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TRADING OFF NUCLEAR ENERGY AND NONPROLIFERATION

IN THE 1970S AND TODAY

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P R O C E E D I N G S

MS. BINDI: Ladies and gentlemen, thank you for being here today for our keynote lecture with Professor Nye, "Trading Off Nuclear Energy and Nonproliferation in the 1970s and Today." I must say that reading your 1978 article one really can think you wrote it yesterday and then you realize that you actually wrote it 30 years ago. But I will take no further time and I will introduce Minister Luca Giansanti. Luca is the Director General for Political Affairs of the Ministry of Foreign Affairs in Italy and he is the one who asked Brookings to organize this event for which Professor Nye serves as the keynote.

MR. GIANSANTI: Thank you. Professor Nye, distinguished participants, ladies and gentlemen, it's really an honor to welcome you to this conference which is a joint effort of the Brookings Institution and of the Italian Ministry of Foreign Affairs and which takes place at the elegant premises of the Italian Embassy. The topic of our distinguished keynote speaker's address, "Trading Off Nuclear Energy and Nonproliferation," is one of the most sensitive on the international security agenda.

A nuclear renaissance is undeniably underway. Meeting growing energy demands and mitigating climate change are among the outstanding challenges of today. How to reconcile the nuclear renaissance with the imperative of nonproliferation is the challenge we are going to face in the next years. Italy today is the only G-8 country without its own nuclear power since it discontinued its nuclear program almost 20

years ago, and is the largest net importer of electricity. In May of this year my government announced that Italy will begin again building new nuclear power plants within 5 years to reduce our dependence on oil, gas, and imported power. The goal is to have 25 percent of electricity from nuclear power by 2030 which will require eight to ten large new reactors by then.

To this end, the Italian government has already introduced a package of nuclear legislation to Parliament including the establishment of a new independent Agency for Safety and Security. Launching nuclear energy in my country entails creating the needed infrastructure and empowering the government to propose incentives to communities which accept nuclear plants. Italy, a member state of the International Atomic Energy Agency, is party to the Nuclear Nonproliferation Treaty since 1975 and is a nonnuclear weapons state. It is a member of both URATEM (?) and the Nuclear Suppliers Group. Italy has signed and newly ratified the -- protocol in relation to its comprehensive safeguard agreement with the IAEA.

Ladies and gentlemen, the proliferation of nuclear weapons continues to be a major threat to international security. Despite the efforts made and results achieved in recent years, the existence of proliferation programs and networks, the difficulty of securing sensitive materials, and the risk that terrorists may acquire nuclear weapons remain urgent challenges to cope with.

Looking forward to the Italian presidency of the G-8 in 2009, I would like to highlight the specific role played by this group in countering proliferation of weapons of mass destruction. In order to prevent terrorists from acquiring or developing weapons of mass destruction, the G-8 Global Partnership was launched at the Kananaskis Summit of 2002, less than one year after the 9/11 terrorist attacks. Since then, G-8 nations, recognizing the proliferation of weapons of mass destruction and their delivery means together with international terrorism as the preeminent threats to international peace and security have intensified their efforts with the approval of the G-8 Action Plan on Nonproliferation at the Sea Island Summit in 2004 under the U.S. presidency. During its tenure of the G-8 presidency next year, Italy will continue along this path, sustaining the implementation of existing initiatives and trying to find new ways in cooperation with partners to reinforce the group's commitment to the global nonproliferation regime.

The G-8 has a crucial role to play. We must work to boost our efforts to reach our common goals. In this connection, I would like also to realize that Russia, a member of the G-8, is a key partner on nonproliferation so it's important to have Russia on board. First of all, G-8's unity of intent should be preserved along with the other values that the G-8 can bring to nonproliferation efforts both at the international level and by encouraging national compliance with nonproliferation requirements. The importance of the international nonproliferation regime based on the

relevant multilateral treaties and arrangements should be underscored, the Nuclear Nonproliferation Treaty first and foremost in view of the 2010 -- conference. In this context, we will reaffirm the G-8's consistent support for the key role of the United Nations and its specialized agency such as the International Atomic Energy Agency in addressing proliferation challenges. Moreover, the G-8 should continue to endorse other concerted initiatives such as the Proliferation Security Initiative, the Global Initiative to Combat Nuclear Terrorism, and the implementation of U.N. Security Council 1514, all of which play an important role in furthering an effective mechanism to prevent and combat the proliferation of weapons of mass destruction and their means of delivery.

However, in order to make the G-8's position more action oriented, we should focus on the promotion of concrete measures such as the conclusion of a treaty banning the production of fissile material for nuclear weapons or other nuclear explosive materials, the so-called FMCT, Fissile Materials Cutoff Treaty. We should consider how we could contribute to overcome the present stalemate in the Conference on Disarmament. Secondly, the universalization of the IAEA additional protocol is another priority. Its de facto implementation by all those states that have already signed it but not ratified it should be recommended. Last but not least, further efforts toward the entry into force of the Comprehensive Nuclear Test Ban Treaty, CTBT, deserves serious attention too. Special attention should also be devoted to regional

proliferation issues, in particular North Korea and Iran's nuclear programs. If conditions so allow, the G-8 may wish to play a greater role especially with regard to Iran.

As to the peaceful uses of nuclear energy, we should once again underline that their implementation is not hindered by compliance with nonproliferation obligations. On the contrary, compliance, effective verification, and the implementation of increasingly strict export controls can facilitate the safe and secure use of nuclear energy and therefore its development. As stated at the last G-8 summit in Hokkaido Toyako, safeguards, safety, and security should continue to be promoted.

This leads to the question of multilateral approaches to the nuclear fuel cycle. We should encourage concrete steps in this area as suitable and visible alternatives to the acquisition of sensitive fuel cycle national capabilities. As far as the trade of sensitive materials and technologies is concerned, we should continue working toward the definition of a criteria-based approach within the Nuclear Suppliers Group.

We would also like to focus on the human dimension of nonproliferation as well as on the need to raise awareness of proliferation threats both in national institutions and civil society. Human resources are an essential element for promoting the various types of nuclear applications. While ensuring the required safety and security levels, national and international education and training activities are needed in the nuclear field in order to ensure the safe and secure use of nuclear

energy for peaceful purposes in the countries concerned. As far as the global partnership is concerned, we might put an emphasis on the redirection of scientists employed in WMD programs. For this purpose we should also refer to the experience gained by the -- international institutions based on Moscow and Kiev.

Ladies and gentlemen, as far as nonproliferation of nuclear weapons is concerned, our distinguished keynote speaker once remarked in 1978 that the long-run task can be defined as the development of an international regime of practices and institutions for governing the split atom that will be widely accepted as legitimate, equitable, and reasonable, and hence can operate effectively in the face of continuing technical and political change. This is also the goal that Italy fully subscribes to.

Finally before giving the floor to Dr. Benjamin, I would like to pay tribute to Federiga Bindi and to her team for the excellent organization of this event. And a final mention and thanks to Sharon Squassoni, Senior Associate of the Carnegie Endowment for International Peace for hercontribution to the success of this conference.

MR. BENJAMIN: Thank you very much. Minister Scotti, Luca Giansanti, distinguished guests, it is a great pleasure to be here today and I want to thank the Italian Foreign Ministry for the opportunity to work with you on thinking through the issues related to nonproliferation and civilian nuclear power for your G-8 presidency. Clearly this is one of the central issues of the moment not only for dealing with energy supply of

which it's central, climate change for which it is central, and nonproliferation, but also it will be a touchstone of international relations in the 21st century and a key issue in determining the relationship between as Fareed Zakaria has termed it the West and the rest and how we go forward in this period of high demand and significant danger.

How that issue is worked out will have a signal effect on other issues on the global agenda and with that in mind it is my great pleasure to introduce someone who has thought deeply about this whole constellation of issues and particularly about the relationships between different parts of the global community, Professor Joe Nye. There is no one better suited to speak on this issue, and I might add that there is no one whose presence in Washington is more appropriate right now. For those of you who are visiting Washington, you may have noted some unusual sounds. For example, the pneumatic rush associated with hugely inflated resumes being circulated and the tapping and clicking associated with all the networking and telephone calling that has brought our telecommunications system to the bring of collapse. That is the sound of the American revolving door. Foreigners have much to complaint about this revolving door and the long transition that we have here in the United States between administrations. However, in defense of this system, I present you with Joe Nye, one of the gems it has produced, and I assure you that Professor Nye had never in his entire life felt the need to inflate a resume.

He is Distinguished University Professor at Harvard and the Sultan of Oman Professor as well. He is the former Dean of the Kennedy School of Government. And on the other side of the equation during his times on the other side of the revolving door, he has been Assistant Secretary of Defense for International Security Affairs, and Chairman of the National Intelligence Council, among other positions. I should add that those of us who have had the good fortunate to have worked with him or attend conferences with him also know him to be not only a brilliant scholar but a thoughtful and a gracious one. One of the things that I think strikes most of his colleagues is the serenity of his intellect which is quite striking even in the most difficult of times.

Joe Nye himself has indicated how that rotation, that time spent in government, has contributed to his own thinking. As the person who was running the interagency effort on nonproliferation late in the 1970s, he found that his inclination as he put it in a recent interview to do everything by himself did not work and he essentially discovered long before the rest of us that unilateralism was a doomed effort. That experience he explained and the need to persuade others in an effort to lead them gave birth to the concept of soft power, a concept that has been worked out in several of his books.

Great ideas often put names on concepts or on thoughts that we all knew were there but groping to somehow codify and I would argue that in the last 4 years Washington has been blinking with the shock of

recognition at the utility of this concept and has been working out in a theoretical way the way that soft power can be employed in our foreign and security policy. We now face the very daunting challenge of actually integrating it into our policy and implementing it more effectively so that we can make our efforts and our goals match up and produce the kinds of results we would like to see. His address is meant to look backward but I'm quite sure it is also going to look forward and suggest some ways in which that effort can be carried forward as we are on the verge of a new administration.

Ladies and gentlemen, it's my great pleasure and honor really to introduce Professor Joe Nye.

MR. NYE: Thank you, Dan, and Luca, and Federiga. I'm going to speak from down here rather than up there because I have several papers that if I tried to spread them out on that podium I think they'd be on the floor. It might be more efficient just to do it this way.

Talking about our subject of the day reminds me of an anniversary card that my wife sent me one year. You opened the envelope and it says "You're the answer to my prayers," and then you open it again and it says, "But you're not exactly what I prayed for." That essentially is the story of the split atom. We have known that it's been a mixed blessing for more than half a century now. We've also known from the start that the difference between the peaceful and destructive sides of the split atom was politics and not physics and wrestling with that problem

of how you set up barriers to create a distinction between the destructive and the constructive dimensions of the split atom is what we've been trying to do for the last half a century of so.

It's interesting that the dilemma that we face today resembles the dilemma that's been there right from the start, but there are two new elements that get a lot of attention today. One of course is the new element of climate change and the concern about CO2 and fossil fuels which has led to the talk of a nuclear renaissance. We heard a little bit of this in the panel just before this. If you look at something like this nice little piece that Sharon Casoni has done about the nuclear renaissance, is it coming and should it, she estimates that you could have two to three times as much nuclear energy on the planet in 2050 as you have today. So that's one thing that is new I would say from the 1970s. The other is transnational terrorism, the new scale of transnational terrorism, and particularly the idea of transnational terrorists getting a hold of nuclear materials or weapons of mass destruction.

These are not entirely new concerns. In preparing for this talk this morning, I looked over some speeches that I'd given when I was in the government in the 1970s and it was interesting to see that nothing is totally new, but there is a difference of degree. We did indeed know something about climate and CO2 and greenhouse gases in the 1970s but they weren't the focal point. We were concerned about energy security and not about climate change. Now we know a lot more. As a result of

the reports of the IPCC, we see that this is serious problem and that once more it is going much faster than expected. The reports on the Arctic ice and the way it's melting and glaciers melting and so forth, the dangers of positive feedback loops where with the melting of ice you get the melting of tundra, the release of methane and so forth, these are dangers which were just on the horizon so to speak in the 1970s but are now very much in the forefront of your thinking.

Similarly, in the 1970s we did indeed think about terrorists getting a hold of nuclear weapons. In fact, I commissioned a report when I was in the government of how hard would it be for terrorists to use nuclear materials. So we were aware of that, but in the world after 9/11, Madrid, London, and Mumbai, it's really a much larger problem than it was in the 1970s, and certainly the evidence that we've seen that al-Qaeda is interested in getting a hold of nuclear materials accentuates that and I don't think we'd feel that they'd had any particular moral constraints on using them if they had them. In addition to this I'd say what's new about the current period is a fear that the barriers we've set up, this nonproliferation regime which is supposed to separate the two sides of the split atom, that these barriers may be collapsing, that they're either eroding or collapsing.

So let me turn from this current picture as I see it of today to some lessons from the past. One of the things to note is that in the 1970s there was also a sense of collapse. In the early 1970s there was a feeling

that the barriers we'd set up, these political barriers between the two sides of the split atom, were indeed on the brink of falling apart, but we were able to forestall their falling apart. We were able to rescue the nonproliferation regime in the 1970s.

Let me give you a brief history of some of the political institutions that separated the two aspects of the split atom. After the failure of the 1946 Baruch Plan, in 1953 you have President Eisenhower's Atoms for Peace and there was a period of considerable optimism. This is the period when it was viewed that nuclear would be so cheap and plentiful that electricity would be too cheap to meter. There was enormous optimism at that time. In 1957 you have the IAEA created, and in 1963 things become a little bit more problematic when you have the Limited Test Ban Treaty. Remember John F. Kennedy predicted that there would be 25 countries with nuclear weapons by the 1970s. We're doing a lot better than that, but there was a feeling that that could be a worry. Of course, in 1968 we have the NPT and that was a source of optimism. But in the early 1970s, particularly 1974 and 1075, there were three big shocks that made people think this system is not working, that our political institutional barriers between the two sides of the atom are falling apart.

One was the Indian peaceful nuclear explosion. The Indians always called it a peaceful nuclear explosion and we often pointed out that there was no way once an explosion occurred to say whether it was peaceful or not, but if you're really droll about this you can say since they

used materials that the Canadians have given them for a peaceful nuclear reactor then it was a peaceful nuclear explosion. But that just makes my point which is that the feeling of the barriers between the two sides were falling apart and this went to the heart of what was part of the Atoms for Peace program.

The second shock of the 1974-1975 period was the oil embargo. In the 1970s you have a fourfold increase in the price of oil and that fourfold increase in the price of oil leads to great concerns about energy shortages, energy security, and that spills over into other areas as well.

Then the third great shock of the 1974-1975 period was the deals that France made with Pakistan to sell them a reprocessing plant and that Germany made with Brazil to sell them an enrichment plant. So this was the day of the early nuclear renaissance. There was a feeling that nuclear was going to solve the oil problem or the problem of energy security and you'd better get into this market quickly and anything you could sell, fine, that was the way you got your foothold into the market.

When the oil shock occurred, there were enormous projections of shortages of uranium. The feeling was that uranium was now going to be the scarce resource. To make matters worse, the Atomic Energy Commission of the United States responded to this new set of fears by closing its order books for enrichment. Talk about dumb if you wanted to exacerbate a sense of insecurity of supply, but these were

bureaucrats saying I have to protect from a national point of view will there be enough uranium and enriched uranium for American reactors. This created an enormous feeling that the solution had to be plutonium, that there was not going to be enough uranium, it was going to be too short, that you had to turn to plutonium, and the IAEA at that time had a projection that there would be 46 countries using plutonium within the next 20 years. That meant enormous flows not just of plutonium but of mixed-oxide fuels and these flows would have enormously overshadowed and overwhelmed the safeguards and institutions that we had established. There was no question that the framework that we had established was not able to cope with this degree of demand.

Antinuclear groups said the way to solve this problem is to stop nuclear energy or stop nuclear exports but this was a little bit of the same sort of put your head in the sand on the antinuclear side that the Atomic Energy Commission agency had done when it said let's protect American uranium sources first. That wasn't going to stop France or Japan or others. It would just put the Americans out of the game. So as we tried to develop a position to deal with this, we tried to look for a middle position, a way in which we could have nuclear energy but at the same time not have it at a pace and rate which would overwhelm the institutions we had created.

Just to give you an illustration of what we were seeing at the time, let me read to you from a speech that I gave when I was Deputy

Under Secretary of State at the Uranium Institute in London in 1978 called "Balancing Nonproliferation Energy Security." What I said at the time was the major solutions to the energy security problem are appropriate price movements and technological development including both renewables and nuclear. One danger is that the political constraints and debates in our democracies may deprive societies of the margin of energy security that the existence of nuclear option provides. If governments wish to maintain that option, they must show their publics that they are able to cope effectively with three key questions, safe siting, long-term waste management, and nonproliferation. Not bad as an analysis of the problem that we face today though it was obviously 30 years ago.

What did the government do in terms of implementing this? The credit for this goes to the end of the Ford administration and not just the Carter administration. Ford stopped the production of mixed-oxide fuels. Carter then came in and said we're going to close the Barnwell reprocessing plant and slow down construction of breeder reactors, not end research and development on breeders, but slow it which meant ending the Clinch River reactor. We also over two administrations negotiated the Nuclear Suppliers Guidelines. I was the chief delegate to the Nuclear Suppliers Group at the time as we finished that. And in 1978 we passed the Nonproliferation Act and we were able through a variety of means to get the French and German deals undone. And we also established what we called an International Nuclear Fuel Cycle Evaluation

which was essentially an international cooling-off period while people studied what some of the problems were of managing a fuel cycle. It didn't produce a complete consensus on everything but it did restore a sense of balance of how instead of rushing for the gates as we were doing after 1974-1975, we had to think more about international institutions.

We also called for, and here again I'll quote from this Uranium Institute speech of 1978, strengthening international institutions. And if I can read from what was then our policy, we need institutions to deal with the possibilities of effective joint control. Where sensitive facilities are economically essential and difficult to safeguard nationally, we should examine together forms of multinational ownership and management which might help to reinforce the effect of international safeguards. The political costs of abrogating an arrangement that involves a number of stats could be added to the costs of dismissing IAEA inspectors. Criteria and procedure can be developed for effective multinationality which requires the involvement of a number of states while inhibiting replication or dissemination of sensitive technology in national facilities. We need to develop institutions to implement the principle of assurance of benefits. Not a bad diagnosis, but let me ask you how much progress has been made on this in 30 years. If you look at the problems we face now about an international fuel bank, it's not a new idea, but there we haven't done very much.

In any case, by and large though I think we did see progress in the 1970s of preventing the sense of decay or collapse of the barriers that had been established in the 1960s, and this turns around in the 1980s. Progress slows in the 1980s for three main reasons. First was the Soviet invasion of Afghanistan which means that the priority now is not to stopping the Pakistani nuclear weapon but to getting Pakistan to help in reversal of the Soviet occupation of Afghanistan. It's interesting that we knew at that time about A.Q. Khan and the fact that he had stolen the designs from URENCO and taken them back to Pakistan. Sometimes people say you focused only on reprocessing. No, we knew about that. We didn't know how much A.Q. Khan was going to spread this around, but we knew that he was bent on creating a Pakistani nuclear weapon. But the priority of stopping that diminished in the 1980s because of the fact that nonproliferation policy is part of foreign policy, it is not a whole foreign policy.

The second thing that occurred in the 1980s was Three Mile Island and the fears that created about safety and the demands for further regulation which is then reinforced by Chernobyl, and that enormously drives up the costs of nuclear energy. The third of course was that oil prices declined. As you got this huge spike in oil prices in the 1970s, it called additional supply which leads to conservation in demand and guess what, prices drop, which again makes it very difficult for nuclear.

There is progress in the nonproliferation front particularly in the 1990s. In 1990, South Africa gets rid of its nuclear weapons. Ukraine, Belarus, Kazakhstan give up the weapons that they inherited from the defunct Soviet Union. Brazil and Argentina with democratic governments turn off their nuclear weapons programs. And of course the 1991 Gulf War and the IAEA did a far more effective job of dismantling Saddam Hussein's nuclear weapons program than anybody seems to have believed in 2003.

In any case, there was a good deal of progress on slowing the spread of nuclear weapons. There were also steps taken on physical security. You had the Nunn-Lugar Program, the Cooperate Threat Production programs, programs to try to remove highly enriched uranium from research reactors and so forth.

But today when we look at the situation there is this concern that I mentioned, that the barriers may be eroding again, that we may again be facing some form of collapse. Here the problems are often identified with North Korea and Iran. North Korea has become the ninth nuclear weapons state albeit a rather poor one in all sense of that term. And again in Kennedy's terms, it's still nine and not 25, but that was a bit of a shock. And Iran now has according to the IAEA enriched enough uranium to have material for at least one explosive device if it were to further enrich it from LEU to HEU and that has shake people a bit.

In addition, we've learned more and more about the A.Q. Khan network and his spreading of information and materials, so there is a feeling today that the proliferation regime is under threat. At the same time you have what I mentioned earlier, the feeling of the need for nuclear energy and the need for a nuclear renaissance and you see this particularly in Asia where China, Japan, and India have significant plans, a little less so I think in the U.S. and Europe, though you're beginning to see some revival here. But I believe that the most interesting thing would be the extent to which it also spreads to other regions and as it spreads to other regions you can find small states that may say now that we have this, we now need our own enrichment or reprocessing plants. The French for example are talking about selling reactors to the UAE. If every country winds up with its reactors even an oil-rich state like the UAE and then demands its own enrichment and reprocessing facilities, you're going to have a problem with the institutional framework we've established.

So that brings to me to what do we do. There are a number of things we can do to repair the nonproliferation regime. Some of them are like issues like safety. I'm delighted to see this new Nuclear Safety Institute in Vienna that's just been created. We can do more to improve safeguards and getting more countries to adhere to the initial protocol. We can do more on Article 6 of the NPT like ratifying the CTB, like going further into reductions in nuclear weapons held by the Russians and the Americans. But when we talk about tradeoffs between nuclear energy and

nonproliferation, then we really have to focus on Article 4. That's the heart of the tradeoffs. There we have to look at both enrichment and reprocessing and ask whether the kinds of frameworks we've had in the past make sense or not.

On enrichment, Iran has brought this to the forefront of public discussion, but as I mentioned, the question is not just an Iranian question, it's also other countries which may say now we have to have our own enrichment program too. And that brings me back to what I described in this 1978 speech that it's time to get serious about an international fuel bank or if not a fuel bank along the lines that Mohammed el-Baradei has suggested through the IAEA, at least some other forms of guaranteed security of supply which doesn't lead to the spread of enrichment facilities, very sensitive facilities, in direct proportion to the spread of nuclear energy. That has got to be a top priority.

The second is the question of plutonium. Obviously when you talk about sensitive facilities you have to look at both ends of the fuel cycle. There are some people who are saying what we have to do is give up this 1970s approach of the once through fuel cycle and go back to reprocessing and mixed-oxide fuels, for example, the French program, the AREVA, is very much based on this. The argument goes something like this. One of the things that's holding back nuclear energy in the United States is fear about safety and regulations and the cost that imposes on siting and building plants, but also the worries about long-term spent fuel

disposal and we've had a lot of trouble getting Yucca Mountain and a spent-fuel disposal facility in place. The argument is if we would just reprocess, we could reduce the volume and solve the waste problem and therefore we could go ahead with our nuclear renaissance. I think that tradeoff is not acute as people feel. First of all, I'm not sure it's going to solve the waste problem. But secondly and even more important, it's not going to solve the climate problem. In other words, if we said the only we're going to solve this extraordinary problem of greenhouse gases is by developing this number of nuclear reactors by 2050, let's take the number of 45 I guess that Peter Bradford mentioned this morning in his talk, let's face it folks, that's not going to solve the climate problem. It's useful. I'm for it. But if we think that this is a life-and-death tradeoff that unless we get 45 nuclear plants by 2050 the Arctic icecap is going to melt, guess what, we're going to have 45 nuclear plants by 2050 and the icecaps will also melt. So don't make tradeoffs in the nuclear nonproliferation area because you think you're solving the climate problem. They're good reasons to develop nuclear but within the restraints that we've built to keep the separation of the two sides of the atom. So I think in that sense when we think about these tradeoffs we do want to plug the loopholes of Article 4 but I think we plug the loopholes of Article 4 in the NPT by developing an international fuel bank and by maintaining what we have done here which is the once through fuel cycle.

Let me conclude by going above nuclear energy to the larger question of proliferation as a policy and how to think about nonproliferation. Some people have said a nonproliferation policy is like King Canute trying to set back the tides or stop the tides, that if there's one thing we know in human history, it's that technology will spread and therefore it's a hopeless policy. I don't know if any of you saw the article by Bill Broad in today's "New York Times" *Science* section, but he has a nice chart of how, if you want to think of it this way, an infection has spread and he argues that these have all spread originally from American inventions but through different countries and different paths, and that leads you to a pessimistic view. People use metaphors like the horse is out of the barn. Why should we pay any price for nonproliferation if it's inevitable and so forth. I think the problem with this is the rate and degree of proliferation still makes a huge different. Kenneth Waltz the political scientist has said as to nuclear proliferation, the more the better. His argument is in a world of nuclear-armed porcupines nobody will be able to make war. That's a terribly misleading metaphor because what you have is an assumption of a rational actor model of the world, and alas, the world is full of humans and not rational actors. I think this view that we should give up and what's more it may not be bad if we do give up on this is highly misleading.

The rate and spread of proliferation make a huge difference in terms of being able to manage the destabilizing effects of proliferation,

the ability to maintain the set of institutions that I've described this morning, and it has to remain a high priority. Then the question is how do we act now to balance both sides of the split atom in the world we face today. First of all is to avoid the illusion that nuclear energy good as it is is going to solve the CO2 problem. It won't. So the tradeoffs are not as sharp as they're often made out to be. Second, avoid too much pessimism. Avoid this feeling that it's inevitable, give up. It's not. We've shown compared to President Kennedy's fears of 25 by the 1970s, nine isn't a bad number of that if you're worried about the destabilizing effects over that three or four decades. Third is use institutions and institutional innovation to repair the loopholes in the NPT system and here I'll come back to my plea in particular for a much higher priority to either a fuel bank or some other international form of security of supply.

Fourth, we have to maintain the priority of nonproliferation. Nonproliferation is part of a foreign policy, not the whole foreign policy, but it has maintain a high priority. We shouldn't repeat the mistakes of the 1980s. Fifth and finally, remember that a nonproliferation policy is linked in part with a nuclear energy policy but an effective nonproliferation policy has much more to it. Security guarantees, effective diplomacy, maintaining stability, dealing with regional crises and so forth, these are equally important in maintaining a nonproliferation regime. An American policy that avoids isolationism, that avoids drawing back, that provides

guarantees in areas is absolutely crucial for an effective nonproliferation policy.

With those five dimensions I think we can indeed today maintain the institutional division we've created between the two sides of the split atom and the reason for harkening back to the 1970s is to say look folks, we've done it once when we thought it was collapsing and there's no reason we can't do it again. Thank you for your attention.

MS. BINDI: Thank you, Professor Nye, for a wonderful speech which was wonderful as all your readings are. I'm not an expert on the NPT, but when I read your 1978 article preparing for this conference I understood everything and everything was finally clear to me. Now I have three quick remarks. When you talked about Kenneth Waltz and his rational approach, I hope the path we will choose for NPT-related issues will not go as far down as getting to a “garbage can” kind of approach. On the other side, when you say that NPT needs to be a high priority, being an Italian, I am proud to see that our foreign minister repeatedly affirmed that nonproliferation will be one of the key priorities for the forthcoming Italian G-8 presidency and this is the reason why we are here. Third, when you say that there can be other ways to preventing proliferation other than direct negotiations, for instance you talked about local crises, it comes to my mind that I was in a seminar 2 weeks ago in Paris and there was this woman from an Indian think tank and she mentioned that after all if Iran

had a nuclear weapon that would stabilize the region and that I found that a little scary. So you might want to comment on this.

We have a little bit of time for questions, but as Dan would say, first of all, raise your hands. Dan usually says make it with a question mark at the end and make questions and not statements. And be very, very brief. Charley?

MR. EBINGER: Charles Ebinger from Brookings. Joe, I'd like to ask you on balance do you think the U.S.-India nuclear deal was good or bad for proliferation.

MR. : Thank you very much. With regard to your comments for an international nuclear fuel bank, I think you said that not much had been done and I would beg to differ that we have now made more progress than in the past 50 years. The U.S. itself is -- some material for a fuel bank. The Russians have agreed with us and the IAEA to set aside 120 tons for a fuel bank. And just today Italian tax euros will have joined European Union tax euros to make a commitment of 25 million euros for an IAEA nuclear fuel bank. So we are well underway to setting up one or another type of a fuel bank. What we need really is more political will and support. And I was wondering whether you might comment on how one can build political will and support particularly among the developing countries. Thank you.

MS. BINDI: Please introduce yourselves.

MR. SMITH: Bruce Smith, Brookings retired. Joe, I had a stint in State you'll remember just a little after yours and I remember, and I'd like to address this to the safety issue, we had a group that went down to Oak Ridge, Tennessee, to investigate the problem of offsite storage. There was some discussion of some desert island that we were going to investigate maybe putting some spent fuel there and then Yucca Mountain and so on. To get briefly to the point, with these technical experts on board, we asked the experts what are you doing with the spent fuel now? They described a pool that was about from here to that wall and said we put them in the water here. How long is it going to take before that fills up? A couple hundred years. Then what do you do? We dig another hole and we put more cement. That was a very large reactor, I think 3 megawatts. What did we ever get the idea that we have to have offsite storage, we have to go into Yucca Mountain, we have to go out somewhere to a Pacific island, when on-site storage is effective, safe, with smaller reactors this could last for three- or four-hundred years? Isn't that a solution to that problem.

MS. BINDI: Thank you very much. Two last quick questions.

MR. KREPON: I'm Michael Krepon with the Stimson Center. Joe, would you argue that the Reagan administration made a terrible mistake in placing priority to making the Soviet Union's life in Afghanistan

very uncomfortable and instead we should have been lasering in on stopping the Pakistani nuclear program?

MR. : My name is Dmitri -- and it seems to me that it is impossible to solve this problem with the old paradigm. My opinion is that we need to change paradigms of what was nuclear energy --

MS. BINDI: The question?

MR. : The question is very simple. Why not change the principle? Why a country needs to establish its own nuclear energy factories, instead to use energy which is produced in safe places as electricity? It was a mistake of private enterprise for nuclear factories. It was the biggest mistake and it's necessary to change.

MS. BINDI: One last quick question there and then we'll have responses.

MR. : -- from American University. I wanted to go back to your statement about terrorists and nuclear weapons. We have heard this statement now since the demise of the Soviet Union but nothing really has happened in 17 to 18 years. Should we keep repeating this story or is it part of the politics of fear? In other words, is it really realistic to think of people boarding commercial aircraft with attaché brief cases with nuclear material peddling it in Germany or Austria, et cetera, or is it realistic to say that this is not going to happen? Because I think that it is part of these overall politics of fear that very often is used today in many different ways. Thank you.

MS. BINDI: Thank you very much.

MR. NYE: On the question about India, this is a clear case of a tradeoff between a foreign policy objective and nuclear nonproliferation. I think you could make the argument in favor of the Indian deal to say the Indians spent 30 years in the penalty box. It wasn't free. They did suffer. Remember they lost the fuel for the Tarapur reactor, they were ostracized and so forth, and you can make the case that even in nonproliferation terms that bringing them into the tent after 30 years was better than leaving them out, but it's also true that there was a strong foreign policy component to it. So I would say some small loss for nonproliferation and not a huge loss. It could have been handled a little bit differently to reduce the size of the loss, but that's a longer argument.

On the question of the fuel bank and progress on the fuel bank, I should have given more credit to the progress that's been made. But when I read a speech that I gave 30 years ago and we're still asking for more political will today, I'm trying perhaps in a speech like this to generate some of that political will.

On the question of spent fuel islands of Bruce Smith, it reminds me we did indeed look at islands in the Pacific as a place to put spent fuel and we found that it was costly, difficult, no island particularly wanted it, and it did raise this interesting question which is why do we have to solve this problem right now. Won't there be technological progress and change, and if you can store in pools for 200 years, why do

you have to give up the once through fuel cycle right now for a problem of that duration? So I tend to lean in that direction that you suggested.

On the issue where Michael Krepon asked about the 1980s, we had a clear tradeoff that we had to make between trying to reverse the Soviet occupation of Afghanistan and giving Pakistan a free pass on its nuclear program. The tradeoff didn't have to be that sharp. We could have done more. Let's face it, the Pakistanis for their own military and security reasons wanted to get the Soviets out of Afghanistan. The ISI was heavily involved in this. We didn't have to give them a free pass on the nuclear program to get them to cooperate on this. So I think the ideological anticommunism so skewed priorities that we didn't do it very well. As with all tradeoffs, foreign policy is the act of trying to get the most of many objectives that you can which means it is the art of tradeoff and the idea that you have one priority, nuclear nonproliferation, then you go suddenly and snap in the opposite direction, now our priority is removing the Soviets from Afghanistan, a sensible foreign policy tries to get some of both and I don't think we did that well in the 1980s.

On the issue of a new paradigm in energy in secure places, it's nice but it's not the world we have. We have to work with the one we have. And on the question of nuclear terrorism, there is a danger of overdramatizing it and creating too much fear and we saw some of the results of this in the American body politic. There are different views as to how realistic this is. My colleague Graham Allison has argued that it's

almost inevitable in 10 years, somebody like Brian Jenkins who is a great expert on terrorism has said no it isn't and Jenkins has a new book out that says we've overdone this. I think the answer is somewhere in between those two. When I headed the National Intelligence Council we did a study in 1994 looking at the angers of nuclear terrorism. After the bombing of Kabul and we discovered in a former al-Qaeda safe house some of their plans for getting a hold of nuclear materials and using them against us, even estimates about the number of Westerners it was legitimate to kill, 3 or 4 million in response to what they assert were the numbers of Muslims who we had killed, that's a bit chilling. It may not be that as easy as people say, but it ain't impossible, and that's why I think we have to keep it in our sights.

MS. BINDI: And that takes us to the next question, Dan, please, of course not because you're a terrorist but because you are an expert on it-

MR. BENJAMIN: And it's also not a terrorism question. First of all, Joe, thanks for illustrating again the utility of good file keeping. A tradeoff question. The conventional wisdom now is that if Iran goes the distance and acquires a nuclear capability, a nuclear weapon itself, that we'll have half a dozen other nuclear weapons states in the Middle East alone. Foreign policy is about tradeoffs in different things. Is it worth going to a military confrontation to prevent that? It's a question I would never answer myself in public, but --

MR. NYE: If you frame the question as one where do we bomb Iran or let them go nuclear, is that the shape of the tradeoff, you have a terribly nasty dilemma because if you bomb Iran you're going to inflame the Muslim world in attacking another Muslim country and so on and so forth, and on the other hand, if you let them go nuclear you have the danger of a proliferation chain of other countries in the region going nuclear. But you may be framing the tradeoff the wrong way. For example, just like nuclear energy is not going to solve the climate problem, bombing Iran is not going to solve the Iran proliferation problem. If you have underground facilities and hidden facilities and all you do is consolidate the desire of the Iranians to do this and get the younger generation to adhere to it, you may not have solved the proliferation problem but created another one so that the tradeoff may not be quite that sharp. In other words, it does suggest that Obama is correct to say let's go for a major diplomatic initiative, no preconditions, across the board, many issues, not just nuclear. After all, with Afghanistan, we and the Iranians have worked together at the Bonn Process in 2002. We have common interests. Let's see if we can't get a broader dialogue to put this in. We may be running short on time and anybody who does policy planning out to be asking if for some reason we're not able to stop this, that we should make a major effort to try, how do you deal with the proliferation chain? That means that you have to ask what are the countries that are most vulnerable? What kinds of security guarantees

can you give them? How do you use other technologies such as regional dimensions of ballistic missile defense and other such things? In other words, somebody somewhere, and I hope they are, should be doing the planning for what if, but we should be making a major effort to avoid getting to that dilemma.

MS. BINDI: We'll take one last question.

MS. GUNTER: My name is Linda Gunter. I'm with Beyond Nuclear. My question is, given everything that you've talked about, the complexities you've talked about, the problems of safeguards, we're talking about will a nuclear weapon or nuclear materials be used by terrorists in 5 years or 20 years, does that really matter how soon or late it is? What logic is there in pursuing nuclear energy with all these concurrent problems when if you look that the -- we're standing in a country -- when you look at Saudi Arabia which is all desert and is sunny all the time, if we're really going to reward countries for not making nuclear weapons, why reward them with something else nuclear? If you're really talking about -- especially if it's not going to solve climate change which it isn't which is our number one crisis right now? Why not reward them and why not help countries actually get an energy infrastructure that is useful to them? That's my question. Why even go here with all these concurrent problems when we have other options that actually do address climate change? And Italy has not solved its waste problems. It's shipping it to

England to reprocess and they tried to put it in -- which was a terrible idea. So it hasn't solved it. So why not go the other route?

MR. NYE: It's a very good question and I would say that if we get the price right, we should let the decision of which technology prevails be decided in part by markets -- markets take into account the externalities. One of the externalities for nuclear is the proliferation problem. One of the externalities for oil is greenhouse gases and so forth. But I might refer you back to what I said in this 1978 speech which was the solution is appropriate price movements and technological development including both renewables and nuclear and then let's see which of these prevail. Nuclear strikes me as safe enough that it should be allowed to compete. In other words, if we stopped nuclear energy now, I'm not sure you would stop the stop the danger of people misusing the other side of the split atom, and nuclear has a contribution to make.

On the other hand, to subsidize nuclear over solar or other renewables doesn't make any sense at all. What we need is something like a carbon tax or a cap and trade, something which takes into account the huge externalities associated with fossil fuels and then see which technology would that price that protects against the externalities of fossil fuels -- which technology prevails. I think this is what I said at the end, don't have illusions that nuclear is going to solve the problem. It may make a modest contribution which is to be welcomed, but don't subsidize nuclear thinking you're solving the problem unless you can deal with the

externalities that nuclear has in the proliferation area and to make sure that you don't discourage alternatives which may or may not turn out to be competitive.

MS. BINDI: Your comment is interesting very similar to a comment made by Nobel prize Pachauri at an MGI seminar earlier this year. Thank you Professor Nye for a terrific speech. Thank you so much for coming here and thank you so much for delighting our ears and brains.

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