



Peter Thiel's view on progress and stagnation in his own words, sourced from a number of his interviews and articles. This document consists only of direct quotes from Thiel, lightly edited for clarity (except for headings and where marked otherwise). Key quotes are in [the summary](#). Compiled by Richard Ngo (@richardmcngo) and Jeremy Nixon (@jvnixon).

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¹ This was the manifesto for a fund Thiel founded, but was not primarily written by him. We therefore only cite it in the final section (on the current state of technology).

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What’s going on?

We’re in an era of technological stagnation

- In the last 40-50 years, we have had enormous innovation in the world of bits, and somewhat less in the world of atoms: clean tech, energy, more generally, transportation, biomedical. [3]
- When tracked against the admittedly lofty hopes of the 1950s and 1960s, technological progress has fallen short in many domains. Consider the most literal instance of non-acceleration: We are no longer moving faster. The centuries-long acceleration of travel speeds — from ever-faster sailing ships in the 16th through 18th centuries, to the advent of ever-faster railroads in the 19th century, and ever-faster cars and airplanes in the 20th century — reversed with the decommissioning of the Concorde in 2003, to say nothing of the nightmarish delays caused by strikingly low-tech post-9/11 airport-security systems. Today’s advocates of space jets, lunar vacations, and the manned exploration of the solar system appear to hail from another planet. A faded 1964 Popular Science cover story — “Who’ll Fly You at 2,000 m.p.h.?” — barely recalls the dreams of a bygone age. [7]
 - The official explanation for the slowdown in travel centers on the high cost of fuel, which points to the much larger failure in energy innovation. Real oil prices [in 2011] exceed those of the Carter catastrophe of 1979–80. Nixon’s 1974 call for full energy independence by 1980 has given way to Obama’s 2011 call for one-third oil independence by 2020. Even before Fukushima, the nuclear industry

and its 1954 promise of “electrical energy too cheap to meter” had long since been defeated by environmentalism and nuclear-proliferation concerns. One cannot in good conscience encourage an undergraduate in 2011 to study nuclear engineering as a career. “Clean tech” has become a euphemism for “energy too expensive to afford,” and in Silicon Valley it has also become an increasingly toxic term for near-certain ways to lose money. Without dramatic breakthroughs, the alternative to more-expensive oil may turn out to be not cleaner and much-more-expensive wind, algae, or solar, but rather less-expensive and dirtier coal.

- Warren Buffett massively capitalized on both of these trends with his \$44 billion investment, most made in late 2009, in BNSF Railway — making it the largest non-financial company in the Berkshire Hathaway portfolio. Understandably, the Oracle of Omaha proclaimed “an all-in wager on the economic future of the United States” and downplayed any doubts he might have harbored. For present purposes, it suffices to note that 40 percent of railroad freight involves the transport of coal, and that railroads will do especially well if the travel and energy consumption patterns of the 21st century involve a regression to the past.
- In the past decade, the unresolved energy challenges of the 1970s have broadened into a more general commodity shock, which has been greater in magnitude than the price spikes of the two world wars and has undone the price improvements of the previous century. In the case of agriculture, at least, technological famine may lead to real old-fashioned famine. The fading of the true Green Revolution — which increased grain yields by 126 percent from 1950 to 1980, but has improved them by only 47 percent in the years since, barely keeping pace with global population growth — has encouraged another, more highly publicized “green revolution” of a more political and less certain character. We may embellish the 2011 Arab Spring as the hopeful by-product of the information age, but we should not downplay the primary role of runaway food prices and of the many desperate people who became more hungry than scared.
- While innovation in medicine and biotechnology has not stalled completely, here too signs of slowed progress and reduced expectations abound. In 1970, Congress promised victory over cancer in six years’ time; four decades later, we may be 41 years closer, but victory remains elusive and appears much farther away. Today’s politicians would find it much harder to persuade a more skeptical public to start a comparably serious war on Alzheimer’s disease — even though nearly a third of America’s 85-year-olds suffer from some form of dementia. The cruder measure of U.S. life expectancy continues to rise, but with some deceleration, from 67.1 years for men in 1970 to 71.8 years in 1990 to 75.6 years in 2010. Looking forward, we see far fewer blockbuster drugs in the pipeline — perhaps because of the intransigence of the FDA, perhaps because of the fecklessness of today’s biological scientists, and perhaps because of the incredible complexity of human biology. In the next three years, the large pharmaceutical companies will lose approximately one-third of their current

revenue stream as patents expire, so, in a perverse yet understandable response, they have begun the wholesale liquidation of the research departments that have borne so little fruit in the last decade and a half.

- The things that do work are often on a scale that's incredibly modest. There is often a way in which humor is used to hide disturbing truths from ourselves. People made fun of technology in the early 20th century; the humor was to disguise how scary it was, how much it had changed, how drastic it was. Today, it's like people throwing virtual cats at each other on the Internet or something like that. The humor, we make fun of technology to hide from ourselves the disturbing fact of how trivial it is, how small it is. People are still worried about what's going on, but I think it has a very different feel from what it did 100 years ago. [6]
- There is a Marxist theory that the time for Communism would come when interest rates went to zero because the zero percent interest rate was a sign that capitalists no longer had any idea what to do with their money. And there were no good investments left, which is why the interest rates went to zero, and therefore the only thing to do at that point was re-distribute the capital. It doesn't mean that zero-percent rates lead us to socialism, but I find it alarming that rates are as low as they are. [13]
- You have Moore's law on the one hand. If I had to simplify it, we've had incremental but relentless progress on the computer side. And on the other hand, we've had basically no progress on energy. And if you think about where oil prices were in 1973 - it was \$2 a barrel - it is now [in 2012] at north of \$100 a barrel. And so you've had catastrophic failure of energy innovation, and it's basically been offset by computer innovation. I think that's a simplified account of what's happened in the last 40 years. [15]
 - Google also has \$50 billion in cash. It has no idea how to invest that money in technology effectively ... if we're living in an accelerating technological world, and you have zero percent interest rates, you should be able to invest all of your money in things that will return it many times over. The fact is you're out of ideas.
- I'd say 1968, the narrative progress seemed intact. By '73, it was somehow over. So somewhere in that five-year period. The 1969 version was: we landed on the moon in July of 1969 and Woodstock starts three weeks later. And maybe that's one way you could describe the cultural shift. You can describe it in terms of the oil shocks in 1973 at the back end. With the benefit of hindsight, there were things that were already fraying by the late 1960s, so the environment was getting dramatically worse. [17]
 - You have the graduate movies, you should go into plastics. I think that was 1968 or '69. So there were things where the story was fraying, but I think it was still broadly intact in 1968, and somehow seemed very off by '73.
- This isn't the dream we looked forward to. Back when my parents came to America looking for that dream, they found it right here in Cleveland. They brought me here as a one-year-old and this is where I became an American. Opportunity was everywhere. My dad studied engineering at Case Western Reserve University, just down the road from where we are now. Because in 1968, the world's high tech capital wasn't just one city: all of America was high tech. [20]

- Tesla and SpaceX are not IT companies. They have this very different feel and there's this sense that they're so valuable because they're so rare. I think it's one of the things that makes Elon Musk as charismatic as he is. [22]
- When we talk about how fast science is progressing, we do it with little precision. Are we accelerating in scientific and technical fields? How fast is this? In response, we get fairly vague answers. I would submit that the consensus in both a Silicon Valley and academic context is that we are doing great and that everything is just moving super fast. All these forms of accelerations. And we can debate whether it's utopian - Kurzweil with the singularity is near, where all you need to do is sit back and eat some popcorn and watch the movie of the future unfold, or this dystopia, all the science fiction movies from Hollywood and all the robots will kill you, or you'll be in this matrix - we're either accelerating to utopia or accelerating to dystopia. The somewhat contrarian thesis I have on this is that perhaps the progress is not as fast as advertised. Things have been slower and have been slower for quite some time. [26]

We've fallen far short of past expectations

- Certainly, if we went back to, say, 1968, the late 60s, and you asked where would people have thought the world would be by the year 2000, 2015, 2016, it's fallen way short. If you look at the Back to the Future movie – Back to the Future I was 1985 – they went back in time 30 years, and things had changed quite a bit from '55 to '85. Still a decent amount of changes. Back to the Future II went from '85 to 2015, 30 years into the future. It was about a year, a little under a year ago. That was a world that was supposed to be radically different, and I think the actual day-to-day changes, outside of computers, would have been quite modest in those 30 years. I would argue since the 1970s. [6]
 - And so you can rattle off these different areas – whether it's biotechnology, where there has been some progress, but it seems to have decelerated. Space travel, transportation, more generally. All kinds of ideas people had in the 50s and 60s about reforesting the deserts or underwater cities, or all kinds of things like this. Fusion. New forms of nuclear power, that at this point all have this sort of retro future feel. The future the way it used to be. Star Trek feels very dated. These things feel very dated in their optimism about how much could be done.
- In his 1967 bestseller *The American Challenge*, Jean-Jacques Servan-Schreiber argued that accelerating technological progress would widen the gap between the United States and the rest of the world, and that by 2000, “the post-industrial societies will be, in this order: the United States, Japan, Canada, Sweden. That is all.” According to Servan-Schreiber, the difference between the United States and the rest of Europe would grow from a difference of degree into a difference of kind, comparable to the difference between Europe and Egypt or Nigeria. As a result of this steady divergence, Americans would face less pressure to compete: [7]
 - *[Servan-Schreiber: In 30 years America will be a post-industrial society ... There will be only four work days a week of seven hours per day. The year will be*

comprised of 39 work weeks and 13 weeks of vacation. With weekends and holidays this makes 147 work days a year and 218 free days a year. All this within a single generation.]

- We need to resist the temptation to dismiss Servan-Schreiber's space-age optimism so that we can better understand how the consensus he represented could have been so terribly wrong.
- [NASA] is this very large agency that has kind of lost its way over the last 30 to 40 years. When we went to the moon, it took less than a decade from the time Kennedy announced it to the time we got there. Mars is harder but surely possible. [24]
- You know all the classic versions of science fiction cities: underwater, cities on the moon, cities on Mars cities in outer space. Radically different and very definite ideas of the future, that would become self-fulfilling prophecies of one sort or another. And when you look at these pictures today, these things don't look futuristic, they look dated. They look like they really are sort of from the past, which is again this very strange way in which things have changed. [25]
- It's possible that some of these things just don't work. And maybe, maybe jet packs are just a bad idea. We have a title on our website. "They promised us flying cars. All we got was one hundred forty characters." Flying cars, maybe they're good, maybe they're bad but, but it's remarkable how all the various things people envisioned. And we've gotten so few of them outside of the, outside of the computer area. [19]
- Let's talk about the history of the future - the way people talked about the future in the past, and where they thought the computer age was going to go. If we'd been assembled in 1969, the future of computers was going to be massive centralization. It was giant databases, giant Allike computer intelligences that would run everything. It was IBM that would run everything. It was HAL. It was one of the early star trek episodes - they come to the planet Beta, where thousands of years earlier someone had unified the planet and set up a computer program that ran the whole planet. The future of the computer in 1969 was centralization, large governments, large companies. Fast-forward to 1999. The future of the computer age was going to be massive decentralization. Libertarian, anarchist. Information had this decentralizing tendency. The internet was going to fragment things. Fast-forward to 2019. The consensus view has swung back to 1969. Google and world governments that control the world's information in a centralized way. The Life After Google thesis that I agree with and enforce is that if people got this wrong in the past ... perhaps the contrarian thing to say is that things can swing back towards more decentralization, more privacy, and things like that. [26]

There's been stagnation in wages

- When you look at this question of how much technological progress has been happening, we get into all these complicated measurement issues. The one that I cite as the big data point is that if you look at the US in the last 40 years, 1973 to today, median

wages have been stagnant. Mean wages have gone up maybe a small amount, not very much. The 40 years before that, 1932 to 1972, they went up by a factor of six. If you looked at how people did from '32 to '72, you had a sixfold improvement. And it was matched by incredible technological progress - cars got better, you had the aeronautics industry got started, you went from no planes to supersonic jets, computers were invented... You had all sorts of incredibly important dimensions on which progress took place. I agree that we've had certain narrow areas where there's been significant progress, but it's very odd that it hasn't translated into economic wellbeing. [15]

- If meaningful scientific and technological progress occurs, then we reasonably would expect greater economic prosperity (though this may be offset by other factors). And also in reverse: If economic gains, as measured by certain key indicators, have been limited or nonexistent, then perhaps so has scientific and technological progress. Therefore, to the extent that economic growth is easier to quantify than scientific or technological progress, economic numbers will contain indirect but important clues to our larger investigation. [7]
- The single most important economic development in recent times has been the broad stagnation of real wages and incomes since 1973, the year when oil prices quadrupled. To a first approximation, the progress in computers and the failure in energy appear to have roughly canceled each other out. Like Alice in the Red Queen's race, we (and our computers) have been forced to run faster and faster to stay in the same place. [7]
- Taken at face value, the economic numbers suggest that the notion of breathtaking and across-the-board progress is far from the mark. If one believes the economic data, then one must reject the optimism of the scientific establishment. Indeed, if one shares the widely held view that the U.S. government may have understated the true rate of inflation — perhaps by ignoring the runaway inflation in government itself, notably in education and health care (where much higher spending has yielded no improvement in the former and only modest improvement in the latter) — then one may be inclined to take gold prices seriously and conclude that real incomes have fared even worse than the official data indicate. [7]
- This dismal and straightforward conclusion tends to be obscured by a range of secondary issues, which are important but do not really change the larger point about trends since 1973 [7]:
 - Mean incomes outperformed median incomes (inflation-adjusted in both cases), and there was a trend towards greater inequality. Median incomes rose by only 10 percent. Mean incomes rose by 29 percent, which works out to a glacial pace of only about 0.7 percent per year - much slower than in the preceding four decades.
 - Non-wage benefits, mostly health care, increased by about \$2,600 per worker, for an additional 0.2 percent per year since 1973. So if the U.S. government has underestimated inflation by only 0.9 percentage points per year, then mean wages and benefits have been completely stagnant.
 - Corporate profits increased from 9 percent to 12 percent of GDP - again, a significant but easily exaggerated shift.

- Women were hired in the 1980s and men were fired in the 2000s.
- College graduates did better, and high-school graduates did worse. But both became worse off in the years after 2000, especially when one includes the rapidly escalating costs of college.
- The era of globalization improved living standards by making labor and goods cheaper, but also hurt living standards through increased competition for limited resources. Free-trade advocates tend to think that the first effect dominates the second.
- Economic progress may lag behind scientific and technological achievement, but 38 years seems like an awfully long time.
- Even though there's always this sense that STEM, we need more STEMs for science technology, engineering, math. I suspect even STEM is a bit of an abstraction. And probably the only engineering fields that are doing really well are computer science and maybe, at this point, petroleum engineering. And most other areas of engineering have been bad career decisions the last 40 years. [5]
- When I was an undergraduate at Stanford in the 80s, probably the top engineering profession was electrical engineering and that was not a great field to go into. You'd work in these very large companies and the semiconductor revolution kept going for a while but it was probably not that good a career decision. And electrical engineering was still much better than say nuclear engineering, aerospace engineering, which were really catastrophic decisions for very talented people to go into. So even though rhetorically we always say that we want more science and engineering people, in practice, these have been extremely tough fields. [5]
- You have the sort of intergenerational thing where our generation, Gen X, has had a tougher time than the Boomers. The Millennials seem to be having a much tougher time than either us or the Boomers had. So there seems to be this generational thing. So there are some of these sort of macroeconomic variables that seem pretty off. [17]

Internet progress masks other deterioration

- I do think that if you were to sort of broaden the perspective on the last 40 or 50 years, we are living in a world where there has been significant innovation in information technology, computers – both hardware, software, Internet, mobile Internet. And much less in everything else. [5]
 - If you were to be even more critical, you could say that all these gadgets and devices, they dazzle us but they also distract us from the ways in which our larger surroundings are strangely old. So we run cell phones while we're riding in a 19th-century subway system in New York. San Francisco, the housing stock looks like it's from the 50s and 60s, it's mostly quite decrepit and incredibly hard to change these sort of things. So you have bits making progress, atoms are strangely very stuck.

- We find we either talk about a specific success and general success or specific failure and general failure. And so we would like to say Facebook is a specific success, it must mean some general success. And so Facebook is a great business, and therefore it will solve all the world's problems. And I think the modality I prefer to think of is, that there are specific successes but they may be symptomatic of general failure. [5]
 - And so Facebook will not solve all the world's problems. But it may still be a great business. And that's not a critique of Facebook. We shouldn't turn Facebook into a scapegoat for the lack of innovation elsewhere. But the challenges that it is so anomalously unique and that there so few other companies like this being built in general. So I tend to think that the story of specific success that masks generalized failure is one we find very hard to tell.
 - On our website, we have this tagline – “They promised us flying cars and all we got was 140 characters.” Which is a little bit of a dig at Twitter. But in some sense Twitter is probably a great business. The thousand people who work at Twitter are going to have well-paying jobs. I suspect it will last for decades.
 - It's probably not enough to take our civilization to the next level. But again it's a mistake to blame Twitter for that. It's more a problem with not enough happening elsewhere.
- Even a company like Uber where you have this major innovation, I often wonder whether it's more symptomatic of the failure of certain political structures. The vision in the 50s and 60s was that you'd build very high-speed transport systems, which the San Francisco Bay area, where I live, were basically vetoed by local zoning ordinances, it's this very second-best solution because you couldn't build the much faster kinds of things that people thought were natural in the 50s or 60s to develop. It again, it's a compensating device for the dysfunction of our cities. Where there is not enough parking so you don't want to drive your own car. You can never find a parking space. The public transportation systems don't work. [6]
 - All of these things that are dysfunctional, but then we have this innovation to ameliorate the dysfunction. But if the political systems worked better in our cities, we might be doing some very, very different types of things.
- There are questions about how healthy it is, at this point, even within [IT]. So the iPhone is now looking the same as it did seven, eight years ago. So that's the iconic invention. Not quite so sure. And so there's been sort of a definitely a change in the tone even within Silicon Valley in the last five, six years on this. But that had been one that was very, very decoupled. [17]
 - The decoupling itself had some odd effects, where if you have sort of a narrow cone of progress around this world of bits, then the people who are in those parts of the economy that have more to do with atoms will feel like they're being left behind. And so there was something about the tech narrative that didn't necessarily feel inclusive, didn't feel like everybody was getting ahead. And one of the ways I've described it is that we live in a world where we've been working on the Star Trek computer in Silicon Valley, but we don't have anything else from Star Trek. We don't have the warp drive, we don't have the transporter, we can't

re-engineer matter in this cornucopian world where there is no scarcity. And how good is a society where you have a well-functioning Star Trek computer, but nothing else from Star Trek?

- [Twitter] is like all these technologies, where we see information technology everywhere except in productivity statistics. Email is the paradigmatic example where it's changed the way we communicate tremendously but it takes so much time that it's only made things, I would say, moderately more productive. Change and progress are not synonyms. You can have something that represents enormous change but only a small amount of progress. [22]
 - We've had tremendous amounts of innovation in IT going back to the '70s and it's led to moderate increases in productivity. It's not a new phenomenon. For us to really have greater productivity gains as a society, we have to do things more in the world of atoms and not just the world of bits. The problem is reflected in the word technology itself. Normally, it means information technology, whereas in the '50s or '60s, it would have meant rockets and underwater cities and desalination plants that turn deserts into farmland.

AI is not making as much progress as people think

- *[Bill Kristol, 2016: Are we at some tipping point for AI capabilities?]* [6]
 - It's very hard to say. I [have] many somewhat conflicting thoughts on this, I don't necessarily want to come down very strongly on one side or the other of these debates. I would say that certainly computers generally are an area where there's been a lot of progress so it's maybe not unreasonable to maybe ask the question, how much more progress could there be? How many more ways could AI happen?
 - On the other hand, one of the things I don't particularly like about artificial intelligence is it's become such a buzzword. I think these buzzwords often always obscure more than they illuminate. One of the ways to see that it is a buzzword is to see how ambiguous it is. Artificial intelligence can mean both the next computing, the last computing that humans will ever build, and everything in between. So it has this rather elastic meaning. When artificial intelligence means the next set of computers, it sort of pushes the conversation in somewhat more automation, replacing certain low-skill or medium-skill kinds of activities people are doing. When you talk about it as the last computing device where you're building a mind that can outthink and outwit any human being, you end up with these very scary, somewhat political questions. Is it going to be friendly? Is it dangerous? And if something like that can be developed then maybe it will be on par with extraterrestrials landing on this planet where I think the first question would not be about what would this do to the unemployment rate? The first question is are they friendly or not? The first questions would be political.

- I would say that certainly the sort of bullish AI consensus that exists is that we're making progress very quickly. There are no deep reasons why computers couldn't do everything better than what humans do. And this may indeed happen in the next few decades. This would, of course, be an extraordinarily important and transformative set of changes. I'm certainly open to all these perspectives, but I also wonder whether there's certainly parts of this that one could question.
- If you had to be a little bit more critical of it, the two points of criticism would be, to first start with the history where people have been in some ways too optimistic about AI for quite some time. In 1970, there were people who said you'd get computers to understand language and everything humans could do within a decade. Same thing would have been said in 1980. We've been here before. So there's been a history when this had turned out to be more difficult than people would have thought.
- Then, of course, there's always this sense of whether it's maybe just a particular moment in time where at the peak of a technology cycle, the only thing we can worry about is technology that's so good that it's too fast and it changes things too radically. There was – in spring of 2000, there was this essay that got a huge readership in Silicon Valley by Bill Joy, one of the founders of Sun Microsystems. It was "The Future Does Not Need Us." How runaway technology would get rid of people. And, so as a socio-cultural observation, a psycho-social observation, in spring of 2000, what we should have worried about was not whether the technology was going to work so well that it would be this runaway progress, but the real question was whether it was working at all? Were the business models working? And it turned out a lot of things didn't work that well, and we had a period when people went back to banking and back to consulting from Silicon Valley. B to C and B to B didn't mean business to consumer and business to business, it meant back to consulting and back to banking. So anyway I do wonder whether the sort of mini-AI bubble that we've seen in the last few years is maybe symptomatic, that we're at some local peak in optimism about how much Silicon Valley is doing and can do, all these sorts of things.
- Again, my worry with all these things is if anything, there's not enough happening. If you take the biggest innovation [in AI] that people are talking about now, it's self-driving cars. I think there are one or two million people who are employed as drivers. Maybe one and a half or two percent of the workforce, maybe, in that ballpark. Maybe it would increase efficiencies because you could get some work done in the car while you're driving to the office. Maybe it could lead to five percent increase in GDP in the whole economy. Maybe I'm underestimating it somehow. I think it would be a significant change, but it wouldn't necessarily take, double our GDP or anything remotely like that. The fact that that's the most transformational change we can imagine is again, perhaps, is, to my way of thinking, strangely unambitious.
- So this is better than 140 characters. Maybe they can park themselves, you don't have to look for parking. In theory, it could help congestion a lot. In theory, it

could take a lot of pressure off parking spaces and things like that. And then at the same time, the fact that this is the technology that's iconically the most radical that we can sort of concretely describe – it's more than Twitter, it's not quite vacation trips on the moon.

- Self-driving cars would be, I would say, almost as big as the car itself. I would still say the original invention of the car was bigger than the self-driving car. If you had to give the rough qualitative [estimate].
- I generally find myself a bit skeptical of all the AI-themed discussions that we have at this point. I think it's still quite a bit further away than people think. It feels like a bit of an extreme consensus that AI is just around the corner, it's about to happen. [12, from 2015]
 - It would take a lot longer to explain all my misgivings about it, but I think it fits a little bit too much into this conventional inequality narrative, that we have rapid technological progress, and the only problem is that people won't have jobs, they'll be replaced by computers. I suspect that's not quite correct. I think the whole AI story is, if anything, happening more slowly.
 - The data point people always give is self-driving cars. The fact that they always come up with the same example suggests that maybe there's not that much to it. Even if you got — and I think self-driven cars would be significant — it might replace at most 1 percent of the workforce, it might increase productivity by a few percent in the economy. If you phased them in over a decade, it would not be that transformative.
- Yes, if we have runaway automation, and if we're building robots that are smarter than humans and can do everything humans can do, then we probably have to have a serious conversation about a universal basic income or something like that, and you're going to end up with a very, very weird society. I don't see the automation happening at all, and I think the question of automation in my mind is identical to this question of productivity growth. We've been automating for 200, 250 years, since Industrial Revolution, agriculture and manufacturing, and the sort of society we have in the early 21st century is one in which most jobs are non-tradable service sector jobs that are not easily automatable. [17]
 - So, it's like a waiter in a restaurant. It's a yoga instructor. It's a nurse. It's a kindergarten teacher. That's what most jobs in our society are, and because they've been so resistant to automation, that this may be one of the reasons why the productivity numbers are slowing down, even if we're still innovating as fast in manufacturing, and even if we're still agriculture, they're a smaller and smaller part of the economy. So, even 5% a year productivity growth in manufacturing, that means a lot more if manufacturing is 60% of the economy, than it does when it's, say, 20% of the economy. So, that's roughly what I think would happen, and if you just look at the current dynamic in the US as we have unemployment, like 3.6%, 3.7%. It's super low, and still, there doesn't seem to be that much wage pressure. There doesn't seem to be that much growth. The productivity numbers still aren't great. You'd think there'd be enormous incentives to increase

productivity. But I think, again, my read on it is just the automation story has been oversold. It's possible it's going to happen. It's possible it's just around the corner, and it's about to happen. That's what we've been told in a lot of these areas over the last 40, 50 years.

- Amazon is the most threatening of the big tech companies in that it's threatening a lot of other companies elsewhere in the industry and disrupting them and making things more efficient, but probably with a lot of sheer forces at work in that process. So, I agree that that's a candidate for automation or productivity improvements or things like that. I'm still not convinced that it's in the aggregate shifting things that much, and then you can go through all sorts of individual job descriptions where people used to have secretaries because typing was a skill, and with a word processor you don't quite need this. You can do short emails. You don't quite need a secretary. People still have executive assistants that somehow do slightly different sets of responsibilities, but it's not clear we have fewer executive assistants than we used to have secretaries.
- So, when one actually concretizes it, it's not quite clear how disruptive the automation that's happening really is. Again, it's a version of the tech stagnation thing. The last 40, 50 years, things have been slow. We're always told it's about to accelerate like crazy. That may be true. In some ways, I hope that's true, but if one was simply extrapolating from the last 40 to 50 years, perhaps the default is that we should be more worried about the lack of automation than excess automation.
- If we had this sort of runaway automation, you could get to 3%, 4% GDP growth, and at 3% to 4% GDP growth, we can solve these problems socially. Then there will be a lot more room for various social programs. I wouldn't want them to be misdirected in all sorts of ways, but there would be a lot of things that we could do. And I would be very uncomfortable starting with the social programs without the growth. That's the sort of conversation that I often see happening in Silicon Valley, where we start with UBI, because we're lying about automation. If automation's happening, then we'll see in the productivity numbers, and then eventually, maybe we need something like UBI. If automation is not happening and you do UBI, then you just blow up the economy. Doing them in parallel, I'm okay with that. I'm not okay with starting with the socialism. Even a Marxist wouldn't believe this. Even a Marxist thinks you have to first get the capitalists to do things before you can redistribute stuff. You can't start with the redistribution before we've done the automation.
- The Google propaganda is that we have runaway technological progress, a lot of people will be left behind, and we need to take care of them. This doesn't show up in any of the data. We have 3.5% unemployment, the productivity numbers are still pretty anemic, and it doesn't show up in any of the economic data. So that's sort of the starting point. If you think about automation and the rate of automation, it's been going over for 200, 250 years since the industrial revolution, and my suspicion is the rate has slowed because the things that we were able to automate easily like farming or manufacturing have been

automated. And even if we're still automating manufacturing at the rate of 5% a year, it's a much smaller part of the economy, and so the total productivity gains are actually slower. The sectors that are left are sectors that look very much the same as they did 100 years ago, and so it's like kindergarten teachers, nurses, yoga instructors, all these sort of nontradeable service sector jobs are fairly immune to automation. They're a large part of the economy, and that's perhaps why things have slowed. And then we always have this sort of fantastical story that this is about to change, but if you look back over the last 40 years, the simple reason it's slowed is because the sectors that were immune to automation have just become bigger and bigger parts of this economy. And so I think the—I don't know. I tend to think the Silicon Valley/UBI discussion, it's like identity politics. It's like this sort of magic trick. We're drawing your attention away to something else. It's like all the technology is going to take all your jobs, and should we have UBI to take care of you? And what we should be paying attention to is that people in Silicon Valley have not been doing enough. There are a lot of critiques of the big tech companies, of things they've done wrong and different things over the last few years. [21]

- My cut on why there's such a political pushback against the tech companies in Silicon Valley is they've not innovated enough. It's like if you've done bad things, one of the things you can always say is, "Well, we've done these good things too," and the list of good things is sort of lacking. Probably the biggest one on the Google list is self-driving cars. And I think that would be a significant innovation, on the other hand, they've been promising it for 10 years. They're talking about it less than they were four or five years ago. They expected the time to be expanding. But it's not that big an innovation. And I think going from a horse to a car is bigger than going from a car to a self-driving car. And so we have to quantify this and really think through how much is going on. And these problems are, if anything, even more serious on the science side. And one form of this problem of scale that I talked about is if you're too big a scale, it becomes impossible to actually know the particulars of what is going on. And I think it's maybe a feature of late modernity that things are so specialized. And we have the cancer researchers talking about how great they are, and the quantum computer people say they're about to build a quantum computer. And you've all these narrower and narrower groups of self-policing experts telling us how great they are.

We've seen globalization rather than technological progress

- The 19th century was an era of both tremendous globalization and tremendous technological progress from 1815, ending with the start of World War I in 1914, when globalization goes very much in reverse, technology continues at a breakneck pace. I would date 1971 when Kissinger goes to China as the year where globalization begins

again in earnest. We have had 40-plus years now of breakneck globalization. But what I've argued is relatively more limited progress in technology, mostly centered on this narrow cone of progress around computers, software, Internet, and not so much in many other areas of technology. So the 20th century had a period of technology with less globalization, and then a period, a more recent period, of globalization with more limited technology. [6]

- I think in the US there definitely are large elements of our economy that have been linked to this globalization story as well, and if I had to do sort of a long-short version, I would try to be skeptical of the parts that are linked to globalization.
- It's reflected in some ways in the different ways we talk about our worlds. So in 1965, when you had technology but no globalization, you would have described the world geo-politically as the First World and the Third World. The First World was the part that was technologically progressing. The Third World was that part that was sort of permanently screwed up.
- Today, the dichotomy would be between the developed and developing worlds, which is a convergence, homogenization, globalization theory of history. The developing world is converging with the developed world and becoming more and more alike. So this is a pro-globalization dichotomy, but at the same time, it's also an anti-technological dichotomy, because when we say we living in the United States or Western Europe or Japan are living in the so-called developed world, we're saying implicitly we're living in that part of the world where nothing new is going to happen. Where things are done, finished, and exhausted.
- I feel that's always a little bit too pessimistic. I think, in theory, we should have both globalization and technology. In practice, we certainly have choices that we make. On an individual level, do we work in ways that are more globalization-oriented, more technology-oriented? It's possible that over the last 40 years there were so many gains from globalization that it was natural for talented people in our societies to work in those, in industries that were linked to globalization. And perhaps those gains are a little bit more hard to come by now. And maybe it makes sense to rebalance towards technology.
- If you think of it geographically within the US, you could say that New York City is the city that was linked to finance, finance is the industry that's linked to globalization simply because it's about the global movement of capital. It's something that's very easy to move around the world so somehow the economy and future was centered on New York City from, say, 1982 to 2007, that quarter century, was the period when people really believed in globalization.
- The sort of strange shift from New York City to Silicon Valley I see is the shift where maybe we can get more out of technology, it's harder to make progress on globalization. I still spend some time in both New York City and mostly Silicon Valley. It's always striking the extreme contrast. Optimism in Silicon Valley and the very deep pessimism that I feel always permeates New York, where there's this model that's not quite working anymore. That's why you see New York City –

and then I think, remarkably, that's what people believe in China at this point, which again as a country is geared to this to a degree greater than perhaps anywhere else in the world.

- If I was talking to a young person graduating from college, I would discourage them from working at a big-money center bank in New York, or for McKinsey, or the international global consulting firm, which is, again, a classic globalization career. Clinton Global Initiative, that sounds very dated at this point. That's so 2005. World Economic Forum. All these things have sort of a dated kind of a feel. This is the way the future used to be.
- I would bet on globalization slowly being in abeyance. I think with the benefit of hindsight, we will realize that 2007 was not just the peak year of the finance boom, but also the peak year of globalization, like maybe 1913. Happily, it hasn't resulted in a world war, at least not yet, but I think we are in this period where globalization is steadily pulling back. And so you want to be in places or industries that are levered to things other than globalization. [12]
- There have been periods of globalization and technology in the last two centuries, and they're not synonymous. The 19th century, I think you had both. You had enormous globalization, enormous amounts of technological process, 1815 to 1914. 1914 World War I starts. Globalization goes into reverse. Trade breaks down. The world becomes sort of much more fragmented. Part of it becomes communist, more or less secedes from the rest of humanity. And technology continued very, very much at a pace. [23]
 - By 1971, Kissinger's trip to China, is the point where I would say globalization starts again very much in earnest. But I think we've had, for much of the last 40 years, a somewhat more limited technological process, where the word technology has been narrowed to information technology. In the 50s and 60s, technology meant many other things. It meant biotech, medical devices. It meant nuclear power, new forms of energy, underwater cities, the green revolution in agriculture, space travel, supersonic aviation, flying cars, etc., etc. So there has been—so I would argue that the 19th century had both—the last 100 years had a period of technology without globalization, and then more recently, a period of globalization with somewhat more limited technological progress. A lot in computers and the world of bits. Not so much in the world of atoms.

What's gone wrong?

What's wrong with our institutions?

Overregulation

- I'm libertarian, I think it's because the government's outlawed technology. We're not allowed to develop new drugs with the FDA charging \$1.3 billion per new drug. You're

not allowed to fly supersonic jets because they're too noisy. You're not allowed to build nuclear power plants - say nothing of fusion or thorium or any of these other new technologies that might really work. And so I think we basically outlawed everything to do with the world of stuff, and the only thing you're allowed to do is in the world of bits. And that's why we've had enormous progress in computers and finance. Those were the two areas there was enormous innovation in the last 40 years. It looks like finance is in the process of getting outlawed, so the only thing left at this point will be computers. [15]

- I disagree with the premise that there's some sort of tradeoff between finance and other areas of innovation. It's easy to be anti-finance at this point in our society, and I think the reality is we have an economy that got very lopsided towards finance, but it's fundamentally because people weren't able to do other things. So if you ask "Why did all the rocket scientists go to work on Wall Street in the '90s to create new financial products?" and you say they were paid too much in finance and we need to beat up on the finance industry, that seems like that's the wrong side to focus on. I think the answer was they couldn't get jobs as rocket scientists any more because you couldn't build rockets or supersonic airplanes or anything like that. It's like, why did brilliant people in the Soviet Union become grandmaster chess players? It's not that there's anything deeply wrong with chess. It's that they weren't allowed to do anything else.
- I always worry that we're not as free a country as would be desirable and that there are, certainly with respect to innovation, there are many areas where it's effectively been outlawed. Not in the area of computers, which are still quite unregulated on the whole. There has been a lot of progress. [6]
 - It's a complicated history. We had the thalidomide disaster with the FDA so there are specific things that you can point to that went very wrong. I think today you would not get the polio vaccine approved. When it was first used, they dosed it wrong, and I think they gave – 10 or 15 people got polio accidentally. So today that would probably slow it down for another 20 years or something like that. I do wonder whether we become too risk-averse in various ways.
- If you're Bill Gates starting Microsoft in 1975, you don't have people from government checking your code, checking how safe it is, how dangerous it is. If you're working in a biotech company, you have massive regulatory barriers all the way through. [5]
 - I think if we had less regulation, a lot of these things could happen. It's possible – it's possible there will be some global – maybe the FDA will have less of a throttle on global innovation in biotechnology.
- If you are starting a computer software company, that costs maybe \$100,000, to get a new drug through the FDA, maybe on the order of a billion dollars or so. If the FDA were regulating video game technologies, and you had to do a double-blind study to make sure that the video games weren't addictive, damaging to your brain, etc. These things are very overdetermined. It's driven by many different factors. My narrow attempt to get out of it is not necessarily to come to DC and beg the regulators to be more reasonable. It is just to try to find ways for people to succeed at the margins. [12]

- I think money and the nature of money is somehow much less important than all the microregulations that make up the economy. If you give me a choice of getting rid of the vast bulk of government regulations and keeping the Fed, I'd much rather do that than keeping all the other zoning laws and crazy rules we have and going with PayPal, Bitcoin, gold, any sort of alternate currency one could come up with.

Dysfunctional governance

- The entire modern political order is predicated on easy and relentless growth. The give-and-take of Western democracies depends on the idea that we can craft political solutions that enable most people to win most of the time. But in a world without growth, we can expect a loser for every winner. Many will suspect that the winners are involved in some sort of racket, so we can expect an increasingly nasty edge to our politics. We may be witnessing the beginnings of such a zero-sum system in politics in the U.S. and Western Europe, as the risks shift from winning less to losing more, and as our leaders desperately cast about for macroeconomic solutions to problems that have not been primarily about economics for a long time. [7]
 - Most of our political leaders are not engineers or scientists and do not listen to engineers or scientists. Today a letter from Einstein would get lost in the White House mail room, and the Manhattan Project would not even get started; it certainly could never be completed in three years. I am not aware of a single political leader in the U.S., either Democrat or Republican, who would cut health-care spending in order to free up money for biotechnology research — or, more generally, who would make serious cuts to the welfare state in order to free up serious money for major engineering projects. Robert Moses, the great builder of New York City in the 1950s and 1960s, or Oscar Niemeyer, the great architect of Brasilia, belong to a past when people still had concrete ideas about the future.
- I am somewhat pessimistic about the possibility of government being a key, a place where the great stagnation gets reversed. [12]
 - Even something like the SDI program in the 1980s. The debate in the '80s was, it's a dangerous first-strike weapon versus a great defensive technology, whereas today, people would say that SDI was just this fictional thing that would have never worked. Again, this very odd way that our expectations have been dramatically reduced.
 - I think the first signal one that really went wrong was Nixon's war on cancer. I always do think the 1970s were this decade where many of our institutions, especially our governmental institutions, started to work much less well. That was perhaps the signal one where things went badly wrong.
 - In terms of investing in science and technology, it seems to me that the minimum criterion for doing it is to have some understanding of these things and some

ability to evaluate them properly. In a government in which two-thirds of the representatives are lawyers and in which . . . Again, just using the House and Senate as a proxy for our government, by generous count, no more than 35 have degrees in engineering or science or anything like that, or any technical field, very generously defined, both the House and Senate.

- Perhaps these are not the right people to be driving these investments. I think we, again, should have much more of a focus on substance, much less on process. I always use the Solyndra bankruptcy as an example in this question of what went wrong. There's a Republican process critique. The process was screwed up. There were kickbacks. Somehow, there was this corruption. They could never quite prove it, but that was the intuition. The Democratic defense was, "We had a process. We had a portfolio, a financial process where we gave money to lots of different things." You let 100 flowers bloom or something like that.
- A mathematical objection to it was that a cylinder has $2\pi r$ the surface area of a flat panel, which would be $2r$ and therefore is, by definition, 1 over π as efficient as a flat panel. You could just use ninth-grade, high school geometry to show that this was a demonstrably inferior technology. It was never going to be commercially viable. You have a Nobel laureate, Steve Chu, running the Energy Department who is not allowed to use ninth-grade high school geometry in evaluating what to do. That sort of a society, that sort of a government is one that should not be allowed to make any investments in these areas whatsoever.
- I wonder whether on some level, the U.S. constitutional system can even work without some sort of growth. Because I think the way – the way things fundamentally work is you have people around the table in the Congress, the White House, and you pass bills that gives some more. A little bit for you, a little bit for me, a little bit for everybody. If you're a difficult person who doesn't get along with people, there's nothing for you. And that sort of a political mechanism works quite well, so long as the pie is growing. [5]
 - If the pie is not growing, there's much less need to cooperate, to craft new legislation. And is actually not clear to me how well our constitutional system even works. We've had in the Western world 200 years of growth, 250 years of growth, since the late 18th century. And if you look at the 1930s, which was probably the one-decade where there was a real shock to growth, it put enormous strain on all the constitutional democratic, republican types of systems. And I do think that's an enormous challenge in our time. So I think we should not be complacent about this at all.
 - I suspect that the bureaucratic incentives [in governments] really cut against people making sustained effort for several years to build something that really works. There is an aspect – I think there is something quite toxic about the whole contractor subculture in DC where people have incentives to sort of bill by the hour, to have projects that take really long and are overly complex so that nobody really has responsibility.

- I'm sort of more on the libertarian side politically. I'm generally skeptical of government ability to do things. But even I was shocked that something like the Obamacare website couldn't work. This is not the Manhattan Project. And so there has been – I think there has been some decline in the government's ability to do these things. And I suspect – I suspect it has a lot to do with very – with bureaucratic incentives that are extremely – extremely misaligned.
- It's a very open question of whether you could have the democratic process in a world without growth. You can't craft compromise where everyone comes out ahead. [9]
- I think that it's very hard to see how anything like the kinds of societies we have in Western Europe, the United States, could function without growth. I think the way a parliamentary republican democracy works is you have a group of people sitting around the table, they craft complicated legislation, and there's a lot of horse trading, and as long as the pie's growing, you can give something to everybody. When the pie stops growing, it becomes a zero sum dynamic, and the legislative process does not work. So, the sort of democratic types of parliamentary systems we've had for the last 200, 250 years have mapped on to this period of rapid growth. We had a very bad experiment in the 1930s where the growth stopped, at least from the economic sense, and the systems became fascist or communist. It doesn't actually work. [17]
 - So, I suspect that if we're in for a period of long growth [*Note: misspeak? Long period without growth?*], I don't think our kind of government can work. I think there is a prospect of all sorts of forms of violence, more violence by the state against its citizens. There may be more zero sum wars globally, or there may be other ways things are super deformed to pacify people. So, maybe everyone just smokes marijuana all day, but that's also kind of deformed. But I think a world without growth is either going to be a much more violent or a much more deformed world. And again, it's not the case that growth simply solves all problems. So, you can have very rapid growth, and you can still have the problem of violence. You can still have bad things that can happen, but that's our only chance. Without growth, I think it's very hard to see how you have a good future.
- [*Eric Weinstein: Why do you think it is that almost nobody sees your preoccupation with violence reduction?*] It's hard for me to come up with a good answer to these sort of sociological questions. I think people generally don't think of the problem of violence as quite as central as I think it is. I think it's a very deep problem on a human level. If you think of sort of this mimetic element to human nature where we copy one another, we want the things other people want, and there's a lot of room for conflict, and that if it's not channeled very carefully, a violent conflict in human relationships, in human societies, between human societies, and this is, I think, a very deep problem. It's sort of Christian anthropology, but you also have the same in Machiavelli or... There are a lot of different traditions where human beings are, if not evil, they're at least dangerous. I think the sort of soft or anthropological biases that a lot of people have in late modernity or in the enlightenment world are that humans are by nature good, they're by nature peaceful, but that's not the norm. So, that might be a general bias people have, is that people can't be

this violent. It's not this deep a problem. It's a problem other people have. There's some bad people who are violent, but it's not a general problem. [17]

- It's hard to remember this, but our government was once high tech, too. When I moved to Cleveland, defense research was laying the foundations for the internet. The Apollo program was just about to put a man on the moon—and it was Neil Armstrong, from right here in Ohio. The future felt limitless. [20]
 - But today our government is broken. Our nuclear bases still use floppy disks. Our newest fighter jets can't even fly in the rain. And it would be kind to say the government's software works poorly, because much of the time it doesn't even work at all. That is a staggering decline for the country that completed the Manhattan project. We don't accept such incompetence in Silicon Valley, and we must not accept it from our government.

Short-sighted venture capital

- The general theme I would suggest is that all trends are overrated. So if you think about current trends in technology: you know, healthcare IT software, education software, overrated. SAS enterprise software, really overrated. Big data, cloud computing, if you hear those words, you need to think fraud, you need to run away as fast as you possibly can. And the reason these buzzwords tell you that something is—these buzzwords are sort of like a tell in poker that people are bluffing, and the business is not undifferentiated, because the buzzwords tell you that it is one company of a category that's undifferentiated from the others in that category, and therefore are symptomatic somehow of a lot of competition, and a bad business idea. So you don't want to be the fourth online pet food company, you don't want to be the tenth thin film solar panel company, you don't want to be the one-thousandth restaurant in San Francisco. [23]
 - So there is something about if you can describe what a company is doing very straight-forwardly by referencing these buzzwords, these categories that already exist, that's actually a sign that it's a pretty bad idea. And I think one of the challenges, conversely, that you have when you have a very successful business is to try to describe it. It doesn't actually fit into any of the boxes precisely, and that makes it very hard for people to understand what's going on. Sometimes you even have companies that are genuinely innovative that do something very new, and they get mischaracterized as being one in a category that's doing something else. So for example, Google in the late 90s was categorized as just another search engine, and this was one of the reasons people thought it was not that valuable, when probably the correct characterization would have been it was the first computer powered search. All the others were this human-organized list. So it was qualitatively different. But it sort of got mischaracterized. Or Facebook, in 2004, would have been characterized, probably still is characterized, as a social

networking company, most straight-forwardly. And of course, it was not the first. There had been a number of others that had done this before.

- One of my friends, Reid Hoffman, who started LinkedIn, started the company called SocialNet in 1997. So they already had the name social networking in the company seven years before Facebook came along. They had all these crazy ideas. You were going to have these avatars in cyberspace, and some people would be cats, and some people would be dogs, and there'd be all these questions how they'd interact, and people weren't really all that interested in that. And it turned out that it turned out that what actually mattered was not social networking among virtual cats and dogs, or anything of that sort. It was real identity. And Facebook was the first company to crack the problem of real identity. That's not the way it got characterized because we're always so biased trying to put things in a pattern in a category, and not to think about what's unique, what's original, what's different.

Dysfunctional science

- [Science] has gone dramatically for the worse. The basic narrative I would give is that we had this preexisting ecosystem of idiosyncratic scientists who were driving research in all sorts of independent ways. You could dramatically accelerate it by giving them a lot of money, which is what we did in the 1930s to 1960s, but it came at this price of suddenly politicizing the system. The problem is that a good scientist is very much the opposite — now, this may be more like 180 degrees, not 175 degrees, it's 179.5 degrees — the opposite of a good politician. It's like, a scientist is someone who's interested in the truth, a politician is someone who has a very troubled relationship with the truth. [\[12\]](#)
 - I think we've had this sort of Gresham's law, where the bad scientists have driven out the good, or people who are nimble in the art of writing government grant applications have replaced the eccentric scientists who've really pushed the research. I think that's this deep corruption of the process.
 - It's very hard for the public to fully appreciate it, because science is so specialized. Who am I to evaluate superstring research, or quantum computing research, or nanotech, or immunotherapy as applied to cancer? Because of this extreme specialization of science, you have these self-reinforcing expert communities that have made this process of politicization extremely opaque to the broader public.
 - I'm very much in favor of science, but I'm skeptical of people who excessively invoke science as an incantation of sorts. When you use the word science it's often a tell, like in poker, that you're bluffing and that no science at all is going on. We have political science, we have social science. We don't have physical science or chemical science. There are just physics and chemistry, there's no debate. If you think about other areas where people use the word science excessively, I think those are areas that we should perhaps be a lot more skeptical of.

- One of the other institutions that I think has scaled quite badly—I always think of science as tech's older brother who's fallen on hard times. And big science has scaled extremely badly. And this is sort of the groupthink of the universities, that they have this ethos that they give us a universal knowledge about the universe that everybody gets. It's something that scales to an extraordinary degree. And the lies that we tell around big science have been linked in with the university lies. And I think a lot of our problems can be described in this way. [21]
- *Difficulty of rewarding innovators:* [3]
 - One of the things that I think is true of any great company is you have to build something that is valuable to the world and you have to capture some fraction of what you create. So you have to create X dollars in value, and you have to get Y percent of X. X and Y are totally independent variables. In most cases, Y is about zero percent. This is a disturbing element in the history of innovation: A lot of innovators discovered things, but weren't able to get anything. Tesla was out-competed by Edison, even though Edison had an inferior technology. The Wright brothers came up with the first airplane, but they didn't get to be rich. Of course, in the sciences, it tends to be even worse. If you are Einstein, you come up with general relativity. You don't get to be a billionaire; you don't even get to be a millionaire.
 - It's always this question of how do you actually capture some of the value of what you create. There is something very unusual about software businesses where so many of them have this monopoly-like character that enables people to capture a tremendous amount of value. That's a very underexplored dimension of it. The marginal cost of producing software is zero. So you have these incredible economies of scale. That's a classic monopoly, a natural monopoly business.

What's wrong with our culture?

Compared with other thinkers, Peter emphasises the importance of culture and attitudes in causing stagnation - and having the potential to get us out of it. Some facets of his thinking about this:

People underestimate the importance of culture

- From the Enlightenment on, modern political philosophy has been characterized by the abandonment of a set of questions that an earlier age had deemed central: What is a well-lived life? What does it mean to be human? What is the nature of the city and humanity? How does culture and religion fit into all of this? For the modern world, the death of God was followed by the disappearance of the question of human nature. [10]
 - This disappearance had many repercussions. If humans can be approximated as rational economic actors (and, ultimately, even Adam Smith and Karl Marx agree

on this point), then those who seek glory in the name of God or country appear odd; but if such odd people are commonplace and capable of asserting themselves with explosive force, then the account of politics that pretends they do not exist needs to be reexamined.

- There is, of course, an older Western tradition, a tradition that offered a less dogmatically economic view of human nature. The older account realized that not all people are so modest and lacking in ambition that they will content themselves, like Voltaire's *Candide*, with cultivating their gardens. Instead it recognized that humans are potentially evil or at least dangerous beings; and while there are vast differences between the Christian virtues of Augustine and the pagan virtues of Machiavelli, neither thinker would have dared lose sight of the problematic nature of humanity. The most direct method for comprehending a world in which not all human beings are *homo economicus* would therefore appear to involve a return to some version of the older tradition.
- The essential strangeness of the unfolding confrontation between the West and Islam consists of the radical difference between the way the confrontation itself is viewed by the two sides. Perhaps never before in history has there been such a radical difference. The Islamic side retains a strong religious and political conception of reality; it views its struggle with the West as a matter more important than life and death, because Allah will judge his followers in the afterlife by how they performed in that struggle. Bin Laden would quote with approval the speeches by Cromwell and Urban II, requiring almost no changes at all. The language still resonates and motivates heroic self-sacrifice.
- By contrast, on the Western side (if it can even be called a side), there is great confusion over what the fighting is for, and why there should be a civilizational war at all. An outright declaration of war against Islam would be unthinkable; we much prefer to think of these measures as police actions against a few unusual criminal sociopaths who happen to blow up buildings. We are nervous about considering a larger meaning to the struggle, and even the staunchest Western partisans of war know that we no longer believe in the existence of a *Gott mit uns* in heaven.
- And then one encounters Schmitt's troubling challenge. A side in which everyone, like Hobbes, values this earthly life more than death is a side where everyone will run away from fighting and confrontation; but when one runs away from an enemy that continues to fight, one is ultimately going to lose - no matter how great the numerical or technological superiority may appear at the outset.
- The modern West has lost faith in itself. In the Enlightenment and post-Enlightenment period, this loss of faith liberated enormous commercial and creative forces. At the same time, this loss has rendered the West vulnerable. Is there a way to fortify the modern West without destroying it altogether, a way of not throwing the baby out with the bathwater?
- A direct path is prevented by America's constitutional machinery. By "setting ambition against ambition" with an elaborate system of checks and balances, it

prevents any single ambitious person from reconstructing the old Republic. America's founders enjoyed a freedom of action far surpassing that of America's subsequent politicians. Eventually, ambitious people would come to learn that there is little one can do in politics and that all merely political careers end in failure. The intellectual paralysis of self-knowledge has its counterpoint in the political paralysis embedded in our open system of government.

- Let's say a little bit about [Girard's] theory. It was this theory of human psychology as deeply mimetic where you copy other people. But you imitate people but that's how you learn to speak as a child. You copy your parents language, that's how, but then you also imitate desire and then there are all sorts of aspects of mimesis that can lead to mass violence mass insanity. So it has, it's both what enables human culture to function, but it also is quite, quite dangerous. [17]
 - When I came across this constellation of ideas as an undergraduate at Stanford, my biases were sort of libertarian, classic liberal, only individuals exist. Individuals are radically autonomous, can think for themselves. And so this was, it was a powerful corrective to that intellectually. But then it also worked on an existential level where you sort of realize, wow, there are all these ways that I've been hyper mimetic, I've been hyper tracked, why am I at Stanford, why does this matter so much? Why am I doing all the things I'm doing?
 - And that's, it's a prism through which when one looks at a lot of things that I found to be quite helpful over recent decades. I think the preference falsification you can think of in mimetic terms where everybody goes along with what everybody else thinks, and then you can get these chaotic points where all of a sudden things can shift much faster than you would think possible because there are all these dynamics that are not simply rational. It's not quite correct to model people as these sort of classical Adams, it's much more entangled.
 - There are a number of different books that Girard wrote. I think the magisterial one is probably Things Hidden Since the Foundation of the World. So it's this truth of mimesis and violence and the ways. So it's sort of part psychology, part anthropology, part history.
 - It's a portal onto the past, and to human origins. It's our history, it's a portal onto the present, onto the interpersonal dynamics of psychology. It's a portal onto the future in terms of: are we going to let these mimetic desires run amok and head towards apocalyptic violence where even the entire planet can no longer absorb the violence that we can unleash? Or are we going to learn from this and transcend this, in a way where we get to some very different place.
 - And so it has a sense of both danger and hope for the future as well. So it's this panoramic theory in a lot of ways. Super powerful and just extraordinarily different from what one would normally hear. There's almost a cult like element where you had these people who are followers of Girard. And there was a sense that we had figured out the truth about the world in a way that nobody else did and that was generative and very powerful.

- There are parts of it that are unhealthy, but it has an incredible dynamism. And then you are aware that maybe things are so different from how they appear to be that... there may be a portal out there.
- I think the problems of violence and scapegoating are universal problems. It's probably the case that there are certain types of people who are more likely to become scapegoats, but it's not an absolute thing. You could say there's an arbitrariness about scapegoating because the scapegoat is supposed to represent, to stand in for everybody. So the scapegoat has to be perceived as someone who's radically other, but then also has to somehow emerge from within the group. There are times when the scapegoat is the outlier, extreme insider, extreme outsider, king/criminal or whatever personality.
- That's probably a dangerous sort of thing. It's like Abraham Lincoln, the incredible orator who also grows up in a log cabin, these extreme contrasts are often people who are at risk of this maybe more than others. And then at the same time, because these are mob-like dynamics, there is a way in which it's not like anyone's really safe from the violence ever. No one's completely safe.
- There is a thought that one of the history ideas that Girard had that is that there's a dynamic to this process where scapegoating, it only works when people don't understand it. As you understand it better, it works less well or it has to get displaced into other dimensions. If you have a witch hunt, say, we need to find a witch to bring back peace to the community, that's a psychosocial understanding of what you're doing is actually counterproductive of the witch hunt itself. The witch hunt is supposed to be a theological epiphany that God's telling you who the witch is. If you think of it as some sort of psychosocial control mechanism, then it won't work any more.
- A metaphor that Girard uses is that the sacred is like phlogiston and violence is like oxygen, but it only works in a world where it's misunderstood. So if you understand scapegoating, you end up in a world where it works less and less well, and the kind of political and cultural institutions that are linked to it will tend to unravel. I think one of the ways in which this has happened a great deal in modernity is that we scapegoat the scapegoaters, go up one level of abstraction.
- That always makes it a little bit more complicated. If we go after the people who were the historical oppressors, the historical victimizers, that's often a super powerful way, and it's slightly too complicated. There was a Bill Clinton formulation of this, "we must unite against those who seek to divide us", which is on some level itself contradictory, but then it's a little bit too hard for people to fully disentangle. That's one way that I think it still works even though when everyone sees these moves, when everyone understands them, it just doesn't work that well any more.
- The theological terminology Girard would use would be that scapegoating is satanic and that archaic cultures were a little bit satanic but not very. They were sort of satanic in an innocent way because the violence was actually a way to limit violence, that violence is both the disease and a cure for the disease. We

need violence to drive out violence. This is how our societies work. And then it's not quite clear how things will continue to work. You could always say that there is a sense in which - and this is super broad brush stroke-type argument - there's a way in which you can say that the Left is more focused on the unjustified nature of violence, and the Right is more focused on how a certain amount of violence is needed for society. There are ways in which they're both right, and then there are ways in which they're both deconstructing each other.

- You could say a nation state contains violence in both senses of the word contain.

We lack positive visions of the future

- Culturally, the failure of an imagination, a different future, is seen in science fiction movies where if you look at all the science fiction films in the last quarter-century, they basically show technology that's dystopian, doesn't work, that kills people. So you can choose between the Terminator or the Matrix or Avatar or maybe - maybe if we don't get Obamacare, Elysium. And that does not portray a future that's radically different and better. I think the Star Trek retread movies are sort of an exception, but that's still a throwback to the 60s. The Jetsons are a completely reactionary aesthetic at this point.

[5]

- Globalization is about some sort of convergence theory of history in which the developing and developed nations converge. And a lot of the rhetoric around globalization is implicitly anti-technological. And so when we split the world into developed and developing nations, this is a pro-globalization dichotomy but it's also an anti-technology dichotomy because we're implicitly saying that the developed world is that part of the world where nothing new is going to happen, where nothing is going to change, where things are basically stuck. And so I think the question that I would like to see us ask more is how can we develop the developed world or something - something like that.
- The rhetorical version of this that I always think is striking is when were the last political speeches you can remember where people in very concrete terms portrayed a future that looks very different from the present? So you can imagine Martin Luther King: "I have a dream of a nation no longer divided." And so it's radically different from the present, a much better, a very different looking future. The last speech like this that I can really identify would be Reagan at Berlin - "Mr. Gorbachev, tear down that wall" - where it's very concrete terms, a future that looks radically different and much better than the present. And somehow that works much less well.
- During the Obama campaign in 2008, there was a subtle change in the way the slogan worked where you started with the slogan, "hope and change." And in the course of the campaign, that slogan changed, to "the change we need." And so in other words, a change from maximal change to the absolute minimum amount of

change that's absolutely necessary, which is quite a striking reversal because it turned out that change poll tested very badly; people were scared of change, they thought that change meant change for the worse, not for the better. And I think that is the sort of political malaise that you're up against whether you're a Democratic or Republican politician.

- [Hope and change] is incredibly abstract and so the abstractions enable people to project onto it whatever they want to. But it suggests that there's not going to be any specific leadership in one direction or another. But again I think this is not a problem limited to Obama or Clinton or the Democrats. I think it's really these abstractions are very much across the board.
- I think in politics or culture for the future to have power over the present, it has to be different from the present. The future has power because it's a time that will look different from the present and so it can't just be an endless Groundhog Day. If it's just always the same, it's just always repetition, then the future does not have any appeal and that's not part of a political agenda. And so if we look at Europe and we say, well, how will Europe be different from the way it is today in the future? I think there's sort of three pictures of a very different future, and behind door number one is Islamic Sharia law, and if you're a woman, you'll be wearing a burka. So that's a very different picture of the future, it's very concrete. Behind door number two is the Chinese communist AI, and it's the big eye of Sauron that will be watching you at all times and all places. That's door number two for the future. And door number three is the green movement, and you'll be pattering around in an E scooter and you'll be separating out your garbage in a recycling can. And then I think the challenge is that there are no other doors. Those are the three options. And this is a, even though I'm not a crazy environmentalist, this would be my sort of argument for why the green stuff has so much traction in Europe. If those are the only three options, I'll go with Greta. [2]
- I would go with Israel over the UK if you forced me to list two [countries with positive visions]. But sure, let's say US, UK, Israel, I'll go with those three. UK's sort of half way between the US and Europe, so it's better than Europe and it's worse than the US. [10]
- It's not just the Right – the Obama Administration wouldn't say that they can have strong substantive ideas of what to do. They can improve processes, but they would never actually think that you could actually build a very specific thing in a preplanned way. They don't even believe in that anymore. [6]
 - It's again feedback from things that are already working and we improve them a little bit; we're all just going to climb up, go up the up-gradient and we may get stuck on a low-lying hill. Sometimes you have to step back and wonder where in the world do we find ourselves? Do we just simply go uphill? Do we end up on a low hill or do we really end up on Mount Everest? And we have all these hill-climbing theories, we have no valley-crossing, mountain-climbing theories, we need more of those kinds of things.
- I think that there probably a whole set of things that came together and there was environmental damage, people became more aware of that. There was the nuclear weapons danger, people became more aware of. That was a way in which our society

became somewhat more risk-averse. We replaced the scientists and engineers with lawyers and bankers, became more financially oriented less, less oriented towards certain other things, then let them play a whole set of reasons why it happened. It's quite hard to figure all of them out. [19]

- I do think that if you look at this culturally: we at this point, live in a society, and in a world, a country, that dislikes science and technology in just about all its forms. We were always told that we have lots of technological progress. I think the reality is much more that the culture is very biased against the technology. The easiest way to see this, and this is always my challenge—people don't agree with this—is challenge you to name me one science fiction film that Hollywood produced in the last 25 years in which technology is portrayed in a positive light, in which it's not dystopian, it doesn't kill people, it doesn't destroy the world, it doesn't not work, etc., etc. Instead, we have one sort of catastrophic, anti-technological scenario after another, and the future is some combination of the Terminator movie, and Avatar, and Elysium, and you know, The Matrix. I watched the Gravity movie the other day. You would never want to go into outer space. I mean, you want to be back on a muddy island somewhere on this planet. And again, I think Hollywood is not the sole source of this. To some extent, it mostly just reflects the broader culture, which I think at this point, is very anti-technological. Which is why I think Silicon Valley is sort of the center of the counterculture in our society today. [23]

We think about the future in indefinite ways

- Indefinite attitudes to the future explain what's most dysfunctional in our world today. Process trumps substance: when people lack concrete plans to carry out, they use formal rules to assemble a portfolio of various options. This describes Americans today. In middle school, we're encouraged to start hoarding "extracurricular activities." In high school, ambitious students compete even harder to appear omnicompetent. By the time a student gets to college, he's spent a decade curating a bewilderingly diverse résumé to prepare for a completely unknowable future. Come what may, he's ready—for nothing in particular. A definite view, by contrast, favors firm convictions. Instead of pursuing many-sided mediocrity and calling it "well-roundedness," a definite person determines the one best thing to do and then does it. Instead of working tirelessly to make herself indistinguishable, she strives to be great at something substantive—to be a monopoly of one. This is not what young people do today, because everyone around them has long since lost faith in a definite world. No one gets into Stanford by excelling at just one thing, unless that thing happens to involve throwing or catching a leather ball. [16]
 - Every culture has a myth of decline from some golden age, and almost all peoples throughout history have been pessimists. Even today pessimism still dominates huge parts of the world. An indefinite pessimist looks out onto a bleak future, but he has no idea what to do about it. This describes Europe since the

early 1970s, when the continent succumbed to undirected bureaucratic drift. Today the whole Eurozone is in slow-motion crisis, and nobody is in charge. The European Central Bank doesn't stand for anything but improvisation: the U.S. Treasury prints "In God We Trust" on the dollar; the ECB might as well print "Kick the Can Down the Road" on the euro. Europeans just react to events as they happen and hope things don't get worse. The indefinite pessimist can't know whether the inevitable decline will be fast or slow, catastrophic or gradual. All he can do is wait for it to happen, so he might as well eat, drink, and be merry in the meantime: hence Europe's famous vacation mania.

- After a brief pessimistic phase in the 1970s, indefinite optimism has dominated American thinking ever since 1982, when a long bull market began and finance eclipsed engineering as the way to approach the future. To an indefinite optimist, the future will be better, but he doesn't know how exactly, so he won't make any specific plans. He expects to profit from the future but sees no reason to design it concretely.
- Instead of working for years to build a new product, indefinite optimists rearrange already-invented ones. Bankers make money by rearranging the capital structures of already existing companies. Lawyers resolve disputes over old things or help other people structure their affairs. And private equity investors and management consultants don't start new businesses; they squeeze extra efficiency from old ones with incessant procedural optimizations. It's no surprise that these fields all attract disproportionate numbers of high-achieving Ivy League optionality chasers; what could be a more appropriate reward for two decades of résumé-building than a seemingly elite, process-oriented career that promises to "keep options open"?
- Recent graduates' parents often cheer them on the established path. The strange history of the Baby Boom produced a generation of indefinite optimists so used to effortless progress that they feel entitled to it. Whether you were born in 1945 or 1950 or 1955, things got better every year for the first 18 years of your life, and it had nothing to do with you. Technological advance seemed to accelerate automatically, so the Boomers grew up with great expectations but few specific plans for how to fulfill them. Then, when technological progress stalled in the 1970s, increasing income inequality came to the rescue of the most elite Boomers. Every year of adulthood continued to get automatically better and better for the rich and successful. The rest of their generation was left behind, but the wealthy Boomers who shape public opinion today see little reason to question their naïve optimism. Since tracked careers worked for them, they can't imagine that they won't work for their kids, too.
- Malcolm Gladwell says you can't understand Bill Gates's success without understanding his fortunate personal context: he grew up in a good family, went to a private school equipped with a computer lab, and counted Paul Allen as a childhood friend. But perhaps you can't understand Malcolm Gladwell without understanding his historical context as a Boomer (born in 1963). When Baby

Boomers grow up and write books to explain why one or another individual is successful, they point to the power of a particular individual's context as determined by chance. But they miss the even bigger social context for their own preferred explanations: a whole generation learned from childhood to overrate the power of chance and underrate the importance of planning. Gladwell at first appears to be making a contrarian critique of the myth of the self-made businessman, but actually his own account encapsulates the conventional view of a generation.

- The contrast of Germany and California I always like to give is that California is optimistic, but desperate, and Germany is pessimistic, but comfortable. But from a Californian perspective, the incredibly deep pessimism is really, really striking, and even on that one dimension, I think Jewish culture is super different. [17]
- There certainly is some very mild anecdotal evidence that you can give. The anti luck argument is that there are certain people who succeeded in doing various businesses on a repeat basis. There's probably perhaps most famously Steve Jobs with Apple and Pixar; Jack Dorsey with Square, Twitter; my colleague Elon from PayPal who went on to start SpaceX and Tesla, was heavily involved in Solar City. Of course there's always a counter-narrative with these things. You can say well each of these people had just one big breakthrough and then everything else was somehow leveraged off of that. And so whenever you drill down on this question - was it luck, was it not luck - it's actually really hard to say. [25]
 - It is striking, however, how much the way we talk about this has changed. And so if you go back in time, the classical way people used to talk about it was that luck was something to be overcome or to be mastered. So Thomas Jefferson: "I'm a great believer in luck and I find the harder I work the more I have of it", which again suggests that it's this thing to overcome, or that doesn't dominate things. Or even simpler, Samuel Goldwyn: "the harder I work the luckier I get". Very much in contrast to that you have something like today's dominant view where success stems from this whole context, the context is random. Maybe you were a member of the lucky sperm club, the lucky egg club, you were lucky where you were born and stuff like that. And that is what drives everything and there's a version of this that applies to startups: that the successful ones were accidental, it's pretty clear how big a role luck plays. I agree with Paul Graham on an awful lot of things but again I think this is a place where it's just automatically channeling our default bias as a society and it's worth asking how much of this is true and how much is not true.
- The classic version of indefinite optimism is a portfolio investing theory: it is that you should invest in a stock market index. That's the way you get the highest risk adjusted returns, because the motion of stocks is like the movement of atoms in the universe: it's fundamentally random and we can't know anything about it. We can maybe describe the laws, the statistical laws that describe the randomness. But what specific stocks or specific companies or specific projects you should invest in you can never know. But you know the stock market generally moves in a northeasterly direction and therefore the

most important thing is to find the way to get maximum diversification at minimum cost and do something like portfolio investing. One of the strange things that happens in the shift from definite to indefinite views of the future is that there is this shift from engineering to finance and and and one of the things that happens is that money somehow becomes much more important. [25]

- In a definite world money is a means to an end because there are specific things you want to do with money. In an indefinite world you have no idea what to do with money and money simply becomes an end in itself, which seems always a little bit perverse. You just accumulate money and you have no idea what to do with it. That seems like a bit of a crazy thing to do but I think that's actually what happens a great deal. And so to illustrate one way that this flow might happen if you start a successful business, you sell the company or you sell shares to investors in an IPO, you make some money. Question: what do you do with the money? You have no idea because nobody knows what to do with anything and so you give the money to a large bank to help you do something. What does the bank do? It has no idea so it gives the money to a portfolio of institutional investors. What does each institutional investor do? They have no idea and so they all just invest in a portfolio of stocks. Not too much in any single stock ever because that suggests you have opinions or you have ideas and that's very dangerous, because it suggests that you're somehow not with it. And then what do the companies do that get the money. They've been told that all they should do is generate free cash flows because if they were to actually invest the money in specific things that would suggest the companies had ideas about the future, and that would be very dangerous. And so one of the worst things you can ever have is a company that's not profitable in this indefinite world. And the contrarian idea that I always like saying is that we always like investing in companies that are losing money. We don't like investing in companies that are making money because the companies that are not profitable are actually the companies that have a lot of ideas about what to do with their money. Whereas a company that's massively profitable on some level is a company that's out of ideas. And it's especially crazy in a world where the interest rates are zero and you actually get paid less and less on the money and then of course the companies are profitable to generate cash flows. The cash flows eventually go back to people and you sort of cycle and repeat and this is the rough flow that happens in the world of indefinite optimism.
- This is a bit of an extreme picture but in effect it's a hermetically closed loop and at the end of the day no one's doing anything real with the money, it's completely abstracted. And what ends up happening is there are fewer and fewer things you can do. And one of the financial ways to illustrate this is if you look at the real interest rates on a 10-year bonds in the US - which is a measure of how much interest you earn on bonds - it's basically been trending steadily downwards. Today it's at minus 0.6 percent, so 10-year bonds are yielding about 2%. The expected inflation for the next decade is 2.6 percent so when you invest in bonds

in real terms you're expecting to lose minus 0.6 percent a year for a decade. And it shouldn't even be surprising because there's no one in the system who has any idea what to do with the money. This has been a consistent critique of the huge deficits the US is running, people constantly are saying there's a point where the bond market is going to blow up. And the interest rates will go higher and one of the really big mysteries is that this has not happened for year after year. And I think the the fundamental reason this has not happened is that people actually have no idea what to do with the money. The last big idea people had on what to do with money that was not circular was to buy houses and to invest in housing, and that was the idea of the last decade. That idea has gone out of fashion. Now that people no longer want to buy houses they have absolutely no ideas what to do with money. The interest rates - the real interest rates - are going steadily more negative and so there's some sense in which this system of indefinite optimism is gradually running out.

People are either in acceptance or denial

- If you have this period of generalized stagnation, you could sort of accept it, you can deny it, or you can fight it. And the modalities that seem to dominate in our culture are acceptance and denial. [5]
 - And probably the Republicans are more on the denial side, maybe a little bit less than before. The Democrats tend to be on the acceptance side. And what probably is really needed is to fight the stagnation or to fight the decline. Acceptance and denial, even though they're opposites in some ways, they're actually very similar in that both of them tell you at the core that there's nothing to worry about, there's nothing you can do, it doesn't actually matter.
 - Men reached the moon in July 1969, and Woodstock began three weeks later. With the benefit of hindsight, we can see that this was when the hippies took over the country, and when the true cultural war over Progress was lost.
 - Today's aged hippies no longer understand that there is a difference between the election of a black president and the creation of cheap solar energy; in their minds, the movement towards greater civil rights parallels general progress everywhere. Because of these ideological conflations and commitments, the 1960s Progressive Left cannot ask whether things actually might be getting worse. I wonder whether the endless fake cultural wars around identity politics are the main reason we have been able to ignore the tech slowdown for so long.
 - It's always tricky, how do you get out of denial without going straight to acceptance, which seems to be the common modality. I describe this era of technological stagnation, it's not meant to be demotivating. It's meant to say: there's a problem – and we could be doing a lot better on these things.
- It strikes me that there are ways we don't want to wake up. We don't want to wake up in a way where it de-energizes us and demotivates. I think one of the ways I think these

institutions worked was they took care of people, but it was also motivational. You study. You get good grades. You'll succeed in our system. One way, when you deconstruct these institutions, there's one direction that I think is always very dangerous, that it just shifts people into a much more nihilistic, very low energy mode where it's just, "Well, there's no point. Nothing can be done." That's the way that I definitively do not want to wake people up. [17]

- There are these paths that aren't really going anywhere and you shouldn't go down these paths. But then there's some other paths here that you need to take. There's a portal here that you need to look at. If we are just saying all the paths are blocked, I think probably the risk is people just sit down where they are and stop moving altogether. That feels like the very wrong way to wake people up.
- The 1990s narrative was the new economy, and you lied about growth. And then the 2000s narrative was the Great Moderation, and you lied about volatility. And maybe the 2010s one is secular stagnation, where you lie about the real interest rates, because the other two don't work anymore. In a complicated way, these things connect. [17]
 - But yes, new economy sounded very bullish in the '90s. Great Moderation was still reasonably long stocks, but sounds less bullish. And then secular stagnation - in the Larry Summers forms, to be specific to what we're talking about - means again, that you should be long the stock market. The stock market's going to keep going up because things are so stagnant. The real rates will stay low forever. So they are equally bullish narratives, although they sound less bullish over time.
 - And of course, I think the crazy cut on the '20s and '30s was that we didn't need to have as big of a crash. You could've probably done all sorts of interventions. Because the 1930s was still a period that was very healthy in terms of background scientific, technological innovation. If we just rattle off what was discovered in the 1930s that had real world practical things, it was: the aviation industry got off the ground, the talkies, the movies got going. You had the plastics industry, you had secondary oil recovery, household appliances got developed. And as you know, by 1939 there were three times as many people who had cars in the US as in 1929. There was this crazy tailwind of scientific and technological progress that then somehow got badly mismanaged, financially, by whoever you blame the crash on.
 - And so, I think that's what actually happened in the '30s, and then we tried to manage all these financial indicators much more precisely in recent decades, even though the tailwind wasn't there at all.

Our expectations are self-fulfilling

- There's a great deal of hysteresis. So when things haven't worked for a while, people do give up on areas. So Nixon declares war on cancer in 1970, says he will defeat it by the

Bicentennial in 1976. 44 years later, by definition we're 44 years closer to the goal but people don't – people are less motivated today than they were in the 1970s. [5]

- And it would be inconceivable for someone like Obama to get on television and say we're going to declare war on Alzheimer's even though one-third of Americans at age 85 are suffering from some form of dementia. And so it would seem like the sort of thing that one should try to do something on. But it's – it just does not resonate.
- For my liking, people are too complacent and I do think there is this incredible self-fulfilling aspect. If you think you can do something, thinking you can do something is a necessary precondition for being able to do it. It may not be sufficient but it surely is necessary.
- It was [Andrew] Wiles, the Princeton mathematician, solved Fermat's last theorem, worked on it by himself for eight years, solved it after 358 years of people trying. And maybe it was impossible, maybe it was a fool's errand to spend time on that. But if you didn't think that you could do it, you were never going to be the person to do it.
- I think there is a big hysteresis part to this where success begets success and then failure begets failure, where if you haven't had any major successes in a number of decades, it does induce a certain amount of learned helplessness, and then it shifts the way science gets done or the way innovation gets done in to a more bureaucratic, political structure where the people who get the research grants are more the politicians than the scientists. You're rewarded for very small incremental progress, not for trying to take risks. It's led over time to a more incrementalist, egalitarian, risk-adverse approach, which I think has not worked all that well. [6]
- When you have a history of failure, that becomes discouraging and so failure begets failure. No halfway sane parent would encourage their kids to study nuclear engineering today, whereas there are a lot of people going into software. The history of success in software is encouraging more people to go into it and drive more innovation. Then the history of failure in these other areas has been very discouraging. What I think would start, if you got some signal successes in other areas, that can then set a precedent and you can somehow get what's been a vicious cycle into a virtuous cycle. [12]
- To build a better future, you have to I think first convince people that it's possible. You have to get people to work. And so there's always a self-fulfilling aspect. We think it's not possible. People won't work on it and it won't happen if we think it's possible, we will work on it and it might very well happen. I don't think it's going to happen as a mass movement, as a mass political change. I think it's much more likely to happen in small groups in new companies, new ventures - could be new non-profits. But I think it's got to be much easier to convince small groups to work on what you want. Start with maybe twenty or thirty rocket scientists at the core of SpaceX, rather than some mass political movement. [19]
 - Somehow our society is not as inspired by science or technology which is why I think progress is more likely to happen in small groups in our time or not at all.

We're too conformist

- What's amazing about these top U.S. institutions in the U.S., whether academic or law firms, banks is that from the outside, they're places where everybody wants to get in. And then once you're – once you're in them, it turns out that it's always fairly constricted. You have enormous numbers of very talented people. So that's the aspect that's very positive. But then it's also, it ends up being – involving a ferocious amount of competition for what I think are often relatively small stakes. Where at Sullivan & Cromwell, the New York law firm I was at, you have eighty very talented people start every year, four or five might make partner after seven or eight years. And it was very unclear even for the people who became partner how much impact they would have on the broader world. So you have some of these people who are incredibly ambitious going in, and sort of gradually gets wrung out of them over time. [5]
 - I do think that Silicon Valley, the technology industry, is still an exception to this, where we're living in a society, where the frontier is not as wide open as it was in the 19th century. Geographically, maybe you can still go to Alaska but there aren't that many places one can move to where there's wide-open space left. Technology, I think, is one place where that still exists and where it is possible for a small group of people to start something new that has a big impact on the world as a whole.
- It's always this question whether it's that good to always be looking at the people around you and getting feedback from them in different ways. There's this very strange aspect in Silicon Valley where so many of the very successful entrepreneurs and innovators seem to be suffering from a mild form of Asperger's or something like this. I always wonder whether this needs to be turned around into a critique of our society where if you don't suffer Asperger's, you get too distracted by the people around you. They tell you things, you listen to them, and somehow the wisdom of crowds is generally wrong. [6]
 - The Malcolm Gladwell wisdom of crowds book, it always – there's a very specific thesis that it has, which I believe is true. Then, there is the way the term always gets misused. The specific thesis is that the wisdom of crowds works if everybody in the crowd is thinking independently for themselves. So if we have a jar of marbles, and everybody guesses how many there are, then somehow the collective judgment ends up being better than most individuals' judgments. But if you have a more common way, the wisdom of crowds works through this sort of hyper mob-like behavior where I think you get a lot of irrationalities. You get the wisdom of crowds becoming the madness of crowds. It becomes a bubble in finance or something worse in politics when it goes very wrong.
 - They've done these studies at Harvard Business School, which I often think of consisting of the opposite of Asperger-like people. People who are extremely socialized, extremely extroverted, have relatively few convictions of their own. [But] good work habits. You put them in a two-year hothouse environment in

which they spend two years talking to one another trying to figure out what to do, which leads to this very dysfunctional wisdom of crowds dynamic where you will simply – because none of the other people have thought about it for themselves and have any independent ideas – and they've done studies on this where systematically the largest cohort at Harvard Business School goes into always the wrong thing.

- 1990 they all wanted to work for Michael Milken one or two years before he went to jail. They were never that interested in tech except 1999, 2000 when they descended on Silicon Valley en masse and timed the end of the dot com bubble perfectly. And on and on. There is something about this that's very tricky where probably a lot of innovation, creative thinking, doing things that matter generally depends on not being so beholden to the people you're immediately around. Even though you get feedback, and the feedback is helpful. There are these cases where it can go very wrong.
- My prior is there is a lot more innovation that could happen so if the feedback mostly is a form of anti-theories – “can't do that, that's too bold, that doesn't quite make sense.” In a world where a lot of innovation is still possible, this sort of horizontal feedback probably has a very bad dampening effect. If we're in a world where in fact everything's been discovered, everything big has been discovered, this sort of feedback would stop people from wasting their lives on some sort of quixotic quest of one sort or another. So it does depend some on what your priors are.
- If I had to make a judgment on it, I think we are in a world where these feedback mechanisms have gotten far too powerful, where people are too easily swept up by these mob dynamics. I'm certainly not going to go on your TV show and blame this on the Internet in any way. But you have to ask whether there are ways some of these technologies have maybe even exacerbated some tendencies that were already there in our society. The phenomenon of political correctness, there are many ways to describe it, but certainly one is you have these incredibly powerful negative feedback effects that get brought to bear and have this very inhibiting character, and I don't think it actually results in things being far more generative than they otherwise would be. It cuts off a lot of lines of inquiry, but I don't think that means it opens up that many more.
- And I think one of the things that I've come to really appreciate over the years is how powerful these psychosocial forces in our society are that basically push people's thinking into a homogenizing kind of direction. And it's on the level of the larger economy in the U.S., we've had this extraordinary history of bubbles in the last few decades, which clearly had a psychosocial component where people were not thinking very much for themselves. You had an Internet bubble in the 90s, an even crazier and more destructive housing and finance bubble in the 2000s. And I would argue even dumber and bigger and worse government bubble in the 2010s. But all these things were characterized by extreme lack of

critical thinking, assuming that other people had figured things out and deferring to that in one way or another.

- And so whenever you see a situation where it's very hard for people to think critically on their own, you have to sort of wonder whether there's something very off on this. There was – and I think you can often get these unconventional truths through means – I'm not sure what the right terminology is, but you could sort of describe it as a political approach where you ask the question what are the things people can't say or can't think. And maybe there's a natural or metaphysical approach where you just try to figure out the fundamental truth of things. And I always have a preference for the political approach because I think it's so much more straightforward, and kind of a shortcut.
- So by way of example, in the last decade in Silicon Valley, 2002 to 2008, there were basically two major things one did as a venture capitalist: you invested in the next generation of Internet companies or you invested in clean tech. And the next-generation Internet companies generally worked pretty well. Clean tech was an unmitigated disaster. And the critical question was, how could you have figured this out early?
- And the sort of the scientific, natural, metaphysical type of approach would have been to evaluate every single clean technology on its merits and then you have to figure out, were people lying about it, were they distorting the results, how far were things off? And one could have done that, but it would have been, would have been extremely hard to figure this out.
- The political approach was to realize that there were a set of intensely held conventions that people could not question. There were things around it involving social status, it seemed cool for people to be involved in this, and they were not that interested in whether it made any sense. And that's why clean tech was not just an initial set of bad investments but why maybe ten times as much good money was thrown after bad in the 2005-2008 period.
- We need to ask, what is it about our society where those of us who do not suffer from Asperger's are at some massive disadvantage because we will be talked out of our interesting, original, creative ideas before they are even fully formed? [\[12\]](#)
 - We'll notice that's a little bit too weird, that's a little bit too strange. Maybe I'll just go ahead and open the restaurant that I've been talking about, that everyone else can understand and agree with, or do something extremely safe and conventional, and therefore hypercompetitive, and probably not that great as an idea. I'd say a lot of these people may not understand this larger theory about society, but they are somewhat oblivious to it, and it pushes progress.
 - I learned that I was incredibly prone to this problem of social convention. If you want to give it a religious terminology, the psychological terminology would be that I had a rolling quarter life crisis in my mid-20s. The religious terminology, I had a quasi-conversion experience where I realized the value system was deeply corrupt and needed to be questioned.

- I do think that one of the ways of challenging convention, one way, the Asperger's way, is just to be vaguely oblivious to it all, and continue apace. Then I think there is another modality where you just become aware of how conventional our conventions really are, and then that becomes an indirect route of trying to start thinking for yourself.
- I worry that the conformity problem is actually more acute than it was in the '50s or '60s, so that the category of the eccentric scientist, or even the eccentric professor, is a species that is steadily going extinct because there is less space for that in our research universities than there used to be.
- It's very hard to measure these things or calibrate them, but I think that in politics, the conventional approach is to simply look at pollsters. What are your positions going to be? You just look at the polls, you figure this out, and it works fairly well.
- At the end of the day, that's probably not how the system really changes. It probably will be changed by some idiosyncratic people who have really strong convictions, and are over time, able to convince more people of them. But whether this means that we have more or less change is hard to evaluate. It always comes from these somewhat nonconventional channels.
- I think it's a little bit unfair to just pick on the business school context. I think it's a very general, very endemic context that we find competition extremely validating, and it is always super-misleading. The academic version of this, I think, was articulated well by Henry Kissinger when he described his fellow professors at Harvard as saying you know, the battles in academia are so ferocious because the stakes are so small. And we always think of this as some sort of definition of insanity. Why would you fight like crazy? You fight like crazy if the stakes are big. Why would you fight like crazy if the stakes are small? And it's in part, it's of course when people are not differentiated, the differences get very small. You fight over less and less, so it is both a definition of insanity, but also a working out of the logic of the situation. [23]
- *[Bill Kristol: Do you have the sense that this psychosocial conformism, or herd mentality, or whatever you want to call it, is stronger now than it was 20 years ago, 40 years ago, 60 years ago or is it just the way democracy is, kind of Tocquevillian?]* [5]
 - It's always hard to compare. I do worry that there are elements of it that are somewhat stronger. We're living in a more globally connected, more transparent world; it often seems more dangerous for people to express unconventional ideas because there's a record of that and so people maybe are censoring themselves more than they were – more than they were 50 years ago. There are a lot of things where I find that somewhat worrisome. I'm not going to get this quote exactly right, but there's the Nietzsche line that madness is rare in individuals but in nations and crowds of people, it's the rule. That was before Nietzsche himself went mad.
 - I do think there's something, there is something very peculiar about the history of the bubbles that we've been experiencing in the last few decades, which is quite anomalous. There was an enormous bubble in the 1720s, there was one in the 1920s. But we've had maybe four or five of roughly the same magnitude in the

last 30 years. And so I do think if you were looking at EKG chart of the health of the world and you started seeing all these up-and-down spikes, it might be a mistake to say that everything is normal, and very sane, and under control.

- If you're one of a very large crowd that's trying to do something, there's always this question, what's even the point because it'll happen anyway, you won't make that much of a difference relative to what you could otherwise do.
- We always think of Japan as this hyper-imitative, noncreative culture of extreme conformity. My suggestion is that perhaps at this point, Japan is the least conformist, the least imitative country in the world. There's actually a lot of interesting aesthetic cultural stuff going on, there still is a lot of very successful types of businesses. There's innovation in food production, all sorts of interesting areas. [12]
 - But then it's an indictment of the West, where I think Japan is no longer the Japan of the Meiji Restoration of the 1870s, or the Japan of the cheap plastic imitation toys of the 1950s. It's a country that no longer thinks it can get that much by copying the West. There's probably still some narrow interest in IT and software. Outside of that, I think they are copying the US and Western Europe less and less.
 - People aren't even learning English that much anymore. They're speaking less English than they were 15, 20 years ago. The golf courses are all getting shut down and converted to solar farms or something; people don't even want to play golf anymore. I think we need to take this as a real critique of our society, very seriously, that they're finding less that's desirable to imitate in the US or Western Europe.
- If you are able to push unpopular causes, that's very good. Then, the Zen-like problem, the paradox, is that you have a lot of impact, if you are able to push a good, worthwhile, but unpopular cause. The Zen paradox is that it's very hard to market it and get money to do it. [12]
 - That's the tension that it's worth thinking through really hard. I think most nonprofits fail at this, where they end up supporting things that are super conventional, they can get funding for them, but if they didn't do it, there'd be 100 other people doing it.
 - Always having a counterfactual sense of mission is important. If we weren't doing this, nobody else in the world would be doing this. To the extent that's not true, you want to make that more true. Maybe it's a spectrum, but you want to always tilt more in that direction.
 - On the business side, on the nonprofit side, I always differentiate mission-oriented businesses, which have this counterfactual sense of importance, from social entrepreneurship. Anything that has a social element to it — the word social is very ambiguous. It can mean, number one, good for society. It can mean, number two, good as seen by society. In practice, the second meaning always ends up dominating the first. Then, you end up with the "me too," lemming-like, sheep-like clones, where you lose every *raison d'être*.

- It's not like we get all the benefits of transparency with none of the costs. They come with a very, very high cost. I do wonder if one of the strange dynamics with the younger generations in the US is that there's a sense that you're just constantly watched. There's this great Eye of Sauron, to use the Tolkien metaphor, that's looking at you at all times. It would be good if you could act the same way and if something bad happened, we could take care of you. But if you're always being watched, I suspect it really changes your behavior. [17]
- Competition makes us better at that which we're competing on, but it narrows our focus to beating the people around us. It distracts us from things that are more valuable or more important or more meaningful. [22]
- It was Aristotle that said, "Man differs from the other animals in his greater aptitude for imitation." It's how we learn languages. It's how culture gets transmitted. But it also leads to all sorts of bubbles, all sorts of insane madness-of-crowds-type behavior. [22]
 - So I always like to flip this around. What is it about our society that somehow talks all of the people who don't have Asperger's out of their original ideas before they're a little bit too weird? Why do we push people to do things that are much more conventional? It's an anti-Asperger's personality, and it's often actually quite bad for innovation.
- Originality is hard. You don't get to be original if you dress up like a hipster and you wear all the same fashionable clothes the other fashionable people wear. So there's a lot of stuff where we always pretend that creativity, originality, all these things are somehow super easy. And the reality is they're very, very, they're very hard. Already in the time of Shakespeare, the word 'ape' meant both primate and to imitate. It was Aristotle I believe, however you say it, man differs from the other animals, and has greater aptitude for imitation. So there is this imitation aspect to human nature that runs very deep. It's how we learn language as kids, it's how culture gets transmitted. But it also leads to many forms of insane behavior. It leads to insane peer pressures, it leads to market bubbles, manias, and so I think trying to find a way to be original is quite difficult. I think in practice, again, I don't think there's a formula. This is how you do these five steps and you will have an original idea. There's no easy formula, but if you described it, it often starts by not being that focused on the people around you, being really passionate about some idea, or something more transcendent. And that's what drives a lot of innovation. [23]

We think about risk in the wrong way

- Even this concept of risk is a very strange concept. One of the things you can do on Google is search for words and the frequency in which they occur in books over time. If you look at the word risk over the last 200 years, from 1800 to 2000, it's a very infrequent word. Very rare until about 1970. And then it goes up at an incredibly steep curve. And it becomes much more common in titles – How to Manage Risk, How to Take

Risks – and so the thought I've been wondering about is whether a lot of talk about risk is actually even counterproductive to risk. If you have a risk that if your kids are left unsupervised in the playground that they'll be kidnapped, or if you have risk that this can go wrong, or that can go wrong, or a risk that somebody is going to die from some new medical treatment, that risk is actually this word that's used to discourage people from doing anything. It's more and more a frequent occurrence is a symptom of society where less and less good risk-taking is actually taking place. [6]

- There's all these ways where I wonder whether the focus on the processes of risk-minimization distracts you from the substance and ideas and figuring things out, of doing new things. And so I think definitely something like that seems to have been very much at work. I think that – let me see how to put this – one of things that's true about risk is that it is this very probabilistic way of thinking about the future where the future is dominated by chance, by fortune, and that's this all-powerful force that dominates everything. And I think it's one of the questions that I think is very unclear is this in fact a deep truth about the universe or is it more about the abdication of our responsibilities?
- As a venture capitalist, the temptation is always: you look at a company and you say, "Don't really know if it's going to work or not, and I'm just going to invest a small amount and see what happens." The temptation is to treat all these companies as lottery tickets, but once you treat them as lottery tickets, I've found you somehow psyched yourself into losing. You've already psyched yourself into writing too many checks a little bit too quickly, and you're not actually making a statement about the inherent chanciness of the universe, you're actually making much more a statement about your own laziness and your own unwillingness to think things through. I do wonder if there is something like that that gets obfuscated by this talk about risk where it always sounds like it's a statement about the larger world but it may really be more a statement about the failure of our ability to think things through. Maybe it is hard to precisely model these things out or something like that.
- In the case of start-ups and very innovative businesses, it's always quite unclear to me how you even talk about risk or probability. And so you can talk about it if you can do an experiment many times and see what happens over and over again. So you did high frequency trading on Wall Street, that has a probabilistic character where you can probably model the risks very, very precisely. But, if you're investing in a one-of-a-kind company, I don't even know how you'd go about measuring what the risks are, how you would quantify it, and if you have a sample size of one, standard deviation's infinite so in theory you can't say anything about the risk. If Mark Zuckerberg started Facebook over again 1,000 times, how often would it work? We don't get to run that experiment. And so somehow risk-orientated processes, they make sense in a context of large N – insurance, the context of large N. Millions of people driving cars so many have accidents, you can model it out. Life insurance policies, actuarial science, these are the large N sciences.

- But I think there are a lot of very important that are small N, or even N equals one. Very small number. And if we're too beholden to these risk-models, I think we just don't do those kinds of things, and they may be very important.
- The way I would put it is if you had a perfectly running insurance scheme, it would probably collapse under its own weight eventually. And so if you think of our education system as largely an insurance policy – the universities are largely this insurance policy for upper middle class parents who are scared that their kids are going to fall through the ever bigger cracks in our society – it can sort of work. But are we really going to have a future in which everybody's insured and isn't that a recipe for disaster over time.
- A super-low risk thing, there are parts of it where it can work, but it probably can't work universally. And I don't think it can work remotely as extensively as it has been done. In ways, I was guilty of this. I went to law school, the low risk, seemingly low-risk thing to do from undergraduate in the late 1980s, early 90s, when I went to law school. It was this fairly low-risk way to get an upper middle class career in a big law firm.
- In retrospect, it's turned out to be quite high risk for the people who did it because there were far too many people who did it. It worked well for a few years, then a lot of things just tend to go wrong, even for the people who come out of these very successful, tracked kind of places. If you wanted to date this, that's maybe 1965 or 1970, if you're graduating from college, there was actually a way you could do a low-risk, very successful career, so few people were doing it that if you – and there was a way you could arbitrage this risk successfully. Don't think that's been working terribly well. I think that's been working less and less well for the last 30-40 years. Even as it's been understood better and better.
- If you're talking about starting a business and saying, "We're going to just do this random walk, we're going to do A/B testing of different types of products and see what people want, we're going to have no opinions of our own and do all this testing of customers." The problem is the search space is just way too big. There are way too many things you can do, you don't have enough time to go through this sort of statistical surveying and feedback mechanism. A lot of the things that have worked the best have been sort of paradoxically not so probabilistically beholden. If you look at Steve Jobs, Apple, where it was – you have something like the Isaacson book on Steve Jobs, where it portrays him as this tyrannical boss who just yells at people all the time.
- Even if all of that is true, it doesn't seem to me to get at why did it work at all? Why did it inspire people? I think it was because there was a plan, you're going to execute against it, and you could pull off some really incredible things that you could never do if you just did everything through this sort of instantaneous feedback from different kinds of things. I think complex planning, complex coordination, these are the kinds of things that's gotten very hard to do in this sort of probabilistic society. I describe to you a complicated plan, in a technological context, you'd think it was like a Rube Goldberg contraption. It's just not going to

work. Something is going to break. Because we think of every step as probabilistic. We think of the steps as more deterministic. You just have to get the different steps to work.

- You can actually have a Manhattan Project, there's no reason you can't do this, there's no reason even the government can't do this. It actually did in the 1940s. You can send a man to the moon with Apollo. You certainly should be able to do a website for the Affordable Care Act since that's demonstrably a lesser, demonstrably inferior technology to Apollo or Manhattan.
- One aspect that I think is somewhat disturbing is certainly that there's this sort of probabilistic thinking that again creeps into the AI issue as well. If you meet someone in Silicon Valley who believes that AI is possible, it's happening soon, and it's potentially dangerous. These are three very widely held beliefs. The fourth thing that you can always push back on them – you don't want to question those three beliefs – but the fourth one, that's a very powerful one to question back is, well, you have no idea on how to build one that's safe, and you couldn't build one that's safe. The way you've defined the problem that you're going to build a superior mind that will be able to outthink you, you won't be able to build it in a way that's safe.
- One of my colleagues was talking to one of the top AI researchers and pushed him on this, and it was basically, "Professor, you obviously don't believe any of your theories about AI because if you did you wouldn't be publishing any of it on the Internet, because when the AI emerges, it will read about it on the Internet, and it will hide to not make you aware of how powerful it has become." So there is something akin to that that's implicit in all of this where if the optimistic case about technological possibility is true, there's this sense of helplessness in terms of what people can actually do about it. It's very much linked to this rather dystopian view, and this gets reflected in the Hollywood movies. I cannot think of a single movie from Hollywood about AI that doesn't have a dark and rather disturbing undercurrent to it.
- Again, I think it's the sort of probabilistic reasoning that technologies are out of our control, there's no human agency, we can't actually know what we're doing that gives it this very strange quality. Of course, there is a sense in which the term AI simply means that human intelligence isn't up to the task so one other way of interpreting the AI boom is that on the surface, it is about extreme optimism about the potentialities of computer technology, and the beneath the surface, it is simultaneously, perhaps, a great deal of pessimism around the possibilities in other technologies that will be developed by humans, and deep pessimism about the possibility of what humans can do.
- Sort of a man with a hammer sees a nail everywhere. One interpretation I have of the AI bubble is that again, in a strange way, it's symptomatic of the technology stagnation thesis.

- Waiting on this AI to save us from all these things, and don't know whether it will be friendly or not. It has this very strangely passive aspect where it's somehow – there's not enough room for human agency to my liking.
- If you want to use a Thomistic category, you can distinguish the intellect and the will. Medievals believed in the weakness of the will but the power of the intellect. Moderns tend to believe in the power of the will but the weakness of the intellect. And so I use a slightly different metaphor: if you have an evangelical Christian Bible study, the outward-facing thing is that people are moral and that they're good Christians; the inward-facing thing is that you're sinful and if you say, well I'm in this Bible study and I've figured out that I'm a really good person, you've somehow not quite got the message. [13]
 - Now to transpose this to a modern rationalist meetup. The outward-facing thing of modern rationalism is that you're more rational, better able to think through things than other people, you're one of the Brights as I think Dawkins liked to put it. The inward-facing thing is that you're not capable of thought, that it's basically your mind is full of spaghetti code, you can't believe how bad people are thinking through things, and that's I think the sine qua non of enlightenment rationality at this point.
 - And we see in all sorts of forms: we do not trust people's ability to think through things at all any more in the 21st century. I think on the cultural side, the mania we have around AI is because it stands for the proposition that humans aren't supposed to think. We want machines to do the thinking, but it's because we're in a world where individuals are not supposed to have intellectual agency of any sort anymore. We don't trust rationality. We can maybe believe in the wisdom of crowds, we can believe in big data, we can believe in some sort of mechanistic process, but we don't believe in the mind.
- What I think people like Zuckerberg or Musk or Jeff Bezos at Amazon have in common is that they're relentless. They don't stop. Every day, they start over, do more, get better at it. People often ask whether Facebook was just a fluke, in the right place at the right time. But I think the more you get to know Mark or founders like him, the less plausible it becomes. And that's, in part, because you can see how hard he works, how much planning it was, how much of a vision there was from the very beginning. [18]

Left-wing ideology has become deranged

- *[Peter Robinson: In 2016, how many professors at the top five law schools endorsed Donald Trump?]* [2]
 - Zero. And the law school example's interesting because you would think it's one where if you took the, a lot of academic fields are more internal to academia, but law is one that cashes out in a governmental political context, and taking a contrarian position in theory is quite valuable. If you're a tenured law professor at

Harvard, and you're the only law professor at a top law school to endorse Trump, I don't know, I think there would be like a 50% chance you would've gotten nominated to the Supreme Court or something like that. So it seems like it's the sort of thing where the contrarian thing would be quite valuable, and then if nobody takes that bet, I mean, wow, there must be some unbelievable enforcement mechanisms, and it's sort of like a gentle version of North Korea. But even though you have tenure, it's like, wow, they can relegate you to some broom closet and play loud music or something. They'll figure out some way to punish you.

- On the technology side, I think that Silicon Valley will continue producing great companies, but perhaps not as many. ... There are certain pluses and minuses to Silicon Valley. The big advantage is that you have all the talent, all the capital in one place, and so you have these extraordinary network effects, and that's been a motor of Silicon Valley for a long time. [14]
 - But there's a point where network effects go very wrong, and where the network effects - the fact that everyone's super connected, everyone knows what everyone's thinking, everyone ends up thinking the same thing, it shifts over into the madness of crowds. And I think we've gotten to the point where perhaps the negatives are greater than the positives.
 - I do think there's something different when it goes from a large majority having one way, to it being almost unanimous, because things are never unanimous. When people are unanimously on one side, that tells me not that they've all figured out the truth but that they are in a totalitarian place, that they are in a one-party state where they are not allowed to have dissenting views. I think somehow Silicon Valley has shifted from being quite liberal, to being a one-party state.
 - Our greatest political problem is the problem of political correctness, properly understood, because that's how we limit the debate, how we aren't allowed to consider all the possibilities. And certainly I think the universities share a lot of blame for this, the education system shares a lot of blame. But the pushback - you just have to try to push back in every specific context where you find it, and say: the real debate is not this super narrow debate, there's a much broader range of possibilities we should be considering.
- In recent years, Silicon Valley has become completely deranged. This one's actually hard for me to explain because it's a remarkable shift, certainly, from 20 years ago. I would say that there is a question how much innovation is actually happening that I always come back to, where I'm somewhat on the side that we've had generally limited progress in technology and science the last 50 years. There was a very big exception in computer software, Internet, mobile Internet, the last quarter century. This was this narrow cone of progress in the world of bits that really drove things. And I wonder if there's actually less innovation possible even in those areas at this point. And so if you look back over the last five years, let's say, there have been fewer new consumer Internet companies that have come out, and maybe the easy ideas have been picked,

maybe we need to move on to other areas but the other areas are regulated and difficult, so biotech or all kinds of futuristic science areas are deceptively hard, and we're in a zone where the returns accrue to the larger companies. So if you say, if you're in an early innovative boom phase, like the dot-com boom in the '90s, it's all startups, it's in small companies that you start new things. When I started PayPal in 1998, one of the questions I was always asked was why can't a big bank just do this? And I never really had a good answer to it. I now think the answer is roughly that most big corporate institutions are very political, they're very slow, they're not actually good at innovating, and that's why you have startups, that's why you have small companies, that's why you're able to merge and the big banks are too political to do anything new. And so if you can do something new and you can do it reasonably quickly there's space to do this. And I think the ratio of these bigger to smaller ones has shifted a lot and it is probably just a less innovative place. And then this cashes out in all sorts of ways politically. [2]

- These things are always overdetermined. You can say it's linked to California. California was a 50/50 Republican Democrat state 40 years ago, now it's a D plus 30, it's the second most Democratic state in this country and so there's a way in which the environment pushes it. There's probably a degree to which the workforce in Silicon Valley is the most educated in the country, has the most advanced degrees, college degrees and advanced degrees, and from the elite universities, and maybe the more education you have the more brainwashed you are, and so there's a version of that. But I think there are parts of it that seem completely unhinged. Elizabeth Warren is taking out these banners saying that she would, in Silicon Valley these billboards saying that she would break up Facebook, Google, Amazon for antitrust. Maybe it's shifted a little bit but the first two, three quarters of 2019 among Google employees, and I think Google's the craziest of the big tech companies, Elizabeth Warren got a plurality of the donations. She got more donations than anybody else. And so if she were, by some miracle, to get elected I think she would be able to argue that even the people at the big tech companies think they should be destroyed. And so there are parts of it that seem just completely deranged in ways I can't fully explain.
- I don't think the intellectual battle is ever fully over because I don't think history's over, and I would say if anything, if I had to characterize the intellectual landscape, we've been in a world for a very long time in which somehow the range of intellectual debate has gotten more and more narrow, and the Overton window's shifted to the left but generally in an ever narrower way. And you could sort of say that we've been in a bear market for ideas I think for something like the last 50 years. And so a lot of the people you cited I think of as pre the late 1960s and that in last 50 years if you had crazy ideas, if you had ideas that were outside the box, those were always bad and you got clobbered and you couldn't get tenure, you couldn't get funding because everything was peer reviewed up the wazoo. And I think we're now at a point where we've been in such a long bear market for ideas and the Overton window is so uncomfortably narrow that I would be long ideas more than at any other point in the last 50 years. I think we're not

gonna find solutions inside the intellectual straitjacket in which our universities and our society put us and I think there will be positive returns to ideas greater than there have been in the last 50 years.

- The visceral problem with communism is not its redistributive tendencies. It's the extreme violence. It's that you have to kill tons of people. One of the professors I studied under at Stanford, René Girard, was a great philosophical, sociological, anthropological thinker, and he had this observation that he thought communism among Western intellectuals became unfashionable. You could date it to the year 1953, the year Stalin died, and the reason was they were not communist in spite of the millions of people being killed. They were communist because of the millions of people who were being killed. As long as you were willing to kill millions of people, that was a tell, a sign that you were building the utopia, you were building a great new society, and when you stopped, it was just going to be like the lethargy of the Brezhnev era or something like that, and that that was not inspiring. I mean, people shifted from Stalin to Mao or Castro, but the violence was charismatic, very charismatic, but then also, if you think about it, it's very undesirable. [17]
 - I don't want to make this too ad hominem, but I want to say that people like your [Eric's] family, were likely very intelligent people, were somehow still always the useful idiots, and there was no country where the communists actually came to power where people like those your family actually got to make the decisions.
 - Somehow, maybe there were indirect ways that it was helpful or beneficial in countries that did not become communist, but in countries that actually became communist, it didn't actually ever seem to work out for those people.
 - *[Eric Weinstein: Things were very different, and there was no clear place to turn.]* Yeah, it's always easy for us to judge people in the past too harshly, so I think that's a good generalization. I would say that there's something about the extreme revolutionary movements that always seem to be... From my point of view, the violence was always too much, and it's a package. It's a package deal, but I don't like the violence part of the package, and that's the part that, at the end of the day, makes me think the package would not have been worth it.
- I felt this was a dynamic that was going on in all these strange ways in 2016. There was a dinner I had in San Francisco about a week before the election with a group of center right people. One of them was a very prominent angel investor in Silicon Valley, and he said: I'm voting for Trump in a week, but because I'm in Silicon Valley, I have to lie. And so he was unusually honest about lying. And the way I lie is that I tell people I'm voting for Gary Johnson. [17]
 - So he couldn't say that he was going to vote for Hillary Clinton. Like the facial muscles wouldn't work or something would go wrong. But Gary Johnson was the lie that you could tell. And then if you actually look at what happened in the month before the election, the Gary Johnson support, collapsed from, I don't know, something like six to two percent or whatever
 - And as far as I can tell, all of that went to Trump. And the question one has to ask is were these people lying all along? Were they lying to themselves? Did they

sincerely change their mind in the last month? Or some combination of that. But yeah, one vehicle for this preference falsification was that you had a third party candidate who was a gateway to the transition, this is what happened with Ross Perot, where the people eventually went to Clinton in '92 or John Anderson in 1980. So that's been repeated and I think that was one element of what was going on.

- But then I think there were also all these aspects of, of the Trump candidacy, that people were super uncomfortable about polite society. That the preference falsification was somehow perhaps much greater than in many other past contexts. And so, even the day of the election, the exit polls suggested that Trump was going to lose. And so there was still a two to three percent effect like this, literally the day of the voting.
- Of course, one of the complicated questions in all this is: did people actually already sense this? And were they lying about this? So, like everybody was saying all the way throughout 2016, most of the people were saying, well, there's no chance that Trump's going to win. This is absolutely impossible.
- And I didn't really connect this before the election, but with 2020 hindsight, I wonder: was the fact that everyone was clicking on the Nate Silver 538 statistical polling model site a few times a day, to reassure themselves that Hillary Clinton was still ahead, was going to win. Was that some sort of acknowledgement that on some, maybe subconscious or barely conscious level, people sensed that it wasn't really as done a deal as they were constantly saying.
- So, there's even a version of that question that I wonder about. Because there was something about the polling that took on this unusually iconic role in 2016, it was so important and there was no truth outside the polls. I remember there's one of the Democrat talking heads saying something like Republicans don't believe in climate change. They also don't believe in polls. That's why they're going to lose. And generally polls are right, but there was something about how all-important they were in 2016 that might've, been a tell that something was a little bit amiss.
- This question of preference falsification, the Timur Kuran theory, is tightly coupled to this question of how intense is the problem of political correctness: how much pressure is there on people to say things they don't actually believe?
- I always come back to thinking that the problem of political correctness in some sense is our biggest political problem. That we live in a world where people are super uncomfortable saying what they think, that it's sort of dangerous. And to use the Silicon Valley context, it's a problem that Silicon Valley has become a one party state. But there are two different senses in which you can be a one party state. One sense is that everybody just happens to believe this one thing. And then the other one is in which 85 percent of people believe one thing and the other 15 percent pretend to. And it's a dynamic with super majorities where in a democracy, we think 51 percent of people believe something, they're probably right; if 70 to 80 percent believe something, it's almost more certainly right. But if

you have 99.99 percent of the people believe something, at some point you shifted from a democratic truth to North Korean insanity.

- And so there's a subtle tipping point where the wisdom of crowds shifts into something that's sort of softly totalitarian or something like that. So in my mind, it maps very much onto this question of the problem of political correctness. It's always hard to measure how big it is in a politically correct society. Of course, we're just saying what we think. We all love Stalin, we all love Chairman Mao and, and maybe we're just singing these songs because we're all enthusiastic about it. And my read on it is: that problem has gotten more acute in a lot of parts of our society over the last few decades.
- On this very superficial layer, we want to have debates on a lot of areas, a lot of hard questions, and questions in science and technology and philosophy and religion, there're all these questions that I think it would be healthy to debate.
- And there's a way in which political debates are a low form of these questions. And there's one sense in which I think of these political questions as less important or less elevated than some of these others, but there's also a sense in which these questions about politics are ones that everyone can have access to. And so if you can't even have a debate about politics, you can't say, you know, I like the man with the strange orange hairdo or I like the mean grandmother. If you can't even say that, then we've sort of frozen out discussion on a lot of other areas. And that's always one of the reasons I think that political correctness starts with correctness about politics. That when you aren't allowed to talk about that area, you've implicitly frozen out a lot of others that are maybe more important and where we're certainly not going to have a debate about string theory if we can't even have a common sense debate about politics or something like that.
- I'm very sympathetic to this distraction theory that what's going on in our society is like a psychosocial, magic, hypnotic magic trick where we're being distracted from something very important and political correctness, identity politics and maybe American exceptionalism, these various ideological systems, are distracting us from things. The thing I keep thinking of, the main thing it's distracting us from, is the stagnation and it's that there are these problems that we don't want to talk about in our society. It's possible it's also a way to distract us from bad thoughts that we have about people.
- But the one I would go back to first is just that it's distracting us from dealing with problems. The reason we have a newspeak, this sort of Orwellian newspeak in politics with these zombie politicians, Hillary Clinton or Jeb Bush or whoever it might be, is that we're not supposed to talk about the real issues and maybe they have a bad conscience and they think they're bad people. But I think the primary thing is just too dangerous to talk about what's actually going on. They don't know what to do about it and better not talk about that.
- This is always maybe naive hope on my part. But I always think that when we can't talk about things, we can't solve them and that maybe these are the

calculations you make and this is the way we pat people on the head, even though they're never going to get ahead. But it's never going to work. And people aren't that stupid and they will eventually figure it out. And so that's why I'm undermotivated to play that game. But, I'm always like this, where I'm always quite hopeful that people realize there's a lot of bad faith acting and they discount this accordingly.

- I was extremely disturbed by Gawker a decade, decade and a half ago because I think it was a really powerful thing at the time where it worked because people didn't understand how it worked. It was this hate factory, the scapegoating machine, but people didn't see it as such. And because of that it was super powerful. Once you see how it works, once you understand it, it is less powerful. So even had I not succeeded in the litigation against Gawker, I think it would be a weaker version of that today. There are of course equally nasty things on the internet, but they're not as powerful because there's more transparency into the bad motives and people get it, and the hate factory only works when it's not perceived as such.
- When I was a kid, the great debate was about how to defeat the Soviet Union. And we won. Now we are told that the great debate is about who gets to use which bathroom. This is a distraction from our real problems. Who cares? Fake culture wars only distract us from our economic decline. [20]

Are we just hitting natural limits?

- To the extent you see it as a technological problem, or a scientific problem, one approach has been that you're just hitting natural limits. This is a Tyler Cowen, *The Great Stagnation*, a recent book by Robert Gordon, another economist, *The Rise and Fall of American Growth*. This idea that there were some fairly simple inventions, the 19th, the early 20th century, that maybe the rate of innovation peaked as far back as the late 19th century where you had incredible numbers of breakthroughs and it's just the nature of the world, of the universe that it's much harder to find new things. The low-hanging fruit has been picked. And therefore we have to resign ourselves to far reduced expectations and a more austere future. [6]
 - *[Bill Kristol: You only invent antibiotics once. I mean, massive gains in public health by a huge breakthrough like that, where half your population isn't dying from infections basically and public health disasters and in infancy. You can't replicate that.]*
 - Those are the arguments on the nature side. I'm a little bit more partial to the culture side on this. That perhaps there never was any low-hanging fruit. The fruit was always at least intermediate height, and it looked pretty high up.
 - Certainly, we have a situation where one-third of the people at age 85 suffer from dementia or Alzheimer's, so if you could do something about that, that would probably be close to as big a deal as antibiotics. We're living in a world where people don't even expect that to happen anymore, I think.

- *[Bill Kristol: You go from horse and buggy to trains to airplanes but what's -]* But supersonic jets don't quite work, so you're stuck at airplanes, let's say. The alternate explanation which I'm more partial to is, that it is a cultural kind of thing. And that even though there probably are some areas where progress objectively is very hard, there are many areas where we could, we could still have progress if we really wanted to have it. [5]
 - And so it's always this question – is it an external reality that's made it hard or is it something in the culture that's changed that makes us less ambitious, more risk-averse, more scared to try to do things? And I do think the regulatory double-standard where we have massive regulation in one place and very little in the other suggests that something like that might be going on.
 - One striking example is something like the SDI program in the 1980s, where I remember at the time, the debates were: the conservatives argued this was a good thing because it would be a defensive technology. The liberals argued it was going to be a bad thing because it meant the U.S. would have a first-strike nuclear capability. But everybody assumed it was going to work. And 20 years later, it is implicitly assumed that it's never going to work. Even though I have things like the Iron Dome technology in Israel, which works remarkably well.
 - And it would seem that if you applied yourself you could have extended these sorts of technologies to things like intercontinental type missiles and things like that. It's harder, but it doesn't feel like the sort of thing that would be impossible.
 - So I'm very heavily on the cultural bias. I think it's always the part that people are more uncomfortable because it suggests that there was some sort of generational failure versus just external circumstances that are outside of people's control. So I think we're always too biased to go to the natural explanation because it's one that exonerates us from responsibility for the slowdown.
- I think one way to parse this question of scientific, technological stagnation is sort of nature versus culture. Did the ideas in nature run out? Or, at least the useful ideas. Maybe we make some more discoveries, but they're not useful. Easily useful. So it's a problem with nature. And then the cultural problem is that there was actually a lot to be discovered or a lot that could be made useful, but somehow the culture had gotten deranged. And I go back and forth on those two explanations. I think it's very complicated. Yeah, I think in physics you'd say ... I mean, probably even the fundamental discoveries stopped after the mid 1970s, but certainly the translation didn't happen. Quarks don't matter for chemistry, and chemistry's what matters on a human level. [17]
 - I would say there was a lot that happened in biochemistry. Not chemistry down, but sort of chemistry up; the interface between chemistry and biology. And that's where I would be inclined to say there's a lot more that could happen and has not quite happened, because maybe the problems are hard. But maybe also the cultural institutions for researching them are restrictive. It's too heavily regulated

in certain ways and it's been just somewhat slower than one would have expected in the 1970s.

- Obviously, if nature has stopped, then the culture is going to derange. So there's a way in which culture is linked to nature. And then if the culture deranges, it also will look like nature stops. There are probably elements of both.
- But I am always optimistic in the sense that I think we could have done better. I think we could do better. It's not necessarily the case that we can advance on all fronts in every direction, but I think there's more space on the frontier than just in this world of bits. So I think there are various dimensions on atoms where we could be advancing and we just have chosen not to.
- I'd be pessimistic on physics generally, so that's my bias on that one. Biology, I continue to think we could be doing a lot more, we could be making a lot more progress. The pessimistic version is that no, biology is just, is much harder than physics, and therefore it's been slower going. [17]
 - The more optimistic one is that the culture is just broken. We've had very talented people go into physics. You go into biology if you're less talented. You can sort of think of it in Darwinian terms. You can think of biology as a selection for people with bad math genes. If you're good at math, go to math, or physics, or at least chemistry, and biology we selected for all of these people who are somewhat less talented. So, that might be a cultural explanation for why it's been slower progress.
 - If you're a string theory person, or even an applied experimental physicist, I don't think you can that easily reboot into biology. I mean, these disciplines have gotten more rigid. It's pretty hard to transfer from one area to another.

What should we do?

Seize the opportunity to change people's attitudes

- The dominant narrative is probably fraying and has been fraying for some time, but it is something like we're in a world of generally fast scientific and technological progress. Things are getting better all the time. There's some imbalances that maybe need to be smoothed out. There's some corner case problems. Maybe there's some dystopian risks, because the technology is so fast and so scary that it might be destructive. But it's a generally accelerationist story. And then there's some micro-adjustments within that, that one would have to make. [17]
 - There are all sorts of ways that I think it's fraying. I think 2008 was a big watershed moment, but that still what's largely been holding together. And then there's different institutions. You can look at the universities where there's a tracked thing. It's costing more every year, but it's still worth it. It's still an investment in the future. And this was probably already questionable in the

1980s, 1990s. College debt in the United States in 2000 was \$300 billion. Now it's around in \$1.6 trillion, \$1.7 trillion. And so there's a way in which the story was shaky 20 years ago and today is much shakier. It's still sort of holding together somehow.

- Now again, I think people are hesitant to actually articulate it quite that way, because that already sounds not quite true to them. Maybe it's a bright future, but it's really different from the parents, because we can't quite know. And they have all these new devices. They have an iPhone and they can text really fast on the iPhone. We can't even understand what the younger generation is doing. So maybe it's better on ... But "better" has an objective scale. Maybe it's just different and unmeasurable, but better in an unmeasurable way.
- So there are ways it's gotten modified but, that would still be a very powerfully intact narrative. And then that there are straight forward things we can be doing. The system's basically working, and it's basically going to continue to work. And there's a global version of this. There's a US version. There's an upper middle class US version. There's a lot of different variations on this.
- I don't think we've lost it all together. It's always, there's always, there is – and there's always a way in which the post-2008 malaise, the silver lining to this is that there is a sense that we need to do new things. We can't just keep going the ways things were. There is a complacency that we had 10 years ago that you no longer quite can have today. People are far more open to this idea that perhaps there's been not as much technical progress. [6]
 - I wrote about it first in 2011, I started talking about it three or four years earlier. Certainly, even in 2011, people thought this was very crazy. At this point even in Silicon Valley, there are people who said, "I thought about it some more, and I think there is actually, there is a lot to this." There's more of an openness to this notion, and maybe that's the first step in getting out of it. You have to realize that we've been wandering in a desert for 40 or more years now and not in an enchanted forest, and that's how we find the first step to get out of it.
- I'm not involved in any sort of political- I haven't run for public office or I don't intend to run for public office. And so I don't know exactly how you convey this rhetorically. I do worry that a pro-big progress political message resonates very strangely. So when Gingrich says we should go back to the moon, it's like well, you're really lost in space or something – something like that. And so I don't know if you pushed for building hundreds of new nuclear power plants whether that would – how well that sort of thing would go over. But I do think that the sort of pessimism that is endemic to places like Japan or Western Europe is somewhat un-American. And so there is – there is – and so it is really critical, there still is always an opening to tell a more optimistic story and that we could be doing a lot better than we are. [5]
 - There is a sense in which the tracked narratives feel exhausted. And that's why I think there is an opening today in a way in which there was not say in 2007 or 2006. If there's a silver lining to the crisis of 2008 and post-2008, it is at least a sense that the automatic-track things no longer work as well. And so for a

number of decades, there were all these reasonably well-paying jobs people could get that would involve taking little risk, would be sort of incremental and you could become a lawyer, or a banker, or a consultant.

- And I think there is some sense that that is no longer working. I think Silicon Valley, even though it's in some ways an exception to this, is much more charismatic. And so I'd be very bullish on Silicon Valley and relatively bearish on New York City, as sort of a tale of two cities where New York was the tracked thing to do in an overly financialized world. And I think at this point, if you have a talented young person in the U.S., Silicon Valley is probably the most charismatic place for that now.
- The hope is that the information technology revolution can somehow be expanded more to the world of atoms than it has. But I do think there's some sense that these set ways of doing things are no longer working as well. So there's that negative sense. It often doesn't quite translate into positive yet where people don't know what to do instead.
- I don't quite know what it would change, what it would require, to change the sort of malaise. But I do think that a world in which little changes and there's little progress represents a radical departure from the past. And it is something we should fight really hard in all ways that we possibly can.
- I don't think [this narrative] is ultimately stable. So I think ultimately our account is going to prevail. The institutional account is so incorrect that it will ultimately fail. I've probably been more hopeful about how quickly truth prevails than it has. [17]
 - I would still be very hopeful that our account is really going to break through in the next few years. I've been talking about this, the tech stagnation problem for the better part of a decade. And I think when I was talking about this in 2008, 2009, 2010 this was still a fringy view. It was very fringy within Silicon Valley. And I think even within Silicon Valley, there's a lot of people who've come around to it, who've partially come around to it. There's a sense that tech has a bad conscience. It feels like it's not delivering the promises. Google had this propaganda about the future and it's now seen as The self-driving cars are further away than people expected. And so I think there is a sense that things have shifted a lot over the last decade.
 - it's striking how fast it's happened. It's striking how much it's happened in the context of a bull market. So if you describe this in terms of psychology, you'd think that people to be as angry in Silicon Valley as they are today, the stock market must be down 40% or 50%. It's like people in New York city were angry. In 2009, they were angry at the banks. They hated themselves. But the stock market was down 50%, 60%, the banks had gotten obliterated. And that sort of makes sense psychologically. And the strange thing is that in terms of the macro economic indicators, the stock markets, the valuations of the larger companies, it's way beyond the .com peaks of 2000, in all in all sorts of ways. But the mood is not like late '99, early 2000. It has this very different mood.

- And the way I would explain this is that, for the people involved, it is sort of a look ahead function. Yes, this is where things are, but are they going to be worth a lot more in five years, 10 years? And that's gotten a lot harder to tell.
 - And so there's been growth, but people are unhappy and frustrated because they don't see that much growth going forward, even within tech. Even within this world of bits, which had been very, very decoupled for such a long time.
- I think there's been the potential to get back to the future for a long time. And there have been breaks in this Truman Show at various points. There was a big break with 9/11. There was a big break with the 2008 crash. You could say some sort of break with Brexit and Trump. [17]
 - And the last few years, it's still a little bit undecided what that all means. But I think there were a lot of reasons to question this and reassess this for some time. The reassessments never quite happened, but I would say I think we're now at the point where this is really gonna happen in the next two years to five years to decade. I don't think the Truman Show can keep going that much longer.
 - We had an offsite when I was running PayPal in spring of 2001. The NASDAQ had gone from 2,000 to 5,000 back to 2,000, the .com bubble was over. And I was explaining, we were just battening down the hatches. At least one little company has survived, and we're going to survive. But the sort of insanity that we saw in the .com years will never come back in the lifetimes of the people here, because psychologically, you can't go that crazy again while you're still alive.
- And I keep thinking that we are at some point where the distractions aren't going to work as well. I think the big distraction on the left over the last 40, 50 years have been forms of identity politics where we don't look at the country as a whole. We look at parts of it and it's sort of been a way of obscuring these questions of stagnation. [17]
 - I would say the right, the right wing distraction technique has been, I would say something like American exceptionalism, which is this doctrine that the US is this singular exceptional country. It's so, so terrific, so wonderful. It does everything so incredibly well that you shouldn't ask any difficult questions, any questions at all. I think it, in theological or epistemological terms, you can compare it to the radical monotheism of the God of the Old Testament where it means that God is so radically unique that you can't know anything about him. You can't talk about God's attributes, you can't say anything about him whatsoever. And if the United States is radically exceptional, then in a similar way you can say nothing about it whatsoever. And there may be all these things on the ground that seem crazy, where we have people who are exceptionally overweight. We have subway systems that are exceptionally expensive to build. We have universities that are exceptionally sociopathic. I mean, you don't have the student debt problem in any other country. We have trade regime that's exceptionally bad for our country, like no other country is as self destructive as this. There are all these things that we somehow don't ask. So I think exceptionalism somehow led to this country that was exceptionally un-self aware. Greatness is adjacent to exceptionalism, but it's

actually still quite different because many countries can be great and great is more a scale. And there's something you measure it against, whereas exceptional, it's just completely incommensurate with anything else. And I think that's gotten us into a very, very bad cul de sac. And I think that there's a way in which that sort of exceptionalism has ended on the right. And there's been, we've moved beyond that. And I'm hopeful that in a similar way, the left will move beyond identity politics even though, right now it feels like the monster is flopping about more violently than ever, even though I think it might be its death throes, but maybe not.

Quantify the problem

- The first and the hardest step is to see that we now find ourselves in a desert, and not in an enchanted forest. [7]
- One of the things that I would want to quantify more is in the world of science, we can quantify things to an incredible degree of Avogadro's number, the fine-structure constant in physics, all these things are precise to many significant figures. But the question about the rate of progress of science, of innovation, is incredibly unquantified, and it's just hand-waving, and if you have sort of this Panglossian hand-waving where everything's exceptional and we're accelerating at the fastest pace possible, and it's not measurable. My suspicion is that these are the ever-narrower communities of sub-experts, the string theorists, the cancer researchers, telling us how great the string theorists and the cancer researchers respectively are. It's a place where there's no outside check, no reality check, no ability to really keep score, and you are certainly not exceptional and you're not even great. [2]
- The direct scientific questions, I think, are very hard to get a handle on. And the reason for this is that in late modernity, which we are living in, there's simply too much knowledge for any individual human to understand all of it. And so in this world of extreme hyper specialization, where it's narrower and narrower subsets of experts policing themselves and talking about how great they are, the string theorists talking about how great string theory is, the cancer researchers talking about how they're just about to cure cancer, the quantum computer researchers are just about to build a quantum computer, there'll be a massive breakthrough. And then if you were to say that all these fields, not much is happening, people just don't have the authority for this. And this is somehow a very different feel for science or knowledge than you would've had in 1800 or even in 1900. In 1800, Goethe could still understand just about everything. [17]
 - 1900, Hilbert could still understand just about all of mathematics and so this sort of specialization, I think, has made it a much harder question to get a handle on. The political cut I have on the specialization is always that if you analyze the politics of science, the specializations should make you suspicious, because if it's gotten harder to evaluate what's going on, then it's presumably gotten easier for

people to lie and to exaggerate, and then one should be a little bit suspicious. And that's my starting bias.

- In the 19th century, pre-Austrian classical economics, the thought was you could still measure things objectively. How many pounds of steel is this factory producing? How many tons of steel is this factory producing? How many cars per hour are the workers producing in this assembly line? There was that intuition about objective value. And there's been this shift towards making things more subjective when it all becomes sort of unmeasurable or there are too many variables to measure. I think that in some ways was started by Austrian economics, and I think by now at this point it really permeates all of it. [6]
 - I think the shift towards a subjective ways of measuring economics, it then ultimately leads to this way in which we can't even coherently talk about progress. Are we actually progressing as a society? And then the answer becomes it's just impossible to know. It's just different, all these things are somewhat different, and maybe you're living in a much smaller apartment in New York City than your parents or grandparents lived, but you have an iPhone with a really smooth flat surface so some kind of hedonic benefit from that. How do you trade that off versus the apartment that's a quarter of the size of that of your grandparents?
 - And so I think it's hard to know how to think about these things, but I do worry that the stress on the subjective, hedonic economic measures are excuses we're telling ourselves to hide the stagnation or decline from ourselves.
- It's mysterious to me how long [stories about continual growth] worked. We had these crazy bubble economies in the ... We had the tech bubble in the 90s, the housing bubble in the 2000s, what I think is a government debt bubble this last decade. And so if you've had this sort of up-down bubble, that's harder to see than if things were just flat. So if the growth in 1970, things had just flat-lined, and you had 40 years of no growth, that would have been problematic. And you might have noticed that very quickly. [17]
 - But in a sense, simplifying a lot, you could say the 70s were down, the 80s were up, the 90s were up, the 2000s were down. So two down, two up, net flat, but it didn't feel that way internally.
 - There was a lot of excitement, a lot of stuff happened. And California was like a even more extreme version of this. The last know the last three recessions in California were much more severe than in the country, as a whole. The recoveries were steeper, and so California has felt incredibly volatile. The volatility gets interpreted as dynamism. And then before you know it, 30 or 40 years have passed.
- I think the individual incentives were very different from the collective incentive. The collective incentives, in which we have an honest conversation and level set things and get back to a better place. I think the individual incentives were often, you pretend that it's working great for you. The 20,000 people a year who move to Los Angeles to become movie stars, about 20 of them make it. And so you could say, "Well, it's been really hard. Nobody wants to hire me. This is a terrible city." Or you could say, "You

know, this has been wonderful, and that all the doors are being opened to me." And the second one is more fictional. But that's the thing you're supposed to say if you're succeeding. And I think there's a way this is how we've been talking about globalization, a weird sort of a glib globalization. It's working great for me, and I'd like to have more people, more talented people come to the US. I'm not scared of competing with them. And on and on. [17]

- Or academia. If you're a professor in academia, the tenure system is great. It's just picking the most talented people. I don't think it's that hard at all. It's completely meritocratic. And if you don't say those things, well we know you're not the person to get tenure.
- So I think there's this individual incentive where if you pretend the system is working, you're simultaneously signaling that you're one of the few people who should succeed in it.
- If you go back 20 or 25 years, I wish I would have known that there was no need to wait. I went to college. I went to law school. I worked in law and banking though not for terribly long. But not until I really started PayPal did I fully realize that you don't have to wait to start something. So if you're planning to do something with your life, if you have a 10 year plan of how to get there, you should ask: why can't you do this in 6 months? Sometimes, you have to actually go through the complex, 10-year trajectory. But it's at least worth asking whether that's the story you're telling yourself or whether that's the reality. [18]

Be more ambitious and agentic

- The future of technology is not predetermined, and we must resist the temptation of technological utopianism — the notion that technology has a momentum or will of its own, that it will guarantee a more free future, and therefore that we can ignore the terrible arc of the political in our world. [8]
 - A better metaphor is that we are in a deadly race between politics and technology. The future will be much better or much worse, but the question of the future remains very open indeed. We do not know exactly how close this race is, but I suspect that it may be very close, even down to the wire. Unlike the world of politics, in the world of technology the choices of individuals may still be paramount. The fate of our world may depend on the effort of a single person who builds or propagates the machinery of freedom that makes the world safe for capitalism.
- I also think there's been this history of success where over time you've attracted very talented people who believe they can do things. And one shouldn't understate how much that sort of belief is effectual. One of my friends was – years ago was looking to join a big bio-tech company, and the pitch to PhDs coming out of graduate school was that we have a better softball team than the other biotech companies. Whether or not you

discover something is so random, so unpredictable, that the only thing we can control about your work environment is to tell you that you're going to have a better softball team, that's why you should join our firm. [6]

- There's something around a lot of these areas where it felt that people were too much of a small cog in a giant machine, very hard to actually impact things, and there was less of a sense of human agency. That's where we always have to come back. How do we come back to a real sense of agency?
- I think always extreme optimism, extreme pessimism, are both equally wrong. As a libertarian, we should always, libertarians, we should always come back to the question of individual agency and it's not these large historic forces. And there are libertarian, or pseudo-libertarian, narratives in which there were these large historic forces and we'd definitively won these battles but that's not even true to the spirit of free markets or belief in individuals. There's always room for history, there's always room for new ideas, and these things are never definitively decided one way or the other. [2]
- I do think that a world in which little changes and there's little progress represents a radical departure from the past. And it is something we should fight really hard in all ways that we possibly can. [5]
- There's nothing automatic about history. History is made up by the choices people make and it's in our hands to decide. [11]
- I don't think the future is this fixed thing that just exists. I don't think there's something automatic about the great stagnation ending or not ending. I think — I always believe in human agency and so I think it matters a great deal whether people end it or not. [12]
 - There was this sort of hyperoptimistic book by Kurzweil, *The Singularity Is Near*; we had all these accelerating charts. I also disagree with that, not just because I'm more pessimistic, but I disagree with the vision of the future where all you have to do is sit back, eat popcorn, and watch the movie of the future unfold.
 - I think the future is open to us to decide what to do. If you take a nap, if you encourage everybody else to take a nap, then the great stagnation is never going to end.
- The future is something that has to be thought of in relatively concrete terms and it has to be different from the present. And only something that's different from the present and very concrete can have any sort of charismatic force. [13]
 - Think a lot harder about the future...try to think concretely what you want to do...there's always a question, where is the frontier, where are some pockets of innovation where you can do some new things and not be in a crazed competition.
- Scientific, technological progress, in a way, the hope is it can lead towards a more cornucopian world in which there's less Malthusian struggle, less violence, and then at the very same time, an honest account of the history of these things is that a lot of it was used to develop more advanced weapons. It was in the pursuit of violence. One account of the tech stagnation, the scientific tech stagnation, is that the breakthrough thing was the atom bomb and then you built the rockets to deliver the bombs more quickly. By

1970 we had enough bombs and rockets to destroy the world 10 or 20 times over or whatever, and the whole thing made no more sense. [17]

- If one of the big drivers of scientific and technological progress was actually just the military dimension, when that became absurd did the whole thing slow down to the space age? Not in 1972 when Apollo left the moon, but was the key moment 1975 when you had the Apollo Soyuz docking? If we're just going to be friends with the Russians, does it really make sense for people to be working 80 hours, 100 hours a week around the clock? And again, I don't think it's all that, but I think one of the challenges, that we should not understate how big it is in resetting science and technology in the 21st century is, how do we tell a story that motivates sacrifice, incredibly hard work, deferred gratification for the future, that's not intrinsically violent? It was combined with that in all these powerful ways.
- I think a lot of meaning comes from a counterfactual sense that if we weren't working on something, this problem would not get solved. That's why I always differentiate between mission-oriented companies and social entrepreneurship. They both have a sense of doing something that transcends making money, but mission-oriented companies are often defined by a unique mission that maybe others don't think is important, whereas a lot of the social entrepreneurship efforts gravitate towards things where you have many copycats doing relatively similar things. [22]
 - Silicon Valley is very competitive with Wall Street banks. And there's a way in which the day-to-day jobs are similar: people sit in front of computers, the people went to similar colleges and universities, even the office floor-planning is kind of similar. There are more similarities than one might think. But the narrative at Google is much, much better than at Goldman. That's why they're beating a place like Goldman incredibly in this talent war.
- One of the ideas I'm very skeptical of is that people learn from failure. I think, in practice, failure's really demotivating. Hopefully, you have the character to persevere and keep going, but I think the default is that failure is powerfully demotivating. But success is very motivating. [22]
 - I'm not trying to get more people to be entrepreneurs. I would like people to start more good companies and fewer bad companies. I think that's the thing. I don't think starting companies or starting startups is an end in itself. I was talking to one of my friends a few years ago. I asked him "What do you want to be doing five or 10 years?" And he said he wanted to be an entrepreneur. It's a terrible answer.

Focus on stagnation over other problems

- I do think there are always different things that are going on. There is acceleration in some places. There's stagnation. There's increasing inequality. You have different

themes, but in a lot of these debates, I would say 70 percent is probably stagnation, and if we focus too much on inequality or acceleration, we're going to get a lot of the public policy debates wrong. [6]

- If you focus too much on acceleration – as Professor McAfee at MIT, The Second Machine Age – it's runaway technological progress, and then it's going to lead to more inequality, and so you need to deal – it's both this really good thing, and it has some problems, and then that pushes you in a certain set of policy directions of what to do. Or the even more optimistic ones are things like, things like Ray Kurzweil with "The Singularity is Near." This accelerating future and all you need to do is sit back in your chair, eat some popcorn, and watch the movie of the future unfold. And then the kinds of policy debates that we end in this accelerating world tend to be, I find, incredibly ethically charged where it always ends up being good-versus-evil technology.
- The technology's so overpowering that the main risks are it's going to destroy us all. So you have utopian forms and dystopian forms, and nothing in between. You have the worries in Silicon Valley about AI, or do you really want to live forever or is that just ethically bad? Whereas on the stagnation side, the antonym to good is not evil, the antonym is bad. The problem from my perspective is not so much that we have evil technologies that are going to destroy the world, but that we have a lot of bad technologies and bad science that simply doesn't work.
- Evil has more this ethical thing, and bad has more the sense of not working. There's an ethical, moral version of it, it's that people are lying about the science, they're lying about the technology, and they're saying that it's really incredible when it's often not quite living up to what it is. I find myself much more in this that stagnation is the general dynamic, and it's reflected in the economic data where median wages have been stagnant for 40-plus years, the younger generation has reduced expectations from their parents, this very broad social, cultural indicators that suggest that things feel, they feel kind of stuck. You have a very different set of questions, what do you do about it? What's gone wrong? How do we get out of it?
- My sense is always that it's basically that the issue is not inequality, the issue is much more stagnation. There's a sense of people's living standards are generally not improving that much, and then, what can you do about that? What are the micro-solutions for that? In Silicon Valley, San Francisco, where I live, I would say the single biggest variable that makes people feel the stagnation is the sense in which housing costs, rental costs, are through the roof. The political fix I would be tempted to pursue would be trying to find a way to break the unholy alliance between urban slumlords and pseudo-environmentalists that prevent any new urban development. But I think it's always much more a problem of stagnation than inequality.
- I'm not convinced that power laws are equally true in all fields of activity. The United States was a frontier country in the 19th century, and most people were farmers, and presumably some people were better farmers than others, but everyone started with 140

acres of land, and there was this wide open frontier. Even if you had some parts of the society that had more of a power law dynamic, there was a large part that didn't. And that was what, I think, gave it a certain amount of health. [17]

- And yeah, the challenge is if we've geared our society saying that all that matters is education, and PhDs, and academic research, and that this has this crazy power law dynamic, then you're just going to have a society in which there are lots of people playing video games in basements or something like that.
- So, that's that's the way I would frame it. But yeah, I think there definitely are some areas where this is the case. And then we just need more growth for the whole society. If you have growth, you'll have a rising tide that lifts all boats. So the stagnation is the problem.
- Look, I don't know how you solve the social problem if everybody has to be a mathematician or a concert pianist. I want a society in which we have great mathematicians and great concert pianists. That seems that that would be a very healthy society. It's very unhealthy if every parent thinks their child has to be a mathematician or a concert pianist, and that's the kind of society we unfortunately have.
- A lot of people deny that there's a tech science stagnation going on, but then one of the other things one hears is, "Well, maybe it's not progressing as fast, but do we really want it to progress as fast? Isn't it dangerous? We're just going to build the AI that's going to kill everybody or it'll be biological weapons or it's going to be runaway nanotechnology." I don't think we should dismiss those fears completely. [17]
 - I think in general it's just that somehow you will lose control over the violence. You think you can control it. Maybe it's a large state. Maybe it's autonomous AI weapons, which in theory are controlled by state, but in practice, not quite. There's all these scenarios where the stuff can spiral out of control. I'm more scared of the one where nothing happens. I'm more scared of the stagnation world I feel ultimately goes straight to apocalypse. I'm much more scared of that, but we have to understand why people are scared of the nonstagnant world.
- [I'm] far more worried about the lack of good technologies than the danger of evil. I feel as a venture capitalist, I see all these bad technologies, bad science where it's things that just don't work. The cool-sounding things. The general problem is not that they're ethically problematic, it's that they just don't work. [6]
- I'm not a techno-utopian. I don't think technology is automatically good. There are definitely technologies that I think could be developed that I wouldn't like. [22]

Improve governments and politics

- Can our government restart the stalled innovation engine? The state can successfully push science; there is no sense denying it. The Manhattan Project and the Apollo program remind us of this possibility. Free markets may not fund as much basic research as needed. On the day after Hiroshima, the New York Times could with some reason pontificate about the superiority of centralized planning in matters scientific: "End result:

An invention [the nuclear bomb] was given to the world in three years which it would have taken perhaps half a century to develop if we had to rely on prima donna research scientists who work alone.” [7]

- *[Bill Kristol: Would you need a political jolt do you think, or could it be done by private citizens in terms of founding businesses that do the equivalent of Facebook or PayPal in medicine and space exploration and other such things?]*
 - It varies in all these different areas. I mean, certainly there was some deregulation of the space industry under Bush 43, and it's probably enabled a private company like SpaceX to gain traction. It's hard to see how medicine can work without a less onerous FDA. So I do think there are parts where you're incredibly embedded in this risk-averse political system.
- One of the problems is that we know what needs to be done long-term in the U.S. You need a better education system, we need to be focused on competing where we can and working together, create win-win situations. The problem is that, in the short term, there are a lot of quick fixes like steel tariffs, like various protective tariffs and things like that. And I think the short-term benefit versus long-term cost is one of the main [problems], and it's a political problem in the U.S. [11]
 - I think it's a close call. We've seen steel tariffs. We've seen reregulation in lots of industries. It is a very close call. It depends on whether you think people are going to think for the long term or the short term. And I think the jury's out.
- It's not clear how you change it on a cultural, political level. I'm always focused on the very modest start-up version, which doesn't actually work for everything. Again, it's a very imperfect solution. You can convince a small number of people to start a new business or to do something new. Convincing a much larger number of people to change things, I think, is a much more challenging problem, and then this gets to all these questions: can you reform government research structures? Can you reform NASA? Can you reform the universities? Can you reform even large corporations that in many ways are not much better than the universities or the governments? Maybe a little bit, but not as much as we often like to think. [6]
- I don't think Bernie Sanders is really a socialist - I mean there's no five-year plan, he doesn't actually claim that's he's gonna make the post office or the DMV work better. If he was promising things like this it would just be completely ridiculous. And the way in which socialism works is it's just this thing that's really different, and it's meant in opposition to the zombie institutions in our society. And there is a problem that we don't have a very well-functioning capitalist society. There's a generational problem where it is difficult for young people to acquire capital, and that's the young people that are supporting Bernie Sanders. And the the two simple political things that one should really think about are the runaway student debt in colleges: it was \$300 billion in student debt in 2000, it's up to \$1.7 trillion today, and if you start your life in debt that can never be discharged in bankruptcy it will be much harder to accumulate capital and you might be less friendly to capitalism. So that is a big problem. And I don't think we should socialize the student debt but we should deal with it in a non-socialist way, we should internalize the costs onto the universities. We should redo the bankruptcy laws, yes, you can

discharge the student debt, and when you discharge it, it's the college that gave you a bad education that gets stuck with the bill. This is the non-socialist alternative. [2]

- And then I think the other basic problem of a lack of capital or inequality is that it's very hard for people to get onto the housing ladder. The main way that the people in the middle class in this country accumulate capital is through owning real estate, through owning your house, and if through a series of urban zoning laws and bad planning and impossibility of building things, it has become impossible for people to get onto that, and if you could find ways for people to own more houses you would have much less of the sort of millennial crazed socialism. So I think we should try to understand where it's coming from, we need to try to solve it, but at the end of the day I think it will be pretty weak because it's mainly a critique. It's a critique of bad institutions, and if Sanders becomes serious I think it'll be as scary as Corbyn was in the UK, and obviously we'll be talking about the post office and the DMV and it'll just be ridiculous. He can't get elected.
- It's not at all clear that we're living in anything resembling a democracy. [12]
 - We're living in a representative republic, but then that's modified through a judicial system. Of course, that's been largely superseded by these very unelected agencies of one sort or another, which really drive most of the decision-making.
 - I think calling our society a democracy, whatever may be good or bad about democracy, is very, very deeply misleading. We're not a republic. We're not a constitutional republic. We are actually a state that's dominated by these very unelected, technocratic agencies. The very difficult political question is, "How can you get an advanced, technological society to function in any way that's more republican or more democratic at all?"
 - Not at all sure how that is, but I think the challenge is that a lot of these agencies have become deeply sclerotic, deeply nonfunctioning, even though the alternatives to them, politically, often seem to be even worse. The Federal Reserve — lots of things they do, I don't like, but then once you get people in Congress involved in dictating Fed policy, that always seems even worse.
- I think we should always resist the sort of naive views of politics: that politics are just some sort of mechanistic process where we take a poll and we all get to some syrupy answer that everyone can agree with. And that's that's not what politics is about at all. [13]
- I have a much more cynical view of this where I think the redistribution rhetoric, it's mainly not even targeted at the wealthy. It's targeted at the lower-middle class, at the deplorables, or whatever you want to call them, and it's a way to tell them that they will never get ahead, nothing will happen in their life and, and that's actually why a lot of people who are lower-middle class or middle class are viscerally quite strongly opposed to welfare, because it's always an insult to them. It's always heard as an insult. I'm not sure they're wrong to feel that. [17]

- Redistribution from the powerful to the powerless, from the rich to the poor, is like from the powerful to the powerless, and so using power to go after those with power, and that's almost oxymoronic.
- It's almost self-contradictory. So, there may be some way to do that. I think most of the time you end up with some fake redistribution, some sort of complicated shell game of one sort or another. I know the causation of the stuff is much, much trickier, but if we look at societies that are somehow further to the left on some scale, the inequality, you have to go really far to the left, and maybe just destroy the whole society, before you really start solving the inequality problem.
- California, when I first moved here as a kid in 1977, would have been a centrist state in the US politically, and was broadly middle class. Today, California's the second most democratic state. It's a D plus 30 state. It's a super unequal, and at least on a correlated basis, not causation, but at least on a correlated basis, the further to the left it's gone, the more unequal it's become, and there is something pretty weird about that.
- I define technology as doing more with less. In the context of security and privacy, a technological solution is one that gives you more security without sacrificing privacy, or more security and more privacy at the same time. A non-technological solution is one that always involves trade-offs where you can get more security and you'll have less privacy, or more privacy but you'll have less security. I think the alternative to something like Palantir would be a world where we're forced to make very unpleasant tradeoffs. I think that at the end of the day, the libertarians lose the trade-off war. [22]
- Disturbingly California is able to get away with putting quite a significant regulatory burden on its industries, and the two big sectors in California are the tech industry in northern California, the entertainment industry in southern California. They're both these heavily networked industries. So it's incredibly valuable to be here, even when the taxes are quite a bit higher. And as a result, I still think we're a long way off from alternate centers getting set up. And one of the things that was very surprising was that the state was able to dramatically increase marginal tax rates in 2012, and it did not actually lead to any excess whatsoever. People are sort of stuck. And this suggests that even if taxes went up a lot more, we're stuck in these network-effect-like industries where people can't leave. I think New York State is much more vulnerable. There's something about finance, which is much more mobile at this point. So I think New York State, as a political experiment, will collapse well before California does. [23]
 - Then I think the part that is dangerous about the California dynamic is that when you have these super networked industries, it's possible that policy can go incredibly far wrong before anybody notices. And the super disturbing example in the US context would be Detroit and the US car industry, which was again, a very networked industry, it was all around Detroit. You had the suppliers, all these different people. There were incredible scale economies, network effects that came from that. So as it got taxed and regulated more and more, people did not leave. There was no response. Then eventually the whole thing completely collapsed. So the risk in California is not that we have some sort of gradual

decline, but that it gets sort of pushed, and then sort of goes over the cliff completely. But I think we're still a ways away from that.

Work around governments

- I do think there's a question about where in the private sector can you coordinate things on a big enough scale. Silicon Valley start-ups have been a way to do it, and maybe there's some class of somewhat larger companies. [12]
 - My PayPal colleague Elon Musk started both SpaceX and Tesla, which are extremely charismatic businesses, because it involved somewhat larger-scale complex coordination, getting a lot of different pieces together to work. Not as big as we could do, perhaps, if you had a well-functioning government. But I think that's not really that realistic.
- In 2009, the prospects for a libertarian politics appear grim indeed. Exhibit A is a financial crisis caused by too much debt and leverage, facilitated by a government that insured against all sorts of moral hazards — and we know that the response to this crisis involves way more debt and leverage, and way more government. Those who have argued for free markets have been screaming into a hurricane. The events of recent months shatter any remaining hopes of politically minded libertarians. For those of us who are libertarian in 2009, our education culminates with the knowledge that the broader education of the body politic has become a fool's errand. [8]
 - Indeed, even more pessimistically, the trend has been going the wrong way for a long time. To return to finance, the last economic depression in the United States that did not result in massive government intervention was the collapse of 1920–21. It was sharp but short, and entailed the sort of Schumpeterian “creative destruction” that could lead to a real boom. The decade that followed — the roaring 1920s — was so strong that historians have forgotten the depression that started it. The 1920s were the last decade in American history during which one could be genuinely optimistic about politics. Since 1920, the vast increase in welfare beneficiaries and the extension of the franchise to women — two constituencies that are notoriously tough for libertarians — have rendered the notion of “capitalist democracy” into an oxymoron.
 - In the face of these realities, one would despair if one limited one's horizon to the world of politics. I do not despair because I no longer believe that politics encompasses all possible futures of our world. In our time, the great task for libertarians is to find an escape from politics in all its forms — from the totalitarian and fundamentalist catastrophes to the unthinking demos that guides so-called “social democracy.”
 - The critical question then becomes one of means, of how to escape not via politics but beyond it. Because there are no truly free places left in our world, I suspect that the mode for escape must involve some sort of new and hitherto untried process that leads us to some undiscovered country; and for this reason I

have focused my efforts on new technologies that may create a new space for freedom. Let me briefly speak to three such technological frontiers:

- i. **Cyberspace.** In the late 1990s, the founding vision of PayPal centered on the creation of a new world currency, free from all government control and dilution — the end of monetary sovereignty, as it were. In the 2000s, companies like Facebook create the space for new modes of dissent and new ways to form communities not bounded by historical nation-states. By starting a new Internet business, an entrepreneur may create a new world. The hope of the Internet is that these new worlds will impact and force change on the existing social and political order. The limitation of the Internet is that these new worlds are virtual and that any escape may be more imaginary than real. The open question, which will not be resolved for many years, centers on which of these accounts of the Internet proves true.
- ii. **Outer space.** Because the vast reaches of outer space represent a limitless frontier, they also represent a limitless possibility for escape from world politics. But the final frontier still has a barrier to entry: Rocket technologies have seen only modest advances since the 1960s, so that outer space still remains almost impossibly far away. We must redouble the efforts to commercialize space, but we also must be realistic about the time horizons involved. The libertarian future of classic science fiction, à la Heinlein, will not happen before the second half of the 21st century.
- iii. **Seasteading.** Between cyberspace and outer space lies the possibility of settling the oceans. To my mind, the questions about whether people will live there (answer: enough will) are secondary to the questions about whether seasteading technology is imminent. From my vantage point, the technology involved is more tentative than the Internet, but much more realistic than space travel. We may have reached the stage at which it is economically feasible, or where it soon will be feasible. It is a realistic risk, and for this reason I eagerly support this initiative.

Fix universities

- We've had a whole series of bubbles in this country, they've been quite destructive. It was a tech bubble in the '90s, a housing finance bubble in the last decade, and we have something of a government bubble going on right now. It's the strangest of all, because the government's so clearly dysfunctional, and yet we have the idea that it's going to fix things, that things affiliated with government will do things better. We have a bubble in education. If there's anything in our society that's a bubble, it's education. Costs have quadrupled since 1980: 300% increase after inflation in 1980 for college education. It's not clear that the quality has gone up at all. And if you measure how many years it takes

for people to recoup the debt that they take on in college, it's actually steadily increasing. Since 2000, it's actually been better to finish after high school than after college on a relative basis. So college was an increasingly good investment through 2000. Since 2000, there's been a roughly consistent gap between college and high school education because the debt has kept going up that people amass. It's still better, but by a lesser degree since 2000. We have an enormous amount of money that's being spent on education, and basically I think the crazy cultural shift that's happening is that people who are in the younger generation, Millennials, are getting completely screwed. They're basically being turned into something like indentured servants, where they have to pay off their college loans. Bush rewrote the bankruptcy laws in 2005 to make it impossible to get out of college debt even if you go personally bankrupt. And so I think there is this very serious issue that education and the debts that are being imposed on people linked to education are turning an entire generation into something close to indentured servants. And that seems to me to be a very bad development. And because they're not being paid enough - the education has been hyped beyond belief. [15]

- I can go on all these critiques of the universities, but basically, the basic problem is if you think of it as an economic good, is it a consumption good, is it an investment good, so is it an investment where you're investing for your future? Is it a four year party? Okay, that hybrid is pretty weird, but I think it's actually a hybrid of an insurance policy that people buy to avoid falling through the big cracks in our society and a tournament, a zero-sum tournament, where the elite universities like Harvard and Stanford are basically a Studio 54 nightclub with a long line and a big velvet rope. And if you were the president of Stanford or of Harvard and if you had some kind of crazed martyr complex where you wanted a mob of students, faculty and alumni to come after you, you should give a speech saying this university is offering a great education and Harvard, it used to just educate the 200 million people who live in the US, today it's educating the eight billion people in the world, and so we should increase the enrollment, not by a factor of 40 but let's say two or three over the next 20 years, and you would just get lynched because you're running a Studio 54 nightclub and you shouldn't forget it. [2]
- If you define technology as doing more with less, education is perhaps the most anti-technological aspect of our society today where you're getting the same at a higher and higher price. The real costs of higher education since 1980 have gone up about 400 percent, that's after inflation. And it's not clear the quality has gone up at all. [5]
 - On some level, the universities have found that they can just charge more every year. And I think – and so I think the question is maybe why has there not been more resistance to these price hikes. And I think it again in part goes to this failure of an imagination of an alternate future. And so talented people should all go to the same universities, learn the same things, pursue the same types of careers. [5]
 - And so if we had an Internet bubble or a housing bubble, we certainly have an education bubble today. Bubbles are characterized by things costing more than they're worth, they're characterized by intense psychosocial dynamics. So it's very hard for people to suggest that you should not go to the best college you

can get into, because people don't know what else to do. So again it's a failure of imagination of an alternate future. [5]

- And it's also bubbles are also characterized by abstractions away from reality. And so I think the word education itself is this incredible abstract filler. And it's worth drilling down a lot more on what is going on. And that's the sort of thing you're generally not allowed to do. So what is it specifically that you're learning; so, engineering, is it some rigorous humanities course, or is it just education in the abstract? [5]
- I've often suggested you could think of this in economic terms. Is education an investment decision where it's basically something you invest to get a better paying job; is it a consumption decision where it's a four-year party? And maybe it's a combination of a bad investment and bad consumption decision where basically people think they are investing by consuming, which was characteristic of the housing bubble, where you bought an especially large house with a swimming pool and you patted yourself on the back for being an incredibly frugal investor. And so there's an aspect of that. [5]
- But I've come to think that even more than investment or consumption, it's perhaps better to think of education as understood as an insurance policy where it's probably not worth as much as people are paying for it, but they're scared of falling through the cracks in our society. And so as the cracks get bigger, we pay more and more for insurance against it. That's the way it's advertised. [5]
- And then I think the reality is that it's the exact opposite of an insurance policy; it is actually this crazy zero-sum tournament in which what really matters is getting into the best schools and then a diploma from a third-tier university is really a dunce hat in disguise. And so there is – so I think at its core, it's perhaps a zero-sum tournament masquerading as general insurance. And that's incredibly dissonant. [5]
- *Can it be changed?* [5]
 - Historically, I think the tone has been set by the top universities. They have these enormously rich endowments and they are incredibly resistant to influence from the outside. And so I do think it's the kind of thing that's very hard to reform from without.
 - It is nevertheless, I think, heading towards a crisis of sorts where it simply no longer works for the vast majority of middle-class students who are amassing enormous amounts of debt going to college. And so there is going to be enormous pressure. It's hard to say exactly what the timing on this is, but I think some of the online alternatives are going to get more traction as these financial pressures start to mount.
 - One of my friends has characterized the university system as the atheist church, which is sort of a successor to the Catholic Church, it's sort of universal. And that the university system in 2014, it's like the Catholic Church circa 1514. There's less diversity, so you have the Dominicans and Franciscans and all these different orders, whereas the diversity between say the Harvard and Stanford

political science department is considerably less. But it is sort you have this priestly class of professors that doesn't do very much work, people are buying indulgences in the form of amassing enormous debt for the sort of secular salvation that a diploma represents.

- And what I think is very similar to the 16th century is that the Reformation will come largely from outside. At some point, maybe there will be some internal need to adapt. But I think the first move will have to come from outside because you have systems that are so far decoupled from what actually makes sense, and the people are so bought into a system that just does not work, that I think you will see enormous resistance from the faculty.
- There is an incredible conformity and the questions of how are you training people to think in different ways have really gotten lost sight of. I think it is striking how little of a focus there is on teaching in general. [5]
 - And there is this subtle point where something goes from a not-great system into an all-out racket – how much sense does it make for professors to really invest in their graduate students and Ph.D. programs when there's a sense that none of these people will get jobs anymore, anyway? And so I think you are in this zone where it has in many ways become this incredible racket. And it is hard to really know what people inside it think. [5]
 - There is an egalitarian assumption embedded in education where it's assumed that everyone is more or less the same. And therefore if you look at how well do people who graduate from Harvard do versus people who just have a high school diploma, let's say they make twice as much money per year if they graduated from Harvard as with a high school diploma. It's assumed that this is prima facie evidence of how great the Harvard education is. When I think the reality is much more that it's a super-selective selection effect. There's selection, there's signaling, relatively little value-added learning. [5]
 - But because we have this egalitarian mindset, it's hard to make the argument that it is just this – the selection, rather than value-added learning. The obvious way to illustrate this would be: if the top universities in the U.S. were doing as good a job as they claim, the most natural thing for them to do would be to increase enrollment. So if you have 1,600 people this year going to Harvard and we're offering a fantastic education that's making them much better than they otherwise would have been, could you have some structured growth plan where you increased that number to maybe 3,000 over 20 years? Certainly the population of the country is a lot larger, it's attracting people from all over the world. And so if you're offering such a great education, what sort of a product is that where you wouldn't increase the number of people who use it? [5]
 - The only product I can think of where you would limit access as much would be a nightclub, which is again a zero-sum product that's based on exclusion. And I think that if you went to any of these top universities and you proposed doubling the enrollment, you would get a uniform opposition from the alumni, from the current students, from the faculty, because they would rightly perceive that it

would make it less prestigious, even though that goes very much against this egalitarian ethos that everyone's the same. [5]

- I think the rhetoric around education is always that it's a positive sum-game because there is his naive intuition that if I know something and I teach it to you, we both will know it. And so there's something about knowledge that's fundamentally, incredibly positive-sum. And I think it masks the very zero-sum aspect of education. [5]
- I went to law school, and if you look at the law schools, there's this brutal ranking on the U.S. News & World Report scale where the top three, I think, are still very good. So if you go to Harvard, Stanford, or Yale, that's really good. Then, I think, there's four after that that are pretty good, and then there's the numbers eight to 14, where maybe if you're in the top half of the class. And then probably numbers 15 to 200, it's very unclear whether it's a positive value for anybody who goes or the bottom 90 percent of those classes. [5]
- *Can it keep going?* [5]
 - When I've looked at this, in the 1980s and 1990s, one saw rapidly escalating costs in education but also increasing inequality in our society. And so it was at least correlated. It was always worth going to the top college because you'd make more money and it would seemingly make up for it.
 - Post-2000, even though there still is a vast gulf between high school graduates and college graduates, it stopped widening. The costs have kept going up. And so the relative value of a college education has actually been going down since about 2000.
 - If you were to measure the value of a college education by how many years it takes you to pay off your debt, the number of years was actually going down in the 80s and 90s because the premium was going up even faster than the costs were escalating.
 - Post-2000, it's taking longer and longer to pay off the debt, so actually the relative premium has been in decline for 14 years now. And, I think, again, 2008 was a bit of a watershed moment where all the sudden, there were a lot fewer of these tracked positions available. When kids graduate from college and moved back in with their parents, that was not part of the deal the parents had implicitly signed.
- Certainly it's incredibly distorted. It's one of the things that makes the education bubble different from say the housing or the tech bubble of the last decades is that it is actually very hard to measure what the quality of education is. And so when people say things like you'll figure it out in 20 years, there's things you will learn that are intangible that will help you 20 years in the future - a somewhat cynical cut on that might be that, well this is the sort of thing you say if you're running a scam where you want to have a really long shelf life to it so people won't notice that they've been defrauded for a long time. [5]
 - But there is something about the immeasurability of education that's made the education bubble quite durable, but on the other hand, it probably also means that it's gotten bigger and bigger in a way that's extremely distorted. [5]

- I think we are at a point where it's going to start changing. And our backgrounds are in these elite universities – you went to Harvard, I went to Stanford. I think those are the ones that will be the last to change, and so we may be underestimating how much change is going to be happening in the next five, ten years in this very broad swath of colleges where the cost-benefit calculation is not working in any sense of the word anymore. [5]
- There's a question: how good are the elite institutions even for the people who go there? So one of my friends started at Yale in 2001, the dean welcomed the class by saying, "Congratulations. You're set for life, you got into Yale." And this is a 17 year old. This seems slightly off. Like maybe it's true as long as you absolutely never believe it to be true. But if you actually were to believe that, it's probably quite toxic. And so I think that the K through 12 tracking to the elite universities sets people up in ways when things don't quite work out automatically for them afterwards, they're not that resilient, they're not that able to recover. [5]
- There is an amazing degree to which people's ambitions get beaten out of them in these top universities. If I look at what people thought my senior year in high school. [They] were very ambitious, had all these ideas of what they were going to do. And if you looked at the same people at college plus five years, nine years later, let's say, it was amazing how much things had been ratcheted down. [5]
- So I do think there's something problematic where all the talented people go to these schools, they're evaluated on the same terms and at the end, a lot of ambitions are beaten out of them. Probably the one that I think is even worse for people than Harvard, in this respect, might be Caltech where you have these brilliant math/physics people and after four years where you're in the middle of your class, you're convinced that the most you can do with your life is become a line engineer at Lockheed and maybe you can go into mid-level management 20 years later. [5]
- And so that is characteristic of what I think has happened. And what I think we need to somehow find a way back to is this idea that there's not just a single track, that there are very different things you can do. The question – what truth do you know that nobody agrees with you on - the career version of this, is what are you really good at that other people aren't that good at? And that somehow gets discouraged by this incredible homogenization. [5]
- There's a sense that there are all these people who are ahead of you. So there's always this sense there's so many people who are much better than you or just as good as you, so who are you to think that you can do anything different? And obviously when everybody starts to think that, nobody does anything. In fact, it becomes self-fulfilling once again and no one does anything different. [5]
- It is always very important to think through where is there a freedom of action that's possible and what spheres is there a lot less freedom of action. And probably the academic setting, the thing it gears the most talented students towards is academia itself. And that is probably a place where the sphere of action has gone down as much as anywhere in the last 40 or 50 years. You

know, this idea that all Rhodes Scholars had a great future in their past. And it's because they're encouraged to then do these super-conventional things, where it turns out a lot of other people are doing basically the same things. And you end up again with this question – why does it matter for you to do it if 20 other people are doing it already? [5]

- On a somewhat more optimistic note, it is not the case that everything is so exhausted. This is, again, this cultural, natural question – is the set of possibilities really this narrow where there only are these tracked things with a few positions at the end of these tracks that are any good. Or are there really a lot of unexplored paths and hidden paths, that are much more promising, that people should explore? And I think political correctness tells us that everything that's conventionally known is true, there's nothing outside that that works. And so that's how I think it probably intersects with this tracking in a very deep way. [5]
- *[Rodrigues: Thiel argued that if we want to retool education to accelerate innovation, we first must decompose "education" into its constituent parts: [9]*
 - *Education as learning. This is rare. Most people who really care about learning are autodidacts.*
 - *Education as insurance. We invest in education in order to hedge against future uncertainty.*
 - *Education as tournament. In this sense, education is zero-sum. Yale and Stanford create a public good by incubating and transferring knowledge, but if they could suddenly triple the size of their student bodies, they wouldn't. Prestige is un-scalable. Elite universities are like nightclubs.*
 - *Education as babysitter. This is our dirty little secret. "Education" can be a codeword for "holding pen."]*
- While I agree that education is important, a perspective to keep in mind is the U.S is able to do far more with less educated people. So if we compare us to Japan. Japan has an educational system that is second to none and yet [still lower worker productivity] and less product, because people are forced into one particular job for their entire lives, the big company mentality. And we don't have that in the U.S. [11]
- You can try to be honest and say the expectations are dialed down, or you can continue to say everything's great and it just happens not to be working out for you, but it's working out for people in general. And somehow it's been very hard to have the honest reset. And the incentives have been for the institutions to derange and to lie. There's probably a way the universities could function if they did not grow. You'd be honest, most people in PhD programs don't become professors. Maybe you'd make the PhD programs much shorter. Maybe you'd be much more selective; you'd let fewer people in. There would be some way you could adjust it, and the institutions could still be much healthier than they are today. [17]
 - But that's not the path that seemingly was taken. And something like this could have been done in a law firm context. Maybe you still let the same percentage of people become partner, but the partners don't make quite as much money as

before, or something like that. So that there would have been ways when one could've gone, but those are generally not the choices that were made.

- When I was an undergraduate, you still had some older professors who were polymaths, who knew a lot about a lot of different things. This is, I think, the way one should really think of Watson and Crick, or Feynman, or Teller. They were certainly world-class in their field, but also incredible in a lot of different fields.
- And the cultural, or institutional, rule, is no polymaths allowed. [17]
 - You can be narrowly specialized, and if you're interested in other things you better keep it to yourself and not tell people, because if you say that you're interested in computer science and also music, or studying the Hebrew Bible, wow, that's just, that must mean you're just not very serious about computer science.
 - The polymaths would be the people who could connect the dots and say: there's not that much going on in my department, and there's not much going on in this department over here, and not that much going on in this department over there. And those people are very, very dangerous.
 - One of my friends studied physics at Stanford in the late '90s. His advisor was this professor at Stanford, Bob Laughlin, brilliant physics guy. Late '90s he gets a Nobel prize in physics, and he suffers from the supreme delusion that now that he has a Nobel prize he has total academic freedom and he can do anything he wants to. And he decided to direct it at - there are all these areas you probably shouldn't go into, you probably shouldn't question, climate science, there are all these things when one should be careful about - but he went into an area far more dangerous than all of those.
 - He was convinced that there were all these people in the university who were doing fake science, who were wasting government money on fake research that was not really going anywhere, and he started by investigating other departments - started with the biology department at Stanford university. And you can imagine this ended catastrophically for Professor Laughlin. His graduate students couldn't get PhDs. He no longer got funding. Nobel prize in physics, no protection whatsoever.
 - *[Eric Weinstein: It comes as a shock to all of these people that there is no level you can rise to in the field that allows you to question the assumptions of that field.]* Right. You're proving yourself, you're getting your PhD, you're getting your tenured position, and then at some point you would think that you've proven yourself and you can talk about the whole and not just the parts, but you're never allowed to talk about more than the parts.
 - The person in the university context, or the class of people who are supposed to talk about the whole, I would say, are university presidents, because they are presiding over the whole of the university and they should be able to speak to what the nature of the whole is, what sort of progress the whole is making. What is the health of the progress of the whole? And we certainly do not pick university presidents who think critically about these questions at all.

- I think one has to go back quite a long time to even identify any university presidents in the United States who said things that were distinctive, or interesting, or powerful. There was Larry Summers at Harvard a decade and a half ago, and tried to do the most minuscule critiques imaginable, and got crucified. But I don't think of Summers as a particularly revolutionary thinker.
- In a healthy system you could have wild dissent and it's not threatening because everyone knows the system is healthy. In an unhealthy system, the dissent becomes much more dangerous. I think that's not that surprising. There's always one riff I have on this is always, if you think of a left wing person as someone who's critical of the structures of our society, there's a sense in which we have almost no left wing professors left. Left-wing in the sense of, let's say, just being critical of the institutions they're a part of.
- And there may be some that are much older, so if you're maybe in your eighties we can pretend to ignore you, or you know, this is just what happens to people in their eighties. But I don't see younger professors in their, let's say, forties, who are deeply critical of the university structure. I think it's just, you can't have that.
- If you come back to something as reductionist as the ever escalating student debt, you can think: what is the 1.6 trillion, what does it pay for? And in a sense, it pays for \$1.6 trillion worth of lies about how great the system is. [17]
 - And so, the more the debt goes, the crazier the system gets, but also the more you have to tell the lies, and these things go together. It's not a stable sequence. At some point this breaks. I would bet on a decade, not a century.
 - I think there are a lot of different critiques one can have of the universities. I think the debt one is a very simple one. It's always dangerous to be burdened with too much debt. It does limit your freedom of action. And it seems especially pernicious to do this super early in your career.
 - And so, if out of the gate you owe \$100,000, and it's never clear you can get out of that hole, that's going to either demotivate you, or it's going to push you into maybe slightly higher paying, very uncreative professions of the sort that are probably less good at moving our whole society forwards. And so I think the whole thing is extraordinarily pernicious.
 - I started talking about this back in 2010, 2000, it was already controversial, but younger people all agreed with me. And it's a decade later, it's a lot crazier, we haven't yet completely won, but I think there are more and more people who agree with this. I think at this point the Gen X parents of college students tend to agree, whereas I would say the baby boomer parents, 15 years ago, would not have agreed.
 - The 2008 crisis was a big watershed in this too, where you could say the tracking debt roughly made sense as long as all the tracked careers worked, and 2008 really blew up, you know, consulting, banking. A number of the more track professions got blown up, and so that was kind of a watershed.
 - I think a lot of these, it was mostly emergent. We had somewhat cancerous, we don't distinguish real growth from cancerous growth, and then once the cancer

metastasizes at a certain size, you somehow try to keep the whole thing going, and it doesn't make that much sense.

- One of the reasons, one of the challenges on our side - let's be a little more self critical here - is the question we always are confronted with: well, what is the alternative? How do you actually do something? And it's not obvious what the individual alternatives are. On an individual level, if you get into an elite university, it probably still makes sense to go. It probably doesn't make sense to go to number 100. There is a way it can still work individually even if it does not work for our country as a whole. And so, there are all these challenges in coming up with alternate tracks.
- I think in software there's some degree to which people are going to be hired if they're just good at coding, and it's not quite as critical that they have a computer science degree. Can one do this in other careers, other fields? I would tend to think one could. It's been slow to happen.
- I would look at the college debt thing very seriously. I would say that it's dischargeable in bankruptcy, and if people go bankrupt then part of the debt has to be paid for by the university that did it. There has to be some sort of local accountability. So, this would be a more right wing answer. The left wing answer is we should socialize the debt in some ways, and the universities should never pay for it, which would be more the Sanders-Warren approach.
- *[Eric Weinstein: What do you think about the idea of a CED, a college equivalency degree, where you can prove that you have a level of knowledge that would be equivalent, let's say, to a graduating Harvard chemistry major, right? Or a fraction thereof.]* Great idea. I love it. I think it's very hard to implement. Again, I think these things are hard to do, but great idea. [17]
 - But look, we have all these people who have something like Stockholm syndrome, where if you got a Harvard chemistry degree, and if you suspect that actually the knowledge could be had by a lot of people, and if it's just a set of tests you have to pass, that your degree would be a lot less special, you'll resist this very, very hard.
 - If you're in an HR department, or in a company hiring people, you will want to hire people who went to a good college because you went to a good college, and if we broaden the hiring and said we're going to hire all sorts of people, maybe that's self-defeating for your own position. So I think one should not underestimate how many people have a form of Stockholm syndrome here.
- We had to hack the prestige status thing, where it was as hard, or harder, to get a Thiel fellowship than to get into a top university. And so, that's part that's very hard to scale. [17]
- At the top universities the BA is the far more prestigious degree than the PhD at this point. So, if you're at Stanford or Harvard, it's pretty hard to get into the undergraduate, and then you have more PhD students than you have undergraduates. [17]
 - There are all these people who are on a very questionable track. They've made questionable choices. And they probably are going to have some sort of

psychological breakdown in their future. Their dating prospects aren't good. There are all these things that are a little bit off.

- So yeah, in theory, if you had a super tightly controlled PhD program, that might work, but you have to at least make those two changes. As it is, the people in graduate schools, it's like Tribbles in Star Trek. We have just so many, and they all feel expendable and unneeded, and that's not a good place to be.
 - And, whereas I think the undergraduate conceit is still that it's more K-selected instead of R-selected, that it's more that everybody is special and valuable. That's often not true either.
 - So, I'd be critical of both, but if we could have a real PhD that was much harder, and that actually led to an academic position or some other comparable position, that would be good.
- What is the teleology of these programs? Where do they go? One of the analogies I've come up with is: I think elite undergraduate education is like junior high school football.

[17]

- Playing football in junior high school is probably not damaging for you, but it's not going anywhere because if you keep playing football in high school, and college, and then professionally, that's just bad. And the better you are, the more successful you are, the less well it works.
 - And then the question is: what's the motivational structure? When I was an undergraduate in the 1980s there was still a part of it where you thought the professors were cool, it might be something you'd like to be at some point in the future, and they were role models, just like in junior high school football an NFL player would have been a role model. And now we think you're just doing lots of brain damage, and it's a track that doesn't work, and therefore the teleology has broken down.
 - So undergraduate, part of the teleology was that it was preparing you for graduate school, and that part doesn't work, and that's what's gotten deranged. Then graduate school, well, it's preparing you to be a postdoc, and then, well, that's the postdoc apocalypse, or whatever you want to call it, postdocapocalypse. But just at every step, I think, the teleology of the system is in really bad shape. Of course, this is true of all these institutions with fake growth that are sociopathic or pathological, but at the universities it's striking as very bad.
 - And I think this was already true in important ways back in the '80s, early '90s, when I was going through the system. And when I think back on it, I think I was most intensely motivated academically in high school, because the teleology was really clear. You were trying to get into a good college. And then, by the time I was at Stanford, it was a little bit less clear, by the time I was at law school, really unclear where that was going. And by the time I was 25 I was far less motivated than at age 18, and I think these dynamics are just more extreme than ever today.
- I think the question we have to always ask is how many people should we be training and my intuition is you want the gates to be very tight. [17]

- One of my friends is a professor in the Stanford economics department, and the way he describes it to me is they have about 30 graduate students starting PhDs in economics at Stanford every year. It's six to eight years to get a PhD. At the end of the first year, the faculty has an implicit ranking of the students, where they've sort of agreed who the top three or four are. The ranking never changes. The top three or four are able to get a good position in academia, the others not so much. We're pretending to be kind to people and we're actually being cruel.
- And so, I think that if there are going to be - you know, it's a supply demand of labor - if there are going to be good positions in academia, where you can have a reasonable life, it's not a monastic vow of poverty that you're taking to be an academic, if we're going to have that, you don't want this sort of Malthusian struggle. If you have 10 graduate students in a chemistry lab, and you have to have a fistfight for a Bunsen burner or a beaker, and if somebody says one politically incorrect thing, you can happily throw everyone, them all out of the overcrowded bus. The bus is still overcrowded with nine people on it. That's what's unhealthy. And so, yes, it would be mistake to say we should dial this down and have zero people in these fields. That's not what I'm advocating, or what was being advocated here, but there is a point where if you just add more and more people in a starvation Malthusian context, that's not healthy.
- I do think there is something about basic science that doesn't all have the for-profit character. Some of it has this nonprofit character. We're building up this knowledge base for all of humanity. I don't yet know how we do basic science without some kind of institutional context. That's one that would seem absolutely critical. I'm super interested in the problem of longevity, radical life extension. My disappointment in the nonprofit institutions and nonprofit world has directed me more and more over the years to just invest in biotech companies and try to find these better-functioning corporate solutions. And then I always have this worry in the back of my head that maybe there are these basic research problems that are being sidestepped because they're too hard. So I think basic science is one that you'd have to do, but you have to somehow also reform the institution so that you don't have this Gresham's law where the politicians replace the scientists. [17]
- I don't like the word education because it is such an extraordinary abstraction. I'm very much in favor of learning. I'm much more skeptical of credentialing or the abstraction called education. So there are all of these granular questions like what is it that we're learning? Why are you learning it? Are you going to college because it's a four year party? Is it a consumption decision? Is it an investment decision where you're investing in your future? Is it insurance? Or is it a tournament where you're just beating other people? [18]
 - And are elite universities really like Studio 54 where it's like an exclusive nightclub? I think if we move beyond the education bubble that we're living in today, the future will be one in which people can speak about these things more clearly. And we will talk about is it an investment decision? Is it a tournament? Is it a trade or vocational skill that we're developing? I think engineering is the

opposite of education because it is actually a specific skill that people are learning. And engineering as a discipline cuts the most against the banality that we're always told that we're just learning how to learn, or you're not learning anything in particular. You don't know why you're learning things. Engineering is sort of the anti education, in that sense. And I think it is, in some ways, a paradigm for the way I think it will be more in the future. I think we will have much less of a one size fits all approach. I think the big tract institutions are delivering less and less and charging more and more.

- And so I think we are at a point where things will look very different. One of my friends suggested that we were at a point in education that's like the place where the Catholic Church was on the eve of the reformation. It had become a very corrupt institution. It was charging more and more for indulgences. People thought they could only get saved by going to Catholic Church just like people today believe that salvation involves getting a college diploma. And if you don't get a college diploma that you're going to go to hell. I think my answer is, in some ways, like that of the formers in the 16th century. It is the same disturbing answer that you're going to have to figure out your salvation on your own.
- This is my candidate for the biggest lie that the Obamas ever told. This is one that's all encompassing, that follows from getting the scale wrong. And they both did it, sort of. I'll let ladies go first; Michelle Obama first. So quote, "The one thing I've been telling my daughters is that I don't want them to choose a name. I don't want them to think, 'Oh, I should go to these top schools.' We live in a country where there are thousands of amazing universities. So the question is, what's going to work for you?" And so at scale, you obscure all the differences. Of course, we know they were lying. The Obamas' daughter ended up going to Harvard. And it's reassuring. I mean, it would be very disturbing if they actually believed that this stuff worked at scale in the way they claim it does. Her husband came up with an even more succinct one, telling two lies at once. Quote: "Just because it's not some name-brand, famous, fancy school, doesn't mean that you're not going to get a great education there." So let's parse that two lies. First off, if it isn't a name-brand, famous, fancy school, you're not going to get a great education. You're just going to get a diploma that's a dunce hat in disguise. If it is a name-brand, famous, fancy school, you probably also won't get an education. [21]
 - And so, if we were to rightsize the scaling for our intellectual life, you should describe Harvard, not as one of the thousands of great universities, you should describe it as a Studio 54 nightclub. It's this tournament. It's probably good for the self-esteem and bad for the morals of the people who go there, and maybe call it a wash. Probably not a criminal thing, doesn't need to be shut down but probably does not deserve a tax deduction.
- I'm very focused on the question of what happens at the elite universities because they dominate the whole narrative. A lot of lesser colleges are trying to emulate the top ones in one way or another. And I do think there's something very odd about our talented people all going to the same short list of colleges and then, from there, going into the

same narrow list of careers. My view is if you want to actually somehow get people to rethink the system, you have to rethink the very top schools. [22]

- I think one of the things that's deeply dishonest about it is that it mostly presents itself as an insurance policy, because people in our society are somewhat pessimistic and somewhat worried about the future. They desperately want insurance. But the reality is that it is this tournament.
- You could ask—is education an investment where you invest in something in order to increase your earning power. Is it a consumption decision where college is a four-year party. And I originally thought it was like the housing bubble, which was a combination of consumption and investment, where people thought I'm buying a big house with a swimming pool, look at how much money I'm saving, which is a crazy way to think about things. So when you think you're consuming by investing, that's sort of like A and not A at the same time. But I think at this point it's actually a combination of two different things. It's a combination of an insurance policy people are buying because they're scared of falling through the big cracks in our society, and then that's combined with the reality of a zero sum tournament where if you get a diploma from the wrong school, it ends up being a dunce hat in disguise. So we basically have a zero sum tournament that masquerades as an insurance policy, which are of course very different kinds of things. So that gets you at the fundamental fraud. [23]

Step up to the challenge of China

- There was that very famous Reagan speech that you [Peter Robinson] wrote for Reagan - tear down that wall, Mr. Gorbachev - and it was very effective. But perhaps it was not only in the West that we learned lessons from it. The Chinese communists also paid very careful attention to it, and they learned that you had to have perestroika without glasnost. You had to get rid of the Marxism without getting rid of the Leninism, and they learned somehow the very opposite lessons of that fateful year 1989. Tiananmen worked in China and that is what is continued to work. So I think that's a simple first cut. There is nothing about history that is automatic or predetermined. It's always a question of agency, of people, and unfortunately, China took the lesson very much to heart and has stayed on this trajectory. Its per capita GDP is close to \$10,000, which was the point where democracy was supposed to start taking over, and it seems to have, if anything, been going the opposite direction. Or there's another historical riff I have on this that I was thinking about the other day, where there was this famous interview with Zhou Enlai in the early 1970s where they asked him about the French Revolution and what did he think of the French Revolution, and he said it's too early to tell, which was seen as a funny diplomatic answer at the time. But I've come to think that there's a very sinister way of thinking about that answer which is that in some sense, the French Revolution, it ended. It ended in 1794 when the insanity burned itself out and you had Thermidor. And then of course when you had the Russian Revolution, one of the promises Lenin had

was that the Russian Revolution, the communist revolution, would never have a Thermidor. But it took a little bit longer than five years as it did in France, but I'd argue you had something like Thermidor, 1956 when Khrushchev gave the anti-Stalin speech, certainly by the time of Gorbachev. China, what Zhou Enlai was saying in that speech was that China is the one country that is still true to the spirit of the French Revolution. It is the one country in the world in which there will never be a Thermidor. And then of course the way this manifests is that it will still continue in the sort of revolutionary communism that will have one genocidal thing after another, and that continues under Xi. [2]

- *[Peter Robinson: Will artificial intelligence overturn Hayek and Friedman? Will it enable China to achieve sustained economic growth without economic or political freedom?]* [2]
 - Well, let's not be too dogmatic in answering this. I certainly think that it's possible that the totalitarian, the form that totalitarianism has in China will exhaust itself, that it will hit some kind of crisis at some point. China does have some very serious demographic challenges. You could say it's a revealed preference that people don't want to have children because it would be very cruel to allow a child to be born into such a horrible society. So I think there are ways that we can speculate on how it might ultimately exhaust itself. But I think we should not be dogmatic on the other side and assume that it automatically will, and that perhaps it can develop, perhaps it can catch up, you could get things to work. And there are probably certain parts of the economy where you don't need to be that free or that creative or that innovative, there is just copying things that work. Just copying the West. And maybe you can't get quite to our standard of living but maybe you can get to a half of our standard of living or something like that.
- I think it's unclear [whether AI is a game-changer], I think there's always a lot of propaganda around all these buzzwords and so I think it's somewhat exaggerated, but yes of course, there's sort a continuation of the computer revolution where you'll have more powerful Leninist controls; maybe the farmers can sell the cabbages in the market and you can still have face recognition software that tracks people at all times and all places, and so there's a hybrid thing that might work for longer than we'd like. [2]
- I'm gonna give you my speculative conspiracy theory on how the Chinese communists are trying to psychologically undermine the West, and I believe they are inducing two perspectives on China in the West. One perspective is that China is very far behind us, that it's still a very poor backward country. Even in 2049, even on the 100-year anniversary, it will still only be a middle-income country, and it's so far behind that we don't need to worry about it and we can be in denial about China. And the other one is that it's so far ahead of us that there is no way that we can ever catch up. It works better, it can build skyscrapers super fast, it works so much better that we have to just accept that we are really far behind. Denial is extreme optimism, acceptance is extreme pessimism, but extreme optimism and extreme pessimism converge to doing nothing. [2]
 - For example, I think there was this question about Taiwan and how protected Taiwan was and I believe it was in a single month in the year 2005 where the US strategic assessment shifted from Taiwan would be safe for decades because of

our aircraft carriers and whatnot, to no, Taiwan was already lost because China had all these missiles that they could knock all our defenses out overnight. And so it's somehow, so the fact that it gets framed in these two extreme terms, I'm wondering if you're a mouthpiece of the Chinese communist party and it's always extreme acceptance and extreme denial, and the reality is actually, no, it's close, and there are strengths the US has and there's strengths they have and it's a fight, and it's gonna be a fight for a very long time. And even if China in some ways gains ground in that fight it will be strategically close for a long time because as China gains ground, other countries will get more scared of China and they will work more closely with the US. Japan was toying with the idea of shifting its alliance from the US to China, this was always the DPJ line in Japan in the late '90s, early 2000s. Under Abe, that's definitively over. Japan is back firmly on the side of the US. Vietnam, much more on the US side than the China side. This is very different from Vietnam of 40 years ago. And so even if China gains ground in certain things, I think the strategic picture will stay very even for a really long time. So somehow it's in between is probably the truth and it will be the truth for a long time.

- It's China is super weak, and China is super strong. And I've been in meetings in China where in some sense you got both messages within 20 minutes of one another, and it's logically inconsistent but psychologically it doubles up. [2]
- *[Peter Robinson: "The issue of Soviet-American relations is in essence a test "of the overall worth of the United States." To avoid destruction the United States need only "measure up to its own best traditions "and prove itself worthy of preservation as a great nation." Kennan writes that in 1951. If we replace the reference to the Soviet Union with a reference to China would you subscribe to that statement today?]* [2]
 - Yes. I don't know, I'm always uncomfortable with saying it's a simple template though. So if we just go with the simple template, it's too automatic, and then if it's too automatic we're back in your Berlin tear down this wall speech, and then we've replaced the reference and we know China's the Soviet Union and because we say it's the Soviet Union we don't need to do anything else because we knew that just all happened on its own. And in practice the Cold War was won in very specific ways. There was a whole series of concrete situations that you had to deal with, and the rivalry with China, it's somewhat different. It's happening in an Information Age, not an Industrial Age. There's a global competition question. There's a way in which the two economies are very deeply connected. We weren't deeply connected to the Soviet Union. So there are a lot of things about it that are very different and I think, yeah, we have to, it's not like 2020 is like 1951, or like 1989. 2020 is like 2020 which is much less helpful but much more accurate.
- I think we often have this with these booms or bubbles where on the surface it's extreme optimism. In the 90s, we had extreme optimism about the new economy in the US, and then just beneath the surface, it was this sense that the old economy was no longer working, and there was no future in the old economy. And so I have been wondering if

there's something like that going on in China today as well. Again, it's a vast country, 1.3 billion or more people. So it's hard to really generalize about something like that from just talking to a few students in an elite university. [6]

- The two kinds of critiques my Zero to One book got would be, on the one hand, that, of course, China can innovate, and it's wrong for me to suggest otherwise – which I didn't really do, but there is a sense that China gets linked with globalization. So one critique is we can innovate just as much as the West, and then the other critique of it is, well, zero-to-one businesses are good for America and other countries, we don't need zero-to-one business, we can just copy things that work. [6]
- These two diametrically opposed critiques. We don't need to do this, or we're already doing it. That leads me to think the truth is somewhere right in between. That there is a sense they haven't needed to do it. They haven't needed to innovate for a long time. This, of course, is the good part of globalization. You can copy things that work if you're a very poor, very underdeveloped country. There's a lot of room for copying. And at some point you run out of things to copy. And there's a sense that this is what happened. This was the arc of Japan. Sort of the Asian exemplar in some ways, starting with the Meiji Restoration in 1870s and then all the way through the 1970s, 1980s was incredibly dynamic. In many ways, it wasn't a strictly capitalist model, but it somehow just worked. Then, you hit a wall in the 80s where they more or less caught up, there was nothing left to copy, and it somehow failed to move beyond that. And then you get the question, when does China hit a wall like Japan? Very similar model. Export-oriented, current-account surpluses. When do they hit a wall? [6]
- If you look at it on per capita GDP, you would say it's roughly where Japan was 1960, so you maybe have 20 years left to go on the copying. So if you look at per capita GDP you'd say China's still 1/7, 1/8 of the US. Japan got up to about 2/3 or 3/4 before they hit the wall. You have a long way to go. [6]
- Then, if you look at it from trade flows, where in many goods China's manufacturing half the stuff that getting made in the world in that category, and you wonder how much growth is there really left doing this. You end up with this question, whether maybe this model worked really well for Japan when it was the first country doing it, and it works much less well for China at a much bigger scale. Maybe they're hitting this wall that Japan hit in the late 80s today in 2016. [6]
- I think with respect to China, I think that globalization has been such an enormous driver. It seems to me hard to reorient it toward technology simply. You have the Foxconn factory where people are manufacturing the iPhones, which again I think more is globalization than technology. 1.3 million people employed there. [6]
- Maybe that keeps going, maybe that gets redirected in some other way, but it's the transition I think is very far from trivial. It was a very big problem even in

Japan. Arguably, it was globalization-oriented, tried to shift towards something more innovative, and never quite cracked that open. [6]

- I believe it was Liu He, who is the chief economic advisor to President Xi, who included in the 2012 [People's Congress] statement that the globalization tailwind that had helped China for 30-plus years was abating. And that you'd have to really think about how to reorient much of the economy, maybe towards internal consumption, maybe towards innovation, but away from a lot of the things that are working. And then a lot of the power structure's linked to things that are working. The subsidies, the state-owned enterprises that export goods and that employ a lot of people. There's a question of how easy it is to reorient that. [6]
- I think that part of [China's growth] is very good, but there are parts of the world that actually do resemble more of a zero sum game. One of the big ones is the oil industry, which is dominated by Saudi Arabia. And basically, as China demands more and more oil, it's now the second largest oil importer in the world today, right after the U.S. Its oil prices are going through the roof, they're at record highs today and they're probably going to go much, much higher. And that's going to help the Islamic terrorists that are the first part of the freedom quotes you started with. [11]
 - The key point is that in the 1970s in the competition with the Soviet Union, one of the reasons the U.S. ended up prevailing was because people were focused on it and they were really scared to death. [11]
 - But, truly, if there's one thing that's not a zero sum game, it is knowledge and development and science. I mean, as people learn more, it's not like it's a zero sum game. That's the thing that, I think, can be a win-win situation. The things that are not win-win situations are the oil situation and the larger geopolitical situation because if the U.S. has the largest economy in the world, then we can also support the largest military and that creates security in the U.S. If China ends up with the largest economy, we better hope that China is a free and democratic country. [11]
 - [The geopolitical challenge] is the long-term challenge. The issue is whether they can have economic freedom without political freedom. China's copying not Hong Kong but Singapore. They want to be like Singapore. [11]
- China is hard to evaluate on this globalization metric, because on some level, the growth story is linked to exports and globalization. Then at the same time, it has these capital controls and all of these ways that it's somewhat separate. I find it always very hard to evaluate. I do think it's interesting that the questions about China are being asked less often in the US today than they were a decade ago. [12]
 - In 2005, it was a very widespread question, in what year will China overtake the US? A decade later, it's reasonable to think that it's a decade closer to when this will happen. It's a much less commonly asked question. At the end of the day I suspect we are underestimating China, but it may be very hard to invest.
 - I've always thought that you could only participate in the Chinese boom if you are a well-connected, card-carrying member of the Chinese Communist Party. I'm not, and so it's not been a place that I've really focused that much.

- If one goes with the general climate change narrative that it's anthropogenic, it's CO2 levels are rising in a way that's dangerous and has a serious risk of some kind of big runaway process, I think always the political question in my mind is, what do you do about China and what do you do about India? Because these are the countries that are trying to catch up to the developed world. They have an enormous way to go to catch up and I think Europe has something like 8% of the carbon emissions in the world. Then we have to have more than just the magical political thinking where it's something like: we're going to have a carbon tax in California and this will be so charismatic and so inspiring that people in China and India will copy us and follow suit. They're not willing to actually say that literally because it sounds so absurd but if you say that that's not the way things actually work, then somehow you need to do some really different things. We need to find energy sources that are not carbon dioxide intensive. Maybe we need to figure out ways to engineer carbon sinks. I mean there's all this crazy geoengineering stuff that maybe should be on the table. Maybe we should be more open to nuclear power. [17]
- The question for the United States is, is the best strategy for the US to go big, to go with the global scale? And this has probably been a thread throughout the US history of at least the last 100 years. Everything from the progressivism of Woodrow Wilson, the New Dealers after World War II setting up the global institutions from which they'd run the planet from Washington DC. And there was a sense that the US was at scale and should always operate on an even bigger scale and should be leading this world revolution, not always a libertarian one. I was reminded of the joke, why is the United States the only country in the world where revolution is impossible? Answer, because it's the only country that doesn't have an American Embassy. But this was in some sense a very good strategy for the US. It was to lean into the bigness of the country and to go even bigger. But I think there are some ways we may need to update this in the world of 2019, and in some ways, it's shaped by the rivalry with China. And if we think about a rival that's also incredibly big, simple bigness is not necessarily the right strategy. And so we think of the four vectors of globalization that I often think it's movement of goods, free trade; movement of people, migration, immigration laws; movement of capital, banking, finance; movement of ideas, the internet. And it made sense for the US to lean into all these things because being the biggest, we've got outsized returns from scale. Whereas, I think if we do a ledger on these today, maybe only two of them are still ones that the US really has a powerful advantage in. I think it's finance and the internet, even though we, of course, have misgivings about those two. [21]
 - There's a sense in which we don't fully trust the banks. We don't fully trust the tech companies. They don't fully trust the US. The feelings are mutual. And so it is difficult for us to really support these companies as national champions. In the 1950s, the CEO of General Motors could still say, "What's good for GM is good for America." It's a little bit of a distortion, but it was not that inaccurate. It would be inconceivable today for the CEO of Goldman Sachs or Google to say, "What's good for Goldman Sachs or Google is good for America." It would be just inconceivable to say that, and so even though this is the model that we probably should still be working on, it's quite a tough lift. I think when you think of trade or

immigration policy, the scale question is much more sobering for the US. We're simply not able to compete with China at scale when you have 7 out of 10 of the largest container shipping ports are in China. The largest in the US, Los Angeles, is only number 11. It's just make the world safe for container shipping. It's making the world safe for the Chinese Communist One World State at the end of the day. That's what you're tilting towards. Or on the immigration issue, it's striking how much better China is at moving goods and people than we are. China has probably had the greatest internal migration of any country in the last 20, 30 years. If you look at Shenzhen in Southern China, it had 60,000 people in 1980. It's expanded to something like 12 million, a growth factor of 200, in the last 40 years. And again I'll use the contrast of New York City, where we had 7.1 million people in 1980. It's grown to 8.4 million in the last 40 years. And it simply does not scale on people.

- We can scale finance. We can scale tech. People, we're really bad at scaling. It costs \$3.8 billion to build one mile of subway in New York City, and it's only \$400 million per mile in Paris. And that suggests that any attempt to scale on people is not the place we should be competing. And so there is, I think, some urgent need to rethink all these different scale questions. Where are we going to be good? Where's going to be much more challenging? I'm not a fan of AOC, to say the least, but if you were to steelman one of her arguments that Amazon should not come to New York. The argument was basically that it would just drive up rents and prices for everybody there. And we have to ask seriously whether that's not entirely wrong. What is actually the inelasticity of real estate in a place where the zoning is so controlled that it's very hard to build new things, it's hard to build new transportation, things like that. There's a famous economics theorem from Henry George in the late 19th century, that in a certain city that's too restricted and too heavily regulated, the inelasticity of real estate ends up being complete so that any gain in the economy of the city simply flows to the landlords. And of course, the mistake AOC made was this is also a libertarian argument because you could say that you need to get rid of all welfare in New York City because all the welfare simply goes to the landlords because it's 100% of a transfer. And of course, it's also an argument that we would have to rethink migration very hard. So to the extent China has focused our competition, it suggests that we need to think about the scale issue very differently. It's a very open question where the US should go from here. I don't think we simply can go subscale, so it's not like Israel or Switzerland. I would like the US to be a tax haven. I don't know if that quite works at our scale, but it's a very urgent question to think about.
- What are the kinds of places we can scale in a good way where we can win and do that better in the years and decades ahead? And if I had to give one general gloss on it, I would say that perhaps we have to shift a little bit from quantity, from simply scaling in size, to quality. And that's the question. And this is back to innovation, back to intensive growth, not just doing more of the same but shift towards IP protection, shift towards fewer scientists but actually doing real

science, fewer good universities, but we understand them to be elite universities. And somehow, a shift to quality over quantity is probably the place of comparative advantage that we have to think through really hard vis-à-vis China. Now the place where I think—one of the things I always find so befuddling is why these questions of scale have not been asked for such a long time, why the China rivalry, in some ways, has remained obscure for as long as it has. And I think in closing, I'll give my thesis on both the left and the right. There are some ideological blinders we've had, and I'm going to be critical on both sides here. I think that on the left the distraction machine from asking a question about what to do on the scale of the United States, the distraction machine has been driven by identity politics of one sort or another. And it's like a subscale. We don't think of the country as a whole, we think of just subgroups within the country, and I think there's something insane, self-contradictory about identity politics. I always think you can start with identity means what makes you unique. It means what makes you the same. If you start with A and not A, you can prove anything. And I keep thinking the identity politics monster gets crazier and crazier. Maybe it's just flopping around its tail in final death throes, but it does seem to have a lot of energy left. And until the left is able to move beyond identity politics, it's not going to be able to focus on the scale that we need to be focusing on for this country.

- I think from the right, the doctrine I would encourage us to rethink is the doctrine of American exceptionalism, which was, again, a super big scale, but put the US on a scale which simply could not be compared to any other country, any other place. And you can think of exceptionalism as—I often use the theological analog that it's like the radical monotheism of the God of the Old Testament or of the Quran, where you can't compare anything to God. You can't say anything about his attributes. And exceptionalism is like saying the US is this country that can't be measured, or compared, or evaluated in any way possible. And what happens - say you're exceptional in all these ways - is you probably end up being exceptionally off in different ways. You end up with subways that cost \$3.8 billion a mile. You end up with people who are exceptionally overweight. You end up with people who are exceptionally unselfaware. And I think something like the corrective to exceptionalism is that perhaps in the 2020s the United States needs to settle for greatness.
- [How can we achieve greater humility on a national and cultural level?] I think that the starting point surely is to frame the issues at the right scale. And exceptionalism can be inspiring. There's something about it that's so abstract that we're not able to talk about the details of what's actually going on. And so I think anything where we're able to focus on these questions of detail will be helpful. And that's the place that I would start. And I think the rivalry with China is what's going to push us to ask these scale questions anew. We're not in a great place in a lot of ways, but the country still has a lot of advantages. And we should think really hard what are our advantages, where do we push them, things like that.

And I think it is one of the few issues that are essentially bipartisan. I think it is actually a place where we could have a reasonable discussion.

What is happening in different areas of technology?²

Aerospace

- In 1961, Alan Shepard became the first American in space. In 1969, Neil Armstrong became the first person on the moon. We have not been back to the moon since 1972 and with the final Shuttle flight in 2011, the US will be without the ability to send an astronaut into orbit for the first time since it began its manned space program. For an industry that supposedly defines the future, space isn't doing so well. [1]
- One of the major barriers to making use of space is the sheer cost of getting material into orbit: about \$19,000 per kilogram (depending on the orbit), a price that has hardly changed since the 1960s. The elasticity of demand for getting into space at very high price ranges looks basically flat – people who have to go, go (the government, telecommunications providers), and almost no one else chooses to. Were prices to decline, the economic potential of space could be more fully realized. Imagine if it cost you \$500 every time you drove to the Apple store. You'd be inclined to replace your computer and phone much less frequently, even though these devices get radically better every year. If there were a vastly cheaper way of getting to Best Buy – or work, the gym, or wherever – you'd consume more of that good. It strikes us then that finding ways to get launch costs down is not only lucrative in its own right, but would vastly increase the size and potential of the space industry, a latter day version of the railroads opening up the West. NASA believes that the commercial market would increase substantially were launch costs reduced by a rough order of magnitude. SpaceX appears to be on track to reduce costs by that order of magnitude, which would make it an enormously valuable company in its own right. If it succeeds, there should at last be plenty to do in space, from telecommunications to power generation to high-precision microgravity fabrication – if investors with cash are ready to fund that innovation. [1]
- Another major area of improvement is overcoming the tyranny of distance. Cheaper, faster transportation has been a major lubricator of trade and wealth creation. For almost two centuries, technology has improved transportation relentlessly. Unfortunately, over the past thirty years, there have been no radical advances in transportation technology (in-flight DVD units are nice, but not revolutionary); take, for example, the travel time across the Atlantic which, for the first time since the Industrial Revolution, is getting longer rather than shorter. [1]

² References to [1] are from the Founders Fund manifesto, which wasn't primarily written by Peter Thiel.

Biotech

- Medicine has been the beneficiary of two radical developments over the past sixty years: the discovery of the structure of DNA in 1952 and the rise of information technologies in the 1960s. One would expect that the discovery of life's code, combined with the power of computing, would have radically increased the quality and length of human life-spans. But life-spans aren't getting longer as quickly as they used to, and in some places they're even getting shorter. Worse, the number of new drugs introduced each year – especially important new drugs (which you can measure by FDA fast-tracking) – is surprisingly low and well below the quarter-century average. [1]
 - That's not to say that biotechnology can't progress quickly. Less than twenty-five years after Watson and Crick published the structure of DNA, venture capitalist Robert Swanson and biochemist Herbert Boyer founded Genentech, which went on to synthesize insulin far faster and more cheaply than almost anyone believed possible. And in a great revolution in the FDA approval process in the 1980s following pressure from the AIDS lobby, the agency acted almost nimbly to approve a huge number of important new drugs for many maladies. But the revolution in innovation and regulatory efficiency has not been sustained. [1]
 - Biotechnology has already created one revolution. It can certainly create another. There are presently three major and related obstacles facing biotechnology (or biotechnology investment at any rate): lack of data, capital intensity, and a medieval approach to therapeutic discovery. The first major problem is that genetic sequencing, which provides us with the body of knowledge we require to create genomic therapies, is extremely slow, expensive, and inaccurate. Present methods of sequencing (which use fluorescence) can only sequence about 95% of larger genomes, take forever to do so, and cost a fortune. The second problem is capital intensity: it simply takes far too much time and money before a company has any real indication that a drug might work with animal/human trials fantastically expensive despite the help of computer modeling. The final problem is an extremely slow drug discovery process: fundamentally, discovery still proceeds by enlightened guesswork, rather than as a disciplined process – and there is no good way for investigators to share data. Biotechnology companies that can overcome these stumbling blocks will create enormous value for their investors and society. [1]
 - It's a tricky thing to measure medical progress . Life-span doesn't reflect quality of life (surely we would view medicine as more advanced were we to live only 75 excellent years rather than 80 years with 20 of them in misery) and it tends to be over determined by infant mortality (but note that both life-expectancy at birth, and years remaining for those who survive to adulthood, suggest that medical progress is mediocre). [1]
- The problem that I remain the most passionate about is for us to make some real and continued progress in the fight against aging and death. This is not just about my face as

a problem; everybody on this planet faces it. We have about 100,000 people a day who die mostly from diseases linked to old age. And what I always find extraordinary is how little we're doing about this problem. It seems that people are either in a mode of denial or acceptance, which are, in some ways, opposite extremes. But they both have the effect of stopping you from doing anything if you're in denial and say this is not a problem, or if you accept it and say there's nothing you can do about it, both of these are passive modes. [18]

- And what I think we need is a much more active mode. Instead of being in denial or acceptance, I would like us to be spending a lot more time fighting death. There are people who say that death is natural to which I think the response always has to be that there is nothing more natural for us than to fight death.

Energy

- A lot of these things sound very out there but if you look at things like nuclear technology, we could be building much safer, much cheaper reactors and I think it is probably a combination of political will and a belief that something like this could work that would enable it to work. And if you don't think it can work, it won't happen. [5]
 - *[Bill Kristol: 50 or 60 years ago, people would have assumed, people did assume energy will be cheap and plentiful, it will be virtually like water]* Yeah, it's too cheap to meter.
 - If you think about the energy density of something, probably the more advanced technologies and ones that produce more energy with less of a unit of volume, and so there's a sense in which something like nuclear power still seems like the energy of the future versus, say, massively distributed windmills or solar panels are less energy intensive than say oil or natural gas. And in that sense, seem somewhat retrograde.
- The correlation between wealth and energy use is extremely high and whichever direction the causality runs, a future world of greater material comfort is going to be one that uses more energy (certainly in the aggregate). Unfortunately, conventional sources of energy are extremely problematic, tangled up with political and environmental costs, and in the case of oil, significant geologic constraints. Alternative sources of energy represent a tremendous opportunity, but as the persistently rising real cost of energy shows, we have made little progress in generating more energy more cheaply. [1]
 - A lot of money has poured into clean technologies. Investments that have focused on efficiency improvements have done well as financial matter, but investments in alternative technologies for actually generating energy have not produced particularly good returns. [1]
 - We believe that this is because many companies pursue the wrong model – they seek to be almost as good as the default product, rather than (as should be the case generally) so much better than the default that customers will rush to switch. Imagine, if you will, if Amazon.com were somewhat less convenient than going into, and offered similar prices to, a bricks-and-mortar store. Would you use it?

Probably not – people only flocked to Amazon when it became substantially better, in selection and convenience, than physical retailers. What we need are companies developing sources of energy that are as good as, or better than, conventional sources at lower prices and at scale. Unfortunately, relatively few companies research such sources, preferring instead incremental improvements on long-established alternative technologies (wind, solar) whose physical limitations mean they cannot satisfy these requirements. But there is no reason to believe that we can't invent an alternative to alternatives. Rising energy costs can reflect many factors, including the internalization of externalities, but as a general matter, real progress would result in a downward sloping curve even so, either because new sources of energy were cheaper or because they came with fewer externalities, or preferably, both. [1]

- I'm surprised by how much [oil prices] have collapsed [as of 2015]. I would say, they are still higher than they were in 2002, 2003 on the oil side. The jury is still very much out on how well it's going to work. I think the big question is, what's the equilibrium price at which fracking is really going to work? [12]
 - Something like \$450 billion has gone into the fracking industry in the last four or five years, and there's a question whether at \$50 a barrel oil, can you actually get a positive return on that money?
 - The striking thing, even as of summer 2014, when oil was still at \$100-plus a barrel, was even though you had these two boom stories: you had the Silicon Valley IT story, and you had the fracking, mid-US growth story. The striking thing was always how much smaller the fortunes were that were being made in the fracking industry, which led me to think that somehow, it was not as great an innovation as was happening on the IT side. Or more marginal, harder to get to work. I think if it barely worked at \$100, it'll be very interesting to see how it works at \$50.

Artificial intelligence

- The exponential growth of computational power (represented by Moore's law), storage capacity (Kryder's law), data transmission (e.g., Butters' law), and other physical embodiments of computing is familiar. What is equally familiar is the somewhat slower rate of development in the utility of computers – software has gotten more powerful, but the rate of improvement doesn't seem to be as swift as in hardware, though measuring improvements in software is somewhat impressionistic. Nevertheless, as anyone who has used a Bloomberg or Lexis can attest, the amount of data we collect clearly outstrips our ability to make easy use of it. One way to look at this is to compare increases in computing power (as measured by the density of transistors on a chip) versus the change in productivity. Few technologies have ever improved as quickly and consistently as computer processors and yet the impact of computing in the (admittedly wildly

overdetermined) productivity statistics is difficult to detect. This suggests that however fast hardware improves, software might be running behind. We certainly don't have anything approaching a general artificial intelligence, a lack many futurists 30 years ago would have found rather surprising. Indeed, until fairly recently, it was difficult to find a stable operating system. [1]

- At the least grandiose level, we need analytical software much more powerful and much easier to use than the current state of the art. Most analytical platforms are exceedingly arcane, requiring lengthy experience with that exact platform to acquire mastery, and yet the quality of analysis remains fairly poor. It does society no good to collect huge amounts of data that only a small minority can analyze, and even then only partially. [1]
- Moving up an order of difficulty, robotics represents another area of underachievement. Industrial robots can be very good at what they do (welding car parts, e.g.), but are extremely expensive and of limited versatility. At the highest end, the industry remains over-focused on producing vanity robots with hyper-specific capability – clunky simulacra that play the violin or smile pointlessly – rather than solving more general problems, like locomotion. And few manufacturers are devoted to making commodity-like robots at low price points, which is essential to a genuine robotic revolution. [1]
- True general artificial intelligence represents the highest form of computing. Whether and when a general artificial intelligence arrives is less critical for the near future than whether we are able to create machines that can replicate components of human intelligence – as we are now doing reasonably well with voice recognition and hopefully will be able to do with visual pattern recognition. At a higher level, machine learning also represents another compelling opportunity, with the potential to create everything from more intelligent game AIs to Watson. The development of powerful AIs (even if they aren't general AIs) would probably be one of the most important and lucrative technological advances in history. [1]
- Certainly, one somewhat more basic point I always try to make is that it's not at all obvious why the question about, let's say, near-term AI – so not the way futuristic stuff but the next generation or the generation after that – why it should be seen as such an adversarial dynamic. We're always talking about computers as substitutes for humans, and yet the reality is they are very different. They are – computers are able to do things in this incredible brute force way, humans are sometimes able to do things far more effectively, and yet there are ways in which our minds are probably much simpler than we think. It's probably wrong to think of a human mind as having hundreds of billions of neurons because that somehow codes for hundreds of billions of things in our mind. You're a really smart person if you have 20,000 vocabulary words. [6]
 - And so I think there is something about computers and humans where they're deeply different, and I wonder whether the focus on AI has somehow obscured these differences. The mystery in some ways is why have we actually not built AI? And the conventional explanation in Silicon Valley is we haven't built it

because human minds are so complicated, you have hundred of billions of neurons, you'd need a computer with hardware, the kind we haven't quite developed yet, and it's just a matter of time, and we'll get there. But you could make the same argument. You could say this cup here has close to Avogadro's number of molecules or atoms in it and could never be modeled by a computer, but you don't actually need to model every atom, you could just model the basic structure. [6]

- In a similar way, if such a reductionist theory of the mind were possible, it could perhaps have already been designed on 1970s- or 1980s-type hardware. I think there are some very mysterious questions like this that have not been fully thought through. My guess is that it's just possible that there are these really big differences and that there are – and there's a separate question if you can brute force a simulation of a human mind, and there are probably ways you could do it, and there are some limits to that, but they're naturally complementary because they're so different. [6]
- We normally need to be afraid of people who are just like us because those are the people we're competing against. If you're – globalization is scary because it means that you have very underpaid people who aren't that different from us in other countries competing with people in the US and Western Europe. The computers are not – they're complementary – they're not really competing. They would be scary if we had a super-futuristic version where we had a robot that looked just like you, Bill Kristol, and we didn't have to pay it any money in any context, and you'd be rightly alarmed by that. [6]
- This is the common-sense intuition why people are scared of cloning, there's a sort of bioethics cut on cloning, but the common-sense reason is that if you had 100 clones of yourself, they'd be competing with you, and you're always competing with people who are like you, and so to the extent that computers are really different, that's, I think, much more of a positive than a negative. [6]
- I think the hybrid approach is very under-explored in general because we think of computers as substitutes for human beings. In reality, I think they are fundamentally complementary. Computers are good at very different things from what people are good. And the dominant narratives in our society on the computer age are either Luddite or sort of utopian in a negative way where we have to stop the computers from replacing us or the computers will replace us, and that's a good thing. Whereas, I think this sort of complementarity is probably the much greater reality. It's conceivable that you could build a computer that would be smarter than a human being in every respect. But I think that's still somewhere between science fiction and science fiction fantasy.
- Yes, my view is that [the brain is] mysteriously simple, and it seems to be able to do very powerful things with relatively few components. Maybe there is some relatively simple algorithm that could replicate it, but it's strange that we haven't found that. But it's perhaps not a problem of hardware, which is the naive standard view that we just need more hardware, and you'll get it to work. [6]

- The more hopeful view that I still have is that it is likely to be just a continuation of what's been happening since the Industrial Revolution where mechanization, automation free people up from certain kinds of repetitive tasks and free people up to do other things. It can be scary if we're living in a society where there are not other opportunities, where there's not enough growth, where there are problems like that. But in and of itself freeing people up from the drudgery of repetitive tasks is probably a good thing. [6]
- Perhaps if we didn't want Chinese manufacturing to become as powerful, we needed to automate the assembly lines even faster than we did in the US. If anything, we didn't mechanize quickly enough in some of these industries. I would say that the sense of nostalgia that we have is a sense that there is a lot that we're losing. The dilemma is that the things that we're losing are very obvious. On the other end of the tunnel, there are many things that we will gain. We have every reason to think the things we will gain are much greater than the things we are losing. It's sort of obvious what we're losing, it's not at all obvious what we're going to gain on the other end. I think that would have been certainly true of the early 19th century when we were in the throes of the first Industrial Revolution. There are certainly aspects of it that are like that today. [6]
- If you've got self-driving cars, that would be a significant innovation which would change a decent amount at the margins. There's some regulatory challenges with it, but it's right at the intersection of the kinds of things that could happen. [12]
 - I think the most natural hope is that information technology starts to broaden out and starts to impact this world of atoms. Then we're going to have this question about whether the technology outpaces the politics or vice versa.
- *[Why is AI communist?]* In practice, the main AI applications that people seem to talk about are using large data to monitor people, know more about people than they know about themselves. And in the limit case, maybe it can solve a lot of the Austrian Economics type problems where you can know enough about people that you know more about them than they know about themselves, and you can enable communism to work, maybe not so much as an economic theory, but at least as a political theory. So it is definitely a Leninist thing. And then, it is literally communist because China loves AI; it hates crypto. And so that, I think, tells you something. And then I think there's a commonsense level on which people are creeped out about it and this is why. And we should label it accurately. [21]
- It's hard to judge but my sense is they're quite good at getting data and they're quite bad at finding any meaning or knowing what to do with it. I suspect that the bureaucratic momentum has pushed towards more and more data because, perversely, if you don't know what to do with the data, the tendency is to just get more and more, even though that never actually solves the core problem. [22]
 - I think "big data" is one of these buzzwords that when you hear it, you should almost always think "fraud," because the problem is actually to find meaning within data. It's to make big data small. That's actually the core challenge. It's not to collect more and more data.

Key Quotes Summary

- When tracked against the admittedly lofty hopes of the 1950s and 1960s, technological progress has fallen short in many domains.
- When we talk about how fast science is progressing, we do it with little precision. Are we accelerating in scientific and technical fields? How fast is this? In response, we get fairly vague answers. I would submit that the consensus in both a Silicon Valley and academic context is that we are doing great and that everything is just moving super fast. All these forms of accelerations. And we can debate whether it's utopian - Kurzweil with the singularity is near, where all you need to do is sit back and eat some popcorn and watch the movie of the future unfold, or this dystopia, all the science fiction movies from Hollywood and all the robots will kill you, or you'll be in this matrix - we're either accelerating to utopia or accelerating to dystopia. The somewhat contrarian thesis I have on this is that perhaps the progress is not as fast as advertised. Things have been slower and have been slower for quite some time.
- The single most important economic development in recent times has been the broad stagnation of real wages and incomes since 1973, the year when oil prices quadrupled. To a first approximation, the progress in computers and the failure in energy appear to have roughly canceled each other out. Like Alice in the Red Queen's race, we (and our computers) have been forced to run faster and faster to stay in the same place.
- Probably the only engineering fields that are doing really well are computer science and maybe, at this point, petroleum engineering. And most other areas of engineering have been bad career decisions the last 40 years ... Nuclear engineering, aerospace engineering, were really catastrophic decisions for very talented people to go into. So even though rhetorically we always say that we want more science and engineering people, in practice, these have been extremely tough fields.
- You could say that all these gadgets and devices, they dazzle us but they also distract us from the ways in which our larger surroundings are strangely old. So we run cell phones while we're riding in a 19th-century subway system in New York. San Francisco, the housing stock looks like it's from the 50s and 60s, it's mostly quite decrepit and incredibly hard to change these sort of things. So you have bits making progress, atoms are strangely very stuck.
 - On our website, we have this tagline – “They promised us flying cars and all we got was 140 characters.” Which is a little bit of a dig at Twitter. But in some sense Twitter is probably a great business. The thousand people who work at Twitter are going to have well-paying jobs. I suspect it will last for decades. It's probably not enough to take our civilization to the next level. But again it's a mistake to blame Twitter for that. It's more a problem with not enough happening elsewhere.
 - The story of specific success that masks generalized failure is one we find very hard to tell.

- We live in a world where we've been working on the Star Trek computer in Silicon Valley, but we don't have anything else from Star Trek. We don't have the warp drive, we don't have the transporter, we can't re-engineer matter in this cornucopian world where there is no scarcity. And how good is a society where you have a well-functioning Star Trek computer, but nothing else from Star Trek?
- If we have runaway automation, and if we're building robots that are smarter than humans and can do everything humans can do, then we probably have to have a serious conversation about a universal basic income or something like that, and you're going to end up with a very, very weird society. I don't see the automation happening at all, and I think the question of automation in my mind is identical to this question of productivity growth.
 - I would be very uncomfortable starting with the social programs without the growth. That's the sort of conversation that I often see happening in Silicon Valley, where we start with UBI, because we're lying about automation. If automation's happening, then we'll see in the productivity numbers, and then eventually, maybe we need something like UBI. If automation is not happening and you do UBI, then you just blow up the economy.
- There have been periods of globalization and technology in the last two centuries, and they're not synonymous. The 19th century, I think you had both. You had enormous globalization, enormous amounts of technological process, 1815 to 1914.
 - By 1971, Kissinger's trip to China, is the point where I would say globalization starts again very much in earnest. But I think we've had, for much of the last 40 years, a somewhat more limited technological process, where the word technology has been narrowed to information technology. In the 50s and 60s, technology meant many other things. It meant biotech, medical devices. It meant nuclear power, new forms of energy, underwater cities, the green revolution in agriculture, space travel, supersonic aviation, flying cars, etc., etc. So there has been—so I would argue that the 19th century had both—the last 100 years had a period of technology without globalization, and then more recently, a period of globalization with somewhat more limited technological progress. A lot in computers and the world of bits. Not so much in the world of atoms.
- If you ask “Why did all the rocket scientists go to work on Wall Street in the '90s to create new financial products?” and you say they were paid too much in finance and we need to beat up on the finance industry, that seems like that's the wrong side to focus on. I think the answer was they couldn't get jobs as rocket scientists any more because you couldn't build rockets or supersonic airplanes or anything like that. It's like, why did brilliant people in the Soviet Union become grandmaster chess players? It's not that there's anything deeply wrong with chess. It's that they weren't allowed to do anything else.
- I think money and the nature of money is somehow much less important than all the microregulations that make up the economy. If you give me a choice of getting rid of the vast bulk of government regulations and keeping the Fed, I'd much rather do that than

keeping all the other zoning laws and crazy rules we have and going with PayPal, Bitcoin, gold, any sort of alternate currency one could come up with.

- Most of our political leaders are not engineers or scientists and do not listen to engineers or scientists. Today a letter from Einstein would get lost in the White House mail room, and the Manhattan Project would not even get started; it certainly could never be completed in three years.
- This is a disturbing element in the history of innovation: A lot of innovators discovered things, but weren't able to get anything. Tesla was out-competed by Edison, even though Edison had an inferior technology. The Wright brothers came up with the first airplane, but they didn't get to be rich. Of course, in the sciences, it tends to be even worse. If you are Einstein, you come up with general relativity. You don't get to be a billionaire; you don't even get to be a millionaire. It's always this question of how do you actually capture some of the value of what you create.
- Name me one science fiction film that Hollywood produced in the last 25 years in which technology is portrayed in a positive light, in which it's not dystopian, it doesn't kill people, it doesn't destroy the world, it doesn't not work, etc., etc. Instead, we have one sort of catastrophic, anti-technological scenario after another, and the future is some combination of the Terminator movie, and Avatar, and Elysium, and you know, The Matrix. I watched the Gravity movie the other day. You would never want to go into outer space. I mean, you want to be back on a muddy island somewhere on this planet. And again, I think Hollywood is not the sole source of this. To some extent, it mostly just reflects the broader culture, which I think at this point, is very anti-technological. Which is why I think Silicon Valley is sort of the center of the counterculture in our society today.
- Indefinite attitudes to the future explain what's most dysfunctional in our world today. Process trumps substance: when people lack concrete plans to carry out, they use formal rules to assemble a portfolio of various options. This describes Americans today. In middle school, we're encouraged to start hoarding "extracurricular activities." In high school, ambitious students compete even harder to appear omniscient. By the time a student gets to college, he's spent a decade curating a bewilderingly diverse résumé to prepare for a completely unknowable future. Come what may, he's ready—for nothing in particular. A definite view, by contrast, favors firm convictions. Instead of pursuing many-sided mediocrity and calling it "well-roundedness," a definite person determines the one best thing to do and then does it. Instead of working tirelessly to make herself indistinguishable, she strives to be great at something substantive—to be a monopoly of one. This is not what young people do today, because everyone around them has long since lost faith in a definite world. No one gets into Stanford by excelling at just one thing, unless that thing happens to involve throwing or catching a leather ball.
- In a definite world money is a means to an end because there are specific things you want to do with money. In an indefinite world you have no idea what to do with money and money simply becomes an end in itself, which seems always a little bit perverse. You just accumulate money and you have no idea what to do with it. You have no idea because nobody knows what to do with anything and so you give the money to a large bank to help you do something. What does the bank do? It has no idea so it gives the

money to a portfolio of institutional investors. What does each institutional investor do? They have no idea and so they all just invest in a portfolio of stocks. Not too much in any single stock ever because that suggests you have opinions or you have ideas and that's very dangerous, because it suggests that you're somehow not with it. And then what do the companies do that get the money? They've been told that all they should do is generate free cash flows because if they were to actually invest the money in specific things that would suggest the companies had ideas about the future, and that would be very dangerous.

- I think there is a big hysteresis part to this where success begets success and then failure begets failure, where if you haven't had any major successes in a number of decades, it does induce a certain amount of learned helplessness, and then it shifts the way science gets done or the way innovation gets done in to a more bureaucratic, political structure where the people who get the research grants are more the politicians than the scientists. You're rewarded for very small incremental progress, not for trying to take risks. It's led over time to a more incrementalist, egalitarian, risk-averse approach, which I think has not worked all that well.
- There's this very strange aspect in Silicon Valley where so many of the very successful entrepreneurs and innovators seem to be suffering from a mild form of Asperger's or something like this. I always wonder whether this needs to be turned around into a critique of our society where if you don't suffer Asperger's, you get too distracted by the people around you. They tell you things, you listen to them, and somehow the wisdom of crowds is generally wrong.
- Competition makes us better at that which we're competing on, but it narrows our focus to beating the people around us. It distracts us from things that are more valuable or more important or more meaningful.
- What I think people like Zuckerberg or Musk or Jeff Bezos at Amazon have in common is that they're relentless. They don't stop. Every day, they start over, do more, get better at it. People often ask whether Facebook was just a fluke, in the right place at the right time. But I think the more you get to know Mark or founders like him, the less plausible it becomes. And that's, in part, because you can see how hard he works, how much planning it was, how much of a vision there was from the very beginning.
- I'm very sympathetic to this distraction theory that what's going on in our society is like a psychosocial, magic, hypnotic magic trick where we're being distracted from something very important and political correctness, identity politics and maybe American exceptionalism, these various ideological systems, are distracting us from things. The thing I keep thinking of, the main thing it's distracting us from, is the stagnation and it's that there are these problems that we don't want to talk about in our society.
- The first and the hardest step is to see that we now find ourselves in a desert, and not in an enchanted forest.
- My suspicion is that these are the ever-narrower communities of sub-experts, the string theorists, the cancer researchers, telling us how great the string theorists and the cancer researchers respectively are. It's a place where there's no outside check, no reality

check, no ability to really keep score, and you are certainly not exceptional and you're not even great.

- If you're a professor in academia, [you say]: the tenure system is great. It's just picking the most talented people. I don't think it's that hard at all. It's completely meritocratic. And if you don't say those things, well we know you're not the person to get tenure. So I think there's this individual incentive where if you pretend the system is working, you're simultaneously signaling that you're one of the few people who should succeed in it.
- The future of technology is not predetermined, and we must resist the temptation of technological utopianism — the notion that technology has a momentum or will of its own, that it will guarantee a more free future, and therefore that we can ignore the terrible arc of the political in our world.
- A better metaphor is that we are in a deadly race between politics and technology. The future will be much better or much worse, but the question of the future remains very open indeed. We do not know exactly how close this race is, but I suspect that it may be very close, even down to the wire. Unlike the world of politics, in the world of technology the choices of individuals may still be paramount. The fate of our world may depend on the effort of a single person who builds or propagates the machinery of freedom that makes the world safe for capitalism.
- There's nothing automatic about history. History is made up by the choices people make and it's in our hands to decide.
- If you define technology as doing more with less, education is perhaps the most anti-technological aspect of our society today where you're getting the same at a higher and higher price. The real costs of higher education since 1980 have gone up about 400 percent, that's after inflation. And it's not clear the quality has gone up at all.
- If you come back to something as reductionist as the ever escalating student debt, you can think: what is the 1.6 trillion, what does it pay for? And in a sense, it pays for \$1.6 trillion worth of lies about how great the system is.
- I don't like the word education because it is such an extraordinary abstraction. I'm very much in favor of learning. I'm much more skeptical of credentialing or the abstraction called education. So there are all of these granular questions like what is it that we're learning? Why are you learning it? Are you going to college because it's a four year party? Is it a consumption decision? Is it an investment decision where you're investing in your future? Is it insurance? Or is it a tournament where you're just beating other people?
- One of my friends suggested that we were at a point in education that's like the place where the Catholic Church was on the eve of the reformation. It had become a very corrupt institution. It was charging more and more for indulgences. People thought they could only get saved by going to Catholic Church just like people today believe that salvation involves getting a college diploma. And if you don't get a college diploma that you're going to go to hell. I think my answer is, in some ways, like that of the formers in the 16th century. It is the same disturbing answer that you're going to have to figure out your salvation on your own.

- I believe they are inducing two perspectives on China in the West. One perspective is that China is very far behind us, that it's still a very poor backward country. Even in 2049, even on the 100-year anniversary, it will still only be a middle-income country, and it's so far behind that we don't need to worry about it and we can be in denial about China. And the other one is that it's so far ahead of us that there is no way that we can ever catch up. It works better, it can build skyscrapers super fast, it works so much better that we have to just accept that we are really far behind. Denial is extreme optimism, acceptance is extreme pessimism, but extreme optimism and extreme pessimism converge to doing nothing.