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The Sixth Extinction: Elizabeth Kolbert on How Humans Are Causing Largest Die-Off Since Dinosaur Age

In the history of the planet, there have been five known mass extinction events. The last came 65 million years ago, when an asteroid about half the size of Manhattan collided with the Earth, wiping out the dinosaurs and bringing the Cretaceous period to an end. Scientists say we are now experiencing the sixth extinction, with up to 50 percent of all living species in danger of disappearing by the end of the century. But unlike previous extinctions, the direct cause this time is us — human-driven climate change. In "The Sixth Extinction: An Unnatural History," journalist Elizabeth Kolbert visits four continents to document the massive "die-offs" that came millions of years ago and those now unfolding before our eyes. Kolbert explores how human activity — fossil fuel consumption, ocean acidification, pollution, deforestation, forced migration — threatens life forms of all kinds. "It is estimated that one-third of all reef-building corals, a third of all fresh-water mollusks, a third of sharks and rays, a quarter of all mammals, a fifth of all reptiles, and a sixth of all birds are headed toward oblivion," Kolbert writes. "The losses are occurring all over: in the South Pacific and in the North Atlantic, in the Arctic and the Sahel, in lakes and on islands, on mountaintops and in valleys."

Transcript

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AARON MATÉ: In the history of the planet, there have been five known mass extinction events. The last came 65 million years ago, when an asteroid about half the size of Manhattan collided with the Earth, wiping out the dinosaurs and bringing the Cretaceous period to an end.

Well, we turn now to a new book that explores what scientists call the sixth extinction, the massive dying off of animal and plant life that is happening today. Up to 50 percent of all living species are in danger of disappearing by the end of the century. But unlike previous extinctions, the direct cause this time is us: human-driven climate change.

AMY GOODMAN: In The Sixth Extinction: An Unnatural History, New Yorker reporter Elizabeth Kolbert visits four continents to document the massive "die-offs" that came millions of years ago and those now unfolding before our eyes. Kolbert explores how human activity—fossil fuel consumption, ocean acidification, pollution, deforestation, forced migration—threatens life forms of all kinds.

The figures are staggering. She writes, quote, "It is estimated that one-third of all reef-building corals, a third of all fresh-water mollusks, a third of sharks and rays, a quarter of all mammals, a fifth of all reptiles, and a sixth of all birds are headed toward oblivion. The losses are occurring all over: in the South Pacific and in the North Atlantic, in the Arctic and the Sahel, in lakes and on islands, on mountaintops and in valleys," she writes.

Yes, Elizabeth Kolbert is a staff writer for The New Yorker magazine and one of the country’s leading science journalists. Her previous book, Field Notes from a Catastrophe: Man, Nature, and Climate Change, explored the science and politics of global warming.

And now you take this a step further, Elizabeth. Welcome to Democracy Now! To say the least, a chilling title, The Sixth Extinction. So, take it forward. What does that mean, exactly?

ELIZABETH KOLBERT: Well, as Aaron mentioned, there have been, you know, five previous—I guess we call them major mass extinctions, because I should say there’s sort of an oxymoron—you can also have a minor mass extinction—but five major ones that we see in the fossil record, the most recent being the asteroid impact that killed off the dinosaurs. And so now human impacts on the planet—burning fossil fuels, acidifying the oceans, cutting down the rainforests, just altering the surface of the Earth—moving species around has enormous effect. You know, everyone has heard of invasive species, but we are moving so many species around the world, we’re really sort of reverse-engineering the planet, bringing—in effect, bringing all the continents back together. So, all of these things have the unfortunate side effect of causing extinction.

AMY GOODMAN: Well, explain what you mean by reverse—by spreading the species around the planet.

ELIZABETH KOLBERT: Well, we—you know, just in ballast water, for example, just to take an example, it’s estimated that 10,000 species are being moved around in ballast water in our—

AMY GOODMAN: Explain what ballast water is.

ELIZABETH KOLBERT: In our supertankers, you know, they have these huge tanks of water ballast to stabilize the ship, and they contain lots of creatures. You know, some are very, very tiny. Some are less tiny. But you’re moving them around, and that has—from ocean to ocean, right? So, imagine, you know, pre-Panama Canal, pre-people, the Atlantic and the Pacific, if you lived—had evolved in the Atlantic or evolved in the Pacific, you’d evolved separately for many millennia, millions of years. You bring these lineages together, and it can have many impacts, some of which can be quite devastating. And everyone has heard stories of invasive species.

There’s a very famous story, for example, of the brown tree snake, which has been told, you know, many times. The brown tree snake was brought from Guam—was brought, I’m sorry, from New Guinea to the island of Guam, probably in military cargo in World War II. Guam had only one tiny native snake about the size of a worm. This snake had no enemies. It went, you know, crazy, multiplied like crazy, and ate just about everything that it possibly could on Guam, so now a lot of Guam’s native birds are either gone or very, very critically endangered. So that’s an example of what happens when you bring together organisms that have evolved separately for a very, very long time.

AARON MATÉ: On the issue of the oceans, would you say that it’s an overlooked part of the global warming debate, the impact of carbon pollution on the oceans? And what should people know about the dangers of humankind to the oceans?

ELIZABETH KOLBERT: Well, yeah, that’s a really big issue. And Jane Lubchenco, who was head of NOAA until fairly recently, has called ocean acidification global warming’s equally evil twin. And I think because we are terrestrial organisms, we don’t appreciate it as much. But a lot of our carbon emissions, so a lot of what we’re putting up into the air, is ending up very, very quickly in the oceans. It’s absorbed by the oceans, and when carbon dioxide dissolves in water, it has the unfortunate effect of becoming an acid. So we drink that acid, this very weak acid, carbonic acid, and you drink it when you drink Coke, but it’s still an acid. And you put enough in the water, and it changes the pH of the water, the chemistry of the oceans. And that’s what we’re doing. And that has, you know, potentially enormous ramifications, because obviously if you’re a creature whose only contact with the outside world is through the water, it’s a very big deal.

AMY GOODMAN: Tell us some stories that you learned, as you did this research from continent to continent, that most alarmed you.

ELIZABETH KOLBERT: Well, one of the trips I took, I got to go—sort of paradoxically, in, you know, chronicling this, The Sixth Extinction, I got to go to some of the most amazing places on the planet. And one place I went to was a cloud forest in the Andes. And we started out at about 12,000 feet on a mountain ridge and started hiking down the ridge. And one of the scientists I was with said to me, you know, "Pick out a leaf that has an interesting shape and watch it. And you’re only going to see it as we go down this ridge for maybe a hundred meters or so, because that tree has a very, very narrow range." Right? It only is adapted to this little band of altitude.

And I think what that lesson, and what he was looking at, why we were in the Andes, we were looking at these tropical species that tend to have a very narrow climatic range and the impact of climate change on these species. And I think that people are aware of the potential impacts of climate change on Arctic species. You know, everyone has seen the pictures of the poor polar bears, you know, as the sea ice shrinks. But really, where climate change could have an even more devastating impact is in the tropics, both because most species live in the tropics—that’s just where the abundance of life is—and also because these species tend to have a very, very narrow tolerance for climatic change. They’re used to a lot of climatic stability.

AARON MATÉ: You identify some key figures whose theories were initially mocked but have since been vindicated. Can you talk about Georges [Cuvier] and the Alvarez father-and-son team, and their findings and their work?

ELIZABETH KOLBERT: Yeah, yeah, it’s a really interesting sort of history of science, you know, story, a rare instance where an idea came and went, and came again. And Georges Cuvier was a great naturalist from the beginning of the 19th century, so right around 1800, and he was the first person to really say organisms go extinct. So, to understand—you know, to appreciate how important that was, when Thomas Jefferson sent Lewis and Clark to explore the Northwest, he hoped they’d find live mastodons roaming around. He really just couldn’t believe, even though he was very interested in fossils—he had a fossil room at the White House when he was there—he couldn’t believe these animals had gone extinct. It just wasn’t what happened. It wasn’t what the creator, you know, had planned for them. And Georges Cuvier came along and said, you know, really, essentially, if they’re out there, we would have seen them. We haven’t seen them: They’re gone. And he posited this whole lost world, which he then proceeded to start to uncover. So a lot of the animal names that we have now—for example, pterodactyl—he came up with. He was the first person to identify a pterodactyl. And his theory was that animals only went extinct in these catastrophic waves—you know, something happened, the planet changed; otherwise, why else would they go extinct?

And then a naturalist named Charles Lyell, who was Charles Darwin’s mentor, came along, and he said, "That’s ridiculous. You know, we never see these catastrophes. They don’t happen. Only—the only way the Earth changes is very, very, very gradually, and things go extinct very gradually, and the world changes very gradually." And that became sort of the doctrine for a very long time, over a hundred years, until the Alvarezes came along and identified an asteroid impact as the event that had done in the dinosaurs—and many other creatures, I should say. The dinosaurs always get top billing, but they—that extinction event did in a lot of other groups, as well. That was resisted; that theory was resisted. But it was proved, and now the sort of general theory is, you know, yes, the Earth changes very slowly, except for these extraordinary moments. And I’d say the whole point of writing the book is that we are in one of those moments right now.

AMY GOODMAN: Talk about the Panamanian golden frog.

ELIZABETH KOLBERT: The Panamanian golden frog is a very sad story. The Panamanian golden frog is a beautiful frog. It’s sort of taxi-cab yellow color. And it lived—it was considered a lucky symbol in Panama. For many years you’d see it on lottery tickets in Panama. And this is in a case of an invasive species. A disease passed through Panama, a disease that affects amphibians, and it sort of raced through. And people watched these frogs disappear, not just the Panamanian golden frog, but many frogs disappeared. And they, fortunately, had anticipated this. They could actually watch it moving through. And they took some of them out of the rainforest, and they’re now in a conservation center. They can’t leave. They can’t go outside. But they’re in this little conservation center in a town called El Valle.

AMY GOODMAN: I wanted to play for you a clip of Congressmember Paul Broun. He’s of Georgia, chair of the oversight and investigations for House Science, Space, and Technology Committee. This is video of him speaking in 2012 at Liberty Baptist Church in Hartwell, Georgia.

REP. PAUL BROUN: I’ve come to understand that all that stuff I was taught about evolution and embryology, Big Bang Theory, all that is lies straight from the pit of Hell. And it’s lies to try to keep me and all the folks who were taught that from understanding that they need a savior. You see, there are a lot of scientific data that I’ve found out as a scientist that actually show that this is really a young Earth. I don’t believe that the Earth’s but about 9,000 years old. I believe it was created in six days as we know them. That’s what the Bible says.

AMY GOODMAN: That’s Republican Congressmember Paul Broun of Georgia, denying climate change exists, coming up right now.

REP. PAUL BROUN: Now we hear all the time about global warming. Well, actually, we’ve had a flat line temperatures globally for the last eight years. Scientists all over this world say that the idea of human-induced global climate change is one of the greatest hoaxes perpetrated out of the scientific community. It is a hoax.

AMY GOODMAN: Those clips also highlighted on Bill Moyers’ program on PBS. Congressman Paul Broun is not only just just a congressman from Georgia, but he’s chair of the oversight—chair of oversight and investigations for the House Science, Space, and Technology Committee. The significance of what he is saying, both on the issue of evolution and climate change, Elizabeth Kolbert?

ELIZABETH KOLBERT: Well, it’s hard to overstate it. I mean, you have a situation where we really need to be taking serious action on climate change, and we’re still having this surreal—I guess I would use the word—debate over whether it’s happening or not. And I think a clip like that shows that, you know, people are really speaking entirely different languages. We’re just not even speaking to each other using—you know, we’re using English, but we’re not really speaking the same language. We’re not looking at the same—well, some people are looking at scientific data, and some people are not, let me just put it that way. And it’s very, very hard to carry on, you know, a reasonable and sort of post-Enlightenment conversation.

AMY GOODMAN: And what are the implications of this for policy?

ELIZABETH KOLBERT: Well, we all know what the—you know, we all see the implications for policy: There is no policy. So, you know, people have essentially given up in this Congress on getting any kind of meaningful legislation through. And the only hope of getting any kind of action on climate change now rests with the administration. And the administration, the Obama administration, knows that. Everyone knows that.

AMY GOODMAN: What needs to be done?

ELIZABETH KOLBERT: Well, you know, massive things need to be done. Obviously we need to start transitioning our whole economy off of fossil fuels. That’s not—that’s not a small thing. That’s a big thing. And if you were going to ask, you know, policy experts what we should do, they would say, "Well, we need some kind of price on carbon." Now, that is—that requires legislative action. In the absence of that, in the absence of putting a price on putting CO2 into the atmosphere, there are things the administration can do and that they are supposedly working on—you know, power plant regulations that would reduce CO2 emissions. But it’s very difficult to get the kind of action that we need without any hope of getting anything through Congress.

AARON MATÉ: On this issue of action, in 2012, David Suzuki, one of Canada’s leading environmentalists, told Democracy Now! that we need a radical shift in our economic system to save the planet.

DAVID SUZUKI: We need to shift that to a better understanding that we are part of a vast web of interconnected species, that it is the biosphere, the zone of air, water and land, where all life exists. It’s a very thin layer around the planet. Carl Sagan told us that if you shrink the Earth to the size of a basketball, the biosphere, the zone of air, water and land, where all life exists, would be thinner than a layer of Saran Wrap, and that’s it. That’s our home, but it’s home to 10 to 30 thousand—30 million other species that keep the planet habitable. And if we don’t see that we are utterly embedded in the natural world and dependent on nature, not technology, not economics, not science—we’re dependent on Mother Nature for our very well-being and survival. If we don’t see that, then our priorities will continue to be driven by man-made constructs like national borders, economies, corporations, markets. Those are all human-created things. They shouldn’t dominate the way we live. It should be the biosphere.

AARON MATÉ: That’s David Suzuki speaking at the Rio+20 Earth Summit in 2012, the 20th anniversary of the first Earth Summit. Now, your book leaves the issue of what to do largely up to the reader, but I’m curious, in your research and in speaking to scientists, to people out there working with biodiversity, whether you came across any thoughts on whether our very economic system is tenable, one that subordinates resources to profit, whether people feel that we also need a fundamental shift in how we organize our economy.

ELIZABETH KOLBERT: Well, I think if you’re out there in the field with scientists, they will say something really big needs to change, you know, if we just continue on the same trend lines we’re on, that a lot of things, including potentially ourselves, are in deep, deep trouble. But scientists don’t tend to, you know, get involved in the question of whether we need to reorganize our economy. I’m going to be, you know, frank with you: When you’re out in the Andes, that’s not the topic that they’re discussing.

But what you do hear them say, you know, a lot is that we need to—we’ve already set so many changes in motion, right? I mean, climate change is occurring; whatever anyone in Congress says, it’s occurring right now. You can watch, and scientists are watching, tracking species on the move all over the planet, trying to track the climate as it changes, so either moving upslope or moving toward the poles. And to the extent that we can preserve any parts of the planet that are not being chopped up or chopped down, so that we can allow species to move where they need to go, to track climate change, that is one thing that we can do, even as climate change unfolds. And unfortunately, climate change has been set in motion so that, really, though we desperately need to reduce our carbon emissions, we’re not stopping that process anytime in the near future, so that we need to start thinking about, you know, a world in which everything is on the move and preserving corridors that things can migrate through.

AMY GOODMAN: I mean, one thing that might unite people is, whether they disagree over the issue of evolution and climate change—and I’m not talking about scientists here, since the mass—

ELIZABETH KOLBERT: Yeah, that would be tough to find one.

AMY GOODMAN: —mass consensus of scientists around the world believes that humans are causing climate change—but are these issues, like in West Virginia and North Carolina, when you have unregulated industry, fossil fuel industries, that are destroying these states. I mean, the fact that there was this major hearing yesterday, and none of the health—the officials in West Virginia could say whether the water is safe, kids being closed out of their schools one after another because the water is smelling like licorice. And then you have Duke Energy in North Carolina and this terrible spill that has polluted so much of the land there.

ELIZABETH KOLBERT: Well, I also think another thing that can unite people, you know, despite the clips that we just heard, is, you know, we are—we are caring. You know, these are all our fellow creatures on the planet. And the pope, for example, is working on an environmental encyclical, I read, and he has a great quote from just a couple months ago, where he said, "God always forgives. People occasionally forgive. But nature never forgives. You drive a creature extinct, that creature is not coming back." This is, you know, not me; this is the pope. And so, I think that there is a potential—I do think people care. You know, basically, it cuts across a lot of different ideologies and groups about, you know, this planet. As David Suzuki said, this is where we—you know, this is your home. And if you don’t care about that, you know, what do you care about? It’s hard to fathom.

AMY GOODMAN: Elizabeth Kolbert, we have to break. When we come back, we’re going to switch gears—

ELIZABETH KOLBERT: OK.

AMY GOODMAN: —because you also wrote a very interesting piece in The New Yorker on the Port Authority and Governor Chris Christie. Latest news out of New Jersey: Many more subpoenas have been issued as the governor is on the run around the country—let’s put it that way. I don’t know if he would describe it as on the run, though many have, as he heads up the Republican Governors Association trying to raise money for the Republican Party. The money is being raised, but not a lot of candidates are interested in having their pictures taken with Governor Christie—quite a change from just a few months ago. Our guest is Elizabeth Kolbert. Her new book that was just published today is called The Sixth Extinction: An Unnatural History. Stay with us.

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