

SUZUKI SPEECH

DR DAVID SUZUKI SPEECH ~ 4 MARCH 2004

I'm delighted to be here this morning, and to have the privilege and the opportunity to share a few of my ideas with you.

I've taken part in extensive discussions at the international level. I was at Rio in 1992 and Kyoto in 1997 and very recently in Kuala Lumpur and for years participated in round table discussions at the national level in Canada and those experiences have firmly convinced me that local communities are where change is going to come about.

Frankston is where we will come face to face with ecological issues and where we can see solutions that can be implemented right here on the ground.

When the Brundtland Commission coined the phrase "sustainable development" many cynics said: "well, the greens got sustainable and the business community got development". I don't think we really know today what sustainable development really means. And a great reason for saying that we don't really know, is that we have so undermined the planet's life support systems, changing the atmosphere, the oceans, the soil and the forests, that we really can't rely on the resilience and the productivity of nature as we did in the past. But one thing is absolutely clear: the planet cannot sustain the way that we are living today, it is utterly unsustainable.

In June of 1992, the largest gathering ever in human history of heads of state took place in Rio de Janeiro. I might mention that I was disappointed that Paul Keating didn't go, and that was the Earth Summit and the Earth Summit was meant to signal a fundamental change in human activity. The delegates there were to declare that from that moment on, no aspect of human activity could be carried out without first considering in a very profound way, the ecological consequences. So economics could not be allowed to dominate the way that we acted any longer, the environment had to be a major consideration. And it was in Rio that a child made a plea for adults to remember why we were there and if I could show you what her plea was:

"Hi I'm Severance Suzuki, for ACO Environmental Children's Organization. We are a group of 12- and 13-year-olds trying to make a difference. Vanessa Suddy, Morgan Geisler, Michelle Quig, and me. We have raised all the money to come here ourselves, to come 5,000 miles to tell you adults you must change your ways. Coming up here today, I have no hidden agenda; I am fighting for my future. Losing my future is not like losing an election or a few points on the stock market. I am here to speak for all future generations to come. I am here to speak on behalf the starving children around the world, whose cries go unheard. I am here to speak for the countless animals dying across this planet because they have nowhere left to go. I am afraid to go out into the sun now because of the holes in our ozone; I'm afraid to breathe the air because I don't know what chemicals are in it. I used to go fishing in Vancouver, my home, with my Dad until just a few years ago we found the fish full of cancers and now we hear of animals and plants going extinct everyday, vanishing forever.

"In my life, I have dreamt of seeing the great herds of wild animals, jungles and rainforests full of birds and butterflies, but now I wonder if they will even exist for my children to see. Did you have to worry of these things when you were my age? All this is happening before our eyes and yet we act if we have all the time we want and all the solutions.

"I am only a child and I don't have all the solutions, but I know I want you to realise neither do you. You don't know how to fix the holes in our ozone layer; you don't know how to bring salmon back up a dead stream; you don't know how to bring back an animal now extinct, and you can't bring back the forests that once grew where there is now desert.

"If you don't know how to fix it, please stop breaking it.

"Here, you may be delegates of your government, business people, organisers, reporters or politicians. But, really, you are mothers and fathers, sisters and brothers, aunts and uncles and all of you are someone's child.

"I am only a child yet I know we are all part of a family, five billion strong; in fact, 30 million species strong, and borders and governments will never change that. I am only a child, yet I know we are all in this together and should act as one single world towards one single goal. In my anger, I am not blind, in my fear I am not afraid of telling the world how I feel. In my country, we make so much waste, we buy and throw away, buy and throw away, buy and throw away and yet northern countries will not share with the needy even when we have more than enough we are afraid to share, we are afraid to let go of some of our wealth. In Canada, we live the privileged life with plenty of food, water and shelter; we have watches, bicycles, computers and television sets the list could go on for two days.

"Two days ago, here in Brazil, we were shocked when we spent time with some children living on the streets. This is what one child told us: 'I wish I was rich and if I were I would give all the street children, food, clothes, medicines, shelter and love and affection'. If a child on the streets who has nothing is willing to share, why are we who have everything still so greedy? I can't stop thinking that these are children my own age, that it makes a tremendous difference where you are born, that I could be one of those children living in the favelas of Rio. I could be a child starving in Somalia, or a victim of war in the Middle East, or a beggar in India. I am only a child, yet I know if all the money spent on war was spent on finding environmental answers, ending poverty and finding treaties, what a wonderful place this earth would be.

"At school, even in kindergarten, you teach us how to behave in the world, you teach us not to fight with others, to work things out, to respect others, to clean up our mess, not to hurt other creatures, to share and not to be greedy, then why do you go out and do the things you tell us not to do? Do not forget why you are attending these conferences, who you are doing this for. We are your own children. You are deciding what kind of world we are growing up in. Parents should be able to comfort their children by saying, 'Everything is going to be all right; it's not the end of the world and we are doing the best we can', but I don't think you can say that to us anymore. Are we even on your list of priorities? My Dad always says you are what you do, not what you say. Well, what you do makes me cry at night. You grown ups say you love us but I challenge you, please make your actions reflect your words. Thank you."

That speech was given 12 years ago and it's every bit as moving and relevant I think today, as it was then. As if to reinforce the importance of the Earth Summit in Rio, the speech that Severance gave at that event in November of the same year a remarkable document was released. It's called *World Scientist Warning to Humanity*. And when you look at the people that signed it, the 1600 scientists, this is the all-star hall of fame of the top scientists of the world. It includes more than half of all living Noble Prize winners at the time and listen to what this document said:

"Human beings and the natural world are on a collision course. Human activities inflict harsh and often irreversible damage on the environment and on non critical resources. If not checked, many of our current practices put at serious risk the future we wish for human society and may so alter the living world that it will be unable to support life in the manner that we know. Fundamental changes are urgent if we are to avoid the collision our present course will bring about". And then they go on to list where the issues confront us in atmosphere, water, oceans, soil, forestry, species and population and then the document, hard enough as is it to believe, grows even more bleak. *"No more than one or a few decades remain before the chance to advert the threats we now confront will be lost and the prospects for humanity are immeasurably diminished. A great change in our stewardships of the Earth and life on it is required, if a vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated",* and then they go on in the document saying what we must do.

Now I want to remind you that scientists are a very conservative group of people; they don't like to make such strong statements in public, so it is quite unusual for such a large number of leading scientists of the world to write their feelings in such strong language. But if their words in this document are frightening, the response of the media around the world was terrifying. There was no response.

In North America, I can't say for Australia, but in North America, none of the major television networks bothered to report it. Both the *New York Times* and the *Washington Post*, arguably two of America's leading newspapers, rejected it as not newsworthy. So, here we have more than half of all Nobel Prize winners telling us that we may have a little as ten years to avoid an absolute catastrophe and the media pronounce this as not newsworthy.

Now I just want to remind you what over the last ten years the media do consider newsworthy. Do you remember a guy named O.J. Simpson? Do you remember a woman named Princess Diana? Do you remember Bill and Monica, and more recently a woman named Janet Jackson? The media were absolutely obsessed with these people and their issues, not for days or weeks but for months and years. That, to me, is terrifying. If the media, the source of where we get our information about the world and major issues that confront us reject the world scientists' warning as not newsworthy and focus on other things, that is truly terrifying.

What has gone wrong? The great boast of our species is that we are unlike any other organism in that we are intelligent. Why is it that we can't see what the scientists are warning us about? If you look at the history of our species, throughout all time, people all over the planet understood that we are deeply imbedded in the natural world and utterly dependent on it for everything that matters in our lives.

If you listen to the stories and the songs and watch the rituals and dances of traditional people today, you will find that they're constantly celebrating our embeddedness in the natural world. They give thanks to the creator for the great generosity and abundance of nature, they constantly acknowledge that as part of nature we have responsibilities, and they promise that we will act in the right way to keep it all going.

Today we don't do that any longer, and I think one of the reasons is that our world that we look out on is shattered. We see the world around us in bits and pieces and there is no sense of the exquisite interconnectivity, the inter-dependence that various parts of the natural world have. We believe that we are different from the rest of nature because we are so smart. But the problem is if we no longer see the interconnections in the natural world in which we still remain, then we no longer see causal relationships. If the world is shattered, then there is no way to recognise that this is the cause of that. And if we don't see inter-causal relationships, then clearly we don't have any responsibilities. Because we don't see how our lives are affecting the world around us, and in Canada, I see it all the time.

This is winter in Canada, and yet in any town or city in our country you can go into a supermarket and buy fresh fruit and vegetables and nobody ever asks 'this is a winter country and a cold country – where the hell are they growing this in the middle of winter?' We can buy cheap apples, and if you look at the labels the chances are they have been shipped from New Zealand and nobody ever asks 'this is madness, how can we afford to do that?' We to Gap or Nike to buy articles of clothing without ever checking where they were made and what were the conditions of the workers that actually created this. You see, we live in a world in which all of those connections are shattered. So there is no responsibility to think about it. And I was most struck about this lack of a sense of responsibility a few years ago when we did a program on asthma.

Now I grew up as a boy in the late 1930s and in that time in Canada the word asthma, nobody even knew what it was, it was an extremely rare disease. The first time I ever met someone with asthma was in my last year of college and I always thought what a wimpy disease because he couldn't take Phys Ed. It was only when I saw a child undergoing a full blown asthma attack that I was absolutely horrified to watch that child suffocating right in front of my eyes. Today, one out of five children in Canada will grow up with asthma. You can't go to an elementary school class and not encounter all kinds of children with puffers. We decided to confront the issue of asthma and one of the pieces of the program was to go to an emergency ward in a hospital during a smog alert day in Toronto.

So we waited for the government to announce the smog conditions, rushed down to the emergency ward, and it was jammed with old people and children. And what struck me was that many of those elders or children were being driven by their kids or the kids being driven by their parents, by people frantic for the conditions of their loved ones. But they drove up in what we call sports-utility vehicles, I guess you call four-wheelers here, and so clearly they had not connected the fact that their lifestyle, the way they choose to live, was a part of the problem that they were now dealing with in the life threatening situation.

So when we live in a shattered world we no longer see the connections and so we no longer feel a sense of responsibility.

Human beings are basically a local tribal species. We are not used to thinking about what our neighbours way over the hill are doing. We have never had to worry about what others are doing to our surroundings.

For the first time in human history, we now have to think 'what is the collective impact of all human beings on the Earth?' and this is hard because we aren't used to this kind of thinking. We still think in local terms because that's the kind of species we are.

What is it that blinds us to the reality of the destructive path the world's scientists are warning us that we are on? I believe that we have had a very sudden conjunction of a number of factors that have all lead to this place where we are now blind to the reality of what's going on. The first and most obvious is the enormous growth in our population.

Human beings are now the most numerous mammals on the planet and when I come to Australia and I tell Australians that there are more human beings on earth than there are all the rabbits in the world, you know instantly that is one hell of a lot of human beings. There are more of us than all the rats in the world, than all the mice and all of the wildebeests. We are the most numerous mammals on the planet, and it's happened with explosive speed.

Every one of you should try this as an exercise; try making a graph of human population in billions over the last 100,000 years. Humans have existed as a species for about 100,000 years, so let's look at population over that entire time and what you find is the curve barely rises over 99% of that time. It is only in the last pencil width of time, that the curve begins to inflect upwards and rises very rapidly. It is estimated that at the time that Jesus Christ was born there were about 200 million human beings on earth, so that's in the last little bit of time on that graph. Suddenly there are 200 million of us; it then took about 2,000 years to reach the first 1 billion people on the planet, early in the 19th Century, about 1830-1840.

I was born in 1936, when there were just over 2 billion people. In my lifetime then, the population of the planet has tripled. If it took 100,000 years for human beings to reach a billion people, we are now adding a billion every 12 to 13 years. So what you find is in the last pencil width of time the curve is leaping literally straight off the page. Well nothing in a finite world can continue to grow like that indefinitely; we are in for a serious crash.

But one consequence of that spectacular rate of growth is that the vast majority of people on the planet, including the vast majority of people sitting in this room were born after 1950. You have spent your entire lives living in an unprecedented and unsustainable period of growth and change. But that's all you've ever known in your entire lives so this is what is completely normal to you and therefore you feel 'since this is normal, then this is what we have to keep going for'. I mean, if we suddenly stopped all of this change over time, you would think the world had gone crazy and gone nuts. Because we are now hooked on this change that you have all experienced for your entire lives, we think this is normal and necessary. So there is a perceptual problem then where we no longer look in the broader sense at the absolutely unprecedented position that we are in today.

We, of course, are not like rabbits, or rats, or mice. As a mammalian species we are empowered with the enormous growth of science and technology. And when you think over the past 100 years virtually every one of the modern technologies we take for granted today, from cars and planes to telephones, television, space travel, oral contraceptives, plastics, antibiotics, organ transplants, genetic engineering, all of this has become a part of our lives in the last 100 years. And that has empowered us with an enormous amount of muscle power, so that on our behalf, tremendous amounts of technology are used and we can now impact the planet in a way that no other species has in the entire history of life's existence on earth.

We have been afflicted with the last half century with an enormous itch for consumption. When I was a boy growing up, if someone said to my father, what I do, "I'm a fisherman or I'm parent", we identified ourselves by describing our place in the community. But today the vast majority of us think of ourselves as consumers. We are an integral part of the economy today and I don't think it was an accident, I think it was very significant that after 9/11 the very first public statement George Bush made was "I want every American to go out and do your civic responsibility: go out and buy stuff, keep our economy growing". We have this enormous appetite for consumption.

One of the most humiliating statistics I know as a Canadian is that in the last 40 years the average size of a Canadian family has decreased by 50% but in that same period the average size of a Canadian house has more than doubled. So we have half as many people living in twice as much space, meaning that on average each of us has over four times as much space per person as we did 40 years ago.

The average Canadian house being built today has one bathroom per person living in the house. I grew up as a boy in a house with six of us we had less than 1,000 square feet living space and one bathroom. And I don't ever remember peeing my pants because my sisters wouldn't let me in to use the toilet. But I guess today, we are so full of it "we need it now, and I can't wait", we have to have our own bathroom. Nobody ever asks in a society which consumption is a way of life, it is part of the economy; nobody ever asks how much is enough? I have more than I've ever needed. Why do I need all this stuff? Am I happier with all this stuff?

And, of course, our consumption appetite is driven by the global economy that all of our politicians are rushing us into. A global economy that seeks resources in every nook and cranny of the planet and it sees all 6.2 billion people on Earth as a potential market for its products. So taken all together, that population, science technology consumption and a globalised economy have made us a force as no other species been on in the 3.8 billion years that life has existed.

We are now altering the chemical, physical and biological features of the Earth in a way that no other species ever has in the past and we are doing it with explosive speed. And our blindness to the reality of this is exhibited even further by the fact that we live in a time when information is exploding.

I don't know what Mr Howard's view is on this but am certain our Prime Minister and the President of the US, they think that the information super highway is the greatest thing going and the avenue to the future. Well I deny that. Our problem today is most of us are overwhelmed with information. It just comes at us from every opening in our body and the problem is that most of it is pornographic or it's junk, it's about selling stuff and we are overwhelmed, we are inundated with information and we don't have the means of deciding what is junk and what is worth keeping in mind and taking seriously. So as we are loaded with all of this information our world is shattered into little bits and pieces.

You think about your six o'clock news that comes on ABC on radio. In Canada, the six o'clock news is to me the most important news we get; it's a half-hour program and in that time we may get 15 to 20 reports or items on that half-hour newscast and when the broadcaster says: 'Tonight we bring you an in depth report', he is talking about a two-minute

report. I mean this passes for profundity and in depth? And what do you get when you hear a half-hour program?

I mean you get a bit from Bosnia, a bit over here from Bangladesh; you get a bit from South America. There is no sense that maybe that these things are interrelated? There is no sense of why this is important, or why you should even pay attention to it, and there is certainly no sense that you can do anything about it.

So all we get in our news are disconnected bits and pieces. You think about what passes as a quote from your Prime Minister or Premier of a Province. If there is some controversial issue, they will go to the Premier and he'll say 'well, I don't agree with that'. That's it. This is supposed to pass as serious discussion and dialogue about important issues?

We live in a world that has been shattered, and the media are a great deal of the problem here, no longer allowing us to see any kind of issue in a profound way. And finally, I think that we live in a way that is fundamentally different today from what it was 100 years ago.

In 1900, over 95 per cent of human beings did not live in cities; we lived in rural village communities, we were an agrarian species. In 1900 of course, there was only one and a half billion of us, but at that time there were only 16 cities with more than 1 million people. None of them was in Australia, you now have five, but in 1900 there were none. The biggest city in the world was London with six and a half million people. Tokyo was the seventh largest city with one and a half million people. So we, the vast majority of people, lived in small rural settings.

Cut ahead 100 years, now over per cent of all human beings in the world and way more than that in the industrialised world live in big cities.

There are more than 400 cities with more than one million people or more and in next 15 years, China plans to build 200 cities from scratch, each of them with more than one million people. The 10 largest cities in the world now have more than 11 million people. Tokyo in 1997 was the largest city in the world with twenty-six and a half million people and if you've ever been to Tokyo you know that no human being should have to live that way. We have become in a 100 years, we have been changed from a rural village species to a big city dweller.

And in cities, it becomes easy to accept the illusion that we are different to other creatures because we create our own habitat. We don't need nature because we live in cities and in a city when you ask a child where does your food come from, chances are they will say down from the supermarket and they are shocked when they realise the chicken they are eating are the muscles of an animal. They are horrified to think that their vegetables grow in the dirt.

When you ask a child when you flush the toilet where does it go, or when you put garbage on the curb where is it taken to, they have no idea. When you take a drink of water from the tap, or you turn on the electricity, where does that come from, they don't know. And if we don't know, that it's the Earth itself that gives us these services or that receives our waste, then it becomes easy to accept this notion that it's the economy that delivers all these services. If we don't have a strong growing economy we can't afford clean water, or cheap electricity or rates, we can't afford to have good sewerage disposal or garbage dumps. It's the economy that provides all of that.

So I believe that all of these things tend to blind us to the reality that people always understood in the past that we are still animals and as animals we are as dependant on the natural world as any other species.

I am told over and over again in my country, 'listen Suzuki, we can't afford to do all the stuff you Greens want if our economy isn't growing', the environment is seen as a sub-set of the economy. We are told over and over that the economy is the bottom line; you have to sacrifice for the sake of the economy. Your community has to give up social services to keep the economy strong and healthy. That's never made any sense to me as a biologist and I hope by the time I have finished my talk you will understand why I feel that.

What changes do we have to make then? If we are no longer recognising the impact of what we are doing to the natural world how are we going to have our eyes open to see the crises that the world scientists were warning us about? Well, to answer that, the best way that I can do that, is to describe my own personal evolution.

I graduated with a PhD in genetics in 1961, and man I was hot, we knew about DNA and chromosomes and genes and I was determined to go out into the world and conquer it and make my name and reputation as a geneticist. I got my first job as an assistant professor in 1962 and I thought now I'm going to make my mark in the world and I was completely derailed by a woman.

Now ever since puberty that has happened to me over and over again, usually disastrously, but in this case I'm ever grateful to this woman for changing my course in life. My greatest regret is that I never met her before she died, she died two years later, but she had as great an impact as any woman I've ever known. Her name was Rachel Carson.

In 1962, Rachel Carson published a book called *Silent Spring*. That was the first book to document the absolutely unexpected effects of widespread use of pesticides in the environment.

The message as I read the book, the message that I took home from her was, 'Oh you scientists, you think you are so clever and you are, you work in the laboratory and you create a compound like DDT and you can go out and kill insects and that's a very powerful technology but in the real world where you scientist don't work, in the real world everything is connected to everything else. And so you spray to kill an insect pest but as everything is connected, you end up affecting fish and birds and human beings'.

By the 1960s, women's breast milk was considered to toxic to feed babies. But it was reading the book I realised that working in the laboratory, I'm living in an artificial world that allows us to probe nature in a very special way, but that I lived in a world that in which everything was interconnected. Now I could no longer ignore the consequences of what I was doing in that real world.

And that is why in 1962, I began my first television series, in order to try and explain to Canadians what science was about and what the implications were for the applications of scientific ideas for the rest of society. Because of Rachel Carson, I was swept up in the environmental movement in British Columbia and the very first issue I got involved in the mid-1960s was when the Americans announced they were going to test underground nuclear weapons in Amkitcha, which was an island in the Aleutian Island chain off Alaska.

And so the huge protest began in British Columbia because we didn't know what the consequences would be, and, of course, Americans were no different then in 1960s than they are today. They said: 'we don't give a damn what you say', and went and blew them up anyway. But one of the results of that was that many people don't remember is that Greenpeace was born in Vancouver, out of that protest against explosions in Amkitcha. Greenpeace was a made in Canada organisation that has become a powerhouse around the world today.

I testified in a commission against exploration for oil off shore in Hecate Strait, one of the most treacherous areas along the coast of British Columbia and we stopped it. I lead a protest against a major dam to be built at Site C on the Peace River and we blocked that. We have now elected an extreme right-winged government and guess what, offshore drilling and the dam on the Peace River are back on the agenda because the province is open for business. So it seems in the environmental area every defeat is forever and every victory is temporary and we end up having to fight them over and over again.

We began to fight and that continues today over the policy of large clear cut logging practices by the forest industries and against the tremendous pollution of air, water and soil from our

pulp mills.

And as I was swept up in this movement all through the '60s I thought that the problem was very simple: human beings were taking too much out of the environment and putting too much waste and toxic waste back into it.

So in that way of looking at the problem it seemed to me that the solution is that we have to regulate how much and what people are allowed to take from the environment, and how much and what we are allowed to put back into it and then you enforce the regulations. So in addition to protesting and blockading, many of us were lobbying politicians in Ottawa and Victoria saying, "Look, we need ministries of the environment".

You know before Rachel Carson there was no environment department anywhere in the world. Rachel Carson put the environment on the map as something that we should be concerned about and so we began to get ministries of the environment at the provincial and the federal level. And we said we need clean air acts and we need endangered species acts and clean water acts and so that was a great deal of our lobbying that was going on.

But by the early 1970s it became very clear to me, "look Suzuk, this just isn't going to work". That is a too simple-minded way of fixing the problem. The reason it won't work is this we don't know enough about how the real world works to be able to anticipate what the impact of our powerful technologies might be.

Let me give you a couple of examples:

I have already raised the issue of DDT. DDT is a very complex ring molecule that was made by organic chemists in the 1800s but it wasn't until the 1930s that a scientist named Paul Muller working for Gigey in Switzerland discovered that DDT kills insects, and right away Gigey saw an enormous opportunity to make money, and they did, and began to promote it saying 'through science we will now eliminate the pests that plagued human kind since the beginning of time'. And boy, we started to buy the stuff buy the millions and millions and pounds and Paul Muller won a Noble Prize for it in 1948, and we thought it was the greatest invention.

And I remember after the war, in the late 1940s, my family lived on a farm, my mother would set the dinner table and then take a canister of DDT and spray it over the top of the dinner table and it would setting down onto our food because we believed what the chemists and companies were telling us, this is a miracle chemical it killed insects and it was safe.

At the time DDT began to be used, geneticists knew enough to say, 'wait a minute now, if you use this powerful chemical, well, you are going to kill all the sensitive insects but you are going to select for resistant mutants. And if you continue to apply this toxin over time you are going to have the populations replaced by resistant mutants. Then your chemical will no longer be effective and you will have to invent another chemical and another chemical, and you will be on a treadmill you cannot get off'.

And ecologists knew in the 1930s that the most important group of animals on the planet are insects. They are the most diverse, the most numerous, the most successful group of organisms on Earth. It is now estimated for every human being on the planet there at least two hundred million insects. So long after humans have gone extinct, don't worry, there will be lots of bugs all over the place. Insects are the most critical component animal parts of ecosystems on Earth. Insects are predators of many other insects, they degrade materials by laying eggs and eating up rotting meat, they pollinate flowers they are food for fish and mammals and birds. Insects are a critical element of ecosystems all over the world.

Doesn't make sense if only one out of every thousand species of insects is a pest to human beings why would you spray a chemical that kills all of the insects just to get at the one or two that are pests to human beings? That would be like say: "Hey guys we have a problem with crime in Frankston. Let's kill everybody in the City". You'll get rid of crime; strikes me as a pretty really stupid way to manage crime. But that's what we did with insects. We knew in

the 1930s about the genetic consequences and about the ecological consequences but everyone was so swept up in the promise of science that nobody said anything. And it wasn't until the 1950s that birdwatchers began to say that something funny is going on with birds, they are disappearing. And scientists tracked it down and discovered something that had never been known before, it's called biomagnification.

You spray in parts per tens of millions. DDT is absorbed by bacteria that don't die, it's concentrated and it's eaten by bigger organisms and at every level up the food chain you concentrate DDT. So by the time you get to the fatty tissue in the shell glands of birds or the breast of women you have concentrated DDT hundreds of thousands of times. How could anyone have said when DDT was first invented, 'No, no, no, we have to go with great care because of biomagnification'? Nobody could have done that because we didn't even know about biomagnification until eagles began to disappear and biologists tracked it down and discovered it.

So how could we manage DDT when we are so ignorant? CFCs same thing; CFCs like DDT they are big ring molecules with a lot of chlorines stuck on them. Now chlorine is a very, very reactive element and chlorine is at the heart of a lot of our problems. Chlorine is in PCBs and dioxins and all kinds of things. Chlorine is a chemically very reactive element but for some reason when chlorine is in CFCs they are chemical inert, so CFCs were this kind of this wonder chemical that don't act with anything even though they have these highly reactive elements on them. Well, why does that matter?

Well, one great use you could have is putting them into aerosol spray cans. You see, let's suppose you have underarm deodorant that you want to put into a spray can. You don't fill the whole can with underarm deodorant, you don't need that much, so if you put a little bit of underarm deodorant in the bottom and you leave air in the rest of the can, air has oxygen, and oxygen is a very high reactive element. Oxygen will react and break down the active ingredient in your can. You can't use air. CFCs are perfect.

You put your underarm deodorant in your spray can, then you fill it up with these big molecules of CFCs and so we began to put CFCs in spray cans and sell it by the millions and millions of pounds. But what happened was over the years, scientists began to realise, 'Gee, CFCs don't react chemically, they don't break down very quickly,' so they are accumulating and what do you know they are blown higher and higher and way up above the Earth ultraviolet light from the sun breaks chlorine-free radicals off the CFCs, and chlorine is a potent scavenger of ozone.

Now when scientists began to say that CFCs were breaking down the ozone layer I was shocked because I didn't even know there was an ozone layer up there to break down. How could we have managed CFCs and look at the difficulty we have had in the intervening years trying to phase out CFCs. How could we have managed CFCs right from the beginning when no one understood what was going to happen way above the Earth?

And mark my words; exactly the same thing is going to happen with genetically modified organisms. This is a powerful, powerful technology. We are creating organisms that have never been present on this planet. We have no idea what pieces of genes inserted into other organisms are going to do when those organisms are grown out in fields or when the products are consumed in our food and as drugs. So I find over and over, and just wait evidence is already coming in, but we have already brought into the technology and its going to be very difficult to get rid of it now that it's all over the place.

So the problem for me as a scientist, is that I came to understand while we are very clever at making powerful technologies, our knowledge about how life exists and interacts is so limited we can't possibly anticipate all of the long-term consequences for society. So the dilemma is, we can't stop science, we are not going to stop technological innovation, how can we minimise the potential damage that will come in the future?

The answer of the way to look at this came to me in the late 1970s when I decided to do a film about the fight against logging on our Western most archipelago islands called the Queen Charlotte Islands but that the native people, the Haida, call Haida Gaia, the land of the Haida. And for years a battle had been raging over the logging on Haida Gaia, and I flew to the islands and I interviewed loggers and I interviewed environmentalists, I interviewed the CEOs of logging companies and politicians and I interviewed a young Haida artist who had led the fight against logging for many years and his name was Gujarat. He is now the President of the Haida Nation. But back then he was just a young guy and he had been fighting them and I had said to Gujarat, I know in your communities you have over 80% unemployment you need economic development and a lot of the loggers are Haida, so that's good for your community you are getting jobs out of forestry and when the loggers finish work they come into your village and they shop in your stores and they go to your barber shop isn't that good economically for your community why are you fighting against the logging and he said, "Sure they can cut the trees down and we will still be here but he said once the trees are gone we won't be Haida anymore, we will just be like everybody else."

And at the time he said it, I was so busy getting all my questions out I didn't really listen to what he was saying, and it was only weeks after I got back to Vancouver and started looking at the rushes that I realised he had opened a window of a fundamentally different way of looking at the world.

What he was saying to me is to be a Haida means not ending it at our skin or our fingertips that being Haida means being connected to the land in the most profound way. That the birds, the fish, the trees, the air, the water, the rocks all of that is what makes the Haida special and different.

And I came to learn that the Haida feel an intimate connection because the land informs them who they are. It gives them their history the very meaning of why Haida are on this Earth is told to them by their connection with the land. And you destroy that connection by destroying an element of their surroundings and they are no longer Haida, they just become poor Canadian white trash.

So, that's how I became a student of the many, many parts of the world listening as a student to indigenous people. I've been to Borneo, been many times to Australia, meet Aboriginal people in Australia, Maoris in New Zealand, Inu in Japan, the San people in the Kalahari desert of Africa, Inuit in the Arctic and the Kiapo in the Amazon. All over the world, aboriginal indigenous people tell us that the Earth gives birth to us, the Earth they call our mother, they say we are created by the four sacred elements, earth, air, fire and water and it doesn't matter how impoverished and dysfunctional the communities are, that sense of the need to remain connected with the land is still there, and it is fundamentally different from the way the dominant societies perceive the earth.

And I came to understand that we have phrased the problem the wrong way. There is no environment out there and we are here, and we have to manage our interaction with it. Aboriginal people are right. We are the environment, there is no distinction. We are created out of the Earth and we are made up of the four sacred elements, earth, air, fire and water. And now we are not speaking in a metaphoric or poetic way, they mean it in the most scientifically literal way. And as I began to re-examine all of the ways I look at the world and what they were telling me I came to understand that science confirms what they say in the most profound way, they are right.

We are the Earth and we are created by the air, the water and the soil and the sunlight. We are born of Mother Earth. Now let me show you how science confirms this.

The moment everyone of us left our mother's body the very first thing we needed was a breath of air and from that point on we need air 15 to 40 times a minute and we will need that until our very last gasp on our death bed, and yet we don't even think about it. Well, I guess if you thought about it air every time you took a breath you wouldn't have time to think of anything else. But I want you to think about air and our relationship with it. We suck it in with each breath. The air penetrates into the lungs. Our lungs are filled with about 300 million

alveoli little capsules we need all of those alveoli to provide the surface area to come into contact with that breath of air.

If you flattened out 300 million alveoli onto this stage it would cover an area equal to a tennis court. So that's how much surface that is all wrinkled up into our lungs. Each alveolus is lined by a three layer membrane called a surfactant, the surfactant reduces the surface tension so when the air comes in, and it instantly fuses to the surfactant. Carbon dioxide rushes out of our bodies into the air and oxygen, and whatever is in the air you have breathed, rushes into our bodies. So the oxygen is picked up by the haemoglobin molecules in red blood cells and with each beat of the heart the oxygen then rushes to every part of our bodies.

When we breathe out, we don't breathe all of the air out, if we did that our lungs would collapse. About half of the air that's in our lungs stays in our lungs every time we breathe out. The point I'm making is this, you can't draw a line and say the air ends here, and I begin there, there is no line. We are the air, it's in us, it's fused to us and it's circulating throughout the body. We are air. And of course, the air that comes out of my nose instantly mixes in this room and goes straight up your nose.

And when I tell kids this, you see them going, oh wuh! I guess they think they have a bubble of air named Johnny or Mary. We are air, and because we are the air, the air that comes out mixes and connects with you. I am you and you are me, there is no separation. We are linked together through this matrix of air. Air isn't a vacuum of empty space, air is a physical substance that links all of us together, not just with all human beings, but links us with the trees and the birds and the worms and the snakes, and all of us are using that air. So air, I believe, should be regarded as a sacred substance. This is not something you can put dollars and cents value on, air breathes life into all terrestrial beings and air ought to be regarded as sacred.

There is a wonderful thought exercise the American astronomer Harlo Shapley did many years ago, he said: 'I want to follow a one breath of air and see what happens to it', how do you do that? Nineteen per cent of the air is oxygen the reason we breathe air every minute of our lives is we need the oxygen, right, you breathe it in the oxygen fuels our metabolic fires, so if you take a breath of air in, oxygen rushes into your body and a lot of it never comes back out. Eighty per cent of the air is nitrogen; nitrogen goes into your body. Some of it reacts, it's not nearly as reactive as oxygen, but some of it reacts and doesn't come out. One per cent of the air is an element called argon, and if you remember your chemistry lessons from high school, you know that argon belongs to a class of elements called the noble gases.

They are noble because they are so bloody snooty they won't touch anybody else, they do not react chemically with anything else, and they are chemically inert ... kind of like CFC's. So you breath air in, argon goes into your body you breathe the air out and the argon comes right back out. So argon is a very nice marker for that breath of air, okay? Through argon we can follow the fate of that breath of air. How many argon atoms are there in a breath of air? Shapley calculates that there are three times 10^{18} to the 18^{th} that three followed by 18 zeros, you can take my word for it, that is one hell of a lot of argon.

Okay. So, let's follow one breathe that comes out of my nose, imagine what happens to it. Through convection currents within a few minutes after that one breath at three times 10^{18} to the 18^{th} , atoms begins to mix in the room. Within minutes, every one of you is breathing gazillions of argon atoms that were once in my body. But the doors are open out goes that argon and across Frankston, across Australia and around the world, then according to Shapley, one year later if we came back into this room, every breathe you take would have about 15 argon atoms from that one breath we took a year ago.

So on that basis, Shapley calculates every breathe you take has millions of argon atoms that were once in the body of Joan of Arc and Jesus Christ and every breathe you take has millions of argon atoms that were in the bodies of dinosaurs 65 million years ago. That every breathe you take will suffuse life forms for as far as we can see into the future.

So air, surely air, connects us not only to all living things today but connects us to the past and through into the future. Air should be regarded as a sacred substance. We boast that we are intelligent and we are clever and we think we are so smart.

What intelligent creature knowing the role that air plays in our lives and in all terrestrial creatures lives would precede to use air as a toxic dump and think it is going to go away?

Air is a sacred substance that gives us life and our activity now is contributing to that thin layer that gives us life. We think of it as stretching up to the sky, well forget it. You know, if any of you saw my series *The Sacred Balance* on SBS recently, I interviewed Julie Pyetica, a Canadian astronaut who says you know you sit in a capsule 400 kilometres above the Earth and you are going around the earth every hour and a half, 16 times a day you see a sunrise and a sunset and every time you are seeing a sunrise and sunset you think you see that thin, thin, thin layer just at the surface of the earth and that's the atmosphere and that's it, it's about 10 kilometres deep.

If you reduce the Earth to the size of a basketball, the air, the atmosphere would be thinner than a layer of Seran wrap and that's what gives life to all of us and that's what all of our engines, every time you start your car, we are breathing all of that stuff into the air. I figure that and at my age I have taken at least 315 million breaths. I have taken half to two litres of air into my lungs and filtered whatever is in it. We are the air and whatever we do to the air we do to ourselves. And when you look at it that way then a great deal of the way we are behaving is simply unacceptable.

We are the air, we are abusing ourselves because we are abusing the air that gives life to us and the most sensitive people in our species of course are our children. And it's not an accident that Canada and Australia have among the highest rates of asthma of any country in the world. And if anyone doesn't think it has to do with what we are doing to the air, come and see me, let's have a discussion. We are the air, whatever we do to the air, we do to ourselves.

We are water, well I mean, nothing could be more obvious. Every one of us is at least 60% water by weight. We are just a big blob of water with enough organic thickener added so we don't dribble away on the floor. The problem with the body is of course that we leak water all the time. It comes out of our skin, our mouth and our eyes and our crotch and the amazing thing is we don't have a big dial here that said hey your water levels are getting low you'd better top up.

Our bodies are always monitoring the level of water that we have and if we drank one millilitre of water more a day than we lose in a matter of weeks we'd blow up. If we drank one millilitre water less a day than we lose, we'd waste away, but we don't, because our bodies are consistently monitoring the level if it gets to high then you know you need to go to the bathroom and if it gets to low well you are overwhelmed with a desire to have a drink.

And if you take a drink of water where does it come from, well this one says product of Australia, so this is Australian water. The first science lesson I remember from grade school was the water cycle. Water covers 71% of the earth, evaporates, forms clouds, rains on the land, runs into rivers and lakes, evaporates, water cartwheels around the planet. You think that's Australian water? Nonsense. That water has come from all of the oceans of the world, has come of the canopy of the Amazon, off the steppes of Russia and the plains of Canada. Water is like air, it's the unifying glue that holds us altogether. We think that we are intelligent? What intelligent creature knowing that everyone of us is made up of water, would use water then as a toxic dump and think somehow it is going to go away and not affect us?

We are the Earth because every bit of the food we eat for our nutrition was once alive and 98% of it was grown in the soil. And children are always shocked when they are told what you eat is that you are eating the bodies of plants and animals. Every bit of what we are made by taking the carcass of a plant or animal into our mouth, tearing it apart and incorporating the molecules and elements in that life form back into our own life form.

We are the Earth through the food that we eat. We think we are intelligent? What intelligent creature knowing we are the Earth, would precede to use the earth as a toxic dump, indeed spraying poisonous chemicals directly onto the creatures that we are going to end up consuming?

And we are fire, because every bit of the energy that we need to grow and move and reproduce, all of the energy in our bodies that makes lives possible is sunlight, sunlight captured by plants during photosynthesis that is liberated by metabolism in our bodies.

Basically when we burn molecules, carbohydrates in our bodies, we are liberating the energy of the Sun, we are burning the sun back out of our bodies and liberating it. We are the fire of the sun because we are made up of the photons of energy transformed into chemical energy from plants. We are the Earth because we are made up of the four sacred elements, earth, air, fire and water so I hope I have convinced you aboriginal conceptions are absolutely right. The miracle of life on the planet is that web of living things around the Earth, what we call biodiversity.

Biodiversity is the very source of the four sacred elements. Biodiversity creates cleanses and replenishes earth, air, fire and water. I don't have time to go into this, I often do an elaborate scenario about this but you just have to recognise that before plants arose from this planet, there was no oxygen in the air.

It was only when plants discovered a way of photosynthesising, that out of the process of capturing sunlight they released a pollutant actually, called oxygen, from the process and over millions of years they converted the atmosphere into the high oxygen content that we depend on as animals. And to this very day all the green things on earth are taking carbon dioxide out of the atmosphere and putting oxygen back in to it.

The problem we face with in the change of the atmosphere today is by liberating vast amounts of carbon through the burning of fossil fuels, we are adding far more carbon than the green things can reabsorb. We are producing twice as much as the planet can reabsorb. So if we want to get back into (and at the same time we are cutting down more and more trees) but if we want to get back into balance, at the very least on average, we have to reduce carbon dioxide emission through by burning fossil fuels by about 50%. But since countries like Australia and Canada and the United States are producing disproportionately more carbon dioxide through our industrial processes and our lifestyles, the challenge for us is that we need to reduce our emissions by the order of 85% to 90%.

So what has to be done is we want to get back into balance with the life support systems of the earth. It means we have to get off a fossil fuel track. Now I understand a lot of your energy now comes from burning brown coal because it's so cheap. But that cheapness is itself an artefact it's an illusion of cheapness because we don't internalise the cost of what burning that coal is doing to the atmosphere. I'm running out of time and I haven't even had the chance to get onto economics yet which is the most important part of my discussion.

I don't know how it is here. Ah, I know in Melbourne where do you get your water? It comes from a catchment area in which the plants and soil, fungi and bacteria filter that water for you. Vancouver I believe has the best water in the world because we get all of our water from three water sheds surrounded by old growth rainforests and those trees and the other plants, fungi and bacteria filter out the heavy metals and toxic materials and deliver the water to us in a drinkable way.

Every bit of our food was once living. They came from nature, and soil itself upon which we grow that food soil is created by life. It is by life forms dying and giving their molecules to that matrix that we get soil, and finally fire is possible on this planet because every bit of the fuel that we want to burn whether its oil or coal or gas, wood, peat or dung, all of that is created by plants; plants that have captured sunlight and then been converted over time into fossil fuels or dung or wood, and the very existence of fire itself on the planet was made possible again by photosynthesis that put oxygen into the air and allowed combustion to take place.

So to me, if we want to talk about what the real bottom line is for not only our survival but our good health and well being, the bottom line surely should be dictated by the reality that we are animals and as animals an absolute requirement is clean water, clean air, clean soil that gives us our food, clean energy that comes from the sun and biodiversity. Those should be the pillars of true sustainability into the future.

I don't have time to go on, I have two other tiers or levels in this foundation that I believe should be before anything economic and that is our social needs and our spiritual needs but maybe we can talk about that later.

The question is what can we do? If you accept the reasoning I have gone through here you would have a legitimate right to say, 'okay Suzuki, I have listened to you, what we can do about it, and in Canada, I'm often called Chicken Little. You know, running around saying the sky is falling, the sky is falling or the Doctor of Doom and Gloom.

A few years ago, I decided I had better go out there and see if there any solutions. Are there examples of individual people of companies and organisations or even governments that are doing the right thing, to begin to deflect us of what is clearly an unsustainable path onto something that is likely to be sustainable? And when I started to do the research, I said to Holly Dressel, my co-author I said, "Gee, Holly, I hope we can find enough examples to make more than just the thin book like this, because I didn't know whether we could fill a book."

To my amazement within a few months it was clear we could have written many, many books. So I wrote a book called *Good News for a Change, Hope for a Troubled Planet*, and I'm proud that it became a bestseller in Canada and Australia it is filled with examples of what people are doing.

The good news is there is lots of good news out there. The bad news is that our so called leaders in politics and business don't seem to be interested. We sent a copy to every single Member of Parliament in the Federal Government we sent it to broad range of CEOs of companies across Canada, virtually no response other than, 'oh thanks for the book'. And either they were so busy, doing what they do, or uninterested in the message but basically the message I got was that people get used to doing things a certain way and they don't want to change. They just don't want to look at what the alternatives are and that's natural that's what we are like as adults, we get in ruts and we don't want to get off that.

So that's what led me then to take another step and say okay if our so-called leaders aren't really going to show vision and leadership then we need to take it to the public and make change happen through a grassroots movement.

So my foundation, The David Suzuki Foundation, is a very small organisation in Canada teamed up with the Union of Concerned Scientists a large, very credible organisation of scientists in the United States and we said, 'What, where do ordinary people impact the most on nature?', and what we found very quickly was three areas have the greatest impact what we eat, how we move and where we live. So food, transportation and housing are the critical areas where our lifestyles affect the natural world and looking at those three areas we came up very quickly with ten simple steps that people can take to lighten our footprint on the earth.

And, to be honest with you, when they first came to me with the list of ten and I looked at it, I said: "Get lost, that is too easy", I thought you had to suffer, that we had to sell our house live in a cave somewhere you know, and its deceptively simple. If you go to our Web site at www.davidsuzuki.org click onto the Nature Challenge and you will see all the scientific reasoning about what taking each of the steps will do in terms of lightening your impact on the earth.

So we have now for a year, we have been going out asking Canadians to sign up and make a commitment to do only three of the ten things in the coming year. We have over 100,000 Canadians. To be honest with you, my goal was to get a million Canadians and the reason for that is not only will a million people very significantly lighten our impact on the planet but if we get a million Canadians saying 'Yes, I care enough that I'm going to make a commitment

here', I guarantee you every politician from the left to the right end of the spectrum will say, 'I'm joining up, too, let me sign'.

That's how we are going to bring around political change.

In fact, I've just met with our newly elected Prime Minister who promised he will sign it, he is in deep trouble for another scandal so right now he's not thinking about anything else, we have two out of the ten premiers have signed it, we have over two dozen mayors of cities across the country have signed it and I believe we will hit a target of a million in the coming year.

We have Canadian Postal, the Canadian Post office of 55,000 employees now pushing it among their employees so we have developed if you look at our Web site we have developed the nature challenge and I have copies of that in a little brochure here and you can take copies so long as we have them. We have the one on the Web site called Nature Challenge for kids because we feel that kids are a way of getting to their parents, and we have just developed a nature challenge for the private sector for business so that businesses can take it to their employees and now get their employees to register.

So that is the way, I think we can bring about political change through a grassroots movement and commitment.

At the same time, we feel as this grassroots movement is growing we need to give politicians a hand and the problem that we see right now with the private sector and with politics is that their timeframe is too short, they are too concerned, business people used to be concerned about the annual report, now it's a quarterly report. The quarterly report often determines whether a company will live or die. That's crazy. But anyway, that's what CEOs are focused on, their bottom line is the quarterly report, they can't look in a bigger way.

Politicians are focused on the next election and in this country, 'my God; it's less than three years, that's a short time. So what we said is we need to offer a goal or vision of where we want to get. Politicians are so busy dealing with immediate issues they are being lobbied, hammered all the time they have to deal with the day-to-day issues right way. Who is going to offer the vision, what do we want be like as a society, as a country, 20, 30, 40 years from now. And so we offer a vision of a Canada in which everyone will feel free to drink the water, from any creek or river and you won't have a hesitation to catch a fish and eat it, no matter where it's caught where the air will be clean and asthma will be a thing of the past. So we have fleshed out a world that is rich in wildlife and forest, this is a kind of future that we are depicting and then we say, we know we are total unsustainable now but let's try to achieve that goal in one generation.

So I have a few copies, of a document we have just released called *Sustainability Within a Generation*, and I must say I have been absolutely gratified by the response of the business community and politicians because now when you get away from the day-to-day short-term hammering of people over you've got to change you've got to do that, and you begin to lift your sights onto a vision that is a generation away and realise we can implement the changes that will begin to change the way we do things over time. We have 30 years to do it. That changes the equation considerably.

So this is what I'm taking as a slogan of our Foundation: "Let's work towards that vision of a society that is rich in opportunity for our children in which we can achieve sustainability within the lifetime of one generation".

I'm meeting with Peter Garrett on Friday. Some of you may know him as the lead singer of Midnight Oil; others may know him as the head of ACF. Peter has been on our honorary board for many years and I'm going to try and persuade him to work with us and transform these documents from a Canadian perspective to an Australian perspective.

I think we should have Nature Challenge Australia, that we should have sustainability within a generation through the perspective of Australian eyes.

Thank you very much.