

Big Picture Podcast – Episode 07

Visit to Rocky Flats, Chapter 5A

© **Conceptual Academy**



John: [In the studio] Welcome to the Big Picture Podcast. We're here on our way to the site of the former Rocky Flats plutonium facility, once an area of heavy industry, today a plutonium-enriched wild life refuge. Please note, there are audio nuances in this podcast you'll find enhanced by head phones or a quiet listening environment.

John: Alright, we're here. OK. We've got the Flat Irons up behind us. It's been raining a lot lately and so it's actually, the grass is really green.

Ian: [background] Hey Dad. Hey Mom [Picture taken]

John: Oh, this is the entrance right here. Do you have the cars locked? [Beep]

John: Alright. We're at the gate entry of the Rocky Flats National Wildlife Refuge. Staff access only. Please contact 303.289.0232 to request entry.

Tracy: There are guard dogs. Should be call them? [pause] I'll call them. Or just go under the gate?

John: Ya [hesitant]

John: OK. We tried. We tried calling. [Number not in service].

John: I'll be the first.

Tracy: OK [hesitant]

[laughter]

John: I have just crossed the gate. Why is there a Jeep there?

Tracy: It's waiting for. . . us. But, the sky is beautiful.

John: It's been hot. The clouds have just come over. It's evening time now.

Tracy: It's beautiful.

John: It is beautiful from up here. Why don't we build some houses?

[walking]

Tracy: You know it's just . . . If there going to do anything with this they could really create an educational site. Like, give pictures. And ahh, maps, and diagrams.

John: So that the history can be preserved?

Tracy: Ya. Ya. A place to learn. I mean, maybe you wouldn't want to attract people here but for those of us [laughter] who are crazy enough to come here and want to bare witness. At least to have a bit of vision of what it might have looked like at one point.

John: But how could you bring kids here when the plutonium is in the grass?

Tracy: You wouldn't. It's probably not a good idea.

John: Just make sure the kids don't eat the grass.

Tracy: And maybe don't be here on a windy day.

John: Or light a fire to get the grass combusted and releasing plutonium into the air.

Tracy: Oh look! A two headed rabbit?

John: [laughter] Ha ha ha.

[Dogs barking, foot steps on gravel]

John: We're looking at a field. A dirt road down through a field we're passing through a series of gates. Alright, so . . .

Tracy: So where did all the plutonium come from? Like, did they ship it out here? Was that what was coming in the trains?

John: What you need is uranium. Utah is full of a lot of uranium. And the uranium you can bombard it with neutrons and generate plutonium out of it, which we all know to be "transmutation". Where did they do that? They did that here. Rocky Flats was one of the places they did that.

Tracy: So, I learned something. We've been reading a little bit online. Some articles. There were 8 major buildings and then around 100 support buildings. And about 5000 people worked here.

John: 5000?

Tracy: 5000. So, uhm.

John: Wow

Tracy: Ya. So it was a real economic boom for the Denver area in terms of having employment. And, uhm. It cost about \$7 billion to clean it up in 2005.

John: So it became a Super Fund Site?

Tracy: Ya. Yup. [pause] OK let's go!

John and Tracy: [Laughter]

John: Let's walk away from those dogs.

Ian: Om

John: Yup?

Ian: Do you want to go further in?

John: Ya

Ian: I mean, we probably shouldn't.

[Dogs barking]

Tracy: [Reading] Managers at Rocky Flats did not always follow the rule books in their decisions. In 1952, for example, they settled a dispute with rancher Marcus Church, by giving him keys to fence locks and allowing him to move cattle through the top secret plant. "Cattle can't talk" one employee said. [laughter] noting that Church only moved his cattle a few times.

John: Hey, here's the train track.

Tracy: Ya

[Walking. John and Tracy splitting directions as they look around]

John: We are at the Rocky Flats. They just call it Rocky Flats. This is where they created the plutonium for nuclear fusion bombs during the cold war. Tons of plutonium produced here just south of Boulder. Upwind from Denver.

[Walking. Background music. Birds]

John: So, how do you make a nuclear bomb? First you need to realize there are two type of nuclear bombs: Fission and Fusion. Fission bombs came first. WWII ended with two fission bombs over Japan. Horrific, but pale in comparison to the fusion bomb yet ever to be used in war. Thankfully.

You see, a fission bomb can only be so large because the bigger you build it, the more unstable it becomes. For a fusion bomb, you use the element hydrogen as the

explosive. And you can gather all the hydrogen you want. The more hydrogen, the larger the fusion bomb, also commonly known as a hydrogen bomb.

[walking, then stop]

It takes a lot of energy to ignite a hydrogen bomb. So guess what they used to ignite a hydrogen bomb? Ya. Fission bombs. You need fission bombs just to ignite a much bigger hydrogen bomb.

So what happened here at Rocky Flats? Gosh. Let me answer that with another question. Ahh. If the US government is going to build nuclear bombs, where do you suppose they're going to do that? On foreign soil? No no. That's too much of a security risk. Besides, we've got plenty of uranium occurring right here within the US boundaries. So the bombs are all built right here in the country. But where exactly? Whose backyard?

The first and biggest processing plant was Hanford, along the Columbia river, near Richland, Washington State. Another selected site was Rocky Flats, just south of Boulder Colorado. And what exactly did they do here at Rocky flats? They transmuted naturally occurring uranium into non-naturally occurring plutonium. And that plutonium was made to make the fission bombs to trigger each fusion bomb now in our nuclear arsenal. Here. This is where they made them.

They made the plutonium into these ingots, called pucks, each about the size of your hand. And over almost 40 years, up to, what was it? 1989, they produced some 70,000 of these pucks. Most of them shipped to, I believe, northern Texas where they were assembled into the, into the actual fusion bombs.

Come on. Let's face it. What are we talking about? We're talking about an intent to kill fellow humans beings on large and massive scales. Scales are so large that you get this one saving grace: You can't blow up your enemy without threatening the planet itself that sustains you and all your friends. And it doesn't help when your enemy has the very same blow it all up technology. Eh?

So, I hope you get the picture. We survived the cold war, yes. But the repercussions of the cold war They're here to stay. As is evidenced here at Rocky Flats.

[walking, then standing still]

OK. I got more. Listen up. This is important. The plutonium, as a chemical element, it chemically reacts readily with oxygen. It burns. It catches fire. So handling the stuff isn't easy. In fact, the Rocky Flats facility had two major fires, one in '57 and the other in 1969, both releasing plutonium into the metro Denver area.

And, you might think: Oh, since it's burnt up, maybe it's not harmful anymore. Well. Hey, you're thinking chemistry. And indeed, it's chemistry that makes the plutonium burn. But before the burning and after the burning you still have plutonium atoms

and their radioactive nuclei. All the burning does is to spread the plutonium atoms to a greater area. That's not good.

But, you also need to know that the plutonium we're talking, here, it's not super radioactive. And it's what we call an alpha emitter. Alpha particles, you see, can't make it past your skin. So, comparatively speaking, it's not that bad, except, except when it's inhaled. You see, in that case, when you inhale the plutonium it enters your body and, like lead, it tends to stick around. So there you are, with an alpha emitter constantly emitting alpha particles inside your body for the rest of your life. That's not good.

So, now, here at Rocky Flats, there's significant plutonium in this ground. Plants absorb it. Like they're pulling up nutrients and in doing that they're also pulling up plutonium. And the last thing you want is a brush fire. Of course, brush fires they're a natural thing out here in the front range of Colorado.

There's much to talk about. Huh? Like what's the difference between a chemical reaction and a nuclear reaction? What exactly is radioactivity? And how is radioactivity markedly different from these things we call fission and fusion? And thorium nuclear reactors. You've probably not heard of thorium as a nuclear fuel. Then it's my honor, let me be the first to inform you that thorium holds much promise. Get this: You can't build a nuclear bomb from thorium. Which I understand is why thorium was never developed as an energy source. Dig that. More so, a thorium reactor can't undergo melt down and the by-products are much more manageable than those of uranium and plutonium nuclear reactors used today. Ya. I'm looking at this field. And in this day of increasing carbon dioxide it rings true to me. The potential of thorium nuclear reactors needs some serious attention in the context of working with our fellow humans. Not against them. That's so clear.

It's beautiful. Behind us are the Rocky Mountains and the Flat Iron foothills. Prime real estate really. It's now a wild life refuge. It's been raining a lot lately. It's green.

I see a deer. I can hear the crickets. And the traffic. People driving by it everyday. No placards. No memorial. Just a field. With beautiful views.

[Approaching footsteps]

John: Hey, Ian. What do you think?

Ian: I think it looks like a regular field. You could drive by it pretty easily.

John: And not know the history of this place.

Ian: Ya

John: Should there be like an education center somewhere?

Ian: It would be neat to have a visitors center. Then I guess everyone would know what was here.

John: Well. There's what they call the "guardianship" where we watch over it for the rest of our time.

Ian: I just wonder what all this development is happening around here.

John: Looks like a sand pit adjacent to it. A sand pit?[Laughter] Heavy metal sand pit. Used for concrete, right? Maybe that's where it's going. Ya, and here comes a heavy duty truck. A cement truck. Wow.

John: Would you say it's beautiful here?

Ian: Ya very beautiful. If you want a lab with some scenery come to the Rocky Flats in the 1950s.

[walking]

John: Oh, there's the train tracks where they would bring in the raw materials.

[walking]

John: We're crossing a field here. Want to pick up a rock memento?

Ian: [laughter] Uhm. Not particularly.

[walking]

John: We're on the train tracks now. This is where massive demonstrations went on in the 80's. They camped out on the train tracks to prevent the trains from delivering the materials needed for the production of the plutonium. We're along the tracks where it splits now. One going to the left down where the plant was. The other going straight. We should get a picture here.

Tracy: [off in the distance] What are you doing?

John: [calling back] Come on! Just one picture.

John: It's hard to believe that this soil is full of plutonium. Or relatively high levels of plutonium. I mean, it's just hard to believe. It's a beautiful field. There are deer, rabbits, birds, crickets. Industry. We've been talking about the traffic going by and the sand pit, which is right next to this place.

John: Alright. Here we are. I want a picture right here. Ian, could you. . . from there. This is for the show notes.

Tracy: [laughter]

[John and Tracy pose for picture]

Ian: This one is for you guys.

Tracy: Aww

John: I want to go down there. Something is pulling me.

Ian: Let's stop standing around then.

John: This you could see from Google Earth. I know you could. Where these train tracks form a triangle.

Tracy: These train tracks form a triangle?

John: Well ya. From Google Earth you'd look down on this and you'd see this triangle.

John: And that way people can see exactly where we were during this podcast.

[walking]

John: Alright. We're here. We are now in that triangle. If you were to Google Earth this, Rocky Flats. [Coordinates: 39.883312, -105.235203]. And zoom in onto the train tracks. We are just on the north side of that triangle. A curved triangle.

John: This is the kind of place if you were a kid you'd just hang out and play. Ride your dirt bike. You know. I'm thinking this is surprisingly accessible.

[walking]

John: Not like everybody's going to want to come here, right? But they could put a . . . That's the debate. Do they make a park out of it? And I could understand people wanting to make a park out of it. I mean people come and have picnics. Fly kits. Throw boomerangs. Makes some nature trails. That's totally understandable. It's a beautiful area.

Ian: [on phone] Hey dude. Oh no. Dad's walking further along than we thought.

John: I don't know. I just feel this pull. What is it? It's like you're seeing this tornado and you're drawn toward it. OK. I'm going to pull myself away. But you can see how they could make a park out of this place. Right?

Tracy: It's beautiful. I mean. It's lovely hearing the crickets and the birds. . . and the helicopters [laughter]

John: There's an expansive view down into the great plains. Because we're up on the edge of the foothills and so we're looking down upon Denver and beyond. Denver sits in a kind of a valley, which isn't good for pollution. Because of thermal inversions. Ahh, but today is a very clear day and it's the view as well as just the landscape that's really attractive. Alright. You done?

Ian: Ya

[walking]

Ian: It's great to see that weather coming in.

John: Oh, clouds coming in now.

Ian: Well it's not going to hit us. It's all going north.

John: Uh, keep it green. Keep it green. Alright back to the studio

John: [In the studio] For more on the Rocky Flats plutonium facility please visit our show notes at ConceptualScience.com. We also encourage you to visit RockyFlatsNuclearGuardianship.org as well as NuclearCarePartners.com. Theme music by Zach Jeffrey. Musical flourishes by John Andrew.

John, Tracy, Ian: Good chemistry to you.

Frank Zappa (the dog): Ruff!

[phone call being made]

Recorded Phone Message: "You have reached the U.S. Fish and Wildlife Service of the Colorado Front Range National Wildlife Complex, including the refuges of Rocky Mountain Arsenal, Two Ponds, and Rocky Flats. The refuges are open and free to the public from sunrise to sunset seven days a week. The refuges are only closed on Thanksgiving, Christmas, and New Year's Day. To reach the visitor's center, visitor information, and youth education programs, please press 1. For the headquarters office, please press 2. If this is a wildlife emergency, hang up and dial 911. Thank you for calling the Colorado Front Range National Wildlife Refuge Complex and have a wonderful day."