

# F.A.S. PUBLIC INTEREST REPORT

Journal of the Federation of American Scientists (FAS)

Volume 50, Number 1

January/February 1997

## Military Officers Join Scientists in Abolition Campaign

What can only be described as a kind of military Pugwash began to form on December 4, 1996, with the announcement that more than 60 military leaders around the world had joined in a statement calling for abolition of nuclear weapons. The significance of this development cannot be overstated.

Although there exists a broad-ranging consensus, in American and global politics, for continuing to reduce, through disarmament, the nuclear overkill, a veil of silence has been drawn over the question of how and whether to move from overkill to underkill, i.e. whether to reduce nuclear armories below the level of the capacity to destroy large countries.

Accordingly, there has always been a certain irrelevance to disarmament discussions in which much ado was made about whether to move from tens of thousands of nuclear warheads to thousands of such warheads or even to hundreds. After all, one hundred nuclear weapons could destroy either the U.S. or Russia.

And below this irrelevance, there has always been the political fact of life that neither scientists nor citizens could persuade Governments to abandon weapons of mass destruction until the appointed guardians of national security, the military officers, would urge—rather than veto—such a step.

### Military Breakout

Leading the breakout were two of the most highly credential military officers that America has: General Andrew Goodpaster (ret.), Supreme Allied Command in Europe (SACEUR) from 1969 to 1974—a man who had served as a war planner for General Marshall

in World War II and with President Eisenhower after the war—and General George “Lee” Butler (ret.) who was Commander-in-Chief of the U.S. Strategic Air Command from 1991-1992, and hence was the one who would have been required to execute any orders to fire SAC’s nuclear weapons.

The joint statement said that nuclear weapons were “not needed against non-nuclear opponents” and that conventional weapons could provide a sufficient deterrent “in combination with defensive measures” against the threat of chemical or biological weapons.

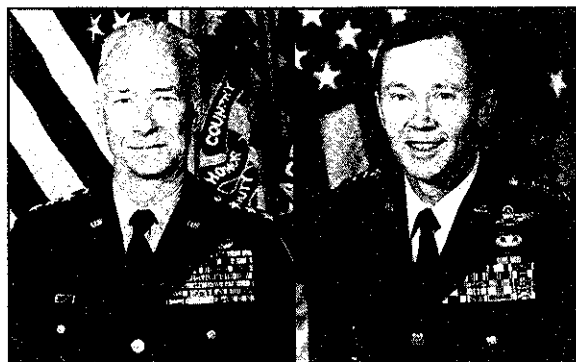
They urged reductions in nuclear arsenals “step by step to the lowest verifiable levels consistent with stable security, as rapidly as world conditions permit.”

What gave the statement its punch was the observation:

“The ultimate objective of phased reductions should be the complete elimination of nuclear weapons from all nations. No one can say today whether or when this final goal will prove feasible, but because the phased

withdrawal and destruction of nuclear weapons from all countries’ arsenals would take many years, probably decades, to accomplish, time will be available...”

They said “steady pursuit of a policy of cooperative, phased reductions with serious commitments to seek the elimination of all nuclear weapons is a path to a world free of nuclear dangers.”



Left - General Andrew Goodpaster (ret.)  
Right - General George “Lee” Butler (ret.)

### Hawks Changed Position in 1989

That the United States needed nuclear weapons to prevent attacks from hordes of Soviet soldiers in Europe was an article of faith until 1989 and the

*(continued on page 2)*

subsequent breakup of the Soviet empire. At that point, thinking hawks changed their positions to observe—as doves had long observed—that a world with nuclear weapons was a world filled with “great equalizers” and not desirable for large nations like ours. Certain kinds of anti-nuclear activities and non-proliferation efforts became widely consensual rather than controversial.

What the military officers are doing is making respectable the (obvious) conclusion that, someday, the world should be free of weapons of mass destruction. Why, one might ask, is there any debate about this?

The answer lies in the fear of establishment thinkers that an abolition movement might get out of hand—that it might lead to an irreversible and unstoppable campaign to abolish nuclear weapons before the conditions were right for so doing. One senior military officer, who opposes this new abolition development, advised FAS that “The U.S. is holding the world together and it is too easy to build these nuclear weapons for us to abolish them.”

A Washington Post commentator called abolition a “bird in the bush” as opposed to useful disarmament projects that are “birds in the hand” but his comments went further and suggested that abolition “might leave things no better off.” Another such commentator said that striving for abolition might undermine a consensus for nuclear disarmament by frightening those who oppose abolition.

Most FAS members will probably agree that the balance of political forces and time periods is such that there is no harm, and much good, in having a small and growing band of military officers including the possibility of abolition in their discussions of disarmament. It is impossible to believe that the U.S., much less other nuclear powers, will undertake to dismantle every last nuclear weapon unless and until conditions have changed appropriately. So there is little danger, and much advantage, in pushing the envelope of the possible—as we have done on every nuclear weapon control issue in the last five decades.

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The *FAS Public Interest Report* (USPS 188-100) is published bi-monthly at 307 Mass. Ave., NE, Washington, D.C. 20002. Annual subscription \$25/year. Copyright © 1997 by the Federation of American Scientists.

POSTMASTER: Send address changes to FAS, Public Interest Rep., 307 Massachusetts Avenue, NE, Washington, D.C. 20002.

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## An Effort to Advance The Unification of the Oldest Civilization on Earth

In a center of China, under the lee of the eastern mountains of Tibet, close to the Sichuan city of Chengdu, sits the Los Alamos of China to which repaired, in November, the atomic scientists of China's former enemies, now partners in a search for nuclear disarmament.

They emerged from their own formerly super-secret bunkers of death where they had prepared the weapons each targeted on the others. Notwithstanding their former role in an enormously overblown "deterrence", like a fraternity eager to communicate their fraternal understandings, they were working smoothly and in friendly fashion, to dismantle the genocidal machine which could not have come into existence without them.

In their hands, arms control has often become portal monitoring, neutron transport and obscure calculations. But there were many papers of more general import albeit ones that often were admittedly bereft of new ideas or that advanced ideas of great and unworkable political complexity. The meeting, sponsored by the Italian ISODARCO group, is an off the record conference.

So much has changed. Only a quarter century before this conference, newspaper reports of Soviet threats to bomb the Chinese nuclear facility—indeed, reports of requests to U.S. officials to condone such an attack—had impelled the Chinese authorities to pick up the atomic headquarters, then in Manchuria and to move it to Chengdu.

Now, in the week before the conference, a leader of the Soviet nuclear program had shot himself despairing of being able to pay his subordinates in a once hidden Soviet nuclear city, following the economic collapse of the post-Gorbachev Russia. Meanwhile, China continued its pell-mell expansion at a record rate. What an astonishing turnabout.

### A Voyage To Mars on Earth

A visitor feels as awestruck by China as Alexis de Tocqueville felt about America almost two centuries ago, when he saw, in American democracy, a rising competitor to aristocratic government. With its unique size, and backed by several thousand years of continuity and isolation, China tends to participate in

the international community with its own rules. And with its enormously talented and hardworking population, China is certain to have the most profound effects on the future of mankind and the organization of governance on this planet.

Perhaps the first obligation of an inquiring visitor from democratic America, to ancient China, is to free his mind from the presuppositions of democracy that surround Americans like air and to which, accordingly, we normally give as little thought.

De Tocqueville taught us that "It is not force alone, but good laws, that give stability to a new government." But what, historically, gave stability to China was a Confucian sense of obligation to rulers that had, somehow, secured—and not yet lost—the Mandate of Heaven. This is a society which has been known, when lacking local authority, to electing a "father" to whom, subsequently, all decisions will be put and filial respect be shown. Not for it, so far, the checks and balances that were built into American society from the first townships.

### China is not America

Where Americans came to America to be free, rebounding from tyranny and predisposed to democratic processes and, especially, to respect for the individual, the practices of China, from time immemorial, could not have been more different. Confucius' philosophy, influential in China for 2,500 years, inculcated attitudes of filial piety which, he well knew, were opposed to resisting tyranny.

You Zi, a disciple of Confucius, said: "It is rare for a man who is filial towards his parents and re-



*Dancers in Sichuan Province, China*

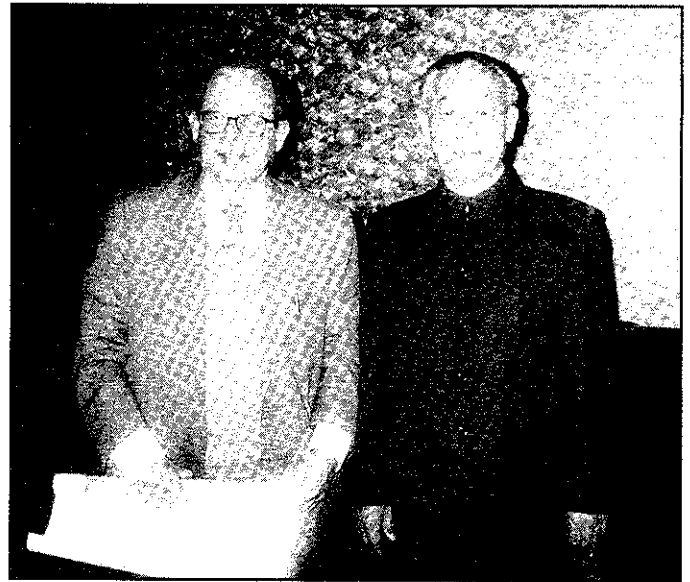
spectful to his elder brothers to go against his superiors; never has there been a person who does not like to go against his superiors and at the same time likes to start a rebellion.”

He actually counseled disciples, who were supposed to participate in good government, to withdraw from “benighted” government rather than be associated with it. For Confucius, virtue was its own reward. This was a man who said: “if one learns the truth in the morning, one would never regret dying the same evening.” Of the four things he taught his disciples: classics, social conduct and faithfulness to friends, the fourth was “loyalty to superiors”. He was no revolutionary and he decried violence. As William McNeill explains in *The Rise of the West*, he believed in ruling “by ritual and yielding”, i.e. by giving way gracefully to others, all according to rules of precedence and propriety. And it seems likely that these ideas were, in any case, a distillation of wholly Chinese attitudes of what had been considered pious and right from the beginnings of village life in China, perhaps 8,500 years ago.

To maintain a stable civilization over a long period would seem to require a rule of obedience to higher authority that was quite strong but not absolute—since an absolute rule would permit the continuance of rulers that were totally unfit. The Chinese theory that the emperor was the appointee of Heaven guaranteed obedience. And the corollary that the ruler held his position only so long as he followed Heaven’s will provided the necessary loophole; really bad emperors or ones that found themselves in untenable positions could be deemed, simply, to have lost the “Mandate” of Heaven—a perfect, albeit a conservative, system.

This view of authority will, no doubt, permit current Chinese authorities a great deal of leeway in their efforts to move China through its inevitably tumultuous path from tight communist controls to a “market” socialism. On the other hand, the prospect of losing the Mandate of Heaven must give Chinese leaders pause and must inform their handling of student demonstrations at Beijing University and elsewhere.

Indeed, asked by a disciple what was needed for government, Confucius said: “Sufficient food, sufficient armaments and common people’s trust in the government”. Asked which was the most important, Confucius said it was “trust”.



*General Xu Xin, President of the Beijing Institute for Strategic Studies, with Stone*

Needless to say, this is all quite foreign to Americans. As DeTocqueville explains, Americans consider the public as the sovereign and all must abase themselves before the public. Presidents—and especially Presidential candidates—are invariably explaining how they have a mystic faith in the judgment of the American public. To oppose the majority opinion openly is considered, by many, not only politically unwise but also erroneous. Where Confucius encouraged benevolent leaders who would, out of their wisdom and benevolence, do the right thing, American democracy encourages public opinion polling as a method of determining what is right.

But how does it look to the Chinese? Are they trained by history to take their chances on whatever leadership surfaces or do they imagine that Chinese society possesses the generalized knowledge necessary to better determine through elections who should be in charge. Probably for most of the 1.2 billion people, the entire notion of such a popular election is now very foreign indeed.

True, democracy is working now in Taiwan but only after careful preparations with elections started first for small positions and then for large and with a much smaller population to adjust. And many distortions exist in the use of media and the funding of the parties. It is no easy task to run an American style democracy and many of the countries which we deem democratic—but which we do not examine too closely because they are not hostile to us—are ones which,



*Institute of Taiwan Studies, Chinese Academy of Social Sciences (CASS) staff (l to r): Yang Lixian, Deputy Director of Political Studies; Liu Guofan, Editor; Stone; Zhang Fengshan, Director of Political Studies*

were we to think about it, we would consider counter-feit democracies.

### **Into The Fray: The North East Strategy**

As FAS readers know from the May/June PIR, FAS invented, in March, a promising plan for a process that would lead, in due course, to reunifying China. This so-called North East Strategy is a protracted negotiation in which, on a step-by-step basis, the Mainland would receive steps (North) toward reunification in return for permitting steps (East) toward "more space" for Taiwan.

Chinese language press in New York and Taiwan called this a "bold" strategy and said it "provides a new way of thinking for both sides who are willing to start peace talks." Experts in Taiwan, some in official capacity, and in America have encouraged it.

It seemed imperative to convey to Mainland experts what was under discussion. Accordingly, in the week after the Chengdu ISODARCO conference, the undersigned held five meetings in Beijing explaining this strategy.

The first, hosted by the Vice President of the Institute of Contemporary International Relations (CICIR), Song Baoxian, involved briefing two CICIR experts on Taiwan who promised to study the proposal. The second involved an elegant dinner with the

President of the Beijing Institute for Strategic Studies, General Xu Xin, who was friendly and constructive.

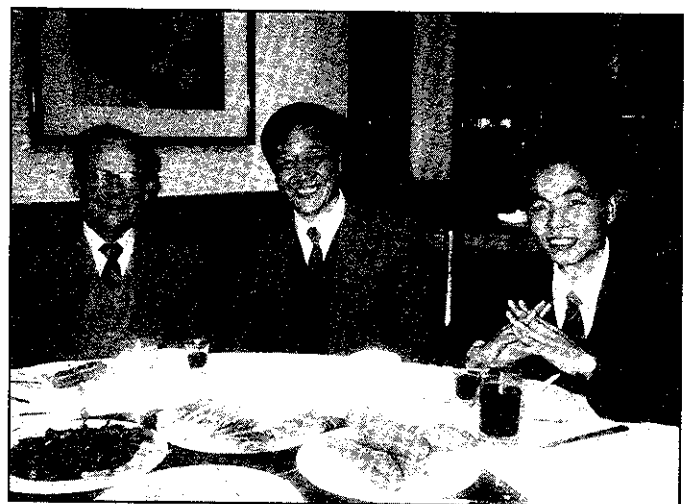
The third was a briefing and discussion with two specialists at the Institute of Taiwan Studies of the Chinese Academy of Social Scientists (CASS). Next was a discussion with officials of a Chinese NGO, the Foundation for International and Strategic Studies who might, it seemed, consider convening a conference to discuss the North East strategy.

And the last, and most important, was a long discussion and lunch hosted by the Director of Research, Xing Kui Shan of the Office of Taiwan Affairs of the State Council. (This had been arranged by the Institute of Taiwan Studies on two days notice!) Mr. Xing said that no American had ever been hosted in the elegant guest house in which the meeting was held—a hotel used for Taiwan guests discussing this most important issue.

One reason for the warm reception received was the memory in China of my dinner with Chou En Lai in 1972, at which was discussed the first scientific exchange with China, and which led me to attempt to send a delegation of cancer specialists to China to assist Premier Chou whom I rightly suspected of having recently been informed that he had cancer. China has a long memory for friends and Premier Chou is, many told me, more respected than Chairman Mao himself.

For further background on China, what follows is an excerpt from the web page of the Canadian Security and Information Service.

—*Jeremy J. Stone*



*(l to r) Stone with Xing Kuishan, Director of the Bureau of Research, of the Office of Taiwan Affairs, and his assistant Yang Jie*

## Excerpts from: CHINA IN TRANSITION

*Canadian Security Intelligence Service, April 1994*

Developments in modern China can be characterized in three ways: enormous, contradictory and rapid. For example, China is going to have to create approximately 200 million jobs in the next ten years to avoid massive unemployment. Annual inflation in many provinces in 1993 exceeded 20%, eroding rural incomes and forcing over 25 million peasant families to leave their farms for work mostly in the southern coastal cities, in turn creating incredible pressure on the country's social and economic systems. Numerous peasant revolts, a rising crime rate, an inequitable tax system and uncertain political succession after Deng Xiaoping all constitute sources of significant potential instability.

Yet China's recent economic advances have been spectacular, due in part to the impressive behavior of private enterprise initiatives in the villages and townships; and estimates for fiscal 1994-5 indicate a continued growth rate at more than double that of any other industrialized country. An enormous labor pool has led to increased foreign exports, and China's trade balances are improving, particularly with the West.

China has experienced remarkable economic success since establishing its "open door" policy and undertaking economic reforms at the instigation of Deng Xiaoping. According to the IMF and the World Bank, the Chinese economy ranks third in the world and eleventh in international trade. China's economy is increasingly affected by market forces (price, production, funding, special economic zones), and the poverty rate has been steadily decreasing since 1979.

### Outlook

The political (successions and changeovers of political power) and economic (plans, restructuring, reforms) cycles have profoundly altered China since 1949. This country has gone from a totalitarian Maoist regime to an authoritarian and still Leninist government that is developing a so-called socialist market economy. We are currently witnessing an industrial revolution and the emergence of a dual merchant class, with one segment that is technocratic and born of the Party's mandarin class, and another that is private.

The pursuit of freedom is slowly extending to the economic arena and releasing forces in civilian society that the regime is finding very difficult to control.

The state is gradually modifying its role in the economy, but continues to use administrative and authoritarian measures to try to correct excesses. It is also passing more and more laws, the application of which is posing immeasurable problems. Finally, the Party is still in command, but corruption has damaged its credibility. Many groups with divergent interests are emerging and developing with or without Beijing's accord.

The implosion of China is not inevitable; China is not the former USSR. The Party remains united despite internal dissension, and China's economic growth is real. There is no Chinese Yeltsin, nor any credible and united opposition. The government is firmly in control of the army and the security forces, and the ethnic conflicts in Tibet and Xinjiang are isolated and do not themselves represent a threat to the regime.

But the changes underway and the challenges to be met are so great that it is reasonable to believe that China—like Europe in the 19th and 20th centuries—will undergo further large-scale, socio-political and economic crises before the end of the century. The media and experts on China are already contemplating the possible scenarios. Continuation, overthrow, transformation or collapse of the regime all figure in these predictions.

### The Party

When one speaks of China, the reference is often used interchangeably with the Party. It is becoming clear that the economic changes set in motion by the Party are making the utility of defining China in terms of the Party less meaningful. What is necessary for the survival of the Party is not necessarily good for the development of the society. Regionalism will play a far greater role in a future China and the existing fault lines, which generally follow provincial borders, will be exacerbated by centre/region conflicts.

The Party may attempt to demonstrate its rele-

vance by aggressively introducing macroeconomic controls to cool down the unprecedented economic growth of the coastal economies or develop tax regimes to obviate regional income disparities. Through such a policy the Party could assert its role in the economic arena; however, any interference by the centre beyond what is strictly required would not be accepted by the wealthier provinces who now hold the economic levers in China. The current austerity program seems to indicate that we may be seeing a "strategic convergence" between what might be called neo-authoritarianism and neo-conservatism. Be that as it may, and quite aside from personalities and factions, Chinese-style modernism and regionalism will continue to play a dominant role after Deng Xiaoping's death.

Should the Party find itself unable to address the key economic issues and structural deficiencies, it may resort to nationalism to prevent any further erosion of its power. China maintains territorial disputes with countries on virtually all its borders. Escalating a border dispute into armed conflict is one

way to distract the population from more fundamental concerns and to counter centrifugal forces. Encouraging nationalism in a country as diverse as China, is dangerous and accordingly, would be the final paroxysm of a Party desperately seeking to revitalize its role and legitimacy. In light of the PLA's efforts to develop its power projection capability, the spectre of an expansionist China is, however, conceivable.

The Party must overcome a number of challenges, some historical and some resulting from its pragmatic desire to develop a socialist market economy. In formulating a response to these difficulties the Party will be guided by the imperative of maintaining, as far as possible, its power. The Party has proven itself flexible but will not willingly allow itself to be broken even at the expense of economic development or its relations abroad. Within this context China's current crackdown on dissidents just prior to the debate in the United States over whether to extend China's Most Favored Nation (MFN) status clearly indicates that China is prepared to take positions not anticipated or expected from a strictly economic perspective. □

## The Department of Energy's Stockpile Stewardship Program

*by Frank von Hippel*

After the Soviet Union agreed to in-country seismic monitoring in 1978, the principal objection by the U.S. nuclear laboratories to a Comprehensive Test Ban Treaty (CTBT) became that it would be impossible to maintain the reliability of U.S. nuclear weapons without testing. Indeed, that same year, the Directors of the Los Alamos and Livermore National Laboratories met with President Carter to inform him that they would be unable to certify the continuing reliability of the U.S. stockpile in the absence of testing. Knowing that the Joint Chiefs of Staff would not support a test ban under such circumstances, and the Senate would therefore not ratify it, President Carter abandoned his efforts to achieve a CTBT.

On hearing of the position of the laboratory Directors, former Los Alamos Director Norris Bradbury; former head of the Los Alamos Theoretical Division, Carson Mark; and long-term Los Alamos consultant, Richard Garwin, wrote a letter to President Carter in which they argued that the reliability of U.S.

nuclear weapons could be maintained indefinitely by periodic remanufacture to original design specifications.

### The Weapons Labs Respond

The response from the weapons labs was that remanufacture to the original specifications would not be possible. As time went on, different manufacturing processes would be used and some materials used in nuclear explosives would become unavailable. They argued that the phenomena occurring during a nuclear explosion—especially the fusion "boosting" of the energy of the fission trigger—were not well enough understood to provide weapons experts with full confidence that such changes would have an insignificant effect on the performance of a nuclear weapon. Indeed, they claimed that 14 problems had developed in U.S. nuclear weapons since 1958 which had only been resolved definitively with nuclear tests.

The labs' arguments were rebutted in turn in 1987, in a report commissioned by a group of Congressmen from retired Livermore weapons expert, Ray Kidder. Kidder analyzed each of the problems that the labs had cited and found that nine had been found in the early 1960s in weapons that had not been fully tested before deployment because of the 1958-61 testing moratorium. He found also that the five post-deployment tests conducted in the 1980s were of designs which had never received full pre-deployment certification tests in their final configurations. Kidder concluded that such problems were very unlikely to occur in the well-tested warhead designs which the U.S. Government plans to keep in its "enduring" stockpile. Indeed, virtually all the problems cited by the labs had been identified within four years of initial deployment, while the youngest warhead design currently in the stockpile is now over ten years old.

### How the Deadlock was Broken

This debate was finally ended by two government decisions: In the fall of 1992, Congress passed and President Bush reluctantly signed the Hatfield-Mitchell-Exon amendment, which gave the nuclear-weapons laboratories up to 15 tests before September 1996 to fix any existing reliability or safety problems in the U.S. enduring nuclear stockpile. Then, in May 1993, after a review of the 15 tests proposed by the labs, Secretary of Energy O'Leary concluded that none of them were essential. Instead, the Secretary offered the laboratories a "Science-based Stockpile Stewardship Program" which would allow them to greatly strengthen their ability to simulate the phenomena taking place during nuclear explosions using experimental facilities and computers, thereby hopefully enabling them to understand the significance of any changes in materials properties.

The proposed budget for the combined Stockpile Stewardship and Stockpile Management Programs was set at about \$4 billion per year—approximately the average Cold War level of nuclear-weapons spending—including about \$1 billion per year for nuclear-weapons R&D. The Clinton Administration also committed to a number of major new facilities, including the National Ignition Facility for Livermore—a huge 192-laser facility designed to ignite a fusion reaction in a small pellet containing deuterium and

tritium.

The deal was cemented by President Clinton's agreement that the Directors of the weapons laboratories would each year have to certify the safety and reliability of the enduring stockpile. If the Directors found that they could not so certify a critical warhead, the President promised that could be a basis for invoking the "supreme national interests" escape clause from the CTBT and conduct any necessary tests.

President Chirac appears to have made a similar deal with France's nuclear-weapons establishment. In addition, the U.S. has promised both the U.K. and France that relevant insights developed in the U.S. Stockpile Stewardship Program will be shared with them. Neither Russia nor China can expect comparable access to the results of the U.S. Stockpile Stewardship Program, however, and neither has the resources to mount a comparable program.

The scale of the Stockpile Stewardship Program has also raised suspicion that the U.S. might be trying to work around the constraints of a CTBT by developing capabilities to design and deploy new nuclear warheads without testing. These suspicions have been exacerbated by the Department of Energy's announcement that the U.S. will be conducting about four explosive but "sub-critical" tests with plutonium under the Nevada Test Site each year. Given the surprises that inevitably occur when theoretical simulations of complex phenomena are subjected to test, however, it is highly unlikely that the U.S. would develop and deploy a new warhead such as a "third-generation" X-ray laser or directional microwave generator which was radically different from the designs it developed before the test ban.

Given the record of virtually no test failures of conservative variants of well-understood designs, however, the weapons labs might well have enough confidence to develop and deploy such variants with-



*Frank von Hippel addressing the Chengdu conference*



out testing. The labs might also develop more radical designs to be tested if the CTBT should break down. Thus the U.S. would be well positioned to resume the competition to develop "more useable" nuclear-weapons should the CTBT break down—even though this competition has generated more paranoia than advantage in the past.

The DoE hopes to defuse concerns about its sub-critical tests by establish arrangements by which independent observers can verify that they are indeed subcritical. In that case, they will not differ significantly from the "hydrodynamic" tests of the implosion systems of nuclear warheads that are routinely conducted above ground. Nevertheless, given that the information that is to be learned from the subcritical tests could probably also be obtained from above-ground experiments, one must wonder why the weapons labs are insisting on these provocative underground experiments. Fermi's observation about physics appears to apply also to the labs: "What ever is not forbidden, is compulsory."

Since it would be contrary to the spirit of the CTBT for the U.S. to design new types of nuclear weapons, a number of analysts have suggested that the Administration make it U.S. policy to forbid work on new nuclear weapons designs by the laboratories. Indeed a clarification of U.S. policy with regard to new weapons design has been sought by at least one high-level lab official. Interagency consensus on such a policy appears to have been blocked, however, by the Department of Defense. According to the public (viewgraph) version of the report on DoD's 1994

Nuclear Posture Review, the Department of Energy has been instructed by the DoD to "maintain capability to design, fabricate and certify new warheads." Arguments for such a requirement may have been stimulated by the fact that, during Desert Storm, the U.S. had no low-yield nuclear weapon which could, with assurance, have destroyed deeply-buried Iraqi bunkers. In the event, however, the DoD found that it could adapt the "physics package" of an existing B-61 bomb to an earth-penetrating shell. Non-nuclear earth-penetrating bombs have been developed as well.

### **Stewardship Program Costs More than Necessary**

Thus, although commitment to the Stockpile Stewardship program appears to have been necessary to get the nuclear-weapons labs to accept a CTBT, it remains far from established that all of the costly programs and facilities that are to be funded under this Program are required to maintain the reliability of the enduring nuclear stockpile. Furthermore, the stated purpose of the Program, to lay the basis for a deep scientific understanding of hitherto only partially understood nuclear-explosion phenomena, has raised suspicions abroad that the U.S. is still trying to achieve some type of nuclear superiority. Such suspicions can never be laid fully to rest but U.S. Government would reduce them significantly if it announced that it will be U.S. policy that the national nuclear laboratories are not to work on the development of new types of nuclear warheads. □

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## **The Case for the Comprehensive Test Ban Treaty**

*David Hafemeister*

After forty years of struggle, the five nuclear weapons states (US, Russia, UK, France and China) and 125 other nations have signed a successfully completed Comprehensive Test-Ban Treaty which will ban all their nuclear test explosions, everywhere and for all time. In summary, the treaty will:

- constrain non-nuclear weapon states from developing nuclear weapons, or for the 3 de-facto states from moving up to hydrogen bombs;

- constrain nuclear weapon states from developing new types of nuclear weapons, such as Chinese

MIRVed ICBMs or third-generation weapons;

- prevent the unraveling of the nuclear Non-Proliferation Treaty regime in which more than 175 sovereign nations have agreed not to develop or acquire nuclear weapons;

- strengthen monitoring down to one kiloton (and lower in a growing number of locations) with four different monitoring technologies;

- maintain the US nuclear stockpile with the Stockpile Stewardship and Maintenance Program.

### **A Test Ban Benefits Non-Proliferation**

Nations can build unsophisticated nuclear weapons without testing, but they would be much less likely to do so knowing they could not test and generals would not be eager to use untested weapons. Testing is needed to develop boosted primaries, hydrogen bombs and compact warheads for missiles. A ban on testing will go a very long way in freezing the non-weapons status of 175 nations and preventing improvements for the 3 de-facto nuclear states.

One-hundred and seventy-five nations have given up their sovereign right to obtain nuclear weapons under the NPT. The CTBT and the NPT are forever politically linked together, if these states give up the bomb under the NPT, they then expect the weapon states to give up nuclear testing under the CTBT. Without a test ban treaty, these 175 non-nuclear weapon states will limit their cooperation in the International Atomic Energy Agency and other fora which are already unwieldy since they often depend on consensus before taking action. The linkage between the two treaties was expressed clearly by Mexico:

“A comprehensive test ban treaty would make the single most important contribution toward strengthening and extending the international barriers against the proliferation of nuclear weapons.... the continued testing of nuclear weapons by the nuclear-weapon States Parties to this Treaty would put the future of the Non-Proliferation Treaty beyond 1995 in grave doubt.” (August 24, 1990, LTBT Amendment Conference)

During the 1995 NPT renewal conference, the US and the other weapon states stated their intention to “seek a complete ban on nuclear explosions.” This assertion strongly convinced the non-weapon states to extend the NPT and to call for a comprehensive test ban “no later than 1996.” Without a test ban, one can expect some unraveling of the NPT commitment.

### **A Test Ban Benefits Arms Control**

A ban on testing is both a nonproliferation and an arms control treaty. The treaty constrains the weapon states from making new types of weapons. For China, this means forgoing a viable MIRVed-missile system. The US has already tested nuclear weapons 1,030

times, while the second-place-tester Russia is losing its capabilities, and the US will retain a significant advantage over other nations on testing information. And only the US is building new facilities like the National Ignition Facility, hydrodynamic test facilities, super-computer facilities, and flash x-ray facilities to maintain their prowess. Without a ban on testing, other weapon states will at some point begin testing anew. Do we really want Russia and China to renew testing, do we want China to develop a MIRVed system?

### **US. National Security Will Remain Strong**

Some will say that our nuclear arms will not remain reliable and safe under a test ban. Don't believe that. Under START II, the US will retain 10,000 warheads, with 3500 of them deployed on ICBMs, SLBMs and heavy bombers. These forces are very survivable, enormous and flexible. Very large (and unlikely) reductions of 50% in the MX and Trident yields (when used against very hard targets of 5000 psi) reduce the two-shot-kill probability by only 4.5%. Reductions of 20% in the reliability, reduces the two-shot-kill probability by only 8%. With declines in the Russian forces, the US forces are clearly supreme. If one is worried about reliability, the most important act would be to increase missile reliability and not warhead reliability since the failure rate of missiles is several times the failure rate of warheads. Aging of the warheads doesn't cause severe and unfixable problems, but at some point the warheads will be remanufactured.

Testing is not needed to make our warheads safer. US and Soviet nuclear weapons have been very safe since no one has been killed by nuclear yield from accidents over the one million nuclear-weapon-years of experience by the Americans and the Soviets. Since bombers no longer fly with nuclear weapons, the most dangerous cause of accidents has been removed. The cost of new designs is extremely high and unnecessary. For these reasons, the safety issue is not relevant to the test ban.

Lastly, the most thorough analysis has been carried out by the JASON Committee, an independent group of senior, prestigious, non-government scientists, which advises the government on technical aspects of national security issues. The unanimous

	US	Russia	France	UK	China	India	Total
Tests	1,030	715	210	45	45	1	2,046

explosions, but rather ripple-fired in a linear array. In order to lessen misunderstandings, there will be voluntary notifications of chemical explosions larger than 0.3

conclusions on nuclear testing by the group of 14 prominent scientists, including four DOE weapon designers, were accepted by the DOE weapon laboratory directors and the Joint Chiefs. The JASON conclusions: They have high confidence in the safety, reliability, and performance margins of the present US nuclear stockpile which will continue to be necessary for deterrence. The US must maintain the quality of its nuclear weapons with the Science-Based Stockpile Stewardship and Management Program which does not include nuclear testing. The range of performance margins of the weapons are adequate at this time, and changes should be made to a weapon type only under extreme circumstances. Continued testing under 500 tons would only marginally assure the quality of the weapons, much less so than the much more important Stockpile Stewardship Program. In the past, problems that occurred were primarily the result of incomplete or inadequate design activities. The JASON Committee is convinced that these problems have been corrected and that the weapon types in the enduring stockpile are safe and reliable in the context of explicit military requirements.

### **A Test Ban is Effectively Verifiable**

Some will raise concerns about the verifiability of the test ban. Using all of the seismic capabilities available, nuclear explosions will be detected with high confidence (90% certainty) down to seismic mb levels of about 4. This mb value corresponds to that of a tamped explosion of about 1 kiloton in hard rock. This assessment is too cautious in that it does not take into account the combination of teleseismic stations (more than 2200 km away) with the growing number of regional stations. A dual system using long-distance, teleseismic and regional networks is now available in many places and it can improve the ability to detect by about one 1 mb unit as the process matures. If there is a suspicious region, a neighboring state can place a regional seismograph close to the suspected region and the ability to monitor will improve. Finally, chemical explosions are readily detectable since they are generally not spherical

kilotons.

Other monitoring technologies will also be used to monitor the test ban. The International Monitoring System will also incorporate 60 infrasound stations (global threshold detection of about 1 kiloton in the atmosphere), 11 hydroacoustic stations (global detection of much less than a kiloton in the ocean) and 80 radionuclide stations (global detection of less than 1 kiloton in the atmosphere, and capabilities to determine venting from underground explosions). In addition the national technical means of satellite reconnaissance, humint and the other "ints" will combine to make the intelligence whole greater than the sum of its parts to both deter cheating and to enhance detection and identification.

States Parties can call for an on-site inspection to examine locations of suspicious activity. The definition of "effective verification" as defined by Paul Nitze and James Baker of the Reagan and Bush Administrations contains a reasonable criteria on military significance of violations and timely warning: "we would be able to detect such a violation well before it becomes a threat to national security so that we are able to respond." By this criteria, the treaty is clearly more verifiable than START since it is verifiable down to the level of one kiloton, and below that level in many locations. Of course, the treaty is not verifiable to very low levels, however, there is much less to be learned in that region and our national technical means have the opportunity to catch such hypothetical events.

### **Cavity Cheating Is Impractical and Improbable**

Some will say that cheating can take place in cavities. There is very little data on decoupled tests in cavities, only one was carried out with a yield greater than one kiloton. If a nuclear weapon is placed in a cavity of sufficient size, such that the blast pressure on the cavity wall is below the elastic limit of the surrounding media, the seismic signal strength can be reduced by a factor of about 7 at 20 Hz and 70 at lower frequencies. (The Soviet test at Azgir was reduced by a factor of 10 at low frequencies.) The

cavity size necessary to obtain these decoupling factors has a radius of 20-25 meters per cube-root kiloton, which makes the cavities very large in size. Many experts have concluded that the higher frequencies of the decoupled signal would still be detectable and identifiable with regional seismographs. The tester's problems would be further complicated by possible venting of radioactivity which could be easily detected; 30% of Soviet tests vented and the US. had severe venting problems with its earliest tests. In particular, it appears that smaller tests can be harder to contain than larger ones. The last four US explosions that vented were from explosions with yields less than 20 kilotons. It is hypothesized that smaller explosions would not sufficiently glassify the cavity, and also would not rebound sufficiently to close fractures with a stress cage. Other intelligence means, such as satellites and electronic intelligence gathering, can also gather evidence on clandestine decoupled nuclear tests. It is widely felt that a clandestine test of a kiloton (or larger), that was decoupled to a degree that enabled the test to escape detection by seismic means and which did not have yield excursions and venting, would require the resources of a very technologically sophisticated nation.

### The Case for the Treaty is Overwhelming

The case for Senate ratification of the test ban is overwhelming. The treaty is needed to prevent the unraveling of the global nonproliferation regime. At the end of the Cold War, the ability of the two aging super-powers to control their neighbor's nuclear

destinies has weakened. A total ban on nuclear testing is necessary to increase the barriers to nuclear weapons. It may take several years for the treaty to enter-into-force, but recall that the Vienna Convention on Treaties obligates the signers of a treaty not to undercut the terms of the treaty. (The Threshold Test Ban Treaty was complied with by both the US and the Soviets for 16 years before it finally entered into force in 1990.) In other words, while we wait for the process to move ahead, all the nuclear weapon states and the more than 125 non-weapon states cannot test nuclear weapons.



David Hafemeister

For those who oppose the test ban, please answer the following questions: Do you wish China, Russian, UK and France to renew testing? Do you want Chinese-MIRVed ICBMs threatening US Cities? Do you want non-nuclear weapon states to begin testing and do you want "de-facto" nuclear states to move up to hydrogen bombs? For those concerned about future the reliability of US weapons, please describe the specific mission you have in mind for the US war-heads and discuss in terms of the numbers of targets and warheads, reliability, hardness and accuracy. For those concerned about cheating under 1 kiloton, please describe how the absence of a test ban would help catch such tests. □

**FAS PUBLIC INTEREST REPORT** (202) 546-3300  
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