

Considerations of Humanity's Need for Nature: Why Biodiversity and A Flourishing Natural World Should Matter

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Abstract: In this lecture, Shane Mahoney discusses how each of us have the right and responsibility to engage in the crusade for a clean, diverse, and thriving natural world. Throughout recorded time, human societies have marveled at the natural world and drawn from its complexity and subtle beauty. Whether it is the physical make-up of man or the inscrutable depths of mind and soul, all stem from our long immersion in the river of life. In our journey to modernity, we have altered much about ourselves, but our fascination for nature and our desire to see it preserved within our midst is an unalterable expression of our humanness. Each person may have a unique interpretation of why this should be so or how mankind should interact with the rest of animate creation, but all will show some measure of interest in what happens to the diversity of life on this planet. It is in this crucible, the admixture of fascination and need, that the hope for conservation swells. By standing for the land around us, whether it be the far horizon of the wilderness camper or the green space in our city neighborhood, we each make our impression on the forward progress of preservation. Whether a hunter-naturalist or an amateur bird watcher, whether a cultivator of wild flowers, or a Rambler of farmer's meadows, all of us have the right and responsibility to engage in the crusade for a clean, diverse, and thriving natural world. It is not man apart, but man within nature, that is the symphony of all good things.

Transcript of Lecture

First of all I'd like to thank everybody for coming and in particular, I'd like to thank the organizers of this event: the Pennsylvania Biodiversity Partnership, the Morris Arboretum, and the Montgomery County Lands Trust. I guess the fact that several organizations have come together in an effort, wise or not, to manage to bring me here underlies the important themes that not only I, but a great many other people, have been emphasizing with respect to questions of conservation of the natural world. It is a theme that has implications for matters broader than simply conservation. It steps over into other issues of politics and international relations.

The theme I'm referring to, of course, is the theme of cooperation. There is little doubt that at the present time, humanity faces an extraordinary challenge. One does not have to be a doomsayer, and it's easy to be a doomsayer, to articulate with conviction that we now face a dilemma with respect to the future of mankind and the future of the diversity of the world – the future of biodiversity – which is unprecedented not only in historical time, but is unprecedented in geologic and evolutionary time.

The current state of extinctions is unparalleled. There is nothing in the entire history of this planet and it always bears well for our ability to understand that good planets are extraordinarily hard to find. But in the lifespan of this largely water-covered speck of dust, we are seeing the loss of extraordinary numbers of wondrous, wild creatures of all kinds. Unfortunately, we don't know the vast majority, but one only has to reflect on what the world would be like without the rhino, without the tiger, without the elephant and to understand that probably in our lifetimes if things don't change, those great creatures of our childhood memories that were such inspiration will be confined to zoological gardens, IF THINGS DON'T CHANGE.

We currently have about 6 billion of us. We currently have the technology to destroy the world. We currently have the technology to land spaceships on Mars, walk around in space, live up there. We read our Bibles with diligence and decided that we would in fact multiply and we would in fact take dominion. The question before us now is what responsibilities come once you take dominion.

The Earth produces a certain amount of energy every year and that amount of energy is used by all living things and drives all living systems – the systems that we depend on. Currently we are using about 45 to 50 percent of all the energy produced annually just to get ourselves moved around, clothed, heated, and allow ourselves to reproduce at an extraordinary pace.

We also have a circumstance of extraordinary prosperity when it comes to the human race. We have somewhere around 800 million of the 6 billion people in this world who live as we do, then we have the rest who live in poverty, in strife, and in fear. It's an amazing thing about that other 5.2 billion people, they are just like us. They want warmth, comfort, and safety. They want their children to have every possibility in life.

But the equation is fairly simple, if the other 5.2 billion consumed as we consume, we would now need to have four Earths. So, the first to find another one is going to be a VERY wealthy person, believe me. The question is, therefore, not just academically put that the future for biodiversity includes us and is, in fact, the future of mankind. That is **not** an intellectual point, that is **not** an academic point. The reality is that every human being will strive to enjoy the security and abundance that we have been so fortunate to have and for that to happen, we will need three more of the planet Earth.

Darwin launched his ideas about evolutionary theory and I would suggest to you that the most important idea in the last thousand years was probably his and those who contributed to it. Once that idea emerged about the notions of survival of the fittest and that this was the way that nature worked, it was the obvious attempt made to say that this was the way human beings operate as well.

Therefore, what was independent and what was competitive and what outstripped the other man was good because it was natural. Then there began to emerge an idea, particularly in western Europe, and then exported to the New World, that we really ought to operate in this kind of way. What was good for expansion, what was good for wealth generation, what was good for the economy, in short in a *laissez faire* kind of way where every industry and every invention and every effort should have its total freedom, was considered to be something appropriate because man in some way or another was meant to be basically competitive.

Well, what is absolutely clear to us is that if we are to safeguard the natural world, it will be essential that man be cooperative. The first question I want to address is whether or not this is a realistic hope and a realistic option. For 99.9 percent of our existence, extending back approximately 2 million years and certainly for the forerunner of ourselves, *Homo erectus*, and ourselves for the last couple hundred thousand years, the model of our existence was small groups living essentially under an extraordinarily cooperative regime. The hunter-gatherer society from which we all emerged could never have possibly existed without extraordinary cooperation. Man is a pretty feeble animal. We don't have long claws. We don't run very fast or fly very well unless we are falling down. We don't have great weaponry and yet around this globe we pursued amongst the small things, such as nuts and berries and fruits, the great and most dangerous creatures the planet had – the bears, the mastodon, the elephant, the giraffe, the rhino, the bison, and the reindeer.

It doesn't take much imagination to understand that a puny human being with one handheld spear was not going to be able to do very much with a mammoth, twelve feet in shoulder with skin two inches thick – if we were not able to develop absolutely extraordinary faith and confidence in our cooperative abilities. If we were not able to depend to an incredible extent on one another, the lifestyles that shaped every person in this room would have been an absolute impossibility. Think of it. Think of what it would be like if twelve of us in this room, set out with handheld spears to kill one of these monsters. The method of killing was to distract the beast until you could drive enough spears into its body to weaken it and finally kill it. That means that when I chose to thrust my spear, I had to be absolutely certain that my partner in this event was going to distract, at risk to his life, the anger and ferocity of that giant animal and likewise for the other persons in that hunting group.

This is the extreme example of where cooperation was absolutely fundamental to the way human beings survived, but it was true of the caring for fire, the caring of the strange little creatures we call babies in our system that took so long to develop. It was true for the aged, it was true for the preparation of a lifestyle that placed a puny animal against the wrath and complexity and actual danger of the natural world.

Think further about what happens in terms of the conception of the human being and how our genetic code operates. In each case, it is the union of competing ideas. The egg and the sperm which unite and which in that fusion cooperate to create the embryo which eventually becomes something that in cooperation among the mother, the child, and the surrounding community that supported the mother, allowed another human being to be created. Inside the corpus of each one of us, all things that drive our minds, our physiology, our physical make-up derive from complimentary, but also at the same time possibly conflicting, small units of genetic material that must cooperate at an extraordinary level, if we are to survive the first moments of life.

If we look around the world at the remnants of small communities of hunter-gatherer societies, cooperation is, IS the maxim. It is the operational statement of these communities and these societies. If we look at times of great peril and great difficulty, we see what has been in the history of this country. We see the fantastic, the enormous capacity for human beings to cooperate. We see strangers reaching out.

Many, many of your countrymen recently spent time in Newfoundland – 10,000 to 12,000 of them were shanghaied on the island of Newfoundland as a result of the terrible events of last year. Now stories are being written and films are being made and scholarships are being established and schools are being built all out of gratitude for the way they were accepted into the houses and communities of strangers who had absolutely no idea who they were. I don't think that the social Darwinist ideas that man must be competitive and that cooperation of an extraordinary kind cannot be achieved are correct. There is too much evidence to the contrary and there is too much in our evolutionary history to indicate we are capable of tremendous cooperation – cooperation for the right things and cooperation for the wrong things. Why is it that if we see this enormous problem facing us, that we therefore seem to be incapable of slowing it down in many regards? Why is it, if so many people know and understand there is a problem and we have this extraordinary ingenuity, this great intelligence, this enormous capacity to handle change and to make change, why is it we seem to find it so difficult to slow down this pace, if in fact we are capable of such cooperation?

Well, part of the reason is that the natural world is an extremely complicated system about which we know very little. And to be able to safeguard some, to be able to weave a fine needle into the nest of complex relationships in the natural world, to safeguard even one single species requires extraordinary knowledge, not just the weapons, but extraordinary, detailed, refined knowledge. We are not building a wooden shelf. We are trying to recreate the systems of nature that are responsible for the glorious examples of creation.

So man is bereft to a large extent of a huge percentage of the knowledge that is required to achieve even a little in our most cooperative ventures. How then can we look at the task before us, even if we accept that cooperation is fundamental to us. How can we look at the task before us with hope and, even more fundamentally, why should we be concerned with this issue of biodiversity anyway? The answers to those two questions are related.

As I mentioned earlier on a wonderful walk through the grounds here, the average North American is spending about 4 percent or less of their entire time alive, breathing in the outdoors. When you think about your own lives, you will see that that is basically true. We are in a car, in a building, in our houses, or we are in a plane, or God forbid you are in an airport! Those are the places where we live – less than four percent. But imagine that it was 100 percent. Imagine that 100 percent of your time you were spending in the outdoors, not only spending time in the outdoors, but actually living off that land. Think about how intimately you would come to know the plants, the animals, the landscapes that are out there. Imagine what it was like for the 99.99 percent of our existence when we lived as wild creatures, about the wildness in us that was to express itself because our basic occupation was to live as wild creatures within the natural world.

Over that long course of time, millions of years, we would have come to incorporate within us extraordinary amounts of knowledge and to refine adaptations and capacities, intelligence, observation, and interaction with the natural world which would have meant that we would have been shaped just as surely as a sculpture is created. We would have been shaped by our interactions with the natural world. It does not matter how long you keep a horse indoors, it remains a horse. It doesn't matter how long you keep a human being indoors, a human being remains a human being. Each person in this room shares about 97 percent so of their genes with chimpanzees. 97 percent! Check your arm length when you go home!

Do you know if you took two seals from the same ice band off the coast of Newfoundland of the same species those two seals on that one ice band would be more different than any two human beings in the world. That gives you some idea of how similar we all are to one another. Two seals, on one piece of ice floating, are more different than a Masai tribesman and someone from Philadelphia. Remember you share 97 percent of your genes with the chimpanzee, but that's not the important story, that's what makes the news. The important story is that you also each share an extraordinary percentage of your genetic material with all kinds of even less desirable cousins. It is not man in biodiversity. It is the biodiversity within man.

Every time a species disappears on this planet, a part of us dies – a sibling, a genetic entity. In some cases, a cousin, a distant cousin. In some cases, the apes, a very close cousin. Every single creature on this planet shares some genetic material. The usual arguments given for why biodiversity matters are not about biodiversity and fully functional systems. They are health reasons. They love the clean water. They love the clean air. They help us grow crops. They provide medicines. They give us some wonderful sense of the aesthetic and they allow us to have in general a clean and healthy environment and for that reason we should be concerned about biodiversity.

All those reasons are true and all those reasons are good reasons. We don't want to be sick, poor, and living in ugliness. That's the strange thing about us, we don't like those things. What we want is to be healthy, have abundance around us, and to see thriving landscapes, and that's why we should keep biodiversity. All of that is true, but there is another and even more fundamental reason, I would argue, and that is the reason I have just explained. When these others die and, by these others I mean every one of the others of millions of species that live on this planet as ugly or as different from us as they may appear, a piece of what we are is gone. A road that we might have gone down has been eliminated and a capacity to understand ourselves has been diminished.

Almost anyone who has become close to animals – their dog, their cat, their horse, a fish in a tank, whatever their pets may be – will remark how in some extent these animals have changed them. In particular with respect to dogs and horses, he will remark about how much they have learned about themselves if they had a close connection with those animals. That is not a fairy tale and that is not an accident. How could we not learn about ourselves? Do we not learn about ourselves in interactions with one another? So now we are going to suggest that suddenly now in the 21st century, that we understand ourselves well enough that we don't need to learn anymore? Are we going to say that we don't learn from other species? We are what we are because we learned from other species.

We survived as we did without the claws, without the teeth, without the speed, without the strength because we learned from other species a way, a niche for ourselves. Out of that learning enterprise with

those others, with that biodiversity, that is where all cosmic and metaphysical and mystical and mythological and religious notions first appear. That is where all art came from, all sculpture came from, all painting came from. It is where science emerged, as we attempted to explain their movements and their appearances; and when we could hunt them; and when we could find them; and the nutrition that we receive from them.

Who taught us first that certain plants would do things? Was it some kind of omniscient baby that was plopped down and rolls his finger and said, "You know if you harvest that plant over there your kidneys will flush better"?

A lady working on African elephants a number of years ago had a mature female with a radio transmitter. Actually it was one of these studies that was primarily looking at this ultrasonic long distance communication between elephants which are capable of communicating huge distances by this rumbling noise they make. Anyway she had this elephant that was living for several years in a fairly predictable home range, as we call it, in a fairly well-established herd and seemed to be socially adjusted for an elephant and the animal was pregnant. She had seen the breeding and assumed the elephant was pregnant. So for years, she was tracking this group of elephants and their movements were predictable and suddenly this female elephant, all of a sudden, broke out of her home range and began to travel over this expansive territory where she had never gone. So she followed this female. She knew this female would soon be close to birthing, so she assumed this female was looking for a place to drop her calf. What this female did was suddenly she came to a riverbank and she walked up to a small shrub and she consumed it. Very specifically, she sought out this relatively rare plant and she consumed it. Two days later, she gave birth to a calf. The researcher was all excited – she suddenly made this extraordinary discovery, until she ran into the locals who said, "Oh yes, that's the plant that we use to eliminate unwanted pregnancies." Now who do you think learned it first? And so on it goes for a thousand stories, absolutely a thousand stories.

We learn much of what we know about the natural world from watching creation. We learned where were the best places to find food. We learned what the plants were that we could safely consume. We learned what landscapes would offer us the best chances. We took away from that, things that are buried deep within us now that would not have been, except for those experiences. We were not always the meditative, car-driving, investing-in-stocks kind of people that we are now. There wasn't a lot of that around 50,000 to 100,000 years ago. It was really a basic kind of life of lifestyle. We invested in our arrowheads.

But isn't it funny, isn't it funny, you can take any people, no matter where they are in the world and you know what their ideal landscape is? The savannah. Walking through these grounds today, everywhere I looked was savannah – open landscape, trees, shrubbery; open landscape, trees, shrubbery; long distance views, small areas with closed views, you can look out from, you can look into. Why is that? Why is it that everywhere from Newfoundland to Alabama, people buy a piece of land and if it's treed, they cut most of them down? And if it doesn't have any trees, they plant most of it in trees. What's that? Is that cultural?

Why is it that people, for example all over the world, spend billions of dollars on candles after we had this amazing invention. Why is that, if anything, all you can see is the growth of the sales of the most primitive kind of luminescence possible. Why are we doing that? Why is it that people in Alabama and Arizona and other places have fireplaces?

Why is it that if you show photographs to people anywhere in the world, ANYWHERE in the world, and you show them a photograph of an open landscape with trees and a photograph from inside the trees and a photograph from out of the center of that open landscape, or a photograph right on the edge, statistically, most people will choose the photograph taken from the edge, where there is the opportunity to see out at the landscape and inward towards the forest, which are not imbedded in either the extreme open, or the extreme forest. These are not landscapes that people know. These are just abstract landscapes. People everywhere have that view. Could it possibly be that buried somewhere in us the preferences, the adaptations that allowed us to survive are those kinds of landscapes – keeping ourselves hidden to some extent by being on the edge, but allowing us to see what was happening elsewhere and taking us out of

the deep refuge of forest where we could not see predators approaching? Could it be that that is what lies behind this preference? What alternate explanations could you possibly offer?

Why is it that you can take children from anywhere in the world, ANYWHERE in the world, black, white, yellow, red – if there are other colors, it doesn't matter – take a group of them and put them in a room and bring in the most sophisticated toy in the world, bring in the most odd-looking human being in the world and then bring in a puppy. You all know what their reaction would be. You all know where every one of those children is going to focus his or her attention. You also know that if a child does not, then what is your assumption? If you brought in a small puppy and you had five or six children in a room and they all went after the puppy and one little child stayed by him or herself just sort of looking at rocks or something, or maybe reading Shakespeare...what would your impression of him or her be? Your impression would be that this child isn't normal. Why is this the case?

These are the reasons why biodiversity matters. Biodiversity matters because biodiversity is the library from which knowledge came. It is the art gallery from which aesthetics emerged. It is the museum that records our past and shows us the extraordinary tunnel of time and the extraordinary experiments through which we've come.

The question becomes for human being – how much of that do you lose before we lose the capacity to know ourselves? Every human being is on a journey, no matter how deep, or how complex, or how open, or how ebullient, or how garrulous a person is. Every human being is on a journey and that's the way it's supposed to be. The journey goes through certain very specified stages. Every primitive culture emphasized those stages from the breast, to the walking, to the talking, to an emancipation of play, to the arrival of puberty, to the entry of young adulthood, to the stage of parenthood, to the point of aging, to the point of wisdom, to the point of death. Every human being is on this journey.

Every other creature in the world is on exactly the same journey and every primitive society created tremendous ceremony around each of those stages. We too used to have great ceremony around each of those stages, and more and more and more in society we are backing away from the ceremonial mythical kind of appreciation of the evolution of the human being. We wonder why people appear to be searching for something. We wonder, with all of this learned capacity and empathy for the natural world, why people find it so difficult to live without nature. We wonder why suddenly in modern society, especially in your country leading the way in this regard, men are all of a sudden trying to find one another for fellowship groups. Do we really think that this is just a phenomenon of steel and concrete alone? Is that the ultimate explanation for these kinds of disassociations? Or is it because the normal pathways of life that we have evolved for, and that you have 100 percent of your genetic material directed towards, are no longer being met? Do we wonder where the neuroses and psychoses of society come from? When all of that for which you are looking, genetically you are programmed to seek. Your sexual nature demands that you find this in the world and you do not. Do we not understand what this does in terms of frustration of the behavioral and psychological world of the human being? That too is why biodiversity is necessary.

Why is it that people who have extraordinary wealth and can do whatever they want in their lives still seek to find this kind of simplistic return to nature? We visited this little cabin, this little retreat here with its stone fireplace and its little wooden table for a person who could be eating off gold, or marble, or whatever. What's more ideal when things really don't seem to be fitting anymore, than to retreat to the most primitive kind of habitation possible. Why is that?

What is it that's screaming inside the human being that says I need to find that? What is screaming inside you that says you need to find that return to nature? Is it because someone told you or what some silly lecturer told you? No it's not. It's because deep inside, which is only another way of saying your make-up, behaviorally, emotionally, physically. Somewhere deep inside there is a well, saying I need replenishment and the only way I can get replenished is through contact with the natural world.

There are all kinds of ways of making that contact and we ought to realize that many ways are legitimate, but not every way is for every person. There are those who seek to rediscover their great origins. Both their mythological and spiritual tendencies will be satisfied by a hike in the wilderness or a walk through a

garden, or keeping a small patch of vegetables. Do we do that because it's necessary? Would we starve to death without our little vegetable garden? No. There is a more contentious debate over hunting. Would we starve to death if we didn't hunt? No. Would we starve to death if we didn't fish? No. Would we perish from psychological deprivation if we didn't bird watch? No. NO. We wouldn't die. Not all at once. But, we die piece by piece.

So, it kind of brings us full circle. We have a circumstance where we believe cooperation is possible. We have a circumstance where we can explain the vast majority of how we feel and what we seek not because of what has happened in the last 50 years or the last 100 years, but because of what we've come through in the last couple million and, in particular, in the last 50,000 years. Our relationship with animals taught us how to live in this world. They were the ones who led the way. We have the capacity and intelligence to learn from them and that is why we succeeded. And efforts to understand them led perhaps as far back as 50,000 years ago, perhaps even more, to sculpture and certainly back to 15,000 years ago to the masterpieces of Lascaux and the other famous caves.

I love to tell the story of when Picasso was taken through the caves. He was in his heyday then, the entire art world was at his feet. Citizens everywhere wanted to see the great man when he emerged from Lascaux. They wondered while they were waiting for him...What was he going to do? What was he going to say? And when they asked him "What was your impression of this artwork?" He said, "We have invented nothing." He was not a biologist, he was not an evolutionary theorist. He was absolutely right.

We didn't start out drawing buildings or better caves, we started out drawing animals. We started out trying to recreate – in a sacramental atmosphere – biodiversity. Who knows..maybe if we had been the only species, we would not even know what art is. What a world that would be. We know that the problems facing us are great and we know as well however that there is an extraordinary capacity for human beings to make a difference at the individual level and at the collective level. But, perhaps the thing that gives the greatest hope, that we will change the attitude of mankind in the natural world, and that will in fact make differences at our local, national, and international levels is the fact that human beings cannot help but be in love with nature, just like we cannot help falling in love with one another. We have no choice about this because it's buried, not just in some mental images picked up out of books. It is buried through your skin, through your flesh, through your bones, down into the very cells that make you up, through the memories of those cells down inside to the chromosomes, down inside through your genes, down inside to the smallest, smallest building blocks of which you are made. You are condemned to care.

Standing in between caring, however, and solutions are two extraordinarily important steps. The first of those steps we have made tremendous advances on in the last two to three decades. That is awareness. People are making the mistake of thinking that awareness translates into the second thing that is required for appropriate action, knowledge. That is not true. It is very easy to be aware, but not to have sufficient knowledge to be able to make the differences that are required in anything in life. Good job at making people aware. We have to do a better job of getting them the detailed knowledge necessary to make a difference.

Leonardo said that great love comes from great knowledge of the thing loved. As much natural empathy and desire we may have for the natural world, it will be propelled further the better we understand how the natural world works and the better we understand our relationships with the natural world. We have to learn more. We have to spend more time thinking. And we have to reinvest in society in what is and has always been the most effective means of change that the world has. It has absolutely nothing to do with publicists and it has absolutely nothing to do with spin doctors, and it has nothing, absolutely nothing, to do with pronouncements.

What it has to do with is gathering a group of highly intelligent apes around a fire, who for the moment forget about just how much diversity and problems and challenges we face, and to focus on what really matters. I think for the majority of people in this room, what really matters is making sure that we do the best job we can inside the city of Philadelphia and the suburbs of that city, in the state of Pennsylvania, in the United States of America, in the North American continent, in the entire globe as we possibly can to protect the diversity of the others that are out there. It is not we and them. It is a continuum of us.

I have been fortunate in the last year or so to be associated with the Pennsylvania Biodiversity Partnership, which is an attempt at a broad scale to make sure that we understand what we have and try to make the most effective strategies available to ensure that it's protected in the long term, and through that mechanism, I have met many groups. I hope I meet many more, like yours, groups that are striving to do the best that they possibly can, making an enormous difference often against this sea of apparent indifference. I urge you to understand that that sea of indifference is not real. There can be ignorance and a lack of understanding, but not indifference – not once people are touched by this movement. Everything that we strive to do is a risk. Coming here is a risk, a bad risk, and driving home will be a risk, but most of the important lessons in my life have come from risk. I'll share one with you that regards risk.

Early in my career, before I was 20, I spent time living with seabirds on a small island off the coast of Newfoundland. For those of you who have never visited Seabird Island and spent time there, it becomes a world that swamps you very quickly. It is a world of sound, multitudes of animals, and tremendous stench, usually of wild weather. And it is a place where you can become very much wild yourself. Don't ever think that the wildness is out of you. Agriculture and domestic animals have domesticated you, but that doesn't mean they have taken the wildness out of you. There is a difference.

Anyway, I worked especially on a seabird, known to the world as a murre, or a guillemot in Europe. It is a member of the Alcidae family, the black and white seabirds of the Northern Hemisphere of which there are many, many varieties. Puffins are a well-known member of this group. Anyway, I was working on the breeding biology behavior of this group of birds. Now they have a peculiar ecology just like we do. They nest on very narrow rocky ledges about twice the size of this podium which can be as much as 1,200 to 1,500 feet above the sea. They have shortened their wings, although they can still fly. They have shortened their wings very much to allow them to pursue fish underwater. They are almost a kind of penguin in the northern hemisphere and since we lost the great auk, it's the best we have.

It has a number of other peculiarities adapted to this life on the ledge. They lay a single egg and they have absolutely no nest building behavior left, it has completely disappeared. They lay the egg on their rock and the egg is very wide at one end and very narrow at the other, so when it is nudged, as it inevitably is many, many times a day by the thousands of these animals that stand together on the ledges, the eggs, instead of rolling, spin. The dynamic of this engineering is such that they spin, which if you are 1,500 feet up and you live on a very thin shelf, it's a very good thing to have happen.

Anyway after about two to three weeks of the parents constantly incubating this egg, one parent goes to sea to feed and the other parent stays on the egg. They switch over, which is a great model of cooperation. Eventually this little chick pops out of this egg and the little chick comes out at about this size, waddles out all sticky with baby feathers plastered to him, a lot like the hair cuts you see at the university. The little chick grows up in pools of dirty water, rotting fish, and broken eggs, rotting eggs, dying adults on this small piece of bare rock with absolutely no vegetation of any kind.

The shelf is sometimes six inches, sometimes twelve inches, sometimes a little more. Here she spends her time waddling back and forth, preening, sleeping, and getting fed. How they get fed is that the parent flies in from the ocean with a small fish which it holds in its gullet with the fish extending out of its mouth and the adult holds the fish long enough to allow its digestive juices to break up the skull and then feeds the remainder of the fish to the little tern, as Newfoundlanders call them. We have a different name for them. So, the little tern takes in the fish whole and then simply sits there on the ledge for however many hours it takes for the fish to slowly get digested and disappear down his system. So it's kind of like a snake eats, except the snake takes it all in and digests it, and the little bird sits there and simply waits for it to digest from the outside in.

And so for three to four weeks, this little chick sits on the ledge, preens, and sleeps, and grows. Like human children they don't grow proportionately in the sense that some parts of their bodies are bigger than others. So, I measured all these little chicks over time, their growth rate, and measured the size of their bodies relative to their adult size. I found the only thing that was really, really growing really fast was the size of their webbed feet, the tarsus as we call it, which is the part on which the bird walks. So, we had a long tarsus and a big foot. The question was why were they developing these?

Well, usually what happens in these colonies is that the birds go into a frenzy from early morning into the end of the daylight hours and then when it comes to the evening time, the ledges settle down. Now we are talking tens of hundreds of thousands of birds. The ledges are just black and white, black and white, black and white. The sea is coming underneath. The whales are swimming by the islands with the currents bringing the small fishes, they are blowing off shore. Slowly as the evening light falls, the noise which is absolute cacophony suddenly starts to fall, almost like a play, because the lights and the sound are all falling at the same time. For a place that can become so noisy, it can become absolutely still. You watch them in the evenings and they suddenly all turn, put their heads under their wings, gather the chicks around them, preen them, and then they fall asleep.

After three or four weeks sitting there watching them in the evenings, suddenly a change occurs. All of a sudden, the ledges started to become agitated. The birds became active and quarrelsome. They were going into a frenzy of calling, fighting with one another, and gathering their chicks. All of a sudden, as terns do, they started this weaving dance – this kind of bobbing up and down with their long necks and beaks, their bodies going up and down. Suddenly the whole ledge was doing this. All the adult birds and suddenly these little chicks, who had never seen this before, started doing it. And finally, some of the adults went to the edge of the ledge and then came back and this was repeated. Suddenly some of them flew down off the ledge and landed on the water below. Then these adults would swim along the base of the cliffs. As they swam back and forth, they would throw their heads back and open their yellow mouths and scream, a growl more like a dog, than like a bird. Thousands of birds would be throwing back their heads, opening their yellow mouths, and screaming. Suddenly these chicks would waddle out to the edge and move back in, then they would waddle up again and look down and retreat back to the safety of the cliff face behind them. You have to remember, they have never, ever, ever been away from their square foot rock their entire existence. They came out of the egg and that's where they've been. They have been fed, they've been preened, they've been cuddled. Life is good.

Suddenly one chick goes to the edge and jumps a thousand feet. Their little tiny wings beating like an egg beater, their feet held out like parachutes into seas ten or twelve feet throwing them against these rocks, and suddenly they would pop up like corks all over the water. The adults were calling to take them out to sea. The gulls were flying around trying to pick up these chicks and kill them. Under the cover of darkness, this flotilla of life goes seaward.

Four years later, FOUR YEARS, until the first time these chicks will feel solid land under their bodies again. For four years they will be at sea. The lesson to me in this story is that life is a leap of faith, like the gulls that were calling from the base of the cliff that knew that this was the way it had to be. Not because they read about it in a book, because birds don't read, but because they know in the same way that your genes tell you that you must care for the natural world, they knew, these chicks had to come off that ledge.

So, when you think that it's not worth the risk to try to reach other groups, or you don't think this will work because it's just too much of a challenge, think of those little birds and you'll jump too.

Thank you very much.

Questions

Question: I just read an article in the *Wall Street Journal* where they said the population of the world is starting to slow down. Isn't that a good sign?

Answer: It's probably in intelligence! The rate of increase is going down, but that doesn't mean we are not still increasing, of course. The rate is slowing down to an extent and any reduction in growth of the human population is a good thing. My own feeling is that, unfortunately, there will be some fairly nasty disease questions that will still arise for us, but nevertheless I do think there are efforts, even on a problem as intractable such as human population growth. There are individuals and organizations who are at work constantly trying to make a difference against what must be seen as an impossibility. So, yes it is true and yes, it is a very encouraging sign. We need to do a lot more, of course.

Question: How do we overcome the justification that we're here in the US, we have money, we live well, and we can afford to care about the animals in Africa, but the people in Africa who are starving to death and have nothing, don't have much time to care about the animals that are in their backyard? If, in fact, the United States drives its economic policy into Africa and they now become as well off as we are, we need two more Earths to support them. Then will there be any animals, or us left?

Answer: Well, first of all I think that the first part of your question points to the fact, I believe, that we in the Western World, those of us who have the advantages of the lifestyle, we all have a great responsibility by virtue of the fact we have a greater capacity and a greater opportunity to do the right thing for the natural world. We should be taking leadership roles in this regard and I think to a large extent we have, but I also think it is absolutely impossible in the majority of cases to expect human beings who cannot feed their children to be worried about monkeys, or aardvarks, or alligators.

However, again, even in those circumstances – one of the most successful and unbelievable conservation stories in the world is of the Indian tiger. You have a recipe for total disaster there. People have for many, many decades been fighting against maintaining these highly dangerous, large carnivores in a country of great strife and great poverty in many cases. The tigers, of course, are living in circumstances where the taking of a single cow can mean an enormous amount of economic hardship for the people.

So even in circumstances like that and certainly in Africa as well, even in "their poverty," there are people there working, not just because western countries are helping them. There are lots of conservationists in those countries who are being in charge for exactly the same reasons that I argue, really in charge because they are concerned.

You know it's true that no matter what the economic state of civilizations, there will always be people who speak about justice and freedom. There will always be people who speak about what is ethically correct and what is not. There will always be people who will fight for things that will out-live their lives. I think we can take some hope in that regard.

The question of our model of economics, because it is not just the United States model, obviously, it is really the western model of economics. I think I can say without prejudice that the United States gets far too little praise and far too much criticism. It doesn't mean that the United States shouldn't be criticized. But, it's true and that comes from being in the political position that you are, but I do think that we are understanding that some of what we have tried has been disastrous. Building industrial plants that just completely ignore clean water. We've tried a lot of things that clearly didn't work very well.

One of the things that we don't understand very well, though we are vaguely aware of it, is we don't understand the principles and components that went into the really successful conservation movement that was started by political persons such as Theodore Roosevelt and by European-trained individuals like Gifford Pinchot, the first head of the forest service in the United States, and so on, and George Bird Grinnell, who started Audubon and became such an expert on the Plains Indians. Your country really has led the way, even though Canada joined in fairly quickly. The United States really led the way in establishing, what I believe to be, the most successful conservation model in the world. By the way, there is a movement, which some of us are now launching and have been involved in for a couple years, of actually pointing out to the rest of the world that this model of civic involvement, multi-partner participation, and very diverse interests, and with in many cases, voluntary taxation and other programs, that this kind of model can work effectively. Africa is going to adopt many of those principles and they need to do it fast because Africa is losing wildlife at a pace that would even shock us, as you may well be aware.

One more comment, this difference between awareness and knowledge is really important in this question also. I'll give you a classic example of what I mean by the difference. The state of Texas did a review of attitudes of school children on questions of endangered species. They asked grade 1 and 2 students a whole pot of questions about endangered animals and, as many of you probably know, the state of Texas is awash in deer, a huge number of deer. Anyway, they asked the students if they knew what endangered meant and they answered they did. Then they were asked to name an endangered animal. Something like 90 percent of the kids said white-tailed deer. You see, they were aware of the issue of endangerment, and they were aware of deer, but they had absolutely no knowledge, the two were not the same. This is what's happening in society I'm afraid, to a great extent.

Question: In Africa and places like that where there is eco-tourism that involves the people of those nations and localities, in your experience does it make a difference, or is it making a difference? Is it catching on all of a sudden?

Answer: Yes. There is no question. There are parts of Africa where there are various names for this, but the Campfire Program, for example, and even Safari Club International which is not an organization that has escaped criticism and controversy, but that program where the wildlife are managed locally for eco-tourism, in some cases just for hunting, but often just for viewing and photography and so on. There is no question that this has, in fact, made a difference. It's a bit of a dicey game equating wildlife just with money. There's a problem with doing that too. We have to be aware of that problem also. Ultimately there are better reasons for protecting wildlife and biodiversity than money. I'm not saying we should ignore those reasons. At any rate, yes, this is making a difference.

Question: It's not just about money. It's about people living with their conditions and not raping the landscape and making money off of it, along with everything else.

Answer: Yes. That is in fact taking place and that's a positive note. I wonder how far in 10 or 15 years from now, how far their own thinking will evolve. We are into game farming, we are into a lot of things that are taking the economic side of it, the benefit side of it, in directions that are not necessarily positive. But, I think right now the alternative, which was a complete disappearance of African wildlife, there's no question that those programs are working.