Assessing the U.S. Strikes on Iranian Nuclear Facilities

June 23, 2025
Featuring David Albright
Hosted by Mark Dubowitz

GOLDBERG: They're working on the delivery system, not just to hit Israel or Europe. They want to hit the continental United States. Can't allow that to happen.

TALEBLU: The Islamic Republic means what it says when it says, “Death to Israel.”

LAPID: Eventually, we will attack Iran's nuclear facility because there's no other choice.

HULATA: Israel cannot allow Iran to go nuclear. Israel is committed to defend ourselves by ourselves. And we will do whatever it takes with whatever we have so that Iran does not become a nuclear power.

DUBOWITZ: This is “The Iran Breakdown.” So, let's break it down. David Albright, wonderful to have you here.

ALBRIGHT: It's good to be here.

DUBOWITZ: David, you're a physicist. You're a weapons inspector. You've been doing this for decades. I've known you for twenty years. I can't believe we've been working on the Iran issue for that long, so I want to welcome you to “The Iran Breakdown.”

ALBRIGHT: Thank you.

DUBOWITZ: David, let's break it down. I think everybody out there, the real question is not the success of the strikes but also the concerns about what's left but before we get into that I'm going to talk a little bit about your background because you've been working on these issues for many, many years and you were one of the few experts around the time of the Iraq war who was deeply skeptical that Saddam actually had a nuclear weapons program. Tell us a little bit about that and then also about your work on Iran and maybe the difference between what you found back in the early 2000s and what you've seen with respect to Iran's nuclear weapons program since.

ALBRIGHT: It does go quite a bit back in time. I mean, it goes to the early– late summer, early fall of 2002. And we had information that the evidence of the Bush administration, which centered on aluminum tubes, was not any good. And I'd first heard about it from an International Atomic Energy Agency colleague in 2001 who basically said that that the evidence was being spun up. And we were a different kind of organization, so it was hard for us to get our message out. But essentially, we went, I went and talked to various centrifuge experts because the whole claim was the aluminum tubes would be made into centrifuges that then would spin and give Saddam the ability to rapidly make weapon-grade uranium. And the CIA called it the Zippe-type centrifuge. I went to Gernot Zippe, who I know. He was one of the founders of the whole centrifuge operation. And he said, “This is ridiculous.” I mean, we had a close colleague who consulted with Oak Ridge, who said that it's just not true. And so, we, I tried to get that across, but we learned that we need to be more effective because the real trouble was, it wasn't that no one knew, it was that the voices that did were suppressed. And so it really is an issue of getting your voice heard.

Now, while that's going on, the Iranian opposition group, NCRI [National Council of Resistance of Iran], said, oh, there's a nuclear site near Natanz and also Arak, and in Iran. And we could quickly find this site near Arak, it was a heavy water production plant. It took some work to find the site near Natanz and the opposition group had said it's a fuel fabrication plant.

And so I had to kind of use our sources and methods to find that it was actually a gas centrifuge plant. And we've been looking for that plant for a couple of years. And what I did is I teamed up with CNN and they confirmed the finding that it was a centrifuge plant. And then they did a spot featuring our work in December 2002. And interestingly, Zarif was the one brought on as, UN, Iran's ambassador...

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DUBOWITZ: So this is Javad Zarif, who was former Iranian foreign minister, but before that was the ambassador to the United Nations, who negotiated the 2015 deal with Obama.

ALBRIGHT: That's right. And he was sort of brought on to deny it all, but not completely. But it actually helped the International Atomic Energy Agency, which had stalled out. Iran, they knew about this. They were approaching Iran, “let us in, let us in.” Iran said, “Okay, next month, next month.” And we decided to go public because it just got ridiculous. And the Director General's office was nervous at first. But after the story appeared, they called me and thanked me. So it helped. And what it did is it forced Iran to admit to having this enrichment program. So it's not a – this is like Iran had this massive secret enrichment plant.

The IAEA [International Atomic Energy Agency] continued to work and led by Olli Heinonen, who you know well, and they found one secret site after another. Some were missed. There was a, you know, Iran was playing the old game of, we're caught, so why don't we admit 90 percent and hide 10 percent? And what the 10 percent they were hiding was their nuclear weapons program.

So, for example, the Fordow enrichment site, which was part of the nuclear weapons program, they hid. And we didn't know about that. We just knew about Natanz. And it was the same with the International Atomic Energy Agency and U.S. intelligence. So in the telling the truth, they were also lying. But it was a massive, massive secret nuclear program. And there were major undeclared activities and materials that led to a UN Security Council resolution in 2005 or so that they violated their safeguards agreement.

DUBOWITZ: So you were deeply skeptical that Saddam had a nuclear weapons program. No one listened. But you became increasingly concerned about Iran's nuclear weapons program.

ALBRIGHT: And no one listened.

DUBOWITZ: And no one listened.

ALBRIGHT: We couldn't get the Bush administration to pivot. I mean, the most we could get out of him, and it was David Ensor at CNN, was a comment sort of, “Well, after we deal with Baghdad, we'll deal with Tehran.” And they were slow to the game to really try to find ways to confront what Iran was doing.

DUBOWITZ: So fast forward today, I mean, you mentioned what we knew, what we didn't know, and I think that's on everybody's mind, is what do we know and what do we not know in the wake of these strikes by the United States and Israel against Iran's nuclear program? So I want to jump right into that, and then we can provide some more history and more context as we talk about the various sites.

But you mentioned Arak, you mentioned Natanz, you mentioned Fordow, three major sites that were targeted by Israel and the United States. The question that is on many people's minds is, that's great it looks like an operation of real incredible tactical brilliance. But if we lost strategically, in other words, is there hidden material, hidden centrifuges, hidden capabilities, nuclear weapons scientists who've not been taken out by the Israelis? And all that Iran has to do is wait and work covertly at developing a nuclear weapon somewhere in some bunker, in some tunnel that we don't know about or that the United States and Israel haven't targeted. How worried are you about that?

ALBRIGHT: Not that worried. I mean, I think you have to be realistic about what you're trying to accomplish, and you have to be systematic. What has been accomplished is to pretty much destroy the Natanz underground site, the pilot site. You're talking 15,000 centrifuges, most of which are advanced centrifuges.

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DUBOWITZ: And David, and just to understand, because I want to go site by site, because we're going to go really technical on this "Iran Breakdown" episode, because I think there's too much discussion in five minute soundbites on major media and not enough opportunity to go deep with one of the foremost technical experts. So talk about Natanz. What was at Natanz before the strikes and what's your assessment of what's left standing?

ALBRIGHT: Well, Natanz was the workhorse of the enrichment program. It's where they would make the up to 5 percent enriched uranium. And it has about fifteen thousand centrifuges, so it can make quite a bit. But if you're going to make weapon-grade uranium, which appears to have been Iran's intent which I can explain a little later, but 70 percent of that effort has to take place at Natanz and so if you knock that out you've knocked out a great amount of their capability to make weapon-grade uranium.

DUBOWITZ: And David why does 70 percent of that effort have to take place in Natanz rather than at Fordow or some other facility with a small number of advanced centrifuges, enriched material that they can then take to weapons-grade? Why is Natanz so important to the Iranian nuclear weapons program?

ALBRIGHT: When you're enriching, it's not a linear process. I mean, you have to expend a lot more effort to go from, let's say, natural, 0.7 percent, to concentrate that up to 4.5 percent. It just takes more work. But if you wanted to go from, let's say, sixty to ninety, you only need about 1 percent so it's 99 percent of the way there. So even though it looks like a big gap sixty to ninety in terms of the enriching the increasing the concentration of the in the isotope that's desired is uranium-235 it's not much effort at all and so Fordow becomes important, as it was originally designed, it was designed to make weapon-grade uranium. It was called the Al Ghadir Project under the Amad Plan. And it was going to get its 5 percent enriched uranium from Natanz. There was a formal document between the Amad Plan people and the Atomic Energy Organization to provide the 5 percent enriched uranium. And then in this much smaller facility that has no more than three thousand centrifuges, they would take the 5 percent and turn it into ninety.

DUBOWITZ: Okay, so just to look back, just for our viewers to understand. So you've got yellow cake, which you mine, and you turn that into uranium hexafluoride. That conversion takes place at a facility called Esfahan, which we can talk about through a conversion facility, correct? You take that uranium gas, and then you move it to Natanz. You then enrich that to 3.67 percent.

ALBRIGHT: Or well, whatever it is.

DUBOWITZ: Or whatever it is, 4.5 percent.

ALBRIGHT: It's been four and a half.

DUBOWITZ: 4.5 percent, right. And that's the workhorse. So that's generating large quantities of four, 4.5 percent enriched uranium. You take that stockpile and then you move that to Fordow.

ALBRIGHT: Or that's right. And some of it was moved to the pilot plant to make 20 percent.

DUBOWITZ: The pilot plant at Natanz.

ALBRIGHT: At Natanz.

DUBOWITZ: Right.

ALBRIGHT: And also 60 percent. It one of the for a couple of years, it was Iran was making the 60 percent at a fairly slow rate. But last December, it decided to take its 20 percent stock and enrich most of it to 60 percent. So it went from several kilograms or so a month to over thirty five kilograms a month.

DUBOWITZ: And that's done at Natanz.

ALBRIGHT: That was done at Fordow. Okay, so.

DUBOWITZ: Natanz is the workhorse that takes the 4 percent.

ALBRIGHT: Makes the 4 percent.

DUBOWITZ: Makes the 4 percent. It also has a facility that can make the 20 percent. It then takes that stockpile, goes to Fordow, takes that 20 percent to sixty. And Fordow is also where they'll take it to ninety, which is weapons-grade uranium.

ALBRIGHT: That's right.

DUBOWITZ: So you're saying that with Israel, the United States destroying the Natanz facility. And it sounds like even the IAEA has confirmed that that the facility both above ground and below ground has been destroyed. They've essentially destroyed the workhorse of the nuclear program that you need for 4 percent and for 20 percent

ALBRIGHT: Yeah, and the 20 percent was also being made at Fordow. But the point is that the number of centrifuges you need to go from five to twenty and then onward is a lot fewer than what you need to make the 5 percent. And again, some of this Natanz was supposed to be a civil facility only making 4.5 percent, 3.5 percent to be then sent back to Isfahan to be converted into uranium oxide to go into reactor fuel.

And one of the signals that something is really amiss is Iran didn't do that in the last two, three years. It was producing 4.5 percent. It was then converting it into 20 percent. And then and then in the last six months or so, really accelerating its conversion of that enrichment of that material to 60 percent. So it was all screwy. And that's not a peaceful program.

I mean, there's no need to go to 20 percent at that amount, let alone 60 percent. So in a sense, we characterized it at my institute as like a slow-motion breakout that they wanted to get into a position to be able to make a considerable amount of weapon-grade uranium in as short of time as possible in the least number of centrifuges. And before the bombing, they reached a point where they would have been able to use just maybe five, you know, let's say a thousand centrifuges, maybe a seventeen hundred, the ones that all the advanced centrifuges at Fordow and be able to make enough for a bomb in a few days and enough for nine within a month. And so that capability is now gone.

DUBOWITZ: So that capability has been destroyed. Now, I know a lot of folks have been concerned. There have been satellite images a few days before the initial Israeli bombing of Natanz that trucks pulled up at the Natanz facility. And the assumption is that material and equipment was taken out. Are you – do you assume that what was taken out were centrifuges and enriched material? And if so, isn't it possible that Iran pulls out the centrifuges, takes the enriched material and then diverts it to some clandestine site where they've built another enrichment facility under a mountain in a tunnel and from there, they can use the centrifuges and the enriched material to produce the weapons-grade uranium they need for a bomb?

ALBRIGHT: Yeah, and that's the worst case. I mean, in terms of what the trucks took out, we don't know. I mean, I assume they've been moving the stocks. The 6- percent were both at Isfahan and at Fordow, and a little bit at the pilot plant. And the pilot plant material was destroyed.

DUBOWITZ: At Natanz.

ALBRIGHT: At Natanz. And we believe the, I believe the Isfahan, the material Isfahan in Fordow was probably moved early on. And that these bombings have been trying to destroy infrastructure. And we have to keep this – in sort of, in a structured or think about in a structured way. You want to make the main sites inoperative. You want to do permanent

damage to parts of them that are bottlenecks for reconstitution. And then you have to deal with the stocks. I mean, Israel could have gotten lucky. And when it bombed Esfahan the first time, maybe it could have destroyed a lot of them. At one point, a couple of years ago, when the IAEA was still reporting on the quantities, 85 percent of the 20 percent and 60 percent was in one building at Esfahan. And that building was targeted by Israel in the first attack of Esfahan. But I would assume they moved it out.

DUBOWITZ: Let's talk about Esfahan, David. So we have a sense of Natanz that's destroyed. Esfahan has been a very important facility. It didn't get a lot of attention in the media in the initial days, but explain to us what is at Esfahan. Our understanding is that there's two conversion facilities, but also there's, as you said, there's a stockpile of enriched material that is likely buried in tunnels. There's also been recent reports. I think it was Rafael Grossi, the Director General of the IAEA, who said just recently about a potential third enrichment facility sitting at Esfahan. That came as quite a shock to me because I never assumed there was another enrichment facility sitting at Esfahan.

ALBRIGHT: Yeah, no, I didn't either. And Esfahan historically was one of the first undeclared questionable activities of Iran, but they were buying uranium conversion capabilities to go from natural uranium to uranium hexafluoride. And they were getting help from China. They were in the process getting a lot of undeclared uranium of various types. And it took them a long time to make that main conversion facility. And most of the enriched uranium, or much of the enriched uranium, well, most of it, that we've seen produced at Natanz and Fordow, depended on uranium hexafluoride from the uranium conversion.

DUBOWITZ: Okay, so that's gone. There's another facility.

ALBRIGHT: Let me just– and then Iran was adding things to the site, fuel fabrication capabilities, making fuel for the Tehran research reactor. It added metal lines so it could make enriched uranium metal.

DUBOWITZ: Talk about the metal, because that's obviously a very – it's a key bottleneck for a nuclear weapons program.

ALBRIGHT: Yeah, and that's right. And so it was part of the Amad Plan, and they had finished a pilot plan.

DUBOWITZ: So the Amad plan was a plan for a structured nuclear weapon?

ALBRIGHT: Well, I don't use the word structured.

DUBOWITZ: Okay.

ALBRIGHT: I think it was just a crash nuclear weapons program. And the reason I don't use it is because then what came next? And it creates this false dichotomy, which I think partly lies at the heart of the failure of the U.S. intelligence community to properly assess Iran, which is it looks at Amad as what Iran would restart. It wouldn't restart an unstructured nuclear weapons program. It wouldn't have an unstructured nuclear weapons program post-Amad. So Amad was a well thought through crash nuclear weapons program to make five nuclear weapons, four delivered by missiles. But it got scared and it shut it down. But also at that point, it wasn't able to make weapon-grade uranium.

DUBOWITZ: They got scared after the United States invaded Iraq in 2003.

ALBRIGHT: That's right. And so they also had no source of weapon-grade uranium. And the IAEA was really pressing them on and finding secret sites. And I think they were scared that the IAEA was soon to find the secret sites associated with the Amad plan. And they knew they could go in a sense in a go in a more reduced way, more covert, and deal with the bottlenecks. The principal one was producing weapon-grade uranium. And now they've managed, ironically, at the same site, Al Ghadir, they now, until recently, developed the capability to actually start with natural uranium and then make weapon grade uranium at Fordow. But they could accelerate the process by running 60 percent through to get them a

jumpstart on the amount of weapon grade uranium they had. So it started as a nuclear weapons production site. It sure looked like one by before this– the bombing attack started.

DUBOWITZ: Okay. So jump back into Esfahan. So we have this facility that takes yellow cake into uranium hexafluoride that gets pumped into centrifuges and then enriched to higher levels. But we also have this conversion facility that takes weapons-grade, 90 percent enriched uranium, turns it into uranium metal.

ALBRIGHT: That's right.

DUBOWITZ: And you need uranium metal for a nuclear warhead. Do you need that also for a crude nuclear device?

ALBRIGHT: Yeah. You can do it otherwise, but it's extremely difficult. And I don't think it's ever really been done in practice.

DUBOWITZ: So isn't that a critical bottleneck and node in the nuclear weapons program?

ALBRIGHT: It is. And I should have probably finished. I got diverted. So Iran knew– learned how to make metal, but it had never made it out of uranium when they shut down Amad. And later the Atomic Energy Organization creates facilities at Esfahan to make enriched uranium metal and then tested it a couple of years ago and then stopped. But it alarmed the kind of the international community that cares about this, the Europeans, the United States, Japan, that why would Iran have a capability to make enriched uranium metal? And they tried to concoct some reason, but it made no real sense.

And so it was one of the first sites taken out by Israel. The first attack went after that metal, enriched uranium metal conversion facility. Now, we don't know for sure what happened to the equipment that was in, the pilot plant was called Shahid Mahallati. And where is that? Was that rolled into the Atomic Energy Organization?

We know the military centrifuge program run under Amad was run into the Atomic Energy Organization. The IAEA was able to establish that and so is there other equipment that didn't get rolled in and has been in storage and it could have been stored at this facility Turquz-Abad which had all these shipping containers of old Amad plant equipment and materiel. So there is an uncertainty but knocking out the facility at Esfahan to first order creates a bottleneck and so you and that's the first things you have to do is destroy the infrastructure that is critical to making a nuclear weapon.

And some of it – Israelis can be quite brutal they, something we would never do, they decided that one bottle potential bottleneck they want to create is in the intellectual capital so they wanted to wipe out kind of the weaponeers elite and make it, they know, Israel's well aware that people can be replaced. But in the short term, it's extremely disruptive.

And that's why I think I would never see this as what's going on as a strategic mistake, if I can just jump back to that for a bit, is that the, you had a program on the verge of being able to make weapon grade uranium in days, make the bomb in a matter of months. And it's crude in a sense, in the sense it's not missile deliverable. It's actually quite a sophisticated design, combining elements of technology from the fifties and elements from the seventies. And so it's half a meter across and has had good Soviet nuclear weapons technology implanted in some of it. So I think it's – I would not call it a crude device, but it may not be ready to be put on a ballistic missile.

And now we've gone to a point where they're going to have to do little things in the garage or in tunnels or whatever to try to make any weapon-grade uranium, and not in the short term probably. And their and their ability to make the bomb itself has been set back, I think, by several months. So we were thinking, you know, assessing maybe they need six months to make this device in a reliable manner some thought it was shorter but now we think it's longer. It's not two years longer, but it's months longer. And that period of time is probably growing.

So I think, so I would say that this has been a very it's been successful. It's just that not all the, not everything is done and that you have to get the rest of the program discovered and destroyed or rendered useless. And it can be done militarily or it can be done diplomatically. But I think what Israel has accomplished in a little over a week is very successful.

DUBOWITZ: So we've talked about Natanz, we've talked about Esfahan, both conversion facilities, the fact that the Israeli strike destroyed the uranium metal facility, which could be reconstituted.

ALBRIGHT: And the facility to make uranium hexafluoride.

DUBOWTIZ: And the facility to make uranium hexafluoride. But they've got large stockpiles of enriched uranium.

ALBRIGHT: Well, no, not so much.

DUBOWITZ: Of enriched uranium?

ALBRIGHT: Well no, of uranium hexafluoride.

DUBOWITZ: Correct.

ALBRIGHT: Natural, which is what they need to run an enrichment program in the long run.

DUBOWITZ: So you talked about the fact that they were close, for four to six months, I believe, that's what your institute had assessed to develop a crude nuclear device–

ALBRIGHT: To make it.

DUBOWITZ: To actually make it. And you think that has been set back. Let's just go to the final or two nodes of this nuclear program, Fordow and Arak, because I want to understand your assessment of the damage that was done to both. Let's jump to Arak and then we'll end with Fordow because that's obviously got the most attention. Tell us a little bit about the Arak heavy water reactor where that was – what it's used for, where it was before the JCPOA [Joint Comprehensive Plan of Action] of 2015 and where it was today before the Israelis struck it.

ALBRIGHT: And it was a reactor design that Iran was creating in the in the 1990s with the help of Russian entities that were providing a key design assistance, designing the fuel. And it was going to use natural uranium, heavy water, and it would be very nice to make weapon grade plutonium in. And they hit it you know it's one of these you know Iranian lies that they were faster in building the heavy water production plant and that's what the Iranian opposition group pointed out as a facility near Arak and that's where it got its name and Iran's line after that was, “Well we just want to have heavy water we want to sell it.”

And three years, three months later, four months later, they realized the absurdity of that. And they admit, “Oh, yeah, we're going to be building a reactor next to this heavy water production plant.” And it became a major bone of contention in the negotiations of the JCPOA, where the US insisted that the core be changed so it couldn't run on natural uranium. It would run on enriched uranium and much less plutonium would be made in it, and it would be poor quality plutonium. And it was a big struggle, and Iran fought this kind of core change. But the United States stuck to its gun and got it through.

Moreover, they got through that the fuel would be made in such a way that it'd be very hard to chemically process. Because it also was discovered that Iran was trying to put together the capability to separate the fuel and end up with – well let me say it this way – would process the fuel and end up with separated plutonium so they have a plutonium pathway to the bomb. And it appears to have been a project of the Atomic Energy Organization, it was not part of Amad there's very little plutonium work in Amad. So the Atomic Energy Organization seemed to want to be able to have a

capability to generate separated plutonium, and it would be weapon-grade plutonium. So you could use it. They could have their own bomb program.

DUBOWITZ: So was Arak proliferation proof before these strikes, or was the concern that Arak could actually be repurposed and turned into a plutonium bomb producing facility?

ALBRIGHT: The original, it's called the calandria, which holds the fuel rods that goes inside this core that holds the heavy water, was destroyed. But then Iran, in its usual, I would say, confused way, kind of said, oh, by the way, we have another one.

DUBOWITZ: Confused or duplicitous.

ALBRIGHT: Yeah. Well, why would they admit to it? I mean, it's always amazing to me. Sometimes Iran does reveal things. Maybe someone just needed it politically to stick it to somebody and felt they would suffer no consequences, which is essentially what happened. And so the reactor was never fully modified to this new way. And it's been in kind of limbo where Iran says, “We're going to finish it. It'll be commissioned by in 2026.” The work doesn't appear to be happening quickly, but Iran keeps saying we're going to finish it. And I think we've all learned that we should take them at their word.

And I think Israel just decided, let's just be cautious and destroyed the reactor core, as far as we can tell. They went through the outer concrete dome with at least three weapons. One would blow open the hole, one or two, and then they went in and caused serious damage in the core area. And then they also to be safe took out a section of the heavy water production plant so I think that Israel was trying to do what John Kerry always promised, make sure there's no plutonium pathway to the bomb.

DUBOWITZ: Okay so we've talked about the Natanz enrichment facility, destroyed. We've talked about the Esfahan two conversion facilities, destroyed. We've talked about the Arak heavy water reactor which could make potentially make plutonium, for a plutonium bomb, destroyed. Now let's get to Fordow, one that got a lot of attention, and that certainly was what President Trump was most concerned about and ordered B-2 bombers to drop these thirty-thousand-pound Massive Ordnance Penetrators to try to do severe damage to the Fordow facility the US has declared it's been obliterated.

ALBRIGHT: President Trump has declared.

DUBOWITZ: President Trump, thank you for the distinction. President Trump has said it's been obliterated. What's your assessment of how much damage was done to Fordow?

ALBRIGHT: Well we could only look at the holes in the surface, you know, what's ejected. And then – and also compare to the design of the plant. We have the design of the plant, thanks to the nuclear archive, because as I mentioned, the plant was designed during the Amad plan.

DUBOWITZ: And David, just say a few words about the nuclear archive and how we know even more about this Amad crash nuclear weapons program. Again, this is a result of Mossad, correct?

ALBRIGHT: That's right. They're seizing this archive, learning about the archive, and then seizing it in 2018. And they decided to share it with the world. So they gave whole copies to the United States, Britain, France, the International Atomic Energy Agency.

DUBOWITZ: And you saw it as well, correct?

ALBRIGHT: And I saw quite a bit of it.

DUBOWITZ: And wrote on it extensively.

ALBRIGHT: Yeah, that's right. With people from FDD, Olli Heinonen and Andrea Stricker. And so we produced, I don't know, twenty reports looking at the various aspects of the Amad Plan. And then we produced a book. So we went through it a lot and went and saw the archive. I saw it twice. Andrea was with me one of the times and had four visits to just meet with the Mossad people analyzing the archive to just meet with them to collect documents and then be able to interview them about different aspects of what they were finding and what things meant.

DUBOWITZ: So John Kerry said in 2015 when people were criticizing the JCPOA that the Iranians hadn't come clean on their nuclear program and with full disclosure and transparency that it didn't matter because we knew everything we needed to know about Iran's nuclear weapons program. Turned out that with Mossad taking the archive in this daring operation in 2018 and pulling out the details of the Amad plan, I think we learned we learned more. Al Ghadir was not known. And it was a surprise to the Israelis, too. So, I mean, when we charted up all the facilities in Amad, came up with about twenty facilities or activities that were being carried on it at safeguarded facilities, making up to 5 percent of rich uranium in Natanz to give to Fordow. So they could make weapon grade. That would be an activity that we charted up. And there were about twenty, twenty three. Half were not known.

DUBOWITZ: And half of the sites were not known.

ALBRIGHT: Half of the sites.

DUBOWITZ: Wow.

ALBRIGHT: And this is from straight from the Mossad people to analyzing the documents.

DUBOWITZ: So just understand that. So you're saying in 2015, John Kerry says, “We know everything we need to know about the nuclear program.” The Mossad goes in, grabs a nuclear archive, and we look at it and we look at all the sites and the details. And Mossad also says there are half these sites that we don't know about.

ALBRIGHT: And they can't speak for U.S. intelligence, but I think–

DUBOWITZ: Pretty safe bet to say that what U.S. intelligence knows often comes from Mossad.

ALBRIGHT: Yeah, on this. And so I think the archive was belittled at the time, but it was a profound – I think it's the greatest atomic espionage action it pulled off and to get this complete rendition of a secret nuclear weapons program was a phenomenal success. And it really has fed into International Atomic Energy Agency actions. Certainly we benefited, but it's helped understand the whole, how do you stop this program?

There was a complete roster of employees of the amount of the, not the Fordow, not the Al Ghadir people, Amad had things like laser enrichment the gas centrifuge enrichment but on the weaponization part to make the bomb itself there was a complete roster of employees with you know names, fathers names, national IDs, education. And so it's a wonderful source of intelligence to be able to follow because the Amad people, when that program ended, the nuclear weapons program didn't end, but they then went into successor organizations where they, you know, from our view, the ideas, keep working away on some things, not work on others, work on bottlenecks, shorten timeframes, and but just keep employed and do things that are under the rubric the Supreme Leader has not given approval to build the bombs.

DUBOWITZ: David, I don't think I actually realized that. I mean, I was very focused on the capabilities and the nodes and the sites and the details that came out of the nuclear archive. But what you're actually describing is, it's that, but it's also the names and details of the scientists who actually worked on that program. Some of whom, many of whom, may still be alive.

ALBRIGHT: Many, probably, it's been a long time, twenty years. Many moved on, but many are still working at the final successor organization, SPND [Organization of Defensive Innovation and Research]. And some were caught or detected working at old Amad sites recently on explosives work.

DUBOWITZ: Right. So it must have helped Mossad put together its list of known nuclear scientists who are actively engaged in this program.

ALBRIGHT: Yeah. And you can see who they know, who they work with. So it's invaluable. So I think the intelligence value of the archive has been tremendous. And it's also been tremendously important just to show what Iran has done. And I think one of the things that I feel the U.S. intelligence assessment did in a very negative way–

DUBOWITZ: The one in 2007?

ALBRIGHT: Yeah. And I only talk about what's in the unclassified version. I have no idea the nuances, but it would worry me greatly if what I'm going to say about the unclassified version is somehow, “Oh, it's different in the classified version.” But it created this false dichotomy. It's like a light switch. Either it's on or off. It stopped in ‘03, hadn't restarted in ‘07. And then you get these reports every year. “They're not building the bomb.” “They're making parts.” In a sense, it hasn't restarted. And Tulsi Gabbard said the same thing.

DUBOWITZ: Just recently, correct.

ALBRIGHT: She was parroting the intelligence assessment, the official one. But what's changed in the last couple of years is that I think there's so much evidence of accelerated work that the intelligence people have either leaked or said that, you know, “Iran shortening the timeframe it may need to build a nuclear weapon.” But they then say, “No, but there is no program started.” But that's, it's sort of, I don't know what to call it. It's a logical thing. That's not the point.

DUBOWITZ: Well, John Ratcliffe, the CIA director, I think put it really well in recent weeks when he said, you know, “Iran got to the ninety nine yard of a football game,” right, “and a team that's on the ninety nine yard line has the intention to score a touchdown.”

ALBRIGHT: No, that's right. And that's another way to put it. But it's also what it is, is that the public thinks often and you hear it all the time. “There is no nuclear weapons program in Iran. So what's the concern?” And that – and if they do the analysis in the sense of, you know, it why would they make 60 percent in this large quantity? Why would they have done that?

DUBOWITZ: And 60 percent is 99 percent of what you need for weapons-grade uranium. Correct?

ALBRIGHT: And that's outside the unclassified intelligence assessment. They said we don't consider if it's the issue, if it's safeguarded. And yet that's that symbolizes the whole problem with the intelligence assessment that that it's not about a decision by the Supreme Leader, it's about. preparing, being ready, speeding up the process if you are decided. And it's a little bit like a weaponeer saying, you know, be confronted with building the bomb. And he says to his leadership, “Well, I haven't thought about that in ten years. You know, why don't you give me five to finish?” I mean, there – if they, the leadership decides to have the bomb, it's going to want it quickly. And so I think the, what Israel is trying to do is that it understands the nuclear weapons capabilities, the weaponization, as we call it. And it's decided to try to make it much harder for Iran to actually build the bomb itself. And again, I don't support killing scientists, but that's why they did it, was to try to erase some of the experience and force Iran to bring up a new generation. That takes time. They went after the headquarters of SPND.

DUBOWITZ: So SPND, just explain to our viewers a few words on SPND. That is the central headquarters of their weaponization efforts.

ALBRIGHT: And it was run by – it was like the third or so successor organizations to Amad, capturing the people who worked in Amad. And Mohsen Fakhrizadeh finally started SPND around 2011. But he also grew it. I mean, he turned it into kind of an Iranian version of DARPA [Defense Advanced Research Projects Agency] to be able to do all kinds of advanced military research, but in it were the Amad people.

They still worked on high explosive projects relevant to nuclear weapons. They worked on, kind of, what's called radiation, which can include the neutron source. And so they kept their skill sets intact. And we believe at the Institute [for Science and International Security] solved some of the bottlenecks in making a neutron initiator or keeping – making sure you're current on using multipoint initiation systems that set off the high explosives. So I think it–

DUBOWITZ: Right. You brought up Mohsen Fakhrizadeh. Worth remembering, this was, for many people, he was considered sort of the Robert Oppenheimer of Iran's nuclear weapons program.

ALBRIGHT: We call him Groves, Leslie Groves.

DUBOWITZ: Explain that for a sec. If you haven't seen Oppenheimer, you remember the character?

ALBRIGHT: Oppenheimer was in charge of one aspect of the bomb, making the weaponization. Fakhrizadeh, Leslie Grove was in charge of making sure you had the fissile material, you had the delivery system. All the – he didn't run a missile bomber program, but he may had to make sure that there was a bomb that could be delivered. And it was a huge organizational challenge. And so Groves wasn't a nuclear expert.

DUBOWITZ: But he was an organizational planning expert.

ALBRIGHT: That's right, and a tremendous manager. And Fakhrizadeh was that, he was also a physicist and knew about centrifuges, knew about weapons design. So he was more technical. But still, it was his managerial capabilities that I think were the most important.

DUBOWITZ: And Mossad killed him in quite a daring operation where he was taken out inside Iran on his way back from his, as I recall, his country house to Tehran where a, if I remember, it was a gun that was brought in, a one-ton gun that was brought in in parts, reassembled inside Iran, put on a flatbed truck, mounted. They knew about the route back from his country house to Tehran. And as he was approaching, he was driving the car at the time with his wife next to him, as I recall, his bodyguards in different cars. A sharpshooter sniper, sitting in Tel Aviv was able to use AI to calibrate the shots and eliminate the lag because it was a two thousand kilometer shot distance and take out Mohsen Fakhrizadeh in his car without harming his wife or his bodyguards. And that was the end of Mohsen Fakhrizadeh.

Of course, he gets replaced. And I've seen reports that at least ten senior nuclear weapons scientists on the Mossad list were eliminated. I've also heard there may be an additional four that have been taken out that haven't been publicly reported. But that's somewhere between ten and fourteen of the senior weapons scientists on Mossad's target list. And I assume if it's on Mossad's target list, they're there for a reason.

ALBRIGHT: Yeah. And most of the names that we see are related to the weaponization side. There's one who worked on centrifuge, the theoretical aspects of centrifuge development and operation but it largely was skill sets needed for the weapon side and also to train, I mean these people are they can have they can work in SPND they can then teach at the university. Fakhrizadeh was also a professor. And there are IRGC [Islamic Revolutionary Guard Corps] run universities, so

their whole purpose is to feed the military industrial complex, including the nuclear. So places like Shahid Beheshti University really should be viewed as military facilities, and most of these people had positions there.

DUBOWITZ: Well, actually, it's interesting, Fakhrizadeh, as I understand, the reason he was driving back from his country house to Tehran that fateful day was he was going back to teach a class.

ALBRIGHT: Could be. Yeah, he was more open the last year of his life. I mean, he started, he was a mystery figure for years. And then suddenly he started showing up at a kind of non-military or non-nuclear events and stuff and would be filmed. And he'd be on the internet giving speeches. And so I think he probably felt he was safer and probably wanted to, I don't know, be in the public domain more. I mean, it's kind of hard to figure out.

DUBOWITZ: Yeah, and get the credit for what he had done. But let me link it back to Fordow. We were talking about battle damage assessment. And then I also want to just tie it back to, what the Israelis seem to know. Which, I mean, Fakhrizadeh is just one example, but we've seen over the past ten days just an extraordinary Mossad and IDF penetration of the highest echelons of Iran's nuclear, military and security apparatus. Which does sort of then start to raise the question if those trucks at Fordow were taking out centrifuges and enriched material–

ALBRIGHT: We don't know if they were taking out centrifuges.

DUBOWITZ: If they were.

ALBRIGHT: Yeah.

DUBOWITZ: If they were. But even enriched material.

ALBRIGHT: It could be. It needs to be tracked down.

DUBOWITZ: Right. So even enriched material, it needs to be tracked down.

ALBRIGHT: Yeah. And it may have been, you know, feed and withdrawal equipment. It may have been, you know, the tanks of 5 percent enriched uranium that are pretty heavy. So it's hard to know. But if something left the site, and that needs to be discovered

DUBOWITZ: Yeah and Prime Minister Netanyahu in recent days has hinted at that in his public comments is that you know they're tracking the enriched material presumably the 60 percent enriched material but you were saying that in terms of your ability to assess battle damage on Fordow your institute obviously had the blueprints for what it looks like, uses satellite imagery to try to figure out what kind of damage has been done both on the surface but more importantly below the surface. Any sense?

ALBRIGHT: Well, one of the things that struck me right away when I looked at the first Maxar satellite images was that some of the three holes are right by the ventilation system. And we were able to confirm that the ventilation system went in as designed because we went back and looked at the old imagery and could see this ventilation system being constructed on the surface. And so it goes from the kind of near the top of the ridge line all the way down into one side of the underground complex so it does go all the way down. And there are three holes near the ventilation system. So those were going through a part of the mountain that had either been vacated for the ventilation system or was softer rock, if I can put it that way. And so I would imagine those got through and caused some amount of damage.

DUBOWITZ: Oh, that's interesting because, again, I think I had missed that. I heard you talking about that the Israeli option was to go after the ventilation system and drop bombs down that system.

ALBRIGHT: It just ended. I mean, if you have to have ventilation to make it work.

DUBOWITZ: Right. But you're also saying that also would be potentially a softer target in terms of the rock formation as a way to get in.

ALBRIGHT: Yeah.

DUBOWITZ: So David, I'm asking you to speculate, and it's difficult because I know you do extraordinary technical analysis, don't like to speculate, but what's your sense? Do you think Fordow has sustained the kind of damage that would take years to rebuild? Has it been rendered offline?

ALBRIGHT: We don't know because in the end, you need some intelligence information. I mean, we haven't tried to look at any subsidence in the ground if something collapsed but the halls aren't that big and it's under eighty meters of rock. And so it's like at a destruction if the ceiling cracks, you better not go in there. And then you just have to abandon it. So I think it's a little tricky to assess, but it doesn't have to be that the ceiling collapses and crushes everything to put it out of permanent operation.

But I would imagine the US and Israel are trying to collect intelligence information through communication intercepts, which probably right now are a little harder, but recruiting people who may have been in the program that know what's going on. This happened a lot after the '91 war against Saddam Hussein where people, a lot of that program, nuclear weapons program was not known in 1991 after the war ended and there'd been lots of bombing of facilities. Many of the nuclear weapons sites were never touched in any significant way. They may have been hit accidentally because they had a transformer or something. But in general, many were not touched.

But after the war and people in the program started to see that there's no future here, they would come out with information and revealed, for example, this massive enrichment program using calutrons, which was definitely not known to the Israelis or the United States. But this one person coming out revealed the whole complex. He had moved from site to site sort of in a support role and knew where everything was.

DUBOWITZ: David, let me summarize where we are for the last ten minutes, because then I want you to talk about what we might be missing. What is that potential facility capability that the Iranians may still have? Let me summarize from what I understand. Please correct me if I'm overly simplifying this.

The United States and Israel together have rendered Natanz, Esfahan conversion facilities Fordow and Arak, let's call it non-operational. There's a question for how long would it take to rebuild, but right now they're non-operational. The Israelis have eliminated ten, maybe fourteen of the top nuclear weapons scientists, including those who were involved in, some of whom may be involved in the original Amad program. Some of whom are younger but have got not only the technical skills, but the operational and planning skills to run a sophisticated weaponization program that could actually produce either a device or a warhead that you would affix to a missile.

And the Israelis have shown extraordinary intelligence penetration. The United States and Israel have shown extraordinary air force capabilities in terms of taking out these sites or rendering them non-operational. But let me ask you what could be remaining and what the Iranian play would be. We briefly touched on this potential enrichment facility to Esfahan. I'm sure that Israel and the United States haven't destroyed every centrifuge. It seems like they went after centrifuge manufacturing facilities.

ALBRIGHT: Three, all three were hit.

DUBOWITZ: All three of the three we know were destroyed. So their ability to actually manufacture additional centrifuges has been setback. But they had thousands of centrifuges to begin with, including advanced models that you need smaller

numbers. And because they're more powerful and because you need smaller numbers, they're easier to hide. It's surely a safe assumption to believe that Iran has deeply buried tunnels, not only in Esfahan, but throughout the country.

So, let me give you the scenario and tell me why we need to worry less about this than I am. Iran just takes whatever it has left. It takes its advanced centrifuges. It takes its stockpile of 60 percent enriched material. It moves that into a deep tunnel. Maybe it's the Esfahan facility. Maybe it's somewhere else.

And they begin to, they spin up the sixty into 90 percent weapons-grade uranium. So now they have 90 percent bombs worth, multiple bombs worth potentially, of weapons-grade uranium. Now they have to take that and turn it into something. Because enriched material is not threatening unless it's turned into a bomb. And for that, they need weapons scientists and they need uranium metal. Uranium metal has been destroyed, but they may have the ability to reconstitute that quickly. They may have some other facility we don't even know about in order to produce uranium metal. And even though ten to fourteen top weapons scientists have been eliminated, they have others.

Now, combine that with the fact that Israel owns the skies. The United States owns the skies. Israel has shown a willingness, certainly in Lebanon, to keep going back in even under a ceasefire and take out key Hezbollah capabilities and has made it very clear they will continue to do that in Iran. I assume the United States will continue to use its capabilities if there's any evidence that they get of an Iranian nuclear weapon breakout. Okay. That's my assessment.

ALBRIGHT: Okay. And now let me respond.

DUBOWITZ: Now respond.

ALBRIGHT: Okay. One is, I think, first of all, that there's been quite a bit of shock in the Iranian nuclear weapons establishment. And so I think they would be scared to start a nuclear weapons program in the present circumstances. And so I think mostly what they're trying to do is hide. And yes, they could have, I would guess, two, three thousand advanced centrifuges that were made, but not yet deployed. I mean, they surprised us last year, they deployed something like seven thousand or so advanced centrifuges at Fordow and Natanz. So some can be hidden.

They have these stocks. Again, probably not the whole stock. They've lost some. And so, yeah, you have to worry about that. But if they went to make a bomb, one is their communications has been disrupted. They're missing pieces that they need, and it's a linear process. If one piece is missing, like making metal, you can't make the bomb. And at any moment they could be discovered and then blow the whole thing. So I think I would be surprised if they were working on making weapon grade uranium now or thinking about making the bomb components themselves. I mean, so that's my first reaction.

The other is, this situation has to be dealt with. The first wave in a sense was to deal with the larger infrastructure. and the ability to enrich uranium in any but an insignificant or a small way. We'll not call it insignificant. Now, what you have to do is either hunt down this stuff, and Mossad would have to be the one responsible, probably assisted by the US. But Mossad is typically the one that's going to push the envelope to find these things.

The other is you have to think about the end game, where in my mind, history doesn't repeat itself, but it does rhyme, according to this old adage. And what the 1991 situation after the throwing Saddam out of Kuwait makes sense to me as a modified way that what we're looking for is a ceasefire deal. And in that deal and it is a ceasefire deal, it's not an arms control deal. And in that ceasefire deal, Iran would stop its enrichment program, agree to dismantle it. And there would be inspections. I don't think they don't need to be as intrusive as the ones in Iraq after ‘91. But they would that Iran would be expected to cooperate and like that situation in ‘91. If they don't, then military action can be taken. And it was.

And so and again, it's not a long term plan. You want to do this to dismantle the program under it. And then that's where you could have more confidence that you're getting all the 60 percent. IAEA knows exactly how much was made, and the same with the 20 percent the up to 5 percent. But you do it in that context, and then what that means is don't make a deal too quickly. Don't stop the war too soon. You want to make sure that if this is going to work, that it is a ceasefire deal where Iran is agreeing to these conditions.

And you can offer sanctions relief or not, but it's really the main thing is that it's a very targeted goal to end enrichment and end the nuclear weapons-related work. And it's been done before, and we know how to do it. And so will Iran agree? I don't know. But I think in terms of thinking about the problem, that's what we should be thinking of, not having a deal where, okay, now you don't enrich for a year.

DUBOWITZ: Right.

ALBRIGHT: And Iran wants to claim they have a right to enrich, fine, so long as they don't. and don't have the capability to enrich. They're free to proclaim whatever right they want. But I think that to me is the way forward and I hope the Trump administration would be moving in that direction.

DUBOWITZ: Yeah. No, it seems that there's always been that option for Khamenei. He could either go to Oman or the United States and Israel would go to Fordow. It sounds like the United States and Israel got to Fordow and now is an opportunity to go back to Oman, and do that kind of agreement that permanently and fully dismantled Iran's nuclear program.

I just got a message that Iran has launched missiles at Qatar towards the Al Udeid U.S. bases in Iraq. So a small number of missiles launched. Obviously, there will be a lot more detail coming out, but this could either be Khamenei deciding to escalate and go after U.S. military bases in some kind of profound and sustained way, which could be the end of his regime. Or it could be a symbolic gesture in order to actually show we're still standing as a precursor move to going back to Oman and negotiating the kind of agreement that you're talking about. We'll have to see.

David, thank you so much. Thank you for your service to our country, to the cause of nonproliferation, and to always being incredibly technical, and cautious, and thoughtful. And thank you for your friendship.

ALBRIGHT: Okay. Well, thank you. That was great to come talk to you.

DUBOWITZ: Thanks, David