# DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1971

## HEARINGS

BEFORE THE

## SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

NINETY-FIRST CONGRESS

SECOND SESSION

ON

## H. R._____

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE FOR THE FISCAL YEAR ENDING JUNE 30, 1971, AND FOR OTHER PURPOSES

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**PART 1**

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NOTE.—On February 20 and 24, 1970, the Department of Defense Subcommittee of the Committee on Appropriations and the Committee on Armed Services met in joint session. All other hearings were held solely by the Department of Defense Subcommittee of the Committee on Appropriations.

Senator YOUNG. Some of the most dovish people in the world thought it was a great idea to go there 4 or 5 years ago.

Senator ELLENDER. You may proceed.

General FORD. I was talking about the students and their doubts about our foreign policy and Asian involvement. I say they do not believe, as Arthur Schlesinger has so well put it, "that if the United States declines to fight to the end in a part of the world where its vital interests are not involved, the rest of the world will conclude that we will not fight at all in areas where our vital interests are involved."

What they do believe has been well said by Mr. Enoch Powell, a right-wing figure in the British Conservative Party, described by Anthony Lewis, in the New York Times, as "an unsentimental man, a man utterly opposed to communism."

> American military power cannot secure any specific political result in Southeast Asia. This is a war in which the United States can win, if it wishes, every battle; but it is a war which the United States is bound to lose.
>
> I have no doubt that the United States forces can eliminate the Vietcong base which has so long flourished—of course, it has—in Cambodia. But when the operation is over, the underlying facts of the situation reassert themselves like the tide washing out footmarks in the sand.

What our thoughtful students do believe is that, far from gaining over communism by this enormous outpouring of blood and treasure, we are actually strengthening and unifying an Asian communism which was splintered and at odds with itself, while we weaken ourselves at home.

Our business executives group (BEM) associates itself with the views here attributed to the great body of dissident students. We support them in their now clearly defined purpose of taking this issue to the people in this year's congressional campaign, to accumulate strength at the polls for their sympathetic respresentatives in Washington.

We ask you to give them hope by taking strong action now to get us out of Southeast Asia by the end of 1971.

We ask your support of the McGovern-Hatfield amendment, or any similar measure.

I might say one additional word.

We feel that the situation in Southeast Asia has been greatly heated up in recent weeks and that the presence all over Southeast Asia, one hears it reported, of tactical weapons in most of the countries there under our control is an element which could, if hasty action were taken, promptly involve us in world war III.

Thank you, sir.

Senator ELLENDER. Thank you.

Are there any further questions?

Senator YOUNG. No, Mr. Chairman.

## STATEMENT OF PROF. MATTHEW MESELSON (CHEMICAL WARFARE), HARVARD UNIVERSITY, FEDERATION OF AMERICAN SCIENTISTS

### U.S. POLICY FOR CHEMICAL WEAPONS

Senator ELLENDER. Mr. Meselson.

Will you identify yourself for the record?

Professor MESELSON. Yes. My name is Matthew Meselson. I am a biologist at Harvard University.

It is a privilege to testify before you this morning, Senator Ellender and Senator Young. I wish to talk about U.S. policy for chemical weapons.

Last year, President Nixon took the wise initiative of renouncing the possession and use of germ weapons. The reasons were simple.

We have no need for germ weapons; no one could figure out a scenario in which it would make any sense for us to use such a weapon; but in the hands of others such weapons would be a great threat against our cities and civilians and their development would open up a new dimension of cheap warfare that could only harm us.

On those grounds, as well as on others, the President wisely took the historic initiative of renouncing all possession and use of germ weapons. He also announced his decision to send to the Senate for its advice and consent to ratification the Geneva Protocol of 1925, a treaty now ratified by 84 other nations but not by the United States, even though we, ourselves, were instrumental in its drafting. That treaty is essentially a no-first-use treaty. It prohibits the first use of chemical and biological weapons. It is a kind of benchmark or guideline so that nations can understand where they might coordinate their expectations during conflict and the rule is very simply stated: no gas, no germs.

However, a problem has arisen and the problem is that many nations feel that some of the weapons we are using in Vietnam are prohibited by the Geneva Protocol.

Last December at the Geneva Assembly of the United Nations, there was a vote on a resolution introduced by Mexico, Sweden, Pakistan, India and a number of other neutral nations. The resolution asserted that all chemical weapons whether used against plants, animals or men, are prohibited by the Geneva Protocol. The vote was 8 to 3. The three were Portugal, Australia, and the United States. We had never been so isolated on any issue.

We exerted ourselves very greatly in capitals throughout the world to persuade our friends and allies not to vote in favor of that resolution. This great pressure succeeded in obtaining 36 abstentions.

This creates a problem. The problem is this. Should the United States, in order to achieve a uniform understanding of which gases are prohibited, give up the use of herbicides and tear gas in Vietnam and in the future? There are benefits in doing that. Or should we retain the option to use those weapons in Vietnam and in future wars? There are benefits in doing that.

I would like to talk about the security implications to the United States of our decision in this matter. Today, the funding generated by such weapons is not huge compared to the overall military budget. On tear gas in Vietnam at $4 per pound, approximately, using 15 million pounds in the last few years, we have spent approximately $50 million or $60 million for the gas; I suppose another equal amount for weapons. That is $100 million. That is a lot of money but it is a small fraction of the defense budget.

Our expenditure on herbicides is about the same.

However, these small beginnings have big implications.

For 45 years after World War I, Senator, our forces did not use gas in combat in any form, shape, or manner. Then in Vietnam a

break with that tradition was allowed to occur and it has escalated very greatly since then.

I have been asked to testify this morning by the Federation of American Scientists. The Federation of American Scientists is an association of 2,000 scientists and engineers interested in the technological relations between public policy issues, interested in the public policy implications of technology and science.

LETTER OF FEDERATION PRESIDENT

The chairman of the Council of the Federation of American Scientists is Herbert F. York. Herb York was President Eisenhower's Director of Defense Research and Engineering, the position presently held by John S. Foster.

Today, the Federation of American Scientists is sending a letter to President Nixon and to Secretary Laird and to the Secretary of State, in which Herbert York says something about chemical and biological weapons and his involvement in planning for those weapons back under the Eisenhower administration. He says:

When I was Director of Defense Research and Engineering under President Eisenhower, I believed that some chemical and biological weapons, especially the non-lethal variety, could be usefully incorporated into our defense arsenals and might in some degree make war more humane. I have come to realize that the situation is very much more complicated than I had then thought it was. Indeed, these weapons generally make war more inhumane, especially when used in conjunction with conventional weapons. I consider my earlier support of biological and chemical weapons to have been perhaps my biggest mistake of that period. I therefore am especially pleased as Chairman of the Council of the Federation of American Scientists to endorse the ideas and recommendations set forth in this statement of the FAS Council.

FAS STATEMENT ON USE OF CHEMICALS IN VIETNAM AND ON THE GENEVA PROTOCOL—MAY 20, 1970

I won't take the time to read that statement but I would request permission that it be inserted in the record.

Senator ELLENDER. Without objection, that may be done.

(The statement follows:)

Dr. Herbert F. York, Chairman of the Council of the Federation of American Scientists today released the following FAS statement on the use of chemicals in Vietnam and on the Geneva Protocol with these comments:

"When I was director of Defense Research and Engineering under President Eisenhower, I believed that some chemical and biological weapons, especially the non-lethal variety, could be usefully incorporated into our defense arsenals and might, in some degree, make war more humane. I have come to realize that the situation is very much more complicated than I had then thought it was. Indeed, these weapons generally make war more inhumane especially when used in conjunction with conventional weapons. I consider my earlier support of biological and chemical weapons to have been perhaps my biggest mistake of that period. I, therefore, am especially pleased, as Chairman of the Council of the Federation of American Scientists, to endorse the ideas and recommendations set forth in this statement of the FAS Council."

The Council of the Federation of American Scientists, representing 2,000 U.S. scientists and engineers concerned with arms-control and public policy implications of technology, today urged the Administration to cease the use of anti-personnel and anti-plant chemical weapons in Vietnam and to submit the 1925 Geneva Protocol prohibiting gas and germ warfare to the Senate without any restrictions that would jeopardize its effectiveness.

The F.A.S. has applauded the wise initiative of the President in totally renouncing biological weapons and his decision to send the Geneva Protocol to

the Senate for advice and consent. It is vitally important in ratification of the Protocol that the U.S. not open loopholes for harassing gases and herbicides. To do so would weaken the restraints against gas warfare that were upheld without violation throughout World War II and the Korean War.

In Vietnam, a dangerous departure from our traditional policy has been allowed to occur and to escalate. The main anti-personnel chemical used is the harassing agent CS, an eye and lung irritant. CS procurement for Vietnam expanded from 253,000 pounds in 1965 to 6,063,000 pounds in 1969. During the same period, the types of gas weapons in use escalated from hand-grenades to 105 and 155 mm artillery shells and nearly 20 other newly developed tactical gas munitions for air and ground delivery. Regular enemy troops are now widely equipped with Chinese gas masks and they are using CS against us with limited but increasing frequency. While the military utility of gas decreases sharply as the enemy obtains masks, it sets the stage for further escalation and stimulates worldwide military interest in the acquisition of chemical weapons.

Herbicide spraying of crops and forest lands in Vietnam increased from 5,700 acres in 1962 to 1,330,000 acres in 1968. Approximately 20 percent of all the forests in Vietnam have been chemically defoliated. This sets a dangerous precedent for massive destruction of the environment for military purposes. Recently, the spraying of forests has been suspended because of concern that the chemicals used for this purpose may cause human birth defects. However, it appears that spraying of crops continues. This tactic does little to harm enemy soldiers, but has inflicted unnecessary suffering on hundreds of thousands of non-combatants. It arouses great hatred among peasants whose crops are destroyed, thus foolishly generating recruits and support for the enemy.

Chemical and biological weapons have the potential of greatly increasing the level of death and destruction in conflicts of all kinds, from guerrilla wars to strategic attacks on great powers. Because soldiers can be protected against such weapons far more readily than can civilians, the main threat is to non-combatants. The United States, with its great wealth stands only to lose if these cheap weapons of mass destruction should come into general possession and use. Our overriding objective should be to prevent the proliferation of chemical and biological weapons and to bolster the psychological and legal barriers against their use. Recently, the General Assembly of the United Nations voted 80 to 3 to affirm that all chemical weapons, including herbicides and tear gases, are prohibited by the Geneva Protocol. It would be tragically against our own best interests to attempt to change the long-standing rule of "no gas" in war. We urge the President to insure the effectiveness of his recent initiatives in these matters by returning to our traditional standard and ratifying the Geneva Protocol without restrictions.

TEAR GAS

Professor MESELSON. I would like to speak directly to you about the issues raised by our use in particular of what has been called tear gas or riot control gas or harassing gas or irritant gas; it is all the same. The code designation is "CS" in Vietnam.

There are benefits to using this weapon against unmasked personnel. It is an effective temporary incapacitant. In the amounts in which we use it, it may also kill but that is not its primary intended purpose. Its primary intended purpose is to incapacitate the enemy. Having incapacitated an enemy, one can bring to bear other weapons.

CS is used today mainly for ordinary military purposes, in attack against occupied enemy positions; it is used in close conjunction with artillery and air fire in order to increase enemy casualties by flushing the enemy from bunkers and other field fortifications.

Here are some of the gas weapons in use today in Vietnam. That is a 155-millimeter gas artillery shell. It has a range of 15 kilometers. It is used together with high explosive fire to increase the effectiveness of casualty production of a high explosive weapon. It is effective against the enemy so long as he has no gas mask.

Here is a helicopter loaded with 80-pound gas bombs; 30 of them.

Senator YOUNG. What kind of gas?

Professor MESELSON. This is CS, all CS.

Senator YOUNG. Tear gas?

Professor MESELSON. Yes; it is a form of tear gas. Actually, the designation tear gas is misleading. Its primary effect is on the lungs. It also is an irritant to the eyes. It has been prepared in a formulation which achieves its maximum effect as a lung irritant. It forces men to seek fresh air. It spoils their aim. It discoordinates their activities.

Senator ELLENDER. Does it kill?

Professor MESELSON. Occasionally, Senator, I believe it kills. Although there are no verified reports, so far as I know, there has been no effort to verify the reports, but one can calculate from the concentration which the Army believes to be lethal whether or not that concentration or that exposure would be achieved under field conditions. It is very easy to calculate that quite often that would be the case.

In a room this size, I would estimate the detonation of two military CS hand grenades would be lethal to half of us in this room if we stayed in it for 10 minutes. Now, we would not stay in the room for 10 minutes. We would get right out.

On the other hand, if you were unable to get out, you were wounded in a tunnel—this is the way it is used in a tunnel—the machine is attached to the tunnel. The gas is put in a hopper and it is pumped in. If there is an exit and the men inside know where it is and they don't fear too much coming out, they can make it; they will not be killed by the gas. But if they stay in there even a few minutes, I would calculate in a reasonably sized tunnel they would be killed.

However, its main purpose in itself is not to kill.

Senator YOUNG. How else would you dislodge the North Vietnamese?

Professor MESELSON. There are several options for doing that. One is to send in an armed party. That is risky. Your men might be shot. Another is to use flame. Another is to use detonation.

Senator YOUNG. Would that not be more inhumane than the use of the gas?

Professor MESELSON. Under some conditions, yes.

Another option that should also be remembered by military commanders is to forget that particular mission. One must always figure the best way of deploying one's men. There are some missions that can be omitted. That is always an option.

My point is that this is a weapon that does have some military effectiveness and, as you point out, that is one of its military effectivenesses.

Senator YOUNG. I watched the television coverage of the demonstration here in Washington recently. I particularly watched the students trying to upset some buses. The police used some tear gas and they moved away quickly. I thought this was a rather harmless way of dealing with the situation.

Professor MESELSON. Yes, sir. That is the police use of tear gas. This is absolutely different from the military use of tear gas. I will say why I think that in just a moment.

Senator YOUNG. Do you think it is all right for the police to use tear gas but not the military?

Professor MESELSON. Let me re-emphasize that I am at this point discussing the military benefits of using this weapon. I am discussing military effectiveness and how it is used.

One benefit that was initially anticipated was to make war more humane. This has not proved to be the case.

Initially, Secretary of State Dean Rusk said that the expectation would be that it would be used only in riot control and similar situations and not in ordinary military operations. That has not been the case.

The amount we have used, over 15 million pounds, is enough to cover all of Vietnam more than once with a field effective concentration. The weapons we have used have escalated from ordinary hand grenades to very large munitions.

The way it has been used has been to maximize casualties to the enemy and to minimize them to ourselves. Now, those are legitimate military objectives. But we should not allow ourselves to be confused that CS makes war more humane. The reason it was thought at first it might be was that there were a few situations in which civilians and Vietcong were intermingled and in a very few of those CS was used and enabled the separation of combatants from noncombatants without injury to the latter.

However, it turns out, as extensive field studies in Vietnam have shown, that this is an exceedingly rare occurrence. Many field commanders do not recall ever seeing or hearing of such an occurrence. The reason for this is that when civilians expect a fire fight to break out they leave, they go away if they can. If they can't, they go down into their underground shelters underneath their huts which many civilians in Vietnam have. CS drives them out. It drives them out into the field of fire and they do not know how to take care of themselves in a fire fight and they are killed.

For that reason today in Vietnam CS is not used for intermingled situations. It is used to attack the enemy. It is used to repel enemy troops when they attack us.

Senator ELLENDER. I guess it is used to flush them out so that they can be attacked or captured?

Professor MESELSON. That is exactly right, Senator.

Now, I said something about the benefits. I tried to establish that it has some military benefits. I could say more about that. I believe that they are very marginal. I would like to say something about the cost because as with most of these questions it is a matter of balancing the cost with the benefits.

The important thing is to get at least factually straight what those costs and benefits are and then it is a matter for individual judgment as to what action to take, based on those considerations.

Senator YOUNG. May I say that, as one member of this committee, and the chairman probably shares my view, I believe we can't ignore the views of a large group of scientists like you. It is a little hard to understand some of your positions, though. Do you represent the view of all 2,000 of the scientists?

Professor MESELSON. No, Senator; I represent only myself.

I have been asked to testify before the subcommittee by the FAS but I am speaking entirely as a private citizen and for myself.

GAS COST

I have not said anything yet about the cost to our national security of using gas, even CS gas. I would summarize those costs in the following way:

The use of gas can raise the level of violence in wars of all kinds, in so-called low-level wars, guerrilla wars, in larger wars, and in strategic wars. However, the effect of using gas would be to particularly enhance not the destructive power of the United States but the destructive power of those whom we wage war against and the destructive power of smaller and dissident military groups.

Why do I say this?

To date, the United States fights wars with money. What I mean by that is that we use fantastic amounts of munitions.

In 1968, we were using 6,500 tons of ammunition classified logistics in Vietnam every day. That is about 500 railway cars every day, day in and day out. This cost a fantastic amount of money.

Each one of those weapons by itself does not have a very large area of destructiveness, a single shell, a single bomb.

Because of our vast wealth, we can supply munitions in an enormous quantity. Taken together, the destructive capability is very great. The kill area of a single weapon, an artillery shell or a mortar cartridge would be increased by a factor of up to 100 if it were loaded not with high explosive but with poison gas.

Poison gas can be made by a large number of countries. It can be supplied to small countries by their big power allies. We cannot expect ourselves to design the rules of war and expect all of our enemies to follow those rules. Once we start using gas for the first time in 45 years we set in motion a process which I would call the proliferation of chemical warfare readiness.

When military planes of other nations see the world's most modern army, the U.S. Army, fightin a war wearing gas masks, using vast quantities and using a whole panoply of newly developed gas munitions, they will ask themselves, should we not buy some gas masks, upgrade chemical training?

Having done that, the marginal cost of buying some gas is reduced. Men are promoted in chemical corps around the world; majors become colonels; colonels become generals. Carriers begin to depend on the gas army in the nation's foreign establishment. This puts gas weapons on the shelf. This creates investment in that kind of warfare. Where will it lead us?

Today, occasionally the Vietcong shoot a 12-millimeter rocket, Soviet rocket, into Saigon. This is harassing. That same rocket with a warhead of approximately 15 pounds of high explosive could be filled with 10 pounds of nerve gas and 5 pounds of high explosive. Its kill area could be up to 100 times what the weapon can do today.

Dissidents generally know where their opposition forces are. Government forces less often know where dissidents are.

What I am saying is that poison gas begins to overcounter city capability to small groups of fighting men. I think we would be foolish to enter into that kind of warfare because we risk ushering in a new era in war, opening up a new dimension, a dimension where

vast destructive power becomes available to forces which today just don't have it.

Now, you can protect military men against this kind of weapon by gas masks and rubber suits but not civilians. Furthermore, even military men can be caught off guard.

As the strategic weapon, the use of poison gas would enable nonnuclear countries with relatively small investment relative to what it cost to get nuclear weapons to acquire not to level off our cities but to attack coastal cities.

A single commercial air transport equipped with modern nerve gas munitions can by laying a line of munitions upwind cause a high proportion of lethalities in a major city. Coastal cities, and most of our big ones are coastal cities, can be attacked. It is hard to penetrate air defenses in interior cities. This is a situation which is obviously against our interest.

I can't put a number on the probability that this would happen if we do or do not use CS gas in Vietnam but it is obvious, I think, that the probability that we would stimulate proliferation of poison gas weapons is increased, not decreased by our use of gas in Vietnam.

I think our use of gas in Vietnam is a decreasing benefit militarily. The reason is that it is not effective against men in masks. Today the North Vietnamese regular soldiers fighting in Vietnam are widely equipped with standard issue of Chinese gas masks. The chemical officers in the North Vietnamese regular units in South Vietnam have Soviet gas masks, the Soviet Schlem masks. They are using gas against us with increasing frequency.

We are fighting a gas war in Vietnam but the utility of our gas decreases as the enemy acquires masks. As we use gas military establishments of other countries buy gas masks. They are cheap. They can be obtained from great powers. They can even be purchased on the open international market.

As we use the weapon, its effectiveness decreases until one reaches the point where against a masked enemy it is of no utility whatsoever. At that point, the thought must naturally occur to field commanders to circumvent the mask, to find a new gas; battlefield pressure is great to reassert the effectiveness of a weapon that is lost.

Senator YOUNG. In effect, aren't you arguing that if we use explosives of any kind, we eventually will escalate to the use of nuclear bombs?

Professor MESELSON. I am saying we very well might.

Senator YOUNG. Let me say this: You know, in World War I, gas was used extensively. In World War II, when both sides were equipped with it, and we had large quantities of it, even Hitler in his desperation did not use it. I understand he did order it, but the German generals would not use it.

I feel that same situation will obtain with respect to the nuclear bomb. In view of the fact that both sides have it, either side would be awfully foolish to start that kind of war. I have a hope and feeling that we won't have a nuclear war because of that. I hope I am right. I might be wrong.

Professor MESELSON. I hope you are right, too. But whenever we have a chance to increase the deterrence against nuclear warfare, we do so. One way we do that is to propagate the psychological attitude

that nuclear weapons are not to be used. It is partly a psychological question.

We could build very small nuclear weapons that would be almost as small as high explosive weapons. Why don't we do it? The reason is that there is a very important psychological line that would be crossed. Today there is a line with gas. The line that the world has followed has been no gas.

We did not use any tear gas in World War II. We did not use any tear gas in the Korean War although field commanders requested it. We used it to quell civil disturbances ever since World War I. Our military police in Europe, for example, did use tear gas but against friendly civilians and GI's during barroom fights and never threw any tear gas against the Germans. There was a reason for that. The reason was that we understood at that time the psychological barrier. One must respect these phychological barriers, I believe, and there is today in the world a psychological barrier that says no gas. We are transgressing it. We might succeed in moving that barrier. We might persuade mankind to have a different perception: To say that a gas in this artillery shell is all right but some other gas is not. We might get away with it but we might not.

I am not trying to convince you that there are no benefits in using gas and only risks in stopping or the reverse. I am instead trying to explain the risks of using gas so that one can make his own individual judgment about what we should do.

A great deal of tear gas was used in World War I, I might say. The first gas used in World War I was in the form of police gas cartridges brought to the front by French soldiers who were policemen in civilian life. This was followed by the use of artillery shells rather like these filled with tear gas.

The first gas attack that most of us read about is the famous German chlorine gas attack at Ypres in 1915. It was reported to have killed 5,000 troops. Few people realize that chlorine gas is not much more poisonous than the gas we use in Vietnam today. The lethal dose of chlorine is 19,000 units. That of CS gas is 25,000. That is not a big difference.

The distinction rather is that this gas, CS, begins to irritate you with a much lower quantity. It has a bigger safety factor. That means it is well adapted for police use but if one uses enough of it, it will kill. The Germans used 240 tons of chlorine in that attack at Ypres.

Then both sides introduced a whole variety of gas weapons. I think that that kind of escalation is an example of the hazard that occurred.

You say the gas was not used in World War II. Thank goodness. But wars occur, deterrence fails, sometimes things get out of hand.

I think that one has to make a judgment here as to whether we gain more by holding out against essentially the majority of other nations with our own standard that it is all right to use some gases as opposed to others. Whether we gain more from the marginal utility of this gas or whether we would gain more by returning to our traditional standard of no gas.

In my mind, it is a question of small but definite marginal advantage today against a very large but uncalculable hazard tomorrow. It is one of those awful decisions where you have to balance what looks like today's slight advantage against tomorrow's big hazard. I think

in the field of weaponry we may be mortgaging the future of our country and of another generation if we open up an entirely new dimension of warfare which has been kept closed for 45 years.

My own judgment is that the advantage of using this gas is not nearly equal to the hazard of breaking down that traditional psychological expectation that gas will not be used.

Senator ELLENDER. Do you have anything else?

Professor MESELSON. No, sir.

(The prepared statement of Professor Meselson follows:)

POLICY CONSIDERATIONS REGARDING THE USE OF HARASSING GAS IN WAR

Over the past five years American military forces have been making increasing use of the chemical harassing agent CS in Vietnam. At first, only police-type riot control munitions such as hand-grenades were supplied and the announced expectation was that their use would be confined to rescue operations and situations where enemy soldiers were intermingled with non-combatants. However, once CS was used in Vietnam, chemical staffs as well as regular soldiers and field commanders found a wide variety of roles for it. Under this pressure from the battlefield, the employment of CS escalated greatly. Many new types of CS munitions were developed and came to be applied over the entire range of combat operations.

In parallel with the increased combat use of CS in Vietnam, there has been increasing concern over the long-term cost to our security of any departure from the long-standing policy of the U.S. and all other major powers to avoid the initiation of gas warfare of any kind.

This paper attempts to bring perspective to the various questions that ought to be considered in formulating U.S. policy in this important area of military policy. The topics that will be considered are:

(1) History of the use of chemical harassing agents in war.
(2) Present and future military utility of riot control agents.
(3) The proliferation of chemical warfare readiness.
(4) Battlefield escalation.
(5) Effects on U.S. ability to discourage chemical warfare.
(6) The Geneva Protocol.
(7) World opinion.
(8) The use of riot control agents for police operations.

HISTORY

The only all-out employment of gas warfare occurred during World War I. The first gas munitions used were tear gas grenades developed before the war for riot control and brought to the front as personal weapons by former French policemen. Subsequently, the Germans and then the French introduced artillery shells filled with agents that cause visual impairment, respiratory irritation and/or vomiting. These chemicals, collectively known as harassing agents, caused few direct casualties but were employed throughout the war in order to upset the enemy's fire, to flush him from cover and to force him to mask. The first major use of gas that directly produced casualties was the famous German chlorine attack at Ypres in June, 1915. It was reported to have killed five thousand allied troops. Actually, the lethality of chlorine is not very different from that of harassing agents such as CN, CS and DM. The distinction is that the latter agents cause significant harassment at concentrations approximately one hundred times less than does chlorine. Thus the "safety factor", the ratio between the incapacitating exposure and the lethal dose, is much greater for harrassing agents. The lethal effect of chlorine at Ypres resulted not from its great toxicity but rather from the very large quantity that was released, some 260 tons. As the war progressed, the Germans and the allies developed and deployed more effective casualty producing gases such as phosgene and mustard, as well as improved harassing agents. Altogether, some 110,000 tons of gas were used causing more than a million direct casualties and approximately one hundred thousand deaths. Twenty thousand direct casualties have been attributed to harassing agents of which the total quantity used was approximately 13,000 tons.

Regarding the future of harassing gases, Brigadier General Amos Fries of the U.S. Chemical Warfare Service wrote in 1921 "The low concentration required makes this form of gas warfare very economical as well as very effective . . . one good lachrymatory shell will force wearing the mask over an area that would require 500 to 1,000 phosgene shell of equal size to produce the same effect . . . So great is the harassing value of tear and irritant gases that the next war will see them used in quantities approximating that of the more poisonous gases." Indeed, large amounts of harassing gas munitions were stockpiled by both sides during World War II.

However, for forty-five years following World War I the United States and its allies refrained from using any sort of gas weapon in combat. Among the factors that restrained our employment of gas were fear of retaliation and subsequent escalation; aversion to gas warfare by policy makers; resistence to gas warfare by our allies; regard for public opinion; and respect for the Geneva Protocol of 1925. No gas whatsoever was used in combat during the war in Europe. Before United States entry into the war, the Japanese Army made considerable use of harassing agents against the Chinese in Manchuria. More poisonous gases such as mustard and lewisite were also employed. No gas was used in the Pacific theatre after our entry into the war.

During the Korean War, there were requests from U.N. field commanders for permission to use tear gas in combat but these requests were denied.

Until Vietnam, there were, understandably, very few official U.S. statements dealing with the use of tear gas in war. In 1922, the American Advisory Committee at the Washington Arms Limitation Conference, appointed by President Harding and chaired by General Pershing, recommended that "Chemical warfare, including the use of gases, whether toxic or nontoxic, should be prohibited . . ." A report from the General Board of the U.S. Navy to the American delegation at the same conference recommended that tear gas be prohibited along with other gases in war because of the difficulty of finding a "clear and definite demarkation" between gases. At a League of Nations conference at Geneva in 1930, the U.S. representative expressed the view that tear gas could not be prohibited in war if its civil use was to be permitted. However, two years later the American military advisors to the conference advocated that tear gas be prohibited in war along with all other gases. Shortly thereafter, our representative at Geneva declared U.S. willingness to have tear gas prohibited in war so long as its manufacture for local police purposes was allowed.

The use of riot control agents in Vietnam was first reported in 1965. Initially our policy as formulated in Washington was to use CS only when it would be more humane than the use of lethal weapons. On March 24, 1965 Secretary of State Dean Rusk stated that—

> "We do not expect that gas will be used in ordinary military operations."
>
> "The anticipation is, of course, that these weapons will be used only in those situations involving riot control or situations analogous to riot control."[1]

For five months following this statement by Secretary Rusk, neither American nor South Vietnamese forces made any use of riot control agents. Then, in September, an event occurred that placed the use of CS in the most favorable possible light. It was reported that a Marine officer came upon a cave where Viet Cong soldiers were thought to be intermingled with civilians. Faced with a choice between sending in an armed party, attacking the cave with explosive or flame, using CS or abandoning the mission, he chose CS. It was reported that four hundred civilians and several Viet Cong soldiers emerged from the cave without injury to the noncombatants. A board of inquiry was convened to determine whether or not the officer had violated command policy. Although he had, the Board decided that his action was in the best interests of all concerned. Shortly thereafter, the use of CS in Vietnam resumed and rapidly expanded in quantity, in types of munitions used, and in the manner of employment. One indicator of this escalation is the yearly record of CS procurement for Southeast Asia (Table I). Another is a list of CS munitions described in two successive editions of Army Training Circular TC 3-16 (Table II).

Although at first riot control agents CN and DM were employed in Vietnam, CS is now the only such agent in use. CS was developed by the British as a riot

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[1] Department of State Bulletin, April 12, 1965, pages 529 and 531.

control agent in the 1950s and has been used by police in several countries including the U.S. It is a white solid which when dispersed in the air as a fine powder or smoke is highly irritating to the eyes, nose, respiratory tract and, at higher doses, to the skin. Symptoms generally pass within minutes after exposure ends. But when used in combat, dosages are sometimes high enough to cause severe blisters and burns that take several days to heal. It has been stated by U.S. officials that there are no known verified instances of lethality by CS in Vietnam or elsewhere. It is not clear whether or not there are any unverified reports although the enemy frequently claim them. However, it may readily be calculated that exposures in some situations must have considerably exceeded the lethal dosage estimated in laboratory experiments. CS is available in two forms: one dissipates within a few minutes; the other remains stable on the ground for several weeks after application and is reintroduced into the air by footsteps or the movement of vehicles. This persistent form of CS, designated CS2, can make areas unusable to unmasked personnel.

### MILITARY UTILITY OF RIOT CONTROL AGENTS

The largest amount of CS used in Vietnam has been employed to deny the use of terrain and field fortifications to the enemy. For this purpose CS2 is the agent of choice. The next most common application is in direct engagement of the enemy during offensive combat operations, such as flushing enemy troops out of bunkers preceding high explosive fire or infantry assault.

Contrary to initial expectations, CS has seldom been used in Vietnam in order to spare civilian lives. This is because mixed groups of enemy soldiers and noncombatants are rarely encountered. Before battles develop, civilians leave. Beyond that, when CS is used on mixed groups of military and civilians, it can have the opposite effect of forcing civilians out of their shelters into the line of fire. Certainly situations can be imagined in which CS would provide a more humane alternative than the use of other weapons. However, the experience of Vietnam suggests that this will be a rare occurrence in actual warfare.

Another use for harassing gas in war is to save property by flushing unprotected enemy soldiers from valuable buildings as an alternative to flame or high explosive attack. In Vietnam, this tactic is not often employed. True, CS is useful for flushing the enemy from structures. However, once the battle is joined, field commanders prefer to use CS in conjunction with artillery and flame weapons when to use CS alone is to prolong the time that friendly personnel are under enemy fire and when sending an armed party into a building harboring an incompletely incapacitated enemy risks more casualties to one's men than does simply destroying the structure from a distance.

If we are to judge from the experience of Vietnam, we must conclude that the main utility of harassing agents in war is not to make combat more humane but rather to assist the conduct of ordinary military operations. This is in line with what is known about the employment of such agents under the quite different conditions that prevailed in World War I.

As with many weapon systems in Vietnam, we have little basis for assessing how many American lives CS has saved or how much it has contributed to achieving overall military objectives. Certainly the main offensive military problem in Vietnam is finding the enemy. Some increase in artillery and air fire effectiveness will result from using CS as an adjunct but even without CS, once a target has been acquired, our enormous fire power can usually be brought to bear with devastating results. In the case of infantry assaults at quarters too close to allow maximum application of artillery and air fire, CS can be a useful supplement to conventional infantry weapons, along with white phosphorous and flame. However, the additional contribution of CS is unlikely to be of major importance, and it imposes battlefield complexities of its own and forces our men to wear masks.

Beyond questions of effectiveness, we need to evaluate the justification for such tactical missions in the first place. Obviously, if effectiveness were the only criterion, lethal gas would be the chemical agent of choice.

CS can be employed in a defensive role rather than as an aid to the attack of occupied positions. To begin to evaluate its worth for this purpose we would need to know how many casualities are sustained in close fighting and how many result from attack by more distant enemy units. For example, CS could help to repel an infantry attack but it is of less utility in preventing enemy rocket and mortar teams from operating against us. A large fraction of U.S. casualties in

Vietnam is caused by mines and booby traps. The use of CS will have little if any effect in reducing casualties from this source.

The persistent agent CS2 may be used to contaminate tunnels and field fortifications in order to deny them to the enemy. This makes his life more difficult. But, in guerrilla war, he will usually have the opportunity to redeploy his troops to other facilities, to construct new ones, or to make more use of civilian facilities in villages and elsewhere.

If the enemy considered CS to be a serious threat, one expects that he would by now have produced masks from China and the USSR or from the open international arms market. This he has done, but only to a limited extent. In the northern half of South Vietnam NVA regulars are sometimes equipped with the excellent Soviet Shlem mask. Much more often, they carry the somewhat less effective Chinese mask. The masks carried most commonly by Viet Cong forces are only rather ineffective field expedients.

Although in Vietnam the enemy is unable to employ gas or any other weapons on the same scale as we do, he has used CS against us and does so with increasing frequency. This tactic is effective mainly when it catches our forces by surprise, without their masks.

Against sophisticated forces, we would almost certainly not wish to initiate the use of CS. Escalation to lethal gas would be a deterrent. Moreover, our use against troops equipped with masks, decontamination equipment, and harassing gas of their own would do little damage to the enemy and would simply add to the hardships and complexities already faced by men on both sides. Against unsophisticated forces, CS will tend to lose effectiveness if they expect to encounter it frequently. Even for guerrillas, the major cost of gas masks is not great and they can be supplied from many countries or purchased on the international arms market.

As we continue to use CS and to integrate CS weapons into our combat forces, we cause other nations' military forces to examine their defenses. This will stimulate the procurement of gas masks and gas weapons. Consequently, fewer adversaries will remain unprotected and unable to retaliate and the utility of CS to us will decrease proportionately.

In summary, in certain situations CS is a useful adjunct to other weapons. However, given the wide variety and enormous power of other weapons available to us and taking account of the various possible enemy responses, we should not expect CS to play a major role in determining the course of future wars in which we may become involved. Still, this in itself is no reason to renounce the weapon. Rather, it provides background as we inquire into the possible arms control and political benefits of doing so.

### THE PROLIFERATION OF CHEMICAL WARFARE READINESS

Vietnam marks the first time since World War I that U.S. forces have employed gas of any kind in combat. Aside from the rather obscure gas campaign waged by Japan against China and Mussolini's universally condemned use of gas against Ethiopia in the 1930's it is the first use of gas by a major power in 45 years. The sight of the world's most modern army wearing gas masks and using a whole panoply of newly developed gas munitions cannot help but stimulate world-wide military interest in the possible utility of gas for tactical and strategic purposes. As a result, analysis and planning for chemical warfare will increase in other countries.

For example, by obtaining gas masks and beginning chemical training, the additional cost of lethal chemical capability is reduced. As more armies become accustomed to training in a chemical environment, as chemical cadres are upgraded and careers become dependent on an important role for gas, the next step leading to acquisition of lethal chemicals becomes smaller and harder to resist.

Since chemical weapons possess much greater area coverage capability than an equivalent weight of conventional weapons, nations less wealthy than we may move to acquire them and our great-power adversaries might be willing to supply them to their smaller allies and to dissident forces who begin to see the possibilities for retaliation, threat and harassment.

Today "low level" conflicts are fought with conventional weapons which individually have limited area effect. Although such wars can be exceedingly destructive, they become so only when enormous quantities of weapons are used. Many of the types of munitions used in limited war, however, could be filled with lethal chemicals. In that case, the "kill area" of lightweight munitions

such as mortar shells and rockets could be increased by a factor of as much as one hundred. Even though combatants could be provided with protective equipment, such weapons would be devastating to military units caught off guard and to civilians.

At the strategic level, the hazard of proliferation of lethal gas weapons is also serious. Countries not possessing nuclear weapons might well be tempted to acquire population-killing capability based on nerve gas. Although it is unlikely that a poor nation could deliver chemicals over a wide area of a country with modern air defenses, a surprise attack of one or a few coastal cities would be difficult to defend against.

In short, our use of CS in combat stimulates other military establishments to become gas minded. In this atmosphere, chemical weapons, including lethal ones, will tend to proliferate, to our disadvantage.

### BATTLEFIELD ESCALATION

Once harassing gas munitions are extensively deployed in a war, the next step to more powerful gases is made easier. This succession has not happened in Vietnam but it occurred in World War I and has been reported to have taken place in the principal cases where poison gas was used since 1920—Ethiopia, Manchuria, and the Yemen.

The use of harassing gas in war inculcates experience and establishes defensive preparations and logistic arrangements that can facilitate the transition to more poisonous gases. Once the enemy as acquired gas masks, CS and similar harassing agents lose most of their effectiveness. An obvious response in that case would be to employ skin irritants. Even CS occasionally causes militarily significant irritation of the skin. The move over to a more effective skin irritants such as mustard may not seem as large as the step of introducing agents in the first place. Furthermore, if the two sides disagree about the legality and definition of harassing agents, there may be serious difficulty in finding a mutually agreeable and workable standard of behavior other than "no gas".

Finally, it should be emphasized that the decision to employ a previously unused weapon can be preconditioned by earlier procurement practices. The large-scale use of CS in Vietnam in 1966 and afterwards may have been made substantially more difficult to avert by the Army's purchase of 367,000 lbs. of CS for Southeast Asia in fiscal 1964. If proliferation of lethal gas weaponry occurs, political leaders may find it difficult to hold to a no first use policy, if there is any military pressure to use gas.

### U.S. ABILITY TO DISCOURAGE CHEMICAL WARFARE

When it was confirmed that numerous gas attacks had been made against the royalist side in the Yemeni civil war, the United States did little or nothing to bring pressure against the apparent attacker, Egypt. Although there were certainly other factors involved, our use of chemicals in Vietnam strongly discouraged us from acting. Whether our use of harassing agents seriously weakens our poential for discouraging chemical warfare by others is likely to depend on world opinion regarding the propriety of our employment of such agents and on our sensitivity to possible criticism. These factors are difficult to assess but clearly deserve consideration. Put in its most general form, the question is to what degree does our use of harassing agents in war prevent us from assuming a role of world leadership in preventing chemical warfare.

### THE GENEVA PROTOCOL

In December 1969, the U. N. General Assembly held, by a vote of 80–3 with 36 abstentions, that the Protocol prohibits the use in war of all toxic chemicals without exception. In view of this, there is no likelihood of getting widespread agreement to exempt CS in the foreseeable future. However, if we were to relinquish the use of harassing agents in farfare, we would almost certainly obtain general agreement on the applicability of the Protocol to all anti-personnel chemicals. Although Britain, under the pressure of events in Northern Ireland, recently advanced the view that CS is not prohibited, the Cabinet was seriously divided and none of the numerous ensuing commentaries in the British press was favorable. Therefore Britain may well be willing to accept a uniform standard if it is reemphasized that the Protocol in no way restricts the use of riot control agents for preserving domestic order.

The Geneva Protocol is an important factor in maintaining the expectation that gas will not be used. This in turn dampens interest and pressure for gas weapons in many countries. Thus, the Protocol helps to avert chemical proliferation, benefiting the United States. Beyond that, the Protocol can provide a clear standard upon which belligerents can base their conduct in war.

Creating dissention regarding the interpretation of the Protocol weakens its psychological effectiveness and calls attention to gas weapons. Furthermore, it reduces the effectiveness of the Protocol as a clear standard for agreement during war. When the simplest focus for agreement is "no gas", we lose much of the benefit of the Protocol by attempting to create exception.

### WORLD OPINION

In many respects, economic, political, and military, we benefit when other nations are friendly and lose when they are hostile, even when the world is at relative peace. Traditionally, the image of the United States in world opinion has been that of a powerful but humane and restrained nation. This image is valuable not only in our relations with other countries but also as a cohesive and creative force among our own citizens, especially the young.

These factors are extremely difficult to quantify but it would seem possible that the reputation of the United States could be seriously damaged if the image of the American soldier comes to be that of a man wearing a gas mask and using gas weapons. Quite aside from possible arms control costs, our use of riot control agents in war and the resultant dissention at the United Nations and elsewhere regarding the Geneva Protocol risks damaging our standing in world opinion.

### RIOT CONTROL AGENTS IN POLICE OPERATIONS

The Geneva Protocol explicitly prohibits the use of chemical agents in war. The Protocol is in no way directed against the use of such agents by police. This distinction has been understood and practiced by many nations since the Protocol came into being. During World War II, United States military police were well supplied with tear gas grenades and used them on GIs and on allied civilians in certain circumstances to quell disturbances. However, these munitions were not employed in combat against the enemy. There are many similar examples. Even Sweden, a nation that is very energetically promoting international action against the use of tear gas in war, uses CS for maintaining domestic order.

Indeed, the main threat to the freedom of domestic police to use tear gas in the democratic countries probably comes from the risk that it will be misused and cause serious injury or death and that its massive and undisciplined use will lead to reaction against it. These consequences can be made more, not less, likely by habituation to the large-scale use of CS in war and by the gradual transition of its image from a police aid to a war weapon.

### SUMMARY AND CONCLUSIONS

CS would be a useful adjunct to other weapons in situations where U.S. forces face enemy personnel lacking masks. However, even for guerrillas, the marginal cost of acquiring protective equipment should not be prohibitive if they expect CS to be used against them. Thus, our continued use of CS creates conditions that render it less effective as a weapon of war.

If our main priority in the area of chemical and biological weapons is nonproliferation and the prevention of their use, our employment of CS in war carries serious long-term risks. Also, our traditional image as a humanitarian and restrained nation could be damaged if we are seen as promoters of gas warfare.

The general problem of preventing chemical and biological warfare is to a large extent a psychological one. If we can maintain and reinforce the traditional expectation that no gas or germs will be used in war, there will not be much pressure for these weapons to proliferate.

This psychological aspect of the problem has been understood by essentially all nations, including the U.S., ever since World War I. Recently, however, a dangerous break with tradition has been allowed to occur and to escalate in Vietnam.

The choice before us is either to 1) derive certain limited military benefits from the option to use harassing agents in war or 2) to act to minimize the long-term arms control and political risks by returning to the long observed rule of "no gas".

TABLE I.—U.S. ARMY PROCUREMENT OF CS FOR SOUTHEAST ASIA [1]

[Thousands of pounds]

| | Fiscal year— | | | | | |
|---|---|---|---|---|---|---|
| | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 |
| CS | 225 | 93 | 378 | 437 | 714 | 2,018 |
| CS1 | 142 | 160 | 1,217 | 770 | 3,249 | 160 |
| CS2 | 0 | 0 | 0 | 0 | 288 | 3,885 |
| Total | 367 | 253 | 1,595 | 1,207 | 4,251 | 6,063 |

[1] Congressional Record, H4775, June 12, 1969.

Note: Total, 13,736,000 pounds for the period fiscal year 1964-69.

TABLE II.—CS MUNITIONS IN 1966 AND 1969

Listed in TC 3-16, July 1966:
Ground weapons—
(1) ABC-M7A3 CS Riot Hand Grenade
(2) M3 Riot Control Agent Disperser
Aircraft weapons —
(3) M4 Riot Control Agent Disperser
(4) M5 Riot Control Agent Disperser
Listed in TC 3-16, April 1969 [1] (in addition to the above):
Ground weapons —
(1) XM 54 CS Hand Grenade, 12 Seconds Delay
(2) XM 674 40mm CS Cartridge
(3) XM 629 105mm CS Howitzer Projectile
(4) XM 630 4.2 inch CS Mortar Cartridge
(5) XM 631 155mm CS Howitzer Projectile
(6) XM 651E1 40mm CS Cartridge
(7) XM 58 CS Pocket Grenade
(8) M106 CS Disperser (Mity Mike)
(9) E8 16 Tube Multiple CS Rocket Launcher
Aircraft weapons—
(10) E158R2 CS Canister Cluster, 47 lb.
(11) XM 15 CS Canister Cluster, 47 lb.
(12) E 159 CS Canister Cluster, 130 lb.
(13) XM 165 CS Canister Cluster, 130 lb.
(14) XM 925 CS Bomb, 80 lb. CS
(15) XM 27 CS Grenade Dispenser System, 122 lb., 72 Grenades
(16) CBU-30A CS Grenade Dispenser System, 1,280 Grenades
(17) M3 CS Grenade Launcher, 168 Grenades
(18) XM 28 CS Dispenser, 1,025 lbs.

Senator ELLENDER. You have made a very interesting statement. Are there any questions?
Senator YOUNG. I have no questions.
Senator ELLENDER. Is there anybody else to be heard?

## GUARD AND RESERVE FORCES

Senator ELLENDER. During the course of the hearings on the budget requests for the support of the various National Guard and Reserve Forces, I was surprised to learn that over 30,000 active duty personnel are engaged in activities in direct support of the Guard and Reserve Forces. These 30,000 active duty military personnel are in addition to over 60,000 civilian employees engaged in such activities. I was also

[1] Army Training Circular TC 3-16, "Employment of Riot Control Agents, Flame, Smoke, Antiplant Agents, and Personnel Detectors in Counterguerrilla Operations", April, 1969.