HEARING OF THE IMMIGRATION, BORDER SECURITY, AND CLAIMS SUBCOMMITTEE OF THE HOUSE JUDICIARY COMMITTEE SUBJECT: SOURCES AND METHODS OF FOREIGN NATIONALS ENGAGED IN ECONOMIC AND MILITARY ESPIONAGE

CHAIRED BY: REPRESENTATIVE F. JAMES SENSENBRENNER (R-WI)

WITNESSES: MICHELLE VAN CLEAVE, NATIONAL COUNTERINTELLIGENCE EXECUTIVE, OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE;

DR. LARRY WORTZEL, VISITING FELLOW, THE HERITAGE FOUNDATION;

MAYNARD ANDERSON, PRESIDENT, ARCADIA GROUP WORLDWIDE, INC.;

DR. WILLIAM A. WULF, PRESIDENT, NATIONAL ACADEMY OF ENGINEERING

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Body

HEARING BEGINS IN PROGRESS DUE TO HEARING ROOM AUDIO DIFFICULTIES

REP. SHEILA JACKSON LEE (D-TX): (In progress) - it's from the talent of this world. And let us make sure that the legislation is reflective of the security needs, but also the needs of the America people to be the friend to the world. And I yield back.

REP. F. JAMES SENSENBRENNER JR. (R-WI): I thank the gentlelady. Do any other members have opening statements?

REP. ZOE LOFGREN (D-CA): Mr. Chairman, I will not take the full five minutes but -

REP. SENSENBRENNER: The chair recognizes the gentlelady from California.

REP. LOFGREN: I clearly -- every member of Congress is interested, concerned and opposed to espionage in our country, so that's a given. The question is how to protect ourselves without doing damage to ourselves? And I think it's important to recall -- I was in elementary school in 1957 when Sputnik went up and we got a little wake-up call that the country was in trouble and that we were in a huge competition with the Soviet Union and we were behind. And we pulled up our socks and we ultimately won that competition.

And I think, in a way, we are in a similar spot today. The American Electronic Association used this phrase, "It's the difference between then, which was throwing the frog in the boiling water. Now the frog is in the water as it heats up." And a lot of Americans don't realize that we are in this competition that's very serious in terms of science and technology and engineering talent. We have slipped in the number of engineering Ph.D.'s awarded in this country. We're falling behind. India and China and the EU are emerging as ever more vibrant competitors. The AEA, again, they just did a terrific report, cite the U.S. graduating 60,000 engineers a year. India graduating 82,000 engineers a year and China graduating four times as many engineers a year as the United States. Now the Ph.D. level, the National Academy of Sciences tells us that 65 percent of the Ph.D. candidates in engineering are foreign students. And many of them stay on and become Americans with us and that benefits us greatly. In fact, I come from Silicon Valley and about 40 percent of the startups in Silicon Valley are from people who were born some place else and became Americans. So we need to keep in mind that if we have to have strengthened systems to make sure that we are protected that we don't end up shooting ourselves in the foot economically. And, I would say also militarily, because the new Americans, the best and brightest also help immensely in terms of the technology that ultimately is used not just in the commercial world, but also in the defense effort.

I hope that as we talk further about this that we can think about what systems that we might put in place, smart systems, so that rather than creating bulky systems that have the result of deterring people we might want to have come in and maybe not deterring the bad guys, we come up with streamlined systems that really target what we need in a way that's efficient and does not do damage to us. So that's what I'm very interested in and I yield back the balance of my time.

REP. SENSENBRENNER: Without objection, all members will be allowed to have their opening statements be made a part of the record.

At this time I would like to introduce members of our panel. Michelle Van Cleave is the National Counterintelligence Executive and as such she is the country's top counterintelligence official and is charged with integrating and providing strategic guidance for counterintelligence activities across government. She reports directly to the director of National Intelligence, John Negroponte, the president's principal intelligence adviser.

In the 105th Congress Ms. Van Cleave was chief counsel for the Senate Judiciary Subcommittee on Technology, Terrorism and Government Information. In 1989 she served on the House Science Committee staff and was later assistant director in the White House Office of Science and Technology Policy. She has also held senior positions at the Department of Defense and is a graduate of the University of Southern California Law School.

Dr. Larry Wortzel has been an expert on intelligence and national security issues at the Heritage Foundation since 1999 and has served as Asia studies director. He is a former Marine, Army airborne ranger and Army colonel and has worked for the undersecretary of Defense for Policy to develop counter-intelligence ***programs***. In 1970 he served in the U.S. Army intercepting Chinese military communications in Vietnam and Laos. Later his career took him to areas throughout Asia under U.S. Pacific Command and as Army attaché at U.S. Embassy Beijing during the Tiananmen massacre in 1995. Dr. Wortzel is an author of numerous books on Chinese military strategy and received his Ph.D. at the University of Hawaii.

Mr. Maynard Andersen is president of Arcadia Group Worldwide Incorporated. He has served in government as deputy undersecretary of Defense for Security Policy with responsibility of setting disclosure policy. In 1988 he served as assistant deputy undersecretary for Counterintelligence at the Department of Defense setting security policy and providing day to day oversight. Mr. Andersen also chaired the National Foreign Disclosure Policy

Committee. Privately he served as chairman of a national Intellectual Property Law Institution board of directors. Mr. Andersen is a graduate of Luther College in Iowa and of Federal Executive Institute.

William Wulf is president of the National Academy of Engineering and vice chair of the National Research Council. He is on leave from the University of Virginia where is AT&T professor of engineering and applied sciences. Mr. Wulf has served as assistant director of the National Science Foundation and chief executive officer of Tartan Laboratories Incorporated in Pittsburgh. He was also a professor of computer science at Carnegie Mellon University. He has authored more than 100 technical reports, has written three books and holds two U.S. patents.

At this time will the witnesses please rise to take the oath. Please raise your right hand. Do you solemnly swear that the testimony you are about to give to this subcommittee will be the truth, the whole truth and nothing but the truth, so help you God? Thank you. You may be seated. Please let the record show that each of the witnesses answered in the affirmative.

Ms. Van Cleave, you are recognized for purposes of an opening statement.

MS. MICHELLE VAN CLEAVE: Thank you, Mr. Chairman. I do have a prepared statement I'd like to submit for the record.

REP. SENSENBRENNER: Without objection.

MS. VAN CLEAVE: Please let me summarize a few points. I appreciate very much the opportunity to appear before you today to discuss foreign intelligence threats to U.S. national security and our economic well being. Since some members of the subcommittee may not be familiar with my office, I would like to take a moment to describe my duties.

In the post-cold war world U.S. confronts intelligence challenges from a broad array of foreign nations. A singular global Soviet threat in decades gone by has been succeeded by a diverse set of adversaries many of whom have become highly skilled in using their intelligence service, especially their human collectors, to acquire U.S. national security secrets. These include the technological and engineering secrets that may give our armed forces the qualitative edge they need to prevail in a dangerous world.

While the threats against us are strategic, historically the U.S. counterintelligence community has not been organized or integrated to accomplish a national strategic mission. On the contrary, the various counterintelligence elements have long been part of a loose confederation of independent organizations with different jurisdictions and capabilities and no one in charge of the enterprise. CI operations and investigations have tended to focus on individual cases with little appreciation of synergy or their larger strategic implications. This structural flaw has undercut our ability to connect the dots of intelligence anomalies or effectively coordinate the different CI arms of our government.

To help remedy this situation the Congress created the position of the National Counterintelligence Executive, or the NCIX. The law directs that the NCIX shall serve as the head of counterintelligence for the U.S. government subject to the direction and control of the director of national intelligence. I am the first NCIX appointed by the president. It is my job to provide strategic direction to our nation's counterintelligence efforts and to ensure the integration of the disparate CI activities of our government. It also includes contributing the counterintelligence dimension to broad national security policy concerns such as the protection of our nation's critical technology.

The primary focus of counterintelligence is to defeat the efforts of foreign intelligence services to acquire U.S. national security secrets. It is also our job to supply CI insights and options to the president and his national security leadership. This includes supporting the overall national effort to stem the outflow of sensitive technology including export control, diplomatic measures, controls on foreign investments in sensitive sectors of the U.S. economy and industry security agreements. I want to emphasize that by far the vast majority of foreign acquisition of U.S. technology is open and lawful, as are the transactions of individuals and businesses involved in their

national commerce as well as the free exchange of ideas in scientific and academic forum. But let me turn to the cases that fall outside the bounds of what is open and lawful.

Last year the counterintelligence community tracked efforts by foreign businessmen, scientists, academics, students and government entities from almost 100 countries to acquire sensitive U.S. technology protected by export control laws or other means. Of those, the top 10 countries accounted for about 60 percent of the suspicious foreign collection efforts against clear Defense contractors. Two of the countries that always rank near the top of the list are, of course, Russia and China. They have particularized interests especially in dual use technologies with military application. The top 10 also include some of our close allies, as you noted, Mr. Chairman.

These may exploit their easy access to push the envelope into areas where they have not been invited. In the majority of cases foreign collectors simply ask by email or phone calls or faxes or letters or in person, they ask for the information or technology that they are interested in. Or they may exploit visits to U.S. businesses or military bases, national laboratories and private Defense suppliers to extract protected information. U.S. businessmen and scientists and academics traveling abroad provide another valuable source of information for foreign countries, as do foreign students, scientists and other experts who come to the U.S. to work or to attend conferences.

One indirect method used to acquire U.S. technology is for foreign firms to offer their services or technology, particularly IT related support, to firm that have access to sensitive items. On this point I should note that the use of cyber tools as a collection technique is of growing concern. As you know, cyber exploitation is inherently difficult to detect as cyber intruders from one country will typically cover their tracks by mounting their attacks through compromised computers in other countries.

Finally, state directed espionage. State directed espionage remains the central threat to our most sensitive national security technology secrets. While the Chinese, for example, are very aggressive in business and good at elicitation and are positioning themselves for strategic investments, and they're adept at exploiting front companies, they also have very capable intelligence services that target U.S. national security secrets. As the Cox Commission report made clear over a decade ago, the Chinese did not acquire the most sensitive and secret U.S. nuclear weapons design by spending late nights at the library.

It is one thing to describe these threats to you. It is quite another to describe what we need to do about them. We will never have leak proof technology controls, just as we will never have enough security to protect us against all threats all the time. Nor would we want to exchange the vast blessings of our free society for a security state. In my view, good security is not the answer alone. We also must have good counterintelligence meaning that we must be more proactive in identifying, assessing and degrading foreign intelligence operations against us, and we need to prioritize our efforts against the most serious threats to U.S. national security and our vital Defense and foreign policy objectives.

Now, in March of this year President Bush approved the first national counterintelligence strategy of the United States which I would like to submit for the record, if I may, Mr. Chairman.

REP. SENSENBRENNER: Without objection.

MS. VAN CLEAVE: It is the first mission statement of counterintelligence as an instrument of U.S. national security policy. This is a very different concept of counterintelligence than the common perception of catching spies and putting them in jail. Counterintelligence encompasses all activities to identify, assess and degrade foreign intelligence threats to U.S. national security and our foreign policy objective, and central to the president's strategy is the call for U.S. counterintelligence to be proactive.

Now, this committee has jurisdiction over America's single greatest resource in countering foreign intelligence threats, the Federal Bureau of Investigation. In the months to come the FBI will be standing up a new national security branch that will span its responsibilities for counterterrorism, intelligence and counterintelligence. Building on Director Mueller's efforts to date, the full integration of these disciplines should enable the FBI to recruit, train and develop a new generation of agents and support personnel dedicated to its core national security mission. And

a more complete integration of the FBI with sister counterintelligence agencies will augment our nation's ability to protect against the most serious foreign intelligence threat.

In closing, Mr. Chairman, I would like to thank you very much for this timely hearing and I welcome your questions.

REP. SENSENBRENNER: Thank you, Ms. Van Cleave.

Dr. Wortzel.

MR. LARRY WORTZEL: Mr. Chairman, members of the committee, thank you for the opportunity to testify today on the theft of national security secrets and national security sensitive technology. I have a longer statement I'd like to submit for the record, if I may.

REP. SENSENBRENNER: Without objection.

Our focus is on the intelligence collection threat posed by China. The manpower pool ***available*** to the Chinese government and its intelligence services is nearly limitless and it's impossible to know for certain if people are here to study, for research or if they are here to steal our secrets. The Peoples Republic of China is methodical in its ***programs*** to gather information from abroad.

In March 1986 the Peoples Republic of China launched a national high technology research and development ***program*** with the specific goal of benefiting China's high technology development. This is a centralized ***program***. It's known as the 863 ***program*** for the date is was announced and it allocates money to experts in China to acquire and develop things like biotechnology, space technology, laser technology, advanced materials.

Thousands of Chinese students and scientists were sent abroad by China over the years to pursue critical, civil and military dual use technologies, and the practice still continues. The U.S. faces an organized ***program*** out of China that is designed to gather high technology information of military use. Now, today inside China there are entire high technology incubator zones that are designed to attract back students from the U.S. or U.S. businesses to bring technology in, and it's very important to recognize that.

Chinese diplomatic missions abroad monitor the activities of their businessmen and students to cultivate informers. And before Chinese citizens get passports or travel permission, they're often interviewed by China's intelligence and security services and sensitized to intelligence collection requirements. I think it's important to remember that the constitution of the Peoples Republic of China characterizes the state as a peoples democratic dictatorship. So it's pretty horrid for legal travelers to simply turn down the Chinese government in that authoritarian state when they get asked to cooperate.

Now, we know from Chinese defectors and Chinese security officials or diplomats in places like Australia and Canada recently that this approach is used not only to collect intelligence in the United States, but also abroad. In 2003 the State Department approved some 700,000 ***visa*** for visitors from China to the United States. That includes about 135,000 students. That's just a lot of folks. There were 40,000 ***immigrant visas*** granted to Chinese citizens in 2003. I have to say that these numbers make it impossible for the Federal Bureau of Investigation to vet every one of these people. There's some 3200 Chinese front companies operating in the United States.

Now, the Peoples Liberation Army of China went into the business of starting companies that bring in technology in the 1970s, late 70s and 80s. The general equipment departments started Polytechnologies. The general political department started Kaili, or the Kerry corporation. The general logistics department started Xinshidai or the New Era corporation. And these are separate legal entities, not part of the military, but they are authorized to conduct these activities by the Central Military Commission of the Chinese Communist Party. They were originally manned by former officers of the PLA or their families, in some cases active officers. And they operated branches in the United States. They regularly brought delegations to the U.S. to bring in technology. And today they have turned into global conglomerates that have spawned some of those 3200 companies that are operating in our country. So

the chief of FBI counterintelligence operations recently said that these companies are operating in such places as Milwaukee, Trenton, New Jersey and Palo Alto.

Now, I think that the U.S. government's security intelligence and law enforcement agencies have to focus on national security information. It ought to be looking for violations of the Arms Export Control Act and the Export Administration Act. But that when it comes to corporate or industrial espionage, proprietary secrets, that's not national security. It may be an economic problem for the United States, but I think that there the government owes companies a good legal infrastructure to protect trademarks, patents and copyrights, a system of education on industrial security here in our country and a strong effort to ensure that China meets its own obligations to create rule or law that protects the rights of ownership and intellectual property. But we shouldn't gloss over into, given the number of people, into losing our focus on national security.

From the standpoint of congressional action, I would point out that the Export Administration Act expired in 2001. It was a 1979 Act. It needed to be revised to take account of the needs of 21st century technology. Senate forced a revision in 2001, the House did not. And I think the executive branch has to regularly review the commodities control list to ensure that appropriate national security controls on exports do not unduly restrict the ability of American industry to compete the world market. Generally speaking, I think the technologies that are widely ***available*** in the world market and not unique to the United States should not be restricted and subject to export controls unless there can be multilateral controls.

I would also recommend that ***visa*** officers get educated by the intelligence community so that things like the ***Visas*** Mantis ***program***, the technology alert list, can work effectively. They have a lot of prerogatives when your out in the embassy. Let me close by saying that I don't think it pays for us to be paranoid and suspect that every traveler, student and businessman from China, or woman from China, is a spy or is out to steal technology. Prudent law enforcement ***programs***, counterintelligence ***programs***, security education and industrial security ***programs*** are important ways to protect our nation. But I would not that in places like Taiwan, the Republic of China and South Korea, it's these students that came out and learned and went back home that changed the political system there and created rule, law and democracy and that could some day happen in China. In the meantime, I do think we need to be vigilant. And I thank you for the opportunity to testify today.

REP. SENSENBRENNER: Thank you, Dr. Wortzel.

Mr. Andersen.

MR. MAYNARD ANDERSEN: Thank you, Mr. Chairman. I too have submitted a statement for the record and with your permission I'll summarize.

REP. SENSENBRENNER: Without objection. Thank you.

MR. ANDERSEN: Thank you, sir. We have proved that foreign collectors representing adversaries and friends use espionage, theft and legal means to take advantage of the United States and cause unauthorized disclosure of protected information. We also need to recognize that there are ethical failures of trusted personnel who are prepared to traffic in information and technology because they are greedy or because they are susceptible to foreign pressure, and they are threats as well.

The United States is an open society and a prime target of collectors because it produces more intellectual property than any other nation in the world and does, to some extent, a poor job of protecting it. World changes producing new alliances and new friendships internationally create more vulnerabilities to our technology. America may have won the cold war but we are losing ground economically to those who would pilfer our commercial secrets. National security and economic strength are indivisible and the real test in this world of military and economic contest for supremacy may not be who first develops technology but, rather, who is the first to use it effectively.

Technology's application is the key, particularly in the area of dual use technology. Integration of the management, protection and use of technology is an objective to ensure that we determine what needs to be controlled, what can

be controlled and employment of the most effective control mechanisms. It's imperative that we determine accurately whether any other nation wants our technology and whether any other nation has it already, because we can't afford to spend resources to protect things that don't need protection. And we need to balance the protection of real secrets while maintaining the competitive position of American industry in the world market.

It would seem prudent therefore to use all of our current legal remedies ***available*** to enforce contracts and personnel actions, to enhance enforcement opportunities against current government and contractor employees who break trust, to establish new standards and requirements for our foreign visitors, particularly students and researchers, and to ensure probably most of all that our citizens know what's expected of them. The easiest, least expensive and most effective protection technique is education.

All custodians of protected information should be subjected to continuing education concerning threats, vulnerabilities and protection of information so that they understand the consequences of its unauthorized disclosure, which are obviously jobs, loss of profits and diminished national security. Everyone should be made aware that national security is every citizen's responsibility. Thank you, Mr. Chairman.

REP. SENSENBRENNER: Thank you, Mr. Andersen.

Dr. Wulf.

MR. WILLIAM A. WULF: Thank you very much, Mr. Chairman, members of the committee. I too, like my predecessors here, have a longer statement which I will submit for the record. I am pleased to come before the hearing today to remind all the members of the committee of the important contributions that foreign born scientists and engineers have made and continue to make to this country. We are more prosperous and more secure in large part because of them. Before proceeding, while I don't perhaps have quite the same credentials in intelligence that my predecessors on the panel have had, I would note that both my wife and I have been advisers to the Department of Defense for decades. We both carry top secret SCI clearances and my wife served for five years in the Pentagon as the director of Defense Research and Engineering where she had responsibility for the oversight of all R&D in the Defense Department.

I am convinced that security, real security, comes from a proper balance of keeping out those that would do us harm and welcoming those that would do us good. Throughout the last century our greatest successes in creating both wealth and military ascendancy have been due in large part to the fact that we welcomed the best scientists and engineers from all over the world. No other country did that and nowhere else has the genius for discovery and innovation flourished the way it has here. I am deeply concerned that our policy reactions to 9/11 have tipped the balance in a way that is not in the long-term interest of our nation's security.

Fifty years ago our scientific leaders came from Europe. They were the famous names like Einstein, Fermi and Teller without whom we would not have been the first to have the atomic bomb. Von Braun, without whom we would not be ascendant in rockets in space. Von Neumann, without whom we would not be world leaders in computing and information technology. Today it isn't just Europeans that contribute to our prosperity and security. The names of those like Praveen Chaudhari, now director of Brookhaven National Laboratory; C.N. Yang, now Nobel Laureate from Institute of Advanced Study in Princeton; and Elias Zerhouni who was born in Algeria and is now the director of the National Institute of Health.

Between 1980 and 2000 the percentage of Ph.D. scientists and engineers employed in the United States who were born abroad increased from 24 to 37 percent. The current percentage of Ph.D. physicists is about 45 percent, for engineers it's over 50 percent. One-fourth of the engineering faculty at U.S. universities were born abroad. Between 1990 and 2004 over one-third of the Nobel prizes awarded to U.S. citizens were to foreign born scientists. One-third of all U.S. Ph.D.s in science and engineering are now awarded to foreign born graduate students. We have been skimming the best and brightest minds from around the globe and prospering because of it. We need these new Americans even more now as other countries become more technologically capable.

If I have one message to convey to this committee today it is that it's a serious mistake to think that all important Defense technologies originate in the United States and hence the problem, our problem is to keep our technology from being stolen by others. We talk proudly about the MIT "Rad Lab" that developed radar in World War II, but the critical technology came from the United Kingdom. At the end of World War II we were a distant third in development of jet engines, behind both Germany and Russian, Soviet Union. The World Wide Web was invented in Switzerland, not the United States, and I could go on and on.

Many U.S. corporations are now shifting their development to overseas locations, research and development to overseas locations, not just because foreign labor is cheaper. That's a common and comfortable myth. It is frequently because the quality is better overseas. Again, real security depends upon a very careful balance, in this case a balance of openness and secrecy. Wall ourselves off from others, from the otherwise open exchange of basic scientific information is a recipe for being surprised and disadvantaged. To be sure, 9/11 and globalization have both changed the balance point. The balance point for the cold war is a different one than for today. We need to fundamentally rethink our policies.

However, in my opinion, several recent policy changes related to ***visas***, to the treatment of international visitors, to new issue of deemed exports, so on, have had a chilling effect. It's already been mentioned, the applications of international students to attend U.S. colleges and universities has declined. Scientists have chosen to hold conferences in other countries. U.S. businesses have had to shift critical meetings to locations outside our borders. In the meantime, foreign companies, universities and governments are marketing themselves as friendlier places to do business or get an education.

In the race to attract top international talent we are losing ground. At the same time, science and technology are growing rapidly in other parts of the world. Over 70 percent of the papers published by the American Physical Society's world leading journal The Physical Review come from abroad, 70 percent. We do not own all of the science and technology information in the world. It's illustrated by a figure in my written testimony, the number of first degrees in science and engineering awarded per year in Asia is now almost three times greater than in North America. Permit me to turn to this issue of export controls for a minute.

They were instituted in 1949 to keep weapons technology out of the hands of potential adversaries. In 1994 the disclosure of information about a control technology to certain foreign nationals, even in the United States has been deemed in export of that technology itself. And recent reports from the inspectors-general of the U.S. Department of Commerce, Defense and State have suggested the implementation of the rules governing deemed exports should be tightened. For example, they have suggested that the exemption for basic research should be altered and possibly eliminated and that the definition of access to control technology be broadened.

The university community is rightly concerned that a lineal interpretation of the IG's suggestions would essential preclude foreign graduate students from participating in research and would require an impossibly complex system to enforce. Given that over 55 percent of the Ph.D. students in engineering in the United States are foreign born, the effect could be catastrophic. Either universities would have to exclude these students or they would have to stop doing research on potentially Defense related topics which of course includes most of the fastest moving new technologies. Neither of these alternatives strengthens the United States. They weaken it.

One might ask, if these policy changes will improve our security? I would point out that the United States is not the only research capable country. China and India, for example, have recognized the value of research universities to their economic development and are investing heavily in them. By putting up barriers to the exchange of information about basic research we wall ourselves off from the results of these countries and slow our own progress. At the same time, the information we are "protecting" is often readily ***available*** from other sources.

And finally, in a country with an estimated 10 million illegal aliens, one must wonder whether onerous ***visa*** policies or demeaning practices at border crossings will deter the committed trained spy or terrorist from entering the country. The 2001 Hart-Rudman Commission, which in February of 2001 predicted a catastrophic terrorist attack on the United States and which then proposed the Department of Homeland Security, said, and I quote, "The

inadequacies of our system of research and education pose a greater threat to the United States national security for the next quarter century than any potential conventional war we might imagine.

"

The essential point is that further damaging our system of research and education, including its relation to foreign born scholars, is a very dangerous strategy. United States still benefits from educating and employing a large fraction of the world's best scientists and engineers. We have great research universities that remain attractive to the world's best and brightest. We are envied for our non-hierarchical tradition that allows young scientists with new ideas to play leading roles in research. We have progressed because we have fostered a tradition of free exchange of ideas and information and embraced a tradition of welcoming talented people from elsewhere in the world. But that advantage is eroding under current and proposed policies.

The international image of the United States was one of a welcoming land of opportunity. We are in the process however of destroying that image and replacing it with one of a xenophobic hostile nation. We are in the process of making it more likely that the world's best and brightest will take their talents elsewhere. The policies that superficially appear to make us secure are, in fact, having precisely the opposite effect. Protecting Americans from threats must obviously be a high priority. But as I said earlier, real security will be achieved only by a proper balance of excluding those that would do us harm and welcoming those that would do us good by a proper balance of openness and secrecy.

With selective thoughtful changes to U.S. policies we can achieve both goals, making our homeland safer and our economy stronger. I would like to close with another quote from the Hart-Rudman report, quote, "Second only to a weapon of mass destruction detonated in an American city, we can think of nothing more dangerous than a failure to manage properly science, technology and education for the common good over the next quarter century." Thank you for the opportunity to testify.

REP. SENSENBRENNER: Thank you, Dr. Wulf.

At this time we'll turn to questions from members of the subcommittee. Ms. Van Cleave, about 30 percent of American university science and engineering faculty are foreign born, accordingly to your testimony, 40 percent of Ph.D.s in these fields go to foreign students. You also say that foreign intelligence services place senior scientists and exploit academic activities. Should there be better reporting of what projects that these individuals are involved in and, in the case of students, also what subjects they are enrolled in perhaps through an enhanced CIVA (ph) system.

MS. VAN CLEAVE: Mr. Chairman, it would be extremely helpful to U.S. counterintelligence to have that kind of increased reporting on these individuals. Frankly, it's difficult to gainsay the statement that was just made by my panel member here that we want to do is exclude those who would cause us harm and welcome those who would do us good. The trick is figuring out which is which.

REP. SENSENBRENNER: And it is possible in that that an individual from a country of concern, if they are applying for a degree in music education, for example, if they start taking nuclear engineering courses as electives, that it would probably be good to know that?

MS. VAN CLEAVE: It would be helpful to get the kind of reporting of changes in emphasis where students coming from one purpose then are switching their majors or emphasis to areas that might have national security implications.

REP. SENSENBRENNER: But they don't have to be major changes. I mean, if an individual takes the course of a four degree, attend classes in chemical engineering, that doesn't necessarily meet the requirements of a minor in chemical engineering, but it nonetheless will probably be very helpful in their potential work?

MS. VAN CLEAVE: Yes.

REP. SENSENBRENNER: Thank you. You testimony states that Chinese intelligence efforts exploit our open economic system to reduce U.S. military advantage and undermine our economic competitiveness. It's actually about the only foreign country you mentioned by name in your testimony. Knowing this, wouldn't you agree that the ***Visas*** Mantis clearance needs better vetting by law enforcement agency especially as it relates to Chinese nationals coming to the U.S.?

MS. VAN CLEAVE: Yes, Mr. Chairman, I think that that would be very helpful. I appreciate the opportunity that we had in closed sessions to discuss in more detail some of the reasons why.

REP. SENSENBRENNER: Thank you. In your testimony you state the top 10 collectors probably accounted for 60 percent of foreign collection at Defense contractors last year. Could you tell us what countries you are talking about when you talk about the top 10, maybe in the order of their collection?

MS. VAN CLEAVE: Mr. Chairman, we did have the opportunity to do that in closed session. I am reluctant to do that in open session. However, I now will tell you some of the reasons why. A number of the countries that are in the so-called top 10 list, there is not unanimity across the community about what really constitutes the top 10. It depends on whether you're looking at incident reports of information that might be amalgamated by the Defense security service, for example, or some of the caseloads that the FBI might be reporting, and there's a different way of counting them. And so the top 10 may vary depending which source data we're looking at.

But let me give you another reason why I'm reluctant to go into specifics. Some of the member states that are among the top 10, as I believe I mentioned, are among some of our closest allies are there are many ways that we deal with these kinds of incidents, different from calling them to the carpet in public forum. There are different kinds of approaches that we might take to allies in trying to stall this kind of activity. But the committee can come to its own conclusion and speculation. Those countries that you have particular interest in in military build up will themselves be looking for those technologies that can help assist in that military build up and they will find the United States a very rich environment in which to acquire those kinds of technologies.

It is also the case that there is some measure of economic competition that drives technology acquisition where there is commercial advantage to be gained and a lot of money to be made. That is yet another incentive and so we see a great deal of activity to include beyond just a top 10. But indeed at least 100 nations -- nationals from 100 different nations were recorded just last year in targeting U.S. technology.

REP. SENSENBRENNER: Ms. Van Cleave, I appreciate the point that you made with regard to our friends. Actually, in your oral testimony you did mention two of those nations, China and Russia, one of our largest trading partners, China. We have ongoing evolving relations with Russia. The reason why I ask the question is the exact reason you gave why you say you are reluctant to give us that, and that is there is assumption among many of our constituents, many of our constituents of United States, that our friends don't spy against us. But as you mentioned in general, that is a very erroneous assumption to be made.

The reason why I asked you that question is to put on the record very specifically who those people are. because once again, it's important for us to know that, for example, through the ***visa*** waiver ***program*** and through other ***programs*** that don't take advantage of the ***Visas*** Mantis system, that there may be requirements for us to change the law with regard to our friends. And I don't mean that with quotation marks. I mean friends, but that have reasons that may be confusing to a lot of us and would be very confusing to a lot of my constituents as to why they aggressively commit espionage against the United States. And so I will not press you on the issue, but I will simply once again reiterate that it's important for us to, in open session, if it is not classified, to divulge this information really for the benefit of this committee and the benefit of our constituents.

Dr. Wortzel, your testimony states that tens of thousands of student ***visas*** were given to Chinese nationals last year, in fact one of the highest. Do you believe we're given preference to China in these student ***visa*** numbers over some of our allies?

MR. WORTZEL: I don't think it's a definite preference towards China. I think what you're saying -- first of all, 1.3 billion, there is going to be more students trying to get out. We're obviously a very attractive place to get an education whether it's high technology education or education in social sciences.

I think our ***programs*** are actually pretty restrictive. It's difficult to go into an American embassy and get into the United States if you're in China. So I think we have to deal with the fact that there are just huge numbers of people there. India only second to that. And that probably accounts for the numbers. REP. SENSENBRENNER: Do you believe in an enhanced CIVA (ph) system would allow us to gain better information to provide our intelligence community the information they need to --

MR. WORTZEL: I do. I'm a great advocate of data mining. I think that the ability to electronically sort through what is open source data, who's here, what are they doing, whether that's by someone in Immigration to -- they've got a right to know what somebody is doing in a university. Now, one could argue that a U.S. intelligence service getting that information might be objectionable to a university president, but if the immigration service gave somebody a ***visa***, I think it would be great to allow customs to get in -- or Immigration, I'm sorry, to get in and say, okay, we gave Joe Doe a ***visa***, he said he was coming here to study this, let me see what he's studying. And those are things that can be done quickly, electronically and things can be sorted out. I do think we should be approaching it that way and I think that we have appropriate agencies in the government that could look at that. And then if there's a reason to raise concerns about what's going on, they turn it over to another agency or counterintelligence service.

REP. SENSENBRENNER: Okay. Without objection, I will grant the chair an additional minute to ask one additional question of Dr. Wulf. Maybe a couple of questions actually, very short answers. You might not have the information.

Dr. Wulf, could you tell me, given the fact that masters and Ph.D. slots for engineering are limited in the United States, would you have statistics that tell us the number of American citizens who are denied masters applications -- masters applications denied as well Ph.D. applications denied in the United States? Would you happen to have those?

MR. WULF: Approximately zero.

REP. SENSENBRENNER: So it's really an unlimited number of masters and Ph.D. slots?

MR. WULF: I didn't quite say that. But the number of Americans who do not enter graduate ***programs*** because there's no space is essentially zero. The trouble is they're not applying.

REP. SENSENBRENNER: They're not -- so there are zero denied?

MR. WULF: Yes, approximately, sir. There may be some oddball cases I don't know about.

REP. SENSENBRENNER: Thank you very much.

The chair recognizes the gentlelady from Texas, Ms. Jackson Lee.

REP. JACKSON-LEE: Thank you very much, Mr. Chairman. Your initial round of questioning certainly points to a dilemma which we face. I would like take some remarks that were made generally speaking through the testimony presented in the open session to indicate my agreement. Let me first of all thank Congressman Lofgren for recognizing Dr. Wulf and the astuteness in which she recognized you in as much as you are representing, or certainly associated with the University of Virginia, and I couldn't think of a better school. I happen to be an alumnus, so I thank the congresswoman very much for her astuteness.

Dr. Wulf, I thank you for your service as well, as I do the other panel. But you did highlight for us the fact that we do prosper because we skim the best scientists from around the world. At the same time I think interwoven into your remark is the idea that we suffer as well from enticing students, graduate students into the sciences and other high technologies that are necessary. So I'm going to come to you and pose that question, but I do want to go to Ms.

Van Cleave to ask, what is the extent that she feels that we are now able, United States, your industry, in terms of counterintelligence are able to identify right now foreign nationals who are coming into the United States to engage in espionage? Do we have that capacity?

MS. VAN CLEAVE: We have limited insight into the foreign intelligence operation into the United States, which is to say, to the extent that we understand the character, make up and operation of foreign intelligence services of concern, we can identify individuals that might be sent here for those particular purposes. However, much of the intelligence collection against the U.S. technology base is carried out not by known intelligence officers, but rather by those who are employing non-traditional collection means against us and that is a much, much more difficult problem. There I would have to say that we have precious little understanding or way of knowing when individuals who are coming ostensibly for legitimate business purposes might in fact have more troubling objectives in mind.

REP. JACKSON-LEE: So in essence, part of the road map that you're providing for us today is the heaping up, if you will, of resources to look at that component that will be non-traditional in the way that they would speak to secure information? That seems to be where we need some emphasis?

MS. VAN CLEAVE: Yes, we've very in need of tools that would enable us to be able to characterize who those people are and why they are here. That small slice that is here for illegitimate purposes.

REP. JACKSON-LEE: I think you.

Dr. Wortzel, I likewise have some agreement with some of the remarks that you've made, but let me just say, and I believe that we will wind up on the same page. We know that, as I've started out by saying, the importance of intellectual exchange and the benefits that United States has gained by a vast number of individuals. And we also know, without any naming or, if you will, illuminating any closed sessions, we know that even our allies have been found to be engaged in some activities that we would not support. So I don't want this to be a hearing that stigmatizes the entire student body from China. They are our allies and friends. We have engaged in some very positive exchange opportunities both in terms of our student exchange, but also our trade exchange and, frankly, we are working towards diplomatic relationships in terms of their continuing improvement.

And I might add, we certainly want to ensure that our military operations are more in sync than in conflict. But you did mention -- I was trying to find your quote, but let just say this. I look at it that the overall war on terrorism has taken us away from -- and I don't want to suggest that we should diminish that effort -- but we need to increase, if you will, the resources for the rest of the intelligence community. Why don't you comment on where we need to, if you will, lift that issue up and in the meantime I'll be finding one of the quotes that I agree with you on, and I guess it is the point that you made about our work should be -- and this ties into my question -- national security versus the question that many members -- rightly so, because if their constituents are impacted, this whole economic issue -- you go to China you're inevitably talking about CDs, country and western music and other music that they have obviously utilized, but that's economic. And I think you said something about we should be focusing on national security. Can you share that with me?

MR. WORTZEL: I think we should. Thank you, congresswoman. We should focus on national security. We need to provide, as I said in the testimony, the legal structure here in the United States and we need to foster a legal structure in China that will provide for property rights and intellectual property rights. But we need to worry about national security here and I think that's the critical test, refining the list of controlled commodities, dual use items to ensure that we protect what is really unique to the United States. I mean, there are some things we're just way ahead on that nobody else is doing, composites that make stealth technologies, turban fanned jet engine technology, nobody else does this. We need to think about that.

I would argue generally that basic research in universities has got to be open, wide open. But when the Department of Defense or the Department of Energy goes to a specific university and funds a ***program*** that moves into applied research, then we should be able to know who's working on it, what they're working on and why they're there.

So I wouldn't worry, Mr. Chairman, about somebody taking 10 courses in chemistry, but if he or she is working to do research on an applied technology with military application or with applications for weapons, I'd get really nervous about it and I would want to be able to know that.

REP. JACKSON-LEE: Chairman, Dr. Wulf, if they might respond to the question I raised, Dr. Wulf, that was the question dealing with a straight out -- the whole question dealing with the importance of the talent that comes here to the United States and the lack of U.S. citizens engaging scientists?

REP. SENSENBRENNER: Without objection. That gentleman may respond.

REP. JACKSON-LEE: And I conclude with that, thank you.

MR. WULF: As I said in my oral testimony and appears again in my written testimony, foreign born nationals represent an enormous fraction of science and engineering talent in this country. I tried to give some examples. In fact, somewhere between 25 and 30 percent of the faculty in engineering schools are foreign born. The fact that overall something like 37 percent of all of the engineers and scientists in the United States are foreign born. The fact that a third of the Nobel prizes awarded in the last 10 or 15 years, two U.S. citizens were foreign born. It's really hard to overstate the benefits that we have reaped by skimming off the best and brightest minds from around the world. And we are, in my opinion, in serious danger of creating an atmosphere that those people will not want to put up with.

Ms. Van Cleave made reference to the fact that in the '50s a number of Chinese returned to Mainland China and set up the missile ***program***. I would recommend to any member of the committee that feels like exploring that, that they take a look at a book called, "The Thread of a Silk Worm". The man who headed the Chinese missile ***program*** is named Tsien. He was a professor at Caltech, got his Ph.D. at MIT, was one of the leading rocket scientists literally in the United States and quite improperly and erroneously got caught up in the McCarthy hearings, was held in house arrest for, if I remember correctly, two years and finally in disgust returned to China and created the Chinese missile ***program***. Yes, it was a returning Chinese, but we drove him there.

REP. SENSENBRENNER: Will the gentleman concede the fact that it was the Communist Chinese missile ***program***?

MR. WULF: Yes, absolutely.

REP. SENSENBRENNER: The chair now recognizes without objection the gentleman from Texas for questions for five minutes.

REP. LOUIE GOHMERT (R-TX): Thank you and I appreciate my colleague allowing me to proceed. I'm going to ask each of you to name the top two immigration practices or omissions that you believe are the biggest threat to our national security. But while you're thinking about that, I want to ask Ms. Van Cleave, are you familiar with the ***diversity visa program*** where we provide 50,000 ***visas*** a year on the basis of a lottery? Were you familiar with that ***program***?

MS. VAN CLEAVE: Congressman, I'd have to say, no, I'm not.

REP. GOHMERT: Okay. Well, then, I don't guess you can tell me how many terrorists may have utilized that ***program***. But anyway, I would suggest that you take a look at it. Some of us -- we voted that out of this subcommittee, a repeal of that, because it seemed ludicrous to some of us that we be awarding ***visas*** on the basis of a lottery, allowing Immigration to abdicate the responsibilities. That's a concern of some of ours. But let me start with Dr. Wulf and work our way down to my left.

Doctor, what do you say is the two biggest -- two immigration practices or omissions that are the biggest threat to our national security?

MR. WULF: Two? That's not easy. But the first one I would name is the fact that immigration ***visas*** are not awarded particularly on the basis of the contribution which the individual will make to the country. They are more typically family based, that sort of thing. I think we ought to give special consideration to those people who can really contribute to the country. And I have to say the second one is overreaction. I really am concerned that we are in the process of making it worse rather than better by overreacting.

REP. GOHMERT: Okay, thank you.

Mr. Andersen.

MR. ANDERSEN: Yes, sir, I think perhaps the most important one to me is we don't know who's arriving here. We do a lot of sort of superficial work, but we're rather poor in determining just exactly who's coming. I don't mean for that to sound discriminatory, but we don't ask our folks, for example, students and researchers coming in, we don't ask those folks to provide us with a great deal of information about who they really are. We ask it of our own students. We ask it of our own military personnel. We ask it of all kinds of people in the United States. But ***immigrants*** really are not subjected to a very strenuous questionnaire on who are you really and I think that may be, to my mind, the greatest one. I'm not sure that I could name a second one. I don't like quotas. I don't think quotas are good. I don't know that that's a threat to us. But I think a failure to really identify our ***immigrants*** is a major issue.

REP. GOHMERT: Okay, thank you.

Ms. Van Cleave.

MS. VAN CLEAVE: From the perspective of counterintelligence, immigration laws are very clear. Where we have an individual who may be known or suspected to engage in intelligence activities inconsistent with U.S. laws ***visas*** are denied. But my real concern about immigration laws is that from a CI perspective they really can't do a great deal for us beyond that. There isn't a panacea that enables our immigration laws to protect us against all of the things that this hearing is now convened to discuss. I would have to say that getting at the real question of who these people are who are coming into the United States, immigration laws can provide some of that information to us, but that really is the point where I think that we need to have a layered approach of which immigration controls are only one part. The matter that was mentioned earlier by the chairman --

REP. GOHMERT: Can you help me? Maybe my mind is too simplistic. I'm just asking you, what do you see is the biggest threat to national security and from a counterintelligence, you're saying we need a layered approach?

MS. VAN CLEAVE: Because I know --

REP. GOHMERT: So the biggest threat in your mind is that we don't have a layered approach?

MS. VAN CLEAVE: I know that foreign intelligence services and foreign governments will exploit such loopholes as they can find to send personnel here to achieve certain ends.

REP. GOHMERT: Bingo. That's what I'm looking for. What loopholes do you know of that we can fix? Number one problem, number two problem.

MS. VAN CLEAVE: And I believe in closed session I was asked to take for the record that particular question and to provide a detailed answer back to the members of the committee. But in open session let me say that I am concerned that where there is an opportunity that immigration laws present forth a foreign national to be entering here because they present themselves as a resident of another country and we really don't get true disclosure on who they are and where they really come from, then that is one particular type of a loophole that I think that this committee may want to consider as it is reviewing our immigration laws.

REP. GOHMERT: So we don't get sufficient information on where this individual is actually coming from, is that correct?

MS. VAN CLEAVE: In certain instances, that is correct.

REP. GOHMERT: Number one. I wasn't asking anything classified, just a succinct what do you say number one problem, number two problem, and then we can go to work from there.

We can get classified information, we can go beyond, but -- okay. So that's the number one problem, insufficient information on where they're from. What else?

MS. VAN CLEAVE: With respect to other aspects of our immigration laws, I have to tell you, if it isn't obvious already, that I am not an expert in U.S. immigration laws.

REP. GOHMERT: You're hopefully an expert on counterintelligence?

MS. VAN CLEAVE: Yes, that's correct.

REP. GOHMERT: Okay. And?

MS. VAN CLEAVE: And being able to avail ourselves of different kinds of databases and information insights on persons who are coming into the United States in various categories of immigration ***visas*** is very valuable to U.S. intelligence and to the extent that we can have more robust databases on persons who are coming here and what they do while they are here, it is of help to us very much.

REP. GOHMERT: And I apologize to you if you felt like I was trying to make you into an expert on immigration. And I apologize if I presume too much in thinking that someone in counterintelligence might overlap or bump into areas of immigration policy where a light would go off, and you go, that's bad for our country that we have this policy. It bumps up against everything we know to be true and good as counterintelligence. Some of us may individually be counterintelligence, but anyway.

Dr. Wortzel, if you would very quickly, my time is up.

MR. WORTZEL: I think that the technology alert list and the ***Visas*** Mantis ***program*** as a process is a good idea. I think it can be improved by education for the officers that actually stand in the ***visa*** line. My own experience in embassies is that when you have an ambassador that insists on interdepartmental cooperation and screening of ***visa*** applications, you end up with better educated selections of who's getting a ***visa*** and who's getting denied. So I would improve that. It's something I think we're doing well. I think where the greatest threat is that when we make it too difficult for an American company to bring in -- and intra-company transfer either to do work in the United States or for a corporate education ***program***, we force that company to export its R&D effort to a third country, or to a place like China. So I think we have to be very careful about this balance of what I just advocated in ***Visas*** Mantis and technology alert lists and ensuring that when a company has a legitimate need for some foreign expert to come in here and get educated or do research and go home and manage or to work here, we don't force that company to export our R&D capability outside the United States.

Now, Mr. Chairman, I failed to respond to one part of Ms. Jackson-Lee's question, and if you would indulge I could do that in a minute.

REP. SENSENBRENNER: Without objection.

MR. WORTZEL: Sir. She asked about the balance between counter- intelligence responsibilities and anti-terrorism, investigative responsibilities for the FBI. Let me say that my experience before and after September 11, 2001, in having to deal with FBI agents here in this country that, you know, I may have spoken to or they come to interview me, they're doing a pretty good job. I mean, they are able, despite the fact that they are out hunting terrorists and hunting people that are perhaps dealing in weapons of mass destruction, they're still able to focus on the big ballpark issues that deal with what may be Chinese espionage. So that they are people who can use more reinforcement. I think they need more counterintelligence agents in the field. They can use more education. I find myself talking to FBI counterintelligence agents that don't know the history of espionage with China and, you know,

I'm going back over the fact that I'm a little older and I've been part of it, but basically I'm pretty happy with what they're doing as an agency and I support the changes and the creation of a new division.

REP. SENSENBRENNER: Thank you.

The chair recognizes the gentlelady from California for five minutes, Ms. Lofgren.

REP. ZOE LOFGREN (D-CA): Thank you, Mr. Chairman. I want to focus a little bit on the ***Visas*** Mantis process because it is faulty and it is slow and it's causing us problems. I'd ask unanimous consent to enter into the record an article from The New York Times this August that talks about a Ms. Wang who was a cryptographer, mathematician actually, who was one of nine invitees to a conference on cryptography that was going to help the United States, because they found a flaw in -- and they were going to help us and they were not able actually to get in to provide that help.

REP. SENSENBRENNER: Without objection.

REP. LOFGREN: I'll just note also, last spring I met with -- I won't mention his name -- but a Nobel prize winner in California who told me that he will no longer organize scientific conferences in the United States because you can't get the scientists in. And so I've actually -- since he said that I've been looking all the high energy physics, it's all -- it's in Toronto, it's in Europe, they're not here any more. And so we're going to pay a price for that. The ***Visas*** Mantis -- stepping back. I think someone said we need to take a look at our export control system and I do -- we've tried to do that, we lost the vote on the floor here. Secretary of State Rice suggest we ditch the end top standard, it doesn't work, and to go with a standard of what's readily ***available***, which makes a lot of sense to many of us.

If we were to do that, here's the question, wouldn't that help on the ***Visas*** Mantis project? Because then you would have a much limited set of technologies and you would be protecting it against the things you really needed to protect instead of this broad area of -- and you go to Fry's and buy it and if you can buy it at Fry's it's too late. And then wouldn't that also help on the deemed export problem? Because right now we're controlling on things that -- I mean, these students are just going to go and get the same thing at Oxford, you know, it's not as if we're the only people that are studying this. What's your reaction on that approach as part of the way to fix the ***Visas*** Mantis problem?

MR. WORTZEL: First of all on Mtops, I would drop that too. I think it's kind of silly to be getting control on speed. I think you have to begin to figure out if there are certain software applications that have great military or cryptographic applications that you control, and I think it's getting silly to control Mtops and I think it's getting silly to control chip density, you know, whether it's 5 or 13 microns or whatever.

Now, all these questions that you're asking really also come down to questions on deemed exports. Or let me give you an example. You can study this. I'm a political scientist, I'm a military officer, you know, I've done a little bit of intelligence work here and there, I'm not an engineer and I've never worked in production and, frankly, most consular officers on a ***visa*** line have not either.

REP. LOFGREN: They don't know.

MR. WORTZEL: They don't know. So their education is a very important part of it, and here, if you're working in an embassy, if you've got a good ambassador or consul-general, he's putting those people in touch with the industry people.

REP. LOFGREN: Let me just -- I know I'm going to run out of time and I don't want to be rude, but right now we have the responsibility, the State Department with Commerce does this whole list. Just simply by shrinking the list we would help the situation to target it, it seems. Would you agree, Dr. Wulf?

MR. WULF: As long as you shrink it by making it more specific. Part of the real problem here is it's a long list, or it's two long lists, and each item on the list is quite generic. So you hand this to some poor consular official who doesn't have a technical background and they --

REP. LOFGREN: It's always easier to say no. You don't get called to account for saying no, only for saying yes.

MR. WULF: Right.

REP. LOFGREN: The other thing I had, looking at it, the slowest part of the whole ***Visas*** Mantis ***program*** is the FBI. They don't have a deadline. And I've often wondered, how much do they really have to offer to this? I mean, these are foreign nationals, they haven't in most cases been to the U.S., they're not permanent residents, they don't live here, you know, maybe the CIA might have something on them in which case we should get that information, but they're not going to be on a rap sheet in the FBI's computer. I mean, it just seems to me that if you're paying a price by having the top scientists go to other countries, having your scientific conferences be shoved abroad -- or I'll tell you, as I was driving to the airport in California I heard interview one of my constituents who had a huge telephone network that he had sold to a company abroad. He couldn't get his customer in to teach them how to use the system. So he relocated the company to Vancouver and left California. So there's a price to be paid on all of this. What are we getting for it in terms of security?

MR. WORTZEL: I don't think it's wrong to ask universities and companies to plan ahead and figure out who they're going to invite.

REP. LOFGREN: I don't disagree with that.

MR. WORTZEL: Two months advance notice. You know, if you decide tomorrow morning you're going to run a conference and you want somebody --

REP. LOFGREN: Right. No, I mean, I don't disagree with that.

MR. WORTZEL: With respect to -- I wouldn't eliminate any part of intelligence or law enforcement communities. But I do think that of all the agencies, from what I have seen and read and experienced, that's the one that can profit the most by a systematic automation of the records.

REP. LOFGREN: It's paper -- and that's why it takes so long. I mean, it's pretty shocking that they've still got --

MR. WORTZEL: Well, I wouldn't eliminate it. Instead, if you -- I mean, you have oversight. That's where I'd push it.

REP. LOFGREN: We've yet to have a hearing on oversight of the FBI and the full committee in the 10 years I've been on the Judiciary Committee. I would just -- of course I know my time is up, but we've talked about our competitiveness, but if the 2 percent of the population of China is really, really smart that's more than the entire population of the United States. So that's what we're competing against and we'd better make sure that we've got new Americans to do that. And I yield back. Thank you.

REP. SENSENBRENNER: Thank you.

The chair recognizes the gentleman from Iowa, Mr. King, for five minutes.

REP. STEVE KING (R-IA): Thank you, Mr. Chairman. I regret that I had to step out of this hearing for a period of time and I missed some of the core of the testimony of the witnesses. I thank you all for your testimony and your written testimony. I have absorbed some of this testimony when the doors were closed and some of it when it's open. And I look back at the United States of America in 1959 and I remember sitting in 6th grade when Sputnik went up into space. I didn't know it that day, but I found out over the years that I had been assigned to, and millions of American students had been assigned to go down the path of science and technology and engineering and math and chemistry. And we did an all out full court press and we mobilized America to educate our young people so that we could prevail in the race to space. And in the process of doing so, we also, I believe, laid the groundwork to prevail in the cold war by succeeding economically where the Soviet Union was bankrupted and before they checkmated us militarily, by the way.

And that backdrop of the history of what we did in this country to mobilize a nation of essentially U.S. citizen students that went into the science and technology, there was a pattern that we had in the past. And I'd ask to what level we have a truly intellectual exchange when we have I think far more students here in the United States studying science and technology than are studying in foreign countries? Is it an exchange or is it just a transfer of our science and technology to foreign countries? And then I begin to think in terms of what's ahead in the next generation of America if we're watching these numbers grow?

And as Dr. Wulf has testified, 25 to 30 percent of the engineering faculty is foreign born, 37 percent of the engineering degrees are foreign born, one-third of Nobel prizes is foreign born. If that number is growing and I suspect it may be, because at more than 50 percent of the engineering doctorates are foreign born, so do we have an intellectual transfer here, or are we just slowly transferring our intellectual property in our human property to foreign countries? A generation from now, are they going to need our universities to teach this? Are they going to have then established in place an ability to teach that engineering and are we going to send our students there at some point? At what point do we reach that critical mass, that tipping point where they're not coming to the United States not because we haven't set a climate that says please come here and learn, but because they've now absorbed the science and technology necessary for them to be the world leaders?

And if we're looking at a nation, like China for example, that has 1.3 billion people and the ability to mobilize all of them if they choose, or skim the cream off of the crop, get that education, bring them back home again, and we've already marketed some of America's future, and what if -- and so within the context of that, that generation or what happens in 25 years or 30 or 50 years, I inject another question. And that is, are the Israelis educating Palestinians or Arabs in military or nuclear technology or missile technology? Do they have an exchange ***program*** going on with their neighbors, their people that are sworn to kill them and drive them into the sea? I mean, that's a little microcosm possibly of this I'll say the risk of an impending crisis with China and a generation from now.

So if the Israelis see the wisdom in not doing that with their neighbors sworn to their annihilation -- and I remember the Chinese general that threatened to nuke Los Angeles, and I wish Mr. Gohmert were here, because he had a conversation with their leadership over there last month, to point that out -- I pose then my question to Mr. Wortzel. Are we thinking generationally in this and what would happen to the future of this country if we decided that we didn't want to take a security risk or intellectual property risk and wanted to mobilize the young people in this country like we did after Sputnik?

MR. WORTZEL: Well, I would like very much to see scholarships targeted toward American students rather than bringing in foreign students into American universities, particularly when you're dealing with a country that has 790 something or $43 billion in foreign reserves. They can afford to send their own students to American universities. But frankly, I would not keep them out.

We do not know the ultimate result of our engagement policy with the Peoples Republic of China. It is a latent security threat and it is certainly a real threat in the sense of its strategic nuclear forces. Perhaps not so much in its conventional forces. But I will tell you that there's great change there. The economic freedom is open enough. It hadn't resulted in a change in political freedom.

You find the average Chinese citizen in most urban areas, and now that's the majority of them, owns an apartment. They have a mortgage. I mean, it's changing. So we don't know what the outcome will be. I think what we need to do again is to identify the most critical technologies and military -- well, no military assistance. But military do use technologies where the United States is so clearly ahead and ensure we protect, but we should not be protectionist about keeping Chinese citizens out of this country or out of our universities.

REP. KING: Thank you, Dr. Wulf.

MR. WULF: I think we all should put emphasis on how we get more U.S. students to study math and science. Just as you pointed out, how Sputnik it became a national priority and by George, a whole bunch of people from my generation took math and science, became engineers and scientists and were living off of them now. The trouble, it

seems to me, is that science and technology is not particularly a priority in this country right now. I just got a letter to make a nomination for the millennium prize. This is a million year old prize that's put up by the ***Finns***.

There are, if I remember correctly, 4 million ***Finns***, right. So kind of a third of New York city. And they put up a yearly million year old prize.

We haven't awarded the national medals in science and technology for the last three years. We've named them but they haven't been awarded. It's not been enough of a priority for the president to do that. Our funding for physical sciences and mathematics, engineering research has been flat or declining for two decades. Total research budget is going up but it's all going into the life sciences. I just read this as our society as a whole doesn't believe that this is a priority and while that's communicated to the young kids and they don't see why they should be doing all that hard work when there's no reward for it.

REP. KING: Thank you, Mr. Chairman. I yield back.

REP. SENSENBRENNER: I think that the chairman --

REP. JACKSON-LEE: Chairman, would you yield for just a --

REP. SENSENBRENNER: Yes, I yield to the --

REP. JACKSON-LEE: Dr. Wulf, I posed this question before I won't ask you to repeat it. I'll just make this statement because I heard your answer to Congressman King's comments. This is not the Science Committee. Both Congresswoman Lofgren and myself are members of the Science Committee. And I would simply say that the problem is even wider than you might have expressed here. That has to be a parallel effort in order to surpass or to overcome the dilemma that we're in. National security, more resources in intelligence, but over here a ramping up of the training of Americans in the sciences and the mathematics and the encouragement of grad students and professors and researchers and more dollars in basic research. Thank you.

REP. SENSENBRENNER: That chair feels compelled to make an addition to the record given my background. Being an engineer student in the late 70s and early 70s, I can't remember a single federal government ***program*** that encouraged me to become an engineer. I do remember the influence of family and community and of the economy and the fact that I was encouraged to follow my desire to study that which I enjoyed, which was the math and physical sciences. It just so happened that my graduation also coincided with one of the largest build ups of the United States military where there was a huge demand for the applied sciences. And the fact that I also graduated at a time when the nuclear industry had gained ground, but as a result of a very limited number of unfortunate incidents in that industry caused that industry to almost evaporate from future growth.

Virtually all of my encouragement came not from the federal government, but came from a robust economy and a strong understanding of a strong national defense, which all of those needed engineers and there was tremendous demand for that. Now, I think if we see a -- it's inversely proportional to the level of attendance that's been taken on by the federal government since I've been in Congress as an engineer. I've heard continually about the fact that we're spending more in the federal government on the attention to science and engineering and we are getting fewer American scientists and engineers.

Once again to reiterate, this is not the Science Committee, but this is a committee that is going to look into in the coming months one of the issues that was touched on briefly here. And that is, what is the relationship between foreign born foreign nationals and our institutes of higher learning with regards engineering and science and why people aren't doing what they did in the late 1970s and that is going into engineering in fairly large numbers. If I remember the fact, there were a few people that were kept out of ***programs*** because of restrictions on attendance at that time.

So I just make that addition simply out of experience and I appreciate the input of all the members of the panel. Your testimony has been highly effective and highly beneficial to this discussion. All members will be allowed two days to make additions to the record. Business before this subcommittee being complete, we are adjourned.

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