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modernized and improved if the policy is to remain effective.

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U S ARMY WAR COLLEGE  
INDIVIDUAL RESEARCH BASED ESSAY

CHEMICAL WARFARE - AN URGENT NEED FOR A CREDIBLE DETERRENT

by

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19 April 1982



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CHAPTER I

INTRODUCTION

"When D day finally ended without a whiff of mustard, I was vastly relieved. For even a light sprinkling of persistent gas on Omaha Beach could have cost us our footing there."

General of the Army Omar N. Bradley[1]

General Bradley's statement made in his memoirs, published in 1951, reflects the concern felt by Allied leaders, political as well as military, on the possible Axis resort to use of lethal chemical weapons in World War II. Fortunately use of chemical weapons in that conflict was restricted to a small number of instances primarily by Japan in China in the late 1930's and early 1940's. The vast chemical weapons stocks of the belligerents were never employed. This was a rather unique happening in the history of warfare. A weapon system of proven effectiveness which caused over one million casualties two and a half decades earlier in World War I, was not used. Similarly, until recently both lethal and incapacitating chemical weapons use has been restricted to a local conflict, the Yemeni Civil War in mid 1960's, where the

forty reported instances of use of lethal chemical weapons occurred over a period of five years (1963-67).

CURRENT DILEMMA

New and disturbing evidence[2] has recently been produced which details that the Soviet Union and its allies in Asia have been using chemical and toxin weapons in Laos, Cambodia and Afghanistan. Since 1975 more than 10,000 people have been killed in nearly 400 chemical weapons attacks in the three countries. Such use of these weapons by the Soviet Union and its allies is a violation of two major international treaties, the 1925 Geneva Protocol, which bans use of chemical weapons but not their possession and the 1972 Biological and Toxin Weapons Convention, which bans production, possession and use of toxin weapons. Perhaps equally alarming is that during this same period the Soviet Union was presenting itself as sincerely engaged in bilateral negotiations with the United States and multilateral talks at the United Nations and elsewhere for an outright international ban on chemical weapons.

The United States is not directly involved in the conflicts where the chemical and toxin weapons are currently being used. Never-the-less the situation poses significant, serious, far-reaching problems for our national defense and that of our allies as well as to the present and future totality of our relations with the

Soviet Union and the other three countries involved in this tragic episode. It is this authors belief a significant threshold of international conduct and trust has been breached, one that has been respected by the majority of civilized mankind for over 60 years.

#### UNITED STATES POLICY

The United States and some of its allies have maintained limited stocks of chemical weapons to deter their use against United States and allied forces in war. The United States policy in this regard is multifaceted but with a central goal of elimination of the use of chemicals in war. Formally United States policy is a stated below:

"United States chemical warfare objectives are four-fold: to deter the use of chemical weapons against the United States and its allies, and, should deterrence fail, retaliate with chemical weapons to encourage cessation of chemical warfare at the lowest possible level of intensity; to expedite modernization of the United States deterrent retaliatory stockpile with binary chemical munitions, in order to establish credible and effective non-nuclear deterrence and gain leverage in the area of chemical weapons arms control; to be able to conduct sustained operations in a chemical environment; and to support the eventual objective of concluding a verifiable arms control agreement prohibiting chemical weapons." [3]

With regard to toxins, all United States stocks were destroyed and facilities involved in their production were either destroyed or diverted to peaceful purposes in compliance with the 1972 Biological and Toxin Weapons

Convention. Our allies also similarly announced if they had toxin stocks and if so that they and their production facilities have been destroyed or diverted to peaceful purposes.

In the remainder of this article I will focus on detailed amplification of the points made thus far; the history of chemical warfare and deterrence of use, and chemical weapons arms control and its current status as well as development of further points on the current chemical warfare threat and United States deterrent posture necessary for the understanding of the dilemma we now face. As a professional military officer I will concentrate my remarks in my area of expertise, national security implications of chemical and toxin warfare and measures needed to maintain a credible block to their use in the future.

## CHAPTER II

### HISTORY OF CHEMICAL WARFARE AND ARMS CONTROL

Chemicals and incapacitating smoke screens have been used periodically in war for thousands of years. Only in the 20th century however has science made it possible to use the toxic effects of chemicals as a effective appliance of war.

#### WORLD WAR I

Their first such widely known use occurred at Ypres, France on April 22, 1915 in World War I. There the German Army released chlorine gas from cylinders in their own trenches toward the opposing French lines. The French troops facing the German attack were totally surprised, unprepared and therefore helpless. They retreated in panic and disorder, the line of allied trenches had been ruptured. More than 5,000 soldiers were killed and another 10,000 were injured. The Germans failed however to adequately follow up through the resulting four mile gap in the allied line for they apparently had not anticipated such success. The Allies eventually

reinforced and sealed the gap after more than a month of fighting at a cost of over 100,000 German and Allied casualties. The war on the western front had become a "chemical war" and the German army had not benefited from its initiation. There is no evidence that the Germans previously tested any tactical concepts on the use of the chlorine in war. They had not equipped their own forces with protective equipment nor had they provided adequate reserves to exploit any success the use of chemicals might bring.

On May 18, 1915 the Allied decision to retaliate was made by the British and was launched at the battle of Loos on September 25, 1915. The Allied and particular British lack of preparedness was due in part to an error in overlooking the capabilities of highly developed German chemical industry to initiate gas warfare and the assumption that the Germans did not intend to employ gas as well as concern of complying with the 1899 Hague Convention. This convention outlawed "the use of projectiles, the sole object of which is the diffusion of asphxiating or deleterious gases". In 1915 this convention had been ratified by all the participants in World War I. Doubtful of this being an adequate restraint in war-time the United States and other nations did not sign the convention.[4]

The use of chlorine at Ypres has been credited by

most historians as the start of chemical warfare in World War I. Numerous German authors in inter-war period publications, however, assert that the French used chemical filled grenades in August 1914. Historians also generally overlook that the Germans fired chemical artillery shells against the Russians as early as October 1914 and that up to 18,000 chemical shells were fired on one occasion on January 31, 1915 at Bolimow by the Germans on the Russian front.[5] In fact, in World War I, Russia suffered more from chemical warfare than any other country. They had 475,000 casualties from chemical warfare, more than all the other Allied countries combined and 62 percent of the total fatalities attributed to chemical warfare for all participants in World War I.[6]

The western Allies, in my view, should have been aware of earlier German large scale use of toxic chemicals on the Russian front. There is no indication however that they were. The possibility for such use in war was raised as early as 1913 in Britain. A dual purpose artillery shell, one that contained explosives as well as a toxic chemical was considered but although permissible by the wording of the Hague Convention was determined contrary to its spirit. Churchill, a year later, further considered "that it would...(also)...not be expedient to introduce into war, elements which might justify the enemy in having recourse to reprisals".[7]

The United States did not enter World War I as a belligerent until 1917, well after the use of toxic chemicals had been established. United States forces were not involved in chemical attacks until February 25, 1918, when they were hit by German chemical shells. On March 21, 1918 one United States regiment was attacked with chemicals and suffered severe casualties, almost 100 percent casualties in one company alone. The United States forces first retaliated in June 1918. By mid October 1918 evacuation for gas injuries (real, suspected or feigned) reached orders of 42 percent of the troops engaged in battle as a general average for the United States forces.

The use of toxic chemicals continued through the remainder of World War I. The initial use was followed by use of more effective delivery means, more lethal chemicals and improved although impeding and never absolute protection. Mustard gas, first used in July 1917, was a persistent toxic chemical that could disable or kill by merely coming in contact with the skin. Mustard could also remain toxic for several weeks under certain weather conditions. Protective masks were ineffective against it and a soldier could not realize that he had been exposed until several hours afterwards, by which time he had already received a lethal or disabling dose. Thirty-four percent of all allied

casualties in October 1918 resulted from chemicals, primarily mustard.

Psychological and other indirect effects derived from protective measures against the toxic chemicals produced fear and loss of tactical flexibility. Soldiers hearing gas was in the area, would acquire all the symptoms of a gas casualty although they had not been gassed. Gas could also induce other severe morale problems. In a United States division it was reported "...an important cause of the low morale was the mounting fear of the enemy's use of gas...it was largely responsible for creating so great a straggler problem that...a solid line of MP's back of the fighting front had become necessary to keep the men on the line. The basis of that fear was the gas atmosphere that the enemy maintained over much of the front by his regulated gas fire each day. When it did not cause real casualties, it supported apprehension and panic, and hastened the onset of battle fatigue and gas mask exhaustion".[8] The very air a soldier breathed or the harmless things he touched had become potential weapons against him.

The battlefield had become complicated, the requirements for individual and collective protection from chemicals were immense. The soldiers protective mask is an example. As a United States Army Officer described it, " The mask is safe but it is the most uncomfortable thing

I ever experienced. If...(anyone wants to) know how a gas mask feels, let him seize his nose with a pair of fire tongs, bury his face in a hot feather pillow, then seize a gas pipe with his teeth and breathe through it for a few hours while he performs routine duties. It's safe, but like a deadly poison which forced its invention, it is not sane".[9]

There were two attempts to halt the use of chemicals in World War I. First by the United States in May 1915 when President Wilson proposed "discontinuence" of the use of poison gas. Both belligerent sides refused the offer. Another attempt was made by the International Red Cross on February 6, 1918. That appeal was also rejected by both sides. It has been concluded that "The atmosphere of distrust could not be overcome despite a mutual interest in terminating gas warfare".[10]

Although not considered decisive in itself in World War I toxic chemical use caused over 1,200,000 casualties and 90,000 fatalities.[6] They proved they "could inflict casualties but to no greater extent than those inflicted in turn by an enemy who was prepared to retaliate" as noted by one writer summing up the developments in World War I.[11] Chemical warfare in the view of another observer "...was an enigma from the perspective of tactical military employment. If it could be used unilaterally, there was no question that it was effective

(but)...once the enemy retaliated, the game did not appear worth the candle. No transitory advantage justified the difficulties of a chemical battlefield. The problems of fighting in a (chemical environment)...appeared insoluble. Science and technology might develop an answer...(protective mask and clothing)...but that was a mixed blessing at best".[12]

#### INTER-WAR PERIOD

The post war attitude towards the use of toxic chemicals in World War I was one of revulsion from civilian political leadership and military professionals as well as the general public. It became a symbol of the inhumanity of modern war. Propaganda on the horrors of a enemy use of chemicals had been effective during the war and was further reinforced by the tales of returning veterans. National chemical industries of the allies, particularly the United States, even used this feeling to gain commercial advantage in end of war treaty articles and high protective tariffs on chemical imports, especially from Germany.

To the military, the immense logistic demands of chemical warfare were a burden, gas substituted for nothing, it was used merely as an additional weapon on the battlefield. Its' requirements were added to an already taxed supply system. The special training, requirements for individual and collective protection and chemical

munitions as well as additional tactical considerations complicated the simpler more easily understood conventional battlefield planning and execution. Successful battle tactics and strategy were felt to be more in the hands of laboratories than in the genius of military leadership. It was also a question of honor, to many military officers it was not professional to "stoop to employ such devices (chemicals) against brave and gallant foes".[13] It was not straightforward, it was a degeneration of chivalry of war to the military establishment.

Allied political leaders, Wilson, Lloyd George and others made sure limitations on Germany's toxic chemical capability were included with the Treaty Of Versailles. Chemical warfare was also included on the agenda of the post war Washington Arms Conference called by the United States in 1921. At that conference there was agreement that the existing legal restraint on chemical warfare, the Hague Conventions, were inadequate. At the initiative of the United States language prohibiting "The use in war of asphyxiating, poisonous or other gases and all analogous liquids, materials or devices..." was included in the resulting Washington Treaty. Several countries, including France and Britain pointed out however at that time that similar provisions in other treaties have been violated with impunity previously and observed that the absence of

any sanctions meant that compliance could only be ensured by national readiness. The treaty never entered into force however, because French ratification was necessary and they objected to submarine provisions in the treaty.

At the 1925 Geneva Conference for the Supervision of the International Traffic in Arms, the United States again suggested a non-use gas prohibition. At that conference such a protocol was enacted with similar non-use prohibitions extended also to bacteriological weapons. The resulting treaty, "Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare", was signed on June 17, 1925. Most major powers soon ratified the protocol, many with reservations reserving the right of retaliation. The United States did not ratify the protocol until 1975. The United States Senate in not giving its advise and consent earlier, among varied reasons, expressed scepticism as to its effectiveness as a restraint, especially one without sanctions and therefore was concerned over the Protocol's possible adverse effect on chemical defense readiness of United States military forces should any enemy violate the protocol. According to one historian, "By 1926 it had become evident to governmental decision-makers that chemical warfare policies derived during or as a result of the Washington Arms Conference were unrealistic if not

actually detrimental to national security".[14] Throughout the latter part of the post war period the United States leadership continued to wrestle with its desire to be a world moral leader in the quest for security through disarmament, to include chemical warfare prohibitions and the reality that deterrence of future use of chemicals required more than the sanction of world opinion that such a prohibition would provide. In an open society which despised chemical warfare, by 1939 a serious gap developed, both goals had been compromised. The United States lacked any real military chemical capability to deter chemical warfare (both defensive and retaliatory World War I stocks had become obsolete) and no effective legal restraints were established.

Just prior to the start of World War II in Europe the Italians used lethal chemical weapons during their invasion of Ethiopia. From December 22, 1935 to April 7, 1936 numerous chemical attacks by Italian forces have been recorded. Italians are estimated to have brought about 700 tons of chemicals into Ethiopia during that war. The Ethiopians lacked any defensive protection or retaliatory capability. The effects on their soldiers was devastating. It has been estimated that 15,000 out of a total of 50,000 Ethiopian army casualties were caused by Italian use of chemical weapons during their invasion.[15] History of that conflict seems to indicate that initial

Italian chemical use was experimental and upon achieving success, gradual wider use resulted.

Vigorous Ethiopian protests were made to the League of Nations and International Red Cross with only half-hearted sanctions resulting. Both Ethiopia and Italy were parties to the 1925 Protocol at the time and acceded to its provisions without reservations to the right of retaliation. Italy first denied that they were using chemicals then subsequently later confirmed it by maintaining that the 1925 Geneva Protocol did not prohibit the use of chemical weapons in reprisal against other illegal acts of war.

Japanese use of chemicals against the Chinese spanned the period from August 1937 until probably mid 1943. It appears Japanese use was never wide spread and limited to specific tactical operations when their forces were under pressure with a decrease of use by the beginning of the 1940's. A full record of specific instances of use as well as casualties has yet to be compiled. Chinese forces, like the Ethiopians, were ill prepared for chemical warfare, lacking adequate chemical protective measures as well as having no retaliatory capability.

In this case also, appeals to international organizations by the country being subjected to chemical attack, China which was a signatory to the 1925 Protocol

(Japan was not at that time) achieved half-hearted results. After about one year of consideration, in September 1938 the League of Nations called for an investigation but the fast deteriorating situation in Europe made it impossible to give China even its collective moral support.

#### WORLD WAR II

In 1939, on the eve of the opening of hostilities in Europe, most all of the eventual major participants were concerned over the prospects of use of toxic chemicals should a war take place as existing legal restraints against chemical use had been violated twice within the previous four years. Britains view in this regard was; "No country could allow its safety to be dependent on the observance by other States of rules of war to which they were pledged. This particularly...(applies)...to gas warfare, where no agreement or conventions could stop the discovery of new gases or circumvent the ease with which any nation, bent on doing so, could evade international prohibitions or limitations...in peace".[16] In spite of this concern the British governments last official communication to their ambassador in Berlin was a request for assurance of non-use by Germany. An affirmative reply was received soon thereafter through the Swiss minister in London. The British intended however to rely primarily on a credible

retaliatory capability to deter use "since the advantage which might occur to the enemy from our not being able to do so might well prove decisive".[16] After all Hitler had broken earlier assurances and Germany had become a revolutionary power seeking to overcome existing world order by armed force. By mid-December 1941 Britain possessed enough chemical munitions and production capacity to wage effective retaliation.

At the beginning of the war Allied intelligence knew that Germany, Italy and Japan had the means to wage chemical warfare but no reliable evidence was available about their intentions or details on aspects of their preparations. False German claims that the Poles had used lethal chemicals supplied by Britain caused concern that Germany was preparing to use them on the Western front in retaliation. Intelligence reports received in the United States early in the war presented Hitler as advocating chemical use against the firm opposition of the military. Through the remainder of World War II Allied intelligence never obtained confirmed information on Axis intent. Unconfirmed information that Germany intended to use chemicals persisted until her surrender. These reports seemed to surface just prior and during most critical Allied operations. Even Enigma decrypts, now available thru 1943, failed to provide an answer. However evidence was available that German forces were well equipped with

extensive protective equipment which was captured in abundance, the Japanese and Italians less so.

Russian concerns however prompted Churchill on May 11, 1942 to issue a declaration that "...we are, ourselves firmly resolved not to use this odious weapon unless it is first used by the Germans..." and that if Germany used chemicals against Russia "...we will use our great and growing air superiority in the West to carry gas warfare on the largest possible scale far and wide against military objectives in Germany." He repeated his threat of massive retaliation on Germany again in April 1943 adding that military objectives included "munitions centers and seaports".

The United States generally followed Britains lead and soon after entry into the war, President Roosevelt on June 5, 1942 enounced United States policy of no first use and effective retaliation against Japan if she persists in use of chemicals against China. On June 8, 1943 he followed with a broader statement covering all Axis powers. In this latter statement he again stated the United States would not first use chemical warfare and he promised "full and swift retaliation in kind...upon munition centers, seaports and other military objectives throughout the whole extent of the territory of such Axis country (that might use chemical weapons)". His declaration further stated that, "acts of this nature

(chemical use) committed against any one of the United Nations will be regarded as having been committed against the United States itself...". Soon thereafter Japan communicated that they "decided not to make use of it (chemicals) in the future on (the) supposition that troops of the United Nations also abstain from using it".

United States preparedness in both chemical protection and retaliation initially lagged behind policy. Only by 1944 in Europe did the United States unilaterally possess a high level of retaliatory preparedness thought to be in accordance with presidential policy, although a United States minimum capability was present much earlier and when taken together with British stocks provided a large Allied retaliatory capability there in 1942. In the Pacific, stocks of chemical munitions were probably adequate earlier but they were scattered throughout the theater making coordinated swift retaliation difficult. Protective equipment appeared to be adequately available in both theaters to equip committed United States forces by 1942.

Only after the end of the war did information on Axis intentions and capabilities become available. It was also subsequently learned that Axis powers knew little about the capabilities of the Allies. Generally Britain was believed by Germany to have a high state of chemical retaliatory and defense readiness, exceeded only by that

of the Soviet Union. Based on German experience in World War I it was thought by them that the United States would have a ample supply of gas munitions and that the growing United States Air Force would play the chief role in any retaliatory use of chemicals in World War II. They were also impressed with the quality of Allied protective equipment that they captured. The Germans had only limited toxic agent stocks in 1939 but by 1944 they had a six month supply with an in-being production capability equal to 50 percent of their monthly requirements. With activation of other stand-by plants coupled with available captured enemy stocks, they had a strong offensive capability. Their readiness program was good, if not better than any of their Western opponents. After the war a total of 102,000 long tons of offensive material alone, was found in the American Occupation Zone in Germany.

Early in the war Germany had mastered the battlefield using other means and they thought use of chemicals was unnecessary. Later when Germany was forced into the defensive, when the use of gas would have been decidedly to their advantage, the Allies had air superiority and German leaders feared retaliation in kind against the German homeland. They also believed that the Allies, like themselves, had discovered new gases. The nerve gases were developed and produced in appreciable quantities by Germany during the war. They were much more

toxic than other existing stockpiled chemicals. The Allies did not discover their existence until the German surrender and were totally unprepared to adequately defend against their use.

At no time during World War II did Germany deploy any of its chemical munitions outside of its borders. There is evidence however that Germany did on at least two occasions consider initiation of chemical warfare. Prior to D Day in 1944 orders were issued to establish chemical munitions depots behind coastal areas in France but these orders were subsequently cancelled.[17] Additionally interrogation of senior Nazi leaders after the war revealed that Hitler throughout the war was keeping the alternative open to initiate chemical warfare. In February 1945, Albert Speer testifying later at Nuremberg, related that Goebbels recommended German withdrawal from the Geneva Protocol. Speer also related that he was told by Naunamm (State Secretary to Goebbels), that "Hitler had already agreed to this proposal...the struggle was to be carried on with all available means and without regard for international agreements". Goebbels, Bormann and Ley are all reported to have supported initiation of the use of nerve agents. Dr. Bandt, Hitler's personal representative for chemical warfare preparations in 1944-45, inferred before his execution that Hitler had authorized the use of Tabun (a nerve agent). Evidence indicates that the

German military did not support initiation of chemical warfare. In 1949 Herman Ochsner, a former Generallieutnant (Lieutenant General) in the German Army previously involved in chemical warfare preparations at the Reichs Ministry for Armaments and War Production related the following:

"...quite considerable stocks of chemical agents had been accumulated by the time this stage (early 1944) of the war was reached. These included gas munitions for use by ground and air forces as well as for chemical projector forces. There was also time to make the necessary arrangements. In short; from all angles the idea seemed to hold out good prospects of success, and no technical difficulties were expected. Never-the-less, the idea had to be abandoned. Enemy superiority in the air had become so overwhelming in the meantime that--the initiation of gas warfare by us might have had incalculable consequences for our homeland if the enemy had decided (to retaliate)...bomb our factories and communication facilities with gas, thus compelling us to carry out extensive decontamination work, not to mention the detrimental effect gas would have had on the morale of the population of big cities already severely stricken." [18]

The Japanese general staff's fear of America's superior productive capacity, through preparation for gas warfare and vulnerability to air attack effectively prevented Japan from initiating chemical warfare in World War II according to a United States report prepared after the Japanese surrender. [19] The report outlines that the Japanese in 1944, fearing Germany would resort to use of gas or that irresponsible use by isolated Japanese units might take place, recalled all stocks of chemical

munitions in the field to rear echelon depots. By mid-1944 the report states despite Japan's "extensive" chemical warfare potential "the decision was definitely made to avoid gas warfare, if at all possible". According to interrogation reports anticipated and real success in 1941-42 made the use of toxic agents unnecessary but as the tide turned the Army General staff recommended employment of toxic agents in the Marianas campaign. Therefore a firm decision to not use chemicals was probably not made until 1944.

Unlike the European belligerents the Japanese were not bound by the 1925 Protocol and did not make a statement at the beginning of the war to refrain from chemical first use. They had earlier initiated chemical warfare against China in 1937 and in January 1943 individual Japanese soldiers on Guadalcanal used toxic agents as last acts of desperation. Only in 1944 fearing strategic retaliation by the United States as well as use by the Soviets (which Japan considered her primary ground threat) did Japan make a firm statement to "not to make (first) use of it (chemicals)".

The Japanese were absolutely confident however, that the United States would not first use chemical weapons. A senior Japanese officer after the war commented, "we knew the Americans would not (first) use gas warfare...". One observer believes this Japanese view

was based on Roosevelt's 1937, 1942 and 1943 statements, the anti-gas attitude of the American people and that use had not been initiated by the Allies in Europe.[20] Japan did not however share this view about the Soviets and at the end of the war the bulk of filled chemical munitions was with the Kwantung Army in Manchuria.

It is evident in World War II restraints of use of chemical weapons by the Axis powers ultimately rested upon the ability and threat to retaliate in kind. Readiness to retaliate was communicated by Allied political leaders backed up by overt military preparations. Of limited effectiveness on the Axis powers was the existing moral and legal restraints as well as public attitudes toward chemical warfare. The lack of assimilation by Axis military officials is attributed by some to also have been a major restraint.[21] In my view this may have affected prior and early war preparations for chemical warfare to some extent, but the perceived lack of eventual tactical and or strategic advantage that could be gained, considering a probable Allied response in kind, was the predominant factor forming the Axis military viewpoint not to initiate chemical warfare. The lack of assimilation was however a large factor, in my view, in the case of United States and British military officials. Fostered by the negative attitudes of political leaders and general public towards chemical warfare as well as the battlefield

complexities posed, chemical warfare preparedness was only taken to develop a deterrent and military capability counter to enemy first use.

### CHAPTER III

#### CHEMICAL WARFARE STATUS TODAY

##### ARMS CONTROL

In the field of arms control or other legal restraints on chemical weapons nothing appreciable has occurred since the establishment of the Geneva Protocol in 1925. A multiplicity of proposals have been made at the United Nations, various Geneva disarmament bodies and elsewhere by many countries. Language was included in a article in the 1972 Biological and Toxin Weapons Convention that;

"Each state party to this convention affirms the recognized objective of effective prohibition of chemical weapons and, to this end, undertakes to continue negotiations in good faith with a view to reaching early agreement on effective measures for the prohibition of their development, production and stockpiling and for their destruction, and on appropriate measures concerning equipment and means of delivery specifically designed for the production or use of chemical agents for weapons purposes".

From 1976 thru 1980 the United States and Soviet Union were involved in bilateral talks to achieve the end

described in the Biological and Toxin Convention. Among a number of issues, verification of any agreement proved to block progress. The negotiations became deadlocked and have not resumed since termination in mid-1980. General discussion is continuing however at the Geneva based Committee on Disarmament of which both the United States and Soviet Union are two of the 40 member nations. There too the issues blocking progress are similar to those that deadlocked the bilateral negotiations with one exception. An additional consideration has now entered the scene. The current use of chemical and toxin weapons in Afghanistan, Laos and Cambodia by the Soviet Union and its allies. The Soviets have denied this, accusing the United States of "slander" in presenting its evidence and concerns on the use.

With regard to verification of a possible chemical weapon ban, the Soviets insist on no more than "national methods...supplemented by international procedures" by which they mean nations will police their own compliance with other nations relying on each others word and non-intrusive intelligence means they may have available.[22] They have stated any international verification (on-site or any other) "are tantamount to interference into internal affairs of states". The United States view reflects its concern to obtain a agreement which serves as a means to increase world security from

use of chemical weapons. It has proposed, in part, that both destruction of existing chemical stocks and manufacturing facilities be trusted to verification by an international body. In other words, in giving up a deterrent to retaliate in kind to a chemical attack, if the United States is to accept an obligation "to relinquish such a capability...the provisions of any chemical weapons ban must provide an adequate level of confidence that potential adversaries are also relinquishing their chemical weapons capabilities".[23]

United States verification considerations are based on the realization that unlike strategic missile silos, the presence or absence of chemical weapons manufacturing facilities, storage sites or delivery means can not be verified by national technical means (satellites) alone. As shown in previous conflicts the 1925 Geneva Protocol remains inadequate in itself to deter use of chemical weapons and another more recent (1972) arms control agreement, the Biological and Toxin Weapons Convention, which contained no verification provisions has been violated.

It is generally agreed that the state of chemical weapons negotiations have not advanced, despite lengthy rhetoric over the past five decades and that future prospects remain no different given present conditions. Never-the-less, most western nations, the United States

included, still feel chemical arms control is a goal worth continued pursuit because of the enhancement of world security that a verifiable agreement would provide.

#### MILITARY THREAT

From the military threat aspect United States and Western concerns have been heightened, especially within the last decade. Egypt in the mid-1960's used Soviet supplied chemical weapons (and possibly toxins similar to those now in use in Asia) in the Yemeni Civil War against Royalist forces. In the aftermath of the 1973 Middle East War it was discovered that much of the standard Soviet equipment supplied to Syrian and Egyptian forces were equipped to fight in a chemical warfare environment. Upon further investigation it was discovered that most all new Soviet vehicles were being similarly equipped and that after an overall reassessment of the total Soviet chemical warfare posture, they were found to be well prepared to initially use chemicals as well. United States and its principal allies immediately embarked to improve their chemical protective posture which had declined to a deplorable state. No action was taken at that time with the United States chemical weapon deterrent stocks although no new production had occurred since 1969 as government policy, public sentiment and political concern was focused toward achievement of a international chemical weapons ban.

On March 22, 1982, a full report was released to the United Nations and Congress, which detailed the use by the Soviet Union and some of its allies of both chemical and toxin weapons in Asia over the period 1975 to the present. The report also summarizes evidence on the existence and extensiveness of the overall Soviet chemical warfare programs. Included in the report was a passage from a 1977 East German military manual which gives insight into Soviet block military views towards use of both chemical and toxin weapons:

"By the middle of 1960 the toxins selected for military purposes were included among the biologic warfare agents. In principle, this was understood to mean only the bacterial toxins. Today it is possible to produce various toxins synthetically. Toxins with 10-12 amino acids can currently be synthesized in the laboratory. Toxins are not living substances and in this sense are chemicals. They thus differ fundamentally from the biological organisms so that they can be included among chemical warfare agents...they would be used in combat according to the same principles and with the same methods used for chemical warfare agents. They can be used primarily in micro-bombs which are launched from the air or in warheads of tactical rockets. Toxin warfare agents concentrates can be applied with aircraft spray equipment and similar dispersion systems".

As noted previously the Soviets and their major allies, to include East Germany, Laos and Cambodia are signatories to the 1972 Biological and Toxin Weapons Convention which specifically bans the development, production and stockpiling of toxins "whatever their origin or methods of production" as well as "weapons,

equipment or means of delivery designed to use...toxins for hostile purposes...". The language in the treaty text is clear, their use of toxins is a breach of the treaty. Perhaps not by coincidence, the idealized method of spreading the toxins in the East German manual also follows closely that which has been observed in Afghanistan, Laos and Cambodia.

#### UNITED STATES NEEDS TO ACT

From a moral dimension alone and the need to maintain some level of international behavior under rule of law the United States needs to take action. Security concerns, both long and short range, also dictate this imperative. According to the Joint Chiefs of Staff; "a Soviet chemical attack would severely degrade all aspects of United States and allied combat operations".[24] This statement summarizes their concern that chemical warfare weapons, despite vast improvements in protection, remain effective casualty producers. Complete protection is neither possible nor desirable with current technology nor are any breakthroughs forecast. As in World War I, adequate protection involves encapsulating the body or its environment against the chemicals to avoid their direct toxic effects. This in turn greatly inhibits the efficiency of an even well trained soldier and in intense combat causes heat stress. Estimates of this degradation of combat effectiveness range from 10 to 25 percent for an

individual soldier to as high as a 65 percent aggregate for unit loss after less than a day of intensive combat. It is clearly evident such losses could be decisive in a potential conflict with the Soviets.

#### THE DILEMMA

Can intent to use chemical weapons in any future conflict involving the Soviets and their allies with the United States be derived from what is taking place in Asia? In my view, in absolute terms probably not, but by any measure it certainly appears highly probable. Given this condition, is it in United States interest to do something about it and if so are effective restraints of the past applicable and is current United States policy and capabilities adequate for achievement of such a goal?

#### Fast Restraints Are Applicable

As shown earlier, historically all significant chemical weapons use since World War I has occurred when one side of the belligerency lacked an in-kind retaliatory capability and did not possess adequate protection against effects of chemical weapons. Legal, public opinion, moral and other restraints in these cases were ignored. Most recently, in World War II, German restraint came primarily from the threat of reprisal of in-kind retaliation on the German homeland coupled with a degree of lack of assimilation by her military toward chemical weapons. Japan used chemicals in World War II against China and was

only forced to stop use by the threat of reprisal use of chemical weapons by the United States.

**Present Policy Is Adequate**

United States policy of willingness to negotiate a verifiable comprehensive ban on chemical weapons coupled with primary reliance of a non-nuclear military deterrent in the form of a adequate chemical protective posture and credible retaliatory chemical weapons stocks, until such a agreement takes place remains appropriate. As noted earlier, significant degradation of military effectiveness results when in a chemical protective posture so it alone would be an inadequate military deterrent as the side employing chemicals would have no comparable restrictions. He knows when and where he would be using his chemicals and he could limit protective aspects to only his troops that might be nearby. Reliance on nuclear weapons to deter chemical weapons use possesses significant risks since the United States no longer has nuclear superiority. Threats to use nuclear weapons are limited and for obvious reasons should remain so. For example, it would not be credible to threaten nuclear use in response to a Soviet surrogate use of chemicals against United States forces deployed in a otherwise limited conventional conflict in any area of the world.

**Present Capabilities Are Inadequate**

Based on Department of Defense estimates the United

States chemical weapons stocks are aging and becoming obsolete and many of the delivery means designed for using these weapons no longer exist, are obsolete or are soon becoming so.[25] It is also pointed out since no new munitions have been made for 13 years, none exist for new weapon systems. More importantly, it has been implied what limited capability we do have is predominantly for short range weapon systems. In other words, we can only adequately pose a limited retaliatory threat to front line troops. Undoubtedly then, in Europe most of any retaliatory strikes would presently fall on an ally's soil. Understandedly this is not a desirable aspect to them nor militarily sound if one wishes to pose a credible threat to deter. One only needs to recall that successful deterrence in World War II was based on a threat of chemical retaliation not only against engaged enemy forces but also against military objectives in the enemy's rear and homeland.

From the present status of our deterrent it is evident it must be improved. Adequate progress is reportedly being made to improve chemical protection but fixing of both qualitative and quantitative short-comings of the retaliatory weapons is not. Reluctance in the past by officials to provide new chemical weapons, despite the risks involved in maintaining deterrence can be understandable to some extent, especially given the high

expectations held by them that a treaty banning chemical weapons might be eminent, but this is no longer the case. We should, as a country, not expect our armed forces to stand any longer out at the end of a line inadequate for the task given. The consequences for adopting a desirable national policy that as a result requires the maintenance of a weapons system that otherwise might not be desirable because of domestic, foreign, personal or moral repugnance must be accepted, if that policy is to be secured.

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