

# **WHY THE U.S. MUST TEST NUCLEAR WEAPONS**

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# Why the U.S. Must Test Nuclear Weapons

James T. Hackett

Ever since nuclear weapons were first used, over 41 years ago at Hiroshima and Nagasaki, there have been efforts to eliminate these weapons. Yet for the past four decades nuclear weapons have been the core of United States defense and those of our allies against the encroachments of the Soviet Empire. With the most massive military machine ever known, Soviet conventional forces designed for offensive warfare stand poised on the plain of Central Europe and elsewhere along the periphery of the largest country on earth.

The Soviets use this power to dominate and influence their neighbors. Soviet military force itself has been used in Hungary, Afghanistan, and elsewhere. It is deterred only by U.S. and allied forces and by the U.S. nuclear deterrent. One of Moscow's highest political goals, therefore, is to shackle the U.S. nuclear deterrent, thereby freeing Soviet conventional forces to dominate Europe, the Middle East, and East Asia. Moscow would take a long step in that direction if it could get the U.S. to stop nuclear testing.

The Soviets know that the reliability of the nuclear deterrent depends on testing. Thus, it should surprise no one that a series of Soviet leaders, from Andropov to Gorbachev, have given a high priority to stopping U.S. nuclear weapons testing. In late July 1985, just before the fortieth anniversary of Hiroshima, Gorbachev kicked off a Soviet propaganda campaign by announcing a moratorium on nuclear testing, and calling on the U.S. to suspend its testing program.\* This propaganda effort was so successful that Gorbachev announced an extension of the Soviet moratorium every few months, milking it for all it was worth.

The Soviet moratorium has not interfered with their military program. They already have deployed a huge force of first-strike intercontinental ballistic missiles and now are deploying a new generation of mobile ICBMs and more submarine-launched multiple warhead missiles. They greatly increased their testing from 1982 through 1984, preparatory to announcing their moratorium.

While the Soviets can afford to suspend testing for a year or two, the U.S. is engaged in a modernization program that requires the testing of nuclear warheads for use against Soviet hardened missile silos. Gorbachev wants to stop the U.S. program and, regrettably, so do many Americans, who believe that an end to testing would lead to a deterioration of weapons on both sides and, eventually, to their abandonment. An end to testing certainly would lead to a deterioration of America's nuclear defenses. But the creation of nuclear uncertainty and instability would, in the words of Assistant Secretary of Defense Richard Perle, "be an insane way to seek nuclear disarmament."

What it would do is encourage Soviet military adventurism and accelerate Moscow's global empire building. The next U.S. nuclear test series is scheduled to begin in February. Gorbachev already has announced the end of the Soviet moratorium, and Moscow certainly will blame the U.S. for the resumption of Soviet testing. Of course, Moscow must test, for the same reasons the U.S. must test: to assure the reliability of

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\*See Appendix.

existing nuclear weapons; to improve designs, yields and safety; to develop improved warheads for new weapons; and to determine the effects of nuclear weapons on defenses, communications, and other military equipment.

It is difficult to protect U.S. security interests against this Soviet assault, but it is crucial that we do so. We have several experts here to explain in greater detail why the U.S. must test. Our first speaker is Mr. Frank Gaffney, the Deputy Assistant Secretary of Defense for Nuclear Forces.

### **Frank Gaffney**

I would like to pick up on a point that Jim made in his opening comments, because if we fail to remember some of the historical dimensions of the current debate on nuclear testing, we're in danger of losing a very important perspective that bears on the present circumstances. As Jim said, it has been a frequent favored theme of Soviet arms control propaganda to pursue a moratorium on nuclear testing. However, it is not purely a phenomenon beginning with Andropov and his successors. Indeed, from 1958 to 1961, the Soviets, under Party Chairman Nikita Khrushchev, entered into a total moratorium on nuclear testing with the U.S.

Consequently, what you are about to hear about the problems of maintaining a credible and reliable nuclear deterrent is not simply the judgment of distinguished experts responsible for the safety, reliability, and credibility of our nuclear weapons systems. It is based on hard experience we have gained in trying to maintain such a deterrent when for three years we did not test. We have learned that without a rigorous and on-going nuclear testing program it is impossible to maintain our confidence, and the confidence of our adversary, in the deterrent power of these awesome weapons systems.

Now why is that important? No matter what one hopes for in the Strategic Defense Initiative, or in arms control, or no matter how hopeful one is of the possibility of using advanced technologies to make more credible the power of conventional defenses, the reality for the foreseeable future is that the United States and its allies will continue to rely for their collective security on the nuclear deterrent.

It is in that context that we ought to think about what we are being asked to do when we are asked to halt or otherwise interrupt the testing of nuclear systems. Instead of promoting peace and stability, as its supporters contend, a nuclear testing moratorium would, in fact, make the current peace more dubious and make our ability to sustain it more tenuous. Nuclear testing contributes in four critical ways to the reliability of our deterrent.

Through testing:

- ◆◆ we safeguard the safety and the reliability of nuclear weapons themselves;
- ◆◆ we ensure that nuclear and non-nuclear systems are survivable against the effects of nuclear weapons;
- ◆◆ we ensure that our weapons systems, as they are modernized, are as effective militarily as they can be, to keep pace with an evolving, dynamic Soviet threat; and

◆◆ we ensure that we understand the physics of nuclear weapons to maintain a credible deterrent and to understand the possibilities of Soviet breakthroughs.

These are four vital functions that underpin a credible deterrence. In the absence of the ability to perform these functions, one simply cannot maintain a safe, reliable, survivable, and effective nuclear deterrent. Now, some have argued that it would be a good thing if we did not have such confidence, that it would reduce the likelihood of our first use of such systems and the Soviets' first use of such systems.

I would submit to you that this is one of those areas where the mirror-image of U.S. and Soviet military requirements and U.S. and Soviet force structures simply has no basis in fact. The Soviets, after all, do not face from either the U.S. or its allies the threat of imminent attack by conventional forces. There is no NATO army poised to march into Eastern Europe or the Soviet Union to liberate those states. The same cannot be said of the Red Army. We must deal with the reality of a conventional threat which is deterred by maintaining credible and reliable nuclear weapons. Since the Soviets do not face a comparable conventional threat, it is possible for them, with considerable security, to forgo nuclear testing even if, in the short term, it imposes some restraints on their nuclear arsenal. We face an asymmetric situation. The United States and its allies require a credible and effective nuclear umbrella, while the Soviets do not have a comparable military requirement.

Let me leave you with the idea that, as we debate such complex issues as the Strategic Defense Initiative and the desirability of a negotiated elimination of ballistic missiles and other offensive nuclear arms, I sense a consensus emerging. It is a consensus both in this country and in Europe that we need nuclear weapons as a continuing component of our collective security. To the extent that is true, we in the U.S. government, and also in allied governments, are persuaded that we must be in a position to continue to conduct a rigorous and credible nuclear testing program.

**Mr. Hackett:** Our next speaker is Admiral S. R. Foley, the Assistant Secretary of Energy for Defense Programs. Admiral Foley is a retired four star admiral, who served as deputy chief of naval operations, commander of the Seventh Fleet in the Pacific, and before his retirement, as commander of the Pacific Fleet.

#### **Admiral S. R. Foley**

I was struck by the last comment, that our allies are beginning to come more and more to this consensus. Two people, one from Japan and one from Norway, recently came to see me and said they were concerned about the issues of nuclear weapons and the defense of Europe. They were concerned that the U.S. commitment to Europe was changing, that reduction of nuclear weapons was going to bring about some significant change, and leave them in a position of asymmetry, where the Soviets have a dominant position in conventional forces.

There is no question about that. If you took all of the nuclear weapons away, we would not have equal deterrence. Nuclear weapons are an essential part of the deterrent posture of the United States and its allies. We have these nuclear weapons and we have to test

them. Take any weapons system. I would not put you in charge of any weapons system, or of developing an automobile, if you could not test it.

If you took our testing away, my confidence in the ability to maintain the deterrence diminishes. And that is what we are talking about, confidence and risk. When one increases the risk, one diminishes the confidence. We have a testing limit of 150 kilotons. Do we need to test up to that limit of 150 kt? Absolutely. Would I like to conduct some tests above 150 kt? Yes, I think it would be very useful in improving the stockpile, because I have much greater confidence when I can test a weapon at full yield. Then I know it works. Hopefully, it will never ever have to be used, but I know it works. The 150-kt ceiling on testing is a limitation on the development of new weapons and on safety. In the Department of Energy, we focus on safety.

The Soviets appear to lack a safety conscience. I think Chernobyl pointed that out. When you are throwing in helicopter crews, or firemen, with full knowledge that you are sending people to death from massive radiation, you're sacrificing people. Receiving a medal posthumously may be fine for some, but you will not get many volunteers.

The people in our forces who handle nuclear weapons, who monitor them and guard them day in and day out, ought to be safe. They ought to be safe in any environment, so we work on safety as much as possible. When we test these weapons, we see that the primaries work and that the secondaries work as much as possible up to the limits we already have on testing.

We cannot test to full yield, but we test close enough to have confidence in our ability to maintain the deterrent. But if further restrictions are imposed on testing, to the point where you are not sure whether or not your opponent has tested, or you are not sure what you are going to get out of your own testing, then the risk to the national security of the United States increases. And eventually it reaches a point beyond which it becomes an unacceptable risk.

Testing is essential because the Soviet threat of ten years ago has changed compared to the Soviet threat we are now facing. Their missile silos have been hardened measurably. What does it take to go in against a hardened target? It takes a bigger boom, or a lot more accurate boom, or a combination of the two, but it takes very discriminatory weaponry to put it on the target.

The Soviets do not have these problems, because we have not put in the amount of hardening and underground basing that they have. We need a different kind of weapon now than we did ten years ago. The kind of testing we did then is inadequate. About one-third of all the weapons that we currently have in our stockpile have been found to have something wrong with them, or have needed some change or fixing during their lifetime in the stockpile.

These improvements are currently being pursued. There have been surprises because the development of nuclear weapons is not precise. You really need to test them. The best scientists at Lawrence Livermore and Los Alamos, with the best of calculations, with the best of simulation, still get surprises. And we get surprises after the weapons are built, not just before their completion, because the chemistry of these weapons changes. The materials change; the reaction of one material to another changes. Temperatures and

atmospheric conditions change the effects, and you get surprises. So you put in fixes that you believe will work, but then you need to test them to find out if they work. A constant test program is necessary. If you stop it, you increase your risks and you do not reduce a single nuclear weapon in the arsenal of either country. So, not testing makes no sense.

**Mr. Hackett:** Thank you, Admiral Foley. Our next speaker is Mr. Don Ofte, Deputy Assistant Secretary of Energy for Defense Programs. Mr. Ofte has spent most of his career at Albuquerque, New Mexico, directing some of these weapons programs.

#### **Don Ofte**

I think it is useful to harken back to 1957-1958, when we were preparing to go into the 1958-1961 moratorium on nuclear testing. There are a number of parallels between that time and now. In fact we just excerpted a few of them and I would like to mention those that deal with verification.

In 1957, Khrushchev announced that verification of a test ban was a waste of time. In 1985, we are assured by Gorbachev that verification would be fully ensured by national technical means. But in our best judgment, there is no way that national technical means would be effective in monitoring a moratorium. In 1957-1958, there was a proposal that we have an expert's conference in Geneva to deal with verification of moratorium issues. And now, Bob Barker of the Defense Department, who was supposed to be sitting in my chair here today, is instead attending an expert's meeting in Geneva, talking about our problems in verifying the TTBT and PNET. At those current meetings in Geneva, the Soviet negotiators take the position that they will only talk about a comprehensive test ban, and not the verification of existing accords.

In 1958, the Soviets declared that they had "finally disposed of the myth that formal compliance with the agreement for the discontinuance of nuclear tests is impossible." And in 1985, their declaration was that "the problem of verification does not exist." But what is striking is to see this scenario playing out again, over twenty-five years later, with a new Soviet push for a moratorium, and once again their failure to deal with the issue of verification. The USSR has stressed the contribution of nuclear weapons to an intensification of the arms race in 1958 and again in 1985, suggesting that the cessation of nuclear weapons tests would be the first important step toward the elimination of nuclear arms. So this is not a new phenomenon; it is all reminiscent of what went on before.

The verification issue is very important to us in the Department of Energy. We feel that verification of a test yield within a factor of two, which is possible today with teleseismic means of verification, is inadequate to assure that there is compliance with the test ceiling on the other side. When we read the signals we get today, and those we got before August 6, 1985, the test in the Soviet Union that could be at a yield of 150 kilotons has a range of error anywhere from 75 to 300 kilotons. And when you get up into that range, between 150 and 300 kt, there is military significance that would be useful to exploit if you are of a mind to do so, knowing that the means to verify is no better than that.

If we use the direct hydrodynamic yield measurement that the President has offered to share with the Russians, which is known as CORRTX, the range of error for the same event would be reduced to between a 105 and a 195 kiloton explosion. We think this is an adequate range of error, and it also uses means that would be nonintrusive. President

Reagan has extended invitations to the Soviets to send a team of their experts to Nevada to observe a test using CORRTEX to monitor the yield of the test. Thus far, the Soviets have declined to respond to that invitation, but we keep repeating it in the hope they will come and realize that we can do better than with teleseismic means, with a method that is available today and is nonintrusive.

The Soviets would be very reluctant to allow our inspectors to get close to the experimental package they want to put down in the test hole and we would be equally reluctant for them to get close to ours. But, with the CORRTEX technology, an along-side hole some tens of meters to the side of the test hole can be drilled and the cable suspended down that hole. By running signals down that length of coaxial cable at a rate of between ten and ninety million times a second, you can get a pulse and echo phenomenon in the region of the hard shock of the explosion that sends a signal back up the cable as the force of the explosion shorts the cable out. This tells how fast the shock wave is moving, which is a function of the yield of the weapon. This CORRTEX system is a much more accurate means of validating the yield of a tested weapon than teleseismic methods.

The reservation the Administration has requested for the Threshold Test Ban Treaty would require direct on-site hydrodynamic yields that would give us a 30 percent degree of accuracy. That is what we really need to resolve the verification issue that has kept us from ratifying these two treaties for many years. Looking back at 1974, when the TTBT was being negotiated, many thought that, if the Soviets were to violate the 150 kt limitation by a factor of two or even three, it was not really that important, because most of the Russian stockpile consisted of very large weapons. The Soviets were fielding weapons in the range of megatons, and these represented most of what they had in their arsenal.

With the passage of time their aggressive MIRVing of warheads has resulted in a reduction of the yield of their MIRVed warheads to around the 500 kiloton range. So now to assure compliance with a ceiling of 150 kt is more important than ever, because being able to test up to 300 kt or more would be quite useful to their weapons designers. If we are going to operate under this TTBT regime, sanctioned by ratification of these treaties, we must have better verification than we have in place today. It is a high priority of this Administration to bring the verification reservation before the Congress, and we trust that the Senate will put the reservation language in any TTBT ratification bill that it acts on.

**Mr. Hackett:** Thank you, Mr. Ofte. Our final speaker today is Mr. Manfred Hamm, who is an adjunct professor in national security studies at Georgetown University.

#### **Manfred Hamm**

Virtually every West European government, with the notable exception of the French, appears to support a comprehensive test ban treaty (CTBT). This stems in part from their obsession with arms control and the idea that any agreement is better than none. It also reflects the anti-nuclear sentiment generated by the debate over the deployment of intermediate nuclear forces to Western Europe, to which the European governments sought to respond by supporting an essentially unattainable goal. Finally, a CTBT is seen in Europe as a way to reduce the role of both superpowers and restore a greater degree of autonomy and status to the former world powers.

The French and British independent nuclear deterrents guarantee the obliteration of their possessors more than they deter attack. Nevertheless, they are symbols of the

sentimental "great power" aspirations of two countries which have lost their empires and roles as determinators of world events since World War II. I do not like to overstress this point, but it deserves mentioning because it relates directly to the French refusal to even entertain the idea of ending its autonomous nuclear testing program.

Obsession with arms control is pervasive throughout Europe, but only a little more than in the U.S. Congress, which has passed a resolution calling on the President to pursue the complete cessation of all nuclear tests. We are, in fact, already legally committed to do so through the Limited Test Ban Treaty and the pledges entailed in the Threshold Test Ban Treaty (TTBT). We all seem to suffer from the same disease; a misunderstanding of the purposes and limitations of arms control.

Despite defense budgets approaching \$300 billion annually, we have relied for decades on security on the cheap. Even these huge expenditures do not give us conventional forces comparable to those of the Soviet Union. Although NATO spends more than the Warsaw Pact nations combined on defense, we appear incapable of mounting a conventional defense that matches in favorable ratios that of our adversary.

There may be many reasons to explain this disparity, but the fact remains that we have relied on nuclear weapons to deter attack more for reasons of politics than economics. President Eisenhower's famous remark "More bang for the buck" may stick in all of our minds as the rationale for NATO's heavy reliance on nuclear weapons. But political reasons, based on the unwillingness of European governments to tolerate any type of military conflict, have been the real driving force behind our increasingly noncredible commitment to defend Europe with nuclear weapons.

Present and past administrations have justified their refusal to enter a CTBT with Moscow largely in terms of the unverifiability of such a compact and the potential loss of reliability or confidence in the functioning of our nuclear weapons. Serious problems in the U.S. nuclear weapons program emerged during the three-year moratorium on nuclear testing between 1958 and 1961. The warheads on the "Little John" missile (W45) and the Sergeant (W52) were essentially duds. Less known are complications encountered in developing the warhead for the Minuteman (W56), the Polaris (W47), and the Poseidon (W68). All C-3 Poseidon missiles had to be retrofitted with a new warhead because the original design later proved defective in tests.

In the past, these reasons may have been adequate, but they no longer are enough to convince the public that nuclear testing remains necessary. We need to come to the heart of the problem and conclusively dispel the notion that a CTBT will accomplish what its proponents promise. We must make it clear that a CTBT is detrimental to U.S. security and that it erodes our position as a global power by undermining our ability to live up to our security commitments around the world. If we are constrained in adapting our military posture in the critical field of nuclear weapons through a CTBT, we will lose the flexibility we need to guard our interests and meet our commitments, especially insofar as Europe is concerned. Nobody wants a nuclear war, but to prevent a conventional one requires the possession of a flexible nuclear deterrent.

I need not refer to the thousands of nuclear weapons stored in Europe, although their number is being reduced, to underscore the role nuclear weapons have played in the



deterrence posture of NATO. More important is the way the alliance has used the nuclear deterrent to compensate for its conventional inferiority. A CTBT would freeze NATO into its present theater nuclear posture that many consider wholly inadequate. By precluding the development of smarter, less destructive and operationally more useful nuclear devices, we would be stuck with defenses of the 1950s and early 1960s. Little updating of the nuclear deterrent took place during the Vietnam War because most of our resources went there.

An antiquated theater nuclear posture would upgrade the value of conventional Warsaw Pact superiority over NATO. Moreover, the current U.S. arsenal probably deters NATO more than the Warsaw Pact. Why else the Montebello decision to reduce the present size of the stockpile? It follows that a CTBT preventing the modernization of theater nuclear weapons would play into the hands of Soviet planners, who increasingly seek to establish conventional-only options for the conquest of Western Europe.

While NATO has relied disproportionately on its nuclear deterrent, the so-called escalation dominance, its doctrine of "flexible response," nevertheless provides a significant role for conventional defenses. For these forces to be effective, they must be able to perform on an integrated battlefield, involving both nuclear and chemical weapons. That means we must test and harden our conventional forces against the effects of nuclear weapons. Without such hardening they easily could be disabled by a limited nuclear attack. We should not think that NATO has the exclusive prerogative for nuclear escalation.

This argument gains particular weight in light of the "emerging technologies" resulting from Secretary of Defense Caspar Weinberger's 1982 initiative and the FOFA (Follow-on Forces Attack) policy adopted by NATO in 1985. Both rely on advanced technologies involving highly complex electronic systems. Without hardening against the electro-magnetic pulse caused by nuclear explosions or even simulated electronic warfare measures, billions of dollars worth of military equipment could be disabled very quickly. Simulation of nuclear explosions cannot do the job; the exposure of these conventional technologies to nuclear tests is necessary.

Therefore, if NATO is serious about raising the nuclear threshold by improving its conventional forces, a CTBT would be an obstacle. The real and unavoidable question is where NATO's priorities and those of the U.S. Congress lie. It is easy to fault the Europeans, but you cannot have improved conventional defenses without testing nuclear effects on conventional weaponry. The MX missile is an example of the proclivity of Congress to commit to the trash heap weapons that it funded through research and development at a cost of billions of dollars.

To a greater extent than the Soviet Union, the U.S. and its allies depend on nuclear deterrence for security. This is true particularly in NATO, where the doctrine of "flexible response" mandates nuclear escalation up to the strategic level under certain conditions. To call into question the U.S. ability to live up to that commitment could well mean the political death of an already hollow military strategy.

The military environment in which NATO must operate is constantly changing. Most of these changes are conditioned by advances in military technology, alterations of military doctrine, and changes in the Soviet threat. We are dealing with a dynamic military environment in which NATO has to adapt constantly, lest it undermine the deterrent upon

which all our security depends. This requires new weapons systems, including nuclear weapons, which could not be developed under a CTBT.

With the nuclear deterrent frozen at present levels, the conventional superiority of the Warsaw Pact would gain greatly in significance. Therefore, any "freeze" on our nuclear capabilities must be accompanied by a corresponding reduction in the conventional force imbalance in Europe. As long as NATO depends on the threat of strategic nuclear escalation for its security, a CTBT would undermine the very foundations of the alliance.

This point was summarized well by Allen Holmes, Director of Politico-Military Affairs at the Department of State, who observed:

The fact is that the United States, its allies and its friends rely on nuclear weapons for deterrence. So long as we continue to depend on a secure and credible nuclear deterrent as the ultimate guarantor of peace with freedom, it is difficult to envision circumstances where some level of testing would not be necessary to ensure the safety, reliability, effectiveness, and survivability of our nuclear weapons.

A complete cessation of nuclear tests must be viewed in its relationship to the entire strategic situation. As we have often stated, a CTB remains a long-term objective of the United States in the context of achieving broad, deep and verifiable arms reductions...expanded confidence building measures, and greater balance in conventional forces, and at a time when a nuclear deterrent is no longer as essential an element as currently for international security....

A CTBT could be an obstacle to the radical ballistic missile force reductions agreed to by President Reagan at the Reykjavik summit last October. Under a CTBT, both the U.S. and the USSR would be unable to adapt their nuclear force postures, and would be prone to cling to redundant and destabilizing weapons currently in their arsenals. But reductions in ballistic missiles would require a restructuring of the U.S. nuclear deterrent force, if the U.S. is to keep its military commitments. The trend would be toward less destabilizing airbreathing systems, such as stealth bombers and advanced cruise missiles, and the force loadings of these systems require testing to validate their design and determine their yield. Consequently, a CTBT could stand in the way of ballistic missile reductions and other nuclear arms control measures.

Our European allies, who so vocally clamor for nuclear arms reductions and a CTBT, should be reminded of this relationship and the fact that their security depends, in the final analysis, on the U.S. nuclear umbrella. If extended deterrence is eroded by an ill-conceived CTBT, their security may be threatened more than that of the United States. The same admonition must be directed toward the U.S. Congress, where proponents of a CTBT labor without being fully aware of the military, political, and arms control implications of such a treaty. It would be best for the arms control debate and Western security if the U.S. formally abandoned its commitment to seek a CTBT.

Improved verification procedures may allow ratification of the TTBT and PNET agreements. With modifications, such as reductions in permitted yields and numerical limitations on the number of tests allowed annually, both treaties would be of greater value than a CTBT created with the illusion that by halting nuclear tests one can put the genie back into the bottle.



## Appendix

When the Soviet Union announced its unilateral moratorium on nuclear weapons testing on the eve of the 40th anniversary of Hiroshima in August 1985, there were conflicting reports concerning the Soviet nuclear testing program. Some reports stated that the Soviets had accelerated their testing prior to the moratorium, while others denied that there had been an increase in Soviet testing. In April 1986, the engineering magazine Spectrum carried an article by John Horgan entitled "Underground Nuclear Weapons Testing," which included a chart of U.S. and Soviet nuclear weapons tests. The data have been confirmed by Administration officials, showing that Moscow conducted a heavy testing program, nearly double that of the United States, during the three years immediately preceding their 1985 test moratorium.

<u>Year</u>	<u>Number of Nuclear Tests</u>	
	<u>USSR</u>	<u>U.S.</u>
1978	27	12
1979	29	14
1980	21	14
1981	21	16
1982	31	18
1983	27	15
1984	27	15
1985	<u>7</u>	<u>16</u>
Total 8 years:	190	120