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[00:00 - 12:50 / French Introduction / Not transcribed]

<<**Lester R. Brown – only speaker until [applause]**>>

Thank you very much.

I feel indebted to so many people who have worked on the book—on the French edition for translation, and for publication. For me it's very exciting to be in France, with not only my own book in French which looks at the global issues—but this is sort of the French response that Philippe was mentioning. It's not done—this is the collection, it's sort of a how-to book, not done by environmentalists, but done by corporations and using corporate examples on how to reduce the stresses on the environment. I'd like to talk for a bit about what's happening in the world and what it means, and then I'd like to respond to any questions that you have.

When we go back and look at the archaeological sites of earlier civilizations, it is clear that more often than not they declined because of food shortages—because of a breakdown in their food systems. With the Sumerians it was rising salt levels in the soil as a result of a defect in an otherwise impressive irrigation system, and as the salt levels went up, the wheat yields came down. The Sumerians realized that barley was more salt-tolerant than wheat, so they switched from wheat to barley, but then the barley yields also eventually came down as the salt continued to accumulate, and as the barley yields came down so did the Sumerian civilization.

We have a similar situation with the Mayans in Central America. At one time, the Mayan civilization was the most advanced civilization in the western hemisphere, but they had a couple of environmental problems: one was deforestation, and the second—closely related to that—was soil erosion, and eventually the soil erosion undermined their food system and there simply was not enough food to go around, and the Mayan civilization also declined and collapsed. For a long time, I rejected the idea that food could be the weak link in our modern, technologically advanced civilization, but I now not only think that food could be the weak link; I think it is the weak link, and I'll talk about some of the reasons for that.

First, let me look at the demand side of the food equation, population growth. This is not new. What is new is that for the last few decades now we've been adding 80 million people a year. Tonight, there will be 219 thousand people at the dinner table who were not there last night, and tomorrow night there will be another 219 thousand people at the dinner table, and if this continues long enough, eventually it begins to put pressure on the earth's land and water resources, and that's what we're now beginning to see.

The second source of growing demand today is rising affluents. We estimate that some three billion people in the world are now moving up the food chain, consuming more grain-intensive livestock products.

So, we have population growth and now have rising affluents, and most recently we have the third source of growing demand for grain in the world, which is the conversion of grain into fuel for cars. Last year, in the United States we harvested roughly 400 million tons of grain. Of that, 124 million tons went to ethanol distilleries to produce fuel for cars. The grain required to fill a large gasoline tank in an SUV or a large car—filling that tank with ethanol requires the grain that would feed one person for a year. So one tankful of ethanol equals the grain supply for one person for a year.

So today we have three sources of growing demand for grain: population growth, rising affluents, and the use of grain to produce fuel for cars. The net effect of these three trends is roughly a doubling of the

annual growth in demand for grain. A decade ago the annual growth was roughly 20 million tons a year; more recently it's been roughly 40 million tons per year. This is with world grain harvest of roughly two billion tons annually. Farmers are finding it difficult to keep up with this increase in the growth of demand. They're finding it difficult for a couple of reasons that are fairly recent. One is climate change. Agriculture as it exists today evolved over an eleven-thousand year period of rather remarkable climate change, and it is designed to maximize production with that climate system, but now, suddenly climate is changing and we're seeing the climate system and the agricultural system that were once in sync with each other now beginning to be more and more out of sync each year.

So the climate system is changing. We don't have a normal climate system to go back to now. It used to be we would have a drought or a monsoon--a failure or something in the world--, and the world price of grain would go up, but it was no problem because we knew it would go back to normal in a year or two. Now there is no normal to return to with climate. It is in a state of constant change. The rule of thumb that crop ecologists use to measure the effect of rising temperature on grain yields is that for each one degree Celsius rise in temperature during the growing season we can expect a ten percent decline in grain yields.

So climate change is now making it more difficult for farmers to expand grain production fast enough. At the same time, we're now facing the emergence of water shortages in many countries in the world. Half of the world's people live in countries that are overpumping their aquifers, which means the water table is falling and eventually the aquifers will be depleted. These countries include both India and China, two of the world's major grain producers. World bank data show that 175 million people in India are now being fed with grain produced by overpumping. My estimate for China is that 120 million Chinese are being fed with grain produced by overpumping. Overpumping is by definition a short-term phenomenon: you cannot overpump indefinitely.

Last year, we saw an intense heat wave, a record heat wave in western Russia. As a result of that, we saw the Russian grain harvest drop from roughly 100 million tons that they'd been hoping for to 60 million tons. That drew down world grain stocks. Grain prices rose sharply, and the world food index in January reached the highest level on record. The hope was that this year we would rebuild stocks, and we could bring down food prices, but unfortunately the world's farmers—though they planted more grain in the spring responding to the very strong prices, they planted more grain, used more fertilizer, they did everything they could think of to expand production faster, but this year they are again falling short, and world grain stocks will drop further. The principle reason is high temperatures in the United States. We have seen the U.S. state of Texas, which is a major wheat-producing state, experience the hottest twelve months and the driest twelve months in its history, just in these last twelve months. Crops are being abandoned, ranchers are selling their cattle because there's no longer any grass for them to graze on and in some cases no water for them to drink.

This heat and drought in the southern Great Plains, concentrated particularly in Texas, is making it more difficult to expand grain production this year. In the Corn Belt, the states of Iowa and Illinois, the two leading corn producers had the highest temperatures in July in more than half a century. That reduced our corn harvest somewhat. The bottom line is that temperatures in the United States are making it more difficult to restore—to rebuild stocks this year. Even more, it is now time in Texas to plant winter wheat for next year's harvest, but because it is so dry many farmers simply cannot plant any wheat because it will not germinate, so already we're seeing climate events, weather events begin to affect next year's grain harvest even though it's still a long time until next year's crop is harvested.

If I were to pick three indicators that I think will tell us more about our future than any others, the first would be an economic indicator, grain prices. The second would be a social indicator, the number of hungry people in the world. During the closing decades of the last century, the number of hungry people in the world was falling. It dropped to about 825 million as we moved into this century, but then

over the last decade the number of hungry people in the world has been rising, and there are now roughly a billion hungry people in the world, and there's not anything in sight that I can see that will arrest that rise in the number of hungry people. This is an indicator we need to be paying more attention to, not just because there are more hungry people—though that's obviously a reason to pay more attention—but because it may be an indication that we are in a situation where we may not be able to produce enough food for the world's people, and we'll face the same situation that the Sumerians faced and that the Mayans faced. The third indicator that we should watch is the number of failing states in the world. That number is increasing, and it raises a disturbing question, which is, how many failing states before we face a failing global civilization? At what point does the number of failing states—these are countries like Somalia, Afghanistan, Democratic Republic of the Congo, Haiti, countries where governments no longer can effectively govern; they may not control much of the territory, and they can't provide the basic things that people expect of a government which are personal security and food security.

So these are the three trends to watch: grain prices, the number of hungry people in the world, and the number of failing states in the world. What do we do? The one thing that I think is clear to anyone who tracks global trends in any meaningful way is that business as usual is no longer a viable option. We cannot just continue doing what we've been doing and expect things are going to get better—they won't.

So our response at the Earth Policy Institute is Plan B, and we've done four books now: Plan B, Plan B 2.0, 3.0, 4.0, and “Outgrowing the Earth” is another book in that series, but we didn't call it Plan B.

Uhm, I'm sorry I said "Outgrowing the Earth"; I meant "World on the Edge." I've written too many books; I get them mixed up sometimes.

“World On the Edge” is also in the Plan B series; the last half of the book is what to do about it. Plan B has four components: one, cut carbon emissions by 80 percent by 2020; two, stabilize the world population at no more than eight billion; three, eradicate poverty; four, restore the economy's natural support systems—forests, soil, grasslands, fisheries, etc.

When political leaders look at the need to cut carbon emissions, they acknowledge that we need to do so. They talked about it at Copenhagen. They talked about cutting carbon emissions by 80 percent by 2050. Why 2050? Because none of them will be in office in 2050, so that's a safe date. But when you start with the science, and you ask questions like, "how much and how fast do we have to cut carbon emissions if we want to save the Greenland ice sheet?", for example, then you get a very different answer and you realize the urgency of the situation we're in and how little time we have. When you ask that question then you see we have to cut carbon emissions by 80 percent not by 2050 but by 2020, and that doesn't guarantee we'll save the Greenland ice sheet, but it's going to take something like that to have a decent shot at doing so. Why do I use the Greenland ice sheet? Because if it continues melting, it will eventually raise sea level by seven meters. Even a one meter rise in sea levels would create enormous problems in the world. For example, the World Bank has a map of Bangladesh with a one-meter rise in sea level. Bangladesh would lose half of its rice land. A one-meter rise in sea level will inundate part of the Mekong Delta in Vietnam, the world's number two rice exporter. There are nineteen other rice-growing river deltas in Asia where a one-meter rise in sea level would partly inundate those areas.

This is a sign of the complexity of the world in which we live. The idea that ice melting on a large island in the north Atlantic could shrink the rice harvest in Asia, where half the world's people live, is not intuitively obvious. It's only when you think about ice melting and sea level and particularly rice production, much of which is produced in rice-growing river deltas or think about the glaciers of the mountains in the Himalayas and on the Tibetan Plateau. It is the ice melt from those glaciers that

sustains the rivers and many of the irrigation systems of Asia during the dry season. If those glaciers disappear—and the small ones have already disappeared, the smaller ones—if the large ones disappear, we have an enormous disruption in rice production and in irrigated wheat production in Asia. We're not talking about trivial issues here, we're talking about trends that could reshape the world in ways that we would prefer not to think about.

So Plan B is cutting carbon emissions 80 percent by 2020. Part of that we can get by simply gains in efficiency. Shifting from incandescent light bulbs to compact fluorescents reduces electricity use 70 percent. Going from incandescents to LEDs combined with light sensors that would automatically turn off lights when no one is in an office or in a room, we could actually get a 90 percent reduction in electricity use, but even an eighty percent reduction would allow us to close 705 of the world's 2600 coal-fired power plants. I could talk about automotive efficiency. Engineers know—and some others also—that replacing an internal combustion engine with an electric motor, same power, reduces energy use by two thirds. So we have all sorts of possibilities and electrically powered cars and plug-in electric hybrids are coming to market now—they're already on the market, and many more models are slated to come to market in the next few years, so we can dramatically reduce electricity—I'm sorry, energy use in the transport system.

So efficiency is an important part of cutting carbon emissions. The other important part is shifting from fossil fuels to renewables: from coal and oil and natural gas to wind and solar and geothermal energy. And I will talk about just one new source of energy to give a sense of how we are scaling up our thinking in the wind sector in a way we've never before seen in the energy sector. Today, the largest coal-fired complexes in the world will generate close to five thousand megawatts of electricity—there are only a few of these, but that's the upper limit. For nuclear power, there are a few nuclear complexes that will generate between five thousand and eight thousand megawatts—just a few. But listen to what's happening with wind farms: we started the early wind farms in the U.S. at the beginning of the 1980s, these wind farms were 50, 100 megawatts, then somewhere a few hundred megawatts, then somewhere several hundred megawatts; now there's a wind farm in development in Wyoming, two thousand megawatts, one in South Dakota, five thousand megawatts, one in the panhandle of Texas that will probably exceed ten thousand megawatts. This is particularly exciting in Texas because Texas is our leading producer of oil, but it's now also our leading generator of wind, and what we're seeing is oil money moving into wind farms, and the interesting thing about this is that ever since the industrial revolution began, we've been investing in resources—in energy resources that would soon run out, whether it's oil fields or coal mines or what have you, and when the oil field is depleted you have to find a new oil field, you have to find a new coal mines, but when you invest in a wind farm and the related infrastructure, you're investing in an energy source that could last forever. It makes no difference how much wind energy we use today. That does not affect how much is available tomorrow. And so we find oil money going into wind farms because of this possibility of essentially inviting in an energy source that could last forever. Now, wind farms, you have to maintain them, the bearings have to be replaced from time to time, but the basic structure is good for a long, long time. We've never had this opportunity before.

So we have a wind farm in Texas of some ten thousand megawatts, and we go to China and see that they have seven wind mega-complexes now beginning construction that will each have at least ten thousand megawatts—at least ten thousand megawatts: larger than any nuclear or coal complex in the world. The largest of these is being built in Gansu province in northwestern China. It is 38 thousand megawatts—38 thousand megawatts. We've never seen a wind complex like this before. That would be basically 19 thousand wind turbines covering hundreds of square kilometers, but it's mostly desert in northern China so it's not a big problem. A lot of desert, and a lot of wind. 78 thousand megawatts from this one wind complex is enough to satisfy the electricity needs of Poland, or Egypt for example. I

mention this just to share with you the sense of scale that's developing within the wind industry, now, and in governments on what—at least a few governments—on what is possible.

The other three components of Plan B—oh, incidentally, the key to restructuring the world's energy economy—to getting these dramatic gains in efficiency and to replacing coal, oil, and natural gas with wind, solar, and geothermal energy—is getting the market to tell the truth. The market is very good at incorporating the direct costs of producing oil for example: pumping the oil, refining it into gasoline, getting the gasoline to local service stations. The market captures those costs very well, in setting prices, but it does not incorporate indirect costs like climate change, like treating respiratory illnesses from breathing polluted air. It does not include the cost of the huge U.S. military presence in the middle east to protect world access to oil. When you include those, then the price of gasoline in the united states does not cost four dollars per gallon—which is the current price—but twelve dollars per gallon, and we could do the same calculation for coal. Coal-fired electricity, if we include all the costs just goes up very, very dramatically. So what we want to do is to get the market to tell the truth. We want the market to be honest with us about how much it costs to burn a gallon of gasoline or to burn a ton of coal, and it is very costly. So, we need to restructure the tax system by reducing income taxes and increasing the carbon tax so that the price of gasoline or the price of coal-fired electricity reflects the true costs—the indirect cost as well as the direct costs. So tax restructuring is one of the keys to our future.

The other components of Plan B I'm just going to mention briefly: stabilizing population, poverty eradication, and restoring the economy's natural support systems.

The key to stabilizing population is to fill the family planning gap. The latest survey, which is now probably two or three years old indicates that there are 215 million women in the world who want to plan their families but who do not have access to family planning services. Those 215 million women and their families represent a billion or so people. They are essentially the poorest one billion or so people in the world, and one of the keys to breaking the poverty cycle there is accelerating the shift to smaller families by making sure that women everywhere who want to plan their families can do so. It doesn't really cost all that much. In terms of say the us military budget, it would almost get lost in that budget it is so small. If we can fill the family-planning gap, world population growth will come to a near halt. It's doable. We know that family planning works because most of the world uses it; 46 countries already have stabilized their populations.

Poverty eradication—there are many components in eradicating poverty, but one is making sure that children everywhere have at least an elementary school education: girls as well as boys. The relationship between the level of female education and the size of families is very clear: as female literacy and education comes up, family size comes down because women have more options and more opportunities. So that's one piece of poverty eradication.

Restoring natural systems is also essential to our future. No civilization has survived the ongoing construction of its natural support systems, which is what we're doing now. Each year our forests are shrinking, our soils are eroding, water tables are falling, grasslands are turning into desert, fisheries are collapsing. This is not a formula for sustainability. We have to reverse these trends. It means reforestation. It means soil conversation. It means increasing water use efficiency, water productivity. It means creating marine reserves so fishery populations can recover. It's all doable.

The cost for stabilizing population, eradicating poverty, and restoring the economy's natural support systems is about 200 billion dollars a year. That's a lot, in these fiscally stressed times. But the second thing we need to do, in addition to restructuring the tax system to get some honest prices for coal and oil, is we need to redefine security. We have inherited a definition of security from the last century: a century that was dominated by two World Wars and a Cold War. If in Washington you use the term

national security, people automatically think military expenditures and advanced weapon systems, but if I sit down with a clean pad of paper and start listing what I think are the principle threats to our security, armed aggression doesn't make the top five. I start with climate change. That's a real threat to our security. Continuing population growth; spreading water shortages; rising food prices; and increasing number of failing states. I see you're taking notes; I'll repeat those. The first is climate change—is I think the leading threat; population growth; spreading water shortages; rising food prices; and failing states. These are the five, I think, leading threats to our security, and when I talk redefining security, I'm not talking just about an intellectual exercise. I'm also talking about a fiscal redefining of national security, and so the 200 billion dollars we need to stabilize population, eradicate poverty and restore the economy's natural support systems is easily within reach. Two hundred billion dollars is less than one third of the U.S. military budget, which is now nearly 700 billion dollars. Two hundred billion dollars is now one-eighth of the global military budget. We can't say we don't have the resources to essentially invest in saving civilization. We can reverse these trends that are undermining our future. It's not going to be easy. And when I think about these things, I think about one it's an extraordinary challenge. These are huge things that we have to do that I've been talking about, and we don't have much time to do them, but I go back and look at the economic history of World War II. December 7th, 1941, the very successful surprise attack by the Japanese on Pearl Harbor Hawaii—they managed to sink a large part of our Pacific fleet which happened to be at anchor in Pearl Harbor Hawaii. One month later, January 6th, 1942, President Roosevelt gave the State of the Union Address in which he laid out U.S. arms production goals because suddenly we were involved in two wars on the far side of two oceans, one in Asia and one in Europe. He said we're going to produce 45 thousand tanks, 60 thousand planes, and thousands of ships, and people couldn't relate to that; it was so far beyond anything they could imagine because we were still in a depression mode economy when the Japanese attacked Pearl Harbor in 1941. But what Roosevelt and his colleagues realized was that the largest single concentration of industrial power in the world at that time was in the U.S. automobile industry because even during the depression years and the thirties we'd been manufacturing two to three million cars a year, so after his State of the Union Address, he called in the leaders of the automobile industry and said, "Because you guys represent such a large share of our industrial capacity, we're going to rely heavily on you to help us reach these arms-production goals", and they said, "Well, Mr. President we're gonna do our best, but it's going to be a stretch producing cars and all these arms too." He said, "you don't understand: we're going to ban the sale of cars in the United States." And that's exactly what happened: from the beginning of April, 1942, until the end of 1944—nearly three years—, we didn't produce any cars in the United States. But instead of producing 60 thousand planes we produced 229 thousand planes—I mean if you can imagine producing that number of planes even today, 229 thousand, but we did it. And the point of this example is that it didn't take decades to restructure the U.S. industrial economy. It didn't take years. This was done in a matter of months, and if we could do that then, then we can certainly restructure the U.S. energy economy during this decade, and that's the real challenge on the climate front. So it is possible to bring about enormous change in the short period of time, if we become convinced that we need to do it, and that's our challenge. We're talking now about saving civilization.

We environmentalists have been talking about saving the planet for decades, but the planet's going to be around for sometime to come. The challenge now is to save civilization, and that is not a spectator sport. We can't sit around and hope someone else is going to do it—you and I have to become directly involved. Pick an issue that's important to you and become politically active—I don't mean just in presidential campaigns. I mean pick an issue like closing coal-fired power plants or supporting international family planning groups or developing a world-class recycling program for your community, which greatly reduces energy needs. These are the kinds of things we need to do, and it's going to take—we're going to have to become politically active if we're going to bring about the

changes that are needed in the time that's available. I thank you all very much for coming out this afternoon, and I'll be happy to respond to any questions you might have.

[applause]

Audience Female>> Mr. Brown, first of all I would like to thank you very much for your presentation and what you're doing for the world, and then I have one question: are you in contact with any U.S. companies who have seriously started to work on their Plan B? Beyond just reducing by some percent their environmental footprint?

Lester R. Brown>> Most corporations talk about the need to reduce carbon emissions and most corporations do it in their manufacturing processes, in their offices—more efficient lighting and so forth, and you read their annual reports and it's there, but they're still thinking in terms of marginal incremental change. They're not thinking about the big picture and the restructuring of the economy. Indeed in the U.S. the oil companies and the coal companies are funding a very large campaign to confuse the public on climate change, and so that's another thing that we have to deal with. It's kind of—it's almost like a last-ditch stand for them because the coal companies know that they're in trouble. I'll just give you a quick example of what's happening in the U.S.: a few years ago the Sierra Club launched a national campaign called Beyond Coal, and the purpose of this was to prevent the construction of any new coal-fired power plants. That goal has now been essentially achieved. The next stage is to phase out existing coal-fired power plants, and of the 492 that we currently have, 71 are scheduled to close within the next few years. Most interestingly, a few months ago, Mayor Bloomberg, of New York City—a retired business man and one of the most respected businessmen of his generation—announced that he was making a 50 million dollar grant to the Sierra Club to close coal-fired power plants. I mean it was amazing; he said very simply, “Coal has to go. Period.” Now, it's one thing if I say that; it's another thing when the president of the Sierra Club says that, but when Michael Bloomberg says that, people have to listen. So, probably what he said and the symbolic effect of what he did may be even more important than the 50 million dollars itself, though the 50 million dollars will obviously help in the campaign, but it's been interesting to watch because we've cut our coal use by 8 percent in the last three years, and the coal companies recognizing this of course went to export the coal if we're not going to use it, and they are particularly looking at China. And so they went to Seattle to build an export facility there so they can take the coal by rail and load it up on ships to go to China, and what they discovered was that the community would not permit them to do that: the mayor would not issue them a permit to construct this coal facility, partly because they'd get nothing from it except a lot of coal dust around the town: the coal was just passing through. But apart from that there was the same groups that are closing coal-fired power plants were organizing this effort, so now the coal companies have to send the coal up through Canada and out of western Canada; I mean it eventually gets there, but it costs them more money, and it sends a message that this is—that the community that's opposing coal-fired power plants, this is an across-the-board effort, it's not just to reduce coal use in the U.S. , it's to reduce the use of U.S. coal anywhere in the world.

Audience Male>> Yes, Mr. Brown thank you very much for your speech. I'm very happy in a way that you do combine the main ecological issues and the security issues, which a lot of French people—and French ecologists especially—never do. Now, I would like to raise one question about that. How does—when you talk about the different issues—how does it affect also the security issues? I mean you do mention, which I'm not sure it's a good example, the way the military complex shifted the whole economy at the certain time between '41 and '42, and probably you do imagine how ambiguous your example is because I suppose that what we have to understand is that we have to reverse by becoming

demilitarized as an economy. At the same time if you think about the climate change, we cannot be very happy that if there is some sea level rise, it might drown some of the U.S. military bases around the world. But at the same time the fact that the military complex and especially the American militaries do not do anything about climate change—and don't even want to talk about it—how do you respond to that? I'm sorry maybe the answer is already in your book, but I haven't read it yet. Thank you.

Lester R. Brown>> Well lest you be discouraged in reading the book I'm gonna let you find the answer in the book. [laughter from audience] It's interesting that the U.S. military sees climate change and the associated instability as a reason for building yet more military bases around the world. That's how they think about climate change and security, and that was sort of implied almost in your question. What would be interesting—and I haven't done it yet; I've thought a bit about it. I haven't seen anyone else do it—is to look at all of the sort of economic fallout from environmental and social and political trends in this complex of issues. For examples, Somalia—Somalia has I dunno six million people or something; Somalia is a place on the map. It's not a country in any meaningful sense of the word; there is no functioning government in Mogadishu. And this is a country that has almost nothing in the way of resources. I mean it's basically an agrarian, agricultural, herder sort of economy, and yet the Somali—the Somali pirates who capture ships and hold them for ransom have created a somewhat a chaotic situation in the Gulf of Suez and the Persian Gulf and the Indian Ocean broadly—in particular the eastern coast of Africa. There are 17 countries now that have naval units in that area trying to control this. The bottom line is that in each of the last three years the income from piracy has been increasing, and it is probably going to increase again this year. We have not been able to deal with what is essentially a rag-tag group of guys in speed boats with a few very light weapons, threatening ships, and that's just one example. I mean what's the price tag on this in terms of disruption? You know, an oil tanker with two million barrels of oil that's held for six months—it messes something up someplace, and it would be interesting just to begin to calculate what the costs are in economic terms of this kind of disruption. I mean I could use many more examples, but I think one of the things we lack is this sort of systemic thinking that enables us to link climate change and food shortages and political instability and failing states and security more broadly. It's a complex set of issues. I think Joseph Tainter, U.S. archaeologist is coming to town over the weekend; there may be an opening of a Mayan exhibit and he'll be a commentator or something, but he's written a book on the collapse of complex societies, and his basic argument was that civilizations evolve until they become so complex they can't manage themselves anymore, and I think about that a bit when I think of our current world. It's a very complex place and understanding it and all the interrelationships is demanding. I mean most of the people who make decisions don't have much time to spend deliberating and you know soaking up this information, analyzing it, I'm in the rare position that I can spend most of my time doing that, but even with that it's still a complex set of issues that we're trying to deal with.

Audience Female 2>> Hello, thank you for being there. Actually you partly answered my question, but because you started your speech talking about ancient civilizations that couldn't prevent their collapse, and I wanted to ask you why you think that we can be more clever than they were, and I wanted also to tell you about Detroit—the city of Detroit because I read lots of articles in the American Press about this city and the way it may be a symbol of the end of an industrial system that is—that has started to already collapse, so I wanted to have your point of view. Thanks.

Lester R. Brown>> Two very good questions. Do I think we're more clever than the earlier civilizations? Probably not. We may be better informed. We do have some sense of what the issues are. We have at least some understanding of climate change and the threat it poses. We understand what ice melting is about and how it affects sea level, and I could go on. I mean I think scientifically we have a reasonably good grasp of what's happening, not necessarily anticipating what it will translate into.

That's one thing we have that earlier civilizations may not have had; I don't know for example if the Sumerians understood why their wheat yields were falling. They may have realized it was salt. They may not have understood the defect in their irrigation system that led to the salting of their soils. I think we do have a pretty good understanding of these threats. I'm sometimes surprised that more people haven't sort of analyzed them and taken them into the future to see what the future holds. On the question about Detroit, I have not seen the article or articles you referred to in effect saying that what's happening in Detroit marks the end of an industrial era, if I understood.

Audience Female 2 (previous)>> It's more my interpretation of the article that I read about Detroit, which speaks mostly about urban agriculture and the way it locally has to rebuild a new system.

Lester R. Brown>> Right, what's happening in Detroit is that the auto industry is in trouble; unemployment is high; the population of Detroit itself has declined as many homes have been abandoned; et cetera; but what they're discovering is that there's a lot of land, therefore, around that's idle that can be planted and cropped, so there's a rather strong urban gardening program in Detroit that involves a lot of underemployed or unemployed people cultivating in their areas, so this is not the way Detroit was originally headed, but I think it also is a manifestation of something else which is I think we're moving away from—in the U.S. in particular—from the idea that having a car is sort of a birthright in the United States. I mean everyone has to have a car. As a society, we have three cars for every four people. What's happening is that things are beginning to change: young people do not have the same attitude toward cars that my generation did, for example; I grew up in a rural community where getting a driver's license and a car or a pickup—something to drive—was a rite of passage. Everyone did it. That's how we socialized: get together a bunch of teenagers in a car and drive around, you know no place in particular but just for fun. But today socialization is not taking place in cars. It is taking place on cell phones and with the social media, with the Internet, and this is creating a very different attitude towards cars. For example, in the United States we have far fewer licensed teenagers in the United States than we had 30 years ago even though our population's much larger. Young people are just not oriented towards cars in the same way, so we're now seeing a decline in automobile sales in the United States and a shrinkage of the U.S. fleet that began just three years ago. So things are changing, and we're seeing Washington D.C. with a bike share program, for example. It's extraordinarily successful. It was introduced a year ago: the same sort of system that Paris has had for a few years now. So we're beginning to rethink things in ways we have not before, and I've seen polls, both for Europe and the U.S., when you ask young people, say age 20 to 30 if they had to choose between a cell phone and a car, which would they take? The majority would take the cellphone; it's more important to them than a car, so things are changing. I've just written an article on declining gasoline consumption in the U.S. , and this is one of the reasons for the decline, and there are several others, so in the U.S. both gasoline and coal consumption are dropping pretty fast now, and I think that trend is going to continue.

Audience Male 2>> Dear Mr. Brown, thank you very much for your conference, and it's an honor to have you here. In Paris, I'm working as an economist in the French Federation of NGOs of French nature and environment. we are a member of [indiscernible]. We are really interested by your idea of—your approach of linking security and environment. In fact we kind of share this approach. We think that from the view of the people—the population—, the main link between the lack of security and environmental problems recently was of course the huge catastrophe of Fukushima, and more recently in smaller scale of course, in France two weeks ago, an accident on a nuclear site in Marcoule leaves one man dead and three people killed [injured?]. So my question is, with this kind of insecurity on the nuclear plants, some people are saying—mostly in France that even if we have these problems of security, nuclear energy still is a solution to fight against climate change, but on the other hand, we can see that tens of billions of euros that we're investing now into nuclear energy are not going into

renewable energy, are not going into the mobility innovations, are not going into energy efficiency, so my question is, for you, nuclear energy today, on the global scale, of course, is it part of problem, or is it part of solution? Thank you.

Lester R. Brown>> When I look at an energy technology or technologies more broadly—particularly energy technologies—, I often go to Wall Street first and see what their research is showing. I do that because Wall Street has a huge research capability; my small institute has a very limited capacity, and what you discover when you look at Wall Street and nuclear power is that Wall Street has not invested in a nuclear reactor for more than 35 years, nor is it likely to, and there's a simple reason for that: economics. The cost of nuclear power is very high, and what the industry has been trying to do now for decades is to unload costs of nuclear generated electricity onto tax payers so it doesn't show up in the electricity rates. For example, in the United States, the disposal of nuclear waste has become a government responsibility. The individual companies don't do anything with it. They just accumulate it and then hope the government will take it and do something with it. That's going to cost us almost a hundred billion dollars; that's almost a billion dollars for every nuclear power plant in the United States. Or we look at the cost of insurance; again, the—it's almost impossible for a utility to insure a nuclear power plant—, and so again they go to government to cover that risk—government being tax payers. Another one is the cost of decommissioning. There's gonna be a huge bill someday in decommissioning nuclear power plants, and exactly who pays it is not clear at this point. So I don't have to go beyond the economics of nuclear power to understand why worldwide nuclear power peaked probably a couple years or so ago and has started going down now and will continue to go down because we have so many aging plants in the world that are going to have to be taken out of use, and we have so few new plants coming on line, and people often point to China and say, “Well China's building new power plants.” That is true, but it is also true that wind electric generation has passed nuclear power generation in China, and it won't even be close in the future, so China—the big push in China is with wind energy; it's not with nuclear power, and my guess is that we're going to see one country after another give up the ghost on nuclear power. We're seeing major corporations phasing out nuclear power. If I remember rightly, Siemens just announced they're going to close their nuclear unit, and there are other companies doing the same thing. I think they see the handwriting on the wall, and I think what Fukushima did was speed up the process of the nuclear phase out. It provided even more reason to close existing coal-fire [nuclear] power plants and not to build new ones, so I don't think nuclear is going to be a big part of our future. I mean it's interesting to look at France: there's one nuclear power plant under construction; it's both behind schedule and over budget, but France at the same time is planning to develop 25 thousand megawatts of wind generating capacity, of which 6 thousand megawatts are already online, so I think the trend is pretty clear, where nuclear is concerned, and though the industry is still trying to talk it up, it's voice is getting weaker all the time.

Man>> Mr. Would you mind signing some books afterward, or are you too tired for that?

Lester Brown>> I can do that.

Man>> You can do that?

Lester Brown>> Yes.

Audience Male 3>> Thank you very much for your work and your talk. My question is about how to make progress on the global issue. For the Plan B you suddenly need all the nations to be united around this problem, but as you know, international relationships is really about leadership and who is the leader and who is following, so that's the first question and inside the question, do you have an idea on how the Chinese think about this global problem?

Lester R. Brown>> The challenge we face in a fundamental sense is, how do we raise the level of global understanding to the point where we can generate an effective policy response? My sense is that

we're probably not going to get global solutions as such. My sense is that internationally negotiated climate agreements are history, and I say that for a couple of reasons: one, it takes time to negotiate them, I mean we worked on Copenhagen for years, and we didn't get anything, but even if we had gotten something meaningful, it would have taken years more for the ratification process to go. I don't think we have that much time; The other thing is, and I watch this in Washington, you look at who the members are of the delegations who go to Copenhagen and these sort of conferences, they're mostly lawyers and diplomats. When was the last time you saw a large group of lawyers and diplomats come up with a really new and exciting innovative idea? You know, it doesn't work that way, and countries are only trying to figure out how to minimize their contribution, and it leads to minimalist thinking, but what if countries were to send into their delegations climate scientists, environmental activists, visionaries and instead of competing to see who can do the least try to see who can do the most, raise the bar instead of lowering it. That's the problem with the mindset going into international climate negotiations, so I think it's going to happen by individual countries moving ahead. And it was interesting to me to watch this preparation for Copenhagen a couple years ago, on the one hand and then watch the Beyond Coal movement and the extraordinary momentum it was building in prohibiting new coal plants and preventing new coal plants and starting to close existing ones. It was almost as though there were two different worlds and two cultures but in the same country, and so my sense is that we are not going to negotiate a lot of international agreements to do this. I think individual countries are going to have to do this either because their governments move ahead or because the people begin to push the country in a certain direction which is what's happening with coal in the U.S. , and we see this elsewhere: David Cameron in the UK not long ago announced that the UK was going to cut its carbon emissions fifty percent by 2025. Now that's not 80 percent by 2020, but it's a big step in the right direction for an important country, and I think we're going to see more of that as voters and political leaders begin to understand what's happening.

Lester R. Brown>> On China, I think they have a pretty good understanding on global issues, but the thing that drives the Chinese leadership, the think that keeps the party in power, it represents only two percent of the population, is that for the party to stay in power, the economy has to keep expanding rapidly. It's like a bicycle—if it ever slows down, it's probably going to all over, and so the government is so committed to rapid economic growth because that's what keeps the party in power; without it, they will almost certainly not be able to stay in power, so it's an unusual situation, and it's a dangerous situation in many ways in terms of the effect it's having on climate for example, but things change rapidly sometimes, you know we hit these tipping points. Who among us saw the Arab Spring coming—who realized that almost every Arab country would be at least threatened by a political revolution? We didn't see it coming, but suddenly it happened, and the same thing can happen on the climate front; I think we're beginning to see it in the United States, and I think we may be much closer to a tipping point on climate in the U.S. than most people realize, because most people look at Washington, and Washington is not doing that much on climate, but I think we're going to see big changes.

Audience Male 4>> Mr. Brown, you are quite optimistic. Here in Europe, we are—many intellectuals are less optimistic than you, but it's very—it's nice to hear someone who is optimistic. Do you really think that the United States can be a leader in this change? Because we have the feeling here in France that the lifestyle, the American lifestyle is very difficult to change and is very difficult to combine with your Plan B. What do you think about this point?

Lester R. Brown>> On the question of are you optimistic or pessimistic is often asked, and I heard someone answer that by saying that it's too late to be pessimistic, and I think there's some truth in that. There's no point in sitting around and being pessimistic now, we have to do something, and doing something can translate into optimism. The interesting thing about the United States is that official Washington does not look like it's in a position to lead the world, but the things that are happening in

the United States, rather—many of them independently of Washington, like what's happening with the coal-fired power, Mayor Bloomberg in New York City and his personal actions for example—these kinds of things can be game changers, and I don't know if I mentioned, but coal use in the U.S. has dropped eight percent in the last three years; gasoline use has dropped five percent, and it looks to me as though they are going to fall even faster in the future. So in terms of carbon emissions, the U.S. is headed in the right direction now, and it's moving much faster than I think most people thought was possible, so before long I think the U.S. is going to become a model for other countries in terms of what we're doing to reduce carbon emissions. We have a long way to go, but I think we're headed in the right directions now, and I think we're gaining momentum.

Audience Male 5>> Yes, Mr. Brown, among the top five national security threats, I'm very surprised that you don't mention the financial system, because to me that's—because to me it has already started to collapse, and I think this is among the dangers, but that is probably immediate danger we are facing now.

Lester R. Brown>> The question is I didn't mention the financial system, and you're quite right; there are actually a lot of things I didn't mention because there wasn't time, but what I have noticed with the financial system is that in New York, you used to have large investment banks, and they would accumulate capital and look for things—productive things to invest it in—, and then somewhere along the way, instead of investing in things that would improve the quality of life, you know whatever sort of traditional investments they would make, they began creating new forms of paper and trading and playing games and got lost, and so they were no longer trying to invest in things to improve human welfare, they were playing this game which not everyone understood very well, and eventually the U.S. government, i.e. U.S. tax payers, had to rescue them—almost every one of them, and so then we passed legislation, but the financial community lobbyists so weakened that legislation that it may not prevent a recurrence of what we saw a few years ago, and that's scary, so I too am worried about that. That's yet another major and potentially imminent threat.

[*applause*]

[end of transcription]