THE BROOKINGS INSTITUTION
FALK AUDITORIUM

HOW ROBOTICS WILL AFFECT THE AVAILABILITY OF EMPLOYMENT AND SOCIAL BENEFITS

Washington, D.C.
Monday, October 26, 2015

PARTICIPANTS:

Moderator:

DARRELL WEST
Vice President and Director, Governance Studies
The Brookings Institution

Panelists:

NICK HANAUER
Co-Founder and Partner
Second Avenue Partners

SCOTT SANTENS
Writer and Advocate
Basic Income Action

* * * * *

P R O C E E D I N G S

MR. WEST: Okay, good afternoon. I'm Darrell West, vice president of Governance Studies and director for the Center for Technology Innovation at the Brookings Institution, and I would like to welcome you to our discussion of robots and their economic effects. And we are webcasting this event live, so a warm welcome to our viewing audience. We also have set up a Twitter feed at #RobotWork -- that's #RobotWork -- so anyone who wishes to post comments or ask questions during the forum, we encourage you to do so.

So robots and digital technologies are advancing at a rapid rate. Amazon right now has approximately 50,000 employees and 15,000 robots and there's a question whether in 10 years those numbers are going to be reversed. It raises basic questions about how emerging technologies are going to affect employment, as well as the delivery of social benefits.

Right now many benefits are delivered through jobs. This is true in terms of healthcare, retirement benefits, and disability insurance. Yet Larry Summers has predicted that if current technology trends continue, one-quarter of middle-aged men of the next generation will be out of work at any given point in time. So today we are releasing a paper that looks at emerging technologies and their impact on employment and public policy.

I discuss the rise of robots, the growing use of artificial intelligence, and advances in machine learning. According to the Bureau of Labor Statistics, one-third of future jobs created in the next decade will be in healthcare, but despite the advancing pace of technology innovation, jobs are expected to drop in the information technology sector. We're finding that many tech firms don't need that many people in order to deliver digital solutions. And if that is true, we then need to think about how to provide benefits to people.

So, in the paper I suggest that there's been a lot of attention paid to the impact of technology on employment, but little attention to the policy ramifications. So in the paper I talk about a number of possible ideas in terms of considering a basic income guarantee, whether we need to revamp the earned income tax credit, how we can provide activity accounts for lifetime learning, whether we need to think about incentives for volunteerism, ways we need to reform curricula and thinking about our need

to expand arts and culture for the rising leisure time that many people may have available.

So in each of these areas we need to start thinking about the impact of technology and how we might need to revamp our public policies in light of some of these emerging trends. So you can get a copy of the paper outside in the hallway, or if you're watching online, the paper is available at our website at brookings.edu.

So to help us understand this subject we have two distinguished experts here with us today. Nick Hanauer is the co-founder and a partner at Second Avenue Partners. That is a Seattle-based venture capital company, a company that funds early stage companies. He is the co-author with Eric Liu of books such as *The True Patriot* and *The Gardens of Democracy.*

Also joining us is Scott Santens, who's a writer and blogger at Basic Income Action. He curates the Reddit thread on basic incomes and he has written extensively on that topic.

So, Nick, I will start with you. There's been considerable attention to new technologies and their societal impact. There was an Oxford University study that found that 47 percent of U.S. workers have a high probability of seeing their jobs automated in the next 20 years. Are emerging technologies creating jobs or destroying them?

MR. HANAUER: Well, first, thanks for having me and it's fun to be here in, as we call it, "the other Washington." I want to start by saying that from my point of view, technological innovation is unambiguously good. That's not to say it's automatically good. Certainly you can create things like napalm, which are morally troubling, but in general prosperity in human societies is best understood not in terms of money, but as the accumulation of solutions to human problems. The difference between a poor society and a rich one isn't how much money is in circulation, it's how many of life's problems have been solved by the products and services that are available to the people in that society.

And if that is true, then economic growth in human societies is not best understood as GDP, which is simply a measure of how much stuff we push around, but really best understood as the rate at which we solve the problems that we face. And if that's true, then innovation, and in particular technological innovation, is the backbone, the source of all prosperity in human societies.

It's important, I think, to remember that it was not that long ago when people dug holes

with their fingernails and then along came a person with a stick and the fingernail diggers were put out of business. And I'm sure there was a big protest at that point and they had a conference about it, but then along came somebody even more clever with a shovel, and that led to the same conference, and today one person running a machine can dig as many holes as 10,000 or 20,000 or 100,000 people could dig with their fingernails, and a bunch of other things obtain.

The population of the Earth is a thousand times what it once was and we employ, in aggregate, many more people digging holes than we once did. The holes are of better quality, we all benefit from those holes, and the people who are digging the holes are infinitely better off than the people who originally were digging them with their fingernails. And this obtains to the entire arc of technological innovation. It is simply ridiculous to say that technological innovation has been a net destroyer of jobs. Clearly it has not.

There are 7 billion people on Earth, most of them are employed, and we have a bazillion times more technological innovation then we once had. The truth is that the robots cannot possibly take our jobs because the robots do not eat. If the robots take our jobs, who will buy the stuff the robots are making? If the robots are flipping all the burgers and nobody makes any burgers, then who will buy the burgers? Clearly that's not going to be the society that we end up with and I think that people who project this dystopian future reject the idea that economic arrangements are made by people and that we have a choice about the kinds of arrangements that we can have.

The truth is that technological innovation is always disruptive because it means that people will shift from doing one thing to another. And the size and quality of the technological innovation is roughly linked to the amount of disruption, which means the better the innovation, the more disruption there will be. And that implies this very simple principle of civic, social, and political life, which is the point of it all is for civic innovation to match the pace of technological commercial innovation. And if we do that collectively, we've got a fantastic future ahead of us. And if we fail to do that, then we're going to have all sorts of problems because, of course, there will be disruptions.

Of course, industries will come in and go out of business. The question is not will that happen or should that happen? Of course it's going to happen and we want it to happen. The question is

what do we do in response to that dynamism?

And the truth is that in the same way that technological innovation is a trial and error process, a process of experimentation and evolutionary adaptation, so must civic innovation be. And so today we're going to talk about guaranteed basic income, which I think is a legitimate potential innovation that can help solve some of these problems.

One of my partners, a guy named David Rolf who works for SEIU, and I offered up an idea called the Shared Security System that was published earlier in the spring, which offered a new way to manage some of these processes. I'm not sure what the right answer is, but what I know is that we have to experiment a lot and, if we do, we will find a way to build an ever more prosperous and high functioning society.

MR. WEST: Okay, Scott, you work at Basic Income Action. How do you see the impact of new technologies of the economy?

MR. SANTENS: Well, I look at a question like that and I think that we should actually understand that technology has been affecting us for decades. A lot of people will look at this and they'll think that, oh, my gosh, all this stuff is right around the corner and we've been making jobs this whole time, so we're fine. But the way that we've been working for decades has been shifting.

If you break down the way we work into low skill, medium skill, and high skill labor, we've actually been shifting our work down to the low skill end, decade after decade after decade. And we've been doing that at the same time as hollowing out these middle skill jobs and we've actually been decreasing the growth of high skill jobs. So a lot of people don't understand that's actually what's been happening.

We talk about you're going to make Facebook engineers and, you know, all these great coding jobs and stuff, but, at the same time, for every one of those jobs you're making a lot of fast food jobs, service jobs, cashier jobs, and those jobs actually happen to also be the jobs that are most easily automatable right around the corner now. So this idea that because we've always created jobs that we're going to be okay, you have to look at that a little bit differently because now we've got stuff like soft AI that's coming out, like Amelia, which is this great example of being able to take over a lot of our IT jobs.

She's actually being tried out right now.

And I say she -- it's funny because she's actually an AI -- but she was put into practice and within months was able to do 60 percent of all the IT calls for this company. So you look at that and you project that to the world and you're actually looking at a possible automation of 250 million IT workers. And these are in call centers in India and all these other places that would have this.

And when you look at this type of thing, I also think we should ask more fundamental questions. Nick talks a lot about minimum wage and I'd like to ask, why do we have minimum wage? And it's not to ask is it a good thing or a bad thing, but why does it exist as a thing? And I think it's important to point out that it exists because people will actually agree to work for low enough wages that they will actually live and work in poverty, working 40 hours a week and beyond. And they'll agree to that because they don't really have any other ability to say no to that.

Here we have been shifting this labor towards those lower and lower skill spectrums and we have actually more recently had the gig economy, the Uber economy, this kind of shared work, zero-hour contracts, this very precarious form of work that's coming, and this is actually being enabled by technology, and it's just making everyone's lives more insecure. And so people can't say no to work itself, to the employment, to the labor market, then we actually have to say, okay, well, let's have a minimum wage and that puts limits on the market.

And so you have to look at this and say, okay, so is it possible that we're actually creating a kind of work disincentive by being so concerned about maintaining the work incentive? So if this idea of universal-based income, it's saying that everybody gets paid no matter what. It's a new income floor. Instead of zero dollars, you're guaranteed a thousand dollars or something else per month. And if you're guaranteed this amount of money, then suddenly you can actually say no. You have a form of individual bargaining power which doesn't currently exist.

We've seen collective bargaining power through unions erode over the decades and I don't see that coming back anytime soon. So the question is, how do you enable people to bargain up their wages? And you can't do that unless people have the option of saying no. This ability to say no will actually allow people to say I will only work for a wage that's high enough, so, therefore, you don't

necessarily need a minimum wage anymore. It becomes optional.

Not that it's still not a good thing because minimum wage combined with automation means that you can actually automate more and more labor more quickly, at a higher labor cost. So that in itself could be good, as well.

MR. WEST: So, Nick, Scott has mentioned the plight of the low-skilled workers and it does seem like they face many different challenges these days, so what can we do to make sure that those people, as well as others who haven't necessarily received the necessary education for the 21st century, don't get left behind?

MR. HANAUER: Yeah, well, there's a longer conversation to be had about whether jobs in general are becoming less skilled or more skilled. I contest the idea that jobs in general are becoming less skilled. If you look at the typical job or the aggregate jobs that we have today versus 100 years ago, there's simply no question that jobs in general are much more highly skilled.

I think we don't have so much a problem with low-skilled jobs today, we have a problem with low-wage jobs. There is simply no doubt that a barista at Starbucks is as well trained as a factory worker or an autoworker was in the mid-'50s or '60s that earned a fantastic middle-class income. The difference is power. That's the only difference between a Starbucks worker and a GM worker from 1965, and certainly Starbucks is every bit as profitable. The company creates as much value as GM did in the day.

Again, the only shift in our economy has been one in which workers have less power, not that they're less skilled. And that's a consequence of a variety of political and economic forces that didn't happen to us that we deliberately precipitated and that benefited people like me enormously and didn't benefit most folks. And obviously, we can change those things, but I think that Scott makes a very interesting point about the way in which a guaranteed basic income can shift some of the power dynamics from owners to workers in, I think, a very constructive way. But I reject the idea that because imagining the future of work is beyond our ability that there will be no future of work.

As I was mentioning earlier in a conversation in the green room, there are something like 50,000 yoga studios in the country today. If you had asked the BLS 40 years ago about the future of

yoga, they would have told you zero. The truth is, we don't know what the industries of the future will be or what technology will bring, although 10,000 years of human history show that it's always something. And for as long as human beings have challenges and problems, we will have jobs. It is simply our collective responsibility to civically innovate, and I'm incredibly intrigued by the idea of guaranteed basic income as one of those innovations that may solve some of these problem. But as long as we innovate in these ways, I think we can have both jobs and security and prosperity for all.

MR. WEST: So, Scott, how should we think about social benefits and public policy in the contemporary period, given the changes in the economy, emerging technology trends, and so on?

MR. SANTENS: Well, first of all, to Nick's point I just want to mention, too, never underestimate mankind's ability to invent new jobs when they absolutely have to create these jobs in order to exist. David Graeber makes a good point, he calls them "bullshit jobs." These jobs that don't necessarily need to exist, but we are creating them.

We also see this and we've actually shifted from 40 hours to 47 hours --

MR. WEST: I have to know, what's a "bullshit job?" What's a "bullshit job?"

MR. SANTENS: A "bullshit job" is a job that doesn't actually need to exist.

MR. WEST: Give me an example.

MR. SANTENS: Okay. Let's say even just the Starbuck's barista, let's say someone's job is taking a drink, say, from point A to point B or something, that job doesn't necessarily need to exist. You can go to point A yourself and get the drink or your food or whatever and come back. The job doesn't need to exist. So let's say I was at a drive-through recently, and here I am speaking through this speaker system that's actually very difficult to understand them and I'm just wishing that I just had a touch screen so I could just reach out and push what I wanted. And I could even pay for it myself and it would just make the process go much smoother and much faster, and I'd be much happier with it as a customer, but that job exists. McDonald's or these other companies can't just release hundreds of thousands of workers because that would just be a huge PR loss for them to just automate that many people, but if you look at this, do they actually need to work?

This is actually a global phenomenon, but about 85 percent of the global workforce is not

engaged in their job. You have people working, say, 4 to 6 hours of their 8 hours that they clock in, and why is that? Why is it that we actually work an 8-hour job, but only actually work for 5 hours of it? And so, these other three hours of the rest of the day you're on Facebook or chatting at the water cooler or whatever. It's like you don't actually need to do that, but you have to do that because you have to maintain your income. So people are actually coming up with ways in order to maintain their income because they have to. And yet, at the same time, we're ignoring all this work that's going on outside of this bubble where all the unpaid work that goes on at home, the unpaid care work.

Wikipedia is such a fantastic example of the work that we have done without even being paid for it. That's like real work. So I've written this article before about the difference between work and jobs. It's like we're not looking at a future without work, we're looking at a future without jobs. There's a big difference between those two. And I think we need to better differentiate what is a job and what is work? A job is something you do for income and work is something that will give you meaning, that you feel is purposeful, that has a purpose.

MR. WEST: So a question for each of you, which follows up on Scott's point there, how should young people today be viewing their employment future in terms of how we think about the world of work and what skills are going to be necessary and what kind of opportunities will be available to young people? So, people in their twenties and thirties, what is their world going to look like?

MR. HANAUER: The only thing you can say for sure about what their world is going to look like is that you cannot predict what their world's going to look like. And the only thing can say for sure about what they should learn to prepare themselves for that future is that they should learn to learn.

In my parent's generation, technological innovation was largely on a human life-cycle scale, that an industry came into being and people went to work for it and they worked their whole lives there. And towards the end of their career something new came along and their kids got different kinds of jobs. But that cycle has been compressed by the rate at which technological innovation is increasing and will continue to increase, barring asteroid impact or world war. And what young people are going to be faced with is going through two, three, four transitions in their lives, from industry to industry and technology to technology. And that, obviously, both offers extraordinary opportunity for personal

enrichment, dynamism, and experience, but also will be highly challenging in terms of requiring you to adapt and change.

And, again, I think, like all things in life, there's good news and there's bad news, but I do think that that trend is unstoppable.

MR. WEST: Scott, how do you think young people should view their future?

MR. SANTENS: You know, with this kind of question I'd really like to focus on the difference between intrinsic motivation and extrinsic motivation. And this is the idea that intrinsic motivation work is work that you do voluntarily, it gives you purpose. It's something that you want to do. Extrinsically motivated work is something that you need to be motivated with externally, usually given money or something.

And if you look at these forms of work you see that extrinsically motivated work is actually something that is best left for machines. This is stuff that does not create creativity. Creative work is stuff that, actually, it's difficult to be extrinsically motivated. It actually hurts it. If you offer someone money to think of a solution to a creative puzzle, they will have a greater difficulty figuring out the solution to that puzzle, so it's actually hurting this.

This is another reason why I like the idea of based income is because just giving somebody the ability to pursue the work that give them the most meaning, that's intrinsically motivated and that's actually hugely much more productive than the work that is extrinsically motivated. And so, to look at this and the stuff that is extrinsically motivated and is the most easily done by technology should be left to technology. We should actually automate as much of that stuff as we can and we should allow people to be focused on creativity, to be focused on what is meaningful to them.

And we'll find that if we do that, I think we're going to really innovate in ways we've never seen before. And so we have to both encourage and allow the next generation to pursue this intrinsically motivated work.

MR. WEST: So one more question and then I'm going to open the floor to questions from the audience, and that concerns leisure time and how it seems like some people are having more leisure time. How do you expect the future of leisure time to differ?

MR. HANAUER: You know, that's a very interesting question for me because I'm a person for whom 100 percent of my time could be leisure if I chose to make it so. And yet, I work like a maniac. And I am surrounded by people in my circumstance. I'm a wealthy guy, I have gazillions of wealthy friends -- and I mean wealthy -- and they all work like maniacs, which makes you ask a question, what's the purpose of life? Is it leisure or to bend the arc of history?

For me the question is clear, I'd rather bend the arc of history, and I find it difficult not to work on weekends myself, so I think the question of leisure is a deeply cultural question and not very much an economic question. The question is, what do you want to do? There is no doubt that given increasing amounts of general prosperity, the people who want more leisure will be able to get more leisure, but I predict that there are many people in a high-functioning society that actually don't want leisure. They want accomplishment, achievement, challenge, and they are going to continue to work 80 hours a week like they do today because it gives them great pleasure.

Who was it who predicted that in the future we'd all work 10 hours a week?

MR. WEST: VEPA.

SPEAKER: Keynes.

MR. HANAUER: Keynes. It was one of his basic things and it didn't work out anywhere, really. So I don't know.

MR. WEST: So, Scott, your thoughts on leisure time and then we'll take questions from the audience.

MR. SANTENS: I think YouTube is a great example of this. And I actually mostly watch YouTube. That's my form of, I guess, TV entertainment. I find people to subscribe to and I'll watch their stuff, and it constantly amazes me how people will create the stuff on YouTube and they're not getting paid for it. They might be able to get something from ad revenue or something, but this is actually work. I see it as work, but some people might not see it that way.

They'll say -- especially with gaming videos, stuff like you record yourself playing a video game and then you post that and someone can be, like, I don't understand this complete waste of time -- doesn't understand that at all. But then obviously that's creating value because you can actually have

millions of subscribers watching you play video games. In fact, there is someone who is a millionaire because of that.

So you see, they are creating value, but it's not necessarily seen that way, and I think that's something very different and I think that's something that we're still not used to. It's almost like a younger generation-older generation kind of thing where the newer generation will find ways of being productive at what they feel is productive and they can actually be very creative, and they can be looked down upon as something that's not productive or creative. And so this future of how we spend our free time, I actually feel, especially if you have a based income, but in general -- thanks to technology, as well -- the people will be greater enabled to be more creative in the way that they spend their free time. It's not so much about just sitting on a beach somewhere or something. You can only do that for so long. But because of the technology around us you can actually create so many amazing things and I think that's the direction that we're going.

MR. WEST: Okay, let's take some questions from the audience. There's a question right up front here. And those of you -- if we could have a microphone up front? The gentleman right here. Those of you who are watching the webcast, if you have questions you can submit them through #RobotWork.

MR. CHECKO: Thank you very much. Larry Checko. I just want to thank Nick from the get-go here for all that he's doing to bring attention to income inequality. Thank you very much. Keep that message going, please. I've written a couple of columns on you already.

MR. HANAUER: Great. Thank you.

MR. CHECKO: Thank you. But to your point about working like a maniac, that's part of the issue, I think, because there are people who are born without that kind of drive, without that kind of motivation, who can't get through in this capitalistic system.

MR. HANAUER: Yep.

MR. CHECKO: Some people want to sit on a beach and write poetry, you know?

MR. HANAUER: Yep.

MR. CHECKO: And there's no money in that. Some people want to be in the arts.

MR. HANAUER: Yep.

MR. CHECKO: So the question I have is, Alvin Toffler, in 1971, wrote a book called *Future Shock,* and the one thing I remember from that all these years is that he said there's going to come a time -- and this was before computers were democratized -- there is going to come a time when technology and advancement are going to move much faster than we can deal with it emotionally. And I'm seeing that happening now. Do you agree or disagree? Thank you.

MR. HANAUER: Yeah. So let me handle your first question first. Let me see if I can get you to follow this train of logic. So if prosperity in human societies is the accumulation of solutions to human problems and innovation is the way in which we solve those problems, then you can see that growth really is a feedback loop between rising amounts of innovation and demand. The more people have money and the more people have the capacity to innovate, that stuff goes like this in a feedback loop and you have goodness.

And that feedback loop, in turn, is unambiguously driven by one thing and that is political, social, and economic inclusion. That is to say, inclusion isn't something we should have if and when we have growth. In a technological, capitalist economy, inclusion is actually the technical mechanism that drives growth. And what that means, in turn, is that there's more wisdom to raising the minimum wage to $15 an hour then just making sure people aren't poor. There's this magical validating thing that happens when you pay people for what they're doing in a robust way.

So we had this extraordinary thing happen in Seattle this week, which is the business paper of record wrote a giant cover story called "Apocalypse Not." This has never happened before in America where the business paper of record writes a cover story and says, wow, all the business people predicted that we would all go out of business when we raised the minimum wage and instead of that happening, everything got better. Who'da thunk it?

But there was this one sentence in that piece that was written that meant so much to me and so much captures exactly what we're after. They interviewed a cook and what he said was getting paid $15 an hour legitimizes cooking as a craft -- legitimizes cooking as a craft because, here's the thing, in a sufficiently inclusive, technological, capitalist economy, all work becomes craft. All work becomes

creative. All work is valued. And that's something that we have the capacity to create if we're smart.

With respect to Toffler, I have no idea. I'm not shocked by anything.

MR. WEST: Okay, there's a gentleman up here on the aisle who has a question.

SPEAKER: Thank you very much, it's very exciting. I would like to advance the idea that we just don't know how it will happen and for that purpose to conduct experiments. I will give you two or three examples where I was involved, in particular in Scandinavia and Japan.

By the way, as a background, Japan is the first country in the world which started in 2006 to develop a national strategy -- actually, it started at MIT -- in what they call now Cool Japan. The first world fair exhibition at Milano Fair in this sector was organized by Japan and next year Japan will organize the first World Economic Forum for these cool industries, including what you said, the craft -- the creativity -- it took 10 years.

It happens I'm involved with UNESCO to leverage Japan to identify those culture and creativity industries, but it's not enough. In Scandinavia or in Switzerland -- the (inaudible) in Geneva -- what we discovered after some experiments, one, for instance, in Oslo during three months, we showed the best of every content in high definition about culture, science, craft, and so on. I can't tell you how much the children, not only parents, were so serious. And we did it in a rural area because we wanted to experiment a lot of ideas for jobs and so on, and what to do.

MR. WEST: And can we get to your question?

SPEAKER: My question is, what type of experiments would you advise to discover those things, to learn what others are doing? I would qualify this. A lot of intermediation jobs to take us at local community level, family, and (inaudible) to this new era of knowledge economy. What experiment would you advise, would you think are possible to identify those jobs and qualifications? What training? It's a collective job, work, and it must be experimental to enable the collective part of it. Thank you.

MR. SANTENS: Well, first off, if you haven't looked into it already, there's some really interesting experiments that have been done with based income, like based income experiments done in Namibia and India, and even just unconditional cash transfer experiments that we've found in Liberia and Lebanon and Uganda and Kenya, just all these places all over the world, where we give people money

without conditions, we find that they do actually create their own jobs. It's fascinating to see what they create and to the amount that they created.

In Namibia, self-employment jumped 301 percent and in Liberia, a third of everyone started their own jobs. And I believe it was in Kenya, the government there gave people money for food aid. It was more like a food stamp, but it was cash. They want it to be most efficient. And, fascinatingly, years later, they found that about 90 percent of the people who received this, invested it in forms of capital. They started their own businesses or they purchased livestock and investments in their own house, this kind of thing.

And so, people, when they are given money without strings, it's amazing to see the creativity involved in what they do. Another example that someone did in one of these -- he was a recipient from -- given directly as a charity, doing this work in Kenya and Uganda. And one of the businesses that someone started up was that they used this cash to purchase some solar cells and then they used that and they created their own business for charging people's phones, because everyone has these phones and, actually, that's how they receive the money. So they started up their own solar charging business for this and that's what people do. They just come up with these ways of using the income to create more income.

MR. WEST: The gentleman right here has a question.

MR. OLIVER: Tim Oliver. Seventy percent of the population does not graduate from college, so we have a lot of folks out there that wonder what they're going to do with their lives. Nick, you talk about the need -- the "if" statement -- if we have civic innovation, what is it going to take for this country to recognize we need to do something for that 70 percent because there are jobs that employers cannot find qualified technical workers to do because no one is incentivized to get a technical education?

MR. HANAUER: Yeah, well, I think that the game in political economy is an argument over cause and effect. The orthodox view, the view I characterize as trickle down, is that if and when we have growth, we should make investments in things like education for our kids, and so on and so forth. And that's both wrong and backwards.

The growth is a consequence of those investments and, unfortunately, the nation's state

legislatures are mostly dominated by people who have accepted -- and by the way, the halls of academia are filled with economists who believe the former, that you make these investments if you have somehow a miracle of surplus, which is just not true. But the big challenge, of course, is that until very recently there has been no effort to advance an alternative theory of growth and so the country has taken a giant step backwards over the last 30 years as we have backed away from making those very commonsense investments in ourselves, recognizing that the economy is not money, the economy is people. And that the degree to which people do well defines the state of the economy. So that's my take.

MR. WEST: In the front row?

SPEAKER: Tyler Cohen wrote a book called, *Average Is Over*, where he argues that meaningful jobs, as you would -- not "bullshit jobs," would be about 15 percent, and 85 percent of whatever jobs are still available, arguing -- for the robots are coming, I mean, that's his belief -- will be meaningless. So in the case of what you were describing, Nick, about your drive to work, if you fit that into that formula, the 15 percent, the danger is that the 85 percent will be completely overlooked in this.

And when you mentioned about the cook in Seattle, he makes $28,800 a year in Seattle? I don't think that leads to a lot of satisfaction and dignity.

MR. HANAUER: Yeah.

SPEAKER: So there is a problem with that.

MR. HANAUER: Well, yes. But let me first say Tyler Cohen is now and has always been, in my opinion, wrong and full of shit. (Laughter) I reject his views and ideas and think he's wrong. And that dystopian future, which is what lots of people have in their heads because they don't have the capacity to imagine beyond what they can see in front of their face today, is not what we'll have.

Look, there is simply no doubt that the proportion of jobs in the world that have gone from awful and dangerous to awesome and fascinating and good is going up. Everybody in this room has a job that is engaging, creative, challenging, and safe. This was not true 100 years ago, and the percentage is going up and this is a marvelous thing.

Now, is it going up as fast as we would prefer? No. Can it go up a lot faster? Yes, if we civically innovate. And, of course, a $15 minimum wage in Seattle, Washington, is inadequate to lead a

robust life, but it's a start. And $15 is the number we picked, right, to try to animate this social change and I will admit freely that it went better than we expected. If I could start over, I might have picked $20. Who knew it would go so well? But $15 is a good start in setting the floor for work. $15 is an amount which in many communities is adequate, if two people earned that, to lead a stable, secure, and dignified life.

And so progress can be made, slow but sure, and eventually we'll get there. But the future is bright.

MR. WEST: And, Scott, what do you think of the robots are coming argument?

MR. SANTENS: Well, okay, I just wanted to mention, too, that I think it's a really good point, this idea that the average is over. I've also heard it called "Extremistan." And if you look at -- there's this great photo set that I found where if you look at, say, Ford Motor Company back in the day and there was just a yard full of tens of thousands of workers, and then you look at, say, Tesla or something today and it's just 100 workers with just lines of robots in the back.

Robert Reich likes to talk about how Instagram, when it was sold, it was capitalized at billions of dollars and it had just like 14 workers, I think, at the time. That's the direction that we're going, where you actually have these smaller and smaller companies that are able to do more and more and more. And it's not even about those kinds of companies, but even if you take a musician like Taylor Swift or something, and you see that this is a globalized thing where you create these superstars.

It's the superstar economy and it's harder to, let's say, be a songwriter. It's harder to get a job as just an ordinary musician. It's all superstar or nothing left. That really is helping to drive this level of inequality and I think that's something not to ignore at all. It's very important.

And also, this idea of every job is something that people really enjoy doing or this kind of thing, I just immediately think of how hard it is to be a truck driver and I cannot imagine having this job where you're just driving 20 hours at a time and just constant on the road and everything. It just seems really hard and there's not a whole lot of creative thought involved. You are practically a robot driving this, you're just trying to stay between the lines.

And so what happens when you've got self-driving trucks, which this came out recently

and they're being tested currently? And so the most common job in the U.S. is truck driver. So if you automate this -- and it's going to happen fast, too -- so when you automate this and suddenly you got 10 million truck drivers and truck driving-related jobs out of work in a very short amount of time, how do you suddenly create an additional 10 million jobs within a matter of years? And what will those jobs be? I can't imagine those jobs being jobs that we actually need or require.

I think that if we don't have a based income in place, those jobs will be jobs that people invent because they have to. You'll see more of this stuff like Amazon trucking, or you've got people --

MR. HANAUER: Or being a YouTube star? It doesn't have to be dystopian, right?

MR. SANTENS: But that's the superstar economy again.

MR. HANAUER: No, it's not. You can earn a good living doing YouTube today, being creative.

MR. SANTENS: A few people can.

MR. HANAUER: No, a few people are richer than anything. A few people are making millions and millions and millions and millions of dollars on YouTube. But your example of YouTube is the canonical example of the way in which technological innovation creates new opportunities for people, and we are at day one at YouTube. YouTube in 10 years is going to be 100 times bigger or a thousand times bigger, and thousands and tens of thousands of people will be enabled to create a living being creative within that construct that used to drive trucks. And that's a beautiful thing, that's an awesome thing.

MR. SANTENS: Okay, just as my own personal example of this, as well, is that people will say that anybody can earn enough income to live, let's say, even off YouTube or something. And let's say you assume that that's true, but it takes time, as well. You have to have to either --

MR. HANAUER: There's no doubt there's a disruption accompanying, yeah.

MR. SANTENS: -- build up a subscriber base, that kind of thing.

MR. HANAUER: Yeah.

MR. SANTENS: It takes time.

MR. HANAUER: And we have to find ways to help people make these transitions.

MR. SANTENS: Right.

MR. HANAUER: I'm in violent agreement with that. And our challenge, collectively, is to help people make these transitions while acknowledging that there is something always that we can transition to. We don't have to be dystopian or pessimistic about the future and the better we help people transition, the better that future will be.

MR. WEST: If I can jump in and add something to your question?

MR. HANAUER: Yeah.

MR. WEST: I think when you compare the current technology companies with the old companies of 30 years ago -- so, for example, I cite this in my paper, Google is worth $370 billion today, but it only has 55,000 employees, which is less than a tenth of what AT&T had in its heyday. Facebook, I think the last time I heard, they had about 1,500 employees. So you have massive technology companies today that simply don't need that many workers. And so this is the thing that I'm personally worried about in terms of the impact on employment in the future.

We have a question, this gentleman over here.

SPEAKER: Thank you. Nick, I think you've really hit on it in terms of focusing on that transition period. What you're both talking about, really, is a future of more entrepreneurs, and I was wondering what your thoughts would be to help that transition? What can we focus on to develop entrepreneurial skills?

MR. HANAUER: Yes, so as a entrepreneur I'm deeply sensitive to this because the thing that makes me a good entrepreneur is being just this side of being a sociopath, which is to say I'm incredibly comfortable with conflict. I'm incredibly comfortable running against the grain. I'm incredibly comfortable with risk and most people are not wired that way. And I think it is a mistake, myself, to try to engineer an economy where everybody has to be an entrepreneur because I don't think that's what most people want. They want stability, security, and dignity and they want to work hard and create something of value, but not everybody wants to be out there on the edge trying to make their own way.

I do think that the new technologies democratize opportunity in a way that can lead to entrepreneurship, but I think that we need to be mindful of the fact that not everybody wants to be a nut

risk-taker like me. And it's just not right for everybody and it's not right to construct an economy to meet the needs only of entrepreneurs.

MR. WEST: Okay, this lady up here has a question. We have lots of people with questions, so I'll try to get to as many as possible.

MS. MESSIAS: Myra Messias, University of Washington in Seattle.

MR. HANAUER: Oh, hey.

MS. MESSIAS: Hi.

MR. HANAUER: How are you? I graduated from there, too.

MS. MESSIAS: Okay. And so, both you, Nick and Scott, you mentioned safety and the job safety and how jobs are safer even now than before and I paid attention to the concept of security. A long time ago, maybe in 1994, a book was written called *Flexible Bodies,* and it's an anthropology of immunity and the health industry and how that transferred into the corporate world, of how you have to be more flexible in order to do more jobs and it's a way of people dealing with the insecurity of a certain job. You have to have more skill. You have to kind of innovate yourself.

I paid attention to one statistic that you said, that middle-aged people in the future will be the ones hit. They will not. The idea that older people in their mid-age are going to be the ones affected the most --

MR. HANAUER: That's the Larry Summers argument.

MS. MESSIAS: I just wanted to reflect a little bit and help me think of innovation and newness, and maybe the newcomers to the job market, the young people versus people who hit the ceiling midway in their mid-life. So if you can reflect, because innovation is for the newcomers, that's great. People can start careers, but what happens when you lose that security midway and you don't know how to be the flexible body? If you can reconcile that for us, that would be great.

MR. HANAUER: Yeah, well, I think that it is another great reason for having unconditional based income, especially for those who aren't as flexible in order to adapt to these new forms of work. And just the insecurity around us, yeah, it's a very good point.

MR. SANTENS: Yeah, and I would just add that, again, we get to decide what kind of

society we want to have. The economy is a construct made by people for people. Economics is basically how we rationalize who gets what and why. And certainly one of the biggest problems with rising economic inequality is that it prevents you from investing the surpluses that you create back into the society in a constructive way.

I mean, I'm violently for as much technological innovation and disruption as possible, with the caveat that we take some of the value that's created and make sure that people in their middle age don't get chucked out into the street, right? These two things are not in conflict with one another. In fact, they're reinforcing. The more successfully we invest the surpluses back into ourselves, the easier it is for people to be supportive of ever more innovation and dynamism, right? That's the society we want to create.

SPEAKER: But we're not doing it.

MR. SANTENS: We are not doing that today, but we need to do that. But I don't think these things are irreconcilable.

MR. HANAUER: No.

MR. WEST: In my paper I suggest that we need a model of lifetime learning for exactly this reason.

MR. SANTENS: Yes.

MR. WEST: Because it's a period of great transition, lots of disruption and, certainly, middle-aged people and older people are most at risk here, but if we move to a model of lifetime learning, then it just gets acculturated that we're going to be constantly learning, we're going to be developing new skills and people will be in a much more flexible position to take advantage of the new innovations.

MR. HANAUER: So David and I just want to follow on this. This is a profound point. So there is simply no doubt in the world that people should go to college twice, right? You should go to college after you finish high school, and then 20 years later, in the economy of the future, you're going to need to go to college again for a couple of years, right?

MR. SANTENS: As long as you don't have to pay $100,000 each time.

MR. HANAUER: What's that?

MR. SANTENS: As long as you don't have to pay $100,000 each time.

MR. HANAUER: No, exactly. Exactly. But think about the employment impact of educating everyone a second time, right? Think about how many people come out of the job market and how many people need to be employed educating those people to reenter the job market. So there's 10 million jobs right there, maybe 15 million jobs, right there, boom, that the BLS does not have in their forecast.

MR. WEST: Yep.

MR. HANAUER: But this is what is possible in a better future.

MR. WEST: Yeah, this gentleman right here in the second row?

MR. APPLE: My name's Martin Apple. I think Darrell West has hit the nail on the head. If you look at all the possible solutions, all the possible dystopias of the year 2050, everything you can think of about the robots are coming, they will. Every new technology has been disruptive for centuries and we've always managed to accommodate it one way or another. This time the problem is bigger and the solution that really stands out over and over again is lifetime learning, not second college.

MR. HANAUER: Yeah.

MR. APPLE: Continuous learning. Continuous learning, so you're always ready to do something new. So I think that is probably the most profound thought I've heard in years.

MR. SANTENS: I agree.

MR. WEST: Well, I agree, too. (Laughter)

MR. HANAUER: Well, I just want to say to that, as well, that we should be focusing on maximizing flexibility and allowing people to make those choices. One of the interesting findings from based income experiments is that people actually do choose to increase their education. High school graduation rates go up, people go to college. They choose to do that and so we should recognize that and understand that, really, what we're wanting to do is maximize the flexibility and maximize the range of options for people to do these things.

And that can mean based income combined with affordable education options and these kinds of things, where people actually choose to do that. I don't want us to go down that road where we,

say, make college mandatory or -- you know, this kind of thing. It's just allow people to do what they want to do and it's amazing that when you actually study the human behavior that people do want to learn. We should enable that.

MR. WEST: The person in the third row had his hand up. Yeah, right there.

SPEAKER: I want to return to your example with the 10,000 truck drivers all of sudden losing jobs. And your point is, and it's a good one, that it doesn't happen in one year. It happens slowly, and that's how it's been happening all along in the last 100 years of automation. Automation slowly comes and people adjust.

I want to suggest and hear, if you can comment, that maybe we're coming to a point when this will not be so anymore. That is, in robotics we're maybe at a point now when innovation will come very suddenly and extremely -- it will be wide. That is that changing the robot from inability of doing something to a robot able to do that will take another smartphone app. Not very hard work on changing hardware, going from tractor to a tank, for example, but just an app.

And so, all of a sudden, making -- replacing by a robot our mailman, bringing our mail home or replacing for NASA a robot that does assembly in space or replacing a person who is helping an older person in their apartment will take exactly the same application which is going to be a program in your computer. This may happen and then the period is going to imagine that we do not have a luxury of a long period to harmonize things.

MR. WEST: Okay, can we get your question?

SPEAKER: That's my question. What do you think about that and would you see a solution for that?

MR. SANTENS: Yeah, so you can call this the checkerboard problem or the chess problem, this idea that expediential growth of technology is this old story saying that you could put, say, one grain of rice on the first checkerboard and then you double it over and over and over again. And we can't as human beings really wrap our heads around what happens when you do that 64 times. It's logarithmic, it's massive, and by the time you get to the second half of the checkerboard it's just growing way too fast to even comprehend.

So, yeah, there's an argument out there that this is happening with technology where it's been going up slowly, like this, and we're just at the point where it's at this inflection point. And I think a really good example of this is just this idea of networked machine learning. And this is actually -- we're seeing this in practice now with the new Tesla update and this is a fascinating business model, as well.

So what was amazing about this latest self-driving update, the autopilot update, was that it went out to all the cars at once and now each car is basically learning as it's out on the road. And it's going to send back what it learns and this is all going to be combined together and then it will be updated to everybody again. So every single car is learning and teaching every single other car. And humans have never done this before. You cannot teach somebody to teach one person one thing and suddenly teach every human being that same thing, but that's exactly what we're doing.

Viv is another technology that's right around the corner, too, which is another AI. And this says connected to the "Internet of Things," so let's say you can actually be able to talk to a vending machine and you'll be able to ask it something like, when's my plane leaving, because it's connected to the network. And so what's amazing about this is that every single interaction with a device and a human being will teach every single other thing in the network. And when you think about that, that is amazingly fast technological growth capability and we are definitely not ready for that. And politics and government is really not ready for that.

MR. WEST: Okay, this gentleman on the aisle who has his hand up?

SPEAKER: Thank you, a very interesting conversation. First of all, thank you all very much for bringing up that we should go back to school, because that's what I'm doing right now. (Laughter) I went back to pursue additional studies at Georgetown and, also, in addition to doing a fellowship that is specifically studying -- because to me decision-making almost always happens at the tip of the pyramid, so that's where a robot is going to be placed in the future, but I'm trying to prove that it's not going to happen.

So the question is, what is your view on a robot being placed at the tip of the pyramid, the one that's going to make a decision in the future? And, again, I'm trying to prove that it's not going to happen, so I just want to see your view.

MR. HANAUER: You mean, will robots replace -- will we have robot overlords? I doubt it. I hope not. I did see *Terminator*, though. (Laughter) It remains, I suppose, a corner case possibility, but the thing about history is it repeats itself and people have the same worries from generation to generation. And we've been worried about technology and robots for a very, very long time and we've had some setbacks, but, in general, there's simply no doubt about the fact that in a general way, globally, people are better and better off and I don't think that we have to worry.

There are challenges around AI, there's no doubt. And as technological innovation proceeds, artificial intelligence is going to create both technical and moral challenges. But the first gun created technical and moral challenges, too, and obviously some bad came with it, but all technology brings straight awesome risks and I think we just have to manage these things and, in the best way that we can, recognizing that we're going to make some mistakes along the way. But I just don't think it's realistic to assume that eventually robots will be in charge of everything. It just doesn't seem reasonable to me.

MR. WEST: In the front row we have a question.

MS. NOTTURNO: Thank you. Leva Notturno with the Interactivity Foundation. If we imagine the future full of robots and artificial intelligence, what do you see social and civic innovation now and emerging in the future? And more importantly, which are those social and civic innovations you think would be the most useful for the public to explore and understand better? Thank you.

MR. SANTENS: Off the top of my head, as far as a civic innovation goes that we could use technology for is really something of -- greater democracy. Have you heard of the term "liquid democracy?" It's an idea where instead of using our normal legislator, our representative that we send off -- if you think about that, that made sense years ago where, let's say, it was a trek to the state capital and it took weeks or months or something, and you couldn't really communicate that well. But now we have the technology where we could actually enable people to decide what they want to vote on, on a piecemeal basis. And not necessarily one legislator. You could also actually assign people.

Let's say you trust Neil deGrasse Tyson's opinion of scientific issues, so you could actually have him as your representative for science stuff. And you could just say, I trust Neil DeGrasse

Tyson to decide what is going to happen with NASA or whatever. And you can actually break this down into a very robust democracy that doesn't currently exist and I think that would be a huge achievement to use and leverage technology to expand democracy.

MR. HANAUER: And I would just like to add, it just seems useful to remind ourselves that it wasn't that long ago, speaking of civic innovation, that people used to work until they died. Like really. And then, all of a sudden, jobs got safer and medical science improved and people lived 20 years or 30 years beyond when they worked, and Social Security was born, right? Somebody had this idea that maybe it would be good if people who retired didn't die of starvation or live in poverty or whatever it is, and we innovated civically and we created a much more robust society.

I think it's important to underscore we didn't just create a more just society, we created a more prosperous society because there are two reasons to pay people Social Security. One is to keep old people out of cardboard boxes. The other is to allow them to continue to be dynamic consumers in our economy. (Laughter) Which creates a feedback loop which is good.

So we're at the cusp of needing other kinds of civic innovations as we have ever higher rates of technological innovation and ever higher rates of automation. The basic guaranteed income is one such innovation, which indeed may be a phenomenal idea, we need to try it. We have to find a way to try something like this in our country. It would be fantastic if a state could give it a throw and see what happens.

But it's these kinds of civic innovations which will open the door to other possibilities and other innovations, I think. But we just have to be creative and try it out.

MR. WEST: In the civil society innovation that I would suggest is that we should elevate our view of volunteerism. So, for example, in the United Kingdom, they are starting an experiment in which people can qualify for social benefits, not just through jobs -- which is typically the way we do it here -- but through volunteer activities. So if there is a tech impact on the future workforce, we need to figure out alternative ways to deliver social benefits.

So the income guarantee is one, but expanding our thinking about volunteerism as a legitimate and socially constructive activity and, therefore, as a way to qualify for social benefits could be

another idea.

MR. SANTENS: Along this, too, because you also asked about social innovation, and you're touching on that, as well, by recognizing volunteerism. This idea that I think would be very socially innovative for us recognize the work that goes on at home, like that parental care work should be considered work. Why is it work when you watch someone else's kid, but not your own kid? And why is it okay that if you trade each other's kids, that can be two jobs, but if you watch your own kid, then it's nothing?

So if we actually have a based income, then that's a way of recognizing all this unpaid work and unrecognized work going on, and I think that's actually very important, as well, as we go into technological care robots and stuff. Do you want to be cared for by a robot or would you rather have a loved one there for you? And I think that, in itself, is very socially innovative.

MR. WEST: This gentleman in the third row has a question.

MR. CALDER: Josh Calder, Foresight Alliance. Both of you have talked about the need for civic innovation, but both of you have alluded to the idea that we're not really doing a very good job of it, and even backsliding, and that there seemed to be impediments. Are there ways to improve our capacity for civic innovation and do you see paths toward that improvement?

MR. SANTENS: I really like the idea of a single transferable vote. I think we need to get rid of first-past-the-post voting. I think that would be a huge change in democracy and you don't really need technology to do that. Basically, you would go in to vote and instead of putting a check box there over who you want to vote for, you can say this is my number one choice, this is my number two choice, this is my number three choice, and suddenly, if you do that, then you're able to actually not count out these third parties and fourth parties. You'd actually be better represented. That's what we should be trying to do, undo this gerrymandering. Just allow people to have a true voice, which is what they don't have now. If you're just voting either against somebody or you're voting for just the second best that you can think of, that's not democracy.

And so there are definite solutions that we can do, such as getting rid of first-past-the-post voting. That would be a major innovation and it's something that we should be talking about more.

MR. HANAUER: Yeah, I think of it differently. I think that giant institutions are slow to change and giant countries are no different. But to almost the same degree that there is no possibility of anything constructive happening in this town, there are thousands of opportunities for super interesting and disruptive innovation in cities, states, and municipalities across the country.

And in my city and state, Washington State, we're trying a million things. And my own sense is that while it is somewhat sad that the federal government of the United States is so locked up, there is wisdom in trying things in localities and states to prove whether they work or they don't. It is completely unrealistic to believe that the Congress of the United States is going to pass guaranteed basic income federally, but it is not unrealistic to believe that you could get a state or a city or somebody to give it a shot and prove that it's a good idea.

We did $15 first in Seattle and, lo and behold, the city did not slide into the Pacific Ocean, which gave other people the courage to maybe think that they should do it, too. And I think that if you care about civic innovation, then you should move out of this place and to a city or state where you might actually be able to make a difference in real time because there is very exciting stuff happening around the country.

MR. SANTENS: This is a really good point, too. Washington State is 1 of the 24 states where we actually have a citizen initiative process. And I live in Louisiana now and I used to live in Washington State --

MR. HANAUER: Yeah.

MR. SANTENS: -- and I tell you, I really miss that.

MR. HANAUER: Yeah.

MR. SANTENS: It was amazing to me how engaged -- you'd even engage the populous to have people out there --

MR. HANAUER: Yeah.

MR. SANTENS: -- gaining signatures for this or that. That's how you build a democracy is just have that ability.

MR. HANAUER: And advance new public arguments.

MR. SANTENS: Right.

MR. HANAUER: You could have a big argument in the state about guaranteed basic income and talk about it and give it a try and stuff like that.

MR. SANTENS: Yeah.

MR. HANAUER: But I really feel strongly that there's a ton of opportunity by going small and building up rather than expecting it all to be top down.

MR. WEST: Okay, near the back there's a gentleman with his hand up, right there.

MR. YUTKIN: Hi, thanks a lot. My name is Joel Yudken. I'm a principal at High Road Strategies. I've been finding this discussion very interesting, but also a little troubling on a couple of things. I'm not in complete agreement on some aspects, so I just want to clarify if I'm getting this right.

I'm not a dystopian in terms of technology. I don't believe that technology, per se, is the problem. What I don't hear, though, because I still see this embodiment of technology as something outside, an endogenous factor, rather than as something that is a product of human decisions.

To give you background, I'm a electrical engineer by initial training, worked on digital design of military satellites before I gravitated to looking at the field of the intersection of technology and economics. And I spent a lot of focus on work issues and I've thought about this a long time. And I guess one of my concerns is that when we have a discussion about automation -- I'm old enough, that this is about my third or fourth discussion that I've seen about this in terms of work. (Laughter) And there's been both good and bad in it. And the thing that is decisive has more to do with what is going on in the political system, in the market economy, and decision-making and who has the power to make decisions and invest rather than the technology, per se.

So the configurations that we are seeing that potentially could be liberating -- in some cases we've been able to do that -- are also, some cases are working the opposite. They are creating problems. They may be causing truck drivers to lose their jobs or they can enhance some of the skills that they need and even the quality of their work life in the truck. And I know that the Teamsters Union has looked at this kind of stuff.

So I guess the conversation here has gotten disembodied and I would like to get a sense

of how you maybe return it a little bit to more of how you really see the trajectory of what we can be doing about shaping these technologies or evolving, especially in the workplace, though obviously the impacts are much beyond the workplace.

MR. HANAUER: Well, let me take a crack. Obviously the closer society becomes to a plutocracy, the more likely it is that the plutocrats will deploy the tools in ways that advance the interests of plutocrats and nobody else. And this is why economic inequality and political inequality are so pernicious and self-reinforcing and why everybody, save the Koch Brothers, has a stake in trying to prevent that. So that's the first point.

I do think that neoclassical economic thinking is very much an enemy of the good in this case because we have defined the good in terms that really aren't the good. Like if you think that gross domestic product is a measure of the good, you will end up in a terrible spot because if we were all the parade outside and vandalize all the cars up and down the street here, we would be adding to GDP. And yet, clearly, that probably wouldn't be a great thing.

And I think that one of the great challenges of our age is to try to push a lot of this neoclassical economic thinking into the dustbin of history and to reimagine what it means to create prosperity in human societies. Because if you believe as I do that prosperity is solutions to human problems, then you can quite easily distinguish between economic activity that actually solves problems and economic activity that creates more problems than it solves. But until you can begin to have that normative discussion about value and meaning and, like, is there a difference between a company worth $100 million that causes cancer and a company that's worth $100 million that cures cancer, right, like, the neoclassical idea is that these two things are equivalent. Well, this is nonsense. This is crazy, right?

And so, I collaborate with a bunch of people who are trying to fix this and find a new way to express some of these ideas, but I think until we get there, it's very hard to crack this nut.

MR. SANTENS: You know, I think you're absolutely right, that this is all just a matter of choices and decisions. It's not saying that this just technology and we're helpless, but I think that something that's really interesting about technology is that in our current system technology is actually -- it's privately owned. It's something that's owned. So, when you invent something, let's say, and that is

yours. So when someone who is an owner of capital replaces their labor with machines, then their labor is now machines that they own. So they're not paying out wages to humans anymore and they get to keep all of that themselves, which grows inequality.

So technology itself is something that, within our system, it drives towards inequality because we're not saying that technology is publicly owned. There is no publicly owned technology, which is interesting because if you look at, say, the technology behind the iPhone, for example, pretty much everything in that was funded at the government level from various departments and whatnot along the way. And so this was publicly funded that ended up in the hands of a private company that became a multibillion-dollar company. But we didn't see any of that. It was all paid for with tax dollars, the R&D was paid for with tax dollars.

And that's actually more and more the case with all this technology that's being built off of publicly funded research. And we're not seeing a return on any of that and that's a choice. And I think that we should look at that choice and recognize that there's another way to go about this, but we're not doing that right now.

MR. WEST: My colleague Vanessa, near the back, has a question. She had her hand up right over there.

SPEAKER: So I was very interested by your remark that the difference between a barista and an autoworker is the power dynamics in the economy today. I've also been following the Fight for $15 as it's traveled across the country and I was wondering if you could speak in more detail about why this campaign, which obviously is pushing against that power dynamic, succeeded where so many other have failed.

MR. HANAUER: Because we changed the frame of the debate because the great challenge for progressives on political economy over the last generation is that we accepted -- and I'm a progressive, if you didn't know -- we accepted the rights explanation for how you create prosperity in a capitalist economy, and then we were stunned and surprised by the fact that people preferred the solutions which flowed inevitably and logically from that explanation.

So, in other words, if the rich are job creators and the more money they have, the more

jobs they create, then higher taxes on rich people is stupid, right? And so we accepted that, the former, and then quibbled over the latter to no effect. So what me and my gang did was tried to offer an alternative explanation to how you create prosperity in technological societies, that we shorthand as middle out economics that you've heard.

And we won $15 for a variety of reasons, but a core reason was that we didn't sell it on the basis of fairness. We didn't allow people to think they were making a tradeoff between growth and fairness. We showed them that when workers earn more money, businesses add more customers and need more workers. We argued that raising wages wasn't just good for social justice, but that it would create more general prosperity in their communities. And once you pivot from fairness to growth, you move from talking to one-third of people who already agree with you to almost everyone. And you go from support in the 30s to support in the mid-60s or 70s on these measures. So that was the trick, to stop talking about fairness, which is true but insufficient, and start prosecuting the issue on the basis of growth. And that's the magic and that's the game in political economy.

MR. WEST: Okay, we have time for one more question and we'll have this gentleman right here.

MR. FINKELSTEIN: Okay, Bob Finkelstein, Robotic Technology.

MR. WEST: Boo. No, I'm kidding. (Laughter)

MR. FINKELSTEIN: Going back to the truck drivers, it's a lot more than the truck drivers, it's the cab drivers, delivery van drivers, all kinds of drivers, many, many millions. And it's going to happen starting around 2020 and go on until about 2030 or so when there won't be any more manually driven vehicles on the roads except where you can drive a horse.

In any event, one solution that I've been contemplating for a while, as opposed to setting up a national redistribution process involving some sort of a national mutual fund or other sorts of central investment mechanism, which may be needed in the longer run -- somewhere before the end of the century when you have robot barbers and robot nurses and physicians and whatever -- but to take care of the immediate problem, it seemed to me that there could be two programs: one government-industry and the other government-industry, but one focused on allowing the erstwhile drivers to own the means of

production, that is to become owners of the robotic or autonomous vehicles, and manage them. Now, they don't have to be full-blown entrepreneurs to do that, they just have to be managers. So you need some mechanism to allow -- to facilitate the financing to allow them to become owners.

And second, you need an educational program to train them to become owners and to manage these systems. And that would not cover all of the people who lose their jobs as drivers, but perhaps could allow some significant portion of the -- perhaps a majority to come out of it with some means of suitable income.

So my question is, what do you think of this notion, which is going to be a potential near-term solution, to allow drivers who work for others to own the means of production with autonomous vehicles?

MR. SANTENS: I think the most efficient way of going about this is actually to just have the government do it and to provide a basic income and that would actually accelerate this automation. If you do this piecemeal and say that, well, let's hope that the truck drivers do this and hope that the cab drivers do this and hope that they do this and hope that the owners of car washes do this, if you hope that everybody is somehow able to get an ownership role, what happens to the people who are unemployed by all of this technology? They're not owning anything. They just can't find work.

So it would be an improvement from now to have this more shared ownership, but is that realistically something that we can achieve for everybody on distributed basis, on a one-by-one thing? And I just think that if we just do the basic income, like what Switzerland is doing, at least they have the initiative process where they can pass this and just get it done. Then, all of a sudden, you set up this situation where you are able to accelerate this automation. And I think that's actually a good thing.

I think we've passed the point where we should continue trying to seek full employment and I think we should seek full unemployment. I think that that's something that human kind should aim for. We'll never reach 0 percent employment, but there will be plenty of work being done and I think that's something that we should aim for.

And I think that this more of a socialism viewpoint or shared cooperative ownerships, these kind of things, I think it's great when companies do that. I just don't think that we can organize

society as a whole to do that in a way that leverages technology for everybody instead of just these groups of people.

MR. HANAUER: I'm largely in agreement and I would just make a further statement, which is that the automation of transportation will produce a circumstance that will be nothing like what you predict. I guarantee it.

So all of the provisions you make today for that automation will turn out to be for naught because it's just going to end up different than you think, if past is prologue. And that's why it's very difficult to pre-bake a solution to these problems because the needs change, the world changes, and then all of that infrastructure is no longer needed.

MR. WEST: Okay, great discussion. I want to thank Nick and Scott. Clearly there's going to be further discussion of the changes in technology and the economy, as well as in our civic world, so thank you very much.

MR. HANAUER: Thank you. (Applause)

* * * * *

CERTIFICATE OF NOTARY PUBLIC

I, Carleton J. Anderson, III do hereby certify that the forgoing electronic file when originally transmitted was reduced to text at my direction; that said transcript is a true record of the proceedings therein referenced; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were taken; and, furthermore, that I am neither a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

Carleton J. Anderson, III

(Signature and Seal on File)

Notary Public in and for the Commonwealth of Virginia

Commission No. 351998

Expires: November 30, 2016