Bomb Test Suspension

The Soviet Union's recent announcement of their suspension of nuclear testing has made Adlai Stevenson look like a prophet of the decade, for it was not two years ago when he proposed that the United States do the same thing, and lost an election partly because of this proposal.

What Stevenson realized at that time, and what American leaders have failed to realize until now, was that at that time the Soviet Union had possessed the propaganda advantage over the United States for only a short time, and that the United States by discontinuing nuclear testing at that time could reassert her leadership as a peace loving nation and call the Soviet Union's peace bluff at the same time.

Now that the Soviet Union has announced suspension of nuclear testing, there still remains in the United States a complete lack of leadership.

The general reaction from Washington was to treat the Soviet announcement as a propaganda move, which indeed it was. However, there seems to be such a void of imagination among the leaders in Washington, as to come up with no concrete proposal to match the Russian announcement.

The President has announced that the U.S. will continue to test weapons in the face of the very real protests by neutral states such as India.

Again the President has let the Soviet Union be pictured in the light of a peaceloving nation, and leads the world to believe that the United States is the warmonger nation whose sole aim is to attain atomic supremacy over the Soviet Union.

This is not the picture that the United States should give to its allies or to its potential allies.

It makes very little difference in the eyes of the world that the Soviet Union has just completed a large series of tests or that the United States is experimenting with a "clean" hydrogen bomb. What the people of the world are looking for is concrete action toward the ending of the nuclear menace.

It makes very little difference also to have statements in the paper about the necessity for testing for scientific progress, when the only thing the United States seems to be testing is materials for warfare.

The United States can at least break even with the Russians on the latest propaganda move, by announcing suspension of American nuclear testing. By this the United States will be pacifying the potential allies like India, and at the same time calling Russia's bluff. If Russia does not test any more, the United States will have gained one of the goals that it wanted to gain at Geneva. If Russia does test in the future, Russia is put in the light of a war monger, and the U.S. will be free to test.

The United States still cannot lose by the suspension of the tests, and the people of the world will rest quite a bit easier without the threat of additional Strontium-90 in the air.

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Problems In The Atomic Age

Nuclear Tests: Another Viewpoint Policy Needs Revision

(David Lawrence is publisher of U. S. News and World Report. It is from this week's issue that this article is taken.)

The Soviet Union's proposal temporarily to suspend, of its own accord, the testing of H-bombs has been hailed by some newspapers here and abroad, and by some partisan politicians in Congress, as a great "propaganda victory" for the Communists.

To the gullible and the craven, to the weak-kneed and the "practical"—who used to advocate doing business with Hitler and who now want to do business with Khrushchev—the Moscow proposal is a "stroke of genius."

But to the President of the United States, who has faith in the truth, the Communist stratagem is a "gimmick" and a diversionary tactic. To all straight-thinking people throughout the world, the Soviet proposal is a transparently phony scheme.

For the Communists have just completed their own series of tests, and they know that the United States is about to begin a new series of tests. Prime Minister Macmillan told the House of Commons last week that Great Britain new has "specific evidence" that not all nuclear tests can be detected by other governments. The Soviet Union, indeed, rejected the resolution overwhelmingly adopted last November by United Nations General Assemby calling for a supervised ban on nuclear tests and the ending of the production of nuclear weapons, with controls. Khrushchev now says he favors "international control" of tests but avoids endorsement of the U. N. plan. What the really wants is his own kind of supervision.

Why, incidentally, was the offer made by the Soviet Union to ban only the tests of H-bombs? Why didn't Moscow announce a decision to accept proposals already made by Western governments to abandon completely the manufacture and use of nuclear weapons under an inspection system that would insure compliance? If testing is a crime against humanity, then the use of nuclear bombs hereafter would be an even worse tragedy for mankind.

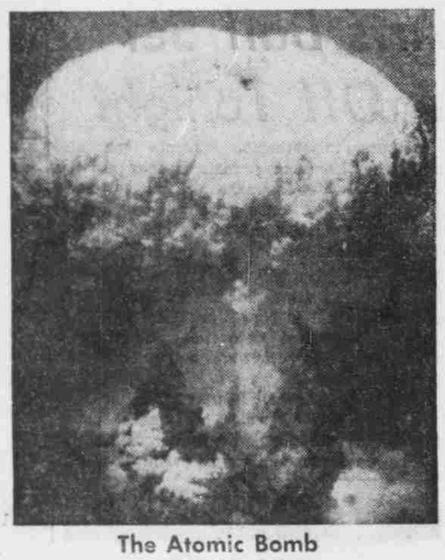
Throughout the 8,000-word speech of Soviet Foreign Minister Gromyko, there is only one sentence about a possible abolition of the use of atomic bombs, and this is couched in the vaguest terms as an aim or hope. Yet every word uttered against nuclear tests could be applied even more effectively against the production and use of any nuclear weapons.

The argument of the native in our midst is that the suspension of the tests will be a "good beginning." After this—it is wishfully argued—may come other agreements. It is familiar refrain. It has been heard every year since 1954. Yet after we engage in talks and conferences, we find out what we knew before—that the Communists break their pledges and will not accept anything but the unconditional surrender of the Western world. Once we agree to stop testing, and the agreement is subsequently broken by the Soviets, then—as the cliches goes—we will at least know where we stand. "To put it more realistically, Khrushchev will be in a position to terrorize the Western nations and tell them where they will by "buried."

Every one of the Soviet proposals, including the recent demand that American bases be abandoned and our troops by withdrawn from Western Europe, has a single military objective—to win domination for the communists without firing a shot.

There are group—here and abroad—who are tired of the fight for ideals. They want to appease the Communists—by accepting the present enslavement of the captive countries as irretrievable. Why do not some of these same unwitting apologists for the cause of the Communists demand the suspension of a few other things besides the testing of H-bombs? Have they no interest in the fate of the Hungarian people and the peoples of the captive countries who are being tortured every day, not by Soviet tests" but by Soviet acts of brutality?

Under certain conditions, we would agree to suspend the use of nuclear weapons althougether, and we have indicated this position frequently in the past. But the Soviet Union first must establish the sound conditions that would warrant the taking of such steps by the free nations of the world today.



The Atomic Bomb
. . . with it questions

(The following is an editorial which appeared in this week's issue of "The Nation.")

The president and Mr. Dulles must realize that the United States is in grave diplomatic trouble and that trying to get out of it with quips and evasions just isn't going to work. By their unilateral suspension of nuclear testing the Russians have got us on the diplomatic hook. It makes little difference that the Russian move is tainted with some blatant hornswoggling. The fact remains that they correctly gauged the state of public opinion in part of the world vital to us, and acted with boldnes, orginality, and superb timing. By all the rules, they have earned their diplomatic triumph.

The outlines of what they accomplished are only beginning to become clear and the spectacle is neither pleasant nor reassuing. Mr. Dulles feared to lose his shirt at a summit conference: He has already lost it without the conference.

The Russians had indicated a willingness to cease nuclear testing with some sort of inspection system backing up the agreement. This was one of the practical questions on which we could have negotiated (freeing the Soviet satellite, re-unifying Germany on our terms, etc., are issues on which no serious diplomat would waste his time); and, had an agreement been reached, we could have shared the credit with Moscow and reaped some advantages from the inspection arrangement. Now the Russians take all the credit, leaving us to incur obloquoy for our tests in the pacific proving grounds, while their own recent tests escape practically scot-free. If all this is a "gimmick", one can only wish to God that our statesmen could concoct such gimmicks once in a while.

Aside from the diplomatic defeat, we are in an uncomfortable position militarily. The big fission-fusion-fission bombs are obsolete. In a sense, they work too well: they kill ho indiscriminately and on such a grand scale that no nation can afford to use them. The rational line of development—insofar as rationality can play a part in these affairs—is "miniaturization" of missile warheads, as well as the familiar miniaturization of components in the guidance system. We must ask ourselves: Why are the Russians so ready to suspend tests? One reason is that they would like to reduce their armament expenditures, which are far more onerous to them than ours to us. To this extent they are acting in good faith, and indeed it is as stupid to postulate that they are always wholly Machiavellian as to believe that their motives are as pure and humanitarian as they say. But there must be other reasons, and one, which must be asumed as a matter of elementary prudence, is that they are satisfied with their present missile technology. In other words, they are ahead, of us, and probably the best we can hope for is to catch up with them in our forthcoming series. These races tend to be neck-and-neck, and by all indications we are a neck behind.

Mr. Eisenhower must therefore try a new line. It would be best, of course, if the new line did not include Mr. Dulles, but since it will, the President should acknowledge to his own private self that Mr. Dulles doesn't know where he is going. For his own sake and that of the country, the President must take the reins in his own hands. And as he prepares to do so, he should bear in mind that the reason the Rusians have been able to get away with a certain amount of transparent propaganda is simply that the world welcomes any move at all towards a cessation of the nuclear-armaments race.

For The Record

	United States	Russia
First Atomic Bomb	July 16, 1945	Sept. 22, 1949
First Hydrogen Bomb	Nov. 1, 1952	Aug. 12, 1953
First Satellite	Jan. 1958	Oct. 12, 1957
Number of Tests	90	39

Science Paves Way For Nuclear Detection

David Bird

(This article is taken from this weeks "Nation." Mr. Bird is on the staff of The New York Times.)

There can be no doubt that if a nation wants to carry out (nuclear) tests in secrecy, observation will become difficult and uncertain—Dr. Edward Teller, University of California physicist who is commonly referred to as "the father of the H-bomb."

On the technical matter of whether you could develop a system to enforce the test ban, I think you can do this—Dr. Willard F. Libby, scientific member of the U. S. Atomic Energy Commission.

The Soviet Union's unilateral renunciation, pro tem, of further nuclear tests simply points up the need to settle once and for all the controversy now pervading the question of whether nuclear—disarmament agreements can be made to stick through workable inspection methods. It is a controversy that is carried on mainly in the dark because the United States Atomic Energy Commission, presumably to keep the Russians in equal darkness, has held nuclear—explosion detection methods under a cloak of secrecy ever since it made it first cryptic announcement almost nine years ago that the Russians had set off their first atom bomb.

Since then the AEC had regularly announced Russian nuclear tests, but its sparse reports have never mentioned how these were detected or how accurate the detection methods are. Actually, the most the Government has revealed came in a statement from President Eisenhower at a recent news conference. He said that "with proper inspectional facilities, seismic and electronic, and so on, (nuclear tests) ought to be detected."

If this dearth of information leaves the average citizen with little basis to make an intelligent judgment in the face of emotional appeals for and against nuclear-inspection systems, it has also left at least some atomic scientists in a similar position. Dr. Harrison Brown, a professor of geochemistry at the California Institute of Technology who worked on the development of the first atomic bomb at Oak Ridge, Tennessee, said in testimony before the Senate Disarmament Subcommittee that it was easier to get information on radioactivity and its detection from Japan than from the Atomic Energy Commission. He added that the Japanese regularly and voluntarily sent him this information, while the AEC required a "special plea," although he has the highest type of security clearance.

Dr. Brown suggests that this with-holding of information gives those in control excessive power in policy formation, since they can make statements which cannot be checked or refuted by critics.

As Dr. Brown's testimony indicates, there has been considerable activity outside the AEC's security net on methods of detecting nuclear tests. Much work has gone on in Japan; some has been done by American scientists independently of the AEC. A great deal has been published without any type of security label. Unfortunately, most of the nuclear news that reaches the American public is channeled through government. And the AEC, adhering to its policy of secrecy, refuses to recognize this information from outside domain. That this domain is effectively extended to other government agencies is illustrated by the Weather Bureau official who, when asked recently about the detection of nuclear blasts through minute barometric variations, refused to comment on the grounds of security.

Barometric variation as a means of detecting nuclear explosions—which hasn't rated public comment in this country—has been under experimentation and perfection for several years in Japan. With it the Japanese have been able to pinpoint quickly the location of the U. S. and Russian nuclear tests. It is one of the four main techniques, developed outside the AEC, of detecting these tests, according to Dr. Jay Orear, a Columbia University physicist who has been exploring the field in nonclassified research. The other methods are through seismic waves, visible light and radioactivity.

Barometric variations can measure the energy that is transmitted to the air from an explosion. This energy travels the way sound does and with the same speed. Then the energy reaches a sensitive microbarometer (similar to those used to check weather conditions by changes in air pressure) it causes a sharp movement in the markings on the recording drum. By noting the time the shock wave is recorded on microbarometers at varying distances and different points in relation to the blast, the exact location can be determined. Judging by the accuracy with which the Japanese have detected Russian and U. S. tests more than 2,000 miles away, this method appears to be the most sensitive and quickest for detecting a nuclear explosion.

Seismic waves can detect nuclear tests through another set of disturbances—in the earth. Both earthquakes and explosions are picked up by seismographs, but each phenomenon has its own signature. Earthquakes, a long and complex pattern of shifting of the earth, manifest a long and complex pattern on the seismograph chart. Explosions, on the other hand, are sharp and compact movements and show up this way on a seismograph. Another difference is that an explosion is to tally outward in its movement from its point of origin, and thus shows up with a similar outward initial movement on all seismographs, no matter where located with relation to the blast. Earthquakes show up as different patterns on seismographs, depending on whether the instruments are situated on the "push" or to he "pull" direction in relation to the quake. Seismographs are generally the only means of detecting underground blasts. Their effectiveness is attested by the fact that the ACE's underground test last September in Nevada was detected in College, Alaska, more than 2,000 miles away.

All nuclear explosions above the ground give off tremendous amounts of light and this provides for the third method of detection—visible light. The hot gases generated by a nuclear explosion produce the characteristic large ball of fire. While not admitting that this is a means of detection that it utilizes, the AEC has stated that "the fireball from a -megaton nuclear bomb would appear to an observer sixty miles away to be more than thirty time as brilliant as the sun at noon." In several of the nuclear tests made at the Nevada test site, in all of which energy yields were less than 100 kilotons, the glare in the sky, in the early hours of the dawn, has been visible 400 or more miles away. The AEC goes on to say that "as a general rule, the luminosity does not vary greatly with the energy or power of the bomb." The light from an atomic blast can be seen many miles away because of reflection from the upper atmosphere in much the same way that we see the sun in the form of twilight long after it has disappeared below the horizon. An inspection station checking on nuclear tests could be equipped with sensitive electric eyes to detect the brightness from a bomb blast. Generally, the limit of effective detection by this method would about 500 miles.

The fourth detective technique measures the "dirt" that comes from a nuclear explosion—radioactivity.

Every nuclear bomb—even the "96 per cent clean" ones that have been tested recently — releases radioactive particles into the air. Some of these fall to earth quickly, but others are carried into the upper air currents. These particles eventually come down to earth and a nuclear explosion is indicated when the radioactivity count rises, as shown on a geiger counter. The location of the bomb blast can be determined by charting the speed and direction of the air currents from which the samples were taken. The length of time that has elapsed since the blast released the radioactive particles can be measures by the age of the particles, which decay at a determinable rate. The main drawback in this method is that it may take weeks for the particles to drift into a detection station. Thus where speed in identification is necessary, other techniques will be used and radioactivity samples will serve only a backstop check.

Using these four methods, Dr. Orear, the Columbia physicist, feels that inspection stations within three hundred miles of each other would be able to detect even low-yield tests in the low-kiloton range. Transferring this to a map, for example, it would require only some twenty-five outposts in the Soviet Union to detect a test anywhere within that country's 8.7 million square miles of area. It should be pointed out, in this connection, that the USSR has agreed in principle to the establishment of inspection posts.

All four of the detection systems can check on nuclear explosions above the earth— the most dangerous type because they release deadly radioactive fallout into the air. Deep underground tests, which do not release contamination and are more useful for the non-military applications of atomic power, can still be detected by at least one method—seismic waves.

While nuclear tests above and under the ground have been the most frequent types, there remains one other general method; underwater testing. This has been claimed to be somewhat difficult to detect in spite of the fact that underwater tests at Bikini were recorded on seismographs. But even with these, there are at least two methods of detection: by measuring samples of water for increases in radioactivity and by using hydrophones to check disturbances in the water in precisely the manner in which microbarometers are used to detect air vibrations.

New Report On Fallout

(Dr. Libby is a member of the Atomic Energy Commission. His article appeared in this week's issue of U. S. News and World Report.)

The biological hazard from the radioactive fall-out from weapons testing is not well known, and, like many biological problems, the determination of the hazard in any exact way seems to be almost impossibly difficult.

Fortunately, however, it is possible to compare the radiation from radioactive fall-out with the intensities of natural radation to which we are always exposed.

For example, it is clear that the present level of radiostrontium in bones of young children, which are, of course, closest to being in equilibrium with the fall-out—since adults have had their bones some time even before there was any radioactive fall-out—is about 2 milliroentgens per year, as compared to an average natural dosage of 150 to 200 milleroentgens per year, or about 1 to 2 per cent of the dosage from natural sources to the bones, depending upon location.

Natural radioactivity present in the ground, building materials and even in our own bodies gives us an average total dose at sea level of about 150 milliroentgens per year, and medical x-rays add something like another 150 milliroentgens.

The radiocesium taken into the body and the penetrating radiations from non-assimilable radioactive fall-out contribute perhaps another 3 or 4 per cent to the whole body dosage.

Thus, the total dosage to freshly formed human bone is at most 5 per cent of the natural dosage.

Furthermore, we do know that the variations in natural background dosages from place to place are enormous in magnitude as compared to the fall-out dosage.

For example, it has been found that exposure from external radiation rise from a value of about 110 milliroentgens per year at sea level to something like 230 milliroentgens per year to 5,000 to 6,000 feet altitude in the United States. These numbers are considerable larger than those expected on the basis of earlier calculations and measurements, the increase apparently being due to the cosmic rays and their increase with altitudes.

In addition, the effects of radioactivity in the soil and in building materials made of stone or soil are considerable, amounting in some instances to 50 to 100 per cent of the average natural background dose at sea level; and the magnitude of the medical exposures to x-rays approximates, on the average, those due to all natural sources.

We see, therefore, that whatever the extent of our ignorance of the biological effects of radiation, we do know that these effects are not unexperienced by the human species, even from the genetic point of view, since it is clear now that persons living at high altitudes on granitic rocks always have received extra radiation many times greater than is contained in the radioactive fall-out from the testing of nuclear weapons, and that even those living on certain sedimentary rocks at sea level always have received about 10 to 20 times the present fall-out dose.

Of course, this does not mean that any of the effects from radioactive fall-out are in any way negligible, and it does not mean that certain numbers of people will not be injured by radioactive fall-out radiations, even though these numbers be very small relative to the total population of the world.

View & Preview

It has no doubt been noted elsewhere, but it merits being noted again here, that the normal furtherance of "co-recreational" relationships is sadly hindered at Carolina. There is no place on this campus for two people to be alone together (excepting parked cars and Kenan Woods on warm evenings).

The philosophy, conscious or unconscious, behind this state of affairs seems to be that affection between Carolina ladies and gentlemen (Note: those terms are used advisedly) is a Bad Thing, and should be carefully controlled.

The end result is that local young lovers are forced either to abstain from even the most simple and innocent love-making, or engage in some degree of public display which is uncomfortable for everyone concerned.

This is but an outline of a problem for which there is no easy solution; nevertheless, it is a matter of considerable importance, applying in lesser degree to many areas of social activity on the campus.

The present situation is serious enough to cause concern, but it will get much worse before it gets better. Whatever the present magnitude of these and many other problems with which the University is faced, the imminent sizable increase in student population will serve to compound the difficulties.

The causes and the ramifications of the existing situation are many. The American moral climate surrounding love, both platonic and physical, is a part of what is commonly referred to as our "Puritan heritage"; thus it is a current in the mainstream of the development in the Western world of that physical-intellectual-emotional complex which we call 'love.'

Obviously, the American attitude toward love and related activities is often self-defeating, encouraging and making more pleasurable nominally illicit activities whch it strives to control; and, at the same time, seriously undermining the mature marital relationship which it is supposed to strengthen and sanctify.

Putting aside, for the moment at least, all far-reaching considerations, we are faced with a Friday evening, and hundreds of couples are faced with the choice of one of several available ways to spend the evening.

It is safe to assume that the relationships existing between these couples constitute a continuum from absolute strangers to lovers.

Only for the absolute strangers does Chapel Hill provide any satisfactory surroundings; for the success of a blind-date, or of any first date, is often fostered by the security of either a movie or some form of public or group activity.

To be sure, any couple, no matter how intimate their relationship, may often enjoy such activities; but it is essential to the maturation and determination of such relationships that there be an occasion and sanction for privacy when it is desired.