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P R O C E E D I N G S

MR. O'HANLON: Good morning, everyone. Thank you for joining us at Brookings. My name is Michael O'Hanlon. I'm in the Foreign Policy Program at Brookings and joined by my colleagues, Frank Rose and Mara Karlin. We're all hosting today a good friend and an amazing scholar and entrepreneur and experienced Washington aid to Senator McCain and others, Chris Brose, who has written a remarkable book called "The Kill Chain: Defending America in the Future of High-Tech Warfare. It's a book that came out of his service with Senator McCain on the Senate Armed Services Committee in recent years, and also derives, I think, in large part, from his background in the Bush Administration, although at that point, he was thinking more along State Department lines, writing speeches for Condoleezza Rice and Colin Powell, but he was thinking strategically then.

He spent half dozen years after that time as a senior advisor to Senator McCain before becoming the youngest staff director of the Senate Armed Services Committee in history and he is now also the CEO of a company called Anduril where he is promoting high-tech innovative solutions to some of the problems he writes about in the book. He hails from the great state of Pennsylvania, outside of Philadelphia and, Chris, we're just really thrilled to have you with us today. So, thanks for joining us.

And I'm going to begin now with a few questions for Chris. We're not going to have a formal presentation per se. I'm going to kick off the Q and A and then we will ask Frank and Mara to also come in with some questions of their own just to explore some of the big themes and main ideas in the book. And we'll reserve the last 20 minutes or so for your questions. And so, I think you are aware, having registered for the event of how you can send those in, but now let me launch right in, Chris, and both in your opening pages of the book, and also in your excellent Wall Street Journal op ed over the weekend, you talked about a memory of a conversation that you had had with Senator McCain that came partly out of some discussions of combat simulations and war games that people like David Ochmanek at the Pentagon had been holding that really put the fear of God into you about America's military capabilities, especially vis-a-vis China. I wondered if you could just tell that story in a nutshell to motivate for people why this book needed to be written and why you feel so powerfully about the argument you make in it.

MR. BROSE: Yeah. Thank you, and thanks for having me. It's really a wonderful opportunity to be with you guys this morning and I'm grateful. The story that starts the book was really an anecdote that sort of crystalized to me the problem that I think we have. It had been really the focus of much of the work that Senator McCain and I and the rest of the members of the committee, the staff of the committee had done for the years that he was Chairman, the years leading up to that, which was the creeping recognition that we were not, as a country, where we needed to be from the standpoint of national defense, that we had been significantly disrupted by China's military modernization. Not the fact that they had played the same game that we were playing, but they were playing a very different game. They had made a lot of progress that I think many people in the Congress just weren't fully aware of, the extent of.

So, in that period of time, kind of 2017, there was a lot of wrestling over the budget and trying to get stable funding, trying to deal with the impacts of the budget control act and sequestration. This was an idea that we had around trying to sort of crystalize in the minds of members of the Senate what the stakes were and really sort of get them focused, not just on the need to sort of stabilize the budget picture and sort of increase funding where that was appropriate, but to really begin making this shift to a different kind of force. David Ochmanek was there and basically the thrust of it was looking at how the United States kind of matches up against peer competitors, which at the time was sort of increasingly the focus of senior leaders in the Department of Defense, as well as Senator McCain and those of us on the committee. The basic concern is that when you sort of look in full at the military capabilities that China has been developing and fielding, they have purpose built a military to undermine the assumptions on which the U.S. military has been built and the way that we had planned to operate it for a very long period of time. You kind of go down the list in the order of battle here with respect to long range sensors, long range precision guided weapons, ballistic missiles, cruise missiles, increasingly hypersonic missiles, counter space capabilities, cyber capabilities, the ability to really target America's forward bases in the Asia Pacific which we had long assumed would be sanctuaries from which we could build up forces in the event of a contingency, project power, sustain military operations through the duration of a conflict, the way in which we rely upon information, both in the territorial environment, but

increasingly in space as well, how we command and control our forces.

This was a military arsenal that has been built up, systemically. This wasn't like the hurricane that happened one day. This was something that had been playing out for years and years and years. I think in part because of that, in part because of other things we were focused on as a nation. We just weren't attentive to how much progress was being made systematically, you know, kind of year by year. I think what really crystalized for us was really looking at some of these simulations which I think most people in the Congress aren't really paying attention to, aren't witting of. Certainly I think most people in the country are not either, but when it comes to people who really track these issues in the Department of Defense, what I think was so shocking to us was the disconnect, for people like Dave Ochmanek, and perhaps Mara, when she was there in the Pentagon. These were things that were kind of understood. Obviously, it motivated a sense of urgency to get after that problem, but the problem on the Hill was that people just weren't aware of it. That's sort of the argument I make in the book, and the reason we sort of sought to make this case to the Congress was if there is not a consensus in the country that you even have a problem, it's hard to build a consensus that you need to build a better solution for that. So, that was really the thrust of what we sought to set up. For the members who were there, it was a pretty stark dose of reality.

MR. O'HANLON: Thank you. I want to make sure also that we get up front in this conversation the essence of your alternative concept for what you think is a realistic way to think about military modernization for the United States, because you do discuss specific budgetary proposals and certain kinds of weapons and technologies. I want to come to that next before handing off to Frank and Mara, but you also have sort of a bigger idea, an overarching theme about how you believe we should view the realistic capabilities that we can develop in the future. Again, I'm going to invite you to pick up the thread here, but I think it ultimately crystalizes around the idea that it's not going to be realistic for the United States to establish the kind of dominance that we had, let's say, in the Pacific against China during the Cold War where it was for all intents and purposes an American lake, even within eyesight of the Chinese coastline. They were going to be living in a world that is contested on both sides and that the realistic standard for us is not to figure out how to be able to sail aircraft carriers safely 10 miles off the

Chinese shore again, like we once could. Those days are sort of gone forever. The more appropriate goal is to make sure that China also would be deprived of the ability to dominate the western Pacific. We sort of use an anti-access area of denial concept against them, rather than trying or hoping that we could somehow overcome their ability to use it against us. I don't want to suggest that it's completely either/or. Obviously some rule for defenses, some rule for American power projection is I think probably still part of your thinking and the Pentagon's, but do I have that right, that the basic concept should be depriving China of the ability to dominate the western Pacific, rather than thinking that we can re-establish the kind of omnipotence there that we once had?

MR. BROSE: Yeah. I think in a nutshell you've got it right. What I argue in the book is that for really 30 years now, since the end of the Cold War, we have been living in this kind of aberrational period in history where we have been so dominant. We've been living in this unipolar world and we have kind of come to assume that this is how it's going to be and be forever, but when you sort of look at that period across the sweep of history, it is an aberration. I think things are starting to kind of revert more to the historical norm which is pretty powerful rivalry competition, kind of pushing and shoving, an emerging power in China which I think is actually more than a great power. I think more in terms of peer competitor, providing they continue on the path that they're on economically, technologically, militarily. This is a challenge that is going to far outstrip what the Soviet Union was able to muster, which we kind of hold up as the classic (inaudible) competition. So, when it comes to how we think about this problem from a military standpoint, I would be the first one -– you mentioned my time at the State Department. I would be the first one to say this is a strategic challenge that goes far beyond the military. That's something we have to be very cognizant of, that the other tools of power are going to be just as important, perhaps even more important in this competition, but from a military standpoint, I do think we need to start by readjusting our objectives. This is not going to be kind of the reassertion of American military primacy the way it was 20 years ago. But I don't think that is sort of cause for despair. We can think about defense in the absence of the kind of military dominance that we have come to enjoy and still, I think, put together a strategy, ends, ways and means that enables us to achieve objectives that are important for us, that allow us to kind of defend the people, places and things in the world that we absolutely have to.

I think with that in mind, the idea of sort of flipping anti-axis area of denial around is something that you and others have written about. I personally think that is going to be generally the right answer for us, that we don't have to control all of this territory, all of this space, but denying the ability of a competitor to control that space, to project power into to, to commit acts of aggression or coercion into those areas, I think that is a doable military objective. But again, I think that leads you to think differently about the ways and means of American military power which I try to think through in the book, but essentially that boils down to we have to sort of think about a world in which we are not going to have sanctuary the way we have assumed, really anywhere. We're not going to have time on our side, the way we once assumed, we would be able to start a war six months after the point of aggression, sort of at a time of our choosing. We're going to have to be much more forward. We're going to be much more reliant on allies for a whole host of things, not least military capability, but then when it comes to the kind of force that we're building -– the force that we have I think is largely built upon assumptions that are increasingly being overturned. We have a force that is built around small numbers of very large, expensive, exquisite, sort of manpower intensive and hard to replace things. Those things are going to have a really difficult time surviving, I think, on this future battlefield. I think the opportunity that technology presents is really to focus on what we're trying to achieve in terms of the outcomes rather than the inputs, which is ultimately the way to think about getting military modernization right. We're not trying to build better versions of things we've had for a very long time and operate them in the same ways. We're trying to solve these problems differently, build different kinds of forces. For me, in a nutshell, the opportunity of these emerging technologies, when you really kind of look at the together, is to build an almost kind of inversion of our current military, which would really take the form of sort of increasingly large networks of smaller, cheaper, and more expendable, more autonomous systems. You don't have to have so much manpower behind every system. You can actually have lots of systems being operated by single individuals because of their levels of autonomy and intelligence.

I think this is an enormous opportunity, especially

as we look at kind of the pace that China is on, as the pacing threat, but by no means the only challenge that we're going to have to deal with in the world, but I think the one that makes the most sense for us to

baseline against, as we think about kind of building toward that most stressing case that we might have to face one day.

MR. O'HANLON: That's excellent. I want to follow up now a little more budgetarily and programmatically as to what this means. I've got just 2 more questions because I want to come back finally to the role of Congress in all of this since you and I spent a lot of time on the Hill. I know we both recognize that Congress has the Constitutional power to

write budgets and its role is crucial, but I was intrigued in your book to wrestle with sort of a intellectual tension, if you will forgive me for putting it that way. I think it's a tension that's inevitable for someone like you who lives in the real world and knows that things change evolutionarily and slowly and incrementally in an organization like the Department of Defense. You don't just tell a big story about robots and small network systems and all of a sudden wave your magic wand and they all appear. You've got a lot of history in the book that talk about Admiral Moffat and General Shriver who developed carriers and ICDM's back in earlier eras, but you also talk about just how much the Pentagon budget would have to change today to steer us in a direction that you feel is consistent with trends in warfare and these new realistic goals that you lay out. In your Wall Street Journal op ed, you said maybe we could even do this, not that you were advocating smaller budgets, but you recognize U. S. military spending may have peaked for a while and we can probably implement a lot of the agenda that you're laying out, even without growing the budget, if necessary. But I was struck that you said even just 5 percent of the Pentagon budget being redirected could make a big difference in pursuing the agenda that you laid out. I wanted to ask you to sort of reflect on the tension in your argument. Again, I don't think it's a contradiction. I think it's because you live in the real world and you know how things really get done, but on the one hand, you're laying out a very big alternative idea for the future of warfare that is radically different in many ways from what we've been doing and what we continue to build and modernize and acquire in the Department of Defense. On the other hand, you are saying that we can do a lot of this by just shifting 5 percent of DOD's budget per year in different directions. Could you explain how, if we're trying to almost create a revolution here, we can do it by just shifting only 5 percent of the budget? Do you see what I'm driving at?

MR. BROSE: Yes, for sure. It's a great question and it's one that I struggle with a lot of

the book. I think the challenge as I see it is defense spending prior to COVID was already flattening and starting to turn down. That was sort of the projection before this latest crisis, with several trillion dollars moving out the door for stimulus, which was necessary. I think that's going to just put increased pressure on the top line, even more than was already there.

So, it's not so much to say that we're going to have to potentially look at how we could do this with less. I think we're going to have to do it with less. I just think this is going to become kind of a political and fiscal reality for the foreseeable future. In terms of how to make this transition, and I want to be clear, I do think of it as a transition. Right? I mean it's not, and you know this and many of the people listening know this. You can't just snap your fingers and all of a sudden get a completely different type of military capability. It's kind of integrated into the force with sort of training and doctoring around how to use them at scale, but it's kind of like the old adage. The best time to plant a tree is 20 years ago and today, like, you just have to start. The frustration that I had in my time in the Congress was looking at how the budget was put together. I talk about this a bit in the book. There was a definition for priorities for the year as that budget was built. Then it was sort of delegated down to the services, the agencies, to begin building their programs from the bottom up. It only felt like at the very end of that process did the Secretary of Defense and Senior leaders kind of get the reins back into their hands and say okay, now, what are we going to fund. So, it was sort of tantamount to everybody ate first. Then with about a small amount of food left over, the most important things we're fighting over at the very end for the table scraps. To me, this is a process that I think we're kind of going to have to experiment our way through. I try to emphasize here that I don't know what the right answers are. I have a general sense of what I think the right answers are, but I do believe this is something we're going to have to kind of feel our way through and recognize that we aren't always necessarily always going to know what the right answers are going to be. There are going to be cases where emerging technologies are going to be the right answers. There are going to be others where really the right answer is going to be using a capability that we have had for a very long time, like a B-52, for example, in a very different way, or somehow marrying, you know, kind of old and new to get the answer that you want. I think for me the process is about establishing a process where you can focus on the outcomes you are trying to achieve, compete

technology's programs, organizations against one another to come up with the best solution and have a process every year where you had real money at stake or who could provide that best solution and to not care about balancing the resource split between the services or among defense companies or the labs or whomever. It should really be a process where we baseline against. What are the operational problems we are trying to solve? What are the best solutions we can field right now to solve those problems and really create an ability to onramp new capability each year and do it at scale so that companies, old and new, really see something worth fighting for and a priority really worth going after because they stand to gain significant resources if they can bring better capabilities to bear and I ultimately think that's how you can better align the incentives for how the private sector can really support what we're trying to do in t his transitional process from the military we have to the military we need, you know, create incentives for them to put more of their own independent research and development and funding into building new kinds of capabilities, but again, the main point here is this is going to be a transition. It's going to play out over a long period of time. It's more about setting up a process where we're going to have confidence that we're going to be able to experiment and come up with solutions each year that are going to be better than the ones we've had and sort of lead us down this path of figuring out how do we make resource decisions around the things that are best now and then the flip side of that is how do we divest of things that we're going to have to get off of our books because sort of either the expense is too significant or the capability doesn't add up and match up to what we're currently capable of fielding.

MR. O'HANLON: So, just a quick clarifying question before my last one on the role of Congress, just to take one example. You're not necessarily saying eliminate the entire aircraft carrier fleet because these are now sitting ducks in the open ocean. You are saying perhaps, again, correct me if I'm getting this wrong, maybe we should prioritize aircraft carriers a bit less, recognizing they may not be survivable if they're deployed all the way to the western Pacific, but we still have roles for them in certain other theaters or maybe we develop an unmanned long range strike aircraft that can operate off a carrier and keep the aircraft and the carrier further out of range of Chinese or Russian weapons so that we can still use that existing platform but in an innovative way that doesn't make it vulnerable quite as much as in the past. That's the kind of thinking you're talking about.

MR. BROSE: Yeah, and really kind of baseline it around real world operational problems, not to sort of end up in a room where everyone is kind of asserting what they believe to be a reality and sort of the strongest voice wins or you cut some messy compromise where everyone walks away a bit unhappy but with part of the resources. I certainly lived that dream when I was in the Congress. I know many things work that way in the DOD. It's more about saying, look, why do we have aircraft carriers? What is the problem that we are actually seeking to solve here? The answer will likely be for many years to come, we will continue to need those platforms. We will continue to have to think about to your point, if we could continue to extend the range of the carrier airwing. That is a way of making the carrier more relevant, even though we're facing the kinds of anti-access area denial challenges that we're looking at from the Chinese, but it's ultimately to say if we're focusing on the problem that we have that system to solve, it creates a level playing field for other alternative solutions to be brought to the table, compete on the merits. So, we can actually have a conversation about what works best at achieving outcomes. IF the answer is, we need to trade a carrier or two for large quantities of anti- access area denials for the precision strike weaponry, kind of ground based long range fires, that's an interesting trade. I'd like to see how that competes out in a real-world scenario to make a informed decision about what's the best use of limited resources.

MR. O'HANLON: Thank you. Now my last question, I love in the book how ever so often there is a bit of a homage to the great John McCain who you had the privilege of working for and helping for so many years. We had the privilege of hosting at Brookings, will always go down as some of my most powerful and grateful memories of my career at Brookings, the change to host the great senator. This, of course, is a testimony to the importance of Congress. One of the things you say in the book, where you're almost hesitantly picking a little bit of a debate with the late senator who opposed earmarks so categorically and you said, you know what? Maybe earmarks are okay as long as they're transparent and the reason for which we put them in is clearly debates and clearly debated to the public because sometimes Congress has a good idea that the pentagon does not. Or sometimes the Pentagon ultimately bows to the political dictates of a White House. The Pentagon is still run by human beings and under the political leadership of an individual in the White House of whatever party may not always get it right. So,

you want Congress to have a strong role. Could you just say a word about that? And again, I really enjoyed the way you were almost feeling slightly guilty of debating your late, great boss, but you felt that he had a sort of 90 percent right, but there might be an even better way to follow this concept in the future.

MR. BROSE: I think 2 points. The broader point is the one you made, which is recognizing at the end of the day that the Department of Defense doesn't build budgets. They build budget requests. At the end of the day it's Congress that is going to make the decision about what gets funded to what levels and really sort of determines where we're putting our money as a nation into the military. Obviously, that's informed by the DOD but the decision makers are on the Hill. So, I think one of the things that we've struggled to do and succeeded to a large extent but really struggled to do was just fight for members' time, get them focused on these decisions really get them to a place where they could feel confident about making hard calls to cut away from things that maybe were programs where we needed to stop putting as much money into, understand the importance of some of these new investments we needed to make because at the end of the day, that was their power. They needed to use it. They needed to use it wisely. They needed to use it strategically. Congress has awesome power to exercise in that regard. I think an element of that, which I touch on, is a question of earmarks, Congressionally directed sending if we're using the politically correct term. I've fought about this with Senator McCain, but I knew it was a losing battle, but the reality is, earmarks were banned for good reason. He was not wrong that they had become a source of corruption. They need to be checked. My concern and the longer I stayed in the congress, the more I came to believe this, was that we had just thrown the baby out with the bathwater. At the end of the day, Congress's constitutional prerogative is to build the budgets that will fund the military, to raise armies and sustain navies. When Congress takes away the ability to say they think they have an idea that is worthy of funding, that the Pentagon is missing, or actively neglecting. Congress has to have an ability, to your point, to put money into something that they believe is strategically important. There are bad ways that this can play out, but there are ways in which I think it can play out very soundly where there just needs to be transparency, so that people know who is asking for what and why. Then these things can be evaluated on their merits and I think there are plenty of instances in the past where

you take a look at the beginning of unmanned aircraft in recent time, with the Predator and the advent of that. That began as an earmark because the Air Force wanted nothing to do with unmanned aviation for a long period of time. Congress eventually said we're just going to force it down your throat and establish this program.

That's not to say this is how it has to be all the time. I mean these probably should be the exceptions. The DOD is going to get a lot right, but Congress I think really emasculates itself when it takes away it's own power to direct resources to priorities that it believes merit greater attention than the Department is giving it.

MR. O'HANLON: Fantastic. So, now I'm going tot urn to Frank and then to Mara each for their own brief reactions to your excellent book. Then they'll each probably have a question or two for you as well. Then again, for the last 10 to 15 minutes, we'll come back to me to handle some audience questions. Frank Rose, over to you, my friend.

MR. ROSE: Well, thanks very much, Mike. Chris, great book. I can tell you're a former speech writer because it reads so easily, but it's also very informative and gets the key points out. I think after reading the book, my key takeaway is that you are trying to impart on the American people the fact that the United States has lost conventional superiority against China. I know this is very difficult for some Americans to accept, but I think it's true. I think you do a nice job at detailing how we have lost that capability, and how effective the Chinese in particular have been in developing these asymmetric capabilities. Anti-satellite weapons, offensive cyber capabilities, medium and intermediate range ballistic missiles to negate our conventional advantages.

So, on that note, I had 2 questions that build on those points. First, over the past 25 years, presidents of both parties in the United States have argued that America's conventional superiority allowed us to reduce the role of nuclear weapons in our defense strategy. That was a theme that was in the Bush nuclear posture review in 2002, in the Obama administration posture review in 2010. Now that we no longer have that clear conventional advantage, what are the implications for U.S. nuclear strategy, especially extended deterrents. We have a lot of politicians on Capitol Hill now calling for the Untied States to adopt a no first view policy. So, I would be interested in your thoughts on that.

Then, second, throughout the book, you rightfully note the importance of outer space systems to the future of warfare. Right now the United States is in the process of standing up the U.S. space force. As we stand up that force, what steps do you think we nee3d to take to ensure that the new service ensures the types of reforms that you recommend in the book? Thanks.

MR. BROSE: Those are two awesome questions. Thank you, Frank. First, with respect to nuclear weapons, your analysis is right. I think you could sort of look at the point that we're at right now and go a different direction than the one that I did, which is to say we are losing conventional military deterrents. So, we need to rely more heavily on our strategic deterrent. I don't go that way because honestly, that's not a world I want to live in. I don't think that it's a good outcome for us to kind of be left in a situation where every challenge that we have, every dispute that we have, be it with China or be it with another competitor, has to be escalated just to the brink of nuclear conflict or the threat of nuclear conflict as a way of maintaining deterrents. I think that we have to have that nuclear deterrent I think part of the challenge, which I touch on just very briefly in the book, is that while we have been de-emphasizing the role of nuclear weapons in our national defense and foreign policy, not just China, but Russia and other competitors have actually been going in the opposite direction. They've been building up. They've been modernizing. They've been relying upon these capabilities even more, not less. I think we've been slow to realize that, too. Personally, I go in the direction of saying we need to put the emphasis on re-establishing conventional deterrents and think differently about how we achieve it. I think that's sort of holistic re-thinking. Part of it is, like we touched on earlier, well, we'll just change kind of how and what we operate with, but as far as the goals, it's going to be 1995 all over again. We actually need to change our objections for the world that I think we're in and moving into. Then from that flows different ways of operating, different things that we would use to operate with, but really kind of re-asserting conventional, re-establishing conventional deterrents from the standpoint of how you build defense without dominance. I think we have the opportunity. I think we can do that. I don't think that is impossible, and I think it's possible even under the kind of fiscal environment that we're going to be living in in the foreseeable future. I think the challenge is we can't neglect the role of nuclear weapons in our national defense, particularly because we have adversaries that are relying upon the bore, but for me, the choice is not

well, we're losing conventional military over match. Thus, let's rely even more on nuclear weapons and the threat of nuclear conflict.

With respect to the second question, to me, space is actually the place where many of the things I write about in the book come together most, kind of poignantly. It's where the problem is most acute in a certain respect, that we have for decades have assumed that space was going to be a sanctuary for the United States and our military, that really no one was going to be able to affect us or touch us there. I think when you look at how technology is changing how we operate in space. It's also one of the areas that is perhaps being disrupted the most where we're now seeing more satellites launched year over year than entire decades before us, where the heavens are just going to be crowded with increasingly large numbers of small satellites, constellations all over the place. I think this is an area where technology is just fundamentally going to change how we operate. That's just thinking about it conventionally, right, sort of space as a way of gaining better understanding about what's going on on the earth, but these technologies are also going to allow us to really think about space as its own domain of military operations, where we will have things and people based on orbit. We will have bases on the moon. We will have manufacturing and supplies based in outer space. We will be conducting military operations, not just from space to the earth, but in space itself. That whole domain is going to become contested. It's going to become an expanded area of military competition. So, the question about Space Force, I was there for much of the debate about much of the creation of Space Force in the years that I was on the Hill. The Congress did not create the Space Force because they believed that things were going well for the United States in space. I think the real opportunity for the Space Force is to recognize that they have a political mandate from the legislature to think about this problem completely differently. That goes to how we recruit and retain Americans as part of this military force. It goes to how we acquire technology and build programs, how we budget for our operations, and ultimately, just how we think differently from a war fighting perspective, of how we think about space as a war fighting domain. I think all of that is on the table, and I think this organization basically needs to take a clean sheet of paper to each of these problems. I think if they come back with ambitious ideas for how to re-imagine America's role, really America's military role in space, I think they're going to find a lot of support for that on the

Congressional side. My sense with this administration, but I think the consensus extends beyond it, they're going to find a lot of support for that in American sort of senior defense circles, but again, this is an opportunity to really think differently about how we conceive of our operations in space, how we build forces, and they really have a clean sheet to get this right.

MR. ROSE: Thanks very much, Chris.

MR. BROSE: Mara, over to you, my friend.

MS. KARLIN: All right. Congrats on the book. It is a very smooth and thoughtful read as we discuss. There are three things that struck me. Feel free to respond to any or all of them.

The first is the diagnosis which I think is largely right. It is profoundly ironic that we are even discussing military dominance when you mention the last 30 years. Of course, at least two-thirds of that involved the U. S. military involved in the longest conflicts in contemporary U. S. history which had been at best inconclusive, but I think this is the point that Frank was to also, which is how do you get others to care. Right? I mean it's pretty grim. Yet, I think vis-à-vis, the sort of China problem. There's this failure of imagination for a lot of folks. Obviously COVID has, I think, shifted the thinking for a lot of people about the role of the military and the extent to which it should be prioritized. So, you're writing, I think, a book that is obviously being discussed by us sort of like walking, nerdy, national security types, but in many ways, it's a book that I want a whole lot of other sorts of folks to read, folks who haven't for the last 10 years been sitting in meetings and saying hey, this is looking really problematic. So, I wonder a lot about how you get them to care. I think your book is a really good first step in that.

So, then turning to prescriptions, there are 2 points that kind of struck me. There is a lot on technology. While I think that's right, I would have liked more to be built out on the talent management side, on the people's side. We're talking about having fewer and fewer people. So, what does that look like? There is this desire across the Pentagon, and I think you might concur, across the Congress to always talk about the stuff. Everyone gets excited about the stuff and where the stuff is made and what the stuff does. When we talk about the people, it's often in superficial platitudes. I think that's unfortunate and going to be increasingly problematic if kind of the capabilities of those people would be increasingly significant.

Then the third point is sort of how we think about pushing the change. Chris, I've joked with you that I found the book shockingly optimistic. Id o think to have been a public servant, you have to have a little bit of this optimism sort of deep in your soul. Otherwise, you'd feel like you're just running into a wall over and over for no reason, but the Pentagon has had strategies come out really since 2012 that have said, hey, we need to worry about this. Yet, changing incentives has just been profoundly difficult. Mike had referenced moving 5 percent of the budget. That sounds almost mind boggling; right? I think near the end of the Obama administration when maybe we were moving 2 percent in this direction, I thought it was a huge wind and that's obviously a little bit soul crushing. There is a lot of things that have been tried that you mentioned. Right? So, I've worked with budgets with Bishop's Funds where it says hey, compete with this special pot. That's nice, but it ends up usually being a really, really small pot. I think the Army and the Air Force have made some good changes in setting up futures command and then for the Air Force, setting up the war righting and aggression capability. That's all goodness, but it seems to me at the end of the day, you're ultimately going to get this big change that you're suggesting, only through this really meaningful civilian control, where you're getting folks who are willing to issue kind of blunt guidance, that says where to invest and where not to invest. Folks were willing to look holistically and willing to kind of make hard choices. That's obviously difficult for valid reasons and for parochial reasons.

So, I'm curious to hear your thoughts kind on all of

That and I would just wrap with a reference you had talked a little bit about, how the Pentagon does a budget request. Of course, Congress turns down many folks. In my department, myself included, occasionally wish to ignore it turns out that Congress has power of the purse, but what I've often found in these thousands of hours of budget discussions, was this constant debate over how much to put things on the table. Right? The view is well, we could put our views on the table, but Congress will never let us do "x" or "y". There is a lot of validity to that argument. I'm actually pretty sympathetic to that argument, even though I ultimately and fundamentally think it is flawed. I think it is incumbent on the Pentagon to put forth the vision, the request that it would like, knowing that it is going to get all torn apart. I'd be curious to just kind of hear your thoughts. What do you do about that, that tension that exists?

MR. BROSE: Those are awesome questions and I will try to do them justice. I would go, I guess, in reverse order. From the standpoint of the tension, you are the only person I found who came away optimistic from this book, which is good because I didn't want to write a book whose conclusion was basically, well, we're screwed. Pack up into little wooden boats and let's just all kind of evacuate the mainland. I did want to try to say, hey, look, there is a path here that we can go down. It's going to be really hard though. It's going to be some extent to be more about establishing those processes, even though we can't say like exactly what the right answer is right now, we can say that we've kind of put in place, processes that allow us to compete the right way to get to the right answer. I 100 percent agree with you that does not happen without serious sort of strong senior leadership in the Department of Defense because the military can't and shouldn't do this on its own because these are decisions that go far beyond the military. They impact the political, economic, social ramifications. They obviously have national policy ramifications. These are civilian decisions. They are not decisions that are sort of unelected or kind of unconfirmed members of the Civil Service or the bureaucracy can take on their own because they don't have the authority to. So, for the same reason this isn't something that they can or should do. These kinds of big changes have to come from senior strong, senior civilian leaders.

In terms of how to get those processes right, we talked about it a bit. Where I try to focus my recommendations in the book are not at if we buy this much artificial intelligence and sort of change some boxology here like, make these cuts, and we're going to be good, I think the problems are structural and more systemic than that. I think it kind of gets to what you were saying about. As I wrote this book, it was just shocking to me as I went back and looked at all the things that we had said and done, rather said for the past 25, 30 years and how strikingly consistent they are. I mean, the things that we were saying in sort of the early 90's and the mid-90's about network centric warfare and the things that, even in the midst of kind of post 9/11 we were saying, it was just so striking how we have been saying so many of the same things, but not actually doing as much of the things we said were important to do, which suggests to me this sort of failure to change has not been as a result of people not thinking about the problem right. I think many people were thinking about the problem right. The people in this call were part of that. It's that we didn't understand or we didn't actually manage to establish incentives that drove in the direction of the

outcomes that we said were important. So to your point about the Congress, yes, you will always lose every fight that you never chose to take on. I was constantly frustrated with the Department coming up nd saying oh, well, we can't do this because Congress wouldn't let us. I'd say, well, look, with respect, you're sitting in my office. I'm like, I'm not Congress but I work here. Don't assume anything is impossible before we have a conversation about it. I try to point out a couple of instances in the book where we actually were successful. Congress and the Department of Defense working together to do some things that at the outset you might have said not recapitalizing the J-Stars program. You might have said would have fit in that bucket of what Congress will never let you do that. It's impossible. There's too many jobs. There's too much political equity tied up in that program, but we were able to do it. I tried to walk through some things that I think that we did that enabled kind of the incentives to kind of align in the direction of the change that needed to occur. Again, to be clear, this is going to be really hard. It's not just going to be civilian senior leadership in the department that's required. You're going to need senior active sort of leadership from the Congress in all the right places to be very aligned. They're going to have to work on this as a team. My frustration in the Hill was that so often the senior ranks of the DOD and the Congress viewed each other adversarialy. There's plenty of reason for that. I get it. There's checking and balancing that's healthy in our system, but when those 2 sides were not very tightly aligned, it creased a massive scene that everyone could then jump into to exploit, take them apart, whether it was industry, whether it was parochial interests in the Department or others, it just created this wedge where one side was played off the other and I think ultimately the best outcomes didn't win the day.

To your question about people, I fundamentally agree. I didn't spend the time on the book. The challenge with a book like this is there are always things about the book that you don't get to writ. I tried to keep it short. I was on sort of a breakneck deadline, sort of people management, talent management was something That I just actively chose to stay away from because that's like a book unto itself. But at the end of the day, I think it is central to this. I do think that the way we recruit and retain members of the military and frankly members of our Civil Service and the Department of Defense is just antiquated. It's not going to hold up for the ways that people want to live their lives and structure their careers in the future and it's not going to get the best outcomes from a national defense standpoint.

We've got to get away from this sort of one size fits all. You will enter the military service and have an unbroken 20, 25, 30-year career. There just has to be more permeability for people to enter, to leave, to not be penalized for that, but actually to be rewarded when they go out and have a broadening experiences r experiences that make them better at their jobs and better able to come back in and add value from the standpoint of being an informed consumer of technology or a better manager of programs and people. I think we need to reward that and then symptomize more of it because I think people are going to steer away from that career if that is sort of the world's in 1975, being offered to people who just don't want to live their lives that way.

Back into your last question, which I think is the most important one, why should people care. Why am I writing this book, the question I mentioned to you I ask myself regularly in the process of writing this book. Why am I doing this? I think that it is a trickier argument to make. Know that the challenges, this is one of those problems that I think is sort of large and transcendent. It's not always the thing that is urgent today. So, whether it's kid of the war on terrorism or kind of COVID now, there always seems to be kind of a wolf closer to the door. Those are real. Those are challenges that we have to address but I think that we have to put them in a broad sort of framework or a broader prospective. Ultimately my opinion, one of the defining strategic challenges to the United States moving forward is going to be kind of the continued rise of China and sort of all of its implications. It's not the only challenge. I think there are other things there that are going to be important, that are going to focus the mind when it comes to defense strategy. To the question of why do we care? I don't think that tomorrow the United States and China are going to be at war with one another. I do think it's like the old adage of nuclear weapons. Well, how often do you use your nuclear weapons. Well, I use them every day to deter nuclear conflict, to keep bad actors kind of in their box. My concern about the world we're moving into is that in the absence of conventional deterrents, adversaries are going to begin making a very different calculus about what they can do in the world, how they can pursue their interests, what they can do to us and our allies, and people and places that we care about. We need to have sort of a more historically accurate and of fatalistic imagination about the world as it has existed as not necessarily the one we've been living in for the past 25 years. I think things are kind of tense and challenging right now, but t hey

can get a lot worse. I don't think that necessarily means, oh, well, it's like World War III. I think it's more about in the absence of conventional deterrents in a world where we have adversaries who actually think they're going to get their ways through violence. What does that mean in terms of how they're going to engage with us diplomatically economically? How are they going to use their influence against our allies? How are they going to try to pin us down, isolate us, deny us friends? I think that very slowly we could end up in a world that looks very different than the one we've become accustomed to, that looks a lot worse than the world we have today. If we can't imagine that is an actual outcome, I think that it makes it more likely that we end up there.

I don't want to go that direction. I think having the influence, having the friends and allies, having the ability to contest things and compete peacefully without having to resort to violence, aggression, coercion. I think all of that stems from having military capabilities that lead competitors in the world to wake up every day and say this really isn't a day that I want to pick a fight with the United States of America or its friends. This isn't a day where I want to risk brinksmanship or an act of aggression or something that I think maybe I could get away with. That, to me, is victory. Every day that we can go to sleep at night, having kind of kept the peace is a good outcome for us. So, I think that's ultimately the reason we have to change. All this second and third are consequences that stem from that.

MR. O'HANLON: Fantastic, Chris. Thank you, Frank and Mara. I'm now going to provide two questions that have essentially come in from the audience. I'm going to aggregate. The first set of question is, Chris, going to ask you to go a little further in terms of specificity about any changes you might advocate for process or structure, either on Capitol Hill. Do we need a 2-year budget? Should we merge the appropriations and authorizations committees? Are the intelligence and foreign relations and authorization committees properly demarcated and delineated in their responsibility?

There are also questions that have to do with the Pentagon structure, including whether the current members of the joint chiefs of staff should include the service chiefs, whether there should be some kind of a fundamentally different structure at the National Security Council. So, in that whole realm of government structure and process, I'm asking you an impossibly big question. So, I'm asking really just for 1 or 2 specific ideas that you might want to highlight here, encouraging people, of course, to read the

book for other ideas.

MR. BROSE: Sure. When it comes to process and structure, what I try to focus on in the book is what we've talked about here in terms of how do you realign the incentives so that competition and kind of experimentation leads you more likely to the kinds of better solutions to the outcomes that we're trying to achieve, the problems that we're trying to achieve, the problems that we're trying to solve. In terms of things that are more specific than that, kid of more structured reforms, I'll point out too. I became an advocate on the Hill for merging the authorizations and appropriations processes and committees. I think that the de facto reality for the past 20 years is that we haven't really had an authorization and appropriations process for the vast majority of what the Congress does. Defense is, I think, literally the last place where you have a separate authorization and appropriations process. So, de facto we have already been living in a world where authorization and appropriation has been consolidated. We seem to be doing okay with that.

From a defense standpoint, my concern with that divide is it creates a massive seam in the Congress that the Department of Defense can play the Congress against itself. This plays out every day. You literally have different parts of the department to deal with the authorization committees, vice, the appropriations committees. They are not allowed to talk to one another. They are not allowed to collaborate with one another. I think it would be a better, more streamlined outcome. I think we would spend a lot less of our time – I spent countless hours on the Hill working with, negotiating with, fighting with the appropriators, collaborating with them, synchronizing, getting into alignment. That's a lot of extra process which I'm not sure actually adds a lot of extra value. I actually think a unified process where you're looking at authorizing and appropriating, overseeing expenditure, making policy is the better way to go. We've kind of been doing that for most of the functions of government for the past 2 decades anyway.

From the DOD side, the biggest concern I have is where I see sort of ownership of problems and ownership of solutions out of alignment. That is sort of reform, I think. A lot of the acquisition reforms that we made in my time on the Hill where you had people who owned a problem, but they didn't sufficiently own the authority for solving it. Ne of the things that I kind of am most concerned

about when I look at the division is that we have combatant commands who own the problem in the sense that they have to be operationally ready. They have to build war plans. They have to be cognizant of the forces that they're going to need to execute the problems that they're going to have to solve, but they don't own the solutions for fielding those capabilities. Those lie with the services. I think that the process that we have to bring those 2 things into alignment through the joint staff, though OSD, is cumbersome and it doesn't work very well, which is why you continue to see short falls and critical capabilities that combatant commanders have been banging the drum on for years and years and years. I also think it's interesting when you look at new combatant commands that have been stood up, whether it's special operations command, cyber command, kind of was space command but now it's kind of migrated into becoming the space force. We've actually created operational commands with service like components and functions where you have sort of a merging of operational responsibility and organized train equipped responsibility. One way to look at that is well, we just kind of did it by accident. We weren't really thinking that we were kind of critically challenging the way we thought about these problems since Goldwater Nichols. I think the other way, which I tend to think of it is, no, we did this intentionally. The nation was making a decision that having a tighter alignment between problem ownership and solution ownership so that the person who had the accountability for the the problem also had the authority to solve it. It wasn't fundamentally reliant upon someone else who may have a different set of priorities, a different set of political realities and may not be interested in getting that individual everything that he needs. I think this is something we need to think about. I find it interesting at a time where joint all domain command and controls the reigning priority of the Department of Defense. We are still organized around territorial war fighting domains. There is something that is going to need a change in that.

So, I'm not going to offer sort of radical, crazy ideas. This is something I'm thinking about. It's more to diagnose that. I think there are disconnects between problem ownership and solution ownership where we're going to need to find better ways of tightening that up than the ones we've relied upon to date.

MR. O'HANLON: Fantastic answer. Last question has to do with what you might consider are the crown jewels of the country, the best technologists, and its best technology. Some of the

questions concerned how do we develop more human capital, building on the conversation you had with Mara a few minutes ago, but thinking even more nationally about that, to increase the talent pool at large from which DOD draws a fraction of the nation's best science and technology expertise. Again, another set of questions had to go with supply chains, export controls and how we make sure that we preserve robust American technology here in the United States and with American firms. Any comments on those 2 broad questions, please.

MR. BROSE: Yeah, I think they are actually quite related. The way I think of it is really from the standpoint of incentives. I think we have ended up in the situation where we have ended up, where so much of the best technology in the United States is not making its way fast enough and at scale into the Department of Defense, artificial intelligence and autonomy distributed, networking, things that members of our military use every day in their daily lives, in commercial products and services, that they don't have access to when they put their uniforms on. The fact that we have this disconnect that everyone keeps talking about between Silicone Valley and Washington, companies that don't want to work as much with the Department of Defense. I think this is the result of incentives that have existed for 20 or 30 years, some created consciously and some created unconsciously, but then that effect has been that when you aren't buying the technologies that you saw are important, when you're not actually helping them transition from interesting little science projects to established programs of record, when so many new entrants are just perishing in the valley of death between kind of interesting upstart thing to a real scaled field of capability, they're going to walk. That's what we've seen. You have seen companies, startups, engineers, investors exit the defense sector because it hasn't been a good investment. Unfortunately 30 years of evidence suggests that that's right. This isn't to say that you are going to be able to make the kinds of returns in defense that you are in commercial software, but you have to be able to do better than the sort of 2 percent margins that traditionally has been what the Department of Defense and Congress have been trying to squeeze t his industry down to. I think that if the Department of Defense and Congress are actually putting more resources into the technologies that we're now saying are going to be central to military advantage in the future, you will begin to see, I think, a similar transition. It's not all going to happen in 1 year, kind of what we're talking about earlier, but you're going to see more

sort of best and brightest engineers. I could actually create a successful defense company. I could build a successful defense product, and it could become something larger. It's a path for me to succeed and grow in scale. Investors are going to start saying defense isn't actually the wasteland that I thought it was. It's actually a place where companies can grow and succeed. So, I'm going to put more of my investment capital into funding them, founding them, enabling them to get off the ground, recognizing that it's going to be a longer process than some of the rest of my portfolio, but I think that's ultimately how you begin to attract this talent back into the defense work. It's not through sort of talking through the problems, like we're actually going to have to change the incentives. We're going to have to make it less hard, less time consuming, but ultimately and I think most importantly, we're going to have to make it a path to success and sort of growth for people who are doing this work, and I think once you start to see some success cases in that respect, you're going to see more people incentivized to get involved. So again, that process will play out for a long period of time, but I think it's about getting the incentives right and ultimately that comes down to where are we putting our money. If we're putting our money into things that are attracting talent and attracting new companies and new investors, I think we're going to see a lot more of that in the future.

MR. O'HANLON: Chris, I want to thank y*ou* very much. I want to thank everyone who tuned in today, remind you of this excellent book, "The Kill Chain." I don't know if it shows up backwards or mirrored on your screen. In any event, please consider purchasing it. It's an excellent read, as Frank and Mara and I all agree. I want to thank my colleagues as well, for the excellent comments and questions. Very best wishes with the book, Chris, with the company and with all you're doing for the country. So, we appreciate you joining us here today and best of luck and best wishes to everybody else as we launch this crazy summer of 2020. Hope it goes well for you all. Thanks and signing off from Brookings.

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