

# F.A.S. PUBLIC INTEREST REPORT

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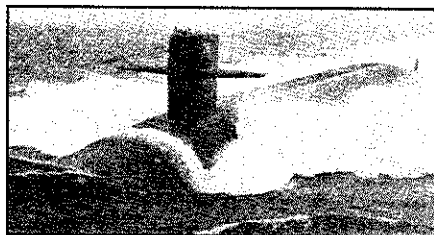
March/April 1999

## A Grand Bargain for Defusing the Nuclear War System

The U.S. Government is urging the Russian Government to agree to modification of the ABM Treaty to permit construction, by the year 2005, of a limited Anti-Ballistic Missile system designed to intercept future North Korean missiles. There is serious doubt that such a system can be made to work and that the North Korean Government, now in a spiral of economic collapse and famine, will last long enough to provide the threat. Meanwhile, the economically-pressed Russian Government is urging the U.S. Government to agree to lower levels in START III than the 2,000-2,500 agreed to in Helsinki in 1997. It is faced with the fact that, by the year 2007, when START II would end and START III begin, it might have less than 1,000 deployed strategic warheads.

A number of FAS experts (see page 5) had endorsed the following statement on January 28:

*As part of a resolution of differences over anti-ballistic missile systems and the ABM Treaty, we urge the Administration to begin negotiations with the Russians on START III--without awaiting Russian ratification of START II--and to offer, in those negotiations, START III limits of 1,000 deployed strategic warheads, with the understanding that START II reductions would continue during the negotiations and that both START II and START III would be ratified once these START III negotiations were complete.*



*Invulnerably-based Trident submarines--four of which are kept on 15 minute alert, in peace-time, for quick disarming attacks on undispersed Russian forces.*

In presenting these views in Moscow in February, FAS President Stone proposed to Moscow arms control experts that it trade the ABM modifications for the lower limits and provided the Russians with a "defuse" memo, shown on page 5, which argued that such a reduction would force a change in the Presidential Guidance. This guidance describes the strategic force options that the Administration must maintain and these options include disarming attacks on Russian forces--whether caught off-alert or on-alert (see page 6). The Defense Department does not believe that it can maintain these counterforce threats with fewer than 1,500 to 2,000 deployed strategic warheads.

Most of the arms control community would want this guidance changed. The threat of a disarming attack on Russian forces is a remnant of a by-gone age in which such threats were thought to deter Russian invasion of Western Europe--now an impossibility. Maintaining the capability is sometimes justified as an option to launch forces on warning of an attack. But this justification does not augment deterrence and is not one, in any case, that any President would use. Today, this capability is widely considered by most to be more dangerous than useful. And such limits would defuse the nuclear war system by forcing an end to first-strike threats as we know them today--an idea approved by FAS in the Jan/Feb 1998 PIR. Meanwhile, Stone believes that some modifications in

Russia Trip Report p3; Memo to Russian Experts p5; War Plans p6; Rogov on Nuclear Balance p7; Corona Conference p8; Russian Labs Doing Arms Control p9; Biological Warfare p10; Kavanaugh Joins FAS p11; China and Ballistic Missiles p12

the ABM Treaty are not that relevant to the future of the ABM. Indeed, the serious pressures from conservatives to abandon the ABM Treaty, and to try to build a large ABM, might best be moderated by keeping the Treaty in place albeit with modifications aimed at a small ABM. Even without Russian agreement to modify the Treaty, the ABM might be built anyway and, with modifications, might well not. Members and experts will have their own assessment of this calculus. But such a grand bargain would not, in any case, preclude FAS officials from working against ABM construction.

Even a change in the Presidential Guidance does not ensure a permanent end to disarming attack options. If the Russian Government decides not to maintain hardened silos for missiles and/or dispersed mobile strategic forces, even very limited U.S. strategic forces could, on paper, attack them. Nevertheless, it appears that U.S. agreement to START III limits of 1,000 would move us far toward the end of an era of first-strike threats. As a symbol of that change, Trident submarines, now on 15 minute alert in the North Atlantic, should be taken off this very high, and totally unnecessary, peace-time alert which only helps keep the Russian forces on a relatively higher alert.

Accordingly, while we do not support modifications in the ABM Treaty, per se, FAS believes: a) the Russians would do well to insist on 1,000 as the START III limit--in their own interests and in world interests in having this guidance changed--in any discussions on the ABM Treaty; b) the guidance should, in any case, be changed; and c) the ABM designed for North Korean missiles is premature and probably will not work effectively. With regard to North Korea, deterrence will have to do. □

*Reviewed and Approved by the FAS Council*

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## Anti-Ballistic Missiles: Third Emergency In Four Decades

Jeremy J. Stone

On the Delta flight to Moscow, on February 20, I recalled my first five annual visits to Moscow in 1966-1970, joined by my wife and her hard-earned ability to speak Russian. Then we were determined to talk the Russians out of building an ABM system with a view, instead, of a treaty banning such systems. The message was: "Don't do it or America will buy an even bigger one--and these systems will not, in any case, work."

The Treaty was eventually ratified, in 1972. There was calm on the ABM front until Ronald Reagan's 1983 "Star Wars" speech induced a second ABM emergency. The speech raised questions in Russian minds whether they wanted to continue disarmament negotiations, previously called SALT talks and later START talks.

### Third Emergency in 1998

Now in the late 1990s, the third emergency had been induced by North Korean missile firings. With Republicans in Congress pressing for an ABM against "third world" missiles, the Administration was asking the Russians for modifications in the ABM Treaty.

By coincidence, the plane had about 30 different U.S. officials--many of them on their way to talk to the Russians about the same subject! These included Deputy Secretary of State Strobe Talbott and Robert Bell, Senior Director for Defense Policy and Arms Control in the White House National Security Council. They assured me they were to be in Moscow only two days to my five.

Strobe is America's finest chronicler of the arms race talks. An immensely talented person, he had, while holding various full-time jobs, written three superb books on the arms negotiations: *Endgame: The Inside Story of SALT II* (1979); *Deadly Gambits: The Reagan Administration and the Stalemate in Nuclear Arms Control* (1984) and *The Master of the Game: Paul Nitze and the Nuclear Peace* (1988).

The last book is generous in describing my role in helping resolve the second emergency and he inscribed my copy of his book with: "To Jeremy

Stone--who planted many of the Master's best ideas". Encouraged by this, I button-holed him and handed him a one-page summary of what I planned to show the Russians.

The memo urged the Russians to agree to the "defuse strategy" described on page 1. The strategic importance of reductions in eliminating first-strike threats had been earlier referenced in an article (with Ambassador Paul C. Warnke) in the Washington Post on "de-MIRVing".

That approach of lowering START limits to eliminate first-strikes had first surfaced in the FAS Public Interest Report editorial of January/February 1998 and had been specifically endorsed at that time by such experts, besides myself, as Alton Frye, Steve Fetter, Townsend Hoopes, Carl Kaysen, John E. Pike, George W. Rathjens, Paul C. Warnke, and Herbert F. York. Now the new element of ABM modifications had been added.

### Arrival in Moscow

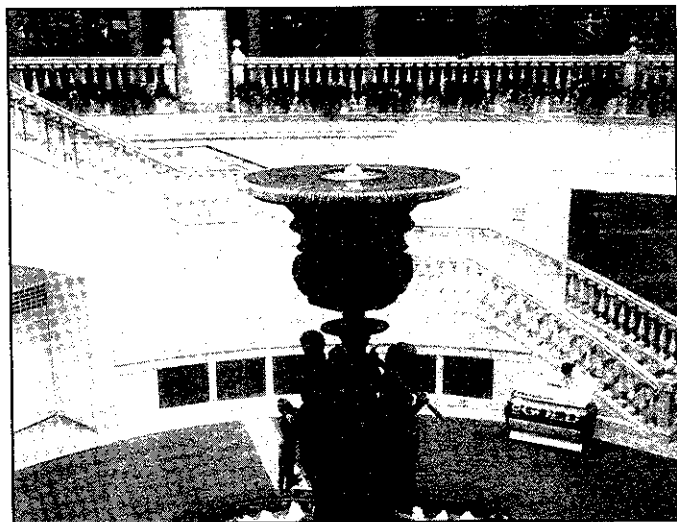
I had not been in Moscow since 1991 but still had a few non-official friends. One, Alla Elvarovna Orekhova, who had translated for me in conversations with Andrei Sakharov and numerous other Government officials, met the plane. Now working for the Soros Foundation in Moscow, she had been working up an itinerary. But there were problems: the flu was raging; Army day was taking place on Tuesday (and it became a two day holiday); there were a lot fewer people interested in strategy and arms control in the nineties than there were in the eighties; and those with influence were constantly out of the country giving speeches or attending conferences.

Moscow is overbuilt with hotels. The new Marriot hotel that charges \$485 per night may have had guests, but my hotel, the Sovietsky (\$124 per night), had only five guests in its 100 rooms. And many ordinary Russians were in dire circumstances. The last ruble devaluation had reduced the value of the ruble from 16 cents to 4 cents but left prices mostly unchanged. Some people could not afford a fresh apple. And a tip 100 rubles (\$4.00) left waiters enchanted. One felt like an Arab potentate.

In the course of the week, the "defuse" strategy was presented to a number of relevant experts including: Academician Georgie Arbatov, the founder of the Institute for Canada Studies; Sergei Kortunov, Councillor of the Head of President Yeltsin's office; Colonel-General Leonid Ivashov, head of the division of international cooperation of the Ministry of Defense; Sergey Rogov, present director of Arbatov's institute; and Anatoli Diakov, Director of the Center for Arms Control, Energy and Environmental Studies at the Moscow Institute of Physics and Technology. My presentation was accepted with interest with comments ranging from "brilliant" to "logical" to substantively non-committal. Preparations were made to organize a U.S.-Russian conference in Washington, under FAS sponsorship, to discuss these ideas with a visit to the United States of a half-dozen important Russian experts. I also talked to the *Washington Post* and *New York Times* Moscow representatives in the form of David Hoffman and Michael Gordon respectively. One problem in discussing all this was that the U.S. had not decided what modifications in the ABM Treaty it really wanted.

### Emphasizing Strategic Significance in Limits

It was evident that more and more Russian experts were coming out for 1,000 as the START III limit anyway--a reduction from the 2,000 agreed in principle at Helsinki by Clinton and Yeltsin. Yeltsin had called for 1,000 twice before and the decline in Russian strategic forces had made Russian experts realize how little they want to build up to 1,500 much



*Fancy new Moscow hotel for the rich*

less to 2,000 and hence how desirable it would be to have a lower limit.

What the experts seemed not to appreciate was the strategic significance of getting the level down to 1,000 in eliminating the counterforce strategy. And this was what I was trying to explain. Of course, my views were not uncontroversial. While the Defense Department would certainly now agree that a limit of 1,000 deployed strategic warheads is not enough to maintain a war plan that includes carrying out a pre-emptive strike against Russian forces--while maintaining all necessary related options and reserves (see "Decoding the War Plan" on page 6)--some American experts are not sure that, if push came to shove, the Defense Department might later revise its position and figure out how to carry out the same war plan options with 1,000. But, bureaucratically, the change in guidance would be the end of an era of first-strike threats and hard to reverse. Certainly, it would represent relatively irreversible progress in de-alerting.

### Meetings with Russian Scholars

Over breakfast, a Russian scholar on American history, Vladimir Pechatnov, told me of his research into Soviet history and how Stalin had chastised Molotov for being too gracious toward the Soviet Academy of Sciences when it elected Molotov an honorary member!

In an evening, we learned that it cost \$40 for food to provide a feast for seven persons at a home. The food prices were not much lower than in the U.S. so food had become a real burden for most Russians. The day before, at the only store in Moscow that sold ancient coins, a crowd of about a dozen hobbyists stood outside the store waiting for prospective purchasers and selling 200-year-old 5-kopec copper pieces made by Catherine the Great for \$10.

Over dinner, Anatoli Diakov emphasized the importance of the U.S. agreeing to negotiate START III without waiting for Russian ratification of START II. He urged the United States to agree to such negotiations if the Russians would agree to negotiate modifications in the ABM Treaty in parallel negotiations. His sense of urgency was emphasized by the fact that elections were coming in the fall for the Duma and then there would be Presidential elections in Russia. □

## The "Defuse the Threat" Memo Carried to Moscow

February 19, 1999

To Colleagues in Arms Control:

The United States continues to keep Trident submarines, on 15-minute alert, in the North Atlantic ready to fire at Russian forces. They are the most apparent part of an anachronistic, unnecessary, and unworkable U.S. capability to strike Russian strategic forces--a capability that keeps Russians forces on a higher degree of alert than necessary and is, therefore, equally dangerous to both sides.

The United States will have to abandon this option if the number of deployed strategic warheads falls to 1,000 and, as a result, will also de-alert its first-strike capability. This gives special meaning to securing such START levels.

Furthermore, at such levels, no plausible ABM system could re-establish a U.S. first-strike threat. ABM systems, even in the Cold War logic, were never reliable enough to supplement effectively strategic attacks that had not already neutralized the vast majority of opposing missile launchers and bombers. Thus low START III levels of 1,000 do more to stabilize the strategic balance than *any* ABM system, much less a minor one, does to upset it. I say this as one who began writing papers looking toward an ABM Treaty thirty-six years ago, in 1963, and who is completely devoted to the Treaty and understands its logic.

Since the U.S. Administration now needs Russian agreement to modify the ABM Treaty to permit a possible anti-North Korean missile defense, Russia has the leverage to ask for the negotiation of low START III levels and, if politically necessary for either country, the ratification of START II later with START III.

The United States does not, in fact, now know how to build a relevant anti-North Korean ABM system, and North Korea might well fail economically long before such ABM systems were built. The only other alleged third-country ICBM threat, Iran, appears less likely to build an ICBM every day. So the U.S. may never, for technical or political reasons, or both, build an ABM anyway.

Thus a Russian Government agreement to

modify the ABM Treaty--in return for sharp reductions in START III strategic force levels--could solve, at little cost, the heretofore intractable problem of persuading the United States to abandon an option that it might otherwise never see a politically compelling reason to abandon. A moment has come when the United States sees a compelling reason for reductions--to satisfy Russia. And the reductions will preclude first-strike threats. Bargaining over ABM Treaty provisions might thus secure a qualitatively more stabilized strategic balance--one far less prone to inadvertence and more de-alerted--while keeping the essence of a treaty that has stabilized the arms race.

*Jeremy J. Stone*

### EXPERTS URGED U.S. TO OFFER 1,000

The italicized paragraph on page 1, urging the United States to propose 1,000 as a START III limit in any discussions over ABM Treaty modifications, was drafted with the help of Ambassador Paul C. Warnke, former director of the Arms Control and Disarmament Agency, and sent to Administration officials on January 28 with the specific endorsement of these experts: Steve Fetter, Alton Frye, Marvin Goldberger, Frank von Hippel, Carl Kaysen, Robert Norris, Gregory van der Vink, Herbert F. York.

The appeal, on this page, to Russian arms control experts is, in essence, simply a suggestion that the Russians call for the very same limits in the very same talks! But it adds the important insight that the lowering of START limits would, in fact, have a most important effect in "defusing the first-strike threat" by forcing a change in the U.S. war plans--thus providing a reason why the Russians might agree to modifications in the ABM Treaty--modifications that would, otherwise, further undermine their strategic position, according to traditional cold war logic.

Having advised Russian experts in the '60s that Russian ABM systems were provocative, it seems strange advising them, in the '90s, to bargain. But, in this case, Russian security would be better improved by dramatically lowering U.S. levels of (effective) offensive weapons than by worrying about (ineffective) defensive ones. □JJS

## The War Plan Decoded

*On March 2, examining a glossary of terms prepared by William M. Arkin and Hans Kristensen [“The Post Cold War SIOP and Nuclear Warfare Planning” recently released by Natural Resources Defense Council (NRDC)], and reflecting on other information, the relevant aspects of the war plan became clear. In particular, the four Major Attack Option definitions included, incredibly, a “peace-time” first-strike option in which Russian forces had not dispersed! This explains peace-time 15-minute alerts on Trident submarines.*

*Major Attack Option 1 (MAO 1), the counterforce option, evidently is expected to require about 680 warheads because this is the number that STRATCOM is planning to have on “hard (i.e. high) alert” under START III--something learned by FAS last year. Furthermore, 680 is approximately 2 warheads for each of the Russian silos (200), bomber bases (a few) and sub bases (3), plus 100 other key targets expected at that time. This option keeps four Trident submarines on 15 minute alert at all times. Their warheads can arrive in less than 15 minutes. Meanwhile the Minuteman missiles can be fired at a moment’s notice but arrive in 30 minutes.*

*Major Attack Option 2 (MAO 2), which is counterforce plus additional nuclear related targets such as warhead storage sites and *dispersal and secondary airfields*, [italics added] evidently, by its definition, assumes some Russian dispersal--hence is a crisis period option. In the crisis, the U.S. would also be alerted and hence the Trident mid-ocean force of another three or four Trident submarines could be brought from 18 hour alert to 15 minute alert. In the START III mode, these submarines would have about 4 warheads per tube and would add another 288 to 384 warheads that could arrive rapidly and be aimed at the targets of MAO 2 or used for the Secure Reserve Force (SRF) or MAO 3 or 4.*

*Major Attack Option 3 (MAO 3) adds leadership targets to the first two options and this means attacking as many of the 18 hardened underground command posts as can be found. Presumably, this has been assigned to bombers with their heavy bombs, including the B61-11 Penetrator.*

*Major Attack Option 4 (MAO 4) adds a full scale attack across the entire target base, adding*

### Earlier Visit to STRATCOM

**FAS traveled to the Omaha headquarters of STRATCOM in May 1998 to describe its proposal to reduce START levels to 1,000--by de-MIRVing. This visit confirmed that new guidance would be required if START levels fell below 2,000 and that, at low START levels, extended deterrence (i.e. disarming attacks) would cease to be an option. (See the FAS PIR of July/August 1998.)**

“economic” targets. These warheads would have to be assigned, also, to submarines because they would have to be “withholdable” for the longest possible period so that, in principle, they could be held back to deter Russian attacks on U.S. cities.

*A Secure Reserve Force (SRF) would include submarines in transit and bombers not used for a particular Major Attack Option.*

According to the NRDC glossary, and FAS analysis, STRATCOM would have evident difficulties maintaining a full-scale counterforce option at 1,000 warheads since it would have only 320 further warheads to add to the 680 needed for the bare-bones, no dispersal, counterforce MAO 1 option. If, as seems plausible, the 1,000 warhead deployed force was allocated at 250 bombers, 250 Minuteman and 500 Trident warheads, 200 of the Trident warheads would normally be in port, or under repair, at any one time and might not be usable. This leaves only 120 warheads for the MAO 2, 3, and 4 and for the Secure Reserve Force (SFR). This is far too few.

This shows why STRATCOM will request changes in guidance if restricted to a START III limit of 1,000. Obviously, STRATCOM wanted at least 2,000--because that is the lower limit of the 2,000-2,500 warheads, it agreed to at Helsinki in 1997. And it believed, then, that the 2,000 would provide only 1700 ready warheads because of readiness problems. So it must believe that START limits of 1,000 would provide significantly fewer than 1,000 to start with--which gives further support to the above calculation. □

JJS

## Sergei Rogov on the Nuclear Balance

*Dr. Sergey Rogov, Director of the Institute for U.S.A. and Canada Studies, recently wrote a paper for the Center for Naval Analyses entitled: "Nuclear Weapons in the Multipolar World". He has become a most influential Moscow commentator.*

Russians have come to consider nuclear weapons a kind of a panacea, a magic solution to all challenges (including conventional aggression) that Moscow confronts in the international arena...[While] the budget of Pentagon has been reduced to about \$270 billion...the Russian defense budget is no more than about one-tenth of American military expenditures....Altogether the maintenance of the U.S. military nuclear complex costs Washington something like \$35 billion in the present fiscal year. On the other hand, Russia spends approximately 10% of its defense budget on its military nuclear complex. This money (\$3 billion) is sufficient neither for the maintenance nor for destruction of its nuclear weapons.

...If the Duma ratifies the START-2 Treaty, the Pentagon will remove from service four Trident submarines with C-4 missiles and 50 Peacekeeper ICBMs, which would reduce U.S. nuclear forces to the level of 3,500 warheads. This reduction will bring to the Department of Defense savings on the order of \$800 million a year--that is approximately 4 percent of all its expenditures on military nuclear forces. A further reduction of strategic forces to the level of 2,500 warheads, as agreed at Helsinki in 1997, will save the U.S. budget another \$700 million per year. And if the START-3 Treaty establishes even lower ceilings, the Pentagon will save another \$500 million a year.

The situation in Russia is different because up to 70 percent of our strategic systems have already surpassed their original service lives. Today the Russian Federation has about 750 ICBMs, 384 SLBMs, and almost 70 heavy bombers. According to some American estimates, these strategic nuclear forces of Russia will drastically shrink by the end of the next decade.

At the present level of financing, the strategic nuclear forces of Russia will be reduced to a level of approximately 1,000 warheads by 2010. At that time, we will have no more than 200-300 ICBMs, 5-6

submarines with about a hundred SLBMs, and 10-15 bombers. In the most optimistic case, the nuclear arms of Russia will probably be reduced to a level of 1,000 to 1,500 strategic warheads and 2,000-3,000 tactical nuclear weapons by the end of the next decade. In the worst -case scenario, these numbers will be "the ceiling" instead of the "floor".

...If the START-2 Treaty is ratified, we can possibly expect to quickly negotiate a START-3 Treaty at a level of approximately 1,000-1,500 warheads. This would permit the Russian Federation to keep numerical equality in strategic arms with the United States in the 21<sup>st</sup> century, while keeping an impressive superiority over China and other nuclear countries....it is mandatory that one of the conditions for the ratification of the START II Treaty should be a law that guarantees the financing of the strategic nuclear forces....other conditions that should be included in the ratification document would be a rigid linkage between the reductions of strategic offensive arms and observance of the ABM treaty, including the protocols signed last year that differentiate between strategic and tactical ballistic missile defenses.

### Russian Concern About Reserves

Our interests also require additional measures of transparency, including those that should be related to "reserve" warheads. The so-called 'sudden breakout' potential of the United States can consist of 3,000-4,000 weapons....naturally, the lower the officially permitted level of deployed warheads is, the more serious these additional stocks of weapons look. Therefore it is necessary to arrange measures with the United States that would reduce the sudden breakout potential. These measures might include, for example, destruction of the buses that can carry a greater number of MIRVs, information exchanges, and, probably, on-site inspections on a mutual basis.

At the same time, taking into account the consequences of the nuclear-weapon tests of Pakistan and India, it is necessary to look more seriously at some of the hidden problems built into the Soviet-American mutual assured destruction model that we inherited from the Cold War. □



## FAS Gathers Experts to Analyze CORONA Imagery

*John E. Pike*

The recent FAS "Through the Keyhole" conference on public policy applications of declassified CORONA imagery marked a major milestone in FAS's Public Eye initiative. The conference reviewed prior public policy efforts in understanding the special weapons programs of other countries, and looked ahead to future imagery applications in support of such analysis. But the centerpiece of the conference was the release of the first efforts by public policy analysts to use declassified high-resolution imagery systematically to characterize the Russian nuclear weapons complex.

Stan Norris, of the Natural Resources Defense Council, began the conference with a review of the sources and methods that were the foundation of the of the landmark Nuclear Weapons Databook series, of which he was a principal author. He posed the fundamental question raised by satellite imagery: "beyond the voyeuristic satisfaction we get from seeing a nuclear storage site or the outlines of the Avant Garde plant in Arzamas-16, what is it exactly that we learn?"

### Handler Provides Some Results

Josh Handler, a Ph.D. student working with Frank von Hippel at Princeton University, then presented findings from his extensive analysis of the Russian nuclear weapons storage facility complex. His work was motivated in part by the question of whether adequate storage capacity existed to accommodate nuclear warheads that might be stored separately from their missile launchers as part of a program of de-alerting nuclear forces. Prior to his evaluation of the CORONA material, there was only a small amount of information on what these bunkers looked like or what they may look like.

Working with FAS Public Eye staff Charles Vick and Tim Brown, Josh was able to identify 10 of the 16 national level nuclear weapons storage sites, as well as several additional regional storage sites. This previously unavailable data permitted an estimate of the storage capacity of these facilities. The imagery also permits an estimate of the potential costs of improving the security of the storage facilities, in

terms of how much fencing would be required and the number of sensors that may be needed.

### The Secret Cities Revealed

The next presentation, by Dr. Oleg Bukharin from Princeton, covered the "Secret Cities" of the Russian nuclear weapons production complex. His conclusion, that "the magnitude of the Russian complex is just immense," was made possible through CORONA imagery presented at the conference. He said, "CORONA imagery really helps to consolidate the existing knowledge base and to figure out what we know, what we don't know..."

Corey Gay, a policy analyst at the Institute for Science and International Security, presented several case studies that illustrated the limitations of these new capabilities. Their experience to date demonstrates that successful use of satellite imagery requires both a strong foundation in imagery analysis as well as subject matter expertise -- knowing what kind of facilities and signatures to expect in imagery.

Looking to future collaborations among different communities, Christopher Simpson of the School of Communication at American University noted the mistrust and misunderstanding among scientists, journalists and non-governmental analysts.

Imagery presented at the conference along with other related materials may be accessed at the Public Eye website at <http://www.fas.org/eye/> □



*Packed house listening to John Pike open his conference*



## New Russian Arms Control Centers in the Weapons Complex

*Charles D. Ferguson*

With the end of the Cold War, Russian scientists and engineers have gradually begun to form nuclear complex-based organizations devoted to non-proliferation and arms control.

As a group formed at atomic weapons laboratories of World War II, FAS has appropriately served as a midwife to the birth of these organizations. On January 13 at the Carnegie Endowment for International Peace in Washington, FAS introduced to their American colleagues senior members of Russia's major nuclear weapons and reactor institutes, who described four new Russian arms control and non-proliferation centers.

Frank von Hippel, FAS Fund Chairman, co-chaired this meeting with Anatoli Diakov, Director of the Center for Arms Control, Energy, and Environmental Studies at the Moscow Institute of Physics and Technology, an existing Russian arms control and non-proliferation center that does physics-based policy analysis.



*(l-r, standing) von Hippel and Sukharuchkin; (sitting) Avrorin, Diakov, Pshakin and Rogatchev*

### Overcoming Lab-to-Lab Limitations

Von Hippel explained that these new centers will complement the Department of Energy's (DOE's) Lab-to-Lab Program, which began in the early 1990s to foster cooperation between American and Russian national laboratories, by encouraging interaction with and making reports available to the arms control community outside the labs

The Russian weapons labs are still primarily directed toward designing nuclear weapons. Nonetheless, Vladimir Rogatchev, Deputy Director for International Relations at the All-Russian Institute of Experimental Physics (VNIIEF) at Sarov (Arzamas-16), described "a philosophical change" from designing weapons to maintaining the safety and

reliability of the arsenal.

Evgeny Avrorin, Scientific Director of the All-Russian Institute of Technical Physics (VNIITF) at Snezhinsk (Chelyabinsk-70), emphasized that VNIITF's Center for Systems Research and Development (CSRD) will pursue an ambitious agenda. CSRD's twenty technical staff will make CSRD one of the world's largest non-proliferation and arms control centers.

Gennady Pshakin of the Institute of Physics and Power Engineering at Obninsk cautioned that many of the proposed projects involve sensitive information. For instance, while fissile material accountancy requires detailed knowledge of the history of plutonium production, Russia tightly guards this information. Analysts, therefore, have "to move slowly" and "step by step" to resolve problems.

### Philanthropic Patronage Needed

Unlike America, Russia lacks indigenous philanthropic support of arms control. Amplifying this point, Vladimir Sukharuchkin, Director of the Division for Nonproliferation and Arms Control at the Kurchatov Institute, said, "Rich people in Russia have yet to support scientific and arms control work," and Russia "needs public education, especially within the business community," of the necessity of this work.

The W. Alton Jones Foundation is providing seed grants to three of the four centers (Kurchatov, Obninsk, and Chelyabinsk-70) and is considering a proposal from the fourth (Arzamas-16). Also, DOE is considering supporting the centers at Chelyabinsk-70 and Arzamas-16. Along with FAS and Princeton University, the Russian American Nuclear Security Advisory Council (RANSAC) has helped these centers organize themselves. □

## Biological Warfare: Genetically-Engineered Weapons Cannot Be Excluded

K.P. Kavanaugh

It has long been rumored that modern biological weapons could be designed to attack specific vulnerabilities of particular ethnic groups. Early in the development of the US offensive biological weapons program Colonel Creasey, Chief of Research and Engineering of the US Chemical Corps, suggested that agents may be selected because of known susceptibility of the target population. This shows that the differential susceptibility of different populations to various diseases had been considered at that time and, according to scientists at Defense Advance Research Projects Agency (DARPA), is continuing today.

Indeed ethnic-specific biological warfare predated the advent of the biotechnology revolution. Smallpox was almost certainly deliberately used against the Native Americans centuries ago and there are other examples. U.S. and British officials believe an ethnic-specific weapon would be used today if it became available during a severe conflict between two deeply antagonistic groups.

### Genetics Not Necessarily Involved

Nor is it essential to focus on the genetic constitution of a particular group in order to attack it in an ethnic specific way. Vaccination of the attacker against the intended biological agent would give specificity if the target population was not vaccinated. Attacking a particular population with lethal toxins could achieve the same effect. Equally clearly, attacking a principal food source of one side which the other side did not consume (as an example, swine induced diseases are being studied by the US Department of Defense in this area) could produce a specific attack on a designated population.

Despite such possibilities, however, most discussion of ethnic-specific weapons has centered on what are termed 'genetically engineered' weapons, which involve the attempt to target genetic differences between ethnic groups.

Genetically-engineered weapons are clearly an emotive issue and have long been the subject of vocal claims of wrongdoing and counterclaims of false accusation.

Today, warnings are coming not only from the medical community, but also from other specially credible sources. There have been indications, for example, that the US Secretary of Defense is concerned about the possible development of genetic weapons. In June 1997, *Jane's Defense Weekly* reported that Secretary Cohen "quoted other reports about what he called 'certain types of pathogens that would be ethnic specific so that they could eliminate certain ethnic groups or races.'" Then after a later interview with the Defense Secretary in August 1997, it was stated again in *Jane's Defense Weekly* that "he also continued to insist that the science community is 'very close' to being able to manufacture 'genetically engineered pathogens that could be ethnically specific'".

### Early Accounts, Then Silence

In accounts during the 1980s of the possible development of genetic weapons, a frequent source of scientific data was a paper by Carl A. Larson, then head of the Department of Human Genetics, University of Lund, Sweden, published in the journal *Military Review* in November 1970. Larson's paper was mainly concerned with the possible development of a new range of chemical weapons, including incapacitants. Individual differences in response to chemical agents had been known for some time, but Larson reviewed what was known of differences between populations in reaction to drugs and saw the basis of such population differences as genetic. Larson seems to have been pointing to possible future developments rather than near-term practical possibilities. The question is whether, almost 30 years later: have genetically engineered weapons become a practical possibility?

There does not appear to have been subsequent detailed open publication by reputable scientists of the application of modern biotechnology to genetically - engineered weapons until the 1990s. Then in 1992 the journal *Defense News* carried a report which noted a scientist arguing that genetic engineering may enable us to:

*...recognize DNA from different people and attach different things that will kill only that group of people...You will be able to determine the difference between blacks and whites and Asians and Jews and Swedes and Finns and develop an agent that will kill only a particular group.*

Shown this quotation in February, scientists within the DOD confirmed that defensive research was being done specifically in this area. Thus the threat would appear to slide along the spectrum from the merely theoretical through the potentially possible to the patently workable. Such arguments have been set out at greater length in an appendix to the 1993 Stockholm Peace Research Institute's *Yearbook*. The most pertinent aspect of the appendix entitled, "Benefits and threats of developments in biotechnology and genetic engineering," reads:

*While modern biotechniques are revolutionizing medicine and agriculture, the possibility exists of their misuse for political ends, for clandestine production and refinement of biological weapons (BW), and for future development of weapons of mass extermination which could be used for genocide.*

Particular reference is then made to the possible misuse of knowledge gained from the Human Genome Project and knowledge about genetic

diversity. The element of critical significance here is contained in the last sub-section of section VI where the question is clearly stated, "Can't genetic weapons be developed?" The answer is that if:

*investigations provide sufficient data on ethnic genetic differences between population groups, it may be possible to use such data to target suitable micro-organisms to attack known receptor sites for which differences exist at a cell membrane level or even target DNA sequences inside cells by viral vectors...*

While SIPRI notes that ethnic differences do not match political borders well, and therefore it might be necessary for a user of genetic weapons to take risks with regard to his own population, there can be little doubt that the development of genetically-engineered weapons is a significant risk.

While genetic warfare is not, in all probability, a practical possibility today, the Fourth Review Conference of the BTWC, was correct to argue that:

*It cannot be ruled out that information from such genetic research could be considered for the design of weapons targeted against specific ethnic or racial groups.*

It would seem to be a mistake to assume that genetically-engineered weapons can never be developed. □

### Kavanaugh Joins FAS

On March 15th, Dr. Kevin Kavanaugh joined the staff at the Federation of American Scientists after serving at FAS as a Scoville fellow for six months. Dr. Kavanaugh is working on Biological Weapons Terrorism and the FAS ProMED Project. He recently completed his Ph.D with a dissertation entitled The Evolution of Conflict: An Analysis and Model of the Cycles of Violence in Intrastate Conflict.

Prior to his graduate work, he had an extensive active duty military career as a Military Intelligence Officer serving in Panama, Honduras, Grenada, Lebanon, Korea, Haiti, and Saudi Arabia,

and earned numerous awards, including the Silver Star and Purple Heart. Currently, he is a Major in the US Army Reserves stationed with the Office of the Joint Chiefs of Staff in the Pentagon. He holds a Bachelors degree from Norwich University and a Masters degree in International Policy Studies from the Monterey Institute of International Studies. He speaks Japanese. □



Dr. Kevin Kavanaugh

## China's Interest In Ballistic Missile Control Encouraged

The FAS September/October Report entitled "Missile Encirclement: China's Interest in Missile Controls" was designed to arouse China's interest in international controls on ballistic missiles. It included a "worst-case analysis" of the threat to China of missile and anti-missile proliferation (by Charles Ferguson) and a textual discussion of possible arms control measures that might be usefully engaged in by China to slow this spread (by Jeremy J. Stone). The newsletter analysis was presented at an ISODARCO arms control conference in Shanghai in October and commitments were received to study the issue from a number of official and unofficial institutions.

Two months later, one of the persons briefed,



*Frank von Hippel, Stone, and Ambassador Sha at the October 1998 meeting in Beijing on the newsletter.*

Ambassador Sha Zukang, Director-General of the Department of Arms Control and Disarmament in the Chinese Foreign Ministry presented an officially approved statement "Some Thoughts on Non-Proliferation" at the January 1999 Carnegie International Non-Proliferation Conference. His paper included this brilliant and unusual summary of the situation concerning ballistic missiles:

"Devoid of any legal basis in international law, missile non-proliferation is the most-underdeveloped part of the entire international non-proliferation regime. As the founders of the Missile and Technology Control Regime (MTCR) admitted, MTCR is just a time-winning device. Its purpose is to delay missile proliferation rather than provide a comprehensive solution to this problem. Even this limited role was somehow diminished by the regime's lack of objective criteria, and the double standard applied by certain MTCR members in implementing requirements of the regime. Recent developments have shown that the risk of missile proliferation is increasing. *It is time for the international community to take a collective look at the missile proliferation issue, including MTCR, and explore better ways to combat this danger.*" [Italics added.]

An international look at this problem is, precisely, what FAS wanted. After the briefings in Beijing and Shanghai, FAS visited Australia and received a warm reception in Canberra by the Australian Ministry of Foreign Affairs and Trade which promised to consider the possibility of offering a U.N. resolution critiquing missiles. □ JJS

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