So, then you think to yourself, "Well, all of this was before I was born. My parents might be responsible for it. Their parents might be, but I'm not responsible for it. And yet, people want me to pay reparations. People want me to do this, that, or the other thing." That's all understandable. But I think more and more the problem we have to worry about is we are each responsible for fixing it, whatever the problem is. That doesn't mean changing history; you can't do that. It is what it is. It means a path forward. How are we going to deal with things going forward? So, looking at poor nations and trying to set up a fund, the rich countries are worried about being held responsible for all the climate damage so far. But they should focus on – "Well, you're rich. You have the bigger responsibility for how we solve the problem going forward. That doesn't seem to be really – we don't seem to really be aiming it the way we should. We're holding grudges. We're trying to fix blame instead of the problem. It's not very productive. It goes back to the Jesus thing. If you find yourself being taken into court by somebody, try to solve the problem on your way to court versus rehearsing your speech about what you're going to say in court. And we're not doing enough of that.

MB: Cancelation is so vindictive, and it also seems like an ugly [inaudible] that is pulling us all apart. Thank you so much, Bill, for sharing some of those ideas.

BH: Well, I don't know that it's helpful, but we have to work on the problem all of us together, and that's eight billion of us. Everybody has something to offer. Everybody has something to regret. It's our job right now. It's the 21st-century task. It's exciting to be part of it. That's another thing. You go back to the cynical part – "Wow. Imagine being alive at this pivotal time in history at this hinge of history." I think we're invited to think – maybe Shakespeare could have covered that, too. We're invited to think no matter where we show up in the progress of the play, we're at the hinge point, and that's pretty cool, too. So, it gives you something to be excited about. I do think, by the way, that – suppose you decide that your task in life is to be responsible for the renewal of the world versus your task in life is to document the collapse of the world. Choosing the second one over the first is a poor trade [laughter] in so many ways.

MB: It also makes me think, Bill, an idea that you've reflected on many, many times, and you've emphasized to think about it as well, which is the abundance mindset, that we have enough to deal with everything. Okay. Thank you so much. So, in the interest of time, Bill, I'm going to ask you one AB [Ask Bill] Anything, if that's okay. So, Living on the Real World is, as I mentioned before, such a gift to each and every single one of us. It seems like it's a massive project. How do you feel about the weight of responsibility that comes with a project like that?

BH: That's a great question. That's a great question. The whole time I was writing it and the whole time that I think about it since then, it is just all the imperfections and shortcomings. One of the things I tried to say a couple of times in the introduction or at the end was, really, the idea was to stimulate every person who turned in read a page or two to think about how they could do it better. So, we have the responsibility, not so much to get it right or solve the problem, but not to put false facts in. I tried to say the whole book is really conjecture; the whole book is really heuristic thinking rather than scientific thinking. I can apologize for that, but I can also figure that if you only have a finite lifetime, and as we've said, there's more and more to learn and know, you'll never put down your thoughts. I think all of us should spend a little more time thinking, "Why am I here? What is my purpose?" and trying to tie it – you talked about the different faiths. No matter what your faith is, you can come at it productively from those couple points of view and worry less about the weight of it all and getting it right. The thing to do is to chuck – any fantasy that you have about getting it right, chuck that out the window as you start down the road, and just resign yourself to – hey, as soon as you start clicking the keys or noodling on a piece of paper, you're already starting to make mistakes. I think part of that was – talking about the tools for dealing with the big problems we face – a basis of facts, keep working on what's real, what the physics has to say – chemistry and biology – social realities, [and] getting policies right because policies have a life of their own. They have unintended consequences. They have emergent consequences. You want to be trying out a whole bunch of

experiments getting those right. That takes some of the responsibility away if you keep reminding yourself you're doing experiments versus trying to get it right. Using IT [information technology], technology, and social networking to just do reality checks with people as you're going along as best you can. Finally, as an older person, I think I could say this without getting into the cancel culture too much, really placing a lot more reliance on youth and vitality [laughter] and letting that be tested and tried out earlier rather than later. You look around the world, and you ask yourself, "Where are people today living in despair?" There are so many young people who have to be in despair when they look at the country they're in, the circumstances of that country, and the laws and framework that's around them as they're running around the stage to find out what part they're playing, to find so many barriers to any kind of hope, any kind of participation in what's going on. Maybe that's an interesting thought to pursue – cancel culture. One of the things you can cancel is participation. You can keep people from playing useful roles in so many ways. Intentionally, absent-mindedly, and so on. You don't want to do that. You want to really get people everywhere a chance. I wake up every day, particularly these days, thinking about you're a kid in Gaza. Where's the hope? You're a kid in Israel, for that matter. Things are a lot better there. You know where the water's coming from, you have a sewage system, you have all that stuff, but you look around and say, "What's the future of all this?" You need to create an awareness in young people of what's going on, but at the same time, you need to keep in your own mind the hope that you have so you can share that with them rather than the cynicism you have for sharing that with them. Yeah. Maybe that's a good bookend for our conversation.

MB: That is beautiful. Share hope, not cynicism, and it brings us back to where we started. So, thank you so much, Bill. Do I have your permission to stop the recording?

BH: You bet.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 1/30/2024
Reviewed by Bill Hooke 1/31/2024
Reviewed by Molly Graham 4/28/2024

Session 24 - November 22, 2023

Interview Summary: The importance of gratitude, forgiveness, and recognizing the contributions of others in making life meaningful is discussed by Dr. Bill Hooke and Mona Behl. Hooke emphasizes expressing gratitude daily, belonging to a higher power, and taking responsibility for actions. The significance of science, free will, and the role of wealthier nations in climate change reparations are also touched upon, highlighting the interconnectedness of gratitude, responsibility, and action in living a fulfilling life.

Mona Behl: All right, it's November 22, [2023], Wednesday. My name is Mona Behl, and I am with Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi there, Mona. Good to see you once again. This is a pleasure.

MB: It continues to be the best day of my life, Bill, Wednesdays with you. In light of Thanksgiving, I wanted to talk to you about gratitude and also something that you mentioned in the last interview: forgiveness. So, could you talk a little bit about how to actually practice forgiveness and gratitude? We say, "Thank you." And we tend to forgive people every day in our lives. But how do you actually practice that?

BH: Yeah, you can do that. We're going to start in kind of an oddball way, and it might take a couple of minutes. I want to say it was around 1520 or so, the year 1520. A couple of guys who were only in their twenties or thirties wrote a catechism, which is a very famous catechism. It's not as famous as the Westminster Catechism, but it's the Heidelberg Catechism. A little bit of the starting point is in the first three questions and answers. The first question is, what is your only comfort in life and death? That's the first question. The answer to that question is, "My only comfort in life and death is that I am not my own, but I belong in life and in death, body and soul, to my faithful savior, Jesus Christ." So, it's kind of saying, "I don't care. Money is not something that gives me comfort. My relationships with other people doesn't give me comfort. What gives me comfort is the fact that I'm in the hands of a loving God." Then, the second question is, what three things must we know to live and die in the joy of this comfort? So, in other words, what three things must you know? The first one is – let's see. The first one is you need to know how great your sin and misery is. Okay. The second one is you need to know how you are set free from your sins and misery. The third one is how can I show my gratitude for such a great deliverance. [laughter] So, it's all in there, the question of gratitude and thankfulness. And that's very fundamental. But I think the main thing is sort of a question of practice. We talked a lot about a TED Talk by Shawn Achor. [Editor's Note: Here's the link to the Ted talk, "The Happy Secret to Better Work" - https://www.ted.com/talks/shawn_achor_the_happy_secret_to_better_work?language=en.] It's the talk about the secret to a happy life. I'll think of the guy's name in a minute, but one of the

things he does is say that every day, at the end of the day, you should think of three things that you're grateful for. What he said was that we get in the habit of thinking about all the bad things, and we don't think enough about what good happened. When you start looking for it, when you say to yourself, "I've got to think of three things," you get better at recognizing them. I've found by doing something like that in a haphazard way that it's hard to get up and not have three things you're grateful for after the first five minutes. I'm up. I'm kind of positive about the day. The temperature in the room is pretty good. You just start realizing that a lot of things that we take for granted that we assume – we tend not to be grateful for the baseline in our lives. Most of us, particularly you and I and anybody who's likely to be in such a privileged position to be watching things like this versus real labor, is – gee, I'm in a pretty privileged position to be able to do this. One of the things managers – I've got a book someplace that talks about leadership; it was written by the guy who made a fortune in Steelcase furniture. He said that managers should spend most of their time going around thanking people. That made an impression on me. He was a Dutch guy, by the way, from the same crowd that brought you the Heidelberg Catechism. He was a big corporation executive.

MB: I want to go back to the idea –

BH: I'm sure if you picked any other faith or persuasion, you could find similar case studies and examples and similar ideas about gratitude.

MB: What you said about belonging, Bill – in life and death, I belong. What gives me comfort is I'm in the hands of Jesus Christ. That also speaks to the fact that you ought to have some degree of – you ought to give up control to some extent and believe in a higher power. What about those of us who don't sense that sense of belonging?

BH: Well, a couple of things. Let's come back to the belonging in a second. Let's talk about giving up control. I really believe that Hell is the place where all your wishes are granted. My basis for this is not anything in the Bible but two folk stories. One is about the Midas touch, the King who's really wealthy beyond anybody's imagination but is greedy. He wishes that everything he touched would turn to gold, and he quickly finds out the horrors of that. The other one is the story of the fisherman and the three wishes. Are you familiar with that story? Yeah. So same idea. After he gets the three wishes, (he wishes to be?) back in the same circumstance he was. I think that maybe – that's a little aside. But then the second question was if you don't have this feeling that somehow you're in – I think one thing is we have to fight a little bit to not realize that. I mean, one of the things that we're very – we like to think that we're in control. We like to think that we're in charge and that it's a good thing. The strain of having such an unrealistic idea weighs very heavily on all of us. It's a huge burden to think that and not sort of stop for a second and realize, "Wow, I was born into privilege." Some people weren't. We're having this conversation, but you are here by way of a long journey from India. I don't know

what your economic circumstances were there, but it never sounded particularly good to me. They weren't the worst circumstances in India by any means, right? But still, I mean, different people will have a different climb to get to wherever it is that they're going. I think the thing is that you start to realize if there isn't – for me, I don't know, it's somehow become easier to explain things if there is indeed a higher power than if there's not. There are some interesting game theory arguments about what an infinitely powerful loving God – what kind of game such a God would play with believers and non-believers. You can Google those things, and they're not particularly Christian or any other way, but they're interesting. It turns out that if you're a God who wants company, you don't want robots, and so you have to have free will. If there's free will, you have to live with it. If there's free will, you maybe spend more time trying to castigate the people who believe in you than you do with the people who don't. Those people, you're trying to hint that you might be there. Anyway, it's all kind of interesting. I don't think any of us – and I'm certainly in that group – spend nearly enough time thinking about life and death and the meaning of life and death as we could. The people we've been talking about – Isaac Newton, Francis Bacon, and others – all thought about these things quite a bit. Einstein thought about these things quite a bit. It's a little unclear. People attribute all kinds of quotes to Einstein. So, it's hard to tell what he really thought. But the message that you get is he did think about it, that you couldn't mess with the equations of science without asking where they came from. I think we talked about – did we talk about dark matter at all and the Midas muffler repair person? Did we talk about that?

MB: We haven't. Probably dark matter [inaudible] –

BH: Okay. I'll just do this very quickly. I'm studying physics as an undergraduate, and man, it's just so clear. It explains everything. You could write the Hamiltonian for a universe; you'd understand it. That was what I was thinking. And then, I went into applied physics. Then, all of a sudden, in the '70s, '80s, and '90s, I became aware that people have been talking [for] a long time about things like dark energy and dark matter and how eighty-five percent of all the stuff in the universe is those two things, and the physics that I had learned that I spent all that time on is about the five or ten percent. It occurred to me, suppose you went to the Midas muffler guy; you needed a muffler for your car. He said, "It's all fixed now. That'll be ten thousand dollars." You say, "Man, that seems like a lot of money. Could you break that out for me?" And he says, "Well, two hundred dollars was for the muffler you can see and touch." He says, "The other ninety-eight percent is for the dark muffler." And your reaction, of course, is, "Oh, yeah, I forgot about that. That makes so much sense. I'm so happy to give you the ten thousand dollars." Somehow, in physics, we live with that. We say, "Physicists are great. They're so smart and intelligent." And really, they've got the biggest fudge factor in the known universe. The other miracle is the potency of what we know about that five, ten, or fifteen percent. It's so useful. It explains things like the age of the universe, why a nuclear reactor works, and things of that kind. It's marvelous. When Vannevar Bush and people like that say, "Science is the endless frontier,"

they are not kidding. Last week, I went to a meeting of the American Philosophical Society. There were four researchers [inaudible] from the California area, different institutions out there in Southern California, who were studying microbes. It was incredibly eye-opening. One of them had a video of microbes emitting oxygen and part of their cycle, depending on the sun being up or not, and you could just see this moving across the oceans in this big number. Somebody said there was something like ten to the 23rd stars in the known universe, but there were ten to the 29th microbes in the ocean. I'm giving sort of the facts as opposed to the really delicious ideas about the roles of microbes in the human biome and the role they play in the web of ecosystems and all the rest of it. I got to ask them one very tiny question at the end of these four talks. We were all having a break or something, and so I wouldn't waste the whole group's time, but in our field, fifty years ago, I was out in Boulder, and I was working with a guy named Russ Schnell, who was a cloud microphysicist. He was telling me there was a bacterium, Pseudomonas syringae, a particular subset of Pseudomonas that was responsible for frost damage in plants. The thing about ice nuclei is that they have to be the shape at a molecular level of ice crystals so that ice forms on them. So, most of them are inefficient; they don't really start forming – ice has many crystalline forms as you get [inaudible] temperatures below zero. So, some of these materials – clay and other things – don't kick in until a few degrees below freezing point. So you get super-cooled water. But these microbes, Pseudomonas, can produce frost damage in strawberries and so on at thirty-two degrees. They're actually used artificially in creating snow for ski resorts and things like that because they will give you a nasty infection if they're alive; you have to kill them first. To be on the safe side, what people started doing was centrifuging them and getting them to shed the little nodules that were the real ice nucleus sites. And that's what they use. Anyway, that was fifty years ago. So, I always wondered, with all this interest in global change and stuff, what would happen if something were to reduce the number of these ice nuclei? So, I was asking these researchers if that was even a thing. It turns out there's a lot of literature, I guess, on the number of bits of biological matter, not living microbes in the atmosphere, but bits of biological matter. They estimate as much as fifty percent of cloud nucleation occurs on this biological matter. Anyway, science – there's just so much to explore. I'm sorry, we got a little far afield from your question.

MB: No, no, this is all linked, Bill. You mentioned you can note three things that you do to express gratitude. How do we actually express beyond writing down? How do you express gratitude, and to whom do we express gratitude? Is that something that you do every day?

BH: That's a good question. When you're a manager, it's easy because the people [inaudible] people hunger to hear – they don't want to hear vacuous praise. They don't want to hear praise that they think is misdirected or undeserved. But if you show them that you genuinely have seen what they did, or you genuinely see the impact that is happening, and you seem to have some insight into that, it's less that you say that, then it's affirming from outside someplace, the thing that they were – the greatest human hunger is to matter, to make a difference, to have a life that

has meaning. The best way you can show gratitude is to show people how what they're doing is really meaningful and not just something – I see all the staff members here at the retirement community where I live. I just say to them all the time, "Thank you for making life livable here." [laughter] They're doing things like emptying the waste baskets and vacuuming the floor, but you don't thank them for vacuuming the floor. You thank them for making life livable because that's really what they're doing for all people who can't really help them in any way, shape, or form. And they do it day after day. I could go on. Gratitude is a huge thing, particularly when it comes to things that worry us because one of the reasons we're so stressed out is we think to ourselves, "Gee, I've got a lot to worry about. I've got an exam coming up, or I've got an exam to prepare to give students, or I've got a briefing to give people for our budget for next year or whatever." We forget all the times that we gave that budget briefing or did that exam; we have this pile of success stories in our history. If you believe there's a God, you can say, "You know, God? You never let me down. Even in the awful ones, even in the ones that I didn't seem to recover from, like my divorce and all those things, I did. You're still here. I'm still here. There's restoration of a sort in some of these things. There's recovery. There's renewal. But you have to look for them to see them. You might ask yourself why that seems unnatural. That is where you get into one of the other parts of many faiths, which is not so appealing to people – I would say the same thing – about some anti-goodness, some evil force in the world. The Christian faith, for example, talks about Satan as the great accuser. Most of the time, you and I feel guilty because we are, but the accusations are always right there in front of us. One of the things is we have to understand, hey, there's no turning back from all that. Again, going back to this idea of failure, we're all trying to move on; we're trying to atone for those things. I'm trying to write a blog post right now on climate change reparations. It turns out that the US and some other governments have made a distinction between loss and damage and reparations, which carries more of the blame for that. I'm struck by this saying that we spend too much time fixing the blame and not enough time fixing the problem and trying to say that as a world – instead of rich people saying, "Oh, well, I don't want to start paying somebody back for all the damage my ancestors did to create this climate change problem, we need to say, "it's going to take a lot of money to fix the climate change problem. I'm the only person that has the money." [laughter] It's like, why did Willie Sutton rob banks? He said, "I rob banks because that's where the money is." The world and facing climate change – Scott Barrett, who is a big economist and expert on gaming and game theory at Columbia, wrote a book about that, and he talks about how it's the countries with the money that have to pay. I think that's just such a reality, and it's nature's reality imposed on us. Nature is saying to us, "Look around you. It's going to take a lot of money to fix this. You're the only ones who have it. Don't try to beat it out of African nations, or Polynesian islands, or whatever. That isn't going to happen. You have to pony up. You're not as rich as you thought you were. But you're richer than you thought you were because it turns out that a lot of the things that you're trying to accumulate aren't really doing you a lot of favors." There was an interesting article in The New York Times yesterday or a day or two ago about how the rich in New York live. They're doing things like hiring a cook at $150,000 a year

to do two meals a day for you. While the cook is shopping, the housekeeper's doing the morning meal for you. Or you have a two hundred thousand dollar membership at a wellness center. And wellness is available to us with just a little gratitude for free. Anyway, that's my economic tip to everybody in today's interview.

MB: I love this, Bill. What I heard from you for what you said is an expression of gratitude is taking responsibility and action. Is that an accurate way to say it?

BH: I love that because that's Mona, the teacher, and Bill, the student. Yeah, that's well said. That's a perfect summation.

MB: Is that also the way in that expression of responsibility and action that perhaps we experience God? I often reflect on this relationship that we continue to bring God, and we have this relationship with God that we can't see. We tend to experience in certain – if we're lucky, if we're paying attention, we tend to experience God throughout the day in various ways. But mostly, a person like me is usually blind and deaf to that God. I just wonder, is it through immersing yourself fully, getting in the flow of doing things, or being in your calling? Is it through that expression of gratitude, responsibility, and action that we experience God?

BH: Yeah. That's a great point. Boy, I could go on for this a long time. But one of the things – my wife, Chris, always used to say, "Well, Bill, you read the Bible so much, or you do this, or you do that." But I looked at her, and she was the one who was always living the teachings, whether it's Buddha, Confucius, Christ, or whatever. She was the one going around helping people and dragging me along, comforting people and dragging me along. She was living. And there's actually a passage where Jesus talks about this. He's talking about separating people who follow him from people who don't. He says, "Well, you gave me a cup of water when I was thirsty, you fed me, you clothed me when I needed clothing, and you visited me in prison." People said, "Well, when did we do those things?" He said, "Well, when you did it to the least of the people around you, you did it to me." To the people that he's consigning to less happy eternity – they're saying, "When did we see you and not do those things?" And he said, "Well, when you were ignoring people." We're invited to think of ourselves as in God's image. When you do that, that's another way of being grateful. Just think about how multifaceted God is, how many faces that he can take, how many actions and skills, how much love and caring, and energy and integrity, depending on where you see it in different people. That all comes into it. There's a lot of joy in doing those things when we can do just a little bit of those things. When we can give somebody a cup of water or recognize that a street person who is asking for a handout, you might say, "Well, gee, I can't give a handout to everybody." And then you say, "But I'm not being surrounded by a hundred people. There's only this one, and it's been three days since I saw the last one." You might have a different attitude about it. All of this – the practice of it becomes easier the next time. Every one of these things. We know that when you're doing

mathematics, if you're really throwing yourself into the rigor of the equations or whatever, if you're trying to do a field experiment and get good results, it's easier the next time. [laughter] So, this is no different.

MB: Wonderful, Bill. So, what you're calling all of us to do is to have an abundance mindset that you've shared so many times to be useful and to give wherever we can by virtue of our position and privilege.

BH: You find out that it's more relaxing. If you give somebody a dollar, you find out you had a dollar in a way that you didn't know before. You realize, "Oh, there's another dollar behind that. And another dollar behind that one. Oh, that was maybe a little more interesting than buying another app for my cell phone."

MB: This conversation is most helpful, Bill. So, I have one ABA [Ask Bill Anything] if I can ask. So, in the spirit of Thanksgiving, we've talked about gratitude and forgiveness. What are you most thankful for, Bill?

BH: Well, I was just rehearsing that, actually, because tomorrow, when the family gathers, that's a question – we sort of go around the table and ask ourselves that. It's not a complete answer, but certainly one of the things – two of our four grandsons are going to be at the table. I think I'm very thankful for the young generation, the new generation that's coming up, and their skills, abilities, energy, and desire to make the world a better place. I think the future is in good hands.

MB: How old are your grandsons?

BH: So, the two that will be with us – one's a graduating senior from UVA [University of Virginia], and the other is a freshman at Virginia Tech. So, they're at the age where you really are starting to see how they're still stem cells; they could become anything, but you're starting to see how they're going to come out. My daughter is an amazing person. I talk about all the things we talked about for the last hour, but my daughter, like my wife, lives those things. She's a social worker, and she raised these two sons to be amazing. We have two other grandsons who won't be with us. One's living in Texas. He's finishing up high school. The other is at the University of Hawaii. It's kind of hard to bring him back for just a day or two. He's studying environmental science out there. I think if my child had come to me and said, "The only place I can get the education that I need is at the University of Hawaii," I would have been very skeptical, but his parents – my son and daughter-in-law – let him do that. We'll see how that turns out. I found this out from the colloquium, and the colloquium participants were just so amazing compared with even the graduate students and the early career people I knew entering the field. The problems that they have to face is challenge – young people like a challenge, and they're drawn to challenges, and we've got a great supply of them, whether they're in public

health, medicine, climate change, finance even, artificial intelligence or construction or whatever. It's an exciting time to be alive. I'm thankful for that. How about you, Mona? What are you thankful for?

MB: I am thankful to you, Bill, for the different ways you've enriched my life.

BH: [inaudible]

MB: For the encouragement that you give me, for your model behavior. You are the kind of person that I would love to be. I am just very grateful to you for giving me your time. Every week, it feels like I'm sitting in a church and talking to you when you have so much going on in your life. Thank you again. I'm most grateful for our time together.

BH: I enjoy these sessions very much. Happy Thanksgiving to you.

MB: Happy Thanksgiving to you, too, Bill. I have one more question, but I'm going to pause. Is it okay if I stop the recording?

BH: Sure.

MB: Thank you.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 2/16/2024
Reviewed by Bill Hooke 2/17/2024
Reviewed by Molly Graham 4/28/2024

Session 25 - November 29, 2023

Interview Summary: The interview with Dr. Bill Hooke delves into various aspects of his life, including family, marriage, faith, gratitude, and forgiveness. Through personal anecdotes and reflections, Dr. Hooke emphasizes the significance of collaboration, commitment, and self-awareness in relationships. He shares insights on navigating family dynamics, the role of forgiveness and faith, and the impact of personal experiences on shaping one's perspective on life.

Mona Behl: It is Wednesday, November 29, [2023]. My name is Mona. I'm in Athens, Georgia, with Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi, my name is Bill, and I'm here in Springfield, Virginia.

MB: I was just about to say, Bill, I wish you were in Athens, but you're in Springfield, Virginia. Thank you, Bill.

BH: Well, Athens is the place to be, with Georgia number one in the college football playoff picture so far.

MB: Most definitely. Every Saturday, we see that Athens is the place to be. Bill, you have mentioned Chris's name so many times in the interviews. Obviously, she's your life partner. So, I want to talk about her today. Could you start with her name, place, date of birth, and education, and then we'll go from there?

BH: Yeah, okay. Before we start that, she is my second wife. My first wife influenced me also, and she had a much harder job, probably in the sense that I was younger and needed some breaking in. She was born in New York City. We met in college. Her name was Lydia. Her dad immigrated to the US from Russia. He was a Russian Jew who got thrown out of rabbinical school for disseminating secular literature when he was twelve. When he was seventeen, his parents were living over here in New York, working in the garment district, trying to make enough money to buy a small farm back in Tsarist Russia, but the Tsar was overthrown, and my father-in-law was, at age seventeen, a mayor of his village and of the wrong political persuasion; he was a Kerensky-ite instead of a Bolshevik, and his life expectancy was measured in weeks. So, he brought what was left of the family over to Brooklyn, where his parents were living, and said, "We can't go back." They lived in Brooklyn until they were in their nineties or something, never learning a word of English. He went on to be a psychology professor. Anyway, my wife was his daughter, and she was born in New York and went to Swarthmore, which was a Quaker school, but, I think, maybe fifty or seventy percent New York students and Jewish students. They could have filled up the school a hundred percent, but they tried to have a little bit of

diversity. And a kid who went to a terrible high school in Wilkinsburg, Pennsylvania, who is not Jewish, qualified as diversity in those days. So we met. We dated for four years in college and got married. She was a Russian major and went to the University of Chicago to study Russian and linguistics as a graduate student. I was there as a graduate student also. She was the mother of my two children, Malcolm and Amanda. We wound up getting divorced, which is a painful story on a bunch of levels. I'd been divorced for about a year after eleven years of marriage. By that time, I had my Ph.D., and I was working in the NOAA labs. Divorced in 1975. In 1976, I was a federal manager, and I loved these short courses for federal managers. I really was interested in the managerial and leadership process; I couldn't get enough of it. I went to a management course that was put on by the University of Colorado on time management. The person who was doing the logistics for that was Chris. Chris (Lambert?) was her name. She was born in Los Angeles. At that time she had gone to San Jose State when she was a freshman, straight out of high school, met a guy, got pregnant, and got married. Then divorced him about seven years later. When I met her, she had been divorced about five years or so. [She] went back to college, put herself through college as a single mom, working as a checker in a grocery store, to what is now called the University of California, Northridge, and got her degree in recreation. She had been a recreation director. By the time I met her, she had been a recreation director at a retirement community. She had taught skin diving. She had had a whole bunch of different jobs – bank teller, working in a candle factory, all sorts of things. But she was doing this meetings management logistics work in Denver. When she graduated from college, she took a few months off and went traveling all over Europe, went into Turkey [and] was planning on going by herself overland over to Pakistan and India, but as a blonde in that culture that she ran into east of Ankara, she started having incidents that suggested to her maybe that wasn't her wisest idea. So, she gave that up and came through Denver on her way back to California, picking up her son from her ex-husband, but got a job in Denver, and that led to a progression with jobs. When I met her, she had been working for the University of Colorado for a couple of years. She had also just become a Christian, which features prominently in this story. So, where do we want to go from there? It's kind of a long-winded thing. I gave you ten times as much. I gave you what you didn't ask for, which was another whole life story, and I didn't really do justice to that.

MB: I very much appreciate you sharing about your first wife, Lydia, as well. Bill, this is the first time I've heard her name.

BH: She was very important in my life. She opened up a lot of horizons to me. I still remember being at a party at her parent's house before we were married, and one guy coming up to me and saying, “The problem with the world is we're too insulated. For example, you don't know any non-Jewish people, do you.” [laughter] He assumed I was Jewish. Whatever equipment I had at seventeen, nineteen, or twenty, it wasn't enough to tell him I wasn't Jewish. I just said, “Hmm.” [laughter] I'll never forget that. Anyway, we were both atheists, really. We kind of felt religion

didn't matter, but the cultural part did. One of the things that contributed to the divorce was she'd had a missed abortion when she was – when we left Chicago, and I had my Ph.D., but she wasn't finished yet, she thought, "Oh, well, now it's time to start a family." The first child – you miscarry, but you don't really miscarry, and that's what missed abortion is. In her family, people used to yell and talk in a loud voice. I remember when her mom got cancer, my first wife's mom got cancer. Her dad went around the house saying, "I know of no greater tragedy than an old man whose wife is dying of cancer." I never forgot that. She didn't die of cancer. She survived it. That's another whole story. Anyway, people were expressive of their emotions, and I came from sort of a stiff-upper-lip family. So, when I did the stiff upper lip thing with the death of the first baby, that was interpreted as not caring. In that way, the cultural differences contributed to the sinking of the marriage. It wasn't a religious difference. But anyway, getting back to Chris and her faith being a whole big part of the story.

MB: How old were Amanda and Malcolm, Bill, when –?

BH: Okay, yeah. That's a great question. Malcolm was about seven, and Amanda was about four and a half when we met. They were slightly younger when I was divorced, and that was one of the things I'd never really forgiven myself for. It was one of the things that helped me turn to this faith. I think I told you maybe in a previous session that I went to church to humor her, but I found that what I'd done to the kids and so on as part of the divorce – I was accustomed to thinking of myself as a pretty nice guy, and I had to confront the fact that I wasn't, that divorce was one thing I couldn't sweep under the rug. So, I saw myself for the first time as somebody who needed forgiveness, and that was one of the things that was on offer in the Christian faith. You feel guilty because you are. You need forgiveness, but there's a son of God who died for forgiveness for the entire world, not just the people who believed in him, but the entire world – past, present, future. A righteous God can't tolerate sin, so some kind of payment has to be made. That's how that was accomplished. So, she started teaching me or saying some of those things, which probably sounds crazy to anybody who's watching this interview because there's not much preparation. It sounded crazy to me at the time, but it led, in an important way, to where I am today. The other thing I could mention was she came from very conservative parents, politically kind of right-wing, and they were [from] Southern California, the whole family. That was a big cultural change for me, too, almost as much of a cultural change as marrying a Jewish girl from New York. [laughter] So, I went the other way. That had a profound influence on me. They were hunters, and they had all these trophies around their home in California. I had to sort out my own understanding of what that was all about, how I felt about it, and what it meant to remain an in-law in that family.

MB: Bill?

BH: Yes, go ahead.

MB: Sorry. No, you go ahead, please.

BH: We need a more structured question in terms of Chris. Were you going to ask more questions about the kids?

MB: I am going to ask more questions about the kids. But I do want to ask you how your parents felt at that time. You were young, obviously. I find myself leaning on my parents even more as I get older, especially at this moment when the ground feels shaky. Did you have that kind of support from your mom and dad at that stage?

BH: No. [laughter] My dad kind of stayed in the background. My divorce was the first divorce in our family. I remember this strongly. My parents were very skeptical of this. They had come to visit me as a single divorced person in Colorado about a week before I met Chris. So, we had that visit. Chris wasn't in the picture at all. And then, they get back to Pittsburgh, where they were living at the time, and it's not too long before their son says, "Oh, I've known somebody for a few weeks, and by the way, we're engaged, and we're getting married in thirteen days." They were not optimistic, [laughter] my mother particularly. They didn't come to the wedding. They had just been to Colorado. Most families, the great majority of families, they'd have come, I think. I didn't think that was unusual at the time. But looking back on it, I realized – they said, "I'll tell you what, during your honeymoon, if you want, we'll pay to have you come visit us in Pittsburgh," which Chris and I did with the two kids – my two kids, not hers. She had a thirteen-year-old son by that time, and he was my best man at the wedding. I asked his permission to marry his mom. He said he knew what answer he had to give, [laughter] but he said yes. That was a big adjustment for everybody, also. He went to be with his dad in the summers, and this summer was no exception. So, he was with his dad. Chris and I went. But my mom had not been thrilled with either of my two choices for a wife. It took her a while to – anyway, I'm not sure. I'm probably transferring too much of my own feelings about what she felt rather than really knowing. I was probably defensive, and that didn't help. So, it was awkward. The saving person in all of this was my mom's dad. He sent me a letter, a handwritten letter, saying, "I understand you're getting a divorce." He said that's more of a thing now than it was when he was my age. He just wished us well. He said, "It's better than living for a long time in a marriage that doesn't make much sense." This is a very personal story. I found out from my mother a year or two before she died – this was maybe thirty or forty years after all this. She told me a story about my grandfather and his wife, her mom. This is that story. They had dated each other in North Carolina for seven years at church socials, mainly. They were both Christian. He asked her to marry him. Shortly thereafter, he met someone he loved very dearly. He went back to my grandmother, and he asked to be released from his request to marry her. She did not give him that release. So, he married her, and they lived together the rest of their lives. He didn't say anything to me in this letter about this. He just said, "Sometimes people get

married, and they stay in a marriage for a long time." I never saw anything in their dynamic, his dynamic with her, or vice versa; that was anything less than what you'd expect. But he lived his whole life with the woman who didn't release him from it. Today, that's just a stunning thing to contemplate, I think. Just to finish the story, my other grandfather, my dad's father – I think I told you this story. He met his wife. He was a little older than she was, a few years, and I think he was a faculty member. He had a car. She helped him wash it. She said, "Oh, nice car. Will you give me a ride?" Because a car was an unusual thing in those days. He said, "Sure, if you helped me wash it." So, she helped him wash it. He asked her to marry him. The engagement ring he gave her had scratched by hand on the inside of it, the word fickle. Yeah. Maybe I said this in one of the earlier interviews or something. He had asked for that ring back from another woman, [laughter] and she gave it to him. So, that was the cultural difference between my dad and my mom. Anyway, let's see. Where were we going with all this? Okay. So, I was talking about – you were asking me about family reaction, and that was the family reaction.

MB: Thanks so much, Bill, for sharing.

BH: It's human frailty. It's flawed. It's dysfunctional. It's brokenness. It's all of those things. It's from a person who needs forgiveness and got it.

MB: There's also so much love, especially love, sacrifice, acceptance, and commitment in all the relationships that you've talked about, whether it is your relationship with your former wife, with Chris, or your grandparents. That story was really touching. It actually reminded me of arranged marriages in India, how that's the thing, and people really honor that wedding. My parents were into that kind of wedlock. But it's not about me. So, thank you so much for sharing that, Bill. You said Chris had a thirteen-year-old son. What's his name? Then you said Chris also has a second child. So, two children. Could you tell me their names?

BH: No, she only had one child.

MB: One child, okay.

BH: And his name is Sean. Sean Lambert. That was the name of her first husband.

MB: I see. Okay. He's the one who lives in Texas.

BH: Right. He lives in Texas at the moment. He's divorced from his wife now. As soon as the younger child graduates from high school, he's going back to Colorado, which is a place where he feels he's at home. But he and his ex-wife have a very good relationship also.

MB: Terrific. Bill, date and place of your marriage?

BH: Okay. It was Denver, and it was June 26, 1976, the same day of June that my parents had gotten married a number of years prior, back in '41, I guess.

MB: Well, that's amazing. Congratulations. I had no idea it was on the same day.

BH: It was not planned that way. My parents revealed that or reminded me of that after. It was either going to be thirteen days or twenty days or something, I guess. The pastor had an opening. That was how Chris – Chris planned to that opening, and I went along. It's a great way to get married, as I realize when I see the preparations that people are taking today to get married, the amount of advance notice, and all the stuff that goes along with that.

MB: Bill, are Chris and your children – (Sean?), Amanda, Malcolm – are they Christian?

BH: So, it's hard to answer that. Malcolm was baptized. I can't remember. I think maybe Amanda was, too. Malcolm, I would call a Christian. He's autistic, and so what that means to him – one of the things we're constantly reminded of is it's God's strong grip on us, not our weak grip on him. It's not a question of scholarship. I often thought that my wife lived more the kind of life that Jesus had in mind, people living more a life of action and doing things rather than contemplation and thinking and talking. She was a doer. I learned a lot from her about actually following through on things. Amanda married somebody whose parents were Unitarian, and so she became a unitarian. She joined the Unitarian Church. But I would say she might not be. One of the things C.S. Lewis says in his book Mere Christianity [is], "Don't look for Christians to be better than other people. Look at them to be better than they would have been if they weren't Christian." [laughter] He said many of the best people in the world aren't people of faith; they're just people who, through some internal strength, model the kinds of things you would hope to see in a person. They're fully human. My daughter's in that category. (Sean?) prays. Yeah, I would say he's a Christian. He doesn't really go to church. He would sometimes go to church with his in-laws. But in terms of recognizing that his life and his fate is not in his hands because he's struggling a lot with his life, but in the hands of some higher power – depending on how you define Christian – Jesus wasn't particularly interested in that. He just loved people and dealt with them where they were. The most important parts of his ministry were to people who would not be considered Christian.

MB: Bill, your transition from being an atheist to a Christian with Chris's entrance in your eyes couldn't have happened overnight or in thirteen days.

BH: It's still happening. It's still in transition.

MB: Yeah?

BH: Yeah. I keep changing my ideas of what it means all the time. Part of it is learning more. Part of it is watching how events unfold in the world. Learning more is a big part of it. School is always in session for people these days. We think of school as something you're in while you're young, but school is always in session for all of us.

MB: My next question to you, Bill, is going to be – you've talked about – oftentimes, in Living on the Real World, through your book and your blog, you've talked about marriage as an analogy for collaboration. Could you expand on that idea a little bit? Is it negotiation? Is it collaboration? What are the things from this kind of partnership that we can learn and bring into solving problems in the real world?

BH: Yeah, I think the biggest one, one of the things – because Chris and I were both divorced ourselves and the faith was important to us, we kind of said to each other – we didn't just kind of say – we said, "Ours will be a lifetime relationship." I said, "I will never leave you." Well, why should anybody take my word for it? I had left one person already. But that was key. A key thing about marriage is the idea [of] the commitment to the relationship as the starting point versus agreement on where to live, what to do, or any of those things. What you agree is we're handcuffed to each other for life, or we're joined to each other for life willingly. You don't need the handcuffs, but you're not going to leave. That means no matter what the problem is, no matter how serious it is, no matter what the differences are, you're committed to working them out. That's the thing that the world is sorely in need of. Virtually all of our relationships are short-term and transactional. It goes back to what we were talking about before we started this interview. I think I told you that my in-laws, Chris's parents, weren't big fans of the welfare system, and they said people who support a welfare system are abdicating their responsibilities to get personally involved. So, they just throw money at the problem through their taxes and stuff, and two bad things happen. One is the welfare institution absorbs all the money instead of the people it should help. And number two, they lose any connection between why people need welfare and whether or not you want to give it to them, whether they were just spendthrift and dissolute, or whether bad things [or] unfortunate things happen to them, and so on. So, this whole idea of relationship and commitment is just so important in life, and it's not easy, particularly now in the 21st century. Much of what we experience is second-hand, but we somehow have to find ways to collaborate and get back to something a little closer, in every instance, to the kind of commitment that a good marriage can have, or a good family relationship, for that matter. A lot of people can fight with their brothers and sisters all the time, but if somebody comes along and gets between them, then they join forces with that brother or sister and work it out. You don't have to be married to see how this works. It helps to be part of a family. You don't even have to have a good family relationship. You can get this kind of bond with other people. I think the idea of taking the relationship as a starting point – you say, "Well, what if your spouse or your partner murdered somebody? What then?" Obviously, you've got to

step in. But that doesn't mean you give up your relationship with the person. You have to take that responsibility on and take the consequences of it and all the rest of it. Anyway, one of the things that people say is you condemn the deed but not the person who did it. You love the person who did it, and you condemn the deed.

MB: That leads me to my ABA [Ask Bill Anything] for today, Bill.

BH: Okay. Yeah.

MB: Ask Bill Anything. In marriage or in any collaboration, Bill, what do you do when the other – when your collaborator, when your partner – doesn't share your gratitude and your good basically goes unappreciated? We talked about gratefulness last time, and you're talking about collaboration. So, could you reflect on responding to ungrateful [inaudible]?

BH: That's easy. It's one of the things that makes a marriage with a higher power at the center of it a lot easier. I think it's possible to sort of wander into the realm of "I am going to make my life partner responsible for my happiness." If you do that, that's more responsibility than any life partner can or should bear. What I tend to do is when I see something like that, I always find myself saying, "That's the way God sees me." God has been so good to me in so many ways. It's been easy for me to see this. I haven't really had a life that anybody would call hard. Here I am, ungrateful, fearful, and not confident in that God. So, if somebody is oblivious to what I've done for them, I think, "Yeah, that's obliviousness …". I take for granted what I've been given instead of thanking God adequately for it. I take for granted being forgiven of my sinfulness instead of thanking God adequately for that. It turns out to be really easy to forgive other people if you realize how much yourself has been forgiven. Actually, Jesus spent some time talking about that. He describes a man who owed his boss a year's worth of wages. He's going to go to debtors' prison, and he's going to lose everything. He begs his boss for forgiveness, and his boss forgives the whole debt. Well, then the guy who's been forgiven turns around, and he's got somebody who owes him ten dollars. And he puts that guy in debtors' prison because he didn't get the ten dollars back. The boss hears about that and says, "You ungrateful servant. I forgave you this year's wages, and you didn't forgive this person ten dollars. I'm going to throw you in jail until you pay me back." So, it's a story that's very easy to understand. [laughter] The trick is to be aware of what you need forgiveness for. You need to have some self-awareness of your shortcomings. I probably don't have enough self-awareness of them, but I have enough shortcomings, so I spend a lot of time being aware of them. So, that's the answer to the question. You're not looking for gratitude, necessarily, and you're getting your approval from this voice inside your head that says, "You did the right thing," or "You did your best." That's where you get your – it's like our friend, Liz Cheney. She's in the news today because she wrote this book [Oath and Honor: A Memoir and a Warning] about the Republicans. Her own party really rejected her, but she remained true to herself, and she can live with herself. However you feel

about her, it doesn't matter to her. Dick Hallgren told me that. In a purely secular context, he talked about leadership with me and what it entailed and all the rest of it. He said, "At the end of the day, you have to live with yourself." I can stand any kind of day except the days where I feel like I screwed up. Bad things can happen to me, people can be ungrateful or whatever, but if I screwed up, that's the kind of day that's a horrible day for me.

MB: Gratitude is the most beautiful thing, Bill, I've learned from you. If science stands valid and if mass-energy – everything is conserved – then no good deed actually should go –

BH: Unrewarded.

MB: – unrewarded. [laughter] Thank you.

BH: But we all say, in a cynical way, "No good deed goes unpunished." We've seen that, too, as part of reality. Anyway, we're talking about this from a position of comfort. I think about all those people in Gaza right now, all the people who lost family members in Israel right now, and all the grief in the Sudan and in the poorer parts of America. There's just so much inequity that people are dealing with worldwide, and here we are, barely touched by all that. So, to people who are barely touched, it is a big responsibility to make things better.

MB: With that, thank you so much, Bill. Do I have your permission to stop the recording?

BH: And probably the permission of every person watching the video. [laughter] Thank you.

MB: [laughter] Thank you so much, Bill.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 2/20/2024
Reviewed by Bill Hooke 2/20/2024
Reviewed by Molly Graham 4/28/2024

Session 26 - December 6, 2023

Interivew Summary: Dr. Bill Hooke reflects on the impact of his family, particularly his wife Chris and his children, on his life and values. He discusses the importance of accountability, commitment, and follow-through in relationships, emphasizing universal principles that apply to all aspects of life. Additionally, he shares insights into his professional life, highlighting the influence of his faith and family on his work, including his admiration for Lewis Fry Richardson and his involvement in climate change initiatives.

Mona Behl: Good morning. It is December 6, [2023], Wednesday. It is my happy day. My name is Mona. I am calling in from Brunswick, Georgia. With me is Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi, Mona. It's great to see you. It seems like you're a snowflake and that you're never doing the interview from the same place twice. [laughter]

MB: [laughter] Definitely. This year has been a lot of travel. I'm so glad that I – all thanks to the internet- can take you with me wherever I am. So, thank you.

BH: There you go.

MB: Bill, last time we talked about your marriage with Lydia [and] Chris. You reflected a little bit on marriage and collaboration. Today, I wanted to follow up with a couple of questions regarding your personal life. Do you have any favorite stories from your marriage that you would like to share with us? I was thinking about the best of times and some of the most difficult times if you might want to reflect on that.

BH: Okay. That's an interesting one. Wow, I'm speechless, I guess.

MB: Well, if you want, we can come back to this question.

BH: Let’s come back to that one if I can. There were plenty of both flavors of [inaudible] in both marriages. They’re still going on in the second marriage.

MB: So, let’s start with something more straightforward and simple.

BH: Yeah, that might be good.

MB: What activities did you do together as a family?

BH: Okay. That's another interesting one. In my first marriage, one of the big activities right at the beginning was going to graduate school together. I think maybe I shared that my first wife wasn't a morning person. We were at the University of Chicago. Possibly more vigorous folks could have walked to the campus from where we lived, but I drove my wife, and she could never manage to get ready except for her to be on time at the last minute to her class. I would drop her off and then have to find a parking place and be visibly late to my class. So, that was a character-building experience that went on for three years. That might come close to being in that second category, things that you mentioned, but it was part of the package. She is a very bright person in different ways. Both my wives are brighter than I am. I learned a lot from both of them. Let's see. Other activity? One big activity that Chris and I always have enjoyed is travel. She had done a lot of it before we got married. So, that was just part of her persona. She got me seeing parts of the world that I never thought I would see or would have seen otherwise. I think she had to throttle back on her travel for our marriage, and I had to step up my game a little bit. She also taught me how to ski. I managed to live in Colorado for ten years without ever putting my feet in skis. She had been skiing since she was five years old. So, when we met, she was supplementing her income because she was still a single mom. She was working for the University of Colorado, but she was also taking groups of skiers. She'd meet them at the airport on weekends and go with them in the bus up to places like Vail and so on and ski with them and then bring him back to the airport at the end of the weekend. [laughter] So, she taught me a bunch of things. I think maybe I told you that she knew how to drive a stick shift car, and I did not. On our very first date, I showed up at her house, and she asked me – she was busy. She needed to have the car moved out of the driveway, and she said, "Could you do that?" And I said, "Oh, sure." I got into the car, and I realized, to my horror, it was a stick shift. I didn't even know the theory. I'd never bothered to learn the theory. So, I had to confess that I couldn't do that. She taught me how to drive that stick shift without ever laughing. She didn't get too mad when I burned out the clutch in the first six months. She taught me how to dance. She did that without laughing. We'd go in the pool a few times. I was a terrible swimmer. In fact, when I use my feet, I would go backward. She managed to correct that a little bit without laughing. But then it came to skiing. So, I had to go skiing. She was an expert skier. Her son, at thirteen, was already an expert skier. They got me equipped with all the rental gear and stuff. We went up to, I think it was Winter Park, and there was a parking lot that was about as level as the floor of my apartment building and wherever you are. She said, "You're going to need to take a lesson, but that won't be for an hour and a half. So one thing you should learn how to do is fall." She said, "You always want to fall backward." So, she said, "Fall backward." I was in my skis, and I fell backward. And then she said, "Now get up." Well, [laughter] I didn't succeed in doing that. I wound up skating across this parking lot for about fifty yards or so. I turned around, and she was just laughing. I finally found something where she couldn't control herself with the humor of it all. For the first few years of our marriage, she and her son would go off and ski the black slopes and the blue slopes, and I would take lessons and ski the bunny slopes. Eventually, I got the hang of it, at least for the blue slopes. Moguls were more of a challenge than they might have

been. I could mosey through it a little bit, but it was not that great. But it was something we enjoyed doing together and helped me like winters for the first time. I hadn't really ever liked winter particularly much. In Colorado, you really need to enjoy winter. She was like that, just enthusiastic about all areas of life. I started living more and enjoying more than I'd been doing up to that time. So, she really opened me up. What other activities? We played a lot of tennis together. This is politically incorrect – she beat me the first time we played tennis, and that was the last time she ever beat me. I was still learning the game at that point. We'd play, and I was getting better. But one of the things I liked about her, and this is, as I said, politically incorrect, she played like a man. She was just very aggressive and vigorous about it. We used to play a lot of mixed doubles, and we won a lot. Not so much because we were better than our opponents, but we would just play and sort of fall behind a little bit and wait for our opponents to have their first argument as a couple. And then after that, we'd cruise to victory usually because we had the superpower of not getting angry with each other. [laughter] We played a lot of tennis. We'd go to movies and entertainment. Not so many concerts. I never made it to big rock concerts or anything of that kind. But again, it seemed like we were always busy. We did a lot of things around the house together. It probably took too long to answer that, but it gives you a little bit of a flavor.

MB: I love it, Bill. These things have not come up in past conversations, and it seems very different from the way you were brought up in the family. I remember during the first few interviews, you were talking about your childhood and how the environment was. It seems like Chris introduced you, as you said, to so many things, whether it was skiing or – well, you did dance. Your mom [inaudible]

BH: In other words, there was a little bit of a clash between both of my wives and my mom for different reasons, but it tended to be there. There's the old thing about – the question about do you know why Adam and Eve had a great marriage? And the answer is they had no in-laws. [laughter] That social dynamic was interesting.

MB: My next question, Bill, is, what family traditions did you try and establish? First of all, did you try and establish any family traditions?

BH: Again, I think Chris was really important in that. I don't think my first wife and I did so much. Chris believed in really observing birthdays and holidays and being with people during their birthdays and on holidays. We would travel to make that possible. She was always doing something special for the kids in terms of a birthday party or this or that, vacations, and so on. [laughter] The reason I'm laughing is the one tradition we had in the early marriage was we had our Christian instruction once a week. We had a book that we read from; it was called Character Sketches. It was done by a guy named – it was Bill Gothard. Anyway, the book was lessons that you could learn about integrity, honesty, and other virtues from animals. The lessons would vary

from the fact that if a sentry crow failed to sound the call, the other crows would kill it. And geese would mate for life – and things of that kind. The kids still talk about how vile those sessions were. [laughter] Somehow, our relationship with the kids survived all that. But that was not exactly a treasured memory from their point of view. The whole thing was probably a little bit forced. So, it didn't work out too well. But we'd try to go to the kids' athletic events. My daughter was in a lot of plays. She was thinking of being an actress at one time, and we'd go to her plays and things of that kind. But the traditions were more church on Sunday, observe holidays, and things of that kind.

MB: Thank you so much, Bill. What an amazing human being Chris is and what a vicarious personality. So many things she's done in her lifetime.

BH: I tell people if they see a part of me they like; it probably was shaped by Chris. If they see some part they weren't too enthusiastic about, that was probably growing up. That's a bit of an oversimplification, but only that.

MB: Well, there are only things to love about you, Bill. So, my next question, since you talked about your children, I was about to ask what was the most satisfying thing about raising children? What was the most difficult? Three children – Sean, Amanda, Malcolm. Could you talk about that?

BH: It was different in each of the three cases. In Sean's case, I went immediately because of the fact that this was our second marriage from two kids who were seven and four and a half, and my biggest problem was keeping their noses clean to Sean, Chris's son, who was thirteen and wanted eighty-dollar wheels for his skateboard. So, that was a big adjustment. It took a lot of patience on Sean's part, but he handled it well. Another big issue with Sean was that he was not a scholar. He's a bright kid, a very bright guy, but he didn't really like school that much. I think maybe I shared the story – I don't think I've put it on. I'm going to go ahead and say it. I don't think Sean would mind. I don't think Chris would mind. He was on the tennis team in high school. One of the real happy things about being his stepdad was any children from my DNA weren't going to be on any athletic team to speak of, so they wouldn't be there to watch. But it was a pleasure going to his tennis matches and seeing him play. He was very good. He's also remarkably personable. Everybody who knows him loves him. He just had these deep friendships that have lasted for decades, with friends going back all the way to high school and college. I admire that in him. But he wasn't a scholar. He had a 1.7 grade point average in high school, including gym classes where he was getting A's because he was on the tennis team. I would tell him, "Sean, you have to work to get grades that bad. You can't just be sitting there in the class. You have to be arousing some active hostility in your teachers." And he would laugh. Then Chris did something that was very surprising. She was always full of surprises. But this is some insight into her character. First of all, Sean wasn't sure what he wanted to do after high

school. He had a couple of cousins. Chris had a couple of cousins whose father had given him a one-way ticket to Australia. I think we talked about this. No, we didn't? When they graduated from high school, he gave them a one-way ticket to Australia and told them to work their way back home. One kid signed up with the New Zealand ski team, went around with them for a while, and then came home after that. The other one was a dancer on a cruise ship [laughter] for a while and came home. Anyway, Sean admired that, and Chris said, "Well, Sean, we're not rich enough to give you even a one-way ticket to Australia. You'll have to earn that on your own." Things had gotten a little tougher for getting to Australia because they wanted a visa; they didn't want people who didn't have employment to show up on their shores. So, he had to do something about – he wasn't able to get a visa that qualified him for work. He could just visit there, which he did for three months. He saved up the money to go. He went there. When he got to Sydney, he literally called Chris from the airport and said, "What do I do now?" He just hadn't thought about it any further than that. But she had. We were going to a Christian Reformed Church at that time. One of the guys that we knew at this church was a fellow named Walt Ackerman, a really nice guy, and Chris had found out he had a brother, Tom Ackerman, who's an atmospheric scientist. Tom and I talked just last week because Walt died here recently. But Tom is a retired professor at the University of Washington in climate science and very well respected. Anyway, he was on sabbatical in Australia at the time. Chris had made the point of contacting him. So, she gave Sean Tom's number in Australia there. Sean called him, and Tom set him up with the pastor of the church that they were going to in Sydney. The pastor set him up with two young men about twenty years old, who had their own apartment and were eager to share the rent with somebody else. So, Sean stayed with them for three months and picked up a lot of girlfriends, who wrote him for years afterward and had a great time. But he came back to the US, and he was thinking he would go to college. The Christian Reformed Church we were going to had a college, Calvin College, in Grand Rapids, Michigan. Vern Ehlers, who was a congressman from Michigan, spoke at the colloquium a few times and had been a physics professor at Calvin. That's another story. But anyway, Calvin would take kids in the denomination, no matter how bad their grade point average was, on probation. Because Sean was going to this particular church, they took him on probation. Chris told him this. She said, "Sean, we're not sure how serious you are about college. So, we're only going to pay for half your first semester. If you make C's, we'll pay for half your second semester. And if you make B's and As', we'll pay for more. But if you make anything below a two-point, we're cutting you off because we're not sending you to college to make D's." I thought to myself, "I'm glad I'm Chris's husband instead of her son." [laughter] She followed through on that. He had some of every kind of semester. First semester, he was terrified; he made C's. Made C's the second semester. Sophomore year, he got a little cocky, and he made a D or two. She cut him off. So, he stuck around Calvin and got jobs as a waiter, working in a clothing store, taking out loans, and so on. And then, junior and senior years, he started making B's and A's. He had a semester abroad in Spain. At the end, we were paying for everything. That was his college career. That tells you a lot about both of them. So, that's a little bit on Sean. He has supported himself in all

sorts of strange ways. He worked for the Skip Barber Racing School as a sales representative. That's a long story. He started his own bicycle wheel shop, which he still runs. [He] sells bicycle wheels that are manufactured in Taiwan here in the US under his label, all across the US from a web-based kind of store and does other things. Amanda went to William and Mary. She got great grades. She really took after my first wife, very strong academically, and so on. She wanted to be an actress to start out with, but [her] diabetes and having one problem on stage when she was in high school with having an insulin reaction, which she got through, sort of convinced her that Mary Tyler Moore aside, that wasn't for her. So, she went into psychology and sociology and became a social worker. She still does that here in the area. She's my moral conscience. She's such a model of integrity and so strong in concern for children and their well-being. I learn a lot from her and try to live up to her example. Malcolm, my son, who's Amanda's older brother, is autistic, a high-performing autistic. He has a job. He lives sort of on his own. We wind up taking care of – anything that isn't a day-to-day thing we have to kind of take care of. He works in the mailroom of the U.S. Mint. I remember meeting John Tukey once, the famous statistician. My dad had worked for him. My dad was a very smart guy. And John Tukey said – we were talking about the fact that my brother was also a statistician. And John said, "Well, what about the kids?" I said, "Well, we were oh-for-three in having any of them go into science. Tukey said, "Yeah, reversion to the norm." [laughter] It's the comment from the great man about my family.

MB: That is amazing, Bill. I love reading about the influences that your children have in your blog posts on "Living on the Real World," especially Amanda and her influence. So, you've talked about that. That's pretty fantastic. What values did you try to raise your children with?

BH: I don't think we went around it in an organized way. They'd be the better judge of that. You should maybe have an interview with the three of them. Wow. One of the things that didn't come up until I became a Christian and Chris and I were married was talking to them about God. Her son, I think, was already a Christian at that point. He had worked that out. He was thirteen years old. My kids were a little younger, and it required some more thought. There was some awkwardness there. Kids pick up a kind of simplistic view of things when you talk to them about that, and this was shared parenthood, so they were spending some part of every week with their mom, who was an atheist, and Chris and me, who weren't. We had a lot to work through with all that. We tried to just share the same values that every other parent does. You try to have your kids have a bit of a work ethic and live up to their potential, but also be honest and humble. You realize, as a parent, your own shortcomings in all of those areas that you're trying to impose on your kids, and you try to do a little better.

MB: Bill, how has being a parent changed you?

BH: How has being a parent changed me?

MB: Yes.

BH: Well, mainly, in terms of [inaudible]. Just in talking about becoming a Christian, I've always managed to think of myself as a pretty nice guy. We're pretty good at kidding ourselves. But the divorce, particularly with the two kids involved, was just something I couldn't sweep under the rug. I still mourn that on a daily basis. I would say the big thing – when you're married and you have kids, you get better at understanding the difference between problems that aren't really problems and serious problems. I've always thought that the national debt is a huge problem, and yet, it doesn't affect us very much. Our own agency debt or our company's financial situation – that's more serious. Our home financial situation is even more serious, and so on. It's that way with kids. When your child is sick, or when your child is struggling with life, it's much more – it's just huge compared with things like that happening to someone you don't know. It shouldn't necessarily be that way, but that really drives that lesson home. I would see that a little bit in my brother's life. He never wanted kids. He didn't have kids. He's been married twice, also. But little things bother him. A typical example would be – you get on an airplane, and the baby in the seat in front of you is screaming its head off. My brother would think – and his wife – totally inconsiderate of the people, of the adults involved. If you're a parent, all you do is kind of think, "It's not my child." [laughter] And you can just listen to the music from the row in front of you for the whole flight all the way to Thailand or whatever. It's not yours. I do remember one flight where the parents got on, and they had a small package of gifts to give everybody in the rows in front of them and the rows behind them – little candies and a few other little things. They said, "This is going to be a long trip for you. Here, have this." I thought, "Wow." That's the difference that marriage makes, I think, in kids. [In] marriage, you lose control over your life. One of the things is you learn how wonderful that is. That's when you do start living versus – we don't see many people having said this, and so I'll take credit for this: hell is the place where all your wishes are granted. If you're living alone, you tend to satisfy all your wishes unless you're a profound spiritual person like you yourself are, a combination of culture and your own family that you're still very involved with. You don't see things that way. But you can fall into that trap. I guess that's what I'm saying. A lot of single people do. They choose tidiness over – I'm thinking about that a little bit with COP 28 going on now. [Editor's Note: COP 28 refers to the 28th Conference of the Parties under the United Nations Framework Convention on Climate Change (UNFCCC). These meetings serve as crucial gatherings where countries discuss and negotiate actions to address climate change, aiming to assess progress, negotiate agreements, and set future targets for emissions reductions and other climate-related actions. They bring together government officials, policymakers, scientists, activists, and stakeholders to strengthen international cooperation in the fight against climate change.] So we could perhaps put a little bit of climate science in this since this is what it's supposed to be all about. The juxtaposition to me is you have this meeting, which is a core of a few hundred people, whoever the people are, who are making real decisions. They're trying to deal with

carbon emissions. They're trying to deal with methane, sort of squeeze those things down to zero net over the next couple of decades. They're trying to have a financial mechanism for making this happen. They've got some problems like that. Then they've got seventy thousand followers who are doing different things all around them. One of them is a small group set up by Pope Francis and a Muslim counterpart [Ahmed el-Tayeb?]. I can't remember the Muslim counterpart's name. They've established a kind of quiet room for prayer and meditation off to the side of this. It's very similar to what Carlos Martinez is doing within the AMS [American Meteorological Society] at annual meetings. At yesterday's conference call with Carlos, I said, "Hey, Carlos, they're imitating you over at COP 28." Here is the point that I'm driving at. In this very turbulent time – normally, in calm times, matters of faith and matters of climate change are completely separate. But in times of turmoil and so on, things become nonlinear and chaotic, and they interact. That's actually a good thing. That's kind of what happens in a marriage. [laughter] You bring that element into things. Marriage is a partnership, and partnerships work best when there's a goal that both people have in common, and they can't achieve it alone. There are various goals that fit into this category in a marriage. That's what's happening in Cop 28. I believe that the folks in this tent that's the quiet time for meditation or whatever, have a lot more in common with the solution – have part of the solution to the problem that the COP 28 people are dealing with, and it's a good thing that they're side by side there.

MB: That's incredible, Bill. What a beautiful analogy. I am very fond of Carlos and his work and how much he has elevated these conversations within the weather-water climate enterprise.

BH: Yeah, we'll see where that goes. I hope that it becomes something a little more robust, but it's headed in that direction, thanks in part to his energy and yours and the other people who are contributing to it in different ways. Yeah.

MB: You said partnerships work best when both people have a common goal. My next question is going to be: what was Chris's and your goal in your life together?

BH: Well, I think some of them are the generic goals. One of them is [to] have kids and raise them. Chris and I came equipped with kids, so we never had any of our own. The kids are a joint project, and you want them to thrive and contribute to society and so on. I'll pick an example which again shows life being out of control, but you learn things. So, Chris set up – the city of Alexandria has a homeless shelter. They set it up about thirty years ago. They reached out to churches in the area, and Chris represented our church. One of the things we wound up doing was getting a calendar, and a couple of dozen churches would come once a month and cook a meal for the people in the shelter. Of course, this was something that was mother's milk to Chris, and it was the last thing that I wanted to do. Of course, it became a shared goal. We would always go do this together. I learned a lot from – again, here I am wanting a tidy life, but when you see what's going on in the homeless shelter, you sort of learn how tough it is for a lot

of people not, and how easy it is for such a small minority of the world's people. That's sort of a peculiar thing to toss in, in terms of a shared goal, but it's in the spirit of all the things we've been talking about all along. But you want to do some of those things together. Travel was a shared goal. Maybe you've had this feeling. Travel is, I think, much better as a shared experience. The difference between my business travel when I went by myself and when Chris happened to be along and we did something before and after is like night and day.

MB: That's amazing. One thing that you said in your last interview was that you learned from Chris how to follow through on things. Can you expand upon that and share an example?

BH: How to –?

MB: How to follow through on things.

BH: Follow through on things, yeah. I actually learned how to do that as opposed to learn how to admire it. That's amazing. Because I think in the workplace, what I did – this is a horrible confession to make – was I surrounded myself with people who were good at follow-through. Then, the group is just capable when you do that of amazing follow-through. [laughter] If you just don't stand in the way of that, then life is good. But she made me confront it. One of the things she told me very early in our marriage – there'd be things that would come up, and I'd fall short in this or that area. I'd say, "I'll try to do better." She would say, "Don't try to do better. Do better." [laughter] So, the light bulb would go on, and I would think to myself, "Oh, yeah. Actions really have to match the words." There were hundreds of applications of that one truth, which is a big follow-through issue. And that kind of summarizes that, maybe.

MB: All right. This brings me to –

BH: I will say one other thing, too, which is that for years, Chris was taking care of a lot of stuff. Since she's developed dementia and been incapacitated, I've had to do a lot of stuff. I've had to take follow-through to a whole other level and a whole bunch of other applications and learn that everything that comes up – so, I heard this in an academic way from a very famous – not very famous, but a climate science guy at NOAA, Mike Hall, who was NOAA's representative when NOAA, USGS [United States Geological Survey], NSF [National Science Foundation] and NASA [National Aeronautics and Space Administration] were setting up with OMB [Office of Management and Budget], the global US Global Change Research Program. Mike used to say, "I'm a boat owner. What I learned from being a boat owner was that if something goes wrong with the boat, it's my fault. With or on the boat, it's my fault." That is related to the follow-through kind of thing. You have to deal with it, and that's what I've learned since Chris's health has been failing. I have to deal with it. School is always in session. We're always learning those pretty simple life lessons. One thing that people would tell us over and over again

is you should embrace them right in the beginning instead of painfully relearning them a little bit at a time. It's like tearing off a bandage or something like that. Or the whole thing about you wanted to be kind to the dog, so you cut its tail off a half inch at a time. You need to embrace the follow-through idea and do it, and then you'll be much happier. So, I say I surrounded myself with people who are good at follow-through. But the other thing is I got very good at making sure that I knew enough of what they were doing so I could tell whether there was follow-through.

MB: What great leadership lessons, Bill, all of us can draw from Chris and your life together. It's quite amazing the partnership that you've elaborated for all of us.

BH: You say it's amazing, but I really think that most couples, and most people who are living, quote, "alone" – I mean, people who are living alone are not living alone, as you know. They have family, they have friends, and so on. These issues of accountability and commitment are universal in those relationships, too. So, it's amazing that the whole human race is doing this. I don't think any of us is much better than anybody else at doing these things. I think you and I could turn this around and interview other people in a certain way, and we would discover reasons to be amazed at what they've done and are doing, how they're going about it, and the integrity they show and the energy and passion. We've probably used up a fair amount of your time here.

MB: [laughter] I have one AB [Ask Bill] Anything if that's okay.

BH: Yeah, that's great. This has been a pleasure. I feel awkward discussing the family. On the one hand, I'm proud of them. I'm happy to do it. Everybody should get a chance. But it's just not something I'm used to doing in the workplace.

MB: I completely understand, Bill, and yet, it speaks volumes about – it sheds so much light on your work as a professional in this space and how you think. I think our families have a huge influence on us, the people that we surround ourselves with, whether it is the family that were born into or our chosen family, be it at work or our friends. So, thank you.

BH: I'll just mention one other thing, too. People talk about management style. They talk about, "Gee, Bill, you can give a pretty good speech," or whatever. A lot of that came from church. I reflected about it. I taught a lot of Bible studies and small groups, and you learn a couple of things. One is when there are only two or three people in the room; you still need to bring your A-game. So, I learned all along not to be disappointed if there weren't hundreds of people in the room and to see the importance of small groups always. Just the way you have give-and-take and engage other people when you're giving a talk instead of just droning on all came from outside the workplace. A lot of those lessons from church carry over to the family

and from family to church and vice versa. I think other people do that. It might not be church; it might be some other kind of social group or committee or something that they do those things in.

MB: Thank you, Bill. Do we have time for one AB Anything?

BH: Sorry, yeah. I have more than enough time for this, but I'm trying to show mercy for you and the viewers. [laughter]

MB: [laughter] Bill, I was rereading "Living on the Real World" this past week, and I came across Lewis Fry Richardson so very often. You mentioned he was a meteorologist. He's the father of the study of fractals. You mention something called the Lewis Fry Richardson World Outlook Project. I wonder if you could share with us you know what your thoughts are with respect to what that World Outlook Project looks like, especially in the context of the things that you mentioned in "Living in the Real World," which is the basis of fact, policy, social media, IT [information technology]. Could you talk a little bit about what you had in mind when you shared with us Lewis Richardson's World Outlook Project?

BH: Well, maybe you can refresh my mind just a little bit more of what I said. So This is one of the one thousand posts on the blog or something, right?

MB: Yes.

BH: I remember when I was talking about Lewis Fry Richardson. This was before computers. Actually, the word computer in his time meant something else; it meant a man or a woman who was doing calculations. He pictured a roomful of people doing these calculations and doing weather forecasts. I was, I guess, trying to extend it to trying to tackle the threefold problem that I kept talking about, the resource hazard environment problem, in the same way that you would have cells that would be sort of locally based, and there would be constant communication about analysis of success and failure and emphasis on early detection of success and failure and sharing those results. I thought it was a way of – I think a lot of people see this climate change thing as, "Okay, there are seventy thousand people at COP 28. So that means that they're …" I'm probably going to be off by a factor of ten someplace. So, seven hundred thousand, seven million, seven hundred million, seven billion – "four orders of magnitude more people who were not at this event." They're all seeing climate change as somebody else's problem. You just can't have a problem that big with only hundreds of thousands or a million or so people involved – ten million people involved, a hundred million people involved – and everybody else sitting there in judgment on how that's going and not participating at all. You really want something that's closer to eight billion participants. What I had in mind with that Richardson project was something along those lines that would draw people in [and] that would have more universal involvement. The good thing about it is that even with artificial intelligence, it couldn't be done

by a whole bunch of computers. You still need people involved because of all the policy decisions you need to make in the kind of issues of poverty and the rest of it. Does that maybe answer the question?

MB: Most definitely, Bill. I am so grateful to you for all the blog posts that you have on Lewis Richardson on Living on the Real World. A particular one that struck me – actually, I reread this morning – was this blog post that you wrote – it's right here in front of me – on October 11, 2012. And it says, "WWLFRD."

BH: What would Lewis Richardson do?

MB: It's quite amazing. It was from Richardson's vision. Imagine a large hall, like a theater and circles – I thought that was very compelling. Very intriguing.

BH: He was interesting on other grounds. He was a conscientious objector, and you paid a real price for that in England in World War I; you were really vilified for doing that. He drove an ambulance in World War I to bring the wounded back from the front. In his downtime, he would sit in the haystack at some barn someplace with his slide rule and try to calculate this forecast for Europe. He had a dataset for a particular day, and it took him weeks. The forecast wasn't any good, really. He messed up in a couple of respects, but he gave it a try. He was a person who is both a scientist – you mentioned his work on fractals and so on. He was a scientist. He was a person of faith. He was trying to integrate all that in his life. He was showing courage while that was going on. He was a pacifist. I mean, there was just so much to admire in each facet of his life. If we knew him, we'd probably think, "Yeah, maybe he was a prig of a human being or something and just very difficult to get along with personally." He must have had some flaws, but that's for another day. But we all do. Well, thank you for bringing that up. Yeah.

MB: Thank you so much, Bill. There is so much to admire in every facet of your life. Thanks for sharing your stories with us.

BH: Well, thank you for listening so patiently. Until next time.

MB: Do I have your permission –?

BH: Yeah. Thank you.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 2/27/2024
Reviewed by Bill Hooke 2/27/2024
Reviewed by Molly Graham 4/28/2024

Session 27 - December 13, 2023

Interview Summary: The interview with Bill Hooke delves into various deep topics such as faith, climate change, renewal, and the significance of open dialogues about death and dying. Hooke emphasizes the importance of love, trust, and community in these discussions, drawing from his Christian perspective on death and resurrection. The conversation also explores the role of professional societies like the American Meteorological Society in facilitating these conversations and fostering understanding.

Mona Behl: It's Wednesday, December 13, [2023]. My name is Mona. I'm in Athens, Georgia. Good morning, Bill.

Bill Hooke: Morning, Mona. Happy to see you.

MB: So good to see you, too, Bill. Thanks for making me happy. I know that I take away a lot of time from your busy life. I'm just super grateful for all your perspectives, Bill. This means a lot to me. Thanks again. Bill, today, I want to talk to you about death, actually. Sorry to sound so morose. The concept of death influences the way we live our lives, I think. I tend to reflect a lot on death, especially after losing the two people that I loved the most. I'd love to hear your thoughts. What does your religion say about death? How do you use that concept of death to influence your daily actions and the way you live life?

BH: Wow, okay, those are big issues. I've thought about them a fair amount. I think we all do. I had a pastor a few years ago, for several years, who used to look at the congregation and tell us all that we didn't think enough about death, that we ought to think more about it, prepare for it, and live in the light of that reality. It's fundamental. So, a couple of things. You ask about what religion says about it. What mine says about it, the Christian faith, is pretty straightforward. From the very beginning, it talks about the idea that people were intended to live forever and that sin brought death into the world. The Bible talks about Adam and Eve, but it's really a story about just what's so fundamental to our nature. It's not that we do the wrong things out of ignorance. We know what the right thing to do is, and we do something else. Faith also teaches that God is holy, and he can't stand that. [laughter] He really can't abide it. He can't let it just go on and not pay attention. There has to be some atonement for it. All through the Old Testament, the people of Israel made sacrifices. They were told that they were made in God's own image, but that really seemed like an alien concept to them. I mean, all they were used to, if you read the narrative, was fire coming out of the mountain and just a very scary God. It was hard to conceive of him as somehow really relating to them. So then, a couple of thousand years ago, a child was born. It wasn't particularly remarked at the time. All of this was a sense that people had looking in the rearview mirror. This child was born into pretty ordinary circumstances. The Bible talks a lot about signs and wonders. But this Jesus Christ, pretty clearly, was a historical

figure. It was pretty clear that people thought he was amazing. To be around him – he would be very frank. We've talked a lot about being frank and honest in conversations. We've talked some about giving people hard news in a way, and Jesus was like that. The people of the time understood that the ones in control, particularly the leaders of their faith, who were in control, the Pharisees, and so on, were hypocrites. They were selfish, and they were the embodiment of all the things that were not supposed to be, but they were in charge. Their message to the larger group of people was you're suffering because you've sinned. Not only are you having a tough time in this life, you're going to have a tough time for eternity. Jesus came with a different sort of message, which was, "Those folks are hypocrites, and God loves you. God really doesn't want anybody to perish. Feels bad about things." So, that was his message. We wouldn't think anything about it if he hadn't been crucified and then been resurrected. You'd think, "Oh, nice teacher." There were other prophets like that; nobody remembers their names, and nobody would remember his name. That would have been the end of it. But what the people present at the time said was that he died, he was buried, and three days later, he was back wandering among them, very tangible in the flesh, not just some disembodied spirit or a holograph or something, but you could touch him, he could eat food, he was recognizable physically, and so on. It changed them. The people who were hanging around him were kind of a ragtag group, not particularly courageous. They were all expecting a Messiah who would be a military leader. So, they figured, "Hey, if we hang out with this guy, the crowds are building up." It's kind of like certain populist leaders we can think of. "We're going to take over. We're going to kick the Romans out, and we're going to have a victory like we're used to having victories." He said no, something else was going to happen. But it changed them. They went from being cowardly, from being impulsive, from being timid to resolutely just saying what they thought happened. This guy came back to life. I think people of that time – they might have been ignorant about a bunch of things. They might not have known certain laws of physics and so on. But they were much more acquainted on a personal level with death than most of us today. Most of us did not see people die or animals die. We have an academic understanding of that, but they had a personal understanding. Death was something they saw every day. So, they were experts at this. They were saying, "This guy lived." Furthermore, he said, "Everybody is going to live in eternity. We don't understand it. But that's what's going to happen." Now, I believe that, and I've tried to give something that maybe sounds halfway rational instead of the ravings of a lunatic and so on. But I want to invite you to think about a little metaphor. Picture twins in the womb. I can't remember whether you and I have talked about this personally before. But twins or triplets in the womb, and it's cozy, and it's the universe as they understand it. Everything is great. It's getting a little crowded and congested. But then one of them is born. What's the reaction [of] the siblings left behind? This one who was born has died. He was with them. He's no longer with them. Or she was with them. She's no longer with them. They're gone. They disappeared. They died. They could have a more sensible discussion about what happens than we can have about what it means to die ourselves. We've been given that metaphor. It's not one we talk about very much, but to me, it means you can't talk about – it's kind of folly to try to talk

about life after death in the same way that infants, doing the best they can, can't really communicate to each other about what they just witnessed or what's in store for them or any of the rest of that. Their sibling died, and we know that that sibling, maybe considering how horrible the world is, probably wishes he was never or she was never born, came into a whole new level of being. If they were fantasizing about what a perfect life would be like for these siblings in the womb, they'd be talking about – the blood would have a little more nutrients, the temperature might be adjusted slightly or whatever, and it might be a little roomier. [laughter] They wouldn't have any idea about light. They might not have any appetite for light. They're not thinking, "Gee, it's dark in here. When do we get out of here? I wish I had a watch with a phosphorescent dial or something so I could see how long I had to wait." They're not thinking that. And we're about that ignorant about death. Okay. There's another metaphor that's popular in our field, which is the metaphor of the butterfly. I once wrote a blog post on this about Ed Lorenz chatting up the three caterpillars. I don't know whether you remember that one or not. But Lorenz is working in the lab. He's running this series of experiments where he's running the numerical data, getting a prediction, and he makes a slight change. He takes a shortcut; he changes the decimal point in a few inputs or something. Instead of getting slightly different forecasts, he happens to get wildly different ones. They're looking for a metaphor about how to describe that, and they come up – somebody said, I think it was a colleague of his, a Canadian guy by the name of Phil Merilees, who came up with this idea of a butterfly flapping its wings in the Sahara and creating a hurricane in Texas three weeks later. So, the idea is that Lorenz doesn't know he's about to discover this butterfly effect. He goes on a break while he's waiting for the computer to run. People had to do that in those days; it wasn't as fast as it is now. He happened to see three caterpillars on the pavement in the grass by the pavement. He talks to them a little bit. He says, "What do you want out of life? What's going on? What's your goal?" The one caterpillar says, "I'm a caterpillar. I'm going to be ten percent bigger. I'm going to be twenty percent bigger. I'm going to be a huge caterpillar. I'm going to be able to eat more and do more and all the rest of this." He talks to the second caterpillar, and that caterpillar says, "That's not enough. I'm going to fly. I'm going to change my innate character, and I'm going to fly. I'm going to be able to go anywhere, everywhere, fly for hundreds and hundreds of miles, and see the world." So, Lorenz talks to the third caterpillar, and the third caterpillar says, "I don't want to just see the world. I want to change it. I want to be able to flap my wings here and cause a hurricane over there and flap my wings again and cause one to not appear. I'm going to make a difference." Then, he goes back to the lab and discovers the butterfly effect in his computer program. So anyway, that's a little – I won't say it's a little whimsical; it's fantastical, but that was what I was thinking the day I needed a blog post. [laughter] I don't know that that really gets to your question very much. By the way, here's the second part of this death thing. Then, people go back, they look at the Scripture, and they say, "Yeah, this idea that there'd be a son of God …". First of all, this idea that we're made a man's image, that's not a stupid idea. That's one of my favorite Christmas hymns, "O Holy Night." You've been reading a lot about that lately because I keep writing about it every year. The line in there about, "Long lay the world in sin

and error pining. 'Til He appears, and the soul felt its worth." For the first time, people could look at that line, "You were made in God's image" and think, "Oh, there is so much more connection than I had dared to hope." I would read this thought and think, "Yeah, yeah, yeah." But now, I believe it because they were looking into the face of a guy – I ask myself a lot why he could get away with saying the things he did. I have a feeling. We've all had this feeling with certain people that you can – you come across them, and you realize that you're in the presence of somebody who genuinely cares about you. For these people, most of them, it was the first time in their life that somebody didn't want something from them. They could just see the caring immediately. It just transformed how they responded to things that he said that would have scandalized them if they'd come from somebody else or irritated them and made them angry, frustrated, or fearful. All they could see from this guy was love. But they went back, and they read the Scripture, and they also wrote about what they were thinking about. It's pretty clear that the people in that time, when they talk about Heaven – we send astronauts out into space, and some of the early ones came back and said, "Well, we just want you to know, we've been out further than anybody has been before, and Heaven isn't there; it's further out than that." But the Bible talks not about that, but about Heaven coming to earth. It talks about the renewal of all things, meaning getting back to that idea, those two ideas that God sort of asked people in the Garden of Eden, this thing that we feel so tangibly that we lost – this perfect world. He said two things: take care of this world and be good to each other – do good, not evil. This idea is that there'll be this second coming. It will be a restoration and a renewal of all things. So that when we work on something like trying to clean up the planet, when the COP 28 [28th Conference of the Parties to the UN Framework Convention on Climate Change] event winds down, and people are talking about it, that's all moving in a direction. You have a couple of choices of the narrative we live in. One is everything is chance. Evolution is chance. The flaws in human nature or chance, but we're condemned to live with them, and that's where we're making a mess of things and why we're doomed. Or you can have a richer narrative that says, "Yeah, we have a role to play. But there might actually be a scriptwriter." [laughter] It's not a rigid script, something more like jazz and improv, where there's an outline, and people know that they're playing the "Basin Street Blues" versus "When the Saints go Marching In" or something. But other than that, there's a lot of license, freedom, and joy to be had.

MB: Thank you, Bill. I have so many questions. I loved the analogy. Just going back to a few things that you said there. I loved the example that you gave about twins. To me, it sounded like transition in Hindu culture. Death is considered to be a transition from one life to the other. You discard one set of clothes and wear the other. So, I really love that. In Hindu culture, this idea of detachment is very prevalent. Was Jesus detached from his actions? His people?

BH: No. Just the opposite. Just the opposite. I think the shortest verse of the Bible is "Jesus wept." It was about the death of a friend, actually. He wasn't detached. He was very involved. One of the things I'd say is – a lot of the things I just said would set the teeth of an atheist on

edge. That used to worry me more than I did. Then I realized that if I were an atheist, what would my goal in life be? My goal in life would be to prove that there's no hope. [laughter] I'd just think to myself, "Wow, what a thing to sign up for." Anyway, you might look around for something else. We can have all these discussions about the nature of God and whether God exists. I put this in the book Living on the Real World. I think ants could have a more realistic discussion about human nature than we can have about the nature of God. The gap between ant intellect and human intellect is far narrower than the gap between human intellect and any kind of God intellect that would matter. If we're going to talk about – God can't just be us plus ten percent, or else we're on our own. Who needs that, right? Don't need somebody ten percent smarter, ten percent more powerful. It's not orders of magnitude. It's clearly not in the picture. We wouldn't have this discussion unless – and here I have an image from my dad, so I'll just mention this. My dad, I think I told you, instead of teaching my brother and me practical life skills, taught us math. After supper, we'd sit down with his fancy, laminated wooden clipboard and his sheets of paper, and he would write in little, tiny scribbles that we couldn't really read. He would ask us questions – and we would fail to answer them – about mathematics. Eventually, out of his love for us, or out of frustration, or out of a mix of those two things – I'd like to think it was love – he would give us a hint. We could not have a sensible discussion about a creator, a higher power, God, whatever faith, unless that creator gave us a hint, and we see them. The Bible talks about this; other faiths talk about this. One hint is nature itself: the beauty, the wonder, the awesome complexity and intricacy, the way everything is connected, the scale of it, all shouts out that wow, there's something behind this. Then the question is, is it good? Is it bad? Did it set all this in motion and go play with something else in creation and not pay much attention to how we're doing over here? Or is it involved or detached? But we get these hints, and every faith has its set of hints. In the Christian faith, the Bible is one. The incarnate Jesus is one. There's a guy showing up saying, "I'm the son of God." You don't have much of a choice there. You can't say, "Oh, he's a good teacher," because he's either who he says he is or he's a liar, a scumbag. [laughter] Then you scratch your head, and you think, "Well, he kind of behaves like I might hope some kind of God would behave." [laughter] "He seems to be walking in his walk." And then he comes back to [life]. You see what I'm saying. So, you get hints. We have hints in our own lives. If we look at our own lives, we can think, "Oh, I got where I am because I was smarter or better looking or played football better, or all those things, or none of those things. I didn't get very far." Whatever. Or you can say, "There's something behind this." Each of us has sort of a different trajectory. That's one thing that gives you hope about eternity. If eternity is a kingdom of cookie cutters, everybody's the same. Everybody's thought the same. Everybody's equally surprised to find themselves there for the same reasons or whatever. It's going to [inaudible] people pretty quickly. One of the things I keep thinking – as I said, we couldn't imagine what it's going to be like. To me, it's going to be unimaginably richer and more varied. We talk about diversity, equity, and inclusion. We're just going to find those concepts are so tame, so limited compared with what's coming, and so unnatural and forced. It's not going well with diversity, equity, and inclusion right now. It's not a good moment. It's a great idea, but

it's struggling, and part of it is it's going to be an even greater idea. It's going to be fundamental, but probably more in the same way that breathing is fundamental. It will be fundamental but effortless rather than something that we have to just sort of take a lot of energy from other things to work out. I have a feeling this video is going to be erased.

MB: I love this, Bill. I have a couple of other follow-up questions.

BH: I haven't given you much chance to get a word in edgewise.

MB: So, about the ragtag group of people that follow Jesus, what did Jesus do to inspire them to rise to be the best of themselves? You've talked about them a lot. What did Jesus do to inspire those people to action?

BH: Well, I said a couple of them. One is, it's pretty clear that if he hadn't come back to life, if there's just the grave someplace – next to Grant's Tomb and Washington's gravesite down south of DC here and so on – you had a tomb that says, "Jesus is buried here," there wouldn't be much action. So, one thing He did – remember, I had a pastor who was more colorful than some of them. But he kept saying, "If a guy can come back to life like that, I'll follow him." [laughter] So that was a big deal. People talk about the miracles that Jesus performed, and He didn't perform the miracles – you'll notice He didn't come and make the world whole. He came and authenticated himself. He changed water into wine, but he didn't change all water into wine. He healed some people, but only a handful. What he was about was saying, "You've got to look within yourself. If you look within yourself, you'll find that you're in touch." I think, again, these messages are not unique to Christianity. I'm talking like this because this is the only one I know. We could turn the whole discussion around, and I could say, "So tell me, Mona, what lights your fire?" Maybe we should do that for a few minutes here in just a second. So, one thing he did was come back to life. That was the big one. The other thing was he – Francis of Assisi says that you should always preach the gospel, the good news, but if necessary, use words. So, the real way that you proclaim good news, the real way you proclaim the kingdom of Heaven is near, is to embody it, to heal, to reassure, to comfort, to bring back to life. He brought other people back to life temporarily. It just aggravated the establishment to no end. I mean, they wanted nothing to do with him. They really wanted to – He was an embarrassment. He was a risk. He was a threat. They worked to get rid of him, and they did. One of the things you'll read is that the crucifixion was not something that happened to Jesus. It was something he brought about. Another metaphor you can think about is, so you're playing a chess game with somebody, and you put a gambit out there, you put out a sacrificial piece, and they're too eager to pounce on it, but as soon as they do, they realize they've lost the game. The narrative is that in this conflict between good and evil, that's what happened at that moment; the power of evil lost its power over the world. I mean, again, going back to "A [thrill] of hope the weary world rejoices for yonder breaks a new and glorious morn." Hope became a much bigger deal. Not right away, but

kind of worldwide. There are a couple of billion people who self-identify this way. Every faith, I think, has its own flavor of hope in it. Not sure that answered your question. Let's turn things around. Okay. I know you've got other questions; if you've got a question that trumps any of this, go ahead and ask it, but I would like to know – so speaking from your Hindu faith or your culture – and we haven't talked very much about this, how do you see these matters – death and how you should live your life? Where does your strength, your love, [and] everything that you like about yourself come from?

MB: Those are such big questions, Bill. I wish I had the right words to answer them. I think in Hindu culture, my mom and my grandmother – both of them were (Vedantees?). Vedanta is a set of principles that defines how to live a life. What I learned from my mom and grandmother was life is about self-realization and discovering, perhaps, our connection with God. That's how life is thought about. So, you're constantly – my grandmother used to visit the cremation grounds when she was a young woman every single day to remind herself of death and how we should use our time on this earth. You've talked a lot about forgiveness, and I've been reflecting on that. I feel – it probably came from you – that if you forgive, you are probably transforming into something which is higher than your petty self. You're transforming yourself and connecting to God, and those are the very few moments, whether it is throughout your day or in life, that you feel connected to a higher spirit and connecting to the world. What you said about our connection to nature itself, I think that's where I often think about traditional and ecological knowledge and how, in my culture, too, we have this deep connection to be stewards of the land where we live and what can we learn from every living being, be it an ant or a tree around us. Whatever you said in the past few minutes deeply resonates with what I had learned in my culture. There are still areas that I struggle with. So forgiveness, we've talked a lot about that. You [said] that Jesus was very frank; He gave people the hard news. It seems like Jesus was able to balance forgiveness and accountability in some way. So, for any great leader, anybody to be in that role, how do you do that? To what extent do you forgive? How do you balance that with any kind of accountability? Did Jesus do that? And if so, how?

BH: Wow. Okay, so you've opened up a couple more subjects. I want to go back to a couple of things you said, but let's try to tackle that last one. So, one story that Jesus told was about a guy who was a manager for a really rich ruler, and he was managing his funds and his assets, but he was also siphoning off some of the money as he went along. He owed the lord about a year of his wages. He was the manager of all this well, so he was getting a lot. His lord said, “You owe me this money; you haven't paid it. I'm going to throw you into debtors' prison,” which was a big deal. You didn't get out of it until somebody else paid your debt. The guy says, “Please, please, please.” So, the lord forgives him his whole year’s salary, lets him continue with his job, and so on. The manager immediately goes from this to a guy that owes him a few bucks and starts to beat him because he's not paying him his few dollars. He has that guy thrown into debtors' prison. Well, word of this gets back to the lord, the king, the ruler. He says, “You did

what? After all I forgave you, you couldn't turn around and forgive this very small thing from somebody else. I'm going to throw you into debtors' prison, and you'll stay there until you've repaid the last penny." The message of that is, if we look at our lives, we've been forgiven a lot. There are many things about us that people put up with every day – a desire to talk too much. You might know somebody who tries to talk too much. I'm talking about myself – or pompous, or full of themselves, or whatever, and people will just cut us all kinds of slack. Yeah, you got the idea. We can look at the Commandments or rules, going back to what you said your mom and your grandmother obeyed. We can just see how we violated those rules just every day in thought, if not, in deed. Reflection and meditation on that should lead to a willingness to forgive others. That's not what's going on. One of the things you'll read about is that if God could do that, He wouldn't be – or She or It or whatever – wouldn't be a holy God. A holy God can't tolerate that. There has to be an actual restoration. Jesus's death was supposed to provide that. That's sort of above my pay grade. I see it on the one hand. Well, the whole idea is somebody has to pay that debt, and the son of this Trinity – God, the Father, the Son, and the Holy Spirit – the son says, "I'll take that on." The Father says, "Yes, you will." And when Jesus says, on the cross, "God, why have you forsaken me?" that's because he's taken on all this evil, and God turns his back on him for the first time in their infinite existence together. It's not the pain or anything else; it's this momentary gap in the relationship that the two of them have had through eternity. There's this third person of the Trinity who dwells in you and me. Somebody once asked me, "Well, what question will you have of God if you have one question?" I thought I had three questions: one for God, the Father, one for God, and one for God, the Holy Spirit. The Holy Spirit one was, "How could you stand it, riding around in my body for the last eighty years with the ways I've fallen short?" But that's the forgiveness. I wanted to go back to one other thing you said. You said your mother and your grandmother lived by these rules. So they obeyed these rules, right? There was a guy who wrote a book called [The 100: A Ranking of the Most Influential Persons in History]. He had Muhammad number one and Isaac Newton number two. Jesus was only number three. The Apostle Paul was number four. His reasoning went like this – I'll never forget this – Newton brought all the science into the world and understanding. Muhammad had a bunch of rules, and everybody obeys them. They pray toward the East. They pray a certain number of times a day. We had a caregiver for Chris who was Muslim, and she would pray when it was time to pray from here. This author would say Muhammad gave people rules, and they obeyed them. Jesus gave people rules; nobody ever obeys them. We're so guilty by the standard that he held up. Also, Jesus needed help in spreading the word. He wasn't a good marketer. Paul did the marketing. So, that's why the two of them are in places three and four. So, going back to your mom and your grandma, in Hindu faith, if it's producing rules that people obey, wow, that's a big deal. That is a big deal.

MB: There are only, like in any other culture, a handful of practicing (Vedantees?). These are people who don't do as much idol worship, but it is by principles – similar in many different

cultures. Bill, I was waiting [for] you [to] tell me about the two questions that you have got for God the Father and God the Son. [laughter]

BH: Well, God the Father – the story of the Garden of Eden is – he says, "There are just two things I'm looking for you. One is you take good care of the perfect world. The second one is, I've got this one tree that's the knowledge of good and evil. This is a metaphor, right? You don't want to acquire an understanding of good and evil by learning what evil is so you can really draw the contrast. So don't even think about trying to do that. Of course, that's the first thing they try to do. There are two trees in the Garden of Eden that matter that stand out. One is this tree of the knowledge of good and evil. The other one is the tree of eternal life. Once Adam and Eve eat this fruit, they learn the difference between good and evil. God kicks them out of the garden. He puts an angel at the door to the garden to keep them from going in. All this is metaphor, right? My question of God was, what if they had eaten from the tree of eternal life first? [laughter] That's kind of a stupid question. Then, the question for Jesus. It's one that I thought was smart at the time, but I think much less so now after thinking about it last year or so. We talked about how Jesus authenticated himself by healings and miracles. He healed people from various diseases. There was one person who was blind, and Jesus healed him. He put a little mud or something in his eyes. He says, "How do you see now?" And the guy says, "I see people, but they look like trees walking" or something. So, Jesus touched him a second time. Then, his eyesight was perfect. And I wanted to know why did it take two tries. I think I told you I'm trying to write a book on some of these things. This whole idea that climate change made us human because that's how evolution went with getting the primates, some of them out of the jungle, and lanky and tall and smart and fast, and so on. But maybe there's a second touch of God coming. Can climate change that's now underway be the triggering mechanism that will make us humane, forcing us to live together in the right way and finish this job of creating people in God's image? That story figures in my thinking a little bit about this: climate change could be the second touch of God through this climate process. If you allowed yourself to think along those lines, what sorts of conclusions would you reach about hope and about where we're headed? So those were the two questions.

MB: That's amazing, Bill. Building on that, you've just said hope, and you've mentioned Heaven coming to earth, renewal of all things. In "Living on the Real World," you talk about the age of renewal. Could you talk a little bit about –? What did you mean by the age of renewal? You've mentioned that with respect to restoration as well. But I wonder, in the context of climate change –?

BH: I'm glad you said that last little bit because it seemed to me that I remember definitely writing a blog post about the age of renovation. I've talked about renewal a lot, but I'm not sure I've really written one on renewal yet. So, let's just talk about first the restoration one. In that one, I was remembering when I was a kid. My parents would take us on the road to visit the

grandparents who lived miles away. There was highway construction going on. The interstate was being put in during the Eisenhower administration during this period. It was being put in a few miles from the roads we were traveling. You could see off in the distance where the grading machines had been, where the new roads were being constructed. Nowadays, when people restore a highway or an interstate, it's right next to the lanes that you're still traveling every day. There are Jersey barriers. There's lots of noise. There's slow signs, and so on. But they're trying – they can't just build something totally new anymore; we have to keep restoring what we've got because we depend on this critical infrastructure. As its name implies, it can't be allowed to miss a heartbeat. So, all of construction engineering has become this art of building new things in the middle of old things. The policy programs office in DC was once in a building that overlooked a Macy's department store that was six stories tall, and it had been built in such a way they could add six stories of office space above it without interfering with the department store, or on one of the busiest intersections of downtown Washington – traffic. So, they had the cranes, and there was this continuous flow of trucks bringing material with the cranes, putting the stuff on top of the building to work on while the traffic would still move below. So, that's renovation. Renewal is something different. Well, I think maybe one close parallel to it – Biden talks about "Building Back Better." So, renewable, I think, an example is renewable, what we're doing with the energy system where we're taking our whole fossil fuels infrastructure – pipelines, power plants, and all the rest of it – and replacing it with wind turbines, solar panels, and grids, electrical grids. So, that's the new pipeline, in a way. When we get done, there's a continual search for renewal, and I have a feeling, again, our imaginations are impoverished. If we can really cooperate, remain a bit unified, and have sensible discussions about things instead of killing each other, we can get there. Again, because we're in a play that has a script and not just sort of a meaningless doomed exercise, I think there's a good chance. I have hope. But hope is not optimism. Okay. I'll just remind people of that again. Optimism is unfounded belief that the happy things will happen, as opposed to hope, believing that an outcome is possible if people work realistically.

MB: Thank you, Bill. Do we have time for one AB [Ask Bill] Anything? I have some [inaudible] questions.

BH: Oh, sure. We're having the same problem that the movies are having, the blockbuster movies. They started out short, and they're getting longer and longer. People are starting to think, "Three hours for Oppenheimer? Three hours for Barbie?"

MB: People would like to listen to more of Bill Hooke talk. My question to you, Bill, is since we talked a lot about dying and death and life and hope in our conversation today, how do you think we can promote open conversation about death and dying in our communities so that we can together envision a more hopeful outcome for our planet and ourselves?

BH: Well, I think the target probably ought to be love and trust as a predicate for having that discussion about death and dying. It's very hard to have that discussion if you're in a room full of people where they're thinking zero-sum game; they can hardly wait for me to die or disappear. You see that in some workplaces, not in terms of death, but "Gee, move on, I'd like your job" or whatever. Working on putting other people's interests first – and that really comes – it works the same way as forgiveness. If you think to yourself, "I'm a needy person; I don't have all I need, let alone all I want," it's very hard to find room for love and for trust. If you have a spirit of abundance, you're thinking, "Oh, man, I've been given a lot more than I need and a lot more than I deserve. I tried giving away a little bit yesterday. It didn't hurt as much as I thought. Maybe I could give away a little more. In fact, it felt good. Maybe I can give away a little more today or whatever. If I start trusting people and I feel their love, then maybe I can start opening up about the deepest thoughts I have." That can't be the right answer. Poets and artists don't wait for that. Otherwise, we would have no poems and no art or music or whatever that dealt with those themes. So they find an inner strength. Again, all of that is your personal relationship with your higher power more than your fellow human beings. If you want to have discussions about it, if you're going to talk to your children – churches, synagogues, temples, in principle, can provide that space. We know there's a tendency for them to be taken over by – to have that just be another arena where life is competitive and tough and hypocrisy lives. There's too much of that. But at its best, it happens. I happen to be going to a church right now, where I think the people going there have a very high trust level with each other. There are all kinds of rules that the church breaks for how to have a – quote – "successful" church with large numbers and making a good economic plan. Most of the people who go to this church are going because they're serious about their relationship with God, and they're happy to be with other people rather than some lesser motivations. So, does that maybe answer the question a little, tiny bit? I have a feeling that these – Dick Hallgren, we've talked about him many times. He used to say, "Ask me any question. I can answer it. A lot of time, the answer will be 'I don't know.'" Everybody who got this far in this series will be thinking, "Gee, it would have been refreshing if Bill had given that answer a lot more often [inaudible] a lot earlier than he did.

MB: People are going to enjoy this so very much. I do want to say thanks to all your colleagues who are suggesting these questions, Bill.

BH: I'm very thankful, too.

MB: [inaudible] I'm receiving questions. One follow-up question – not question, but a thought that did come to my mind as you were saying places like churches and synagogues have a high level of trust; they have rules about what makes that church successful. I feel that annual meetings of professional societies should be that place to have that discussion, especially if we're serious about a relationship with a higher power, whatever we may call it.

BH: I'm so glad you said that. I think the AMS [American Meteorological Society] is – I belong to a bunch of societies. The AMS comes closer to that model than any other secular group I've ever belonged to. It really is a community. At least, it's always felt that way to me. Maybe there are people there who – it would be a shame, and there probably are people there who don't have that experience. The AMS has a lot of formal mechanisms. You've been involved in creating and fostering a lot of those for trying to include people and give them the community that they seek. But the AMS – it's been amazing. That's just the thing that – it's been such a happy experience to be a member for half a century. Wow. Yeah. So, great point. It might give a sort of sliver of connection to NOAA, the AMS, and all the folks who have been involved in putting this series together. It should have come up earlier and more forcefully.

MB: Well, that is fabulous, Bill. I sincerely hope that we can continue having these discussions within more scientific settings at the AMS annual meeting and other meetings and conferences because, quite frankly, I feel our need to reflect on our relationship with the world happens to be more urgent – that need to have these discussions in an open, respectful and constructive way. Whether it is developing any kind of rules, as you said, that makes a church successful, perhaps we need to have some frameworks around which we can have these kinds of dialogue within the weather-water-climate enterprise. I'd love to, at some point, hear your thoughts on that.

BH: Well, Carlos Martinez, as you and I both know, has taken a big step forward with establishing this interfaith committee, the small group that works with him, and they have done things – just a little bit more of an infomercial about AMS. Unfortunately, people will be viewing this long after the moment has come and gone. But one feature of COP 28, the [Conference] of the Parties, was essentially this faith – not room but – building or venue for a quiet space that the Muslim host of the meeting provided and brought all faiths together. That actually mimics something that Carlos started a year or so ago with the AMS to have a quiet space at AMS meetings where people of faith could go and regroup a little bit during the hubbub and excitement and all the other good stuff in the meeting. I think there'd be an appetite for it in that symposium that we were both at the last meeting, where Carlos looked at the group of a hundred, or a couple of hundred people, whatever the number was at the time, and said, "How many of you are people of faith?" He got a pretty fair number of hands going up. I think the statistic, for scientists, generally, is about one person in seven identifies as a person of faith. It's not one person in two, but it's also not one person in twenty. It's a pretty sizable number of thinking people who were thinking along those lines, and there's a reason for that. It's worth contemplating. Frankly, I think if you look at the group, I'm not sure you'd say that they're happier than the average group, but using the C.S Lewis metric – he used to say, "Don't ask a Christian if he or she is better than other Christians, or don't demand that of them. Just ask if it made them a better person than they would otherwise have been." That's the metric. Can you find joy there versus something that's illusory, something that's, say, drug-induced or something like that, but a happiness that's founded on some logic?

MB: Well, thank you so much, Bill. I just wanted to mention Carlos's committee is –

BH: COSMOS, yes.

MB: – Committee on Spirituality, Multifaith Outreach, and Science. So, that's fantastic.

BH: Thank you for putting that full title in there. I think what's happened on my email folders – I've got it labeled "Interfaith."

MB: I tend to forget the abbreviation.

BH: I keep forgetting that it's COSMOS, yes.

MB: You're not alone, Bill. The other thing I wanted to point out – Pew recently came out with a survey on spirituality among Americans. You're absolutely right, actually. It says seven in ten US adults describe themselves as spiritual in some way, including twenty-two percent who are spiritual but not religious. So there's a huge contingent of the population that I think that – the people in the world, eight billion of us – a huge number of us, I think, broadly speaking, not only just in America but around the world that do reflect on our relationship with the planet. We'd be remiss if we don't have these conversations within our mainstream scientific professions and other disciplines.

BH: One question people might ask themselves is, is it taking me more effort to think that higher power doesn't exist, or more effort to accept the idea that one might or does exist? I frankly think it's a lot more work and a lot more stressful to try to work in that first category. If you can make God go away, that turns out to be a much tougher job than the other. Ask yourself why that is. [laughter]

MB: Well, on that note, Bill, do I have your permission to stop the recording?

BH: You do. I'm sure the powers that be say, "You not only have permission, you have our profound blessing. We thought this would never end." [laughter]

MB: [laughter] That's very funny. I'm going to stop the recording, Bill.

BH: Take care.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 3/2/2024
Reviewed by Bill Hooke 3/2/2024

Reviewed by Molly Graham 4/28/2024

Session 28 - December 20, 2023

Interview Summary: The interview with Dr. Bill Hooke delves into the significance of critical thinking in journalism, education, and society. Hooke also discusses his efforts in enhancing weather forecasting and warning systems in the US, stressing the value of collaboration, social factors, and public engagement in science, particularly in the context of climate change. Additionally, he emphasizes the role of journalists in effectively communicating scientific information to the public.

Mona Behl: It is Wednesday, December 20, [2023]. My name is Mona, and I'm here with Dr. Bill Hooke. Hello, Bill.

Bill Hooke: Hi. Good morning, Mona. Good to see you.

MB: Great to see you too, Bill. So Bill, today I'm going to start asking you a question about suffering. I want to ask you, how do you perceive the utility of suffering? What is the value of suffering to us as humans and to us as a species as we go through our life carrying suffering around like some mind-numbing and soul-crushing weight? I think every single one of us suffers. During the last conversation, you described how Jesus came on earth and He, too, had to go through suffering. What are your thoughts on the utility of suffering?

BH: Well, I've got to say, right at the beginning, the thing that hit me right away when you said that was I don't have a lot of personal experience with suffering. I think that renders me unqualified to really talk about it much. I'll just expand on that a little bit. It's hard to look at any form of media – social media, news media – and not appreciate in the abstract that most people are suffering tremendously, most people out of the eight billion. A very small select number don't have much to complain about – you know. You've heard this expression many times, I'm sure, at work and in the neighborhood about first-world problems. That's all I've really experienced. So, I'm really reluctant to – it's the kind of thing where it's easy for somebody to say, "Oh, that's good for you. It builds character." But I think I shouldn't be discussing it.

MB: Okay. Well, let me ask you this question, then. What is mercy for you? Can you talk about that?

BH: What is?

MB: Mercy.

BH: Mercy?

MB: Yes. What is mercy?

BH: M-E-R-C-Y?

MB: Yes. [laughter]

BH: Maybe I could talk about that. I should just say about suffering. You and I have known people who have suffered. So many of them are some of the most powerful people we've known, and the suffering has made them that way. I guess I'd also say that you can tell that it affects people one way or another. They either are crushed by it, or it makes them even stronger somehow. So, the very special people in life usually have been the ones who have suffered in some way. Mercy. I heard a great definition once of justice and mercy and grace. I've always liked that. So, justice is getting what you deserve. Mercy is not getting what you deserve. And grace is getting what you don't deserve. [laughter] So, mercy is in that triad. That's kind of glib. [laughter] But I think it captures – it's important to look at that word in the context of the other two, and it's a nice characterization.

MB: That's very, very helpful, Bill. What is prayer to you? Do you pray?

BH: I'm pathetic at prayer. It's one of the disciplines. It's held in high regard. I realize periodically that I should do more. When I do even a little bit, it is good for me. I sense that it works. I think a lot of people see prayer as asking a higher power for something. But a lot of it should be listening. There's this great little story of the Bible about Samuel, who grows up to be a judge of Israel. He is a kid, and he's been offered by his mom to the chief priest of Israel to bring up. She had not been able to have a baby. She prayed that she would have a baby. When she had a baby, she was so grateful that she gave it to God and, in fact, had several more kids. But Samuel was growing up in the priest's home, Eli, and he heard God speaking to him. He thought it was the priest Eli. So he kept going in and saying, "What do you want?" Eli finally said, "God's speaking to you. So the next time you hear that, instead of coming in to see me, you say, 'Speak, Lord, for Your servant is listening.'" I always liked the ring of that. I think a lot of people turn it around. When they pray, they kind of say, "Listen, Lord, because your servant is speaking." [laughter] I think part of the idea is to listen. One of the things that the Bible says is that – well, the Bible talks about a three-part God. There's God the Father, there's his Son, Jesus, [and] there's a Holy Spirit that resides in each of us. One of the things the Bible says in the New Testament is we don't know how to pray as we should. We don't know really what we should be asking for [or] what we should be looking for/listening for. But the Holy Spirit interprets for us. It's what a kid does when the kid draws a picture. The parent or the teacher or whatever is saying, "My, what a fine picture." There's some element of that that goes on. There's an awkwardness about it. We tend not to ask for the right things. We tend not to want the right

things. We tend not to listen for the right things. We tend to hate some of the things we hear. One more rumination on prayer which is that a lot of people see it as a very confined, ritualistic thing. You close your eyes, maybe you get on your knees, there's a whole bunch of things of that sort. Some religions, you pray facing a certain direction, that kind of thing. I remember a book that I read, Daring to Draw Near by John White, that took a lot of passages, descriptions of episodes in people's lives and talked about how they were prayerful aspects to them, whether it was dancing, or conversation with strangers, or just appreciation of nature. Anyway, it was kind of a mind-expanding book in terms of seeing that it was possible to be prayerful in many circumstances. I think we can imagine that just looking back on classes that we've attended, for example, and sometimes teachers are full of themselves and self-aware. Sometimes, there's something that is a little more, a little richer, a little more foundational than that. The teacher is kind of approaching this in a more respectful way. Maybe you say that has some element of prayer in it.

MB: This is very helpful, Bill. You said we don't know the right questions to ask, and I personally feel that too. It's better to listen as you're praying. How do I know that I'm on the right path? That's a question that you often think about in the context of – at least I think about in the context of my work, my life, where am I going. How do you know that?

BH: How do you know that you're in the right –?

MB: On the right path, P-A-T-H.

BH: Oh, the right path. You have such a dignified English [inaudible].

MB: So, sorry. English is not my first language.

BH: It's just so dignified. I [inaudible] path. [laughter]

MB: Path it is.

BH: Wow. I spent very little time actually knowing that, so I'm maybe not the person to ask. Sometimes, you don't even know what path you're on. The right path. Usually, the right path doesn't mean things are easy. Part of it is we're much better at knowing when we're doing something we shouldn't be doing, or it's not very elevating than we give ourselves credit for. We tend to kind of – we find ways to stifle that, sort of suppress that realization. So, that's one element of that. If you can sort of make yourself a little more sensitive to whether you have peace of mind at any given moment, regardless of the circumstances. Circumstances may be hideous. I always felt that a successful day was one [where] it didn't matter what problems I had as long as I wasn't causing them. That's part of it. You don't want to be causing problems for

other people. You can call attention to problems that other people are bringing on themselves, but you shouldn't be causing problems for them. That's not a good answer. You're asking a bunch of questions that I feel you should be asking of a priest or something. Not a layperson.

MB: I know. That's exactly why I'm asking.

BH: I'm going to flunk this multiple-choice test. Most of us do very poorly on questions like this, and it suggests all of us ought to do a lot more thinking about it.

MB: I'm grateful, Bill. Thank you for taking my questions and answering them. Whatever you're saying is resonating with me. [inaudible]

BH: I should turn these questions around a little bit. How do you know when you're on the right path?

MB: I think when I can probably shut the voices of all influences in my life and listen to what God is trying to tell me. [laughter] I think it goes back to what I said before about a quote about Mahatma Gandhi, "God speaks to us in various ways only we [don't know how to] listen." I definitely feel that I'm on the right path when I can shut [out] all the influences and all the judgments and suspend all of that and listen and believe in that inner spirit and walk forward.

BH: When Gandhi said, "God speaks to us in various ways," did he expand on that? Did he have a list?

MB: I'm sure he did.

BH: [inaudible]

MB: If I could remember, I would be such a great disciple of Gandhi. I only remember the quote, Bill. Do you remember?

BH: Well, no, I don't remember a quote. But I've heard some Christian authors will venture into that space, and one that keeps running through my mind is one that has four parts. God speaks to us through the Bible, through prayer, and through circumstances. The last one is kind of tricky. He says through Christian friends. It seemed to me, and I remember being in groups discussing this because this was a book that several of us were reading, that it shouldn't be limited to Christian friends, that we have otherwise friends; I'm talking with one. [laughter] I listen to a lot of people who would not take the label Christian or maybe be horrified at the label Christian but still have so much to offer. So, that one never rang true with me, but that was their list.

MB: That's a great list, Bill. Actually, let me ask you this follow-up question. How do you find yourself again when you feel like you've strayed so far from who you used to be or who you are? Have you thought about that? Have you tried to come back to that ever?

BH: Usually, I think you find that you're being attracted to something that doesn't really offer you much or shouldn't attract you, or you're running away from something that shouldn't be fearful. You empty that thought from your head. If you're thinking to yourself – you're worried about some money problem, or whatever, you start thinking, "Well, money really isn't my biggest problem. My biggest problem is some of these other things we've been discussing: my lack of mercy, my fearfulness to begin with." So there's a self-awareness. Tony de Mello, [whom] we talked about last time, uses the metaphor of waking up. I had a particular experience last night. There's a dream that people who are behind in their work have; usually, it takes many forms, but it's got to do with having some simple thing that just seems to be stretching on and on forever and ever. And I had one of those. I haven't had one of those in a while. I think it's because I'm doing a few more work-related things. So, waking up, realizing you're creating a little nightmare for yourself about whatever it is that you're thinking. Waking up is a metaphor for recognizing that and giving it up, moving on somehow.

MB: Bill, you talked about fear, and I just remembered something that Nina Simone said. Nina said, "Freedom means having no fear, sometimes on stage." I read about her, and I read that sometimes, on stage, she would reach that kind of state where she felt that kind of freedom. So, do you have any advice for how to free oneself from fear? You just talked about fear as well. How do you combat fear?

BH: Well, I don't think you do it by fighting it. I think you used the word combat fear. I think if you do that, again, it's a question of looking at it squarely. A lot of people say, "Well, you tell yourself, what's the worst thing that could happen?" And then you realize that's not so bad, or whatever, and you move on. I don't think that's quite the right question to ask: what the worst thing that could happen is. But something along the lines of – you should really always be moving forward somehow towards something. I think another point that gets easier when you get older, or at least easier for me, is you have more and more – very few things that I'm fearful of in life are new. [laughter] I've been afraid of them before, and here we are laughing about it. So, I tell myself, "I was afraid of this, and my fears were never realized." It'll be the same with this. Actually, in the Old Testament, one of the things that used to irritate God the most when you read these dialogues that are between God and human beings is, "Gee, you saw me part the waters of the Red Sea, you saw the ten plagues that fell on Israel, and you're still complaining and worrying. What's wrong with you?" Variations on that theme are mentioned over and over again in the Bible. One of the things that I try to tell people along those lines – the Ten Commandments are full of a lot of don'ts. One of the things that Jesus says – he doesn't say, "You don't need to worry." He says, "Do not worry." It seems to me that people don't make

enough of that. Worry is a statement that you don't trust your circumstances, or you don't trust in a higher power or [inaudible]. Maybe it's possible to look at that and say, "Well, I'm worried. And if I really believed – if there really were a God, I wouldn't be worried. Therefore, there isn't one." [laughter] You can do a logic like that, or you can reach some other conclusion.

MB: Okay, Bill, I'm going to transition into a couple of Ask Bill Anything's.

BH: Probably a good idea. I think people looking at this would say, "If he had a pastor's seminarian degree or something like that, maybe we'd listen to this guy, but not this guy on this subject." So this is good. So, let's try. Ask me anything. Go for it.

MB: Okay. This is now transitioning into the weather and climate world. One of your colleagues asks: what do you think about working across disciplines to improve weather forecasting and warnings? In particular, they're interested in learning about what you think has been the most successful. How have you successfully contributed to improving weather forecasting and warning in the US? And why? So, I'll stop there. They have one last question, which I will ask at the end.

BH: See, I would say that I've worked with a lot of people who made great contributions to improving weather and climate warnings, but I probably had nothing to do with that myself. I worked with people, I supervised people, and I use the word loosely because in the government, when you're dealing with senior scientists, the guidance – one of the criteria for promoting somebody from GS-9 to 11, to 12, 13, 14, is as they progress up that scale, they need less and less technical guidance. It's more about just ensuring that the things they are doing are squared with the policy aims of the agency and larger issues and so on. I feel I was around during a time when great progress was made. I led efforts where great progress was made. Did we talk about the six phases of a project? When I first started work at NOAA – it wasn't even NOAA then – somebody gave me this list that some engineer had come up with of six phases of a project. Phase one is enthusiasm. Phase two is disillusionment. Phase three is panic. Phase four is search for the guilty. Phase Five is punishment of the innocent. And phase six – and this is why I bring up the story. Phase six is awards and honors for the non-participants, meaning if you succeeded in something, your boss got the credit. That sort of strikes me as the answer to your question. So, I could say, "Oh, I did this or that." What I really did was supervise it. [laughter] The ocean was moving this way, and I was in a life raft floating above it and carried along with the current. So, things that happened were the modernization of the Weather Service. It could just go on and on. In particular, a lot of work in small-scale weather, short-term weather, aviation weather, things of that sort. Those were, again, things groups I managed worked on. Made a lot of progress on those things, but it was wonderfully sharp people who did it, and I just kind of went along. I'm sorry to disappoint. People are thinking, "Gee, if I'd heard that in

lecture two instead of twenty-seven, I would have turned this whole thing off way earlier and saved myself a number of hours of wasted time."

MB: No, this is perfect, Bill, actually. So let me ask you this. Two other questions, follow-up questions. Let me actually pull that question up. So, in light of where we are right now, with respect to weather forecasting and warnings, and especially in light of climate change, where do you think we –? What needs to happen next? Where should we go?

BH: Okay, I guess I have a strong perception on that. It relates to what we just talked about. So, I might go back to that a little bit. So the thing I would say is that, although I didn't do this, I had a career in weather and meteorology and climate during the following – at the beginning of the period, the reason that weather forecasts and climate forecasts weren't very helpful socially was that they weren't very good physically and mathematically. At the end of my career, now, the reason that these forecasts aren't of more benefit has far more to do with what's going on at the receiving end – the poverty, the poor land use, the poor engineering of structures, the preoccupations of people with other things. It's all now at the social end. We're coming full cycle in. In Living on the Real World, the book, I kind of whimsically started out by saying everybody thought like meteorologists in the beginning. The nomads, members of small tribal groups and villages, everybody woke up, knew how to read the sky, and knew a little bit about the seasons. Then we got away from that; we made it very specialized. And now [inaudible] so that the solution to making better use of weather information, climate information is now, once again, everybody's business. The reason we're not more successful in dealing with climate change is that eight billion people are not participating in the right way, whether it's leaving our lights on too long or not having more vegetables and less animal protein in our diet. I'm guilty of these things, but everybody's a participant now; nobody's a bystander, and that's a big change. Does that make sense? So, it's shifted from, "Gee, we didn't know what was happening," or "We could never figure out what was happening," to, "Oh, we now know very clearly." It's what we're doing, the rest of us, in response to that. There are a lot of parallels between meteorology and dentistry. The dentist can tell you when they're cleaning your teeth every six months, encouraging you to floss, but it's up to you to take care of your teeth daily. It's up to you to integrate weather information appropriately. By that, I don't mean watch the weather channel twenty-four hours a day. Just have a little clearer view of how it's going to impact your day and the rest of it.

MB: Bill, for those of us who are in the weather, water, climate science business, or enterprise, as we call it, what can we do to work with those eight billion people and get to the receiving end of the problem, engage people, and make it more personal? What needs to be done? What are some gaps that still need to be filled in this?

BH: [inaudible] question. Well, I think one thing that people would point to scientifically, and I'm not sure quite where we are on this, but as recently as a few years ago, I think people looked, and they saw – we have a very clear idea of what goes on in the deterministic forecast regime, the period from zero hours out to a couple of weeks. We have a pretty good idea of what's going on [with] the decadal climate change. This intermediate period of seasonal to interannual variability is an area where there's a tremendous impact on human affairs. We have a sense that if we could tighten up our understanding of atmospheric and oceanic coupling [and] if we could do a little more about small-scale cloud processes in the models, we could make some inroads into that, and we ought to be tackling that. I think scientifically an area that could really – and I think it's probably still true that it needs work. There was no silver bullet here; it was sort of a bunch of things that all have to be done to make some headway there. It'll be interesting to see what effect artificial intelligence has on all this machine learning because it's pretty clear that people are able to do a lot in forecasting these days, not that it's better than the deterministic models, but it uses less computer time. So, that would be one big area. One of the problems with trying to have an effect on the eight billion people is that we're too much of an interested voice. Maybe the great thing about asking a layperson questions about theology is that – well, there's this horrible Samuel Johnson phrase that I'll paraphrase rather than using its original version, but something like a scientist preaching is like a dog standing on its hind legs; it's not done well, but you're surprised to see it done at all. But the scientists doing that might have more impact on somebody else, saying, "Well, maybe I ought to look into the whole spirit-filled thing or the faith-based thing than I had thought." I'm hoping that's true. That somebody would say, "Well, maybe there's something to that." A scientist saying, "Oh, you ought to pay more attention to scientists. You ought to pay them more. You ought to see that your kids learn more about science. You ought to do this and that." That's the wrong voice. Unfortunately, or fortunately, what you need – and again, this is a biblical thing. Don't say good things about yourself. Let others say good things about you. I think what's involved – when politicians take notice of meteorology, they can carry it to extremes, like Professor [Al] Gore did, and maybe turn people off. [laughter] But they can also say, "Oh, there's something here. We need to do this." I think Al Gore did a big service to the world by – he took a lot of flak at the beginning, and all the rest of that, but I think he's worn well as time has gone on. That's what's needed: other voices coming in saying we ought to pay attention to these people. You do that probably – going back to Gandhi and your thoughts there. He said, "Be the change you want to see in the world." And that's it. So instead of hoping to convince somebody of something, you recognize that it's enough to be that somebody yourself. If you're doing something worthwhile, there'll be one or two people that notice, and maybe they'll emulate that or do something better along the same lines, and that will eventually work.

MB: Bill, you talked about the beginning of your career. From the beginning of your career to now, you've talked about the advances in science and technology that have led to advances in meteorology. You've also talked about ways in which we should be integrating social and

behavioral science, perhaps to do that work. Is there a difference? What kind of newer approaches are needed to do the science that we do? I think you are alluding to the fact that we should engage more responsibly, perhaps, if at all, with the public. What are some other approaches in which we should change the way we do our science to invite and bring other people into this mix so that these weather and climate issues are more real and people can have the agency to participate?

BH: Yeah, agency, I think, is tied up with margin and wealth and so on. If you're poor, you're stuck. If you're a single mom, doing some job that doesn't really make ends meet, and you're trying to take care of your kids and so on, there's not much room for thinking about the weather forecast. There's not much room for thinking about anything long term. You're being a very creative person. But the huge creativity is focused on just getting through the next twenty-four hours. I remember a guy who was an expert on faith-based organizations and community resilience talking about how the poor – every day is a disaster for them. So, they're much more resilient in disasters, like earthquakes and floods, than everybody else because they know they're going to shoulder the responsibility of getting through the next twenty-four hours. They know it's up to them. They know not to expect any help and all the rest of it. I think that's part of it. I think I wrote a blog post one time on this idea that a football coach – if there's a miscommunication between the quarterback and the wide receiver – the quarterback's throwing a pass to the wide receiver, and the wide receiver has run another route, and the ball is intercepted or falls on the ground or something. What happens in meteorology is people put out a forecast, and nobody listens to it. So, all the social scientists say, "Well, you've got to work on the impact of your messaging. You've got to make your messages better." The football coach doesn't just pull the quarterback over and say, 'You've got to have more impactful messages in the huddle. You've got to really get your teammates …". The football coach also goes over to the wide receiver and says, "Stop thinking about your girlfriend in the stands and remember what the play is." There's got to be some emphasis in the social science on societal uptake. I think that's related to K through 12 education. Rush Holt, years ago – I'm trying to remember. There was a big push by some group to improve science education. I think this was around the turn of the century. Rush Holt gave a couple of talks in that period. He was a congressman [and] a plasma physicist, representing Princeton, New Jersey, and he said, "The tragedy of Sputnik was that it alerted America to the fact that it needed to spend more on science education and pay more attention to it. But it only did that for the brightest." He said, "There was an idea that it was socially acceptable, it was okay – everybody didn't need to know science. Just some people did. Some scientists and engineers." He said, "Imagine going to a cocktail party or something and saying, 'Oh, I don't speak English very well.'" [laughter] If you're an American kid, you don't do that. But you can go and say, "Oh, I never was very good at science," and everybody says, "Oh, yeah, we all understand that." He was trying to make clear the idea that science – everybody should be as facile with that for a variety of reasons, particularly in a democracy. In a democracy, you should be educated enough so that you can know the science behind green

technologies and also the social science behind the root causes of immigration, the root causes of the failures, the problems that the rich world is seeing now at borders. I still remember my dad saying in the ’60s, long before any of this was a problem. “One day,” he said, “there are going to be Asian people everywhere.” It’s simple diffusion. It’s reality. This is my father, the mathematician. “There's a big concentration of them there. They're going to spread out.” [laughter] And they outnumber most everybody else. So, for a long time, I've been thinking, “Yeah, the country is going to look different, but English is going to be the world language.” [laughter] I'm not at all sure that's true now. There'll be some blend of English and Chinese and Spanish and maybe a few other things thrown in. I think we discussed the fact that The Economist made a statement that if you open the borders, it would be chaotic for a while, but the GDP [Gross Domestic Product] of the world would double because people would go where the jobs and the money were, and the countries where everybody left would either be a small minority, or they would up their game and make the opportunities more widely available where they are. That's a long-winded answer to that question. But you've come to expect that after twenty-seven [sessions].

MB: I love that. Thank you so much for elaborating, Bill. Several things resonated with me, but in particular, something that I've started to pay more attention to, especially as I work in diversity, equity, [and] inclusion, is getting to the root cause of the grand issues. This was an observation I had for myself that I would scratch the surface, and I still do, but it's interesting when you get to the root cause of the problem and try and eliminate that itself or the kinds of solutions that you come up with are far more resilient to the test of time and stress test than anything else. Did you want to expand on that idea?

BH: Only that most of the equations that we study in school are silent on that subject, but that's the reality of it. As you pointed out, I think in these conversations, but elsewhere, to me, throwing money at the problem might not even be the beginning. There's so much that is there about having to come alongside people. Both learn how they see the world and why and also spend quality time with each other – really communicate and share what's going on.

MB: On that note, Bill, I want to ask you – you've mentioned K through 12 a few times. Since you mentioned communicate and share, what do you think is the role that journalists can play in this sphere?

BH: Yeah. Well, they play the role, don’t they, of teachers in the adult education world because you and I are getting most of whatever continuing education we're getting from journalists of one stripe or another. It's been interesting working with journalists over the years. I find so many of them underestimate their power, and they tend to show up around scientists and say, “Oh, I shouldn't even be asking you this question,” or, “I don't know how to ask it, but …”. But the thing is, they know a lot more than they're letting on, and they're doing that because they're

playing to scientist's natural arrogance, I guess, or whatever. They know the scientist is going to fall for this. [laughter] I think it's important somehow to think a little bit about what's factual and the truth. The latest issue of The Economist actually talks about news media and how they've changed over the last decade or so. They actually made an attempt in The Economist to see if they could distinguish between a democratic bias and a Republican bias in US publications and found some ways to do that. They were quantitative based on word usage and so on. I think it's tough to be a journalist these days and get your facts straight. It's not just facts because as soon as you start saying you got to get your facts straight, then everybody says, "Oh, but you can solve that problem by cherry-picking your facts. You can emphasize facts that support your case rather than the others that don't." I'm hoping that what will happen as a result of what's been going on the last few decades is that all of us, instead of clinging to a couple of voices – a lot of people will say, "Well, it used to be that there were just three TV networks, and they all were middle of the road." Rather than relying on that so much, all of us get a little better at dealing with an information soup, learning how to sift through it, but that means that schools have to emphasize critical thinking a little more than they do. Somebody pointed out that American schools were tuned to producing the labor force that factories needed. But the labor force that innovation needs is quite different. The education system needs to change a little bit. Somehow, I think everybody needs – all of us need to work a little more on our critical thinking, and journalists need to do their bit by making critical thinking a little less necessary. [laughter] The same thing is true of science and society; people need to think a little more scientifically, and scientists need to make that a little less necessary.

MB: Those are perfect answers, Bill. Thank you so much. With that, do I have your permission to stop this recording?

BH: Yes, you do. You probably have the watching world saying, "Thank God." [laughter] "Now I believe there is a God. He's stopped talking."

MB: I will not stop the recording. I'll continue to do this. [laughter]

----------END OF INTERVIEW----------

Reviewed by Molly Graham 3/4/2024
Reviewed by Bill Hooke 3/4/2024
Reviewed by Molly Graham 4/28/2024

Session 29 - January 24, 2024
Interivew Summary: Dr. Bill Hooke discusses his work on disaster reduction and building partnerships in the weather-water-climate enterprise. The interview highlights the importance of evaluating climate legislation, utilizing artificial intelligence for climate impact understanding, and promoting collaboration and innovation in addressing societal issues related to disasters and climate change.

Mona Behl: It is Wednesday, January 24, 2024. My name is Mona. I am with Dr. Bill Hooke. Hello, Bill, and happy new year.

Bill Hooke: Hi there, Dr. Mona Behl. I'm happy to see you for the first time, I guess, really in the New Year. Yeah, this is good.

MB: Same, Bill. Same. I've waited for this for one month. Thank you so much for your grace and patience with me as I visited family and wasn't able to connect in the past month. I am just thrilled to learn more from you today. So, one of the questions that I received, Bill, from one of your colleagues who has worked with you for a long time – here I quote what they said. As you listen to the comments, you're very likely to know who they are, but I will not take any names. They write, "My first encounter with Bill was when he was chair of the White House National Science and Technology Council's Interagency Subcommittee for Natural Disaster Reduction," which still operates today as SNDR. We've talked about this in the past. He organized a wonderful series of workshops, exploring how the public and private sectors could work together to reduce losses from disasters." Those findings are compiled in a report. I'm going to drop a link in the chat window to that report so that you can click on it and review it if need be. Your colleague adds, "Bill's intro from that report likely has a lot of questions, but just asking him about the process by which he assembled so many partners would be a great starting point." Your colleague also mentions, "Bill has a wonderful story about the interest taken in the work of SNDR by Second Lady Marilyn Quayle during the first Bush Administration. So, please ask Bill to reflect on that as well." I believe we've talked about this before, but I definitely wanted to make sure that I share this question with you and hear your reflections more comprehensively.

BH: Okay. I did not see this coming. So, it's been a long time since I thought about the Public-Private Partnership 2000 that the subcommittee did. You said I put it together, but really, it was a group effort. As you might imagine, we had contacts in the private sector, from the property insurance industry, and particularly, a group called the Institute for Business and Home Safety. There was a guy named Harvey Ryland, who was a former FEMA [Federal Emergency Management Agency] executive. I think he was maybe deputy director or something of FEMA for a while who had this job. But that was a collection of property insurers, and we worked with them. Within the SNDR itself, there were a couple of people from USGS [United States

Geological Survey] who were particularly active. A fellow named Tim Cohn, who died way too early in life of cancer a number of years ago, and Kathleen Gohn, also with USGS, were very active in putting this together. We had some great meetings with the insurance executives about this. It evolved a topic at a time. We put on sessions about once a month or so up on Capitol Hill for congressional staffers and members of Congress if they wanted to come to it about different aspects of disaster resilience, as people would call it now; reduction, as we called it at the time. You mentioned Marilyn Quayle, and maybe I'll take that up then. This was during the Bush Administration, with Bush and his Vice President, Dan Quayle, coming into DC in the – let's see. When was that? That would have been the late '80s. I think it's customary for the President's wife – or President's spouse because now we have a Vice President's husband – a Vice President's spouse to pick an issue or issues. There are very few perks for having those jobs, but one of them is you get to pick an issue that you're going to devote some special attention to. Marilyn Quayle decided that she was going to devote a large part of her time to disaster response and disaster issues. She really distinguished herself, I thought, by doing a lot of homework on this subject herself and going around and poking at things. I think she was an attorney by training. She got interested in the disaster reduction issue, and we thought we should invite her to one of our meetings of the Subcommittee on Natural Disaster Reduction. So, we did. [laughter] There were a lot of interesting stories associated with that. She accepted this invitation. Oh, boy. It's hard to know – we were coming close to the meeting, and we were going to have it – I reserved a room. The Secretary of Commerce had a meeting room in what we called the "blue carpet area" of the Herbert Hoover Building, and the meeting was going to be held there. I think it was maybe less than a week – it might have been twenty-four hours before this meeting took place – I got concerned calls from both the Secretary of Commerce's office and the White House Science Advisors Office, saying, "What the heck are you doing? What's this Marilyn Quayle visit?" And I said, "We let you know three weeks ago about this. We submitted this in the report to the Secretary of Commerce." There was this silence, and I said, "Oh, I take it you never read those reports," which didn't exactly thrill the person that I was talking to at that time, but they recognized that we had submitted. We told people we were going to do this, they knew about it, they okayed it, they arranged the room for us, and so on. That was true at both Commerce and the Office of OSTP [Office of Science and Technology Policy]. Just all of a sudden, they were alarmed and frustrated that this was happening and that they weren't involved. When the day came, I was in charge of meeting Marilyn Quayle at the Secretary's special elevator, went down there, greeted her, and brought her up to the meeting room with a couple of her staff members. Secretary of Commerce Robert Mosbacher made a point of coming through and saying hi to her once we got upstairs. She said to him, "Do you know these people?" She was looking at a roomful of all of us who were career bureaucrats, and he said, without batting an eyelash, "Oh, yes, of course." I was thinking, "He had never seen any of us until that moment." I thought he could have come up with some other answer that would have been gracious but true. [laughter] Anyway, it sort of gave me insight into how flustered he was. She stayed with us. She was supposed to stay with us for about forty-five minutes or an hour.

She stayed a couple of hours with us and kept asking great questions about what we were doing and why and how we saw the issues at this career level. She was just wonderfully engaged, and it gave me a lot of respect for her. It was good for our morale, certainly, to have somebody from that perspective be so interested in what we're doing. That's maybe a long answer. I haven't done justice to the talks on Capitol Hill, but we tried to do a lot of refreshing things. We had one talk on the role of the military, uniformed services, US Army Corps of Engineers on the one hand, and also military efforts to go in and provide disaster relief, both domestically and National Guard kind of things and internationally, things that the Army and Navy would do. We looked at NGO [non-governmental organizations] and their role, like the Red Cross. Elizabeth Dole, Robert Dole's wife at that time, was the head of that NGO, and so that had a lot of visibility. We picked topics that helped people. We looked at the role of the insurance industry. A guy named John Garamendi had the insurance portfolio in the State of California government. He has since been a member of Congress, and you still see him on TV, but [he] was involved. They were well-attended events, and people paid attention to them. We did about a dozen or fifteen or so of those meetings over a year, a year and a half. It was a good thing for the issue.

MB: Bill, you say you don't remember, but you remember the specific names of people and the specific instances. I mean, that's remarkable. You remember a lot.

BH: They were memorable names.

MB: [laughter] This remote report is remarkable. I've had a chance to review it since I received this question from your colleague. The way it's organized in different sections and recommendations you've listed at the end of each section to move forward in that regard is really, really helpful. What was the outcome of this work bill of all these workshops that took place?

BH: So, we tried to provide some record of them as they went along, and we tried to use it to inform this activity, but I'll ask you a question. You said you read it here recently. To what extent do you think any of the recommendations were actually followed?

MB: Yeah, that was going to be my next question. I think that report – I believe it was written back in 2000, and it's as relevant today as it might have been at that time.

BH: Right. That means that nothing happened. That was the very disappointing thing. Not saying nothing happened is – I think the world has gotten a lot less naive about disasters over this last twenty years or so. I think I told you that we had a whole discussion about the International Decade for Natural Disaster Reduction, and this goal that losses were going to be reduced by twenty percent or fifty percent rather over a ten-year period. Of course, nothing like that happened. The losses are doubling about every ten years, and for reasons that are hardwired into the way we do business. I would say there's one idea that people are still nibbling with a little bit

there. And that's the idea of an analog to the NTSB [National Transportation Safety Board], which has been so effective. The National Transportation Safety Board has been really effective in reducing commercial aviation accidents and fatalities. Even today, people like Max Mayfield, who's the retired director of the National Hurricane Center, and others are getting invited to speak to ideas like that. It keeps popping up in legislative proposals. It's not simple; it's not as simple or as doable as the aviation problem, but it still merits more attention than it's getting. I think maybe the way to look at this is that we might not be making the progress that we would like, but are we addressing the right problems? And I think, to some extent, we are addressing the right problems. We see the importance of poverty; we see the importance of learning from mistakes, and we see other larger issues and better how they connect with the resilience issues.

MB: Bill, one of the things that I read as I was reading one of the chapters in the report was making disaster resilience a public value. I am trying to pull that exact quote that you had from one chapter, but I was just wondering if you could reflect a little bit on that. I think that came from this notion that our early warning systems need improvements, and somehow, we need to think about – every human being needs to think about hazards in the day-to-day routine and life and understand those risks and incorporate those decisions into their planning and living.

BH: That's an area where I would say my thinking, maybe the thinking of a lot of other people, has evolved. I think at the time, what I had in mind was life, liberty, and the pursuit of happiness; they're national values. One of the things that we used to reflect on is what does that mean when you're trying to accomplish those three goals on a planet that does its business through extreme events. So, I know one of the things that I kicked around was a kind of Bill of Rights for such a planet. Instead of the right to life, because the planet was free to take that from you at any time – the planet doesn't see you as having that right – I was thinking of a right to a warning in the face of a hazard. You think about that and the inequities in access to warnings and things like that, and you can understand what a difference making that a value would have. Another one was the idea that home should be the safest place to be. Instead of a point of disembarkation during an evacuation. So, in other words, instead of home being a place where you gather together all the children who are at different schools, pack some belongings into your SUV and head inland or whatever, if you could, through land use and building codes, make home about as safe as possible, that would be good. And you see that. People are reluctant to leave home and evacuate these days because they know they have a lot of difficulty getting back. They know there's very little protection for anything at home if people are back there looting and so on. If there's been damage from a storm and an earthquake or something, and they aren't making repairs. So, anything you can do to kind of reduce that was important. Another one was a job to come back to after the hazard had come and gone because, in a lot of cases, businesses might still be standing, but they couldn't get any employees back because the employees lost all their homes, or vice versa, the employees' homes were safe, but their business wasn't, and the disruption and suffering that caused was a problem. I think the fourth one – and there probably

were a couple of others. But the fourth one I remember was [the] idea that natural disasters would stay natural. Because what happens is a flood turns out to be kind of a slurry of – it's not just a big rush of water, it's a slurry of toxic chemicals, human waste, animal waste, and things that are flammable. Sometimes, the floodwaters catch on fire, and all the rest of that. So, if you could pay special attention to the vulnerability of systems that were going to release toxins into places they shouldn't be. Thinking about the value – thinking about disaster resilience as a value is more tying it to other values that we've just discussed, not only saving your life but making it worth living so that schools were there and jobs were there. Some critical infrastructure was there. You weren't just without electricity and without agency and without everything else.

MB: Bill, another question that I had related to this public-private partnership was – it seems this was a result of partnerships that you probably had built previously and sustained for a long time. In the world that we live in today, response to disasters, I think, hinges on effectively collaborating with others and partnering across sectors and scales. What are some strategies to build and strengthen those partnerships? What are some gaps that you still see need to be addressed in terms of fostering those partnerships to address disasters?

BH: That's a great question. I'm the wrong person to ask. So, I think you remember from one of our earlier conversations I mentioned to you that in the ’80s, I found myself on this panel, this academy panel that was setting up a framework for the International Decade for Natural Disaster Reduction. I found out that instead of hurricane experts being the engine of the train, we were the caboose on the train, [and] all of the issues were pre-existing. Hazards expose and aggravate pre-existing inequality, social inequalities, and vulnerabilities in the way of doing business. So, a lot of these partnerships, it wasn't so much that – I mean, I certainly didn't find any of them or set up any of them. Other people were already doing it, and I did the only thing I could do, which is pay attention. “Wow, look at what these people have done. Look why it matters. Let’s pass that information forward somehow.” So the Lori Peeks of the world, the Dennis Miletis of the world, her predecessor at the Hazard Center, people like Ann Bostrom – those are the people who should be consulted with that question. Margaret Davidson, who's no longer with us – Margaret Davidson, for those of us at NOAA, we know her as the consummate developer. She was the Johnny Appleseed – I’m hoping that people of a certain age – every age – know who Johnny Appleseed supposedly was. He went through Colonial America, seeding apple trees. But Margaret Davidson did the same thing in public-private partnerships, and she was doing it from her position at NOS [National Ocean Service]. She refused to have a lot of senior positions, like director of the National Ocean Service, because she thought she could do much more in building these public-private partnerships further down in the organization than being a gadfly for the rest of us. [laughter] She was just magnificent at it. I loved her. It's a shame that she's not here for doing the interviews. The interviews would have to be X-rated because she used almost as many profanities as a certain ex-President uses. You never knew what was going to be the next word out of Margaret's mouth, but you had to pay attention. She got people moving on these

partnerships. She had a lot of government experience, but a lot of it came from – I think maybe she was involved with Louisiana Sea Grant. I'm not sure. The Sea Grant people – you are all in the business of a lot of these partnerships with the private sector, state and local governments, and so on. So, keep it up.

MB: Thank you, Bill. I really do. I've had the opportunity to meet with Margaret only once or twice when I was working with the AMS [American Meteorological Society] Policy Program, and I loved that. There's a fellowship named after her. I loved everything that you said about Margaret. She would speak her mind, but there was a warmth to what she said, and one would leave the conversation never feeling offended. [laughter]

BH: There was also brilliance and substance to what she said. A lot of people speak their minds, but they don't have enough on their minds or the right things on their minds. Margaret was always working on the salient stuff, things that mattered and things that you could do something about. However many good words we could say about Margaret, they would be inadequate.

MB: That's wonderful, Bill. So, the fellowship named after Margaret is called MAD, MAD fellowship.

BH: Yeah, perfect.

MB: I love that. It embodies her spirit. [laughter] Thank you so much for sharing that, Bill. Partnership is incredibly important, and how to build and strengthen some of those partnerships is going to be the key as we move forward. Do you think with the advent of newer tools that we have today, [such as] AI [artificial intelligence] –? We've talked about that, and you've reflected [on the] use of AI in disaster response, recovery, and preparation. Do you want to reflect a little bit on that? If you look at the report that you put together in 2000, and we had AI in the mix, how might things change?

BH: So, I'll give a story, which I think gets to this. Around the year 2000, the Clinton administration had been around for a while. Well, when Clinton came in in '93, he brought in his emergency manager from Arkansas, a fellow named James Lee Witt, to be head of FEMA. The deputy director of FEMA at that time was a guy named Lacy Suiter, who was the emergency manager for the state of Tennessee, Al Gore's state. The thought always was that Lacy and James Lee Witt might have switched roles if Al had been President and Bill Clinton had been Vice President. But Lacy came in – and let's see. I have lost the thread here a little bit.

MB: I was speaking about how might the report change with respect to AI and the advent of new technologies.

BH: That's right. Okay. Lacy had a deputy in Tennessee that he brought with him. I don't think he brought him to the federal government, but it was a guy named Tom Durham. Tom had written just a stellar disaster preparedness strategy for the State of Tennessee. It had like ten basic elements, and one of the things we were constantly thinking of in government of those days was, was there some way to come up with similar plans for the other forty-nine states. The job seemed a little daunting, but with AI around, it ought to be – it just raises the level of expertise. So, the question was – Tom had a lot of expertise, and he brought it to bear on this very thoughtful strategy and worked with people to develop it and get started implementing different aspects of it. That would be the kind of thing that more people could do if aided by artificial intelligence. There'd be a lot of that. It's kind of like saying that AI can look at radar images of evolving weather and see things that human beings, not maybe more than human beings, would see, but untiringly catch them. One of the big weather events that occurred when I was still living out of Boulder was we had some huge thunderstorms moving rapidly through the Denver area. There was a small echo up in Cheyenne, Wyoming, that didn't seem worth paying much attention to. Well, it stayed put for six hours while these other rapidly moving storms moved through the Denver area. It produced two feet of hail in the Cheyenne area, with drifts of hail up to six feet and a few tornado funnels. So, people went to their basement to avoid the tornadoes, and one or two people drowned when the flooding occurred. That's the kind of thing that an artificial intelligence system might be better at capturing that kind of alertness and just looking for a detail, or what seems to be a detail that other people might miss. So, I think AI really changes the possibilities for good if we have good intentions and look for ways to harness it.

MB: I'd be eager to learn about ways in which AI can also perhaps foster equity. I mean, the discussions around AI and ethics are prevalent in the weather, water climate enterprise, but I'm yet to hear about ways in which AI could actually help us promote equity in disaster and risk management.

BH: Again, that is a great question. My guess is I should be interviewing you on that question, and you should share what you know. I'm behind because AI has become a big thing, really, in the time since I've had to step back from my job. I would say I'm not the best person up to speed on the possibilities. But they do seem to me – well, just AI and every aspect of things just seems like an enormous thing. We were talking before we turned on the recording about research. I'm sort of feeling that AI would be really useful in keeping researchers from duplicating work that others are doing simply because they don't know about it, and AI could make researchers aware of things that are going on in their area. The problem, as we mentioned, is it might be too much information. You'd be working on something and trying to think it through, and faster than you could think it through; AI would be providing you rabbits to chase, very closely related and maybe very stimulating, and maybe every once in a while providing just the right answer, but also every once in a while really discombobulating your thought process. It's going to be fun to

sort it out. But I think it really changes things. The computer changed things. You're an oceanographer, and it used to be that oceanographers went to sea. [laughter] That's what they did. They put up with all the discomforts of being tossed around by waves, and so on, and hours and hours and days and days, and they developed an intimate association with the sea. Then today, many oceanographers are running computer models in the sea. Some still do go to sea, but it's not what it used to be. I think something like that will happen in the AI universe as well. The character of research is going to change, and the topics will change. There'll be some benefits to that and some problems.

MB: Thank you, Bill, for that information. Something else that you highlighted in your previous remarks was the importance of systems thinking. I wish that in graduate school – graduate school emphasizes a more systems thinking approach to problem-solving, especially in the hard sciences. That's something that I learned in my work. But it was not how to think like an ecologist, as you pointed out a few times; it was not something that we necessarily learn in graduate school. Yet, it has implications if you're in the weather, water, and climate world and working on these issues.

BH: That's well said. Yeah. Maybe it'll help people build meaningful collaborations. We've all enjoyed collaborations that have been meaningful, but usually, they have a random feel to them. It might be that there'll be sort of a richer set of possibilities that we'll all be aware of, and we'll tap into the ones that will get a lot better at collaborations that matter and [have] fewer distractions.

MB: I think we have time for one more question, AB [Ask Bill] Anything, Bill. This one is from another colleague. Actually, they have a set of questions, but I'm going to be able to fit in only one. They ask, what do you hope AMS and the weather-water-climate enterprise to achieve in the next fifty years?

BH: Fifteen or fifty?

MB: Five-zero.

BH: Well, let's go back to fifty years and ask how people would have answered that question at the time. I think they'd have said they wanted more observations. They already had satellites at that time; they wanted to make more use of them. They wanted to be able to harness computers and the computers of the future to do those things. I'm not sure that fifty years ago, the social side of it, the actionable side of it, would have received as much attention. I'm not sure if people would have seen that we need to build the connections between the information and its utility for action – I noticed that NOAA just recently got a big slug of money from these infrastructure bills that have been passed by the Biden Administration to look into things like that. I'm not sure that

was a priority, necessarily, for people at that time. The social scientists might have been seeing all of these things we were just talking about – the links between disaster and poverty and so on. But they, too, might not have seen the opportunities for expanding that. Now, we're asking ourselves what's invisible to us at the moment that might be worth – it shouldn't be things that are invisible; it should be things that are visible but seem to be minor players. My metaphor that I keep running into with this is if you were a mammal just before the K-T meteor hit, life was not very good. The whole air reeked of dinosaur breath. You were just watching every step you took, and suddenly it got very dark, and the air was poisonous and all of that, but you were about to come into your own. [laughter] Somebody's looking at the scene – the dinosaurs weren't really saying, "Oh, we got to watch out for those mammals." Gary Larson, in his famous cartoon, saw that, but the dinosaurs weren't thinking that. So, what is it that we're missing? I think one of the things we were talking about just before we went on the air here – collaborations are becoming so important that somehow there's going to be a collision between collaboration and attribution. Right now, we're all thinking, "It's very important that if I have some genius idea, it's attributed to me." [laughter] I think more and more people are going to realize that, "Well, 'your' so-called" – with quotation marks around "your" – "wonderful idea was really something that had its antecedents in about a hundred wonderful ideas from other people before you." One of my favorite examples is that woman whose name I can never remember – I got to remember her name – from the 1850s, who looked at greenhouse gasses and saw that they were going to be a problem. [Editor's Note: Dr. Hooke is referring to Eunice Newton Foote, an American scientist known for her pioneering experiments in the mid-19th century that demonstrated the warming effect of carbon dioxide, contributing to our understanding of the greenhouse effect and climate change.] We've talked about this before, and I'm sure people are going to say – talk about Bill's blind spot. They'll say, "He can't remember that name, which is so important." But here she was; she was working away at this. I think, somehow, the reward structure for doing science is going to have to change. I'll pick another area where if we ask ourselves what – it's more important now than ever before that we be innovative. The limits to innovation are tied up, again, in this poverty issue and sectors of the population that we're not training to be innovative, and so on, but also in the K through 12 public education issue. Fifty years ago, we were training people to be useful in a society that was mass-producing things – automobiles and other things. Now, if people are going to be useful in today's society, they have to be creative. They have to be inherently transforming themselves all the time rather than thinking, "Oh, I'm going to become a certain thing and stay that way for the fifty years of my career." Those things are the things that will change, and maybe we'll get to the point where we've done enough with poverty so that people really can afford to put weather in the forefront of their consciousness rather than picking up the kids from school or not losing your job because you didn't show up for it or something, things that interfere with safety in the presence of weather. Well, you've been very patient and taking notes on all this, but I think I've exhausted what I might have to offer on that. Those are great questions. I'm going to have to start asking my colleagues anything just to return this "favor."

MB: [laughter] Bill, there are so many gems in the remarks that you just said. As you were talking about the fact that in the future, there will be a collision between collaboration and attribution, I was reminded of the fact that perhaps at that stage, we're able to be inspired by the spiritual plane that you pull us up to, where sharing and giving and attributing to others and sharing credit is going to be even more important.

BH: If we have a psychology of abundance that works best if we feel that our needs are being taken care of – sort of Maslow's hierarchy of needs. Where's our food and shelter coming from? I think it's a mistake to go over to something that sounds Marxist on this – "from each according to their abilities, to each according to their needs" – because you've got to have room for innovation and creativity to be rewarded. So, it's not clear how this will be worked out. But I'll also say that fifty years ago, it wasn't clear – a lot of the things about why people respond to disaster warnings or why they don't, and how they respond, and how to encourage useful responses, particularly to large groups, we just didn't see all of that. So, hopefully, we'll get much better in some of these other areas.

MB: One last thing that you mentioned that sparked a thought in my mind was the recent climate legislation with bipartisan infrastructure legislation – IRA [Inflation Reduction Act]. I feel it might be so important to also evaluate the effectiveness of these legislations to see whether or not these climate investments are proportional to what is needed on the ground by communities. Any thoughts on that, Bill?

BH: Yeah, okay. My first thought is it reminds me of some studies that I think might have been funded by the EPA [Environmental Protection Agency] itself but certainly dealt with EPA and the funding that EPA was putting into various environmental risks versus those actual risks. Those studies showed that there was a big disconnect in a number of cases between large resources going into things that really weren't going to matter much and vice versa. I think there's going to be – there would be some of that, but there's merit in that kind of exercise. This gets back to what we were talking about in terms of you want policies that are experimental, where you're trying these things out, and there's early detection of success and failure. You don't get that if you don't build in how you're going to do this evaluation from the start. So, what tends to happen is you go off and do something for a while, and then some maverick someplace decides to come along and say, "Oh, well, I'm going to study and see if this really works." A lot of times, that's been beneficial. It seems like, recently, a lot of that has been done for political purposes. Somebody decides in advance, "Well, we want to find the weak spots in this or that, and we'll cherry-pick those weak spots versus really analyzing the cost-benefit of something," which is more daunting. Also, it's a moving target. We aren't very good at seeing the long-term impacts, plus and minus the things that we do, and we just need to get better at doing that and pushing out the horizon of – I noticed in this morning's news, somebody was pointing out that

the Bulletin of Atomic Scientists still has its clock set at very close to midnight, which is the amount of time society has left. This whole question of buying time for the human race – that's really the way to look at it; it seems to me that sort of. Figuring out what are the areas where we've got a lot of time and a lot of options versus what are the areas that could really be showstoppers in a very short order that are blind spots for us. The military, actually, has a history, I think, of doing better at this and being more organized about this than civilian sectors of government and society. So, they're constantly gaming different situations. Because it's a tough problem, they haven't been entirely successful over this same fifty-year period we've talked about. They are, at least, trying, and the attempt is showing two things – first of all, its importance. Second of all, the difficulty and how much we still have to learn. Artificial intelligence may provide some help in that regard in terms of getting us to notice things that we've missed and giving us a little better feeling for how some of those things interact with each other.

MB: That's fabulous, Bill. Everything that you said has also been underscored in the Fifth National Climate Assessment, especially this need of measurement and evaluation of adaptation actions that are taking place locally, and to learn from those lessons and, again, either improve those policy instruments and law mechanisms, but just scale that at a rapid pace up and down.

BH: Before, I think it was hard for people locally to see those things. You didn't have the expertise locally that you needed, and then also hard to call attention to it [and] do something about it. We're entering an era of information exchange, where that will be a lot better.

MB: So, I started this ABA by asking you about the report. I will just mention that in the report that you published in 2000, you refer to the Second National Climate Assessment, and we're the Fifth National Climate Assessment. Everything that you drafted in that report is still valid to the world that we live in today. So, thank you so much for your reflections, Bill. Eunice Foote was the name of the person who was able to –

BH: Yes, thank you for tracking that down. I'm glad we said her name while the recording was still going.

MB: [laughter] Because I have my notes. Thank you.

BH: Good for you.

MB: Awesome. Well, Bill, I'm so sorry. But I might have to conclude here if that's okay. Can I stop the recording?

BH: Yes, thanks.

MB: Okay, let me stop the recording.

----------END OF INTERVIEW----------

Reviewed by Molly Graham 3/6/2024

Reviewed by Bill Hooke 3/6/2024

Reviewed by Molly Graham 4/28/2024

Session 30 - February 7, 2024

Interview Summary: The conversation delves into the significance of oral history, mentorship, and personal connections, emphasizing the value of open-ended discussions and the impact of individual experiences on questioning. The dialogue also touches on the importance of documenting environmental change and cultural traditions through oral history, highlighting the challenges faced in the field and the shift towards digital formats. Additionally, insights are shared on the influence of family, advice for future professionals in the weather, water, and climate sectors, and the importance of storytelling for future generations.

Mona Behl: Good morning. It's February 7, 2024. My name is Mona. I am the interviewer here, and I have two special guests with me. It is my extra special Wednesday today. My first guest is Dr. Bill Hooke. As always, Bill, welcome.

Bill Hooke: Well, it's great to be here. It's great to see your other special guest, too.

MB: My other special guest – I had to pull their biography this morning. They are a professional oral historian and radio documentarian. Molly Graham, my special guest here, is trained at the Salt Institute for Documentary Studies in Portland, Maine, where she produced the award-winning radio documentary "Besides Life Here," which has been licensed by several National Public Radio affiliates. She has a master's degree in Library Science and Archives Management from Simmons College in Boston. Molly is the former director of the Oral History Program at the Wisconsin Veterans Museum and Assistant Director of the Rutgers Oral History Archives. In 2013, Molly co-founded Oral History and Folklife Research, Inc. with the mission of preserving the stories, voices, and cultural traditions of Maine and beyond. She is currently an oral historian for NOAA Voices Oral History Archives, where she collects, preserves, and curates oral histories, documenting historical environmental change and its impact on fisheries, oceans, and coasts. Molly, I'm so thrilled that you can join us. Welcome.

Molly Graham: Oh, thank you. This is a treat for me.

MB: Fabulous. With this, we begin the extra special episode of Hooke interviews. [laughter] So, Molly, I want to start [with] a question for you, actually. Tell us a little bit more about the NOAA oral histories project, and we'll go from there.

MG: Sure. I've been in this position for six years now, and I still haven't quite developed an elevator speech to explain it in under a minute, so this will be tricky because it's so many things. First, Voices is both an archive and a program that's been around for twenty years and documents the changing environment through first-hand testimonies. Currently, we have over 2400 unique oral histories that date from 1895 to the present, from Downeast Maine to Samoa. Historically,

we've been fisheries-based and Fisheries-funded. But we realized you can't have an interview about the fisheries, which isn't also about the changing climate, oceans, coastal communities, and the other weather events we're facing and dealing with. So, a number of years ago, we expanded our scope to document those things as well. So, we have testimonies from tsunami survivors in Hawaii. We also have interviews with tsunami experts who have worked at NOAA. The scope is planet Earth. The way interviews come to us is mainly crowdsourced from independent practitioners, historical societies, colleges and universities, museums, and other non-profits that want to archive or co-locate their holdings with us. As part of my work, I conduct about five to ten interviews a year, documenting NOAA institutional history and memory. I also provide support to people who are doing oral history, and I work closely with practitioners to make sure they're trained to do this work. That's been my connection to Mona – training, guiding, and being a big fan of the work she's doing. To that end, I provide workshops, guidance, and support to prospective practitioners. So, folks who haven't done interviews can learn how, and folks who have done interviews can archive them with us. The repository is a tool for researchers; if they're looking to supplement their scholarship, literature, heritage site, exhibit, or really just for fun – we know someone who listens to our interviews while they run on the treadmill. So, there's something for everybody and a seat at a really big table for everyone.

MB: This is really fabulous, Molly. I did not know so much about NOAA oral histories as much as you've shared with us.

BH: Can I ask a question?

MB: Please do.

BH: Molly, that was fascinating. It made me think that the whole discipline of oral history must have changed quite a bit, even in your career. You've got a lot of career ahead of you. Could you say maybe a word or two about that and also where you see the field going?

MG: Sure. My first job in the field was with the Wisconsin Veterans Museum. When I arrived, the entire collection was analog, on cassettes. When you say that to students these days, their eyes cross, and they don't know what that is. Various mediums quickly become obsolescent. I converted everything to CDs, and now CDs are obsolete. We're working in the digital world. Another paradigm shift came with the COVID pandemic and conducting interviews the way we are all connecting today – remotely. As Mona mentioned, my background is in radio production, so I was very Zoom-reluctant in the beginning. I don't like the degradation of sound quality. I don't like not being able to sit in someone's living room. But I've found that even through Zoom, you can still get that rapport and trust. It's kind of nice to peek into your home, and you can peek into mine, see my daughter's artwork, or my dog going in and out of the house constantly. I find, actually, that the interviews become longer because we have the flexibility and because we're

kind of desperate to connect with people who we haven't been able to connect with over the last four years.

BH: But what about going forward?

MG: Going forward, I don't really know. I know that oral historians are talking more and more about embodied knowledge and that we have to treat every interview uniquely. Interviewers have to shed our agency when we approach communities. We have to make this an egalitarian opportunity for folks to author their life stories. I think oral historians are becoming more aware of marginalized communities and filling gaps in the historical record. AI [artificial intelligence] has revolutionized our work. Your interviews are much easier to transcribe because I run them through AI software as a head start, but then I go through it with my human fingers and eyes.

BH: So, that's why you've been able to put up with all these interviews. Yeah. Okay. I see your secret now.

MB: It helps, but it certainly doesn't perform perfectly.

BH: Right. That's very interesting. I could see, as people get more used to the idea, maybe it would become a sort of richer part of work experience, maybe a lot more things could be recorded – meetings and conferences and things because that would give you another whole flavor on how things were going. There might be some resistance to that. But on the other hand, we're all called to be open and transparent about many of the things that we do. It just seems like this is going to be a growing field.

MG: Yeah, I hope so. But I am also worried that it hasn't caught on. We've spent twenty years really trying to make the case to NOAA to fund this permanently and make it an integrated part of the agency, and that's been an uphill battle. It's also hard to fundraise for this kind of thing. I think it's because oral history exists in this part of our mind that we don't want to face, that we're not permanent, we're not immortal, and we don't have all the time in the world to tell our stories. So many people have said to me, "Oh, I should have hired you," or "I should have had you talk to my grandmother before she passed away." But it becomes too late. I'm an oral historian and have been for fifteen years, but it wasn't until last year that I thought, "Huh, maybe I should start to gather my own family history," and did.

BH: Maybe in our rushed world, the thing about audio and video is that you can't accelerate them very much; you pretty much have to watch them in real time. It's not like reading a transcript, where you can just speed through it and have the illusion that you're there. You've really got to be patient to do this. Okay. Sorry, that was all fascinating. Thank you.

MB: Bill, I'm so glad that you asked those questions because this is a conversation that we're having today. I want to definitely, Molly, learn more. You've been doing oral histories, it seems, for the past fifteen years? What are some unique things that have stood out for you? How has that influenced your life? So, if you could reflect on that.

MG: Sure. There are so many things I love about oral history, and one of those things is the "shared authority." The interviewer is not the expert. Everybody has their own expertise. I'm just the midwife to your life story. You've done all the work; you're creating it, and I'm just guiding it out gently. It's allowed me to connect to people who I wouldn't connect with otherwise, who maybe I don't understand or agree with politically, but I can at least understand how they arrived where they are, and I can set aside my own feelings and connect with them on that level. The other thing that is so exciting to me is that you're creating brand new primary source material; once the recording is going, what follows doesn't exist in other places. A number of years ago, I was hired to do the ACLU's [American Civil Liberties Union] oral history in anticipation of its one-hundredth anniversary, which was in 2020. I was interviewing a man named Stephen Pevar, who had started his career as a legal aid attorney on the Rosebud Sioux Reservation in South Dakota. We did another marathon interview; it was four sessions, around twelve hours total, and I think we could have gone for another twelve hours. He kept saying throughout the interview with tears in his eyes, "Molly, nobody knows these stories until now." So, what existed in his mind and memory is now on the record, in print, and available for the public and for the future. To me, that is just so exciting.

MB: Bill, do you have any questions?

BH: I either have none, or I have a hundred. I'll try to bite my tongue here for a bit. It's fascinating. It's been fascinating to be on the receiving end of this. Mona has done a great job. We had a good relationship before. I think it's an even better relationship now. You talk about remaining a little bit detached from what's going on, but I think it's hard. Reporters, I think, always find that – journalists and probably historians, to some level, as well.

MG: Well, that's been the challenge, really teaching this work to scientists because they have questions they want answers to. They have theories. They have hypotheses. They want someone to speak to the thing they're studying. But oral history doesn't do that very well, and it's not the most effective tool when you're trying to answer a question. You just want to know what the possible experience could be.

BH: Well, you bring up a problem for scientists, which is it's not unlike the problems that football players have. They adapt their physical bodies to play the game. Scientists adapt their personas to do the science. Scientists, I think, are really poor at being in touch with their humanity or our humanity. I'll say this as a mediocre scientist, it was easier for me to stay in

touch with my humanity because my fellow scientists were always reminding me of my shortcomings. I think that's a real problem. Maybe a little more attention to oral history would solve that problem. It's getting to be more and more the case because science really should further societal life benefit, and those connections are getting more urgent and stronger. I don't think the detachment has served us entirely well.

MB: Well, I'm so grateful, Bill, that you trusted me enough to share your professional journey with me. It's been such an immensely rewarding experience. Molly, I cannot thank you enough for giving me this experience. Remember, Molly, the time when I first got in touch with you and I shared this idea? We went back and forth. You informed me how Bill's name had come up in other interviews. Do you recall that exchange that we had many, many months ago?

MG: I don't, which is the ironic thing about someone who does memory work. I have the worst memory, which I think is why I'm so desperate to collect as many as possible. I know how fleeting it can be. I don't remember, Mona, but that rings true. It is interesting to meet the person who I have heard so much about in other interviews and finally get his perspective and background. It will connect me to many more interviews in the future.

BH: I can't resist interjecting this. Maybe you've had this experience that if you don't record notes about your appointments, you're actually better at remembering them. In a sense, it's stronger to have the little card that says these are today's events or whatever. But I think as an oral historian, you've put so much of this stuff on record that that's why you have trouble remembering it. It's all been recorded for you. You know where to get it, but it's not up here. Sherlock Holmes used to tell Watson that your mind was like a chest of drawers, and you shouldn't clutter it up too much with stuff.

MB: So, Molly, all thanks to you for your support and mentorship. You taught me so much in this process. I've been able to go back and interview my family, too. I've always wondered, Bill, did you ever wonder where we were going with this project? Did you ever wonder what did I want you to say? Or the purpose of this oral history that we did together? What were some of your impressions? Molly, I'll invite you to ask some questions to Bill, as well.

BH: I did feel a little bit that I was being allowed to go all over the place, and either you didn't try to rein me in, or you tried and you were unsuccessful. You had a vision, and that was enough for me. I felt I was living in the moment in these interviews. I thought periodically that perhaps it would be better if it had a direction or direction I could see, but I think, in some respects, it would have been really limiting. Probably, as an interviewer, you choose your flavor of that – when do I want structure in my oral history, when and where, which projects, and so on. It probably isn't either/or; you want a range of things and just get to see how different ones turn out.

MG: Yeah, you have it right. When I go into interviews, I have an idea of where I'm going, but we never end up in that spot. So, being open to areas of exploration – when someone brings something up that's interesting, we'll spend more time on that. So, I go very roughly linearly or chronologically, but if you mapped it out, it would be a series of swirls and arrows in all kinds of directions.

BH: My experience as a manager and in life really is that control is pretty overrated. The only things you can really control are dead things. You're much better off letting the interactions – it's improvisational. Scientists might do better to be a little more improvisational. In improv, you never criticize. And yet scientists pat themselves on the back for their critical ability, especially criticizing themselves, supposedly, and it leads to a lot of problems.

MB: Bill, our conversations truly felt like improv to me; you always agreed, you always said yes, and you always built from there. I'm so grateful for your trust and your forgiveness and tolerance of many errors, mistakes, and inaccuracies that are kind of woven into the last thirty conversations that I've had with you. So, thank you. Thank you for that. Thanks for your trust in me over and over again. Did you feel pressure, Bill? I think oral history does put a lot of pressure in terms of asking people to summarize their experiences in a few minutes. Did you ever feel that as I was interviewing you? Did you ever feel you just needed more time?

BH: I don't think so, partly because of the open-ended nature of it. Certainly, in the workplace, I was very conscious when I was giving short presentations of the need to be very much on top of it. Maybe I talked to you about [how] my wife put on meetings for the University of Colorado. She didn't teach them, but she had lecturers come in for these two and three-day courses. And one of them told me once that if you wanted him to talk for fifteen minutes on a subject, he wanted two weeks to prepare. But if you wanted him to talk for two weeks, he was ready now. And that's been a little bit of a flavor on this.

MB: Thank you, Bill. Molly, as somebody who transcribed these interviews and was a witness, I feel, to these audio-video conversations, what were some of your impressions for the last eight months that we spent together?

MG: I was initially a little bit worried because of the existing relationship you two have. It's sometimes hard to get outside of that and ask questions as if you don't know so many things about Bill Hooke already. But the nature of your relationship really helped you have that immediate trust, that immediate rapport. Mona, you just took this opportunity to ask all the questions that you hadn't asked already. That was actually the impetus for my family project. We were sitting around at a family gathering, and my Uncle Larry said, “How come you guys

have never asked me about Vietnam?" So, these interviews are an opportunity to ask all the questions that you have never asked before. And you just did such a beautiful job at that, Mona.

MB: Thank you, Molly. So, can I tell you both something? In India, we have this beautiful, beautiful tradition, and I've written about this tradition before. It's called the Guru Shishya Parampara. Guru is a teacher, and Shishya is a student. They're in this traditional relationship, which is a very unique and pedagogical approach to living life. The guru, that is, the teacher, takes comprehensive responsibility of their Shishya, which is the student. The Shishya also is supposed to have some attributes. In Sanskrit, those words are smriti, that is memory; medha, that is intelligence; shlanga, that is merit; raga, that is devotion and dedication; and sangharsha, that is hard work. So, a guru in traditional India used to accept a student only if they possessed these attributes. Now, the Guru Shishya Parampara, I also felt was very limited to the kings and the princes. And I had not really heard or read in Indian tradition where a woman would have a guru as well. I started this interview with – Bill, we started with the relationship of mentorship. To me, these interviews truly did give that opportunity, Bill and Molly to ask direct questions from someone who understands the field in which I work, understands the context of science, and takes the time to listen to me and answer any number of questions that I might have related to personal or professional life, and truly is forgiving and does not give up. So, Bill, I've learned so much from you in the past eight months, and I feel truly privileged to have that kind of access to your wisdom and knowledge. So, I'm so grateful for your time. Molly, what are some of your impressions in terms of oral histories being that conduit through which science can probably better serve society and through which human beings can probably combat any of the misinformation and disinformation as well that we see rampant in the world today?

MG: I don't know if oral history can help with the latter. Oral history has "a different kind of credibility." That's a term coined by Alessandro Portelli, who's a well-known oral historian. That's the beautiful thing about oral history, which is that it's a little bit slippery, and like jazz and improvisation that we've talked about, our memories are constructed over time. That was something I wanted to ask Bill in this conversation was how he thought this conversation was going to go, how it went, and what he now thinks about it because sometimes those things are different. Oral histories teach us that everyone has their own truth. The documentary you mentioned in my introduction was about two guys who claim to be abducted by aliens in Maine's Allagash wilderness. This is where I developed my approach to conducting interviews. It does not matter how I feel about your story. This is your version of your life story, and I'm just here to hear it. To the first part of your question, I think people should be practicing oral history in their everyday lives. Active, empathetic listening. This is how I approach my six-year-old daughter. If you could just not wait for your turn to talk, if you could really hear what people are saying and then just wait to see what they have to say next, it raises awareness, builds connection, and bridges generations. I mean, there's nothing oral history can't do. [laughter]

BH: I have some comments to all that. I'm glad that you said some of the things you did, Molly, because I guess I came into this feeling – I have a friend who is a historian; he and I wrote a paper once about a meteorologist by the name of Cleveland Abbe. I thought I understood history, and he taught me more about the discipline and how almost useless in his mind personal recounts of this were because they were so self-serving and so laden with emotions they clouded people's perception of what was really going on. A historian was supposed to get multiple sources and rummage through all this and sort it out. I still think that. [laughter] But I'm glad you put a voice to it. It complements history in a way, but it certainly doesn't supplant it. The other thing I'd just say, in response to some of the things that Mona said at the beginning, was I'm very uncomfortable with what she explained about the guru; it sounds to me like a wonderful thing in the abstract, but way too one-sided. I think mentors in the West are guilty of thinking this, that they really are sage, and the flow of information and wisdom should be from them as opposed to two-way. Working with the early career people in the colloquium and elsewhere, I always tried to say – we get told these days we need a mentor. That's one of the things young people are advised. First of all, that creates a psychology of need as opposed to a psychology of abundance. People should be invited to see that they started mentoring from the time – you talked about your six-year-old daughter – from the time they're six [laughter] and maybe even earlier. Once you see that, and once you see that it's energizing to have that kind of relationship, you'll never be needy again, and you'll have a much healthier idea about [mentorship]. It's two-way. That's one of the things that always bothered me; you'd see it in NOAA and other federal agencies. They'd say, "Well, since mentoring is important, we're going to set up a matrix, a spreadsheet, or something." We'll take all of the old people, and we'll assign them each a young person, and mentoring will occur. It's not something that can be legislated like that. I think it's more relational. Sorry. I think I've said that already, probably on tapes one through seven or something. [laughter]

MB: I'm so glad that you did say that, Bill, because throughout our conversation, you reminded me of all the people that I have surrounded myself with, and I'm lucky to have in my personal and professional life because all of those people that I've had deep, long relationships with, be it my family members, or the colleagues that I've worked with and collaborated with for a long time, I truly have had, in many cases – appreciate the qualities that I see in them are the other qualities that I seek in myself. So, I would say mentors come in many shapes and many, many different relationships. Most importantly, I think our conversation brought me even closer to my deceased mother because I feel that everything that I was – everything that I've learned from you, learned from Molly in the past eight months, are things that I first heard from my mom. In many ways, my questions to you, Bill, may have seemed absurd, but I was speaking with Molly about how the questions were inspired by my personal life and experiences in the past eight months, as well as the influence that your responses were having on me. It gave me a chance to reflect on your life as someone who I look up to and understand your challenges, the unique challenges that you face. I think it's in those challenges that we're looking for acts of heroism. This is why

some movies resonate with us. When we read something, it resonates with us because we want to see normal human beings really lead their life with integrity and value and consistency of those values. Our conversations actually brought me even closer to my mother, who is my first and foremost mentor. So, I just wanted to definitely say that. I very much appreciate the time, the investment of time, emotion, and trust that went into this partnership. Right, Molly? Hasn't this felt like a partnership? What do you think?

MG: You just went so full force with this, Mona. I would sit on the edge of my chair, holding my headphones for all of these interviews because I was hanging on to every word. Such a beautiful relationship unfolded through these conversations. It was clear that you were bringing some of yourself to these conversations. This is an example of perfect oral history. I don't know quite what else to say. But I have learned so much from these conversations. I'm writing down notes. I want to be more Mona in my next interview. There are things you did, questions you asked, and ways you approached questions that I want to adapt to my practice, too.

BH: In a peculiar way, while you were saying that, Molly, I flashed on Barbara Walters because she used to do interviews – you can pick other people. William Buckley used to do interviews. They're successful to the extent that they can do some of what you just said, show a little bit of their personality as they're going through it, and some warmth. William Buckley didn't do that so much. I kind of felt that he saw every conversation as a debate, and he usually won those debates here in the US by never making a declarative statement, just asking slightly aggravating questions of people who cared what they were talking about, and they would immediately get upset. He once made the mistake of going to England, and he got into some public debates there in places like Cambridge, and people like Germaine Greer ate him alive. [laughter] But we digress. Sorry.

MG: The other thing I'll add is Mona, like lots of good oral historians, has this intangible quality that can't be taught. It's that warmth you talk about, Bill. It's the quality where when you walk into a restaurant or public space, someone just unloads. I told Mona once that good oral historians and good bartenders have that quality. Mona and I have had conversations off the record where afterward, I think, "Why did I just tell her that whole story? Why am I opening up to the stranger the way I am?" It's a quality that she has.

BH: Earlier, I was thinking to myself – we were talking about thanking each other for this experience. I was going to say, "Well, let's wait until we see some of the outside reactions, at least, and where that takes us," for that reason. But I think you're right, that there are certain people that have the gift of getting people open up, and Mona is definitely one of them.

MB: Right back to both of you for that. Being in your orbit is disarming. I feel emboldened to ask any question that I want to. Bill, thank you for that. Molly, thank you for always being so

encouraging and supportive. Had it not been for you, I don't know if we would have come this far along. There were many moments when I doubted myself a lot, that I wasn't doing justice to this. But thank you. Bill, in our conversations, I sometimes felt the past few months, everything, as I mentioned, that's going on in my personal and professional life did inspire some of those questions. It also made me reflect on how our own anxieties and assumptions can prevent us from fully grasping the significance of what the narrator is perhaps saying in that moment. I've had a chance to review some of the video conversations that we've had together and reflect again on those things. So, did you have anything –? Did you have similar impressions?

BH: Not sure who's being asked that question. One thing flashed on again – I'm sorry, I probably have ADHD or something. But you used the word anxiety or something. I just read something – I forget who the person was who wrote it – but she was talking about how anxiety is not the problem. Avoidance is the problem. Being anxious encourages us to avoid challenges and things that we should be doing. I'm still processing that a week or two after having read this article. Mona presents herself in these interviews as being so humble and self-effacing. But we're talking to somebody who didn't have the easiest slog educationally or career-wise and changed cultures to come over here, work in the US, and get a Ph.D., which is never the easiest thing to do in the US system. So, I have a feeling that we're talking to a pretty strong person. And I've seen that, Mona, in a lot of other cases, whether it's AMS Council or some of your Sea Grant work or something. I've seen you take stands that I think you knew were not particularly popular or something, but you did it because they were right.

MG: I don't have much to add to that except to say that you can't help being a human in these interviews. It's okay to bring these other influences to the table, particularly when both you and Bill have created such a safe space for these conversations.

MB: Bill and Molly, thank you for those reflections and for that encouragement and inspiration as well. Molly, you brought up your six-year-old daughter a few times. Tell us her name.

MG: Her name is Charley.

BH: Could you explain that a little bit? Is it Charlotte?

MG: No. It's Charley, spelled with an L-E-Y. We didn't know what we were having when we were pregnant, boy or girl, or something in between. I was pretty sure she was going to be born a boy, and I didn't have any girl names lined up. Charley kind of stuck. It suits her.

MB: Thank you. Thanks for sharing that. Charley has given me much encouragement and brought a lot of joy just looking at her picture. Can you describe that photo to us, Molly, that you shared with Bill and I?

MG: Sure. Charley has developed a lot of really great strategies for her own anxiety. She does this thing where she presses each finger and says, "Peace begins with me." So, when she's heading into a birthday party or a new situation, she says, "Peace begins with me." Another one of her strategies is monkey bars. We have monkey bars in our backyard. She would do them for hours at a time. It was kind of how she dealt with the stress of her kindergarten day. She loves being upside down. I think there's something regulatory about being upside down. So, there's a beautiful picture of her where she is hanging upside down. She's been the best intervention for whatever I'm experiencing in my personal and professional life. She just encourages me to step outside of those things, to have a really good laugh, and to know what's truly the most important. I think she's a future oral historian herself because she's such a good listener. She really understands the diversity of experiences. She has deep, deep empathy, so deep that the first time I ever showed her a movie – her very first movie was *Corduroy* when she was maybe two and a half, three years old. The scene where Lisa leaves the store, not being able to afford Corduroy – Charley just broke down in tears. She really understood the pain of Corduroy. She's a big feeler and a big empath.

BH: Wow.

MB: And she has such an amazing mom. This was beautiful. Thank you so much for sharing more about Charley, too, Molly. That picture has given me a lot of encouragement so many times. So, thanks for sharing.

MG: Thank you.

MB: Molly, my question is going to be to you. You've reviewed all these interviews. Are there things that I should have asked Bill? You wish I would have asked Bill and I didn't? This is your opportunity now to ask.

MG: Well, I'm not totally caught up. So I might have to – I'll let you know in a couple of weeks. I really wish this series of interviews would never end. I was telling Mona the other day that every Monday I check my Mona folder, and when it's empty, I'm disappointed. So, I think the answer will probably be yes, but it's impossible to ask all of the questions. The questions I'd ask may be different than yours, and then that would be a different interview and maybe not as successful.

BH: Do they fall in a category? Molly, is Mona hitting you with this question cold, or did she give you a day or two? Yeah. That's the kind of question where the person hearing it thinks, "Gee, I wish I had known this question in advance. I could have had a few notes jotted down or something."

MG: I'll go back through, and if something stands out as really a major gap, maybe I'll let her know. But the conversation is the conversation, and I think it unfolded exactly how it should have.

BH: Yeah.

MB: Thank you, Molly. Bill, are there any questions that you wish I would have asked you, and I didn't?

BH: I can't think of a particular one, but because my experience was one [where] I just got to see so many special people do so many things, they probably would have to do with exploring this or that person's impact on our field there, or what was your connection with him or her. I might have a list or just going down – probably a number of whom were already in one of Molly's histories. It would be more things like that rather than questions about me.

MB: Thank you, Bill. So, there were a couple of common questions that we got. I'm, first of all, very, very grateful to all your colleagues, our colleagues who shared their questions and provided contributions to Ask Bill Anything. That was quite an amazing process of soliciting and learning from all of them. One of the common questions was, Bill, who were some of the people who influenced your life? You've spoken about many, many people throughout your interviews. If you could just talk a little bit – reflect a little bit – on the people who still inspire you, I think that's a thing that we've heard over and over again.

BH: Well, I think Molly would probably pick up on this, too, that you ask a person that question at different stages in their lives, they'll give different answers. And that's one of the perils and positive things about oral histories. I'll take two that I've been reassessing in recent weeks, and that's my parents. Just very quickly there, my dad was a mathematician, and my mom always used to say – my mom functioned as my dad's deputy when we were growing up. She was very good at telling us why we should be more like our dad and so on. She'd talk about how smart he was and all the rest of that. I think I mentioned that he had one paper that he got a patent for back in the '60s. This was a paper on what was called direct search; it was an attempt to find optima in things when you didn't have any formulas to go on, you didn't have any pre-existing biases about what the optima should be. He would talk about this at the dining room table, and it wouldn't make much sense to my brother and me even though both of us were in college or graduate school. But now, recently, I find that this is a paper that's quoted often in so many articles about artificial intelligence. It's actually been cited six thousand times, and this Hooke-Jeeves method is something. I tried to go to some of the artificial intelligence sessions at the AMS [American Meteorological Society] meeting in Baltimore last week. They were all so crowded; people were standing by the walls when I'd get to the room, and I realized I couldn't

really do that. So, I asked the chat box on my phone if the Hooke-Jeeves algorithm had anything to do with the use of AI and weather prediction. And it had. There were papers. So, I thought here was a connection to my dad that I never thought I would see, and what a blessing it is to find all that out – little hints of it. It reminds me so much that I was a big history buff when I was a kid, and I'd read about the gold rush of 1849. I just think about all those people in the covered wagon, some of whom made it to California, some didn't. But they changed American history, even though we don't know their names. And I was kind of thinking, "Okay, my dad is like that." In my mom's case, she and I had – she was the one that sort of gave us life skills, and they were flawed in some respects. I remember a particular one, which, even in this open atmosphere, I'm not sure I want to discuss, but it's one of the things that I had trouble forgiving her for. Anyway, I just had trouble forgiving her for it. And then there were things she didn't forgive me for. She was the best all-around in her high school, just getting A's and beautiful, and everybody loved her. I sort of had the belated experience recently that maybe she wasn't that thrilled that she married Dad. [laughter] That maybe they didn't have the greatest relationship in the last years. But when I was applying to college, I had an interview with the dean at Swarthmore and talked a lot about my dad and his mathematics and so on. And my mom asked me afterward, "Well, what did you say about me?" I said, "You were healthy." She was so insulted by that. I was a sickly kid. My revisionist interpretation of that history later was that health meant more to me than she gave me credit for. But also, looking back at my career, there are two pieces of it. There's the science piece. That's Dad. But the faith piece, even though my wife, Chris, played such a pivotal role in that, my mother came from a faith environment. Her father was an elder in the biggest Presbyterian Church in Greensboro. She spent some time trying to get us to go to church as a family. My dad went with her when he was dating her before they got married, and then kind of stopped once they got married. We had an intermittent connection with that. But I realized, in retrospect, these two big pieces of my life, the faith and the science, came from my parents. That's such a long answer to that question. I'll focus just on the two of them. It's a wonderful thing to discover at this point.

MG: That's the gift of oral history, too, is that we can trace and capture that influence by asking you about family history because so much of our present and our past and our future is shaped and inherited by our parents and their parents and where we come from and what gets handed down.

BH: Yeah.

MB: Bill, thanks again for sharing that. So, my last question, Bill, is, what is your message to all the students, early career professionals, and people who are working in the field in the space where you walked – the weather, water, and climate enterprise? What is it that we need to remember as we address some of the issues that face our planet and ourselves?

BH: Well, I probably said this already, too, but I think that if you look at our history and our place in the world today, this is how it feels when things are going well. What I mean by that is I'm forecasting that a couple of hundred years from now – I don't know what life will be like. I have a little bit of an idea of what life will be like in two hundred years, but I have a better idea of how they'll look back at this time, the year 2000. So, two hundred years from now, they're just going to see it as the year 2000, and they're going to say, "Well, people got the computer. Well, they got satellites and radars. They were able to get a lot of information about the Earth and all sorts of things – the sea and the atmosphere and the geology. They had the computers to digest the information. And it occurred in the nick of time because eight billion people were turning the planet into an ashcan." They'll envy us. They'll think, "Not only did Molly and Mona and Bill get to live through this period, but we had the sense of manifest destiny that everything was going to be great." [laughter] And they're jealous. They're going to say, "It's not like today, the year 2200." They're going to say today, "All we have is polarization and organizational infighting, dysfunction of red tape, and dysfunction of every type." But they're going to forget. If you were, say, a seaman on one of Columbus's vessels in the Age of Exploration, the boat leaked, the grog was weak, the bread was moldy, the bunk bed was too short, and the captain was certifiably crazy. Then there was this guy on the bunk above you keeping you awake by saying, "Oh, this is the great age of exploration. We're all lucky to be alive during this." You'd think, "What an idiot." Anyway, that would be my message. Basically, we're in the business of renewal of society and the Earth. Those two things have to happen together. We should make our best efforts to not flag in the pursuit of this and also our best efforts to remain hopeful about how things are going to turn out.

MB: Thank you, Bill.

BH: Thank you for asking these questions and keeping us going. Thank you, Molly, for actually showing up and having to endure this twice, once when you participate, and now you're going to ask, "Why did we ask so many questions? Why did I talk so much? I've got to transcribe this."

MG: Endure is not the word I would use. This has been such a pleasure. I sometimes waffle between feeling fairly nihilistic about what I do, especially when I think about the future. What's going to be the point of this enormous Encyclopedia of Life if life no longer exists as we know it? But this is the kind of interview series that reminds me why I do this, why this is so important and valuable. Imagine if we had oral histories from the Age of Exploration, and we could understand what people thought, anticipated, felt, and believed. What an opportunity to capture your oral history and so many others at such a critical time in our planet's history.

BH: The hopeful thing really matters because we're bombarded with negative information because the media know that eyeballs are their lifeblood, and people watch terrifying things, scary things, vexing things, and so they feed us that. And then we look up at the end of the day,

and we think, “Man, that's all I've gotten.” I've inflicted this on Mona, Molly. But have you ever watched –? TED Talks are not all equal. Have you ever watched one by a guy named Shawn Achor? It’s called “[The Happy Secret to Better Work].” He starts out with the story of when he was seven, and his little sister was five. It takes about eleven minutes. I encourage you to find some time in your otherwise busy schedule and watch that, maybe with your husband, your life partner, or whatever is going on. Maybe watch it first, just to be sure that your husband would like it, and then try it out. It’s Shawn Achor, and it’s “[The Happy Secret to Better Work].”

MG: I will. I feel like I could do that TED Talk because I’ve figured it out; it's being an oral historian. [laughter]

BH: Wow. Now, see, that's the thing. That's one thing. I've really looked forward to going to work every day. Particularly when I was taking the metro, I would think to myself, “I'm going to work with three-quarters of a million brave people," because you can look at their facial expressions. They're not happy about going to work, but they're doing it. The three of us maybe have had that experience. The work we do is just hugely – what a privilege and really enjoyable. Thank you both. Wow. By the way, I don't think we said this explicitly. But this is the final interview. Right? This is the high note that we're ending on. What a privilege. Looking forward to continuing to engage with both – oh, let me just mention one other thing. Maybe we should shut off the recording. Let's do that.

MB: Bill, thank you again for your time, for your generosity, for everything, for this beautiful, beautiful gift. And Molly, I am so grateful to you as well for being such a fantastic colleague, a teacher, a friend. Molly, my last question is actually to you. In the age of renewal that Bill has talked about, what advice do you have for future oral historians about how they might collaborate with NOAA Voices to capture these stories so that two hundred years from now, we do capture these important life stories and experiences in this age of renewal?

MG: That's a really tricky question. I think there's so much planning involved in doing oral history and project design and preparation. And you really just have to get out there and do it. Connect with folks. Set aside your agency and your own context, and really understand people's indigenous knowledge, what their experience is, not how their experience relates to your own experience. I don't know. There are so many skills in doing oral history that are good for the world beyond the interview. When I teach college students oral history, I tell them how it improves their love life. It's a way to connect, understand, and build trust and rapport. Doing this work pays off in dividends – in the interview itself, building that connection and creating primary source material that folks can use for a variety of reasons going forward. And like Bill said, it gives me hope, hope for the future, and hope for our society.

MB: Terrific. Thank you both so much. Do I have your permission to stop this recording?

BH: Oh, yes.

MB: Molly?

MG: Yes.

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Reviewed by Molly Graham 3/10/2024
Reviewed by Bill Hooke 3/11/2024
Reviewed by Molly Graham 4/28/2024