

**THE CARNEGIE ENDOWMENT FOR  
INTERNATIONAL PEACE**

**“THE TABOOS, SECRETS, AND HIDDEN HISTORY OF NUCLEAR  
WEAPONS”**

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MR. WILLIAM BURR: Good afternoon, thanks for being here. I'm Bill Burr, I work with the National Security Archive, I'll be chairing today's panel. This morning, we had a fascinating discussion of nuclear history. This afternoon, we'll continue discussion by looking at the – by looking at Taboo, Secrets and Hidden History of Nuclear Weapons. During the last 20 years or so, nuclear history as a field has come into its own. In the US and around the world, a variety of academic and nonacademic historians have made extraordinary contributions to understanding a very difficult, but highly important subject, such scholars as Barton Bernstein, Richard Rhodes, Martin Sherwin and Toshi Hasugawa, just to name a few have greatly advanced our knowledge at the dawn of the Atomic Age and the first use of atomic weapons. Others such as David Alan Rosenberg and Marc Trachtenberg have elucidated – used with the war plans during the early Cold War and nuclear sharing arrangements with allies. The nuclear history field includes exceptional studies of the Soviet and Chinese nuclear programs by David Holloway, Steve Zaloga, John Lewis and Xue Litai, and on the British program by Stephen Twigge, Len Scott and Margaret Gowing. I can go on in the same vein citing other topics and war authors for example Scott Sagan on Nuclear Crisis and Accidents, John Clearwater, on Canadian Nuclear Weapons, US Weapons on Canada, George Perkovich, on the Indian Bomb, Avner Cohen, on the Israeli Bomb, this is only some of the literature and includes the important literature produced in East Asia and Western Europe.

And, of course, there is a large area of secret histories prepared by government historians around the world. As rich and fascinating as the nuclear history literature is, it's always been extremely challenging, even daunting literature to produce - to do the research - of the secrets that states want to keep, secrets about nuclear weapons are at the top of the list. Some of the secrecy may be necessary, this relates to the most dangerous weapon ever produced, ever known to humanity, but the degree of secrecy has always been contested, government officials, scientists and other scholars have argued for years over how much of the secrecy is necessary, desirable, or even possible. In some countries such as the US and the UK, the political culture has made possible, some degree of openness about nuclear policy. Nevertheless, secrecy remains an important problem and important areas of US nuclear history remained hidden. No doubt the nuclear history will always be an upward struggle far into the future.

Today, we have three speakers, whose names could easily have been mentioned in my brief review of historiography. Their efforts to work through and around the US Government's classification, declassification system have produced works of great accomplishment. They have forced readers to think of new ways about the complex issues of nuclear weapons deployments, nuclear weapons use, and nuclear war planning.

Now, our first speaker would be Robert S. Norris, Stan Norris, who was a Senior Scholar --- Senior Research Associate at the Natural Resources Defense Council. After

Stan, we'll hear Lynn Eden, who is an Associate Director for Research and a Senior Research Scholar at Stanford University's Center for International Security and Cooperation. After Lynn, we'll hear Nina Tannenwald, who directs International Relations Program at Brown University's, Watson Institute for International Relations, International Studies. There's more details on their -- these are in the book, you can get the rest of their great resumes in the program. So, we'll start off with Stan. Stan Norris.

MR. ROBERT NORRIS: Thank you very much. I have to apologize again here for my voice, which -- a very bad timing to catch a cold. Let's see here -- Bill, we need to start off the -- yes, okay, here we go -- well, Joe Cirincione asked me to summarize the history of the nuclear era in ten minutes and I don't like to disappoint Joe, but what I thought I'd do instead is to try and provide a way of looking at the discipline of nuclear history. So we will start off -- always good to start off a quote by Winston Churchill telling us how important history is in our understanding of things. How do we get the rest of it there? Keep holding it -- there we go, oops, went too far, okay. So rather than go through all of the different countries nuclear histories, what I thought I would do is break up policy into four different kinds and use those as windows to examine the histories of these countries very, very quickly. So it's a perspective to look at the current countries, and by examining them we can assess what we know or what we don't know about these countries. It's a way to enter into this difficult topic and define a research agenda.

A nation that decides to develop and then possess nuclear weapons must eventually adopt I would allege four kinds of policy - declaratory, acquisition, employment, and deployment, and by the way, I borrowed this idea from Lynn Davis who wrote about it 30 years ago in the Delphi Paper and I have always found it useful to kind of separate things out and help define what we are talking about.

So let's quickly in my brief ten minutes that I have here go through these four different kinds of policy

First is Declaratory Policy, those things that are expressed in public by officials like Mr. Joseph at lunchtime, and they deal with a host of different issues, why the nation chose to develop and possess nuclear weapons in the first place, why it needs to currently retain them, why new ones may be necessary, and most of this, of course, falls under the rubric of deterrents that this is the basic reason offered for why nations need nuclear weapons. Declaratory Policy also covers how the weapons might be used. In the United States, this has been quite refined over the years and public statements about massive retaliation or flexible response and so on, first use assured destruction, countervailing strategies, all of this is the lexicon of declaratory policies over the years in the United States. Declaratory policies also have to deal with proposals about decreasing the dangers. Again we heard some of that in the lunchtime talk whether there are arms treaties or confidence building measures, notification procedures such as hotlines or notification about forthcoming missile tests. So declaratory policies then cover all of these, they are made in public, they serve many political and psychological purposes, and

they're directed to several audiences and send signals to adversaries, allies, and domestic publics.

A second type of policy having to deal with nuclear weapons called acquisition policy. This area has to do about money and resources. It focuses on the techniques of how to research, develop and produce weapons, how much is it going to cost, and how are we going to mobilize the resources to do it. This is done in either a public or a secret fashion and decisions have to be made about how many weapons are needed, how they'll be purchased and produced and the range here is from very open in terms of the United States with elaborate congressional committee hearings, budget documents to the highly secret decisions of Soviet Union, China, North Korea, Israel, South Korea, South Africa, openness is definitely the exception and in this area in terms of looking at the histories. The participants in acquisition policy are military services, whoever has to build them whether they are corporations or their counterparts, relevant bureaucrats, legislators if that's applicable, the media if that's applicable and so on. So, depending on the country some or all of the participants weigh in to determine the above questions. acquisition policy also has to do with the technical features of the weapon, cost, state, performance and so on.

A third type of policy having to do with nuclear weapons is employment policy. Employment policy establishes the goals and determines how nuclear weapons would actually be used, it concerns real war plans. It creates scenarios for use, targets, frequency and timing of strikes, yields of weapons, projected damage levels. The actual plans themselves, of course, are among the most secret of all information known only to a few in any country.

In the United States, Single Integrated Operational Plan -- (SIOP) -- was the main US nuclear war plan for strategic forces and of course there are normally differences between what leaders publically state the declaratory policy and what is actually in the operational war plans. This, of course, has to do with a host of issues, command and control, who is authorized to use the weapons, how did the orders go forth, how would it be carried out, nuclear footballs in briefcases and Russian counterparts.

The fourth kind of policy is deployment. Of course, this is entwined with employment and acquisition, and declaratory as well, but it describes basically that nuclear order of battle, where are the forces located and at what sites within the nation's borders or at what sites in foreign bases, on the high seas or under it, weapons are in missile silos, strategic bomber and tactical air bases, submarine and navy bases, and so on. The US had the most extensive deployment of its nuclear weapons among the countries; they were in all but a few states, numerous territories and possessions in more than 15 foreign countries and on the high seas.

Dramatic changes have taken place since the end of the Cold War in terms of consolidation and reduction of this deployment scheme. For the most part it's largely secret, the general policy of the United States government and all the others basically is to neither confirm nor deny their presence anywhere but, of course, much can be gleamed

about where nuclear weapons are in a host of ways that bear on treaties perhaps nuclear weapons accidents and a host of other reasons.

Anyway, those are the four types of policies and what I'm suggesting here is it's a kind of template to then examine the different countries, the United States, Soviet Union/Russia, Britain, France, China, Israel, India, Pakistan, North Korea and South Africa and decide how much is known -- this is a very, very subjective chart here on a basis of one to ten with ten being the most and one the least or zero, about how much is known about these different types of policies in each country.

So, just quickly, if you look at the United States, we have high marks in really all four areas, the highest of all of the countries. In Russia, we have -- again, you can make up your own numbers here and we can talk about it, but it's a way to focus here on deciding how much we already know or where we can apply research efforts in the future to find out more. In places like North Korea, we know virtually nothing about any of them, for example. So as my ten minutes comes to an end I will just close with a, what's called a Venn diagram, I think it's called, which suggests another way of looking at nuclear history and it has to do with the sharing of knowledge over time among the powers that have gained nuclear weapons. The size of them is roughly the number of tests that have been conducted, so the United States conducted 1,030 tests and the Russians - Soviets 715, the other it's not quite to scale, but you get the idea and it shows the overlap either intentional or unintentional, unintentional would be espionage for example, of the ways in which knowledge from day one from 1945 on, has been shared with other countries of the world.

So, the United States we see there is an overlap with Russia, so this is the espionage scandals of Fuchs and Ted Hall and so on. Britain is sort of a wholly own subsidiary of the United States here - inside the United States starting with the Manhattan Project and of course since 1962 testing in Nevada and sharing all kinds of data in renting our missiles. So, anyway, I think this is a visual way of seeing how proliferation has occurred over time overtly, covertly, above board, below board and I didn't bring in the other countries that shared in this Canada, which is a non-nuclear country, of course has a role in all of this, as do many others, but these are just among the countries that have gotten the bomb. So, I think at about ten minutes here my voice is out and I look forward to your questions afterwards.

Thank you.

MR. BURR: Thank you Stan. Next will be Lynn Eden.

MS. LYNN EDEN: Thank you Bill, it is nice to see you. I am going to base my few minutes today on this book, *Whole World on Fire* that I wrote and was published last year by Cornell University Press. I think that this falls under the category of 'secret and hidden' in our title, in our panel title today, and I would say in terms of what Stan just said, what I am going to talk about is one underpinning of US employment policy, that is US nuclear war planning. *Whole World on Fire* is about a puzzle. The question I ask is

how and why for the entirety of the nuclear age from 1945 to the present, the US government has seriously underestimated the damage caused by nuclear weapons in its strategic nuclear war plans. Specifically, why did the government develop the ability to predict blast damage, but did not take - did not and does not take into account the firestorms or mass fires that would result from the use of nuclear weapons?

Let me say at the outset, that *Whole World on Fire* is about an unobvious organizational or inter-organizational failure to understand the physical world. More broadly, it's a study in how organizations develop knowledge about their environments, define their tasks, and choose the problems they seek to solve and to limit potential solutions.

I am not going to get outside of this case whatsoever today, but you can see that there is a potential here to look at other kinds of organizations as well. My argument, too simply stated is that organizations solve the problems that they set out to solve and in so doing, they can reduce the likelihood of solving even more important problems, how this happens is the focus of the book.

I will do just two things this afternoon. First I will explain why this matters. In particular, I will explain the magnitude of the underestimate of damage. Second, assuming that I am not past eight minutes at that point -- and Bill kick me if I am -- I will provide a very small amount of historical illustration.

First, it's generally understood that Hiroshima was subject to tremendous fire damage caused by a firestorm or mass fire, which is a term that physicists generally use. In this photograph of the damage at Hiroshima, not only was a large area blasted out, but it was completely scoured by a ferocious firestorm that began within minutes of the detonation. This was a dense city of many structures, with the exception of some monumental buildings, which we can see here, everything was rapidly burned down - blasted and burned down, and these buildings were gutted by fire. This map shows the extent of damage from the mass fire. The radius of damage was a little over a mile, the area is generally estimated as 4.4 square miles, what is called severe blast damage was for this yield 15 kilotons roughly about the same as the fire damage. It's less well understood that Nagasaki also was subject to mass fire, everything in red here is fire damage. This is a picture of Nagasaki taken by the Japanese photographer Yamahata from which the book jacket is taken, you can see smoldering rubble everywhere, however, such damage was and still is completely ignored in US strategic nuclear war plans. I mentioned that the bomb at Hiroshima was 15 kilotons and at Nagasaki it was 21 kilotons, or the equivalent of respectively 15,000 tons and 21,000 tons of dynamite.

Starting in the early 1950's the United States and Soviet Union, each developed much higher yield bombs in the hundreds of kilotons and low megaton yields. I will do something a little bit a - unhistorical well lets say, its current history or hypothetical history. Let's look at a fairly typical contemporary weapon of 300 kilotons, and I am going to show you how damage was and is calculated by US nuclear war planners. This is an example using an aerial photo of Washington, DC, so it's obviously hypothetical.

US war planners don't plan to bomb Washington, but I am using it as – as a not untypical target that could be near any urban or suburban area. So, here is the Pentagon, here is the Capitol Building, here is the White House, here is where we are today at the Reagan International Trade Center and to the north is the Carnegie Endowment building. Here is the area of severe blast damage against a pretty massive industrial target from a modern nuclear weapon. I see a – I see a target here in the audience, so this would be a 13Q7 target. So, it would be say, a chemical, very heavy chemical manufacturing plant. This is the damage the US war planners, this is the blast damage and the only damage for targeting purposes the US nuclear war planners predict. I will fill in these specifics in a moment, I just want to give you the spatial intuition right now. Here is a larger notional area of blast damage from the same weapon, also use the same, also a prediction used by nuclear war planners. Here is the area of mass fire damage from the same weapon. This is the damage that US war planners do not predict.

You can see how much greater is the range of fire damage than blast damage, indeed, it would be reasonable to extend the range of fire, another mile up to 4.5 miles, which would cover everything in this photo except for the corners, but as far as the government is concerned, this fire damage simply doesn't exist in bureaucratic planning, it's not predicted, and it's not there. Here is a closer view just so you don't – you don't lose my point, virtually everything here would be consumed in a firestorm.

Okay, how did this happen? I am actually not going to be able to summarize a decade of work, I can do it in 30 minutes, I can't do it in ten, but I will give you just – just a tiny sketch of it. Basically, I claim that when it came to US nuclear weapons, and nuclear weapons effects, the US government was the prime shaper of knowledge, that's not surprising we would expect that, yet the government drew on three professional communities that existed long before the invention of the bomb, indeed they existed long before mobilization for World War II. The first community was by far the dominant one, this group of highly qualified engineers and a few physicists focused on predicting blast damage. They – this is a group that was in – mobilized during World War II, they predicted blast damage from conventional weapons. The template was focused on precision bombing in an association of blast and precision targeting. So, it was just – it was a kind of tight association and this notion carried over after the war and many people did as well. The effort was large, successful and resulted by the mid 1950s and the government being able to predict nuclear blast damage for use in war planning.

In the same early post war period, there was some effort, very little, to predict fire damage. For various interesting reasons, the effort was not successful, and I am not going to be able to provide any color, but this was a very interesting group of people, ranging from fire insurance engineers, foresters, chemical engineers, but they were not able to transfer that knowledge to the physical scale of nuclear weapons. The result was that fire damage was considered - not only could the government not predict it, it was considered to be not predictable. So, there was an interesting interaction in that the predictability of blast damage and the unpredictability or the apparent unpredictability of fire damage reinforced each other.

In the late 1970's, a third approach was developed. A small group, largely physicists, a group focused - built around – Hal Brodes work at a Santa Monica consulting company called RDA, which had broken off from RAND, focused on predicting both blast and fire damage under government contract of course. Importantly, this group developed an entirely different and very effective way to understand and predict fire damage, and they put both fire damage and blast damage together in a single knowledge laden routine, an algorithm that the government could use. This method of prediction was politically savvy, computationally powerful, and in 1992, the government almost decided to adopt it. It did not – there have been further studies since, but it's essentially shelved and to this day, to my knowledge, fire damage has not been incorporated into US strategic nuclear war planning. Okay, I will end there.

Thank you.

[Applause]

MR. BURR: Okay, thank you Lynn. We will hear from Nina next.

MS. NINA TANNENWALD: Imagine if you - well a virtual PowerPoint. There is a big mushroom cloud up there with a big red X through it. I am talking about the Taboo part of the title today, a nuclear taboo, and I am going to talk first about the origins of the nuclear taboo, and then the implications of the taboo for nonproliferation. My starting question today is why nuclear weapons have not been used in the last 60 years and how we might avoid their use in the next 60? One answer is deterrence, but deterrence is clearly not the whole explanation for non-use, because it can't account for cases of crises or conflict where nuclear states face to non-nuclear adversaries, but did not use nuclear weapons.

Another answer is a taboo, a nuclear taboo, a widespread inhibition on the use of nuclear weapons stemming from a powerful sense of revulsion associated with such destructive instruments of war.

In a book I have written called the Nuclear Taboo, coming out in early 2006, I traced the origins and rise of the taboo and its influence on US leaders. I argue that it has played an important role in constraining US leaders resort to use of nuclear weapons since 1945, so in the book, I am essentially challenging narrow conceptions of deterrence. Now, a sense of revulsion is not itself a taboo of international politics. There is a political and historical process by which this taboo developed and took hold in international relations. Let me mention very briefly four factors that contributed to the origins of the taboo.

First, was an early precedent set by President Truman, both domestically and internationally that established nuclear weapons as different from other kinds of weapon, this was putting nuclear weapons, atomic weapons under civilian rather than military control, and internationally and proposals to the UN for international management of atomic energy.

The second factor was the tasking of the UN to pursue nuclear disarmament in 1946, and this established the UN as a permanent institutional forum for the collective delegitimization of nuclear weapons. That is the UN essentially institutionalized anti-nuclear weaponism. Non-nuclear states have played an important role in this and this has been one of the UN's ongoing roles. Now this kind of anti-nuclear agenda politics was reinforced by Cold War power politics between the Soviet Union and United States, where the Soviet Union tried to delegitimize the weapons of the West and in doing so helped to scare people about nuclear weapons and nuclear war.

The third factor – third factor contributing to the origins of the taboo was the creation of the category of weapons of mass destruction which is now an issue of some debate today, and this was defined by the UN in 1948, to include atomic, lethal chemical and biological weapons, radioactive materials and any weapon developed in the future with comparable effects. So, this is an old category, not a new one, and this became an important category and important exclusive category in which the taboo took root.

Finally, a fourth factor in the – in my mind perhaps the most important is the key role of a global grassroots anti-nuclear movement and anti-nuclear public opinion. Anti-nuclear groups and you were talking especially about the rise of an anti-nuclear movement in the mid 1950s, which peaked in the late 1950s, early 1960s and then again the rise of the largest anti-nuclear movement ever in the early 1980s. These groups essentially castigated the bomb as unacceptable for use by civilized nations. Now these groups were advocating disarmament and disarmament has largely not been achieved, but the single most important legacy of the anti-nuclear weapons movement is to make it impossible to think about nuclear weapons as just another weapon that is they shifted their discourse on nuclear weapons.

Starting in the 1960s, the taboo then began to become implicitly institutionalized in arms control treaties and institutions; this was driven by the superpowers' increasing recognition of a mutual interest in the non-use of these weapons. There are two effects of this taboo.

First, it has undermined deterrence between nuclear and non-nuclear states. General Chuck Horner, commander of the air war in the 1991 Gulf War said that the threat to use nuclear weapons against a non-nuclear state was no longer credible and I think this view is quite widespread.

Second, it has reinforced mutual deterrence between nuclear powers that it is – it has helped to undergird stable nuclear deterrence. Okay, that's the taboo implications for nonproliferation, I am moving along here. Historically, the nuclear taboo in the nonproliferation norm has been mutually reinforcing. Initially, the fact that nuclear weapons remained in the hands of a very small number of states in the 1940s and 1950s helped to buy time for normative opprobrium regarding nuclear weapons to take hold, that is if nuclear weapons had spread very quickly early on, it's much less likely that a taboo would have taken hold. The stigmatization of nuclear weapons in turn facilitated

the creation of a nonproliferation norm by the late 1960s and the nonproliferation regime further inhibited the spread of such weapons is not to – to specifically to technology, but to normative legal and institutional barriers and so thus reduce the chances that nuclear weapons might be used.

Today, the taboo with the sense that nuclear weapons are illegitimate is fundamental to the future of the nonproliferation regime. A prohibition regime cannot be sustained over the long haul by sheer force or coercion or physical denial. It requires an internalized belief among its participants that the prohibited item is illegitimate and abhorrent, and that – and the prohibitions must apply to all.

What is the status of the taboo today? Although the taboo is widespread and I think the taboo unused is reasonably strong, the state of affairs today is somewhat troubling for the taboo. We see a US interest in building new generations of nuclear weapons, Russia's return to greater reliance on nuclear weapons in its defense policies, heated rhetoric from India and Pakistan in a series of crises since 1998 that persuaded nuclear weapons by North Korea and possibly Iran, the dismal failure of the May 2005 NPT Conference.

What explains the state of affairs? There are numerous factors, but let me just highlight one, the absence of a grassroots anti-nuclear movement. Arms controls NGOs today are toiling heroically in the trenches, but there is no widespread public movement to put pressure on governments and to hold them accountable for their nuclear weapons policies, this is especially the case for the United States where there is really very little domestic cost to the administration for its nuclear weapons policies and I think until there is a kind of widespread anti-nuclear movement, we are not likely to see very much progress on the US nuclear policy.

Indeed, US policies lead to the question that Thomas Schelling, 2005 Nobel Laureate in Economics posed very eloquently in an op-ed article on the nuclear taboo in *The Wall Street Journal* on October 24<sup>th</sup>. Schelling asked, "Does the US administration think that the taboo is in the US interest?" by this he means the Bush administration. In the 1950s, the Eisenhower – the Eisenhower administration did not think so, Secretary of State John Foster Dulles argued somehow we have to get rid of the taboo on the use of these weapons. Every subsequent administration - the possible exception in this, Nixon, has thought that this taboo is in the US interest. Today, the Bush administration is very unclear on this issue.

All right from this what follows, what should we do to strengthen the taboo in order to survive for the next 60 years? Let me mention three sets of measures.

First, the frequently stated recommendations to decrease the role of nuclear weapons and security policies to minimize the value of possessing them and to avoid developments that blur the line between nuclear and conventional weapons. A declared No First-Use Policy and a ratified Comprehensive Test Ban would be important steps in this direction.

A second set of measures has to do with democratizing domestic policy making on nuclear weapons, and this gets to the issue of internalizing the taboo domestically within a country and this would include support for a civilian-nuclear analyst and arms control group and other groups in civil society, as well as public education on nuclear weapons. It is also suggest the creation of government bureaucracies mandated with an institutionalized interest in arms restraint. Why not have a bureau of the nuclear taboo?

Finally, we should pose the question to government leaders about whether the taboo is in the US interest. I encourage journalists and others in the audience to pose this question directly to officials, not only in the US, but also in India, Pakistan, Russia, and other nuclear and aspiring nuclear powers. We need to have an open public debate on this issue and on the role of nuclear weapons in security policy more generally. There is very little public debate and there is very little government accountability to citizens. So let me conclude by saying, if the nuclear taboo unravels the end of the nonproliferation regime is probably not far behind.

Thank you.

(Applause)

MR. BURR: Thank you, Nina. We have heard three very interesting presentations. They raised a lot of questions and I am sure you all have questions. I am sure you all have questions about our very interesting presentations we just heard, any questions from the floor? Could you come to the mike and identify yourself please.

Q: Clay Moltz from the Monterey Institute. I thank you all for your presentations. I would like to ask Dr. Eden about her – about the implications of her findings for today because I was aware of this issue about the fact that the fire damage was not considered in original SIOP calculations and what not from Stephen Schwartz's book, I just taught that to my students actually a week or two ago. What I was not aware was that this had been factored in today, and what I am wondering is do you have any information about considerations today of revising those kinds of calculations because - for example, the NRDC, you know, had this presentation about two or three years ago saying that, you know, one Trident submarine would kill 50-70 million Russians, you know, depending on the weather conditions and what not, which would suggest that, you know, overkill, to say at least understated. So I am curious. Do you have any evidence? I know that when you know Ash Carter was trying to look at the SIOP, I mean there were a lot of questions about even getting the target sets. So, you know, do we have any sense of how the calculations are made today and is there any effort to try to implement the kinds of ideas that you suggest?

MS. EDEN: Let me be completely transparent. When I worked on the earlier period, I was deluged with documents, it was a mountain of documents, in part thanks to Bill, who liberated quite a few obviously legally through FOIA procedures as you get closer and closer to the present you become more and more dependent on – basically on

interviews, you can use newspapers, you have to read those very carefully, and interviews, and as you get even closer to the present the interviews tail off into just a few sources, so what I am saying I can't – I cannot speak with the same level of confidence of that I can for the earlier period.

My understanding is that the US does not currently take fire damage into account. I think that – I think I wouldn't want to state my life on it, but I am – I am comfortable enough saying – saying it here if I would be corrected I would be delighted to know that, but no one has told me that I am wrong on that. So the methodology is the same standard methodology that predicts blast damage as part of the probability of kill calculation that goes into the calculation of damage expectancy, so, it's - there is not a difference. Now, there has been study out at strategic command – in the decade of the '90s some very serious interest in, after '92, in trying to do these predictions. But as far as I know, those study groups and there is some study currently going on as well, has not resulted in a change in nuclear targeting plans, it's considered to be quite far off if ever – this is what I have been told.

Q: Thanks for a very provocative and interesting panel. My question, I am Kennette Benedict from the Bulletin of the Atomic Scientist. My question follows on Jonathan Schell's observation this morning that we still have a strategy for using nuclear weapons, even though the political relationship is changed for which that strategy was first built that is the relationship between the US and Soviet Union. From your presentations this morning, which you have taken from what could be called - kind of ordinary organizational bureaucratic theory, I mean, your presentation of all of the kinds of things that go into making these decisions about nuclear weapons just I think brought that home to us.

Could you comment on the fact that in a way the nuclear weapons bureaucracy is actually quite normal - that is - that it's normal just like any other government bureaucracy. There are very few that have died or been put to death. The Law Enforcement Assistance Administration I think is about the only one that I can think of, federal government agency that has gone away. So I am interested in how much of this is really kind of still organizational routines and what would it take then do you think to reduce our dependence on nuclear weapons as a part of our own strategy if this kind of bureaucratic and organizational routines are so well entrenched?

Thank you.

MR. NORRIS: Again I guess that was addressed to me. The previous question you brought up a study that we did a couple of years that was presented here about the SIOP and if you could just focus on that in that bureaucracy, I think your point is well taken about the momentum of all of these things. These bureaucracies who keep doing the things that they had been told to do until they are told otherwise. What we concluded in that study was that one of the main engines of the arms race, one of the things that kept the whole thing going was this war plan. The war plan is very demanding, it is creative and says that you need 'X' number of warheads to kill these kinds of targets, and so on

and so forth. So the military goes about its business in very carefully developing it and running it through computers and thus on and on it goes even though as Jonathan said this morning here the political situation is totally changed.

Our conclusion at the end of this study and one that we still hold today was to abolish the SIOP to make the engine halt and stop the momentum. They haven't listened to our advice yet and they continue to do not only the traditional targeting against Russia and China, but we are finding out apparently new kinds of targeting against other countries. So, I think you can only come from the top through fundamental change. And here we are 15 years into the – past the end of the Cold War, and these bureaucracies grind on day in and day out doing what they are told to do.

MS. TANNENWALD: I have -- Kennette mentioned only she says the one agency that's been dismantled, and there has actually been another which is relevant to my story which is the US Arms Control and Disarmament Agency which was established in 1961, and in my book plays an important role as a voice for restrained and self-restrained especially arguing against the Atomic Energy Agency in terms of arms control. We now – I had mentioned one of my recommendation is to create institutions within governments mandated with institutional mandate for restraint. We in this country have been dismantling those, so in 1997 Act was dismantled and folded into the state department and then in July of this year, the Bureau of Arms Control was itself dismantled and has now turned into the Bureau for International Security and Nonproliferation. The word Arms Control is now gone, which means the notion of self-restraint has been removed. Where does the taboo discourse in the US government lie?

MS. EDEN: I would take a slightly different approach, but a little bit closer to Stan's, which is that I think in order to change the kind of – the routines of bureaucracies in this case would require – absolutely would require a presidential attention and a real direction all the way down, not enough to say do something, you would have to task people to really make sure that this was done. That said, if you would have a big change let's say in the way nuclear employment is done, you would need leadership from the top of the strategic command, and I don't think that that's at all impossible. So, I think it would take a combination of very high level and then very high level within the bureaucracy, and then just a kind of grinding effort to make sure that those changes are implemented.

So, Nina will talk about an outside strategy, I think Stan and I would talk - well you actually did an outside strategy, I think there - given outside pressure it is possible with presidential attention very high level to get change within.

MR. BURR: Howard?

Q: My name is Howard Mueller. During the decade of 1980s, I spent full time working in this anti-nuclear movement that you were talking about, and in addition to traveling all over the country and giving talks to local organizations, I had the job here on the Hill of preparing voting records of members of Congress on issues that we were

promoting and I discovered – what was to me surprising that whether a member of Congress was going to vote for or against nuclear weapons is very easily predictable on the basis of one factor, and one factor alone. You probably don't know what I'm going to say, population density of the district, but this is a - there is - a pro-nuclear culture is rural and suburban, the anti-nuclear culture is urban. And if you throw this together like they do for Congressional, for Presidential things - for the every state takes - the winner takes all in every state, you get the same blue state / red state phenomenon. But it breaks down within states to urban versus non-urban, and so I think this is more of a statement than a question. But if you want to revive the anti-nuclear movement, I think you have to understand that its basically a cultural conflict between urban and the non-urban culture in the country.

MR. BURR: Thank you, next question please.

Q: I'm Diane Perlman, Co-chair, Committee on Global Violence and Security for Psychologists for Social Responsibility. I have a question for Lynn and for Nina. For Lynn, when I was in – this summer I was in Hiroshima and Nagasaki for the 60th anniversary and one of the many really disgusting things I learned was that when they were choosing cities to target they were advised not to conventionally bomb them so they could just use nukes on them so that they could study the effects and that there were also - there was another plane with instruments to measure effects so, I guess, there was some interest on the effects, but obviously the question that I guess - I would like your comments on that, but also I don't know whether you go in to the issue of denial, psychic numbing, group think, that goes on with lot of things and also overconfidence in success certainly gripped by overconfidence and denial and rejection of information about negativity.

Do you want to answer that?

MS. EDEN: What I do is not on the social psychological level. I certainly believe those phenomena exist, but I, but I would agree with Kennette that these are - I don't think there is actually anything very special going on. I hate to say these are just dedicated, very capable soldiers doing war planning, people you would like to have as neighbors. So I don't think that there is – I don't think there is actually a psychological story here, I think it's above the psychological level that this occurs, might sound odd, but that's how I see it.

MR. BURR: Thank you.

Q: Thanks for a good panel, Bill and others. I'm Daryl Kimball with Arms Control Association, which is one of the remnants of the anti-nuclear movement, you know, that still is working on this and I wanted to ask the panelists to respond to a recent debate about the taboo, which has had a very, I think, positive results, which is the debate about the Robust Nuclear Earth Penetrator, which contrary to some expectations in 2002 has been defunded by the Congress and there have been really two in my analysis – two things going on here, one is a specific debate about the use of a weapon in a specific

circumstance, which seems to me to be different than most of the nuclear policy debates that we had over the last several decades which are about broad policy and strategy and it seems to me that when policy makers on the Hill, military planners get down to the specifics of do I actually want to use this weapon to destroy a specific target and I look at the collateral damage, there is a different result.

So, what I wanted to ask is from your historical background experience, what other instances do we see where there might be a different outcome when the policy debate is centered or pivoted around a specific instance and I think it was Stan, or perhaps it was Richard Rhodes in the session earlier who picked out the instance in 1963 after the Cuban Missile Crisis where the military planners were thinking about numbers, and they came to a different conclusion based on the specific experience the Cuban Missile Crisis. So that's the question. I mean how does the outcome differ depending on the context of the decision, whether it's specific or general?

MS. TANNENWALD: Can I ask you a question? I mean I actually don't know the real reason why - I mean why this was pulled - I mean I'm not convinced that this weapon has gone away, and we don't know the or I don't know the internal reasoning for why the Pentagon decided to pull the request for this, so I think it - in my view, you know, it is a good step for the taboo in the sense that we are not going to build this weapon at least for now. I'm not convinced that's really gone, however, ideally if this were really a good step for the taboo what you would want to do is have President Bush go to Hiroshima make a speech saying we are not going to build the Robust Nuclear Earth Penetrator because, you know, it violates the taboo, it makes nuclear weapons seem more usable, you know, creates new generation of nuclear weapons that as you want to take the occasion - make opportunities to create meaning that enhance the taboo, and this doesn't do that right. It was basically presented as whether this weapon isn't really feasible. It doesn't quite do what we wanted to do in the way we wanted to do so, you know, but if we could find a weapon that would work, we would build it.

So, there are those implications. They are not - I don't know enough of the back stories so, I can't fully answer the questions.

Q: I acknowledge that, and the decision to drop the program was really a decision made by Pete Domenici rather than the Department of Energy and the news is still to come out about, you know, where the administration really stands on that. It's my understanding they still would like to see the ARNP, but the political decision makers on the Hill have come to the conclusion that, you know, this is not worth that cost, in my analysis it is not worth the financial investment, and they are looking at the specific problem of defeating certain kinds of targets in all their alternatives and this seems to be a conclusion if you look at this if they are coming to.

MS. TANNENWALD: Uh-huh.

MR. NORRIS: In your remarks Daryl, I thought of the - I mean it's the basic paradox of possessing nuclear weapons that you have to make the other side believe that

you are going to use them, and this one really was the centerpiece of that because to talk of all of these underground targets and everything, and then that really pushes up against the taboo here, that it gets people excited here that, oh, my goodness, they really might use them. So, I think people fled from that and I think you are right the specificity of the debate around this thing. It got a lot of bad press and people used those arguments over and over. And it remains to be seen what the story is combined – it seems - maybe it will make a return in some other guise. But for the moment it looks like a positive development.

MS. TANNENWALD: Another example is the neutron bomb of 1977.

MR. NORRIS: That's a good example.

MR. BURR: Please, next question.

Q: Bruce Unger, Randolph-Macon College. Given General Horner's comments about the minimal or lack of utility of nuclear weapons and the threats of nuclear weapons against nonnuclear weapon states. Can you use your historical perspectives to find any examples when the threat of the use of nuclear weapons has either deterred or compelled non-nuclear weapon states from activities that the United States opposed?

MS. TANNENWALD: That's a really good question and we don't have great research on that. There is I mean the examples we could be talking about are China, you know, North Korea and Iraq we - you know, there are - it has been argued that US nuclear threats during the 1991 Gulf War deterred Iraq, that evidence is very flimsy though and I think we don't really know whether they were deterred or not. There is now more research out on the - on China and North Korea and there were some evidence there that they expected a nuclear attack, but if there is not strong evidence that they were deterred by a nuclear threat.

Q: On the North Korean case, in the spring of 1953, General Eisenhower believed that the threat that was supposed to be communicated via India to Mao Tse-Tung convinced the Chinese to end the deadlock at the talks in Panmunjom. But, in reality, Prime Minister Nehru said he never delivered that message and there is no evidence that – that was delivered.

MS. TANNENWALD: That's right, I mean that story has pretty much been refuted, that the timing was wrong, that Eisenhower did make the threat, but the Chinese had already basically made the decision to concede on the negotiation so the timing doesn't work out right. They didn't – they really had already made their decision before the threat was made.

MR. BURR: Anyone else want to jump in or –

MR. NORRIS: No. You jump in too Bill.

MS. EDEN: It's a great question, yeah, Bill you want to take crack?

MR. BURR: Pardon me?

MS. EDEN: You want to take a crack?

MR. BURR: No, I think what you said on Korea I think, you know, I have nothing really additional to say but maybe later. Next question please?

Q: Caleb Redden, Department of Defense. I want to ask you a quick question about the endurance of the taboo you spoke of, you talked about discourses that helped it – for you to sort of form and trench that taboo, I think you spoke about them to some extent in isolation from other discourses that they no doubt must compete with or that are reinforced by or sometimes obscure. I was wondering if you could talk about the effects of competing discourse that are prominent in current dialogue you know for example counter-terrorism discourse or pro-democracy discourse and the effects that they might have on the endurance of the taboo.

MS. TANNENWALD: I'm not sure that I see those as competing discourses, democratization or – well, I guess a discourse that I see as problematic for the taboo is – a discourse associated with I would say a – sort of the ideology of American hegemony, which is that the taboo no longer applies to everyone or to all nuclear weapons, it applies only to certain states.

So that, you know, the rules that apply to others don't necessarily apply to the United States. So other countries should not use nuclear weapons, the United States reserves the right to use nuclear weapons to deter or respond to the use of chemical or biological weapons or nuclear weapons by others. So that, I think, is somewhat of a shift in the taboo. It doesn't necessarily apply perhaps to us, but we can actually use nuclear weapons to enforce norms against barbarians, that I would see as a competing discourse. I don't – I don't know how widely spread that is within the government or whether it's going to become accepted or not, but it certainly is a discourse that is out there.

Q: John Hilborn, I'm a Canadian scientist. What is the present status of taboo against the first strike option?

MS. TANNENWALD: Against the first strike? – well, the United States does not have a No First-Use Policy. So we maintain the right to use nuclear weapons first.

Q: What about the others?

MS. TANNENWALD: Russia has returned to – to a First-Use Position after - Russia declared a No First-Use Policy in 1992, and has returned to a Policy of First-Use at recent years largely because of perceived weakness in conventional forces. China has had a No First-Use Policy since 1964, and will likely maintain that. India has declared a No First-Use Policy although now in 2003, it changed its policy in imitation of the US, it

reserves the right to use nuclear weapons against chemical and biological weapons. Pakistan does not have a No First-Use Policy, so it varies.

Q: Looks like there is an opportunity for a leadership in that respect?

MS. TANNENWALD: Absolutely.

Q: Hi, Lee Moore from the Center of International Trade and Security, you listed three things that could help –

MS. TANNENWALD: Tell me?

Q: Yeah, sorry, three things that could help to bolster the nuclear taboo. I took that those were more geared towards the Western United States, audiences are the public. Is there any way we could use the nuclear taboo for states like Iran?

MS. TANNENWALD: Well, that's a very good question, and we don't know, I think, whether the taboo – whether Iranian leadership -- a taboo -- I think the taboo is nearly universal, but maybe not entirely. We don't really know. I think it's possibly held in India and Pakistan, but it's not very well internalized. I think one thing we want to do is ask the Iranian leaders. As I suggested, I think one thing we want to be doing is posing the question to leaders in general about whether they think the nuclear taboo is in their interest and whether what – whether they think their policies support the taboo. Now, I think, you know, it's – if we require some sort of research in looking into Iran and thinking on this issue and you know, I can't give you a good answer to that – to that and I don't know if anybody can, but it's certainly a very important question.

MS. EDEN: Let me jump in for a second. Part of what's difficult here is – it is that Nina is talking about a taboo that has held since the bombing of Japan, the behavioral taboo. It's a description of what has happened. And I think you are talking about internal attitudes in crisis decision-making. But US Declaratory and Employment Policy is not based on a taboo. It's based on this credibility of letting these things rip and under circumstances that are hard to imagine that nobody would want to use. So having this threat and having a taboo at the same time, these ideas are intention, I think, that actually both exist. But this is not a simple world here. This is really quite difficult to – it's very complicated.

MS. TANNENWALD: Yeah, I know that's a very important point because in my research I am looking at how top political and military leaders thought about using nuclear weapons in a crisis, and in many occasions, presidents didn't really consult the SIOP. The SIOP is there and the military knows about it and they have plans for all kinds of things, but when it gets down to the crunch, you know, what do top leaders think about? And so there is a disjunction between how they think about nuclear weapons when they are under pressure to use them and what's in the war plans.

MR. BURR: Question please?

Q: Hi, my name is Helen Tong. I am from the University of Virginia. I have a question for Ms. Tannenwald. You mentioned the importance of grassroots levels and open discourse and I was wondering how do you suggest we stimulate public debate over this issue without being perceived as alarmists?

MS. TANNENWALD: Yeah, scaring people is always a good start. I mean that's really a hard question, and I would probably want to throw this one back to the – the activists and advocates in the room. I mean there's – you know, I think there is a number of reasons we can point why there isn't much of an anti-nuclear movement. Obviously, 9/11 has changed things quite a bit. I think Americans have a very hard time thinking that their nuclear weapons are really a problem. But there wasn't a big anti-nuclear movement even before 9/11, and public opinion - if you look at public opinion polls, they help explain why there isn't a movement. While American public opinion, about 60-62% supports nuclear disarmament, there is also majority support for retaining nuclear weapons, because there is still a strong belief that nuclear weapons provide security.

So there isn't - you know, the public is mixed on this issue and there isn't that sort of some catalyzing event that's getting people out on the streets, and you know I don't really want to wish for some terrible event that will mobilize people, but I think you know, it's the – arms control groups and organizations, I mean, they sort of reaching out to the younger people is something that's very important. I teach at Brown and my students are all interested in globalization and economic development and human rights and saving the Third World War, and nuclear weapons haven't been as big an issue on their agenda. I think they are coming back a little bit now, but it's something that we are going to have to work on.

MR. BURR: Next question please.

Q: I am John Burroughs from the Lawyers' Committee on Nuclear Policy. A very interesting presentation on taboo and as I am sure you know there is a – there is an international law piece of it – International Court of Justice in 1996 said, the threat or use of nuclear weapons is generally illegal for various reasons, indiscriminate harm, and so on, but I have a question which goes back to the interesting discussion you started just a couple of minutes ago, and that is, how doctrine and planning plays out in the government.

I had a conversation with somebody at the National Security Council a few years ago and we were - I was with others, we were challenging him on the 1995 Joint Nuclear Operations doctrine, and he said oh, that's a just a bunch of colonels running around, you know, don't worry about that, we will keep that stuff closely held in you know in National Security Council or at the White House. Well, Hans Christensen just did a story in the Arms Control Today, which created quite a stir about the new draft joint nuclear operations doctrine which has a lot of very provocative stuff in it about possible scenarios for nuclear use, first use of nuclear weapons against chemical, biological capabilities, et

cetera, scenarios which were not excluded by earlier doctrine but which we are not really spelled out in this way.

So I would like comments from any of you about how you think this kind of decision-making goes on in the government and the importance of doctrine?

MR. NORRIS: We should let Hans to take the question perhaps, but well again we know the different levels of decision making that have to go on to implement all of this, I mean it does start with some presidential guidance and eventually some sort of national security decision directive, and it goes through the different levels through the Pentagon and eventually ends up as a war plan in STRATCOM and elsewhere. So for the Bush administration, it's now taken about four years for all of this to begin happening and really have a reality in the real plans themselves. And much of it has to do with this global strike mission, which now means that we can attack, you know, any target, anywhere in the world in a fairly rapid fashion and some melding together of nuclear conventional forces. And if we look back at the nuclear past review, this is sort of the defining statement that I don't think they ever meant to actually publicize. I think that was all supposed to happen quite in secret, but it got out and gave them a lot of bad publicity. And we have learned a lot as a result of that which we should, but it is all those colonels working away because they had been given tasks from their superiors to develop a contingency plan to strike North Korea. I mean period, that's it, and they go about and do it and they put it on the shelf and its there.

One dramatic difference here is that in terms of my - four different kinds of policy provisions, which are absolutely beyond me here - they decided to make this preemption which they are very proud of saying, part of the Declamatory Policy, and now they didn't have to go ahead and say that they had this First Use option, which was always there before - which was always there before, but was always unstated and never said. But this just drew attention to what I think is something that gets carried out in real war plans. I mean those are the vehicles by which these intentions get transformed into real things with real weapons and bombs and missiles and how many, and so on.

So I think we are pretty far down the road in the Bush administration and the implementation of all of this as Hans has discovered and you know it has a long history, I mean, within a decade its been going on and its just the Bush administration began earlier than that in its formulation.

MS. EDEN: Let me just very briefly say that whenever someone says to you it's just a bunch of colonels running around that you should be very suspicious. I think in some sense when it comes to the military, its colonels who make the world go round, so they are very, very important people, I think of it as, let's say the whole nuclear war plan and the resulting deployment and alert levels, so our Employment Policy, you can think of it as a very high performance car. The colonels have built the car, in large measure, and you get to a crisis and the President wants to be briefed and says, you know, well, I want to put on the brakes. But, you know, how do they work? Well, it's the colonels who have designed this. There are many, many things that are known at lower levels that

aren't understood at higher levels and that's part of why Bill could have also called this panel a dangerous world.

Q: Hi. I am Amy Wolf from the Congressional Research Service. And, first not to put in a plug for a colleague, but I have to get the back story on INAP. Jonathan Medalia from CRS is running around here today, and he probably has a pretty good insight; you should track him down. I am going to disagree strongly, but I think it's a matter of style as much as substance. I do not believe there is a nuclear taboo, I believe there is a nuclear threshold, and the threshold always has been high. Now, I read your article in the international securities. I may know more than people in the room, but to put it in the realist perspective which you just – or which you didn't quite dismiss, but you want to replace, it's a cost benefit analysis. And one of the costs of making a decision to use nuclear weapons is the international outrage or the domestic outrage or the, "Oh my God, we broke the threshold" or whatever.

You seem to see that is being outside the threshold first you make your decision and then that tamps you down, I see it as being inside the decision making process, but having said I don't agree with you, I agree that whatever it is the threshold or the taboo is diminishing these days, and the reason for it is because of the difference in the cost benefit analysis in the good old Cold War days if we shot nuclear weapons, they are going to get shot back at us and the cost were very, very high. Today, if we shoot nuclear weapons they probably won't get shot back at us at least not in more than a once choosy type of fashion and there are those in the decision making process who see that cost as not being too terribly high when compared with the alternatives.

Now, to turn to the issue of public outrage or people taking to the streets, I also don't buy that has any impact at all on the nuclear planning process, it may have an impact on the radar that they got at the White House, but not the planning process. Seven hundred and fifty thousand people took to the streets of New York in 1982, and we didn't get a nuclear phrase. We had 80% or 90% approval ratings in the polls for the Comprehensive Test Ban Treaty. We don't have one. So, I understand the desire to reinvigorate Arms Control and Disarmament Act of this community when we are in a room full of people. But I don't see, (a), a reason to do it, and, (b), that would have any effect. And I'd really like to know how you think that might have an effect in a world where it's just not on anybody's agenda, but no matter what the numbers look like, it's just not important enough for anybody to take to streets.

MS. TANNENWALD: Well, I will send you my book. Just very quickly, I do think that the taboo operates instrumentally that is, it imposes a normative cost, I mean, you can have decision makers who feel its consequences, not because they personally hold it, but because other people hold it. So, for example, Nixon -- I don't think he shared the nuclear taboo, and one of my cases is the Vietnam War. And so I looked at how Nixon thought about it. You know, Nixon was like proud to claim that he thought about using nuclear weapons several times. He didn't personally share this, but he was constrained because other people, his own advisers, the rest of the world, the international community basically shared this. So it certainly operates instrumentally. But I think - I

think there is quite strong evidence that it also operates typically -- that is, if some people have internalized it -- and that they hold it substantially. We believe this is wrong, it's immoral, it kills too many people, this is just wrong, we don't do this, and I think I provide actually quite strong evidence for that.

MR. BURR: We have time for two more questions, so please keep them short. Thank you.

Q: I will try, though. Thank you. Stephen Schwartz, unaffiliated, but the editor and co-author of Atomic Audit.

Bill Arkin said years ago, and may have said it more recently, that nuclear weapons are like cockroaches: they run when the lights come on. And the lights, in his view, are democracy, and he feels very strongly that nuclear weapons and democracy cannot coexist, which brings me to my question.

What does it say about nuclear weapons and nuclear weapons policy that those - that the plans regarding the production, testing, and perhaps use of nuclear weapons must be kept secret, or that the bureaucrats who control all this believe they must be kept secret to the point of lying to the very people that are supposed to be protected by these weapons? What does that say about weapons? And perhaps a counterfactual for any of you who care to answer, what might have changed if there had been more openness and accountability from the get-go with regard to pick whatever your topic is, the deployment, the use, testing of these weapons? And do you believe that nuclear weapons and democracy can coexist?

MS. EDEN: I think they do coexist and again in a very complicated way and I think it's just a kind of really wonderfully juicy research area to get into. I think that there is a great tension, but it's not the only area of democracy where there are secrets and stands subjective rankings of what we know - we know a lot more about our programs and that has to do with being a democracy than anyone else knows about anyone else's programs.

MR. BURR: Last question?

Q: I am Allen Barrington from the University of Denver. I am one of those former Air Force colonels that wrestled with this problem you are talking about from the inside. And after wrestling with it for about ten years, ten years ago I came to conclusion, it really wasn't the weapons, it was the strategy behind the weapons. And my question is this: why is it permissible to kill people with conventional weapons, such as we did all across Japan and Korea and Vietnam, and in Iraq to a degree, killing with conventional weapons, but not nuclear weapons, and what was the difference? Would you like to address that? In other words, we're all here about nukes. But isn't our underlying strategic doctrine to target civilians or make some acceptable collateral damage? That's the real problem.

MR. NORRIS: Well, I think things have changed since World War II. I mean we thought nothing of the strategic bombing and burning down of cities. Curtis LeMay burned down most of Japan and would have targeted those last few cities that were held off the target list, having been told not to. So, I mean we don't do that any more. I mean we don't really, really just bomb civilians.... We all heard Rumsfeld tried to the best of his ability to say that these targets were very precise and we have the weapons that just hit that. And, of course, there is still going to be collateral damage, but we didn't level the whole – the whole neighborhood the way we did in World War II. So that norm has changed as well.

And as far as nuclear weapons, I mean there is something special and different about them, and we have internalized what that is, and there is a special abhorrence about them, and interestingly, I think, partly to these considerations of the taboo.

MR. BURR: I think this ends our presentation. I would like to thank the panelists for giving great presentations. We appreciate it and thank you.

(Applause)

(END)