

Program Information:

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Good evening. I am Stewart Brand from the Long Now Foundation. We are going to have a vote shortly so I am going to need lights up in the house or we won't know who won. Our next speaker you should know is on the Wednesday, May 21st, it's Iqbal Quadir who is the guy who started the Grameen Phone in Bangladesh which started the cell phone revolution which is bringing about two billion people out of poverty these days. And his theme is that that works for technology across the board, Technology Empowers the Poorest. After that my old teacher Paul Ehrlich in June 27th. He has taken on a new field in his 70s which is Human Cultural Evolution and he'll be talking about that, I think for first time in June. Now the idea of the Long Now actually its size was determined by Peter Schwartz who is here in the middle seat, that it's 10,000 years have passed because that's how long we have been doing agriculture in towns and domesticating animals and ourselves and things like that. And the next 10,000 years the idea that whatever the story is we're right in the middle of it, not at the end, not at the beginning we're right in the middle. One of the peculiarities is this odd asymmetry between the last 10,000 years and the next 10,000 years, past and future of different animals. And they have different disciplinarians who teach us about them, and very few in fact I think no futurists have actually had historical training; is that right Peter? Yeah there you go, and not that many historians even want to speak about the future, though we have one tonight. So there is a philosophical, epistemological, disciplinary mindset between these two areas which is quite different. And so tonight we have leading practitioners one of each. Now the way these Long Now debates work, we have had one. So it's now a tradition. Is the audience decides who goes first, that person then comes up here and holds forth for exactly 15 minutes and goes and sits down and is interviewed by the second speaker for 10 minutes, just basically drawing them out, it's not a debate point making deal, it's an interview. And then that person who is doing the interview has the job of summarizing the first speaker's argument to that person's satisfaction. And then they reverse roles. Second speaker comes up for 15 minutes, gets interviewed for 10 minutes, and so on. All this time some of you will be writing questions, I hope, which will be forwarded up to Kevin Kelly who will process for the best ones and bring them up to me, I'll be up here on the stage and at that point and throughout the questions we will be keeping questions coming up, you guys are in the thick of it as well. I have been asked to give some framing for how to vote, and one is a historian, one is a futurist. The existing

entity that in a sense both are dealing with

is this recent book by Niall Ferguson called *The War of the World*. It is about the 20th century, and it is a dark, bleak grim book;

The age of hatred is the subtitle, in England not here. And Peter Schwartz's books tend to be things like inevitable surprises, the art of the Longview, one called the Long

Boom and they are all future oriented. So we are about to have a vote and you are to "you should be thinking about what you want, not join some title flow

but actually you know do your vote, it will be a hand and if you want to say something you can, and I don't know which one will go first. Okay who

want Niall Ferguson to go first? Alright hands down. How many want Peter Schwartz to go first? I make that as slightly less, do you guys agree that Niall is

won the vote, do you think Niall won the vote? Or we could do this like the democratic primary and just "Niall you ignorant slut.

Niall you are on, good luck.

Thanks very much. Well, well it's a great pleasure to be here, I am a huge fan of the Long Now, we have been trying to make this happen for some considerable time and I can only say it's a great honor to be on the same stage as Stewart

and Peter, since time is not on my side. I am now going to cut the flattery and get straight to the point. There is one thing that I think Peter and I agree on and that is that there is

ladies and gentleman no such thing as the future, there are only futures; plural. However there is only one past, albeit a past which can be interpreted in multiple ways. Now I want to explain

to you what the past is and then what is history is. The past it used to be said is another country, that's not true, it's another planet. And it's a planet inhabited by the dead. And the dead outnumber us massively. According to the population reference bureau from

50,000 BC, when Homo Sapiens first appeared until the 1990s, I haven't updated the figures; a hundred billion human beings have been born. So the current world population is about six

percent of all the human beings who have ever lived. And the past is that other planet where the dead majority lives.

What historians do is to try to understand that planet, what they can do and I want to be very clear about this, they can't establish universal laws of

social or political physics with reliable, predictable paths, there are two reasons for this. The first is that there is no possibility of repeating the experiment

called history. The sample size of human history is N=1. The other problem is that you can't really have physics when the particles have consciousness,

particularly the kind of consciousness that human beings have evolved which interestingly enough turns out to be especially skewed when it comes to

understanding the past, our heuristic biases are very bad when we try to access past events. So that's what historians can't do. But ladies and gentleman they can do some important things nevertheless. They can do is "first they can analyze and interpret human experience in the past at multiple levels. We

can go from the micro, the individual's experience, to the macro, the entire experience of

humanity, over short or long time periods. It's a very flexible discipline in that sense. And we work in a certain rough and ready way, that's not such a bad thing. We can with a rather coarse grained approach. We can draw analogies between different situations in the past or between situations in the past and situations in the present.

For example we can quite easily make comparisons between financial crises over time. They have certain common features even although now two can be said to be identical. The same goes the geo-political crises and wars. The other thing that historians can do which is quite clever in my view, though hardly any of them do it, I do it compulsively, is we can imagine or simulate alternative pasts, and I use the term advisedly, because there is only one past, fake pasts that didn't happen, but might have. They're a terribly important device for understanding what did happen. It was the great

Louis Namier who once said that historians could only really be said to be doing their job well if they had an instinctive sense of what didn't happen.

Part of the point of my book *The War of the World* is to explore a particularly important counterfactual scenario, and needless to say we have jargon

for this procedure of what if question. What if World War II had broken out in 1938? That's at the very core of the book, I

am not giving up away too much when I say that it would have been a shorter war and many many fewer people would have died. But now the critical thing to understand is how historians do what I have just described, how do we do it? Well the answer is that we commune with the dead, we do.

Sounds quite weird when I put it like that. To be honest being a historian is a rather morbid, possibly psychotic activity. I genuinely prefer the company of the dead. I spend much more time with dead people than with people like you. And I am sure future psychologists will explain this in ways

that are not favorable to me. Have I have a rationale for this, of which I will explain. R.G. Collingwood who is one of the great philosophers of history

produced by my old university Oxford, once said in his wonderful brief autobiography and I quote, "Historical knowledge is the reenactment of a past thought encapsulated in a context to present thoughts, which in contradicting it confine it to a plane different from theirs." That's actually the single most important sentence ever written about historical methodology in my view.

We are reenacting past thought; we can only do this by communing with the dead through the records that they have left of their past thoughts. What did it feel like to be an ethnic German in central and Eastern Europe after 1918? That's one of the questions that I try to address in *The War of the*

World. But historians don't just do that, the other thing that we do simultaneously in a completely different methodological way is that we try to infer what Carl Hempel called covering laws about the way that the human past is operated for mainly quantitative data. There is a kind of rough and ready covering law at the heart of *The War of the World* and it goes like this. If you have simultaneously Economic volatility, Ethnic disintegration

and Empires in decline - each of these begins with the letter E which makes it easy to remember. Then the probability of a high level of organized

lethal violence is significant. Probability not certainty, this isn't a law, it's not a model, in the way that social scientists would tend to - to think. It is just a statement of a rough regularity. Take these things together, Economic volatility, Ethnic disintegration and empires in decline and violence is likely to be significantly higher than under different circumstances.

Now what do futurists do? If that's what historians do in a nutshell. The answer is that they infer future scenarios on the basis of past examples and past

data but without necessarily acknowledging that the knowledge is their drawing are historically inspired. They claim to be concerning themselves

with the future, but in reality they are as much concerned with the past as historians because what else do they have to go on. It's not the power of prophecy

with which Peter is endowed. What he is trying to do is infer from the past, future plausible scenarios. Now, I don't think that's a bad procedure and I

want to make it clear that this is not the House of Commons and I am not here to oppose of the thing he says. On the contrary we in fact have much in common

and being asked to do this forced me to ask myself what we agree about, we've known one another for at least 10 years, and much of the time we are in almost

beautiful and perfect harmony. But it seems to me there is a methodological problem, that Peter, not being a historian, may underestimate about what he

does and the problem is this, if you are constructing future scenarios on the basis of past data without adequate historical training you are more likely to

be susceptible to the kind of heuristic biases that I mentioned before.

Peter's scenarios are in fact as he himself acknowledges plots for unmade movies, that is what they are. And it seems to me that they are inspired as

much by his own personal predilections as by any very rigorous assessment of past data. I

won't go through the full list of heuristic biases of which I think

he may be guilty though it is quiet tempting. I want to "because time is limited, give you a tale of five futures, the two futures that are implied in my

book, of which I made explicit in an article that was published in Foreign Affairs shortly after the book was published. And the three futures envisaged in

Peter's book the "Art of the Long View". My future is very simple. I make the point in "The War of the World" that we can learn from the history of the

20th century that scientific and economic progress does not reduce the risk of organized lethal violence. On the contrary, despite the advances that we

made economically, scientifically and otherwise in the 20th century we prove to be capable of unprecedented levels of murderous behavior. We should

learn from this, that globalization is vulnerable, may even generate its own destruction. That there is a potential for conflict regardless even of levels of

education, and that the three things I mentioned earlier, Economic volatility, Ethnic disintegration and Empires in decline, can still cause high levels of violence in our time.

The implicit second future, is that we learn from history and make sure or at least endeavor to make sure that

these things do not coincide again, in

other words, aware of the fragility of the order we call globalization, we do our best not to have a 1914.

The Art of the Long View is a wonderfully

stimulating book and deserves all the praise that has been heaped upon it and it contains three future scenarios, for the period between 1991 when it was

written and 2005. And it's fascinating to read these now, three years after 2005, the three scenarios, Peter favors three rather like the UN with its

population projections, there is a cheerful, there is a gloomy, and there is just right "the Goldilocks future. The three futures have - some of you will

doubtless know from your reading, the following titles, new empires, market world and change without progress. I am not sure which movies inspired

the first two, but he admits that the third, the pessimistic one, was inspired by *Blade Runner*.

It's clear that of the three the middle Goldilocks projection has come closest to being right. It is a kind of vision of globalization and there's much in it that I admire and understanding of the way in which computer micro-

worlds, he uses a term that hasn't really caught on, would transform the way in which the world works. There is even a 1997 financial crash "full marks,

However,

there is a missing elephant or rather giant Panda. In scenario one, China "goes its own way preoccupied with territorial disputes with India." In

scenario two, China causes a financial crisis by defaulting on its debts to Japanese banks. And scenario number three, the Blade Runner scenario, China

fights a major war with India using Pakistani weapons. The only thing that I can find to salvage this story is that China in scenario three "exterminated the

Tibetan Independence Movement." Well that, to me, may turn out to be dead right. But everything else that Peter wrote about China in his best selling book

has been wrong. And to be wrong about China is to be wrong about the single most important thing that has happened since 1991. That seems to me

to illustrate, not the perils of being Peter Schwartz, on the contrary, it illustrates the perils of being a futurist.

The inherent impossibility, of making predictions about a system as complex as the world of human beings, could not be better illustrated, than by this

glaring omission in all three of the scenarios in *The Art of the Long View*. How can we work together? It seems to me we can work together, that

futurists can learn from historians and historians from futurists. I think our best hope is to make historical enquiry more rigorous than it is and I want to

make it clear that I don't, in fact, regard my profession as particularly impressive when it comes to standards of scientific and scholarly rigor. Historians

need to know more about Chaos Theory. They need to know more about complexity theory. They need to know what a power law is and they

particularly need to understand evolutionary biology. They need to learn from the sciences much more than they do. Here I think we would be

in complete agreement. But I want to conclude, ladies and gentlemen, by suggesting that futurists really do need to learn from historical method. They

need to understand better that point that Collingwood made. That it's not enough just to understand the world as some kind of hydraulic system. It's

important to get inside the heads of the dead, and if you don't do that it seems to me your future scenarios are likely to be worth rather less than the

paper that they're printed on. Thank you very much indeed. Hope I wasn't too-

Okay I will first of all thank you, both for the flattery and the critique. So I have a few questions to see if we understand, first of all

what you're saying. I want to come back later to the questions of your view of the world and where it's heading and so on which you touched on as

well. But I want to spend a few minutes on what I think was your most central point which is the issue of how we think about the future and what the nature

of learning from history is. So first question you alluded to heuristic biases and you know you said, well you could enumerate them and be it fairly

explicit about them, please.

Well where to begin? Well one of the greatest problems that we have from we're thinking about the future is that, we are attracted to certain scenarios more

than to others we have a certain confirmation bias; I'll illustrate this point with another part of your book. You were strongly attracted to the importance of

the teenager, and the global teenager is a key player in your book. I think that's a classic product of a strong prior that you instinctively felt this was

important because you were once a teenager when teenagers mattered. It would be typically a baby boomer who thought that teenagers would continue to

matter. They don't matter, they became less and less important with every passing year. The demographics, not only of the United States, but of China

itself, make teenagers increasingly unimportant as a group. But because you had a strong prior in favor of thinking they mattered, you wrote a whole

chapter about the global teenager and I strongly feel I strongly feel that the global teenager is a minor player compared with the global oldie. And I

would certainly you know say that having addressed the major benefactors of the Hoover Institution this morning, who are the global oldies.

That's a good example, okay another point you made which I think is actually quite profound and worth exploring for a moment I think. Because you

you know, I think time was running down and you touched on it without exploring it further. And that is what the sources of learning in a sense for the

historical community in terms of being able to look at novelty and new things like the frontiers of science and so on, and you touched on a few of those,

biology, complexity and so on. Expand a bit more how you would see those kinds of ideas coming to play in the world of history. Because I think it is a

challenge you know brining these worlds together.

Well it's most easy to do if you are, like me, concerned with economic and financial history Peter, because that there is no question that when it comes to trying

to understand financial crises. There are all kinds of benefits to understanding complexity. That's that to say that in many ways financial systems do

behave a lot like complex systems in the natural world. That the regularity of financial crises does not follow the bell curve normal distribution, they are

very fat tails in the history of finance. And this is a recurrent feature that takes you all the way from the South Sea bubble of 1720 to the present. And

so simply understanding a little bit about distributions of extreme events, understanding a little bit about how systems can become critical seems to me absolutely essential if you want to, if you want to understand how financial crises occur. That's actually more helpful than understanding the theory of modern finance as exemplified by the Black-Scholes Formula because actually the theories of option pricing is based on a completely false notion about the distribution of financial outcomes to the effect that it does follow the bell curves, so that's one example. Chaos theory was something that inspired me when I was writing a book called Virtual History, because I was acutely aware of the sensitivity of political and social systems to initial conditions and the proverbial butterfly flapping its wings can cause the hurricane at the other end of the earth. It's important that historians understand this because historians have their own heuristic biases. Please let me make that clear, one of our heuristic biases is that we really do want great events to have great causes. We hate the idea that a war as big as the First World War could have origins that date back no further than July or June of 1914. We want big origins for big wars. We want the origins to be in at least the 1890s maybe even the 1870s and I have read books that date the origins of the First World War back to 1815 which is a hundred years before it broke out. Now that seems to me to be based on a fundamental misunderstanding of the historical process, that a small misjudgment, and I think there was a small misjudgment on the part of political actors in European capitals in 1914, sufficed to cause four and a quarter years of carnage. One last thought which is particularly important to me at the moment is understanding evolutionary biology. If you are writing, as I am at the moment, a history of world finance, or rather a financial history of the world I think that's a better way to do it. You can plug the name of the book, it's ok. Which is going to be entitled 'The Ascent of Money'. If you are old enough you will remember Bronowski's Ascent of Man, an ironic pun on that, 4000 years of financial history strongly resemble the history of evolution in the natural world. Almost all there - there are great dyings, there was speciation, there was natural selection. And one can think, therefore, of the story of financial history as a very compressed evolutionary story. There are differences some of the mutation is conscious, Lamarckian not Darwinian, but nevertheless it seems to me a very helpful way of thinking about it, profoundly important historical process, I hardly need to say how important it is this year. I might say Stewart and I are big fans of a book called 'Why Big Fierce Animals Are Rare' which is all about in fact precisely that kind of evolutionary thrust. Okay pushing on you, you, moving now across in some sense the boundary between methodology and substance. You said something I think very important but it was in the context of alluding to methodological issues and that had to do with the notion in the future, your view of the future, was simple, that science and technology had not reduced the risk of increasing violence. But you also have a clear example in modern history of mutually assured destruction in which we avoided the Cataclysmic war. How do you deal with

the differing effects of science

and technology in that arena as well as others that may have reduced the levels of violence from, as a result of economic progress and better health

care, water, environment all those kinds of sources of conflict that emerge from advances in science.

Well, There are two ways of thinking about this. One is that mutually assured destruction might easily have led to mutually assured destruction and it only just

failed to by a hair's breadth on at least two occasions, I mean one can't, again allow the retrospective fallacy to turn the Cold War into the Long Peace. I am certainly

old enough to remember how very unpeaceful it felt to be staring the abyss of nuclear destruction in the face. I must say that the more one

thinks about the history of the Cold War, the more one becomes aware of how close it came to disaster, particularly in the Cuban missile crisis. And

although the stakes weren't quite so high in 1973 the nuclear arsenals were substantially larger so the risks were even more terrifying. So I am

not sure I buy the idea that just because post-hoc, there was no Third World War, ergo-hoc therefore it was because deterrence worked. I think we were

lucky. A 1914 could have happened, in the early 60s or the early 70s. The other way of looking at it is that of course there was a Third World War. It was

just, and this is a point I make in *The War of the World*, it was the Third World war. That having established arsenals that were too powerful to

use on each other, the super powers waged a war that was just as destructive in terms of human life as the First World War, indirectly by proxy, through

a succession of Third World countries. And so in a sense the volume of violence didn't decline in the world after the invention of the atomic bomb. It

it didn't decline in a substantial way. By the end of the century there was still the potential for genocide and it could still be carried out with extremely

primitive weapons in countries like Cambodia or Rwanda. So that's the double argument that I would make.

Well, actually you in your answer you actually answered my last question as well, because you had alluded to the forces of economic volatility,

ethnic conflict and empires in decline as the powerful engines of violence and expressions of hatred, etc. And the question I really had for you was what

was the difference between the first half and second half of the 20th century and you are basically saying if I read you right, "not much".

Yeah, location, location, location. That was the difference, because all that happened was that the violence which in the first half of the century was

heavily concentrated in Central and Eastern Europe and Manchuria, Korea. There are these two great killing zones at each end of Eurasia. These

zones finally become off limits in the early 1950s. Germany and Korea are partitioned and realized that fighting over these areas is in some ways

too destructive to happen again. But the violence has just moved, and takes place in Guatemala, in Cambodia, in Angola and so on. So that's the

simple answer. And of course why my first gloomy scenario about the future is that this could happen somewhere else. And the obvious place

today where there is economic volatility aplenty, ethnic disintegration in full swing and an empire in decline is of

course the Middle East.

Thank you.

Now your summary.

Okay, well it seems to me you are "you are talking about two obviously related sets of ideas. And the first has to do with how one thinks about the future. I think the wonderfully eloquent description of the planet of the past, very hard to get to, we don't know yet how to travel there and so we can only get there by empathy as it were. And I thought the "the empathy with the dead was a very eloquent way of putting it. I think you also clearly challenged how we think about the future in terms of the depth of understanding of history, and what one can draw from an extremely complex, rich record and what meaning one draws from that. And particularly I think you know "and one of the things that I admire about your work is the willingness to consider and learn from alternative interpretations of the past, different ways of thinking about what happened and what might have happened as you did both in virtual history and at various points in The War of the World. I think you also rightly drew attention to the source of novelty that ought to inform even historical thinking when one draws conclusions for the future and that is sources of new knowledge from the sciences and so on. And I think you identified several that I find particularly important by logical thinking and evolutionary thinking, complexity and chaos and that line of thought. I think obviously you also had a critique I think of some of my work. You know I think "and I will come back to particularly the issue of China and how and why. But I think it is indicative of something which you touched on and which I will come back to when I speak. And then finally I think you also provided a framework for thinking about the recent history of the last century and what it implies and particularly the focus on these things. And I think this "this was new in your book. I don't think people had put this particular story together of these three forces of economic volatility and its impact on societies and the social fabric, the impact of ethnic and religious conflict and its virulence and depth and the inability of empires to manage the world as it where and sustain an order, in both the decline of Britain and the failure of the US to rise to the imperial challenge. And that that leads one to ask serious questions about what may happen not very far ahead, particularly looking around what we see as events like financial crises and wars in Iraq.

I am told I am supposed to say you got it at this point. But as I never say you got it under any circumstances, what I will say is "yes but there is a "a couple of points that I would like to just throw in. "You got it "my foot. One of them is actually self criticism. I wondered if you had spot the flaw in my argument, perhaps somebody else has. I don't think I can convincingly show that you would have got China anymore right if you had been a historian.

Well, I am going to make that argument myself.

Rule number one, I am from Glasgow. Get your retaliation in first. I wouldn't make the other point, you're probably gonna make it, I should leave you one.

Go ahead, go ahead, go ahead-

No, no I will leave you the other one.

Are you basically satisfied?

Oh, I am always "I am always satisfied with what Peter says that was that was a mere quibble. Can I borrow your pen Peter, I don't have one.

I borrowed it from Stewart; please. I said to my wife Kathleen when we came over here, I am "I am either brave or very stupid to take on Niall

Ferguson. You have seen why I feel really honored to be on the same stage with Niall, I truly admire his work, I have read I think everything since the

Pity of War. Most of us who write nonfiction wish we could write books with such scholarship, depth, originality, elegance of prose; they are real page

turners. He always makes me think. And I highly recommend reading The War of the World which you can buy out there. And indeed this debate

came about from a dinner that Niall and I had about 18 months ago while I was beginning to work on a new book. And that book was optimistically

titled the Case for Optimism. I had just finished The War of the World, and was shattered. It really challenged my thinking as each of his books has

done, forced me to reflect on my basic assumptions about where we were headed and what it meant, and it basically stopped my book. I said alright, I

have got to confront the issues that Niall raises in his book and really think them through in a very fundamental way. And I have spent the last eighteen

months doing that. So in a sense you are part of my thought process, by having this debate I have forced myself to reach some conclusions about the

arguments which Niall so eloquently made in his book.

And as Niall rightly puts he does alternative past, I do alternative futures, but here is where I want to take a small line of difference and that is that "well you know you talked about the Land of the Dead, well we futurists have imaginary friends; imaginary friends

in the future as it were. And that is that we on the one hand really do need to do good history and I will allow that from time to time, we fail in that. But I spend most of my time

reading either history or science; the things that changed the future, the frontiers of the new. And you know we have to live in science with the laws of

physics, there is no real "beat me up Scotty", but you know yes to the flip phone, we have what Star Trek saw then, so imagination sometimes works

and Niall unlike most historians brings imagination to his task. That "indeed what part of the virtual history task is. And indeed in the case of China, mine

was a failure of imagination, not a failure I think of history. In fact we are probably too bound by our view of the limits of how much China could

evolve. And if anything I would say many of my historic mistakes have been not from a failure of good historical analysis but a failure of imagination. But

I will allow both of those frankly, because I have made both classes of mistakes.

So now let me turn a bit to how we think about things differently, in particular with respect to the book and some of the arguments which you have

made about what's shaping modern times in history. And I think if I would characterize a very simple framework for thinking about how I think you see it

versus how I see it, and which leads to different scenarios is I think you see the momentum of history as on a kind

of downward slope or at best flat,

with the possibility that we could get it right and reverse direction. And I on the other hand see the momentum of history basically on an upward

trajectory with the possibility that we could get it wrong and head down. So your uncertainty is mainly on the upside and mine is mainly on the

downside. And in fact I agree with everything in The War of the World until we get to the epilogue, which is what deals with the last fifty years. It

basically the book brilliantly covers the run-up to World War I and all the way through the Korean War as one in a sense continuous context of

conflict. And this and you touched on this I think in your remarks, has to do with how we view the second half of the 20th Century versus the first half.

I think you see them as mostly not very different, and I see them as the second half as representing real progress, where we have meaningfully fewer

deaths for example. In the first half I think in the book your number's 160 to 180 million, second half it's closer to 10 to 20. What that

means is that the first half of the century we killed off somewhere on the order of five percent of humanity, one in twenty. In the second half it was

one sixth of one percent.

Now if you were you know the mother of the soldier who died among those, or the family that was raped in Bosnia, that matters a lot. But I submit

that there is a huge difference between killing one in twenty and one sixth of one percent. And part of the reason is that we made real progress in human

institutions that constrained the violence, that limited the conflict, part it was mutually assured destruction, but part it was the rule of law that limited

particularly transborder conflicts to very few. Most were civil wars and they were ethnic and violent and particularly ugly. But I submit that nothing

reached the levels of the Holocaust in that respect in World War II. We also have much wider prosperity with vastly more people enjoying the benefits of

progress and much more freedom and democracy in many places, and by the way there is also more eco-friendly. So you know we have seen a lot of

progress. So unless we blow it we have a chance of getting it better. But I will say this. I want to set the bar even higher, because something you

don't touch on your book, which I think is now an issue for the future, is climate change. And so that could be another set of sources of conflicts and if we

don't deal with that, then we are leaving something very big. If the China was the elephant of the last decade climate change is the elephant of the decades ahead.

So I think there are real powerful forces for progress. And if we think about the last 30 or 40 years we have seen enormous changes that have

surprised us. The rise of the women's movement and how it transformed the role of women in America. So today four out of five Americans say they

would vote for Hilary Clinton without thinking about you know it's not 100 percent, but it's 4 out of 5. We have seen the population bust. We have

lowered the population expectations for the future. We saw the end of the Cold War, basically Soviet Union said, "Eh, not worth fighting anymore," gave

up, went away without violent revolution. And we have seen the dramatic transformations in China. All of these things have left the world in a much better place, and very hard to have anticipated. I got it wrong in China. So it is this sense that we can make very real progress. So if we think about the issue of prosperity. We have a long history of increasing prosperity. More countries are in the game. First it was the US, Europe, Japan; now China and India, lots of new technology that increases productivity, knowledge is spreading around the world, Wikipedia is the best new anti-poverty tool we have ever seen, spreading access to knowledge everywhere at essentially no cost. We see the difference in places like Singapore versus Nigeria where knowledge drives growth and resources fail you. So many more people have a stake today in the system in preserving what we're doing. And indeed I would argue that even today's financial crisis; one possible outcome is real reform, again part of the learning process of our system. I think the second big thing is that we have learned how to contain conflict. We avoided the big nuclear war. We have had very few real trans-border conflicts. So we are "have been involved in one right now. We have more means for intervention. And a great example of getting it right is what " is going on today in Kosovo. Here's Kosovo declaring independence " and oh by the way the last time this happened there was wholesale slaughter. This time, as a result of the previous intervention, we are not doing that. The Serbians aren't slaughtering the Kosovars, because they learned something along the way. They will get hit if they do. And so " in fact the system of intervention and prevention of conflict is working. We see it happening. And I think we will be chastened by the Iraq war, you know. We are going to find that Unilateralism doesn't work. So we are seeing improvement in the international security systems, improved governance, more and more countries are better governed. China and India today compared before, maybe even Russia. New regional governing structures, the EU the OAU, global level the WTO, Security Council, IMF, World Bank, NATO. And in fact one of your articles recently which I loved " and reading Niall is a real delight regularly, publishes a great deal, you talk about a world of powerlessness and that could become anarchy. And " like the Dark Ages. But in fact I see " and this goes back to the notion of complexity " a complex network, adaptive learning systems, bottoms up emerging system, not top down imperial system of many actors, governments and multinationals, small businesses, NGOs, supernational institutions, in a complex web of power, not an empire. And then finally the climate challenge which I put on the table. You know this is a very urgent issue. Some of you were here last year when I debated Ralph Kavan on nuclear power; I think this is a global crisis of great urgency. And it's not hard to imagine how it could become a source of conflict; the history could easily be there. Imagine if the Tibetan highlands begin to dry up, the Mekong begins to dry up, the Chinese dams begin to affect the Vietnamese downstream, and this is " you know here we have the exact ingredients, you have talked about the Vietnamese and the Chinese don't like

each other very much, and you could imagine a conflict over access to water.

On the other hand climate change could be the shared threat that really unites us, that it creates a new environment for collaboration. China and India and in the United States face the same challenge. We have huge technological resources and capabilities. I can easily imagine the scenario that we work together rather than work apart, rather than conflict it's collaboration. And that has happened in recent history as well. So I think many of the technology options in a world where we both want more electricity, more cars, are a plausible scenario, and particularly given the outcome of this election. All three candidates are in favor of dealing with climate change. We could see a fundamental change in the very near future.

So I see a very different future than I think that dark future that is implicit in The War of the World. I see a positive second half of the 20th century, leading to a remarkable 21st century, not Utopia but continued progress you know. I can see it being driven by increasing global integration, technology progress, the challenge of climate change and sustained economic growth with some ups and downs, but doubling per capita income by 2030, not at all implausible. New technologies like synthetic biology leading to a new industrial revolution. We had Craig Venter here last month, talking about how we were going to re-invent the industrial society and be able to essentially make the next several billion people rich without destroying the world's ecosystems eco-systems using new biological production methods. In fact we just "at a meeting the other day seeing literally the first bacteria producing diesel fuel, bubbles of diesel coming out, basically these bacterial shit diesel, and not a distant dream, but already out there today. So we could see major development in the new infrastructure of clean energy. It's a bit like war in that respect, but a war on climate change that spurs growth and leads to high employment leading to narrowing income gaps. See growth in China continue to widen and deepen maybe even spread to South America and Africa. US would back off perhaps our missile base in Europe that's pissing off the Russians. A big thing is the question of how many of the countries really work within the systems of international institutions. And one could even imagine the evolution of new security organizations that come out of NATO, including the BRICs Brazil, Russia, India, China; maybe even a new global EPA coming out of Asia. These things could contain and limit ethnic violence, perhaps even begin to shape new forms of support looking toward Africa and Latin America. The brilliant new book by Paul Collier called The Bottom Billion, in which he argues that we need the equivalent of a Marshall Plan for the poor of the world. And this includes not merely aid, but also security support, because obviously what's happening in Africa and big parts of the world are the kind of conflict that I think you talk about and without support security structures it will be impossible to have levels of development. But all of that happens best in a multilateral context which I think can actually develop.

So I think you can see how the momentum of history I think the last half of the 20th Century perhaps may carry us forward toward greater progress.

And perhaps at mid-century we would look back and say, the world is more peaceful, prosperous, equitable and sustainable. And we would thank Niall

Ferguson for making clear what the hurdles were ahead. And fortunately we would find that unlike his pessimism we were actually up to the challenge

and a better world was the result; thank you.

Well, it was a great pleasure to listen to Peter. It's my duty now to throw some questions at you. My first one is your faith in technologies is of course

critical to your argument. Isn't one of the difficulties that war was in fact the great driver of technological innovation in the mid-century and far from

clear that the technology necessarily and always has benign, pacific outcomes? In fact technology is strangely neutral about our future as a species. It can

be as capable of destroying us as of enriching us and making our lives more comfortable. How would you grapple with that Janus faced character of

technology in human history?

Well I think you are right. I mean it's a both end. In fact if you look at I am an engineer by education, not a historian, and if you look at the history of

engineering it began with fortifications. I mean that's what the first engineers were about, building forts and then building things to break the forts. So

basically what it was all about. And so it's not a surprise that the frontiers of technology are at the frontiers of warfare as well. And indeed

you know there is no question that the downsides, both deliberately and potentially, accidentally of technology are obvious, whether they are

as we have seen, nuclear weapons or possible biological weapons or all the things we are yet to imagine. So I don't have any doubt that the destructive

potentials both today and yet in the future of technology are very real. That having been said it is also the case that much of what we take today take to

be a much better life is the result of technology. None of us would want to go to a dentist of 1900 today, you know you only needs to think about what

drilling would be like without anesthesia, to imagine just to see the smallest grain of technological progress. But I think one of the best examples you

can see is what's happened for example the environment. You know I think it is one of the challenges ahead. But if you look at what's happened as a

result of things like the Clean Air Act and technology that come along equivalent in the UK and in the United States. Today the air in the Bay Area is

much better than it was 30 years ago; the bay is cleaner than it was 30 years ago. The fishing in the Thames which they couldn't do 15 or 20 years ago.

The air in London is you know it isn't perfect, but it isn't like the coal smog of the 1950s. And we have made the automobile of today 90 percent

cleaner than the automobile of 25 years ago. So you know I think it's a both end, I think human progress depends upon enormous continuing advance

in technology. We can't solve the climate change problem I don't think we can end poverty without doing it and so on. But we can get it wrong. The bio

fuels mess that's creating some of the rice crisis that we are having right now is a good example of getting things wrong. So technology doesn't automatically guarantee a good outcome, what we do with it is obviously what's critical.

You have to acknowledge though that much of the progress in medical science, you mentioned dentistry, but "but the progress in anesthesia, progress in that field was again accelerated by warfare.

Absolutely.

And this seems to be to be "to be one of the recurrent features of our predicament that it seems to take a massive cataclysm to make our technological innovation accelerate. But there is a piece of sleight of hand that I want to pick you up on. You simplified my argument by dividing the 20th

Century into two halves, a very destructive half and a relatively less destructive half. But the book actually tries to avoid that periodization by "by

suggesting a period from around 1904 to 1953 of "of mega death. And then there is lower level conflict, the Third World war in actually less populous

places. The problem is the period before it that you don't say anything about. Aren't you ever worried that you might be like one of those pre-1914

intellectuals who said war is now impossible?

It was Norman Angell, wasn't it? Norman Angell was one, there "there was a chap named Ivan Bloch who argued that war had now become technologically far too destructive to be

sustainable for any length of time. In fact there were a whole group of people who came to the conclusion that the technological progress that actually

made great power war highly unlikely. And indeed you could see why they thought that, because from the 1870 onwards the amount of war "of

particularly the risk of great power was seemed to be declining, something quite interesting, the financial markets were much less nervous in the decade

before 1914 than they had been in the 1870s and 1880s. So if we go back a little bit earlier, isn't there a sort of alarmingly similar scenario? I hate to

use the word scenario "a period in which a futurist, a Peter Schwartz would have said, its all going to be fine, technology is going to solve our

problems. We are all going to live in peace. And then 1914 comes along, and the books are all remaindered. How do you address that problem?

A, the best example we can see is Palm Beach in 2000 for the kinds of events that could deflect history. And so unquestionably "I think you are right

on this one. And "and I see very much the risk here. Indeed if you had been here in 1908 you would have been enthralled by all the new technologies,

the automobile, electricity, radio, the telephone, airplanes, you know and we would have just had Einstein published "you know his epic year and the world

was about to change, globalization was very real, you know travel "and the famous quote, I think you "you have the quote from Keynes that you know

soon thereafter "a man could go anywhere in the British empire and you know not even need any money, cause everywhere it was all "good British sterling

was available. So I think the analogy is actually rather apt and it is worrying. I think it is genuinely worrying. But I think it is a matter of choice, that is I

think what we saw then and I think your book rightly argues it, was staggering misperceptions and misjudgments on the part of political leaders. Now, indeed I think we have just seen in one of those catastrophes of misjudgment and incompetence on the part of political leadership play out in Iraq. And indeed those events are genuinely worrying, and I think you rightly pointed to where the biggest risks in the world lie today. And we have certainly exacerbated it. But it may be an opportunity for the world and we to learn a lesson "at a fairly high price I might add, but not as catastrophic as say Vietnam was in human death from our point of view at least. But having said that I think the analogy ought to give us pause because I think there is enough merit in it and then we ought to be thinking hard about how we not follow that path of kind of cascading events and misperceptions into a war no one wanted.

Well, I am glad you acknowledged the part of my objective in writing a book like *The War of the World*, is precisely to make sure that I am wrong. In other words that the objective is to force people to think about the historical process in such a way that they avoid *War of the World* the sequel. But there is a part of your argument that I am puzzled by and that is your "optimism about the question of climate change. When you make the point that things have got so much better in England or in California because the industrial world has been relocated to Asia. And anybody who spends any time in East Asia will tell you that the pea-soupers of old London are nothing compared with the kind of pollution that is being created, as a fifth of humanity embarked on a far more rapid industrialization than English speakers ever dreamt of. I mean this is all being done at a breakneck speed and it seems to me that the optimism that you have, that this is all going to be resolved by "I don't know, microbes that shit diesel" it is hard to -. I have to tell you that the idea that that is going to solve our problems is a stretch for me. I really struggle with that. Though I am sure Craig Venter is a very smart guy. The law of unintended consequences tells me that his diesel shitting microbes will end up destroying mankind, taking over the world. I don't know "I don't like the sign of any of this at all. And I, you know, I know what H.G. Wells would say about those microbes if he were here.

Well the "the issue of China and the environment and pollution is "probably is one of the biggest challenges, not only for China but for the world.

And how do we solve that? Because you didn't really say that they "they aren't part of this wonderful new democratic network system of global governance.

Yes, they are, I think they are as a matter of fact.

Oh, I missed that.

Well, in fact "what?

You know I thought they were still ruled by a Communist Party with a one party state and "Yes they are, but they are also engaged in a great variety of efforts already dealing with the consequences of

climate change both in collaborative efforts

right here at UC Berkley for example, and in a network of scientists and basically technical people in a variety of different domains trying to deal with

the shared problems that we both face. And for them the biggest issue is coal. They have got to clean up their coal, they have got to find ways to

capture it, the carbon and sequester it, they need clean vehicles, they have exactly the same needs for technology that we do. And so my view is fairly

straight forward. There is no *it ain't a done deal by any means*. But very much the same technology challenges that they face, we face, and that we

are likely to be working together in one way or another, or competing you know. But then driving each other to do better in that sense *to develop the*

technologies of things like clean coal and clean cars, because neither one of us will make it without them. And one already sees at least the seeds of that

in collaborative efforts, beginning.

What if there is another outcome though? Let *build a scenario in which something much more like the past recurs, in which rival empires fight over*

increasingly scarce natural resources and do not adopt new and more benign technologies because *just too damn difficult*. What makes you so sure

that we won't be quarrelling over coal and oil, particularly oil and natural gas, much in the way that in previous eras meant for wars over coal *or for*

that matter sugar which was a great source of energy in the *in the 17th Century*.

Well look it was access to oil that triggered World War II, you know *with Japanese in particular*. So I think the risks are very real, though

interestingly enough I think the risks are greater between say China and Russia and access to Russian natural gas for reasons of substituting for dirty

coal, cleaner natural gas and the issue of *you know who really owns Siberia may become an issue, and that one worries me as a source of conflict*.

Well I think at this point that the *the time is up and that means that I have to now* *really quite a challenge, this*. That is *almost impossible for*

anybody with jetlag to *to do*. But I have now got to summarize

Peter's arguments in such a way that he will say *you got* *So my understanding is*

that *that your argument is as follows*. First that we *we both methodologically are engaged in the same activity, we use our imaginations, and we use*

our imaginations to try to draw inferences from past data. The inferences I draw are about how the dead thought and the inferences you draw are

about your imaginary friends. And I have a very good doctor that you can see about that. So that's the first point.

In a sense we are both engaged in challenges that require our brain's computational part, to do things that no other computational part can do. And we

are not actually ever going to be tremendously effective in that sense. The China question is the interesting one. You put that down to a failure of

imagination. I think we should try and talk more about that, because it seems to me to be at the very heart of what we are discussing here. And I still don't

really know $\neg \exists x (A(x) \rightarrow \neg B(x))$ if had I asked myself that question with a somewhat different set of historical assumptions I would have come up with a better answer than you. So that $\exists x (A(x) \wedge \neg B(x))$ is the first point.

The second point is, that I am a pessimist and you are an optimist. That $\exists x (A(x) \wedge \neg B(x))$ is how I interpreted much of what you said, and though you take precisely the same data that I take from the 20th century and come to a fundamentally Panglossian conclusion, where as I am Cassandra and all I can do is predict, yes, more carnage. I think this is a legitimate point, though it risks discrediting us both. If we are simply writing books that express our fundamentally different temperaments, you the cheerful West Coaster, me the gloomy, despondent Calvinist scoff, then $\exists x (A(x) \wedge \neg B(x))$ there may not be any need to read these books. You just look $\exists x (A(x) \wedge \neg B(x))$ look at our bios on Wiki and say, he is a pessimist, he is an optimist, that $\exists x (A(x) \wedge \neg B(x))$ all you need to know.

So that $\exists x (A(x) \wedge \neg B(x))$ that seems to me to be a somewhat problematic proposition. I hope that I try to transcend as best I can, my $\exists x (A(x) \wedge \neg B(x))$ my temperamental difficulties, my, the Calvinist legacy is one that it $\exists x (A(x) \wedge \neg B(x))$ hard to shake off. But that $\exists x (A(x) \wedge \neg B(x))$ I think at the heart of the second part of your argument. The third and final part of your argument is that technology is the driver. In your approach to scenario building you always list a bunch of drivers, they are usually about seven or eight, but it always seems to me that the one that you instinctively want to put at the top and give pride of place to is technology, which I suppose is reflection of your background as an engineer. And hence the notion that out of all the troubles that we currently face, there will be technological solutions and that with one bound or one bacterium, we will be free. Is that a fair summary of your arguments? What do you think? Well- I think it $\exists x (A(x) \wedge \neg B(x))$ probably an unfair summary of your argument.

Oh well no. Well $\exists x (A(x) \wedge \neg B(x))$ the truth is in substance of course it actually is, except I wouldn't $\exists x (A(x) \wedge \neg B(x))$ say that $\exists x (A(x) \wedge \neg B(x))$ in fact I think it is Panglossian versus a kind of Dour Scott. I think it is actually the relative weight one gives to the novel versus the methods of history, that the force $\exists x (A(x) \wedge \neg B(x))$ not the methods, the force of history, how much, how malleable is the human condition? How much can we really reinvent what is possible? And my impression is you would give greater weight to the force of history and those things that are enduring and I might give greater weight to those things that are more novel and that challenge some of those things that have persisted for a very long time.

Just this one little footnote which occurs to me, one point that you've made recently very eloquently is that you may live to be a 150 which $\exists x (A(x) \wedge \neg B(x))$ which is an exciting thought, though I am not sure our debate would be that good in 50 years if $\exists x (A(x) \wedge \neg B(x))$ I can't $\exists x (A(x) \wedge \neg B(x))$ promise to be anything other than gaga if I am still around.

But $\exists x (A(x) \wedge \neg B(x))$ but you know, if that is possible you might think that it would radically change our argument condition. Yet the lesson of history is that making people live longer doesn't $\exists x (A(x) \wedge \neg B(x))$ radically change the human condition. We actually already have done this, because life expectancy at the beginning of the 20th Century $\exists x (A(x) \wedge \neg B(x))$ average male life expectancy even in developed or relatively advanced European societies were still amazingly low by our standards.

Late 40s

Right, so we got from 37 to where we are now, which in the more deprived parts of Scotland is still in the upper 60s. It hasn't radically changed the world, that we have achieved this. I don't think that we are in fact significantly more benign, I don't think our societies are significantly improved by the fact that people live a lot longer. So this seems to me to illustrate precisely the point that you make; big changes in our technological or biological circumstances seem to leave us unaltered as human beings, and the dark forces within us that incline people towards active violence or irrational political decisions, which are tremendously important, they seem to be any wiser, we are definitely older but I don't think that we are wiser.

I am not sure, you know you have people now who lived multigenerationally, in other words there are people today who remembered the worlds of the 50s and the 40s and even the 30s and I think we have that process and possibility of inter-generational learning far more extensively and far more deeply than we ever have before, more 90 year olds who are around teaching their great grandchildren something of the world in which they once encountered. So I think that there is an opportunity not necessarily universally taken. But I do see it happening and I see it happening frequently of this kind of inter-generational learning that you know we had lots of forgetting as generation after generation died and we have to repeat the crises that happened again and again. And not to say that there is universal learning, but I think that there is a kind of adaptive process that as we live longer we learn more and more deeply.

Which it sounds like an argument for the 71 year old rather than the 46 year old in the presidential election. But I will leave politics out of that.

I knew politics would