

Getting Curious with Jonathan Van Ness & Bill Nye

JVN [00:00:02] Welcome to "Getting Curious". I'm Jonathan Van Ness, and every week I sit down for a 40 minute conversation with a brilliant expert to learn all about something that makes me curious. On today's episode, I'm joined by television personality, climate change advocate and most famous, gorgeous, sensual science guy, I ever did see, Bill Nye. Where we discussed an array of topics from green algae to renewable energy. And really, how do we get people to give a fuck about climate change? Welcome to the studio. Bill Nye, the literal science guy. I added the literal part, but it's literally you in front of my face. I can't believe it.

BILL NYE [00:00:39] Oh, I got to be somewhere. I'm here with you.

JVN [00:00:42] Because, you know scientifically, can't really be two places at once.

BILL NYE [00:00:46] No.

JVN [00:00:46] Not yet.

BILL NYE [00:00:46] Not as far as we know. Yeah. And this whole idea, well, let's clone you. That doesn't work. You have to have a whole life experience, you can't just show up with the same genes. Heavens.

JVN [00:00:56] Well, Barbra Streisand apparently cloned her dogs. And I have to say, after the year I've endured with losing cats, I would totally be down to like clone pets.

BILL NYE [00:01:06] Well, you can clone your cat, but the cat isn't going to have the same life experience.

JVN [00:01:11] But he would have the same personality, right?

BILL NYE [00:01:14] It is to be presumed. You know, everybody wonders nature versus nurture.

JVN [00:01:18] Because maybe like when-

BILL NYE [00:01:19] If you've changed cat food, who knows what stress you could induce.

JVN [00:01:23] Or if I was just like more like available like the second time-, oh, I can't even get into it. Oh, my God. OK. So global warming. I feel like growing up I was born in '87, I-

BILL NYE [00:01:36] 1987.

JVN [00:01:37] 1987. And I remember hearing about global warming as early as first grade. And I remember in first grade, it was 1993, and there was a huge flood in the Mississippi River that year. And I remember back then they're like this is like a once every 500 year flood. We were like sandbagging, which I particularly loved because there was a KFC and a Taco Bell tent by the river when you were sandbagging. So I could eat a lot.

BILL NYE [00:02:01] Wow. Cool.

JVN [00:02:02] Yeah. You know, I was little-

BILL NYE [00:02:02] Where was this? North and south?

JVN [00:02:04] I was in Quincy, Illinois. That's how I was born and raised. So it's kind of right in the middle of Illinois. But it was a really massive flood that year.

BILL NYE [00:02:10] And it was still a flood that far north. Wow.

JVN [00:02:12] Yeah, well, it was it was it was really bad. At West Quincy, the town across the river for me was a completely underwater. And my town was mostly spared because it's up on a, on a large bluff, but it was still a really intense flood. The point is, is that global warming and climate change is something that I've been hearing about for most of my life. But it does seem that I am observing the effects of it. It does-.

BILL NYE [00:02:36] 500 year floods every week.

JVN [00:02:38] Yeah.

BILL NYE [00:02:38] Yes.

JVN [00:02:39] Yes. It definitely seems that, you know, things are increasing. And it, and it seems that there is a kind of a a growing like a dystopian disconnect between like government and scientists.

BILL NYE [00:02:51] Well, this government, yeah. This US government. For sure.

JVN [00:02:54] Yeah. So, I mean, but that's been, you know, a lot of events in the last three years. So most recently we had Sharpey Gate and there's a lot of like little-.

BILL NYE [00:03:02] The Sharpey Gate. That's the hurricane?

JVN [00:03:02] Hurricane. Yes.

BILL NYE [00:03:03] I did not, this first time I've heard that coinage.

JVN [00:03:06] Yeah, that was Sharpey Gate. And then also I mean, I think one of the, we've talked about this a little bit-.

BILL NYE [00:03:09] Poor guy, you know, he just lies all the time. And, you know, people like this. He lies to everybody, then he lies to himself about how he lied. And people like that are frustrating. But this guy ended up to be president.

JVN [00:03:24] Well, what do you see as like the wider dangers and implications for us on a day-to-day, affecting our daily lives level of this, you know, not listening to scientists and experts when it comes to climate change, like in the near future?

BILL NYE [00:03:41] Well, there's, we can't keep ignoring it. I mean, I just don't, I don't think the current administration, I think is not going to get reelected as we know it. And though, I think things will go back to a little bit to normal, but I just hope that as people, well, of course, hoping doesn't do much good. Except you have to be optimistic. I think sooner or later, things will change very quickly. And by that, by things, I mean transportation systems and government investment in new sources of energy. I think it will happen really fast. And the example I always give people is my grandfather went into World War One on a horse. His daughter was in World War Two in a street car. His son was in the Korean War in mechanized infantry. You know, he's in real cars and trucks, real tanks and all that sort of thing. And so things will change very quickly. But the sooner the better. People say in 12 years, 11 years, the sooner the better.

JVN [00:04:41] Well, I mean, in 2016, no one thought that Donald Trump was going to win then. You know, we do have-.

BILL NYE [00:04:48] Well, and as we, as some people remind us, he didn't win the popular election.

JVN [00:04:52] Right. But unfortunately, until we ratify a new constitution, you know-.

BILL NYE [00:04:56] That's not gonna-. So the way we're going to change that, Jonathan. You guys, big changes are very hard. This is what I would tell our good friends on the, on the far progressive side. Your Bernies and your Elizabeths, is you guys, people don't go for sweeping changes. They go for small changes. And this change that's starting is the state of Colorado is proposing a law that would require or would induce, their all, their Electoral, Electoral College votes will go to whoever wins the national election, the popular vote for president, no matter what else, happens in the state of Colorado. If this law were to pass, all their Electoral College votes would go with the national winner. So if that started in a couple of purple states or Colorado and say, Iowa. Nebraska is a unicameral go, they don't have a House and the Senate, they only got a House. If that happened in a few places, then the Electoral College would in, let's say, four or five elections, 20 or 24 years would be irrelevant. And-.

JVN [00:06:06] Right, but-.

BILL NYE [00:06:06] Then people would change the law.

JVN [00:06:08] Sure. But, you know, with this new science that's come out that says that like the climate in the world that we know it is going to be face irreparable damage in 12 years, like we literally don't have 20 years, according to these statistics.

BILL NYE [00:06:17] No, that's true. Yes.

JVN [00:06:18] And, you know-.

BILL NYE [00:06:19] But if the next time a regular president gets elected, a regular president with a regular understanding-.

JVN [00:06:25] But that's a huge if.

BILL NYE [00:06:26] Well, sure.

JVN [00:06:27] So here's my direct question to you.

BILL NYE [00:06:28] Yes. Bill Nye, what?

JVN [00:06:30] Can our, can our climate, can our world endure a Trump presidency in 2020?

BILL NYE [00:06:38] Oh, you guys, we remind us, if you like, you love to worry about things. That's your shtick.

JVN [00:06:44] Is it?

BILL NYE [00:06:44] Yes. Yes. Chemicals, air, things. I'm pretty wound up too. But the Earth's going to be here no matter what we do. That's what sucks. The Earth does not care about

humankind. We are just one more species coming and going. What we want to do is save the world for us. For us humans. And so, yes, another presidency with all these extraordinary B team players. My goodness. Where did they find such mediocre men and women? So me, I didn't know there were that many.

JVN [00:07:17] Well, you know, that's the thing about. I mean, you know, say what you will about Marianne, Marianne Williamson's past, and in her books and everything. She said, I really don't know that much about her, but what I will say is this. I think that it's, that she really hits the nail on the head. When you say that, like, we aren't going to beat this particular president with the same things that didn't work the last time. And it does feel like it's going to take a bigger movement. And I'm just getting nervous when, I mean, I look up to so much as a scientist and as a leading voice.

BILL NYE [00:07:40] Right on.

JVN [00:07:40] And it's like. But, you know, when, when we're talking about like if we get someone, when we get someone, I mean, it seems like the people that are at the top of their game in climate change are say, are starting to say like, you know, we really don't have that much more time. And it seems like, like when does that wiggle room start to end?

BILL NYE [00:07:55] Well, it's starting to end right now, you guys. You're talking about your 500 year flood that happens every year now, or it's kind of, there's more heat energy in the atmosphere and that just makes more storms. It just makes more weather unstable. And people have been talking about this, what'd you say? 1987 you were born?

JVN [00:08:14] Mmhmm.

BILL NYE [00:08:14] Yeah, it was, when I was in engineering school, Carl Sagan, this famous guy, was talking about climate change in 1980. And James Hansen, the, Jim Hansen is the big climate scientist at NASA. He testified in front of Congress in 1988 and said, hey, we're going to have a problem. And Exxon Mobil had, has these documents. Or I guess it was just Exxon back then, has these documents where the scientists are saying, hey, we're in the wrong business. But nobody did anything but we will soon.

JVN [00:08:47] What did those memos say?

BILL NYE [00:08:48] That they knew they were putting or they had discovered that they were putting carbon dioxide in the atmosphere at an extraordinary rate and that was warming the world fast.

JVN [00:08:57] And that was fossil, burning fossil fuels to make oil.

BILL NYE [00:08:59] Yeah. And that's how I got here. I got here in an electric car. Actually today. Today I might have come here on solar power.

JVN [00:09:06] Can you explain to us, you know, I didn't realize that fossils literally came from fossils. Or fossil fuels came from fossils until like a year ago.

BILL NYE [00:09:15] Well, fossil is a word that means "bury". Buried. So fossil just means stuff that's buried. So coal is ancient swamps. You know, when you go, like in Illinois, Indiana, the coal fields or coal mines, they are underground. And you, you can see these, these ancient trees that are part of an ancient swamp that's turned to coal. It's amazing. It's amazing.

JVN [00:09:40] And so there's coal deposits that are really just buried stuff all over the world.

BILL NYE [00:09:45] Yeah, well, there's big swamps, you know? There was an inland sea where we now have Wyoming and stuff.

JVN [00:09:50] And so how much more fos-? So fossil fuels are finite.

BILL NYE [00:09:54] Yeah, but here's the thing. We'll never run out of coal. There's so much flippin coal. It's a coal festival here.

JVN [00:10:01] And so if we, so you literally even though it is finite. It would really take like, what, decades?

BILL NYE [00:10:06] Three centuries. They say.

JVN [00:10:08] Three.

BILL NYE [00:10:09] Three more centuries.

JVN [00:10:11] Of burning at the rate that we've been burning.

BILL NYE [00:10:13] Yeah.

JVN [00:10:13] OK. So three hundred more years.

BILL NYE [00:10:17] But that's. You don't want to do that.

JVN [00:10:18] No, course not. I mean, of course that. But I mean, isn't that where sort of this, you know, mediocre approach to climate change comes from? Because it's like we can, it kind of feels like we keep kicking the can down.

BILL NYE [00:10:29] Well that's at the, the slow motion property of climate change, very frustrating.

JVN [00:10:33] So but that's the thing. I mean, if I hear you say that, like we know when we get a new president, things will happen very fast. But it's like it's hard to get that sense of urgency when it's like, where are we going to get the sense of urgency?

BILL NYE [00:10:45] That's what I mean. That's why I'm here, man.

JVN [00:10:47] So help me.

BILL NYE [00:10:47] Be urgent.

JVN [00:10:48] So but, so help me be urgent. I mean, your own response to Trump in 2020 was kind of like not that urgent feeling?

BILL NYE [00:10:54] Well, I am hopeful that cooler heads will prevail and all those guys and gals will be swept aside if just people show up to vote. And, you know, people went on and on about collusion for a longtime, couple of years, but it's really just regular old corruption. It's not, it wasn't like he was in cahoots with, let's say, the Russians or the Russian intelligence agencies. He's just corrupt, just using government money to finance or keep his golf courses afloat and-

JVN [00:11:28] Well, let's-.

BILL NYE [00:11:28] Proposing that the international summit be at his property and stuff.

JVN [00:11:32] Well, let's talk about some of the stuff that he, that this administration really has done to climate. I mean, first of all, he pulled us out of the Paris Climate Accord.

BILL NYE [00:11:38] Big mistake.

JVN [00:11:39] Then. And basically, the Paris Climate Accord was about fossil fuel emission or just carbon emissions. Right?

BILL NYE [00:11:45] Yeah, Carbon, well, it's the same thing.

JVN [00:11:46] It is. So because do we get a lot of-.

BILL NYE [00:11:48] It's the shorthand.

JVN [00:11:49] Do we get a lot of carbon emissions from non-fossil fuels? Like from other industries?

BILL NYE [00:11:53] No, no. I mean, making plastics. There's, I guess there's got to be some emissions, but that's a tiny fraction of just burning, burning, burning. So, you know, when you burn. So there's a couple of things. Carbon is in carbon monoxide and it's also in methane. The natural gas that leaks out of things.

JVN [00:12:12] And like from cows. Right?

BILL NYE [00:12:15] Cows. Yeah. That's their burps. By the way. For you, if you're scoring along with us.

JVN [00:12:18] It's not their farts?

BILL NYE [00:12:18] No. It's the other end.

JVN [00:12:20] And it's not their poop.

BILL NYE [00:12:22] Not so much. The problem is just, here's what it is. When I was a kid, there were three billion people in the world. Now there's seven. Almost 7.7 Billion people. And everybody's breathing and burning all this stuff and we're just pumping carbon monoxide like crazy.

JVN [00:12:39] Creating so much heat.

BILL NYE [00:12:40] There's just so many of us. Well, creating so much carbon monoxide that it holds in more heat than ever. So when I was a kid, there were around 350 parts per million of carbon monoxide. Today there's 410. And the guys, there's a guy named Joe Bastardi who's a big climate denier weather guy. He's on Fox News from time to time. And I offered him a bet that 2010-2020 would be the hottest decade on record. I offered him 10,000 dollars. He wouldn't take it. 10,000 dollars, by the way, I chose when Mitt Romney, if you remember him, was going to bet Rick Perry, if you remember him, the guy who wanted to close the Department of Energy has now been put in charge.

JVN [00:13:26] Yeah.

BILL NYE [00:13:27] The Department of Energy. It's a cartoon, people.

JVN [00:13:29] And, and the EPA. I mean, we've had, I mean, they're rolling all the clean water stuff.

BILL NYE [00:13:33] Just so, so the whole idea that regulations are bad. Whose idea is that? You pay taxes on the whole road you get to drive on both sides. What do you mean? No, there's rules, for crying out loud.

JVN [00:13:47] Ooh. That's a good thing. So you're basically saying like because-

BILL NYE [00:13:50] Rules are good.

JVN [00:13:51] Well, especially with like the Clean Water Act, we learn a lot about it on this podcast, but they've really been fundamentally rolling all that back and especially these last few weeks, they're really rolling it back.

BILL NYE [00:13:59] They're trying to.

JVN [00:14:00] Well, yeah. But I, but that really creates a public health crisis. I mean, we've already been through the whole thing with Flint. But there's also this whole a blue green algae bloom thing that's going on. Do you know about that? What's that whole thing about?

BILL NYE [00:14:12] Yeah. So everybody, the reason we're able to feed 7.7 or 7.6 something billion people is because we can make fertilizer. This, we can take nitrogen out of the air and make powder that sticks, that plants take up and make more plant crops. But if you fertilize, fertilizer got so, has gotten so cheap that people over fertilize, and it ends up in your Mississippi River. It goes downstream and ends up in the Gulf of Mexico, and then these algae just thrive on it. And then when you fill the water with these algae particles, then the fish can't breathe. And it's just everything sucks.

JVN [00:14:54] So it's too much fertilizer.

BILL NYE [00:14:56] Yeah. That's a big thing.

JVN [00:14:57] So-

BILL NYE [00:14:58] But it's just management. It's just, we should be able to figure this out.

JVN [00:15:02] Oh my god. We got to get to it in just two seconds.

BILL NYE [00:15:03] Oh, we got to take a break. We got to take a break.

JVN [00:15:05] We'll be back with more Bill Nye the Science Guy, right after this. Welcome back to "Getting Curious". This is Jonathan Van Ness. So we were just leaving off with algae. So is that like the number one reason why these blue green algae bloom things are happening?

BILL NYE [00:15:28] It's over fertilizing. Yeah.

JVN [00:15:29] It's over fertilizing.

BILL NYE [00:15:30] And the ocean is getting a little warmer.

JVN [00:15:32] And is the over fertilizing here in America, is that like the corn? The soybeans?

BILL NYE [00:15:37] Yeah, all that stuff. In the breadbasket, as it's called, you know, the Midwest where you're from.

JVN [00:15:41] So when those dogs, like, jumped into that lake in South Carolina and like, got, like died from that blue green algae thing and like, those people are talking about the blue green algae in the freshwater. Like, that's literally from over fertilization?

BILL NYE [00:15:51] Probably.

JVN [00:15:53] So where does-?

BILL NYE [00:15:54] One example, I'm not sure, but probably.

JVN [00:15:56] So where does that start? Like, is that like the poor farmers was like, "Let me get as many crops as I can, so I'm just going to fertilize the shit out of it."

BILL NYE [00:16:02] Yeah. Yeah.

JVN [00:16:02] Like who makes that choice?

BILL NYE [00:16:03] Yeah.

JVN [00:16:04] So.

BILL NYE [00:16:04] And-.

JVN [00:16:05] But aren't they maybe being pressured by some of the economic decisions that this president is making to try to get better yields because of the tariffs and stuff? And they are already struggs?

BILL NYE [00:16:12] That I don't know.

JVN [00:16:13] Can't draw that line. I'm just being conspiracy theorists right there. Oh, my God. Oh, my God. I'm so sensitive.

BILL NYE [00:16:18] The yarn on the pushpins.

JVN [00:16:19] Yeah.

BILL NYE [00:16:20] The pushpins on the, on the bulletin board.

JVN [00:16:21] Okay, fine.

BILL NYE [00:16:22] But over fertilization is a big problem. And what I've always said is it's solvable problem. We should be able to figure this out. We should be able to manage our fertilizer. And if you talk to most farmers, they work very hard to manage it. But, or but, and when weather becomes less predictable, it's harder to manage your inputs, as they're called, in agriculture.

JVN [00:16:46] So let's say that in 2020, we elect Donald Trump. Then let's say in 2024 we elect Don Junior. Then let's say in 2028-

BILL NYE [00:17:00] Vladimir Putin.

JVN [00:17:01] No. Let's say no, let's say Ivanka. Fuck it. Let's, let's say Ivanka does it. So let's say we have, let's say we have three administrations coming in front of us after Trump that are all pro corporation, anti science. We'll take a Sharpie to a National Weather Service map and make their own thing. And they will, because I mean, essentially what we're thinking we're finding out here is that Wilbur Ross, not Wilbur Ross, who's the guy that runs the NOAA?

JVN [00:17:26] NOAA. National Oceanic and Atmospheric Administration.

BILL NYE [00:17:28] Yes.

JVN [00:17:29] And NO, who? Who do we call it again? The NOAA.

BILL NYE [00:17:32] NOAA. NOAA.

JVN [00:17:33] NOAA. We love that. But it stands for?

BILL NYE [00:17:35] National Oceanic and Atmospheric Administrator.

JVN [00:17:37] I think it's Wilbury?

BILL NYE [00:17:39] Well, he's head of EPA.

JVN [00:17:42] Well, basically-

BILL NYE [00:17:43] I'm under pressure, I'm thinking of the guy's name. Oh. Anyways, so-

JVN [00:17:47] Well so, he basically he made, he made the scientists say, that disagree with Donald Trump-

BILL NYE [00:17:52] Tried to.

JVN [00:17:52] Retract their, yes. Tried to retract. And so there's that thing. But if that is the attitude that continues to prevail in the next 12 years, the next 16 years, like when currently scientists are saying-

BILL NYE [00:18:03] Well, that would be real serious. Yeah.

JVN [00:18:03] So like, what's going to happen? What will that look like? I mean, right now we have Greenland. All the ice is melting in the middle of the summer.

BILL NYE [00:18:09] We're going to have trouble. We'll have crop failures and we'll have flooding on coastlines not just here in the developed world, but in the developing world, in Bangladesh and South Asia. People are going to move away from the coasts and where are they going to go and what are they going to eat? And there's going to be conflict. And everybody can see it coming. But I think I, I think these, the conservatives are just obsessed with getting judges, getting the judges they want. And this has led to them putting up with just about anything.

JVN [00:18:42] Well, I mean, there's such a-

BILL NYE [00:18:43] That's my hypothesis.

JVN [00:18:44] Well, there's such a divide and conquer strategy here. I mean, from the, from the Republicans and a misinformation situation. I also think that it's important to start to draw differentiation between, like Republicans and Trump supporters, because I do, that's where I will use the word hope and hope that there is a difference, because I do think that there, that that is two different breeds the people.

BILL NYE [00:19:02] Yeah, I agree. Conservatives started the freaking Environmental Protection Agency.

JVN [00:19:07] And conservatives used to be like really pro-choice, like pre Phyllis Schlafly in late 70s, like it was very pro-choice. Like-

BILL NYE [00:19:14] It was live and let live.

JVN [00:19:15] They were just fiscal conservatives.

BILL NYE [00:19:17] Yeah.

JVN [00:19:17] They just didn't want to spend their fucking taxes.

BILL NYE [00:19:19] That's right.

JVN [00:19:19] It wasn't, that was. And honestly, sometimes I feel cheap. Sometimes I feel like I want to be a little bit cheaper with my tax money. But, you know, I get. But it's all this other-. Okay. So anyway.

BILL NYE [00:19:29] Well, we disagree. You know, people have different opinions when they think, when they feel tax dollars are being wasted.

JVN [00:19:34] Yeah. 'Cause I feel like mine are being wasted. I think they're actually being used to like, you know, oppress poor Yemenis people and, like, give arms to Saudi Arabia and all this other fucked up stuff.

BILL NYE [00:19:43] The other thing, conservatives right now, they're so into this having, preventing abortions, that they, they're put up with all, with any extraordinary nutty point of view. And it's very frustrating. So we'll see what happens when states enable or, California is going to enable abortions and then there'll be federal lawsuits. But that'll go on for a long time. Same with cars. When California won't, it's not the same as abortion. Excuse me. But when California won't let you import your car, if it doesn't have, if it doesn't meet certain emission standards, then that's going to be enormously influential no matter what some wild person in the federal government makes up.

JVN [00:20:28] Oh, yeah. Because. Because Gavin Newsom wants to keep going with those same emission standards and they're going to-

BILL NYE [00:20:35] And so do the automakers because they can see it coming.

JVN [00:20:38] Yeah, but Trump doesn't want to.

BILL NYE [00:20:39] Yeah, or his people.

JVN [00:20:40] So. So basically-

BILL NYE [00:20:41] Can you-? I mean, does everybody, does anybody know what Trump wants really? Can he keep a thought in his head? One hour to the next? It's a toughie.

JVN [00:20:50] He just wants. I feel like he wants power. I feel like he wants money. I do feel like I see a pretty clear-

BILL NYE [00:20:54] Well, he doesn't want to lose any more money. I'll give you that.

JVN [00:20:56] But I feel like he's really enriching himself a lot from the presidency by like having all us for saying at his courses and blah blah blah. But here's what I want to ask. How do we make climate change a central issue to the 2020 election? And furthermore, I have trouble wrapping-like we need to get a sense of urgency on this if we want to bump this up in the priority list.

BILL NYE [00:21:21] Yeah, yeah.

JVN [00:21:22] Because to people in the middle of America that will elect this next president. Hearing that people in Bangladesh are going to move inland is not a real a-

BILL NYE [00:21:30] Oh yeah. I agree Yeah, yeah.

JVN [00:21:31] It's not a real. It's not. It's not going to make them you see the sense of urgency. So it's like that's what I'm trying to get to, is that like there is a genuine disconnect. And, and when people can't see the threats, it feels like boy who cried wolf. And that, I think, is-. How do we get climate change as being something that people have been hearing about in the periphery their whole life, and I'm still here. And I'm not saying I'm a climate change, change denier. I am, you're preaching to the choir. But what I am saying is that there's a whole bunch of people who have shown up, who have, who have shown in the past that they will not show up for climate change.

BILL NYE [00:22:08] For climate change. Yeah. This is, this is why we're here, man. That's why we're doing this podcast, man.

JVN [00:22:11] Yeah. So how do we do it?

BILL NYE [00:22:13] Well, we talk about it. I say all the time, if, people say, "What can I do about climate change"? And the answer is my answer, rather, is talk about it. If we were talking about climate change, the way we talk about Medicare for all. The way we talk about gun violence. The way we talk about the corruption in the administration. If we were talking about climate change at that level, we would be doing something about it. And I think pretty soon we will be because the consequences are just getting more and more apparent.

JVN [00:22:42] Well, I'm trying to draw some parallels so that people can see what those consequences are. I think one of the most clear has been Flint, because that feels-

BILL NYE [00:22:49] Well, Flint, yeah. Flint's also mismanagement.

JVN [00:22:52] But it is a little bit of an environmental issue. I mean.

BILL NYE [00:22:54] Oh, yeah.

JVN [00:22:55] They, you know, or it's not a little bit. It is. I mean, they switch where the water source came from, it wasn't clean. It had lead, there's pipes. I mean, there's there's definitely science to that. So what are some other-?

BILL NYE [00:23:06] Oh, the hurricanes, man, the hurricanes. They're, they're getting bigger. And by bigger, I mean, everybody's obsessed or fascinated with categories. The categories are getting bigger, which means the winds are stronger, but they're also getting wider and moving more slowly and dumping more rain.

JVN [00:23:23] Oh, they're moving slower.

BILL NYE [00:23:24] It's just trouble, trouble, trouble.

JVN [00:23:26] But with bigger winds.

BILL NYE [00:23:28] That's. Yeah. Yeah. It's all bad.

JVN [00:23:30] And then what about the wildfires? Can we directly linked those to global warming?

BILL NYE [00:23:33] Yes. Yes. According to climate scientists that I spent time with Mike Mann at Penn State, Rick Rowley, Richard Rowley, the dehydration of the soil in California and Montana is directly, directly related to climate change. And people have been talking about this for years. I don't mean to be dismissive. It's just yeah, this is what we've been saying, everybody. And it should not be a conservative or progressive issue. It should be everybody's issue. Let's go.

JVN [00:24:03] How do you, how do you-?

BILL NYE [00:24:04] So they blew up some, some oil refinery. In-.

JVN [00:24:09] Philadelphia?

BILL NYE [00:24:11] No. In Iran.

JVN [00:24:14] Oh, yeah, yeah, yeah. In Saudi Arabia.

BILL NYE [00:24:16] Saudi Arabia. Iran apparently was involved in blowing up at an oil refinery in Saudi Arabia. Five percent or six percent of the world's, world's weekly oil supply is cut off. That's an opportunity, you guys. Let's use less oil. And that doesn't mean drive less. Let's use more efficient vehicles. This whole thing of what would you sacrifice? What would you give up? You can't use a plastic straw. So let's make better straws for crying out loud. You can't drive an inefficient car. Let's make cars more efficient. If every car got the equivalent of hybrids' mileage or let's say, my electric Chevy Bolt, my equivalent mileage is over 100 miles per gallon. If every car had five times the, or four times the fuel efficiency they have now, we would buy a lot more time in addressing climate change. The technology is here.

JVN [00:25:14] So you-.

BILL NYE [00:25:14] And there will be a day when nobody's driving, or very, very few people are driving gas powered cars.

JVN [00:25:19] So you drive a gorgeous Chevy Volt. So she's an electric car, your car?

BILL NYE [00:25:23] Yeah, it's a Bolt with a B like bravo.

JVN [00:25:25] Bolt. Bolt.

BILL NYE [00:25:26] Ba, ba, ba.

JVN [00:25:26] So it only does electric?

BILL NYE [00:25:29] Yeah. There's no place to put gas.

JVN [00:25:30] That's cool.

BILL NYE [00:25:32] Oh, yeah. Yeah. It's a U.S. made car. And some management at General Motors now, is those guys on strike. Okay. All right.

JVN [00:25:38] So, and that is a way that we could greatly reduce our use of fossil fuels. Has this administration done anything to, like, incentivize or de-incentivize?

BILL NYE [00:25:49] No, de-incentivize. Yeah.

JVN [00:25:50] De-incentivized it.

BILL NYE [00:25:51] But so everybody remember, an electric car in and of itself, electric bus, electric truck, are not the answer. But, but keep in mind, the electric vehicle doesn't know in a sense where the electrons or the electricity comes from. If it comes from a nuclear power plant, the car runs fine. If it comes from a coal fired power plant, the car runs fine. If it comes from solar panels, the car runs fine.

JVN [00:26:15] Is there any solar powered panel cars right now?

BILL NYE [00:26:17] No. No.

JVN [00:26:18] No. Wouldn't that be fun?

BILL NYE [00:26:20] Yeah. Yeah, it would be cool. But there isn't enough roof area on a car to produce enough electricity to run it right now.

JVN [00:26:28] OK. We're going to take a really quick break.

BILL NYE [00:26:29] Taking break, everyone. Standby.

JVN [00:26:31] Standby. That's my mom's favorite phrase.

BILL NYE [00:26:33] We'll be right back.

JVN [00:26:48] So welcome back to "Getting Curious". We have Bill Nye, the Science Guy, who is literally so fucking gorgeous in real life, I can't even get over it. So-

BILL NYE [00:26:56] My hair is getting long. I guess he digs that.

JVN [00:26:58] I do. I do dig that. So but electric cars are like one gorgeous way, a nice resource.

BILL NYE [00:27:03] Well, they're part of the answers to the problem.

JVN [00:27:06] What are some other gorgeous solutions that you think?

BILL NYE [00:27:08] Well, so what I'm all hot for is, first of all, whoever invents a better battery will change the world and get rich. Which would be good for you with your better battery.

JVN [00:27:20] Expand.

BILL NYE [00:27:21] And then, well, then we'd make electricity. So right now, one, like 15 and 20 years ago, everybody wanted you to use your appliances in the middle of the night.

JVN [00:27:32] Yes.

BILL NYE [00:27:33] After 11:00, after midnight, something like that. Charge your electric vehicle after midnight. After 11:00 p.m. Well, now they want us to charge our electric vehicles between 10:00 in the morning and 2:00 in the afternoon. What?

JVN [00:27:47] Sun is the strongest there?

BILL NYE [00:27:48] Yeah. And so here in Southern California, there are so many solar panels. Solar farms built out, you know, north of Altadena. Like out there near the town of Mojave. And, and well, north of, there's another city, everybody called Sun Valley in California, north of all that, are all these solar panels that are powering my car. Cool, warm, hot. It's good. Lancaster, out there by Lancaster.

JVN [00:28:20] So the solar panels collect the electricity or the sun-

BILL NYE [00:28:24] Sunlight converted to electricity. We distribute the electricity in the city. And we-

JVN [00:28:29] Through like grids?

BILL NYE [00:28:31] Yeah, it's the grid. That is the grid. The electric grid. And then at my house specifically, I'm a hobbyist. This is not for everybody. But I have batteries. I have the Tesla Powerwall. On my house.

JVN [00:28:43] Okay. Wait. So there's. Okay. So fossil fuels. OK. Got it. And then, you know, or charge your car. Got it. But then at home. Solar, like what's the difference between like classic electricity and like solar powered stuff?

BILL NYE [00:28:57] None. But the difference practically is solar panels don't provide electricity at night. Wind turbines don't provide electricity when the wind's not blowing. So what we need is a way to handle what people call the base load. How much electricity do you need when everything else is not working? And how much electricity will there always be a demand for? No matter what's going on, how many refrigerators will be on? How many air conditioning or heating, heat pumps will be on at night or during the day? What's that base load and where we're going to get the electricity for the base load? This electricity, everybody is magical.

JVN [00:29:37] But how does it affect global warming?

BILL NYE [00:29:39] Oh, so by producing, traditionally, a power plant burns coal. Nowadays, a great many of them burn natural gas.

JVN [00:29:49] But isn't that, is that any better or worse?

BILL NYE [00:29:52] It's way worse, fantastically worse.

JVN [00:29:53] Why? Why, why?

BILL NYE [00:29:55] Than solar panels. Because they, you're putting carbon monoxide in the air.

JVN [00:29:59] Ooh.

BILL NYE [00:29:59] So you burn the coal, you get heat. Then you boil, traditionally, you boil water and that becomes steam. And that allows you to drive a wind turbine, I mean, a steam turbine like a pinwheel, a giant stainless steel, enormous set of pinwheels. A jet engine running backwards.

JVN [00:30:17] Are any of these-? So they're either doing burning coal for it or they're doing natural gas. Both are bad. And then-.

BILL NYE [00:30:24] Coal's worse.

JVN [00:30:25] Coal's worse. But natural gas is also bad. And then basically the problem with, like solar and the wind is that. So basically, once the electricity gets created by this solar and the wind, we can't store it?

BILL NYE [00:30:38] We store it in batteries. But the batteries are expensive and they don't hold that much electricity.

JVN [00:30:43] So that's why you said that we need cuter batteries.

BILL NYE [00:30:45] Yes, cuter.

JVN [00:30:46] Like more resourceful, better batteries.

BILL NYE [00:30:48] Yes, better batteries. And I want somebody out there to invent and I want her to get rich.

JVN [00:30:52] And then what else is? Is a good tool box to reduce global warming?

BILL NYE [00:30:55] So I am all hot for the following idea. You've probably heard of cold fusion. Do you remember that?

JVN [00:31:01] No.

BILL NYE [00:31:02] Oh, really? So there were some guys-.

JVN [00:31:04] I miss that fucking episode, damnit.

BILL NYE [00:31:05] No, it's fine. There were people in Utah that claimed they had fusion, which is the same way the sun or any star makes heat and light. They had it on work, on a lab, laboratory bench. Like we got it working right here, we don't need a star. We got it right here. But that turned out to be a hoax. Then when I was in college, well, ever since I was a little kid, people have had the idea to do fusion here on Earth. Now, fusion is, in shorthand form, is how stars make heat and light. And they do it by overcoming the natural repulsion of protons. These are things inside

atoms and they're both positive. Both, if you have two protons, they're positive, they're repelling each other. But if you have enough gravity, which is what a star has. You can smash them together so forcefully that they fuse, overcoming the strong atomic force. One of the four fundamental forces and release all this light. Neat, fabulous. In a star, like the sun, is a balance between the gravity crushing all its stuff and the stuff inside fusing and pushing the gravity back out. So there are some guys, some guys and gals, some researchers of all ages, by the way, in Orange County, California, who have the following idea. Oh, since I was in school. People have tried doing fusion on Earth. The famous thing is in Princeton, a Tokamak, which is some fabulous acronym for shooting protons, which you get from hydrogen gas, which you get from water, H₂O. You shoot hydrogen into hydrogen, that carries an extra neutron. You may have heard the expression heavy water.

JVN [00:32:56] Yes.

BILL NYE [00:32:56] Yeah. And then the premise was that protons would fuse with the neutrons and you'd get this fantastic, enormous amount of heat and light. But no one's been able to make enough heat and light to sustain the magnetic field that you need to hold the whole thing together. But. These guys in Orange-, and gals in Orange County may be on to a different scheme. Instead of trying to use hydrogen with an extra neutron. They'll use everybody's favorite boron and hydrogen gas.

JVN [00:33:32] We all love boron.

BILL NYE [00:33:34] Yes, because that's what Death Valley is made of.

JVN [00:33:37] That's also what they did incorrectly in "Chernobyl" when they were dumping the boron. In that one episode, they were dumping boron and that was wrong because it was they were stopping it, but is making it melt worse.

BILL NYE [00:33:50] So-.

JVN [00:33:50] Did you not see episode two of "Chernobyl"?

BILL NYE [00:33:52] So-.

JVN [00:33:53] Bill, it's so good. You have to watch it.

BILL NYE [00:33:55] I know, it's awesome. Everybody gets sick. Nothing to worry about. We won't let you leave the city.

JVN [00:34:00] Oh, it's so good. Everyone's shaking their head. You got to watch it. I mean, you already know because you're a scientist.

BILL NYE [00:34:04] So Boron is, you know, 20 mule team borax. Are you of an age where you remember laundry detergent booster?

JVN [00:34:12] No, I keep going "Chlorophyll is bore-aphyl" from Adam Sandler, in my mind right now.

BILL NYE [00:34:16] So it's atomic number five and hydrogen's atomic number one and they'd come together and be atomic number six. Then you hit him with the new, with the protons, and they'd become three number twos and they release tremendous amount of heat and light. And if

that could work, if that would work, we would have unlimited electricity around the world. If that would work, if it doesn't work, so it goes.

JVN [00:34:36] And it wouldn't be as dangerous as like nuclear stuff?

BILL NYE [00:34:39] No, no. Be no ra-, well, hardly any radiation. Huge magnetic fields that you have to manage. But we could do that. And so instead of it being cold fusion, it's very, very, very hot fusion. Hotter than the surface of the sun. Contained in-.

JVN [00:34:54] That's sounds dangerous, though.

BILL NYE [00:34:54] Well contained in magnetism. Yeah. Well, and if the magnet goes off, the whole thing stops and just sits there cooling off.

JVN [00:35:01] Oh.

BILL NYE [00:35:02] No, no. The whole thing. The promise is extraordinary. But here's what I'm driving at. If we were taking climate change seriously and when "I am king of the forest", we will take climate change seriously. Next week or whenever it is, we would invest in processes like this. We would invest like crazy to see if we could make this thing work. The people who manage this facility say they need 30 billion dollars. The Apollo program put people on the moon. We just celebrated the 50th anniversary. Close to 300 billion. Close to 10 times that.

JVN [00:35:39] Well, the insurance industry make-.

BILL NYE [00:35:40] We walked around the moon for two hours and came back. It was cool.

JVN [00:35:43] Well, the insurance industry has made 72 billion since the institution of the Affordable Care Act over the last six years. So that's double the money that we would-.

BILL NYE [00:35:49] No, no. In other words, if we were to invest in it, we could try this, build better. We could invest in better batteries. We could distribute energy and wealth and educate girls and women, and we would address climate change.

JVN [00:36:05] So what are the three? So three biggest contributors to climate change are?

BILL NYE [00:36:11] Well, burning fossil fuels, I think. Then transportation, any time you like, a jet airplane burns fossil fuels. Almost all cars burn fossil fuels and people in the developing world burn everything to do anything for heat and light. And so but, of course, you can have five kids in Central Africa and not have the effect of a single kid in Los Angeles.

JVN [00:36:38] What about-?

BILL NYE [00:36:38] Or Kansas City.

JVN [00:36:40] What about like the burning-?

BILL NYE [00:36:43] Or Lincoln, Nebraska.

JVN [00:36:44] What about the burning of Amazon fields for, like, the cows and that whole thing?

BILL NYE [00:36:47] Yeah, that's a drag.

JVN [00:36:49] It's a drag.

BILL NYE [00:36:50] It's a drag.

JVN [00:36:50] You don't believe?

BILL NYE [00:36:51] Oh, no. I mean, I would rather, I think everybody would rather they weren't doing it. But if you have a man-, if you have a management, what's it called? President, who doesn't accept human made climate changes and encourages burning, farmers burn so that in the hopes that they can grow more financially rewarding crops.

JVN [00:37:14] So-.

BILL NYE [00:37:14] But what we would prefer?

JVN [00:37:15] So you have a gorgeous new podcast. Well, you have a gorgeous podcast where you're discussing a whole bunch-.

BILL NYE [00:37:21] All these sort of thing.

JVN [00:37:22] Yes. Which we love. And it's "Science Rules".

BILL NYE [00:37:26] "Science Rules". Turn it up loud.

JVN [00:37:27] I love "How to survive another Chernobyl".

BILL NYE [00:37:31] Yes, that's right. We had her on. She was cool.

JVN [00:37:33] Well, what do we need to-.

BILL NYE [00:37:34] This gal that studies the effects of nuclear fallout.

JVN [00:37:37] Is it like iodine that we all need to have in our house?

BILL NYE [00:37:39] Iodine is good. But the main thing she said is stay inside for 24 hours. So apparently what really got you in Chernobyl was the dust. The radioactive dust, what people call fallout, falling on you. So you to stay inside. But what about my kids at a daycare? No trust it. Stay home. Have the kids stay at daycare. Go there tomorrow in the hopes that everybody's OK. And you can go everybody, you can go a day without eating. You'll be OK.

JVN [00:38:07] And it's best to just let all that shit settle outside.

BILL NYE [00:38:10] Yes. But understand, this scenario that we're discussing is a freaking catastrophe. You don't want to blow up nuclear freaking power plants, or use nuclear weapons.

JVN [00:38:21] What are your thoughts on nuclear power plants?

BILL NYE [00:38:24] Well, they are OK. So what we want to do is keep the existing ones going. Now. But until somebody has a good, reasonable place to put the nuclear waste that people will accept. I'm not getting into the technical argument about whether Nevada or Idaho or that place in Germany, the mine, whether the, or in Arizona, we're not talking about technically whether or not it would work. It's the place that people, voters and taxpayers will accept. And right now, a nuclear, a nuclear industry has not come close-.

JVN [00:39:00] Because they almost had it settled with Harry Reid in Nevada that one time, but then he pulled the plug at the last minute. They were gonna store like all that nuclear waste rods and-. Because it's the containment rods or the cooling rods. Right?

BILL NYE [00:39:11] And, and well, all of it, the cadmium rods are trouble, but it's the, the low level waste, all the paper coveralls and stuff, and the tanks full of solvents. So the other thing, I've been to Yucca Mountain in Nevada, it'll never work for storing nuclear waste. It leaks. It's made of old rock called tough. It's porous, volcano rock.

JVN [00:39:40] So much dangerous.

BILL NYE [00:39:41] Well, it's just a, a short term thing. You know, when you say you're going to store something for the equivalent of the time the Roman Empire was here, that's quite an extraordinary claim. I mean, who's gonna believe it you're gonna be able to do that safely? So that's a problem. So we keep the nuclear plants that are working, running, until we come up with something better. But the other fundamental problem with nuclear power is getting a license to build one, takes 15 years because it's, not just bureaucracy, because like Fukushima, they built it on a freakin fault and a tsunami came in and blah, blah, blah. And Three Mile Island, you're too young. But at all, it didn't blow up, but it almost did. But Chernobyl, you watched the thing. Well, they shouldn't have been doing that. I know, but hey did.

JVN [00:40:26] What's Three Mile Island?

BILL NYE [00:40:27] It's in Harrisburg, Pennsylvania. It's a nuclear power plant. And it, it had some fretting in the valves, some, it was scraped up, some plumbing. And so there was a leak. And the industry had it so that this side of town will go that way across the bridge and that side of town will go this way across the bridge. It was a mess.

JVN [00:40:48] When was that?

BILL NYE [00:40:49] 1979.

JVN [00:40:51] And they evacuated it or something?

BILL NYE [00:40:52] Tried to, but it didn't work.

JVN [00:40:54] Oh, shit.

BILL NYE [00:40:55] So it was all under control, ultimately. But because of the sloppiness of the nuclear industry, that nobody is on board with their big ideas. But let's keep the existing ones running till we come up with some better.

JVN [00:41:11] So we mentioned a little bit earlier about just, you know, this kind of normalization of the manipulation of, you know, the public trust with science, with press, with, you know, this administration and, you know, to me, the most important piece of that is, is like how do we develop our critical thinking and really-.

BILL NYE [00:41:33] Critical thinking. Yes, Jonathan. That's key phrase. Yes.

JVN [00:41:37] So how do you want to, we have, you know, a few minutes left. It's like, how do you want to implore people to think critically about making these issues, the issues that are voting

issues and issues of, if you're someone who's passionate about what's going on at the southern border. If you're passionate about equality. If you're passionate about-

BILL NYE [00:42:00] Climate change.

JVN [00:42:00] Yeah, but no, but equality. That's what I'm trying to say. Climate change has a relationship to every other issue that is important to us.

BILL NYE [00:42:09] It certainly does.

JVN [00:42:09] And people don't see that. So what I'm begging you to do this whole time-

BILL NYE [00:42:12] Bill Nye.

JVN [00:42:14] Is paint the fucking picture to people on why they should give a fuck.

BILL NYE [00:42:17] Oh, yeah. So-

JVN [00:42:17] Why does climate change, why is it so important to us right here? Why is it an economic issue? Why is it an equality issue?

BILL NYE [00:42:24] So if we didn't need to buy oil from overseas, then that the threat of terrorism to our oil supply would just not be that significant. And that would be true not just for the U.S., but for any country or large area where the group of countries, it would. This would seem like common sense. And then-

JVN [00:42:45] So you're saying our dependence on oil from countries that are rich in oil from the Middle East starts to create some of the imbalance in the first place.

BILL NYE [00:42:52] Oh, yeah. And then wait, wait, there's more. So because the, because of desertification, because deserts are getting bigger in the Middle East, land is drying out. Young people are leaving the family farms and going to the big city looking for work. And this is where apparently, to a large extent, you get people, young people, young men, who are disenchanted and get recruited by terrorist organizations. Like that, even that is connected to climate change. And then the terrorist organizations that take over these dams that are used for irrigation, for raising farm food in those areas. This is all related to having weather patterns change. So for us in the literate, scientifically literate side of this, climate change has tentacles reach every facet. Now, when you talk about equality. If we had more equality worldwide, let alone in your own county, wherever you live, people, there's just less conflict. When people have enough, they don't, they don't get at each other's throats. I'm not the first guy to point this out. But here's an interesting thing, Jonathan, to me. As President Barack Obama remarked, if you couldn't control where you would be born, but you could control when. In all of human history, do you want to live in the swing era? Do you want to live in cave guy times? Do you want to live before or after the U.S. civil war? Do you want to live before or after Norway changed from driving on the left to driving on the right? If you, if you you could pick when but not where, this would be the time to be born. As screwed up as everything seems to be, as troublesome as everything seems to be, as much trouble as there is in the world. There's actually less trouble than ever. There are actually, strangely enough, fewer wars than ever. There's actually, weird as it may seem, less gun violence than ever. But with that said, we're also aware of it now because of the way we distribute information.

JVN [00:45:04] Is there less gun violence than ever?

BILL NYE [00:45:06] Yeah. I mean, if you count wars.

JVN [00:45:08] But how would we know? Well, I mean, well, okay.

BILL NYE [00:45:10] People go to a lot of trouble to try to figure that out.

JVN [00:45:12] Yeah. I mean, if you count wars, I guess.

BILL NYE [00:45:15] Well.

JVN [00:45:15] I mean, 'cause we're not like a civil war or a revolution.

BILL NYE [00:45:17] But you didn't go to war. You didn't join the military. You didn't get shot at, right?

JVN [00:45:21] No. But interpersonal domestic gun violence is not at an all time low. I would challenge that.

BILL NYE [00:45:28] Well, I'm not. Okay. You're going specific. Yeah, but just the number of people that get killed by guns is smaller than ever.

JVN [00:45:35] Because we're not like a literal civil war.

BILL NYE [00:45:38] A global war. We don't have a world war. Yeah.

JVN [00:45:40] Right.

BILL NYE [00:45:42] And so you didn't, nor did I, have to join the military, but or, and, because we did not have a global conflict that demanded it. And I missed, I missed going to Vietnam by that much. By six months. Really.

JVN [00:45:55] Unlike our president who had like a fake medical disorder.

BILL NYE [00:45:58] Yeah, and one more thing not to like about him.

JVN [00:45:59] So, you know, I got to say, thank you so much for your time. I really appreciate it.

BILL NYE [00:46:04] No, it is I. Jonathan. We had fun.

JVN [00:46:06] But is there? What, what do you want? Is there anything, I mean, you want to leave people with?

BILL NYE [00:46:08] Yes.

JVN [00:46:09] Which is?

BILL NYE [00:46:10] Be optimistic. We can do this. We can change the world. Three things we want for everybody on earth. Clean water, renewable, reliable electricity, access to the Internet for everybody. I'm not kidding. I'm not talking about playing video games. I'm talking about providing access to global information to everyone. What we want to do is raise the standard of living of girls and women. If you can do that, it's very difficult, but if you can do that, women have fewer kids, they have more choices because they're educated. Education is the key. They have more choices. They have fewer kids. The kids they do have are better cared for and they have more opportunity. And if we can do this, we can change the world. So enough with the

hand-wringing and let's get out there and do this. If you want clean water, we need unlimited, we need a lot of electricity. We can do that. We can desalinate sea water. We can manage the water that falls naturally better. And then renewable electricity. There's all these opportunities and wind and solar. Maybe this fusion thing, maybe. Distribution of electricity, better powerlines, better transmission systems, better management and electricity. We have literally more efficient light bulbs. We can do this. And then access to the Internet will now be provided with assets in space, with satellites. To everybody in the world. Let's go.

JVN [00:47:38] I'm ready to go to school and become a fuckin' scientist.

BILL NYE [00:47:39] Right on. Yes.

JVN [00:47:41] Yeah.

BILL NYE [00:47:42] Check out the Planetary Society at Planetary.org. We flew a solar cell spacecraft, the first one ever on Earth orbit to build orbital energy. Thanks to your support, our 50,000 thousand plus members around the world. Let's go, Jonathan. Blow it up!

JVN [00:47:59] Yes! You've been listening to "Getting Curious" with me, Jonathan Van Ness. My guest this week with Bill Nye. You'll find links to his podcast and other works in the episode description of whatever you're listening to the show on. Follow us on Instagram and Twitter at [CuriousWithJVN](https://www.instagram.com/curiouswithjvn). Our theme music is "Freak" by Quiñ. Thank you so much for letting us use it. Have you enjoyed our show? Introduce a friend and show them how to subscribe. "Getting Curious" is produced by me, Emily Bossak, Julie Carrillo, Rae Ellis, Harry Nelson and Colin Anderson.