THE HENRY FORD

COLLECTING INNOVATION TODAY

TRANSCRIPT OF A VIDEO ORAL HISTORY

INTERVIEW WITH

WILLIAM MCDONOUGH

CONDUCTED SEPTEMBER 8, 2008

WILLIAM MCDONOUGH + PARTNERS

CHARLOTTESVILLE, VA

Interviewer: Barry Hurd

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QUESTION:

01:00:33;07 You were inventing a new water bottle downstairs.

WILLIAM MCDONOUGH:

01:00:36;01 Right.

QUESTION:

01:00:36;10 What's that? Can you tell us anything about that?

WILLIAM MCDONOUGH:

01:00:39;12 They'd shoot me if I did.

QUESTION:

01:00:40;13 Oh, (CHUCKLE) okay. Well, could they shoot you after the interview? That way we'll have the information plus. Just tell me what you do around here. This is an amazing place. We were walking around. Just in general what goes on around here.

WILLIAM MCDONOUGH:

01:00:51;07 Well, what we have here is an architecture practice on the second floor that does relatively conventional architecture with a sort of green bias. And then up here we have what's called McDonough Consulting which is general consulting to C.E.O.s and to leaders of industry on the Cradle to Cradle ideas, how that works. So that's really pretty much my time and how it's managed, and my book writing, and things like that.

QUESTION:

01:01:24;12 Are you actually drawing blueprints or anything like that? Is that from year's past? Or how does that work?

WILLIAM MCDONOUGH:

01:01:29;04 I still sketch on tracing paper.

QUESTION:

01:01:31;21 And then you hand it off to a staff?

WILLIAM MCDONOUGH:

01:01:33;13 Right. I work with a whole cadre of people who draw on the computers and do it very fast.

QUESTION:

01:01:38;10 And I assume it's a growing business 'cause everybody gets more attuned to the ecological plans?

WILLIAM MCDONOUGH:

01:01:42;17 Yeah, definitely. There's more and more interest in what we've been talking about.

QUESTION:

01:01:46;21 Is this something all your life you've been into? Or just--

WILLIAM MCDONOUGH:

01:01:49;12 Yeah.

QUESTION:

01:01:49;16 How did that all start? Did you-- I know you were born in-- in-- was it Tokyo?

WILLIAM MCDONOUGH:

01:01:53;26 Tokyo.

QUESTION:

01:01:54;04 Tell me a little bit about that, and then when you grew up and how that might have influenced-- what you do now.

WILLIAM MCDONOUGH:

01:02:00;08 Well, when I was a baby, I remember hearing the oxcarts come in at 2:00 in the morning to collect our sewage and take it out to the farmer. So my mother called it the night soil, and they called them the honey buckets and the honey wagons. And so, you know, when you're little kid, stories about poop are always fun. So we always knew that our waste went out to become food and soil. And so when the oxcarts came back in with the tofu and the vegetables and all the meats and things, you know, that was directly connected to our waste. We knew that. So waste equals food has been sort of ingrained in me ever since I was a little baby. That was the way it was. One thing's waste was another thing's food.

01:02:47;10 So in terms of growing up, we moved to Hong Kong, and then I was in a place with six million people on 40 square miles with no water during the dry season. And so we had four hours of water every fourth day, and that was normal life. And then coming to the states and seeing this world of abundance in contrast to the world of limits made me very sensitive to the fact of waste here in the western culture. And so this development of a design strategy around waste equals food using the sun for power and celebrating diversity had a lot to do with the fact that I grew up overseas in different conditions.

QUESTION:

01:03:34;07 I'll bet your originally it wasn't a very popular notion, was it, years ago?

WILLIAM MCDONOUGH:

01:03:39;03 Well, I was the kid who was running around turning off the showers after gym 'cause the kids would leave them running hot water, and it just used to freak me out. So I was considered eccentric.

QUESTION:

01:03:48;24 And then how did you translate from the kid turning off the showers to what you're doing now? Something obviously happened. You decided to go to school? Or I mean give us that transition.

WILLIAM MCDONOUGH:

01:03:58;11 Well, I think the big transition occurred when I went to architecture school at Yale in 1973 because that's when we had the first oil shock. And so as a designer, as an aspiring architect, I realized that I really wanted to deal with this question, and that the time had come, and that the consciousness was ready to be promulgated because of the oil shocks.

01:04:28;13 QUESTION:

So that was the impetus to….

WILLIAM MCDONOUGH:

01:04:30;05 Yeah, to integrate it into my design work.

QUESTION:

01:04:31;17 Were there people that influenced you? Parents, other architects, thought leaders that you kinda looked up to when you were in your formative years?

WILLIAM MCDONOUGH:

01:04:41;18 There were a lot of people I looked up to in the formative years. My parents certainly 'cause they were very fair, and very open, and very delighted at showing us other cultures. So they gave us a broad education. I went to 19 schools before college. So we traveled around a lot and saw a lot of different things. My dad was in business. And then, in architecture school I had great teachers there, Charles

Moore, James Sterling, Harry Cobb really well-known architects who you know, were great inspirations to me.

01:05:21;28 But I was also inspired by the work of Frank Lloyd Wright, and the Modernists, Le Corbusier and so on, and the ancient writers like Vitruvius who understood exactly where the sun was and how it moved around the building and things like that. But I'd say the most moving mentor I had was Walker Evans, the photographer. I got to know him very well, and we used to take pictures together and trade photographs and things like that. And he really, I think, invented pop art. And yet in a way that was deeply enriched messaging for our culture.

01:06:05;08 And so the idea of light that transmitted a message became part of the architecture strategy for me. That it wasn't simply just light upon mass and composition, it was also meaning that was inside the effect of that you'd be creating. So I moved from photography to architecture, but with Walker's sensibility in me.

QUESTION:

01:06:35;07 Do you remember any conversation you had with him? You know, one of those agendas where he said something and it stuck with you?

WILLIAM MCDONOUGH:

01:06:42;06 Well, I remember him looking at one of my pictures for about half an hour. And after half an hour of staring at it, which is a really long

time, he was in the hospital, so I think he was medicated you know, drifting in and out of awareness, but he looked at this picture and he said, "You know, this isn't great, but it's very close." And then asked me to bring pictures every night for him to look at. And that started our friendship.

QUESTION:

01:07:14;11 Now did you get some sense that this idea that you were into the light, and the food, and the waste, was something innovative happening at the time in society? Was it not being done other places?

WILLIAM MCDONOUGH:

01:07:29;27 Well, I think the real recognition of the innovation in what we do happened a little bit later. I built a solar-heated house in Ireland as an experiment as a student. And you know, in innovation it's been said that you don't glide from success to success. You lurch from failure to failure. If you think about Edison and how many experiments he did, you know, while you're searching for something. So, you know, I piled up lots of rocks in this solar house to store heat, and then realized after I had piled up 30 tons of rocks that the house itself was actually quite massive, and I didn't need all these rocks. You know, so it's like, "Oh, shucks, that was not necessary." Large scale effort on my part. But I did it myself and I learned from it.

01:08:20;15 So, you know, learning is really what tells you that you're innovating, when you're learning. And so, when we did the offices for environmental defense fund in New York and found out that we were the only people we could find that were actually dealing with indoor air quality issues as architects, you know, there were very few people involved in the commercial sector then looking at materials and what they were off casting and things like that. There were a few scientists. There were a few architects. There were a few engineers. But it was really an area where people weren't active.

01:09:02;11 And we found ourselves really having to do the work from scratch and learning as we went. And so lots of innovation occurred then and still occurs now based on those original searches for information about the health of materials and the health of systems. And we're still at it, and there's still a huge new frontier, so the innovation continues.

QUESTION:

01:09:32;28 Okay, let me ask you about a couple of people here. Let's have your impressions. Amory Lovins tells us a little about your impression of him.

WILLIAM MCDONOUGH:

01:09:43;08 Well, Amory is a physicist. And he's a genius, and is a generous genius. He sees whole systems, very sophisticated, in very sophisticated ways. And puts them together and does synthetic

optimizations of large scale circumstances. And so I find, you know, it's always delightful to see whatever it is he's working on.

QUESTION:

01:10:21;08 Is he innovative in his field, do you think, by doing something new and useful or peeling back the frontier?

WILLIAM MCDONOUGH:

01:10:25;00 I think he's very innovative. And I think he's also got the ability to explain what he's talking about in ways that are accessible and fun. I think that's an important part of the innovation is that he's found a way to communicate what he's innovating with in a way that's effective.

QUESTION:

01:10:44;03 What about Paul Hawken?

WILLIAM MCDONOUGH:

01:10:46;23 Paul Hawken is another one of the sort of real serious contributors to the environmental movement. You know, he has a deep understanding of systems and of society. And puts those two together in innovative ways.

QUESTION:

01:11:09;12 Is this whole idea that you sort of gave birth to growing? Are people starting to get more keyed into it. Is it taken off? Or is still an uphill fight? Or how does that work?

WILLIAM MCDONOUGH:

01:11:21;00 Oh, it's taken off tremendously. There are people everywhere, I think, looking for ways to deal with the modern world that answer some of the most serious questions we might have as a culture and as a species. You know, what are we going to do about climate change? This is a fundamental question. It's gonna require innovation because, you know, it's been said that insanity is doing the same thing over and over again and expecting a different result.

01:11:52;21 Well, if we see the results of climate change, or endocrine disruption, or plastics in the oceans, or heavy metal contamination, I mean you name the current design protocol isn't gonna be adequate to the task. We're gonna need a new design protocol, new way of going about things. And that's gonna require massive innovation.

QUESTION:

01:12:15;13 All righty. Here's one a little broad. Tell us a little bit about your design philosophy and just in general. I mean if you were to explain it quickly to somebody, I mean I know it's very broad and very specific. But how would you put it? Like, if we were talking to younger people trying to sum up what you were really doing, that philosophy behind the design of what you do?

WILLIAM MCDONOUGH:

01:12:38;15 Well, I work with a philosophy we call Cradle to Cradle. And I've developed it with Dr. Michael Braungart from Germany, who's a chemist. So you have an architect and a chemist. And the way we look at the world is design and chemistry. And so we say, "Wouldn't it be wonderful if everything that we designed was like a living thing where you could be happy that it's growing. Instead of being worried that it's getting bigger, you're happy that it's getting bigger." Whereas for most environmentalists, growth is of concern because it's growing asphalt or, you know, growing destruction. But if we grew things that were good, wouldn't that be wonderful?

01:13:20;24 Secondly, nature uses the sun for its source of energy. Wouldn't it be wonderful if human artifice used sun as the source of energy. And thirdly, in nature, we have an open system of chemicals operating for the benefit of the organisms and their reproduction. And wouldn't it be great if human-designed things were operating for the benefit of the organisms instead of their destruction or causing adverse effects and things like that?

01:13:48;14 So we designed Cradle to Cradle. We work with the idea that waste equals food, use current solar income, and respect diversity. And those are the three design guidelines we use. And the simple question we ask when we start the design of a project is how do we love all the children of all species for all time? That's the first question. It's not

just our children. It's not just our species. And then we set a goal which is a delightfully diverse, safe, healthy, and just world with clean air, water, soil, and power, economically, equitably, ecologically, and elegantly enjoyed period. And then we got to start our work.

QUESTION:

01:14:43;04 So you told us your real hero was a photographer, not an architect. Tell us how you met him and a little bit more about that.

WILLIAM MCDONOUGH:

01:14:47;27 Well, when I was a senior fellow at Dartmouth in 1972, Walker Evans came to New Hampshire to be the artist in residence there. And he had surgery, then went into the hospital immediately. So I had a captive audience. I used to bring photographs from the darkroom to him in the hospital. And so he would have time to look at them and time to talk to me. So we got to know each other because I became part of his comfort keeping.

QUESTION:

01:15:20;12 But you just knew he was in the hospital and walked up and introduced yourself?

WILLIAM MCDONOUGH:

01:15:23;10 Yeah, I was contrary to the instructions of the head of the department, but I figured I had to pay my respects. So I went to pay my respects to him. And he invited me in and said, "If you're a photographer,

where are your pictures?" And so I brought out this picture. He looked at it a long time and said, "It's, you know, it's not great, but it's very close. Now bring me a picture every night, and we'll look at pictures together." So every night I would sneak into the hospital and visit with Walker, and we would look at photographs together.

QUESTION:

01:15:56;29 Interesting.

WILLIAM MCDONOUGH:

01:15:57;04 That's how I got to know him.

QUESTION:

01:15:58;12 And you mentioned you had attended 19 schools as you grew from a small lad to a larger. Tell us about those 19 schools, and where they were, and some of the reflections on those.

WILLIAM MCDONOUGH:

01:16:08;28 Well, my mother informed me of this because when I turned 40, she called me and said, "I'm sending you your box." And the box was all the things she had collected from my childhood. It included all my report cards. And so she had sifted through them and noticed that there were 19 different schools before college. And so they were in Japan where I went to kindergarten and first grade. They were in Hong Kong, and three different schools, four different schools in Hong Kong as I grew up, got older. And then as we traveled, I went to

school in Cleveland for three months. I went to school in Washington State, in rural Washington State in the Puget Sound. So I went to school in Seattle twice, two different times.

QUESTION:

01:16:57;08 Well, why did you move around so much?

WILLIAM MCDONOUGH:

01:16:59;16 No, my father was a Japanese language officer during the second World War for McArthur and stayed in Japan after the war and my mother came over. And so he went in the import/export business in Japan. And then one of his clients was Seagram and they asked him to take up their Far Eastern operations, so we moved to Hong Kong. And in those days, living overseas was considered hardship. So you would come back to the states for three months at a time. So my parents would send us kids with my mom back to the states to be with her mother and father or with my dad's mother and father and in Seattle or Cleveland and things like that.

01:17:44;24 And then once we all took off as a family and traveled around America. Went to Detroit. Got a car made. Got in the car and drove around America just so we could see what America held for us as Americans 'cause we didn't grow up here.

QUESTION:

01:17:58;22 At that time, did America seem like the land of opportunity? The place you could really hitch your wagon to a star and be a great, something or other? Did you sense that at all?

WILLIAM MCDONOUGH:

01:18:08;27 Yeah, we definitely sensed that. I mean as a, whatever, nine-year old, I was only interested in getting to Disneyland or something. But the United States held out such great promise growing up overseas. We were really curious about the culture. And clearly almost anything could happen. So it was a land of special opportunity that we could see.

01:18:35;24 When you're growing up in Hong Kong and you're living with people who are either dying of hunger, or disease, or are destitute as people were there, especially after the fall of or the rise of the communist regime in China, we had a lot of refugees. And so you had desperately poor people living in cardboard boxes and eating beetles that they knocked out of the sky and street lamps for food. I mean it was pretty rough stuff. And so you felt really blessed to be an American and have the opportunities that were ahead of us.

QUESTION:

01:19:15;11 Okay, tell me, over your shoulder there, there's a couple of Buckminster Fuller sculptures. Tell us a little bit about those, and why

they're here, and how they sort of fit in. If they do, what you do and or what your impressions of them are.

WILLIAM MCDONOUGH:

01:19:55;29 These are gifts that I received from Thomas

WILLIAM MCDONOUGH:

01:20:08;08 These are gifts I received from Thomas Zung.

WILLIAM MCDONOUGH:

01:20:13;13 These are gifts I received from Thomas Zung who is a partner of Buckminster Fuller. And what's interesting about this one is that it's what he called a tensegrity structure. So it's a compression and tension. And these struts are in compression. The cables are in tension. But they hold in tension a ball at the center of this tetrahedron. And so it identifies a single point in space held in tension, which is quite amazing when you think about it.

QUESTION:

01:20:50;23 Now to an average guy like me, what am I supposed to think about?

WILLIAM MCDONOUGH:

01:20:53;25 You're just supposed to look at it and say, "Isn't that beautiful."

QUESTION:

01:20:56;14 But does it somehow fit into…?

WILLIAM MCDONOUGH:

01:20:58;17 I look at it as a poetic experience because I look at it as the oneness of dispersed energy. You know, when you look at this whole thing being in tension and this being in compression and this point being identified as a point, you can think about the different aspects of life that bring together, you know, a single point of perspective. So this, you know, this could be the economy. This could be social equity. This could be the environment and so on. This could be energy. And all these things brought together, collide and hold in place a single point of view, which I think is quite beautiful. So I think that's one thing. Bucky Fuller was working on this when he died. Another quite astonishing object is this one, which…

WILLIAM MCDONOUGH:

01:22:07;11 This is another astonishing object which uses this fractal triangle. You see that triangle made up out of three pieces?

QUESTION:

01:22:16;02 Yeah.

WILLIAM MCDONOUGH:

01:22:15;20 And so it's a fractal triangle, self-similar. And then it folds up by itself to form the tetrahedron.

QUESTION:

01:22:31;18 Now tell us a little bit about Fuller. Was he a sort of a, he had a system. Like, you've got this system you think in. Did he have a system he was thinking in from what he did?

WILLIAM MCDONOUGH:

01:22:41;17 He absolutely had a system. He was one of the first thinkers, from a design perspective to go from the scale of the molecule to the scale of the galaxy and try and come up with a sort of a unified design theory that could transcend, you know, dimension like that. So if you stop and think about it, the fact is he dealt with something he called synergetics which was how the whole world worked. And then he had his tensegrity in his geodesics for the earthbound objects.

01:23:27;06 And if you then watch history unfold, you find nanotechnology creating the very first human constructed molecules out of carbon and called the Buckminster Fullerenes. Right? So, he really did see things at all these different scales and all those different scales together. So, he had a unified theory. And for us, we see the chemistry of the making of things, and we see the physics of the making of things, and we see the biology of the making of things.

01:24:10;25 And so for us, we look at energy comes from the sun because that's our physics. And we have more energy than we need to operate human systems coming from the sun. It's eight minutes. It's

wireless. You know, what's out problem? So we can use solar energy to power our systems, and so that's a design philosophy.

01:24:33;06 We then look at the mass which is chemistry. And you can look at inorganic chemistry and ask the question, "Why would you take all the chromium out of South Africa, put it in products, sprinkle it, little holes in the world, you know, through waste management that makes it unavailable to future generations and toxify the planet?" Why would you do that? That's a bad design. So we have chemistry, which is mass. And then I think about Einstein. He did energy and mass equals MC squared. So he had energy, physics, and mass chemistry. But what he didn't do was biology.

01:25:11;13 And so we have to look at Francis Crick and James Watson for biology when the discovery of D.N.A. in 1953. And then see that biology was the celebration of energy and mass coming together in the sunshine, with water, to form biology, which is phenomenal. So you have physics, chemistry, and biology. And so we design things to either go back to nature and back to biology safely. We call them biological nutrients. Or we design things as what we call technical nutrients, things that go back to technology in a coherent way, like these metals, for example. And a computer, or a car, or something like that we call technical nutrition. So we have biological and technical nutrition. So that becomes our worldview.

QUESTION:

01:26:02;11 You said Bucky's thing was almost poetic. What you're describing sounds poetic just the words you use. Do you sense it's artistic as well as the physical things you describe?

WILLIAM MCDONOUGH:

01:26:15;14 There's no question that our scientific view of the design work yields a poetic dimension because if you look at E equals MC squared as a small poem, you know, then it's energy equals mass times the speed of light squared. You realize that we're dealing with this unbelievable force that has poetic dimension and involves the creative spirit of the human being. When you ask, like, "Why was Einstein afraid? Well, why was he afraid?" Well, because if you square C, which is a really big number, you get an almost infinite number, which means that M, if it's in any way positive, and it can be very small it yields an E that's almost infinite. So a small amount of mass, one atom, can yield an immense amount of energy. That's why Einstein was afraid.

01:27:17;16 So the question has to become a poetic one for the culture because what are we gonna do with that power is a question of culture, not a question of just science. With science we can use it to destroy Hiroshima or to generate electricity or do whatever we want with it. But what do we want to do with it, and how are we meant to deal with it is a cultural question and a creative question.

QUESTION:

01:27:44;05 One final question of this section. You were talking about this sort of recycling approach. How do you get rid of the trash around here? Do you have some special systems?

WILLIAM MCDONOUGH:

01:27:53;16 We're simple-minded recyclers like most people. We have composting, and we have worm bins, and things like that for composting the soil things like compost that are compostable. And then we have recycling for metal and plastic, and then we have trash, which we can't do anything with. So we're just like being in a house that does recycling.

QUESTION:

01:59:59;24 We're gonna talk a little bit about innovation. So, just to start: when you think about it, how would you define innovation?

WILLIAM MCDONOUGH:

02:00:07;29 Well, I think the first thing I would do (in defining innovation) is distinguish it from invention in the same way that I would distinguish a discovery from an invention. So, innovation is taking the things at hand and reorganizing them to a fundamental purpose in ways that are new and refreshing and effective. And invention is similar, except that it requires the creation of things that we've never really seen before. It's a sort of surprising element that something that we didn't

recognize, even, needed to be solved got put forward, like the light bulb. You know, it was an invention, not an innovation. A compact fluorescent is an innovation on the electric light bulb.

02:01:08;23 A discovery, I think, is really where I look for the platform for innovation is under discovery. So, when we looked at Cradle to Cradle, what we recognized is not that we had innovated a new system, or that we had invented something fresh and different.

02:01:33;23 We simply had found something that exists in the world, which is that materials can be seen as nutrients and can go through nutrient cycles. So, instead of being more efficient with something, we were trying to find a way to be effective with something. It's the difference between efficiency and effectiveness. When you look at a manager: it's a manager's job to be efficient with something and to do something the right way; and that might involve a lot of innovation. But it's an executive's job to be effective and do the right thing. The discovery is really the platform for the innovation and invention. And that's why I think when you look at people discovering, you know, electricity or discovering, you know gravity things like that, they're just there but they still have this sort of wonderful magic to them Copernicus, you know, seeing that the heavens were arranged, you know, in a different way you know, even though once perception might lead them in a

different direction. So I'm really excited about the idea that we innovate, we invent, and we have discovered in all three territories.

QUESTION:

02:03:07;21 Okay sort of a broad question, but tell us what kind of architect you are. I mean, they're classified in different ways. And how would you describe what kind of architect you are? We've covered a little bit, but go through that again for me.

WILLIAM MCDONOUGH:

02:03:20;00 Well, I would be characterized as a modern architect basing our work on the traditions of the 20th Century. We would be considered sort of green architects, because we care about the environment. But we're mostly worried about developing delightful places in the sunshine, where people can celebrate human creativity. That's our fundamental strategy. So, we design places that are delightful for children delightful for other species. If you look at the Ford Rouge project, for example the ten and a half acre green roof is a habitat. So, when we started the design, one of the questions was, "How do you love all the children of all species?" Well, how would you love the birds that fly overhead, then migrate across the site? Well, if you could come up with a cost effective solution for a storm water problem, and at the same time produce an immense amount of habitat for a large number

of species: why not? You know, maybe you consider it innovative, but it's really not a very complicated idea, when you think about it.

QUESTION:

02:04:40;09 It's also the what you do as a business. So, I mean you gotta sell your ideas to people, and they may wanna modify them. Tell us how in the Rouge project, how you met Bill Ford, how you decided to do this, and that sort of process, and how you were able to sort of (if it's true) protect some of these new ideas when you're working with a big company that might have had maybe some of their own ideas that whole process that you sort of get all the way through it.

WILLIAM MCDONOUGH:

02:05:03;04 Okay. This will take awhile. (LAUGHTER)

QUESTION:

02:05:05;16 Not in real time.

WILLIAM MCDONOUGH:

02:05:06;12 Okay

QUESTION:

02:05:08;02 The highlights.

WILLIAM MCDONOUGH:

02:05:08;18 I met Bill Ford on January 14th, 1999, and we went up to his office which was on the top floor, and looked out. It was under construction and looked out at the Rouge in the distance. And he asked me, "Do

you think you can apply your ideas to that place?" And I remember thinking, "If we can't, you know, we're all dead", because this has to become a living thing, instead of a dead and dirty thing. And it's a whole new strategy. Well, when we got the chance to actually work on it, the key to the whole project was what we call "the Rouge Room", which I asked to form in the basement at the bottom of the service elevator from Bill Ford's office. So, we created the Rouge Room. And I would be surprised if it a thousand people didn't go through that room. And what we put up were principles, goals, strategies, tactics, and metrics. So, we basically asked the question "What are the principles that we're gonna use to design this place?" And the quality of workplace became the guiding principle. This is a quality workplace. And then the questions became things like quality soil, quality water, quality environments, and so on; and once we had that, we could then set the goals.

02:06:41;08 And I'll give you an example on the soils. When we said, "What is quality soil", we decided it wasn't a certain parts per billion of a certain heavy metal, and things like that. It was when would we allow our children to play in the dirt. That became the goal.

02:06:57;25 The goal was children could play at the Rouge safely, and their parents could be confident and comfortable with their children playing there.

That was the goal; not some scientific benchmark of minimization and avoidance, but actual healthy systems. So, that's what we did. And then because we had those kinds of goals, we could then posit lots of different ideas. So, we tried you know, we said, "What if we made the auto factory a tent?" Well, that wouldn't work, because you have to hang all the equipment from the roof for all the monorails and some of the robots and things.

02:07:32;17 Okay. So, it won't be a tent. So, it needs to be a steel structure that holds up robots and monorails. Good. What if we could fully daylight the building? Well, we can't daylight all of it, because the protocols for quality of light and have to be under a certain kind of control and certain kinds of places.

02:07:53;09 Other places we could put daylight for example, where everybody moves around, or we have training rooms and things like that. So, we went through the whole litany of opportunity. And when we got to the roof if you can imagine a million square foot factory with all this roof and the exposed to the sky, and this huge storm water problem. The engineers had proposed the storm water system that had four foot concrete pipes, three chemical treatment plants, and a lot of chemicals sitting around, getting ready to be used for in the storm event, and a bunch of UAW workers standing around, praying it doesn't rain.

02:08:30;16 And that was the system that it's conventional storm water management site of that scale. We said, "What if we could put a habitat on the roof very thin and very light and have it absorb water?"

02:08:45;03 And then have the parking lots all porous and so they absorb water? And then have all the landscape porous and have, you know, ponds and various filters reeds, and rushes, and different aquatic plants, and then swales that lead to the river, so the water travels slowly through a lot of plant roots on its way to the river and basically come up with a system with that takes three days for water to get to the river, instead of ten minutes. What would the impact be on the building, and the pricing, and so on and so forth?

02:09:17;09 Well, it turns out that the conventional engineering solution was somewhere between 30 and 48 million dollars depending on how you interpret the Clean Water Act. And our system was effectively you know, compared at 13 million dollars.

02:09:35;17 So we save Ford, you know, somewhere between 17 and 35 million dollars. So if you look at, you know, the Ford Taurus coming out of Chicago at a four percent margin, that's the equivalent of an order for 900 million dollars worth of cars. So the board approved it in about a minute and a half, but it took a massive amount of hope and a massive amount of creativity, a massive amount of teamwork, and a massive amount of leadership a heavy dose of leadership from Bill.

Because Tim O'Brien who was in charge of the project at one point, would make jokes about people would come in and say, "Do you know what McDonough wants to do now? He wants to cover the building with a habitat". And it took Tim saying, "Well, what's wrong with that", instead of, "He must be crazy to allow this thing to move forward". So I think Bill Ford opened the door to innovation and said, "Innovate your way to the solutions that are cost effective, that meet the green agenda both in economic terms and in ecological terms".

QUESTION:

02:10:57;02 And now you've given us a lot of this, but was your role more of come up with a concept, than going and keep selling it and keeping it on track? Or do you draw sketches? I mean, from that standpoint, your role very specifically? In the general philosophical way, I think we understand, but--

WILLIAM MCDONOUGH:

02:11:13;02 Our role was as architects doing the schematic design of the roof, and of the visitors center, and of the landscape, and looking at the building product itself, the materials of the skin for their ability to be recycled, and things like that; but we were part of much bigger teams. For the for the auto plant, we work with Arcadis and Giffels; and they were the primary architects, of record, who did the execution. So, we would do sketches and help identify the systems and come up with a conceptual

framework. So, that was really our role, and we would draw that. I mean, we had drawings you know, piles of drawings this thick. And then for the visitor center, we did that with Harley Ellis, and they were in charge of that. And we were tryin' to work out how a visitor could actually get up and see the roof. So, we helped with the design of that and we helped with all the landscape, laying out all the landscape strategies.

QUESTION:

02:12:21;03 Okay. let me ask you this. I mean, we were talking about the innovation before. What were the play…Do you want some water?

QUESTION:

02:12:34;29 Tell us: did you have to go keep pushing these ideas and selling them so they wouldn't be beaten back to the more traditional ways of a automotive factory?

WILLIAM MCDONOUGH:

02:12:42;09 All the time but we had a great opportunity by having Bill Ford's personal interest in seeing this innovation occur and giving everything a chance to be tested. I think the important thing for everyone to know about the Rouge is that it really, was a "non-invented here" environment when we started. And when we finished, it was an "invented here" environment, which was really exciting. And so if you just look at the green roof alone, what happened is once you had

someone like Gordon Cooley, out of Ford Land when Gordon said, "I think we oughta go ahead and try for this thing, and get this thing done", everybody said, "Gordon, you're taking a risk". And he said, "What's my risk? I could get another job in a better climate. You know, what's my risk. So, let's go for it".

02:13:44;01 And we found the roof in East Germany, and it had been developed for aircraft hangars as cheap camouflage for aircraft hangars during the Cold War. And so we had been looking for something that was only an inch and a half thick that we could afford to put up with light weight.

02:14:03;20 And so we found examples of it in Europe, where they had 20 million square feet of green roofs. So, it wasn't such a stretch. And once the Ford engineers got their teeth into it-- they took it on with great vigor, because they're engineers and they understood; and they saw it as an engineering solution.

QUESTION:

02:14:21;14 That's the green roof, right?

WILLIAM MCDONOUGH:

02:14:22;12 That's the green roof.

QUESTION:

02:14:22;28 Show that to us, and tell us a little bit about how that worked. Hold it up a little higher.

WILLIAM MCDONOUGH:

02:14:27;29 Well, it's these are our skylights for the workers areas, these skylights here. And this is the green roof. It sits on an inch and a half of rocks, essentially exploded shale; and it's a sedum. It's a succulent plant that can survive the summer drought and can, you know, come forward in the spring, and goes dormant for the winter and so it changes colors with the seasons, makes oxygen, provides habitat for hundreds of species, accrues solar energy, absorbs particulates cools the building when it needs it keeps the building warm in the winter shunts the wind load, it turned out to be tremendous on this building thermally, shunts the wind load off the building. So, it's serving all sorts of human purposes, while looking quite beautiful and being relatively simple to maintain because of…

QUESTION:

02:15:30;10 Do you go back from time to time to check and see how it's doing, and learn even more about that?

WILLIAM MCDONOUGH:

02:15:34;09 Yeah. This has been a great roof to go back and see, because it just gets better and better.

QUESTION:

02:15:40;02 What's something you've learned from it that you do anything surprise you?

WILLIAM MCDONOUGH:

02:15:43;20 We were surprised, let's see, we were surprised at the fact that the birds started nesting within five days. That was a surprise. The birds arrived. That was a delightful surprise.

WILLIAM MCDONOUGH:

02:16:03;18 I was surprised how light it was. It's only seven pounds a square foot. That was the Holy Grail for us was to get something that was really lightweight, something between seven and ten pounds a square foot. 'Cause then it just fits within snow loads, and it's no big deal.

02:16:25;06 QUESTION:

Put that into the perspective of innovation at the time.

WILLIAM MCDONOUGH:

02:16:29;05 Well, I had started thinking about the green roof for an American factory about ten years earlier, when we designed a factory for Herman Miller in Zeeland, Michigan. In fact, that building was seen by the Ford engineers. And we really wanted a green roof there, but there was no green roof available that was lightweight, that met the criterion for an American factory, which is cheap, durable you know, fire retardant. You know, there's a lot of technical matters here. So, we had been looking, for years, for something to do this job. And so the innovation didn't just occur like a snap in a meeting. It was something we had been diligently searching for a decade relentlessly.

02:17:26;05 And we had done a green roof for the Gap, for their corporate campus, in San Bruno, California, which was a meadow of ancient grasses, beautiful roof, but it was very heavy, because it was a real solid meadow with this much soil under it. So, no one had really done a large scale lightweight roof.

02:17:49;04 And part of the innovation, I think, was the language that we used to describe it. I describe it as "ballast, with weeds", to make you understand how simple it is. You know, 'cause nobody building a roof doesn't understand that you're gonna need some ballast to keep it down, and protect it from ultraviolet shock and thermal shock, and things like that. So, ballast is a standard way of roofing. And the sedums are like weeds; they grow without a lot of care. So, ballast with weeds. It's not that complicated.

QUESTION:

02:18:21;02 You know, take us back. You said you were thinking about it ten years ago when you mentioned the Herman Miller, I mean, when did you design your first building with this Cradle to Cradle philosophy? Take us back to the very first time you got some of these ideas and did something.

WILLIAM MCDONOUGH:

02:18:35;09 Well, I would say the first, doing the first solar house that I did in Ireland meant that I built it myself by hand; and so I had to deal with

these materials. And a lot of them, you know, were off gassing chemicals, and I didn't understand any of that stuff. I just knew I was breathing formaldehyde; and I wondered what that was about and whether it was good for me or not. So, I started thinking about it then. Then, with the Environmental Defense Fund's national headquarters in 1984, we started getting into what was in the materials, and the air quality, and things like that. So, we had the energy, and then we had the materials that we were working with.

02:19:17;19 And then I did a daycare center in Germany, the design for one. And I started looking at children in the building environment, and realized they were putting their mouths on everything. And so I thought, "What's in these products? What are the kids taking up in these poor little bodies from all these different materials?"

02:19:37;18 And that's when I got interested in finding an ecotoxicologist to help me understand what these kids were eating and breathing. And that's when I met Michael Braungart from Germany, a chemist and a preeminent ecotoxicologist. And so that's when we started developing the whole Cradle to Cradle approach together as a result of that. But you know, it started by just observing the world and realizing that it was full of questionable materials and systems that just weren't solar powering things, and weren't necessarily healthy, and that just didn't seem to make any sense.

QUESTION:

02:20:13;05 You know, we're gonna be out in the San Francisco area in a couple areas, and we're gonnashoot the Gap building, which I guess now YouTube is in there.

WILLIAM MCDONOUGH:

02:20:19;16 YouTube's headquarters, yeah.

QUESTION:

02:20:20;24 Well, tell us about the building and imagining that we're seeing it, 'cause we'll actually you know, shoot this building. Tell me a little bit about that.

WILLIAM MCDONOUGH:

02:20:29;10 Well, the building we did for Don Fisher was an office building that we designed to be very flexible, so other people could use it. It could be converted into housing in the future. It could become loft apartments, things like that. But the windows open, and we thought that was a good idea.

02:20:50;00 *The Wall Street Journal* thought it was news and did a story about windows that open in an office. We thought that was a low point in western civilization, when a window that opens is news; but there it was. It seemed obvious to us, but it wasn't so obvious to the commercial world.

02:21:06;03 So you know, an innovation: a window that opens? That's hard to believe, you know, after a few millennia of operable windows; but so it goes. We reinvent things. The roof is covered with grasses that were harvested as the closest things that we could get to the ancient meadows of that place. It was done by a group called Rana Creek. Paul Kephart was the botanist involved. And so I wanted the building to have this undulating meadow as a roof, so that a bird flying overhead would be looking down and saying, "Oh, it's our people. They're back".

02:21:48;08 You know, it would take care of the storm water problems that San Bruno had. San Bruno had a very serious storm water problem, because it's surrounded by parking lots and impervious surfaces. So this building absorbs storm water.

02:22:04;22 It doesn't release it except as a trickle. So it solved a very serious technical problem that had to be solved, as well as provide acoustic separation for the.., from the airport. It's right near San Francisco airport, and 747's take off overhead. But when you're inside the building, it's so quiet. You can't hear them. So, that roof is doing a lot of things. It's serving storm water. It's protecting you from acoustic shock. It's protecting the roof membrane from thermal shock and ultraviolet degradation. It's a growing business up there.

QUESTION:

02:22:48;15 Okay. Let's talk a little bit about innovation. Where are the places where the innovators, I guess in your world, hang out the forums, the conferences, the club? And then which ones you belong to, and what do you think of them? Are there some organizations for innovators around?

WILLIAM MCDONOUGH:

02:23:06;27 I'm not part of any formal organization of innovators, but I do go to the TED conference every year the Technology Entertainment Design. I love that. I go to the World Economic Forum.

WILLIAM MCDONOUGH:

02:23:34;09 I'm not part of any formal group of innovators, or something like that. We just do our work. But I'm very fond of the TED Conference (Technology Entertainment Design) that happens-- in the winter every year.

02:23:47;19 I go to Davos (Switzerland) to the World Economic Forum and there whole series of young global leaders that are there to innovate in business and in technology. That's always very exciting, but essentially, in the world of green design, there's a whole cadre of people that move around to different conferences, we see each other in different conferences all the time.

02:24:14;16 We see each other at business relationships all the time and so we get to share our best stories with each other; and we do that regularly.

So, essentially it's a group of people just doing their work, who circle the same places in society you know, the same businesses, the same conferences, the same books that we read, and dialogues that ensue.

QUESTION:

02:24:53;04 You got a lot of people here. Do you actually actively manage these people and encourage them to innovate? And how do you keep innovation or is your process discovery, innovation, principle and that whole thing? How do you keep that going here? It's obviously important to your business.

WILLIAM MCDONOUGH:

02:25:10;08 Well, I read a study once that looked at people and looked for changes in personality and what caused them. And they concluded that the major cause of personality shift was financial stress, which I found interesting. But I also found interesting in the appendix that they pointed out that there were two characteristics of people that never changed under any circumstance, and they were friendliness and willingness to experiment with new things. Those were the two characteristics of people that don't change, even if they're under incredible stress. So when I hire people for my enterprises here, I look for their friendliness 'cause I know I can't change that, and I look for their willingness to experiment with new things. Now, if I'm hiring an accountant, I don't want somebody who experiments with new

things. If I'm hiring a designer, I want somebody who experiments with new things. So, we fill up this enterprise with people who are friendly and are delighted to experiment with new things.

QUESTION:

02:26:24;02 And do you give them the freedom to experiment? I mean, some, we've heard some people say that, "Without freedom, there is no experimentation", even if they want to.

WILLIAM MCDONOUGH:

02:26:30;18 Yeah. We give people a lot of responsibility and encourage them to create new things. And it's sort of like, we work with Google. And Google has a policy at their office where they give everybody one day a week to do whatever it is they want that they think is good for the enterprise. And we don't have a formal policy like that, but everyone here it's a transparent organization. So, everybody can find out what's going on anytime, anywhere; and anything they can bring to the enterprise that improves us is delightfully entertained.

QUESTION:

02:27:05;20 And how many people do you have here?

WILLIAM MCDONOUGH:

02:27:08;01 We have about 65 in Charlottesville and about 15 in San Francisco.

QUESTION:

02:27:14;15 And with what you do, is it easier to do it with a smaller group of people? I mean, if you had, like, hundreds of people, do you think it would be hard to get that philosophy throughout the whole organization? Does smaller size help?

WILLIAM MCDONOUGH:

02:27:25;13 I think the smaller size helps. I know that, like, for me, I surround myself with people that are running teams. So, I can deal with a certain number of those teams. But there is a limit to how much I can do, so I focus, personally, on, you know, a few projects at a time. But it is good to have a compact group of people that all hear the same messages.

QUESTION:

03:00:18;11 One of the questions we've been asking people is just if they have a favorite kind of music, song, a piece, a style. What was your reaction to that?

WILLIAM MCDONOUGH:

03:00:25;29 Oh, I'm a big fan of Van Morrison.

QUESTION:

03:00:43;27 Tell us about your favorite music or musician song, etcetera.

WILLIAM MCDONOUGH:

03:00:47;26 Well, I'm a big of Van Morrison and Mozart. Those are my two favorite kinds of music to listen to. And you know, it's funny, because when

you see the diversity and the richness that exists in music, you realize, you know, that an architect is often dealing with, as Lou Kahn pointed out, frozen music. And so, music is a really important part of what we do creatively. And it also is evidence of something really key to the innovative spirit, which is this idea of creativity for the sake of the creative act, an act of generosity. And so, when we look at that, we see also this abundance of joy that gets created by a person that is very similar to what happens when a cherry tree blossoms in the spring.

03:01:52;25 Where you have this incredible explosion of creative pleasure. And you realize that it's not being efficient, it's being effective, it's being delightful. I mean, you don't look at a cherry tree in the spring and say, "How many blossoms does it take?" Right? And you wouldn't listen to Mozart and say, "How many notes does it take?" You know, he could a hit the piano with a two-by-four and got all the notes at once. That would've been very efficient, but it wouldn't have been delightful or creative. And so I think that we use music a lot to study its power as a metaphor for the work of human creativity more generally, that has to do with stuff.

QUESTION:

03:02:36;28 Okay. Tell me a little bit about some of these other green designers that you know and how you interchange ideas. Who are some of the

ones in the movement that look like they were comers, they're gonna do some good stuff.

WILLIAM MCDONOUGH:

03:02:55;03 Well, I think you've mentioned you know, people that we consider designers. I see design as the first signal of human intention. So I look at people who have intentions, and then are trying to evidence those intentions creatively as designers. So, it's not your typical, the designer is someone who draws with a pencil and builds stuff or makes things. You know, it's more like, meta design. And I'd say the most sophisticated designer I know is Michael Braungart, the chemist. Because he sees things at the molecular level and can manifest whole systems around that kind of chemistry.

03:03:37;09 In the green building world, there are a raft of designers now that are doing fabulous things. There are many names. I mean, they're too many to even start which is pretty exciting, 'cause it's been taken up so vigorously. And the U.S. Green Building Council has been one of the fastest growing non-government organizations in the world. So, there are thousands of green designers now out there, which is very, very thrilling.

QUESTION:

03:04:06;27 Okay. We were talking about the green roofs on a couple of the building. What about solar panels. Is that something that is really gonna become a thing of the future, you think?

WILLIAM MCDONOUGH:

03:04:15;11 Solar panels are gonna become really critical very soon. We have some experiments at the Rouge of solar. We have solar thermal and solar photovoltaic right there on the visitor's center. But I'm involved as a venture capitalist now, with a group called Vantage Point Venture Partners.

03:04:33;09 So, I get to see this innovation up front and close from an investor's perspective. And what we're seeing now are 900 megawatt solar farms in the desert that are coming fast. They've already been contracted. We're seeing thin film solar collectors that are coming, that will be at the price of grid electricity very soon.

03:04:57;25 In fact, I heard last week and this is September 2008, that a company in Ohio has just signed a contract to produce electricity at 10 cents a kilowatt hour from thin film photovoltaic. Ten cents a kilowatt hour is grid parody. It's normal pricing for electricity without any help. Now, that's a real breakthrough. That's a tipping point that we're seeing here. So, I think we're gonna see massive deployment of solar energy in the next few years.

QUESTION:

03:05:30;02 That's exciting.

WILLIAM MCDONOUGH:

03:05:30;29 Yeah. It's very exciting.

QUESTION:

03:05:32;05 Yeah. You were talking before about, you know, you've got the building, you've also got the ideas. You sorta are putting both in the society. What'd you think has had the biggest impact on people? You, the actual buildings, or the thinking behind what you do?

WILLIAM MCDONOUGH:

03:05:45;09 I think in my impact on society it will probably be the ideas. The buildings are platforms for experimentation, and it gives us a chance to test our ideas on a daily basis. And it also keeps us really humble because it's so hard to do this. So we test the ideas against reality by being practices you know, practicing professionals in the business environment. So in the end, I think the buildings will be emblematic of some of the ideas, and will be part of the legacy that we leave behind. But I think the ideas of Cradle To Cradle will be the important legacy.

QUESTION:

03:06:38;20 Okay. You mentioned when you were a child or young man, came to America, seemed like the Land of Opportunity. Is America still a great

place for innovation in our current situation right now? What do you think about that?

WILLIAM MCDONOUGH:

03:06:52;09 I think the United States is an one of the greatest places for innovation in the world, because we have such desperate needs to redesign almost everything. We're at a critical point. If you look at our system we've got a system that puts billions of pounds of pollutants into the air, water, and soil every year. The ships are commercial paper and our Treasury bills overseas. I mean, the Chinese have a trillion dollars worth of our paper.

03:07:32;04 We've got huge bills for energy that send our money offshore. These mean that we're ripe for massive innovation, because the system as we currently have it is not sustainable. You can't keep sending your money to China. You can't keep sending your money to the Middle East, and expect a different result than what we're seeing.

03:07:59;05 And you can't keep using fossil fuels and burning them without seeing that result. So, I think what we will see in the very near future is massive innovation in energy, because there's so much money involved. And I we're talking about windmills in the Midwest in numbers like millions. And we're looking at solar energy deployed—in you know, gigawatts you know, per hour at some point on a global

basis. So this is large, large scale opportunity. And the real signal that it's happening will be China and the Middle East, because, if you look at the Middle East now, they're making massive investments in solar energy and wind energy. Massive.

03:08:50;10 Why would they do that? Well, because it's reached the tipping point and it's ready to be deployed. Why would they, you know, burn a barrel of oil when they can sell it, and make their own electricity using solar energy? So when the Middle East goes renewable, and China goes renewable the United States is certainly in a position to help lead in this space, and we'll, you know, read the writing on the wall, and either seek to lead or catch up.

QUESTION:

03:09:21;11 How do you compare innovative capabilities of the United States to the rest of the world on America versus global? Do you think we still have a leadership position or is the world starting to tug us?

WILLIAM MCDONOUGH:

03:09:33;16 What concerns me now in terms of worrying about leadership is that we're gonna need leadership on everybody's part. And I worry about the United States. Somebody told me the other day that there are a few thousand, I think 4,000 or 6,000 industrial design students in the United States. There are 200,000 in China.

03:09:57;12 So, within a couple of years, 200,000 designers industrial designers will come into the marketplace in China. And we'll deliver 10,000 or 20,000 or whatever. So, just the sheer mass of human creativity that's about to be unleashed is really critical. Now, we have a unique chance a unique culture that rewards entrepreneurialism. And the stimulus that comes from that in the job creation, and so on, so forth. So, I'm hoping that we'll be able to rise to this occasion, and I think we will. I think we will, as a society, recognize the opportunity we have is an opportunity for innovation and job creation.

03:10:47;16 And don't forget, entrepreneurship was always considered a social benefit. The local entrepreneur in a village or a town, as we industrialized, was considered, you know, a critical part of society. And they gave back to their local community. They not only created the jobs that the local community would enjoy, but they became the philanthropists, they became the people supporting the hospitals, and so on, so forth.

03:11:13;17 So entrepreneurship, as a general strategy, is a hugely productive one. And we have a society in the United States that is culturally attuned to entrepreneurship. So, I think we will have a lot of great things coming.

QUESTION:

03:11:32;08 Let's look into the future a little bit and prognosticate. The United States has always sort of gone through looking for the one big fix for everything. Do you see that there's a big fixing coming? Or a lot of smaller fixes that collectively become a big fix?

WILLIAM MCDONOUGH:

03:11:45;05 I think the question of whether it's a lot of little fixes or a big fix is-- is really the same question. If you're working from a unified theory of how things could go together, then all the little pieces of the puzzle add up to one big picture. So, I think if we look at the big design opportunities for our nation, we have to parse it into the basic elements of science.

03:12:16;15 And so, we have physics, chemistry, and biology. So, from a physical perspective, I think we have to become renewably powered. That's the big fix. The big fix is we get solar, wind, geothermal, things like that, renewable energy sources-- deployed at a huge scale. That's a big fix. And it's great job creation, and the economics are spectacular.

03:12:43;08 So, that's gonna happen, 'cause just be driven be economics. So, that's a big fix coming in the energy sector. On the mass sector, and chemistry, I think we'll see design for plastics, for example, that go into close cycles. So, we'll recycle the plastics and be using them over and over again.

03:13:00;04 And this'll be at a great human benefit. And it's an important use for oil, because if you think about oil, the stupidest thing you could do with oil is burn it. But the smartest thing you could do with it is make plastics out of it, because it's a very sophisticated material to begin with. So, I think we'll see oil becoming a thing that you wouldn't wanna burn, because it would be such a waste and cause such a problem. It'll be something with which you wanna make polymers. So, I think in chemistry, we'll see massive advances in polymer chemistry, both from hydrocarbons, and from carbon hydrates from biological sources. And then on the biology front, I think we'll see massive change and innovation as we understand what it means to genetically modify organisms what it means to have healthy soil, and not lose our soil to the wind or to erosion or to toxify our rivers with nitrogen flushing and things like that. I mean, we have to have a massive change in how we deal with the health of the landscape itself.

QUESTION:

03:14:05;09 So, are you more positive or more negative about our future?

WILLIAM MCDONOUGH:

03:14:09;29 Well, someone made a joke about me in the office the other day. I was waiting to go into the conference room, and making a cup of tea, and somebody in the room said, "Well, when Bill gets here, you have to understand that he's not an optimist or a pessimist. An optimist

thinks the glass is half full and the pessimist thinks it's half empty. Bill doesn't think it's big enough."

QUESTION:

03:14:33;24 Suppose we had a bunch of young kids in here, what would be your advice to them for the for what their world's gonna be like, and what they should be doing if they wanted to get in this green movement and the psychological revolution?

WILLIAM MCDONOUGH:

03:14:46;03 My advice to young people is to travel. When I was the dean at University of Virginia, that was my advice to the graduating students, was to get out and see the world. Because if you're not open to the world, you won't be able to imagine the kinds of solutions that are gonna be necessary. And there may be an essay of clues out there for you, as an individual, that you could see by opening yourself to other cultures and other experiences. And I think that freedom that you're giving yourself by traveling is a really special gift of youth. You can do it before you get married and have kids, and get tied down.

03:15:27;24 So, I would say travel is the key. Because in the green movement, it's going on everywhere all the time. So, it means you could practice it wherever you are. And so, you know, typically for professionals, I suggest that they, go home, and start practicing this way. If they

wanna travel, travel broadly and widely while they're young, things like that. But experience the world. Experience as much of the world as you can, because there's so much creativity that comes from that you can't get just sitting behind a computer.

QUESTION:

03:16:15;16 And was there an example, maybe, where you had to, like, compromise and let them do something that might not totally fit your philosophy just to know to get the project moving or get it done?

QUESTION:

03:16:34;01 Tell us about working with patrons and some of the experiences with ones that may be a little more difficult, or you have to push a little more, and maybe don't get your way all the way through it.

WILLIAM MCDONOUGH:

03:16:44;03 Well, we've been really lucky with our patrons, because they typically come to us because of what we do. So, they're interested in our perspective. I would say the job we have is to convince people that our proposals are intelligent, and meet their needs. And so, the first sort of crazy thing that we propose at scale once for a patron was that we wanted 10 square miles of trees to be planted to offset a building's impact on climate change and global warming. This was in 1989. So, this was 20 years ago.

03:17:32;11 And the developer real estate developer, as you can imagine, sort of it was a competition we had won, and, you know, was looking at us and saying, "Is that essential part of your building?" And we said, "Yes, it is. If you want our design, we will want you to plant these trees."

03:17:47;17 And it was to be in Poland, in Warsaw. It was before the Communists were knocked out. And so, he went and studied what it would take to plant 10 square miles of trees in Poland at the time. And it was $100,000. And it was a 200 million dollar project. So, he came back and said, "Okay, that's great. That's a great idea, because it will bring great recognition to our project you know, better than any campaign we could have about any other qualities of the building, would be this forest that got planted."

03:18:25;04 So and it was a question of, you know, being able to put the idea out there. We didn't know if it would work or not or what it would cost, but we felt it was an important statement as part of a building in a coal powered country. And it was a long time ago.

03:18:42;04 We often have to compromise. We'll look for two or three things that-- we can get accomplished in each project. We don't try and solve every problem in the world with every project. So, sometimes we get what we want and sometimes we don't. But when you know, the projects that give me the most pain are the ones where we didn't listen to our inner messages or our compass, and allowed a project to

go forward without our feeling really comfortable about it. And those are the ones that hurt the most. You know? So-- we try and avoid them when we can.

QUESTION:

03:19:35;11 Tell me about the three or four or whatever things you're most proud of that you've done.

WILLIAM MCDONOUGH:

03:19:43;08 Well, I guess I'm proudest of being a husband and a dad. So, that would be item one. The buildings have their own lives, and I would say, of the buildings we're especially proud of, Overland College, where we made a building that makes more energy than it needs to operate and purifies its own water, building like a tree that's a pretty amazing thing.

03:20:16;11 We're very proud of the Ford Rouge project because it's a building that's a habitat. And set a signal out to the rest of the world that people could copy it. And it has been copied left and right. I mean, you know, once we did that giant green roof, everybody could do a green roof. Before we did that giant green roof, nobody could do a green roof.

03:20:36;20 So, I think that was really an important project. The Gap Corporate Campus represents, I think, one of our finest pieces of work. But

every building is like a child. That you love them all. So, I think, you know, their buildings will stand for something.

WILLIAM MCDONOUGH:

03:21:10;10 Yeah. Each building's like a child, so, you love them all. But I would say, you know, we're sitting here in Charlottesville, Virginia, and if you stop and think about it, this is Thomas Jefferson country. And I've had the privilege, having been dean at university, to spend five years living in a house designed by Thomas Jefferson. And when you live in a house designed by Jefferson, who was a great innovator he didn't consider himself an inventor he did the moldboard plow, but he considered that an innovation, not an invention, that he was building on the work of others. But if you look at Jefferson, and you look at him as a designer, you recognize that he saw himself as a designer. Because all you have to do is look at his tombstone and you'll see on it only the things he designed.

03:21:57;29 It says, "Thomas Jefferson. Author of the Declaration of American Independence, the Statute of Virginia for Religious Freedom," which matured into the Bill of Rights, "and Father of the University of Virginia." That's it. There's no mention of having been President of the United States twice.

03:22:13;07 So, he's only recording his legacies, not his activities, not his jobs. So, the things that he was proud of were legacies, things he designed. I'll

be proudest of the Hanover Principles, which I wrote for the World's Fair for the year 2000 for the Design Principles. I wrote them in 1991, '92. And the *Cradle To Cradle*, the book, would be another one.

03:22:39;22 And I still have yet to develop my third one. I'm not sure what the equivalent of the University of Virginia would look like. But something great must still be ahead, 'cause I've got a lot of work to do yet.

QUESTION:

03:22:55;04 I was gonna ask you, is there anything you're working now you can talk about? That a big project or what's exciting that's going on now?

WILLIAM MCDONOUGH:

03:23:02;04 Most exciting things that are going on now for us include the work we're doing at Google. We consider them a great company and really fun to work with. We're helping with some architecture issues and sustainability criteria, things like that. So, that's a lot a fun. We're working on projects in Holland that are big, that are aspiring to be inspired by *Cradle To Cradle* and that's pretty special and quite important.

03:23:32;17 I'm working on a lot a products right now. We've just designed a new line of carpets, with Shaw Industries, which is coming out this fall. I'm very excited to see those coming out, 'cause it'll refresh our collection. We're working on consumer products, things like that.

03:23:53;10 But I'd say the biggest thing of all is that we're looking to take our chemical's database, which we now we look at chemicals there are over 100,000 chemicals made by humans and used by humans. Only a third of them have probably been tested for ecological and human health. And we've databased thousands of them in our process with our clients against 19 fundamental criteria. And like, no more cancer, birth defects, genetic mutations, heavy metals, things like that. And we are going next year to take that database and make it open access and put it on the Web.

03:24:34;08 So, anybody anywhere in the world could see a chemical name, type it into this database, and find out whether it gives cancer, birth defects, and so on, so forth. So I think that's gonna be a huge gift to humanity. And it’s a big project for us and to give it away.

03:24:53;26 And so, we have to design the whole business of how to give it away. We have to design all the secrecy agreements that have to go along with the chemical's industry. 'Cause we have a lot of, you know, information that in terms of formulations that we can't reveal, but we can reveal the base chemicals. So, it's gonna be quite a surprise to the human species to find out what humans are using to make stuff. That'll be next year.

QUESTION:

03:25:20;03 I'm gonna say in a world that's sort of run by the dollar, I mean, why did you decide to give that away?

WILLIAM MCDONOUGH:

03:25:25;09 We think that in this world today, transparency is the key to the future of commerce. And I think it'll make us more valuable. And we make our living by creating things. And so, the database itself is just one of our tools. And if we share that tool with thousands of other people who then get to use the tool I think it'll make our business more valuable, because we'll have more to contribute.

QUESTION:

03:26:01;13 You kinda touched on this, but, you know, a hundred years from now when people are looking back, what do you want 'em to think of you? What you'd be remembered for? I don't wanna say, "What's on your tombstone?" Jefferson already got the corner on that, but, I mean, I know you mentioned a few things before, but take me through that again. What are the things you'd like them to think about you, remember you for down the road?

WILLIAM MCDONOUGH:

03:26:22;02 Well, I think I'd like to be remembered for having posited design principles for a sustaining world very early in the process of thinking it through as a species. And that would be the Hanover Principles. And

then mainly, I think, I'll be remembered for *Cradle To Cradle*, the book I did with Michael Braungart.

03:26:50;02 I think that, you know, was a chance to put a stake in the ground and make a call for a new kind of design. And then the third thing will be probably the releasing of the chemical's database. I think the fact that we open the door to the health and of human artifice, and made it public, made it transparent, is gonna be a big deal.

QUESTION:

03:27:32;11 This interview is gonna be preserved theoretically forever. So, you imagine a couple a hundred years from now, somebody goes in, pulls this stuff and looks at it, is there a message you'd like to leave with something from our time to their time? Something you'd like to say to the people down the road?

WILLIAM MCDONOUGH:

03:27:47;04 Sure. The idea of sending a message 200 years hence is not an unfamiliar one, because the native peoples constantly talk about making decisions on behalf of your seventh generation. That's about 200 years. So, from our generation, we can look back at Thomas Jefferson and say we have the pleasure of living with his Declaration of Independence. I think we can look hence 200 years, and say that there were people here at the beginning of this century who are looking at the Declaration of Interdependence. And that

interdependence would recognize things that are similar to the Declaration of Independence, in that the Declaration of Independence called for life, liberty, and the pursuit of happiness in a context that was essentially free from remote tyranny. And the idea was that the people here would not be tyrannized by someone else who didn't understand the local circumstance or cared less. And that was unacceptable, and was cause for revolution.

03:29:05;15 And I think that now we have a new industrial revolution that is starting, based on the idea that we would not want to cause intergenerational remote tyranny. And that we wouldn't tyrannize our seventh generation with bad design. And so, at the beginning of this century, and the end of the twentieth century people got together to develop design protocols that would allow people 200 years from now to celebrate life, liberty, and the pursuit of happiness, free from intergenerational remote tyranny.

QUESTION:

04:00:13;14 Just riff a little on innovation what comes into your mind about that?

WILLIAM MCDONOUGH:

04:00:18;24 Well, I think there are a series of events transpiring on the planet. And with our species that will stimulate massive innovation. One is the revelation that we are the dominant species. I think the fact that

we no longer can romanticize nature if you can't think of a place in the world that we can't get to, or bring our stuff and take over.

04:00:49;19 Ninety-nine percent of the large mammals on the planet are under human management. So we are the dominant species, there's no question about that. So what are we doing with that responsibility? I think that's a great innovation question. Is that responsibility. I think the other thing that is interesting is transparency.

04:01:09;22 With YouTube and with electronic media now information is going to be generally available. And people are going to expect transparency. And so we're starting to see this every day. And when you look at the history of the environmental movement and innovation, you could see that we saw one of the first times that the Russians in that case couldn't get away with lying.

04:01:44;08 Because the spotty Mir image from, of Chernobyl with a 30 meter resolution was enough to see that something terrible had happened. Anybody in the world could connect to the image and realize that we need to do something. So we haven't seen nuclear power explode as a business since that transparency.

WILLIAM MCDONOUGH:

04:02:53;18 So I think we're going to see a lot transparency. We've seen the history of transparency from Chernobyl, where they got caught from outer space where we're seeing, you know, things like currencies used

to have their values determined by the countries. Remember the ruble was determined by the Russians the value of the ruble.

04:03:14;06 And that's no longer possible. The markets do that every day now. And so what we saw with The Earth Summit in 1992 was the fact that there were no leaders in this space. And that's what we need. When Maurice Strong, the head of the Earth Summit, was asked, "How many world leaders were at the Earth Summit?" He said, we had 120 something heads-of-state but no leaders.

04:03:42;09 And so what we need is leadership. And the tricky part is that what we don't need is just efficiency. And that's what's been promulgated by so many people is just let's be more efficient about what we do now. What we need is actually a change in what we do. Because efficiency won't save us. It may even be pernicious. Because it makes us think we're doing something.

04:04:05;25 But as we grow in population if our per capita use of things comes down slightly but our number of people goes up, we still have the same frame conditions. So what we need is a completely new design. A completely innovative space. And so that to me is really a challenge to young people everywhere. And when you look at the history of revolutions and we're talking about a revolution.

04:04:33;06 So we're not talking about an evolution. We're talking about a revolution. And one of the nice things about living in Charlottesville is that we can talk about revolutions here. And people don't think you're crazy. Because we had revolutions that start from here. So the idea of a revolution is really key. And when you look at both Jefferson and Gorbachev, they both said similar things about the fact that in order to have a revolution all you need is five percent of the thought leadership of the population.

04:05:06;03 Five percent to have a revolution. That's how you have Perestroika. So I think that this new industrial revolution that we're talking about won't be that far off. Because we'll have five percent of the thinking population with this mental model relatively soon. It's happening every day. When Wal-Mart takes up sustainability as the fundamental part of its business model, you know? The world's about to change. There's no question about it.

QUESTION:

04:05:47;03 You feel that coming any sense from the other part of where you live? How did you end up Charlottesville just down the road from where you were before?

WILLIAM MCDONOUGH:

04:05:47;03 No. I was in New York. And I was asked to be the dean at university here. School of Architecture.

QUESTION:

04:05:47;03 That's what I meant. So…

WILLIAM MCDONOUGH:

04:05:47;03 So we moved here and I stayed.

WILLIAM MCDONOUGH:

04:05:47;03 Yeah. We stayed here. We liked it.

QUESTION:

04:05:47;03 You have kids?

WILLIAM MCDONOUGH:

04:05:47;03 Yeah. Two kids.

QUESTION:

04:05:47;03 Are they architects?

WILLIAM MCDONOUGH:

04:05:47;03 No.

QUESTION:

04:05:47;03 No, you want them to be architects?

WILLIAM MCDONOUGH:

04:05:47;03 I think Drew will probably be an engineer. He's got great talent in putting stuff together.

QUESTION:

04:05:47;03 And how old are they?

WILLIAM MCDONOUGH:

04:05:47;03 Fourteen and nine.

QUESTION:

04:05:47;03 Okay. So they got a ways to go

WILLIAM MCDONOUGH:

04:05:47;03 They got a ways to go.

WILLIAM MCDONOUGH:

04:05:47;03 Yeah, yeah.

QUESTION:

04:05:47;03 Anything else on innovation or, I mean, you're free to utter stuff like that.

WILLIAM MCDONOUGH:

04:05:47;18 Well, there's one thing that occurred to me while I was--

QUESTION:

04:05:54;01 It's not sustainable unless we tape this thing.

QUESTION:

04:05:57;01 Okay. What did you say? You had one more thing about innovation?

WILLIAM MCDONOUGH:

04:06:12;28 I think the key to innovation is in the stories that we tell each other, and we'll tell the future. And the question becomes, what is your story? And if your story was, "Well, I figured out how to pollute or

destroy," it's not a great story. And with our new tools, if you think about this electronic ear I'm reminded of a great section of a book called *Mind And Nature* by Gregory Bateson.

04:06:47;15 And in it there's a point where he asks the computer "Tell me, computer, when do you think computers will begin to think like humans?" And there's this long pause. And the computer says, "That reminds me of a story." That's when computers will innovate.

* * *END OF AUDIO* * *

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