CHEMICAL WARFARE

A Magazine devoted to the activities of the
CHEMICAL WARFARE SERVICE

Of Interest To All Arms

Published Once a Month by the Chemical Warfare School at Headquarters Edgewood Arsenal - Edgewood, Md.

VOL. 11 **APRIL 15, 1925** **NO. 4**

Edited By STAFF, CHEMICAL WARFARE SCHOOL

Editorial Comment.

GOING AND COMING.

On March 28th the eighth class of non-commissioned officers completed a four weeks course. The thirty-eight student non-commissioned officers assembled in the School auditorium where a short address was made by Major R. C. Ditto, Ass't Commandant of the School after which the certificates were awarded.

Of the thirty-eight finishing the course eleven were from the Coast Artillery Corps at Forts Totten, Eustice and Monroe, one Air Service, Aberdeen Proving Ground, one Chemical Warfare Service, 2nd Corps Area, two Chemical Warfare Service, 3rd Corps Area, two Chemical Warfare Service, Panama Department and twenty-one from the 1st Gas Regiment.

The class were exceptionally keen and enthusiastic and made an excellent record. These men will be of inestimable value in their organization as instructors and non-commissioned gas officers. It is hoped that all organizations of the Army will in the near future send this class of men here for similar instruction.

The present Line and Staff Class which is composed of thirty-six officers from the Army and Marine Corps will complete their labors on May 9th and on May 18th the 4th Navy Line Class will matriculate for a six weeks course. It is expected that this class will be composed of about thirty-six officers from the various ships stationed along the Atlantic seaboard.

Following this Navy Line Class there will open on July 6th a two weeks course for Chemical Warfare Reserve Officers, and indications point to even a larger class of these officers than were assembled at this school last year when thirty-nine Reserve Officers attended.

In the meanwhile there will assemble here at Edgewood the student R.O.T.C. for a months course of instruction in Chemical Warfare. This will be the first time that Edgewood has welcomed an R.O.T.C. unit for the study of Chemical Warfare. It is these men who furnish excellent material for our Reserve Corps.

OUTLINE OF THE BOLL WEEVIL PROBLEM.

By H. W. Walker.

I. INTRODUCTION.

It is the purpose of this article to point out some of the essential facts regarding the cotton boll weevil and cotton growing under weevil conditions. This paper is by no means a complete technical and scientific discussion, but rather a popular portrayal of the high spots of the problem.

II. LIFE HISTORY AND HABITS OF THE WEEVIL.

The boll weevil is a hard shelled beetle about one-fourth of an inchlong and about one-third as wide. So far as is known, his only food is the cotton plant, although when starved in captivity, he has been known to eat bananas. It is certain that the female lays her eggs only in the cotton plant and in no other vegetation.

The boll weevil has six legs and a long proboscis or beak and its food consists of the tender shoots, the forms or squares, the flowers or blooms, and the young bolls of the cotton plant. However, the actual damage caused by the weevil's feeding is of secondary importance to that caused by the immature stages of the insect. The female weevil lays her eggs in the square or form, or in a young cotton boll. The egg hatches in a short time and the grub immediately starts to feed on the square or boll. The infested square or boll is usually shed by the plant and falls to the ground. After passing through several moults or stages, the weevil emerges finally as a full grown beetle in from two to four weeks time after the egg was deposited and in a few days after emergence is capable of reproduction. The theoretical offspring from a single pair of weevils during a season is over twelve million.

The weevil is a slow feeder and a clumsy flier; it does not move rapidly and is fairly easy to catch by hand. It is adept at the art of concealment in the plant and it is quite possible that an uniniated person could pass through a cotton patch rather heavily infested with weevils without finding a single one. Furthermore it has the trick of playing opossum in many cases when disturbed. In addition to its other pernicious habits, the weevil is a heavy drinker and two things essential to its existence are cotton and moisture. A long spell of hot, dry weather during the period when the cotton is being made (i.e. the bolls are being formed) is a God-send to the cotton planter, because in addition to limiting the weevils water supply, the infested squares and bolls will have fallen to the ground or dried out so that the immature weevil stages are destroyed.

The weevil is a hibernating insect. As soon as cold weather comes or as soon as there are no more cotton plants in the field, it goes into a state of suspended animation until the following spring when warm weather and the new cotton sprouting gives it a chance to continue its evil cycle. Only about 6 per cent of the weevils which go into hibernation emerge alive the following spring after a normal winter. In the case of a very severe winter, such as

prevailed in the South during the year 1923-1924 this percentage is much lower. The U. S. Department of Agriculture advocates destruction of all cotton plants left standing in the field as soon as the crop has been picked, in order to force the weevil into early hibernation, as indications are that the earlier the weevil is forced into hibernation in the fall, the less the chance of survival until the following spring.

III. SOME FACTS REGARDING COTTON GROWING.

Ninety per cent of the cotton crop is produced on farms of fifty acres or less. A negro and his family with one mule can easily put out and care for ten acres of cotton a year and under favorable conditions he can handle twenty acres. It takes about twelve to sixteen hundred pounds of cotton as gathered from the field to make one 500-pound bale of finished cotton. Land capable of producing a bale of finished cotton per acre is very good land and a great deal of cotton is made on land producing from 100 pounds up. Poisoning will pay ordinarily on land producing 250 pounds per acre or more, depending however, on the market price of cotton and the cost of the poison. Labor is one thing which the ordinary cotton farmer has in abundance; cash is one thing of which he has least, so that any cash outlay is an item which has to be carefully considered. This means that expense of dusting apparatus or other machinery for distributing poison is out of the question in many cases, no matter how efficient; but on small farms one mule dusting apparatus or even hand implements are favored in spite of the fact that at first glance the labor cost of such distribution might seem excessive.

IV. PRESENT METHODS OF WEEVIL CONTROL.

Under favorable weather conditions the method outlined by the Department of Agriculture for the use of calcium arsenate dust will make a cotton crop in spite of the boll weevil. This method calls for from 3 to 5 applications of dust of about 5 pounds per application, at 4-day intervals, immediately after infestation is noted, a subsequent application at any later time if heavy weevil infestation occurs. Should rain occur within 4-day period after an application, it is necessary to poison again, immediately, and a long rainy period will cut down the efficiency of this method tremendously. The calcium arsenate used is specified by the Department of Agriculture and this specification for calcium arsenate is mandatory in many states for all material sold under the name of calcium arsenate.

It should contain at least 40 per cent total arsenic as arsenic pentoxide. It should not contain more than 0.75 per cent water soluble arsenic as arsenic pentoxide. The number of cubic inches of the material per pound is also specified in some instances. The material should be about 300 mesh in fineness.

In localities where there is comparatively little dew, the molasses mixture of calcium arsenate, molasses and water is preferred to the dust. The mop mixture for hand application consists of:

Calcium arsenate	1 lb.
Black Strap molasses	1 gal.
Water	1 gal.

This material is said to stick to the plant better in dry localities than the straight dust. For application by spraying machines it is necessary to use the higher percentage of water.

The Department of Agriculture has found as the result of long experimentation that a higher water soluble treatment of arsenic than 0.75 per cent is injurious to the plant.

There is much controversy about the exact way in which calcium arsenate poisons the weevil. Some experts claim that he gets poison through the drinking of water and others that he gets it by feeding. As mentioned before, the weevil is a slow feeding insect and undoubtedly the mortality of the poison is due to a cumulative effect. In cage and tumbler tests it requires at least 48 to 72 hours for 90 per cent mortality for the dust and about 96 hours for the molasses mixture.

V. PROPERTIES OF IDEAL POISON.

Without being too theoretical, an ideal poison should be cheap and commercially available in large quantities. It should stick to the plant in spite of a light rain and if one could be developed which *would* stick to the plant for 4 days or more under any conditions, it would be ideal.

The material should not injure the plant and should have a toxicity against the weevil at least equal to that of calcium arsenate. It should be easy and economical to apply and should have no injurious effect on the personnel and animals engaged in it's application, and further, it should have no permanent deleterious effect on the soil.

VI. SUMMARY OF CHEMICAL WARFARE WORK.

The Chemical Warfare Service has undertaken to test the toxicity of a large number of compounds against the boll weevil. These tests are run on a comparative basis using calcium arsenate as a standard and the relative efficiencies of some of the various substances have been determined. The tests were run using the materials as dusts and as mixtures with molasses or other suitable solutions. Those materials which showed promise in the preliminary tests were tested further under comparable conditions, again using calcium arsenate as a standard. Over 45,000 weevils were used in this work last season and it is hoped to use in the neighborhood of 100,000 this season. Altogether about 300 different compounds were tested last year and it is expected to add about 1000 more to this list during the coming year.

While the results were sufficiently encouraging, it should be emphasized that this first year's work was entirely preliminary, although several substances were deemed sufficiently promising to try out on large scale acre plot tests this year. In addition, a comparatively large number of the compounds proved sufficiently interesting to call for field cage test work during 1925.

The original test materials were selected without regard to

possible plant injury as the main thought was to discover if possible the particular groups or radicles which caused the weevil the most grief. By means of this preliminary information additional compounds have been selected, having the physical and chemical characteristics most likely to make them non-toxic to the plant while still retaining their poisonous nature against the weevil.

Coincidently with this work the weevils killed were analyzed and the arsenic necessary to kill a weevil by eating calcium arsenate has been found to be approximately 0.015 mg. per weevil expressed as metallic arsenate. The average weight of a live weevil is 16 milligrams. The specific toxicities of various war gases against the weevil has been determined although these data are not yet sufficiently complete.

In obtaining the toxicity figures many interesting biological data were obtained, likewise hibernation studies had to be carried out, green house cotton had to be planted and nursed, and at Edgewood Arsenal today we have over 400 young cotton plants thriving under artificial conditions better than they would in the middle of summer in the center of the cotton belt.

In conclusion, let it be pointed out that the results expected from this investigation, if they come about, will come not as the result of miraculous foresight or ingenuity, but by dint of covering as thoroughly as feasible a wide field of possible materials, by a dreary routine of petty details and closest attention to them, and finally, by intelligent analyses of these data, the selection of some few substances which may prove better toxics from all viewpoints than those now in use, or summed up in Thomas A. Edison's words, "99% perspiration and 1% inspiration."

MEETING OF THE CHEMICAL WARFARE SERVICE ADVISORY COMMITTEE.

A meeting of the Advisory Committee of the Chemical Warfare Service, consisting of fifteen members of the American Chemical Society, has been called to meet at Edgewood Arsenal April 3rd and 4th. This Committee considers both the general plan for the various researches undertaken and the methods for carrying out the work, and gives to the men engaged in these researches the benefit of their knowledge and experience. The opportunity thus afforded for the discussion of vexing problems is always looked forward to with the keenest interest by the technical men at Edgewood Arsenal.

The members of the Advisory Committee are as follows:

H. E. Howe	L. T. Sutherland
W. D. Bancroft	C. L. Reese
G. A. Richter	L. C. Jones
A. B. Lamb	W. H. Walker
E. P. Kohler	J. Bradley Dewey
W. K. Lewis	A. S. Loevenhart
F. M. Dorsey	Reid Hunt

Julius Steiglitz

FOREIGN POWERS FOR CHEMICAL WARFARE.

From Army and Navy Journal, April 4, 1925.

A perusal of the activities of the foreign powers relative to the defensive and offensive use of gas warfare, indicates that they all recognize the necessity for preparedness in chemical warfare. The clause in the Limitation of Armaments Treaty has not yet been put into effect through exchange of ratifications, with the resulting consequence that it is, therefore, not binding upon the signatory powers.

Even if the Treaty were ratified, it is pointed out, there would be no assurance that some other power would not employ gas. That necessity for preparedness in chemical warfare is recognized by most nations is easily seen from the following brief statements of their activities:

ENGLAND WELL ORGANIZED.

The Chemical Warfare Service of England is well organized under a Chemical Warfare Committee, headed alternately by an officer of the Army or Navy, and composed of officers of the Army, Navy and Air Service, and scientists. The knowledge of the leading scientists of the country is used in the investigations being carried on at colleges and commercial factories, as well as at the central chemical warfare station at Porton Field.

The latest English field service regulations provide for an extensive use of gas, if its employment is once decided upon by the responsible authorities at the outbreak of the war, and indicate appreciation of its great value as a weapon of warfare.

France appears to consider that chemical warfare will exert a great influence on future wars and has organized three sections in the War Department to handle chemical warfare matters:

(a) Bureau of Inspection of Gas Defense Material.

(b) Administrative Section.

(c) Technical and Material Section.

The Technical and Material Section is sub-divided for the study of defensive measures against gas and the offensive use of gas. This section works in close touch with the chemical industries of the country. A school is maintained in Paris to train officers in gas defense, who in turn, train the student officers of the smaller units.

Germany, by the Treaty of Versailles, is prohibited from making active preparations for offensive chemical warfare, but, in possessing the world's largest dye and chemical industry, the country is well prepared for an emergency. The 500,000 or more newly-manufactured gas masks now stored in the German arsenals have a significance. Further, it is understood that a department of the War Ministry, devoted to chemical warfare is maintained.

Japan has been very active in learning the possibilities of chemical warfare, and the methods being developed in the various countries for applying it. Within the past year she has sent special commissions to this and to other countries to study the question, and a late reduction in her Army was reported to have been made for the purpose of using the funds thus made available on her Air

and Chemical Warfare Services. The chemical industry is subsidized by the Government, thus providing for manufacture of chemical warfare materials in emergency. Research is being carried on in Army medical and scientific institutions.

SOVIETS DEVELOP C.W.S.

Russia has been active in organizing for chemical warfare. She has established a Chemical Warfare Service which, according to Soviet newspapers, is expected to be more effective than the other fighting branches. There are many reports that considerable quantities of poisonous gas are being manufactured in Russia for the use of the Army, but few reports are seen of its actual use, except in maneuvers where a number of casualties have occurred in connection with tests. There is evidence that Germany is assisting Russia to a considerable extent in her chemical development.

Italy has a separate Chemical Warfare Service similar to that of the United States. Use is made of the knowledge of the scientists of the country in research and development methods of chemical warfare. The service also includes a small combat force and a school for instruction in chemical warfare. Italy is not particularly well provided with chemical plants and is lacking in certain of the necessary raw materials.

Spain, Switzerland, Poland, Czechoslovakia and Sweden all have Chemical Warfare Services in one form or another. It will be recalled that Spain used gas against the Moors in one of her campaigns.

Even Mexico and certain Central and South American countries are showing a growing interest in chemical warfare. Certain of them have made purchases of gas equipment and have sent investigating committees to this country.

MAJOR W. S. GROVE.

Major W. S. Grove, formerly head of the Intelligence Division of the Philippine Constabulary, died on February 8th, 1925, on board the U.S.A.T. "Thomas" enroute to the United States. Major Grove was the Chief of the Chemical Warfare Service in the Philippine Department during the World War and had charge of the procurement of cocoanut shell and cocoanut charcoal, which was shipped to the States for the manufacture of gas masks.

After the war Major Grove resigned from the United States Army and devoted his entire time to the development of a hemp stripping machine which bears his name.

Since the war Major Grove has always been in close touch with the Chemical Warfare Service. He gave valuable information concerning the planning of the procurement of cocoanut charcoal in case of another emergency.

THE VITAL REGION.

By Major General R. L. Bullard.

After seeing the dreadful effects of unpreparedness in the war, Congress passed a National Defense Act. The national defense means were, under this Act, to consist of a Regular Army, a National Guard and a Reserve, all worked out according to the genius, the views, and the customs of this people. The Regular Army, the costliest component, was to be of fair size in the beginning, until the National Guard could be improved and the Reserve could be organized; then it was to be decreased. The National Guard, costing much less than the Regular Army, small at first, was to be increased. The Reserve, to cost little, was to be organized into a sort of skeleton, larger than the Regular Army and the National Guard both together, to be filled up and used in war only.

Hardly had the War Department made a start to execute this law when the pre-war pacifist re-arose, the pacifist whom we all during the war learned to curse as the worst enemy the country ever had, the peace-leaguers and religious extremists, all railing against the Army, all knowingly or unknowingly, but none the less effectively, as has later been quite well established, playing into the hand of sovietists and revolutionists against our government and our ideals. They filled the press, some sixty publications, I am told. By juggling cost figures (doubled says the Secretary of War) they obtained a ready hearing before the country, anxious for economy. Congress has responded and by cuts in money and personnel has crippled the Regular Army so that it can hardly carry out its mission of instructing the National Guard and organizing the Reserve, largely cut off increase in the National Guard and seriously interfered with the starting of the Reserve.

It is of concern to the whole country, and of especial concern to you, because you live in the vital region of the United States. Look here! Here (indicating on map) is the vital region of our whole country. It is vital because it contains or controls all that is essential to keep the country alive - agriculture, industries, wealth, population, lines of communications. It is vital because it is the region without an enemy, though he have all the rest of the country, would yet not have us. It is vital as is shown by the fact that it was the great objective of the English in their efforts to subdue the Colonies. The War of the Revolution was really fought in this region. Whatever was done elsewhere was a side issue. You know it.

The entrance, the gateway of this region is here on the east coast.

Strange to say, its vulnerability is also here.

It is vulnerable because an enemy fleet once off the coast could easily blockade the region against the outside world.

It is the vulnerable region because it contains a large number

of landing places along here (indicating on the Long Island and Jersey Coast) that cannot, for lack of men and means, be adequately defended against a hostile landing.

It is vulnerable because once landed, an enemy would be in easy cutting distance of all those big lines of communication (indicating) with the rest of the country. You can see it.

The dangerous British effort in the Revolution was made here, came from the sea, along here (indicating). Their effort from the north failed. A like effort of Confederates from the south failed at Gettysburg. From the west, it is safe - too far from the Pacific Ocean.

This then is the vital and at the same time the vulnerable region of the country. The vulnerability of this region is what has caused the War Department in the past and now to plan and make its principal maneuvres here. Many of you no doubt remember the great maneuvres made in Massachusetts, Connecticut and Rhode Island in 1910-1912. In this vital, vulnerable region are you and your interests. And you and your interests are inadequately protected because the Regular Army is cut to the bone and the plans for the improvement of the National Guard and the Reserves have had to be greatly curtailed.

In this reduced state of the Regular Army and the National Guard, you can easily see that it is important that we should have something on which we could count in case of war. For this the law provided the Reserve and this Reserve the War Department is trying to organize. That is why I am talking to you. Before the World War, when an Army officer spoke of the dangers of war, he was accused of "seeing things", and he generally shut up. When the war came and found us unprepared, then people said that the Army officer "had had no vision". Even at the risk of being considered a fool or interested, he cannot permit this to occur again; it is too serious. We must be prepared.

Now some of you may say: "Oh, there's no danger of any war! The nations are exhausted and can't make war". That was said of Japan after the Russo-Japanese War. She just *would* come into the World War. That was thought of the Balkans after the Turko-Balkan War, but they all took a hand in the World War. That was said of Turkey after the World War but she has lately licked the Greeks and is now saucing all Europe. That was firmly believed of France too after the World War but she has got her back up and is ready to fight now at the dropping of the German hat.

EDITORS NOTE:-

The region referred to is the strip of our Country from about Portland, Maine, south to the Carolinas and west to the Mississippi River.

A PEACE TIME USE OF CHEMICAL WARFARE TRAINING.

"On February 9, 1925, Lieut. Col. Paul B. Moulton, CW-Res., was called as a witness for the Plaintiff in the case of Commonwealth of Massachusetts vs. Hippocates Anthony, the latter having been charged with burning a building to defraud an insurance company. The case was tried before Judge McLoud in the Superior Criminal Court, District Attorney Clark appearing for the Commonwealth.

"It was charged that on the 21st day of October, 1923, Anthony hired one Anastatio Anastasious to burn the building; that 48 holes were cut in the partition, into which a mixture of alcohol, gasoline and amyl acetate was poured, and a fire set thereto, causing an explosion to occur five minutes thereafter.

"Colonel Moulton was called as a State witness and qualified as an expert, although not a graduate chemist. His training as Chemical Warfare Officer was such that he could testify as to the odor, there being no liquid left to prove what was used. He testified that the odor was that of Amyl Acetate (Banana Oil, $CH_2CO_2C_5H_1$). It was later found that 175 gallons of Amyl Acetate had been shipped to a Haverhill shoe factory and that Anastasious had brought some of it to the place where the fire was started.

"The convictions and arrest of the defendants in this case were due to the tracing of the odor and the knowledge of gases obtained by Lieutenant Colonel Moulton while in the Chemical Warfare Service, and as far as is known, this is the first time that evidence as to an odor has been allowed as expert testimony in Massachusetts. The Chemical Warfare Service, therefore, has been instrumental in gaining another peacetime victory."

TWIN CITY VETERANS MEET.

On March 26th, 1925, the Twin City Veterans of the First Gas Regiment met at the Andrews Hotel, Minneapolis, for one of their regular get together dinners. Mr. C. C. Westerberg was in receipt of a letter forwarded through several of the former members of A Company which was of special interest to the original 1st Battalion. We are anxious to get in touch with the secretaries of the various local organizations regarding a 1st Gas Regiment reunion at Omaha in connection with the American Legion Convention.

ROSTER.

Active:

F. H. Bailey	E. F. Dunn	H. S. Matteson
C. G. Westerberg	R. F. Beard	W. S. Fewer
C. O. Woodward	Oscar Berglund	A. E. Logan
C. C. Webster	C. S. Corl	J. R. McNamara

Dead but wont lay down:

F. S. Kasple	L. A. Weese	E. V. Olson
John Entenman	A. G. Teegarden	H. Winger
W. E. McMann	V. C. Shepherd	W. C. Weber
A. A. Jones	W. S. Jones	C. E. Swanson
C. G. Moberg	A. C. Holmberg	

CHEMISTRY AND TOMORROW.

From Boston Transcript, March 27, 1925.

On the 26th March, one bombing plane flew over the Charles River Basin and made a smoke blanket that hid nine other planes circling about. On the same day, at San Pedro, California, anti-aircraft guns discharged eight hundred and eighty shells at a "sleeve target" controlled by airplanes without a single hit. On the evening of the same day Major General Amos A. Fries, Chief of the Army's chemical warfare service, made a speech in Boston that we trust has been read throughout the United States. There are two reasons for this: the first, that chemistry, through chemical warfare efficiency, plays a part in the military defense of the country, and second, that all thought of warfare aside, chemistry is a vital branch of American commerce to a degree that is daily emphasized. ****

Quoting Gen. Fries still further: "Today, we are manufacturing no masks or other articles and supplies needed to protect your sons if we have to defend our rights again by force of arms. We are doing practically no training of the Regular Army, the National Guard or the Reserves. We are manufacturing practically no smoke materials, no tear gas, nor other training materials, and we are having to abandon certain highly important lines of research".

This statement is its own commentary, but passing to commerce it is only wilful ignorance that can blind its eyes to the tremendous part played by chemistry in the arts, in the trades, in manufactures, in a word, in almost every department of the livelihood of nations, and of these, most emphatically the United States. After long and painful experience won at risks a few years ago which cause one to tremble, the American chemical industry has been put in American hands. In those hands it must remain or a large part of our national economy pay tribute to the foreigner. Which do you wish? What will you do? What has been done? The answer is that in the peaceful field of manufacture, research and commerce Americans have won a stable and self-respecting basis for a national chemical industry. Turn, however, to the military use and perfection of chemical warfare as anticipated by the United States and the answer is found in what Gen. Fries said on Thursday. The United States is not prepared as it should be, though the national imagination should work on what happened at San Pedro and over the Charles River Basin. Here are no hypotheses, no mere theoretical allegations. Chemistry and the air have delivered the goods. What use shall we make of them?

TURKEY.

From Military Intelligence Division, G. S.

New Military Cap: A new military cap has recently been adopted for the Turkish Army which is of general interest due to the fact that for the first time a visor is to be worn. This innovation is significant for, hitherto, Moslem tradition has forbidden any form of headdress which would prevent the wearer touching the ground with his forehead when he prays.

MADISON RESERVE OFFICERS DINE.

The Chemical Warfare Reserve Officers furnished the program for the March 25th meeting of the Madison, Wisconsin, Chapter of the Reserve Officers Association. The meeting opened with dinner at the University Club with about sixty members present. After dinner Major J. H. Mathews - C.W.-Res.- introduced Major G.W. Keitt - C.W.-Res.- Division Gas Officer of the 38th Division, A.E.F. Major Keitt outlined the part played by Chemical Warfare in the World War and then discussed in detail the duties of the Division Gas Officer. He was followed by Major A. S. Loevenhart,-C.W.-Res.- of the C.W. Advisory Board, who presented some of the research problems which must be solved before a new chemical agent is available to troops. The present activities of the Chemical Warfare Service were then presented by Captain G. F. Unmacht, C.W.S., 6th Corps Area Chemical Warfare Officer, in his usual forceful and interesting manner. His talk was illustrated by three reels of service movies, including a reel on the Boll Weevil Investigation. After an informal discussion of the Chemical Warfare Service, an excellent exhibit of chemical warfare material and service photographs were examined and explained in detail.

Entertainment during dinner was furnished by Miss Ried, Soprano, Mr. Ross, tenor, and Miss Hess, pianist, of the School of Music, University of Wisconsin.

The program for this meeting was arranged by Lieut. H. A. Kuhn, C.W.S., chairman; Major J. H. Mathews, C.W.-Res., and Major J. H. Walton, C.W.-Res.

There are now forty C.W. Reserve Officers at the University of Wisconsin. This is probably more than at any other university in the country and is maintaining the pace set during the World War when twenty of the thirty men on the Faculty of the Chemistry Department entered the Service. The Medical School is also well represented in our C.W. Reserve.

JAPAN.

From Military Intelligence Division, G. S.

Military Dogs: The training of the so-called military dogs at the Infantry School practiced during the past six years for the Imperial Army has been attended with such reassuring effect, according to the authorities concerned, that their latest decision is to establish an independent Dog Training Corps after the example of the Pigeon Training Corps at Nakano.

About a dozen dogs of the best stock were imported from France and Germany soon after the great World War, and have been properly trained in all sorts of field service. These dogs will be divided into several groups, each group to be composed of a number of dogs to be shortly imported for the purpose, so that the trained ones may act as guides.

In the coming military maneuvers, these dogs will be employed by the Infantry School Corps in charge of them in order to test their capacities and to find for what line of field service each of the different breeds are best fitted.

"GAS MORE EFFECTIVE THAN BULLETS".

From Philippine Free Press, Dated February 14, 1925.

Lachrymatory or "Tear Gas" can stop an angry mob and smoke out a hiding Criminal quickly and harmlessly - Manila Police learning how to use it.....

There are gases that make you sneeze and gases that make you feel stunned; gases that make you laugh and gases that make you weep. Then there are those that kill instantly, and others too that cure, as chlorine gas, with which some doctors experimented on President Coolidge's cold. In a word there are all sorts and all kinds of gases from the deadly poison gas first used in the World War down to just plain gas - the kind that fills some people's swelled heads.

All of which platitudes serve to introduce lachrymatory, or tear gas, which the Manila police department is adopting for the purpose of dispersing serious mobs. Readers of the FREE PRESS will remember how as a result of the recent fracas in Hawaii, that territory voted 50,000 to buy at least two motor cars fitted with machine guns to handle future troubles. Manila is going Hawaii one better; it will use lachrymatory gas, which will handle mobs much safer and more efficiently and much more effectively. And the beauty of it all is, that it won't kill anybody. Lachrymatory gas will blind you by tears, and will interfere with your breathing too. So the instinctive dread of human beings to lose their vision and have their breathing interfered with as if being choked and smothered will do the trick of dispersing any angry mob.

There is only one way to avoid being affected by the gas, and that is, to get away from the place where it is let loose. With the use of this new weapon introduced here through the United States army, there will be no more need of shooting a hiding criminal who will not give himself up to the authorities. A criminal in a house can dodge bullets, but not gas, which will fill every nook and corner of his hiding place. So there will be in the future no need to shoot a Ronquillo and bring him to Manila dead. Lachrymatory gas will get him, helpless and alive.

Three years or so ago the Manila police used revolvers twenty years old with cartridges that many times wouldn't explode, and if the gun were to go off, it was fifty to one that the shot missed the target. Now it is different, the policemen being given the same course of instruction in markmanship as is given soldiers of the United States Army. Day by day in every way the Manila police force is certainly growing better and better. Indeed, it is a remarkable evolution from the 20-year old, unworkable revolver of three years ago to lachrymatory gas today!

CHANGES - CHEMICAL WARFARE OFFICERS' RESERVE CORPS.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
LT. COLONELS		
Crossett, Frederick M.	O.C.,CWS	331 Madison Ave., New York City. Apptd. 2/24/25; accptd. 2/28/25. BA Group, E.A.
Mills, James E.	Unassigned	Edgewood, Md. Apptd. 3/14/25; accptd. 3/21/25.
MAJORS		
Auer, Charles I.	O.C.,CWS	2729 Pershing Drive, El Paso, Texas. Apptd. 1/28/25; accptd. 2/16/25. BA Group, E.A.
Brooks, Benjamin T.	C.C.,CWS	50 E. 41st St., New York City. Apptd. 2/19/25;accptd.2/28/25. BA Group, E.A.
Clark, Arthur J.	O.C.,CWS	356 Oak Hill Ave.,East Lansing, Mich. Apptd. 1/26/25; accptd. 2/2/25. BA Group, E.A.
Cutler, Thomas H.	7th C.A.	Add. chgd. from: 323 Frisco Bldg., Joplin, Mo. to: c/o Missouri State Highway Commission, Jefferson City, Mo. TA Group.
Files, Ellery K.	2nd C.A.	364 White St., Orange, N.J. Appt. expired 2/6/25. TA Group.
Lawrence, Ruben B.	O.C.,CWS	Correct add. is 62 N. Harrison Ave., Bellevue, Pittsburgh, Pa. instead of Belleville, Pa. BA Group, Tech. Div., OC-CWS.
Loevenhart, Arthur S.	O.C.,CWS	40 Roby Road, Madison, Wis. Apptd. 2/9/25;accptd. 2/16/25. BA Group, Medical Research Div., E.A.
Namm, Benjamin H.	O.C.,CWS	Hotel Ambassador, New York City. Apptd. 1/21/25; accptd. 1/28/25. BA Group, 2nd C.W.S. Procurement District.
Volwiler, Ernest H.	6th C.A.	5007 No. Ashland Ave., Chicago, Ill. Apptd. 2/17/25; accptd. 3/16/25. BA Group.
CAPTAINS		
Barker, Augustus L.	O.C.,CWS	823 Watson St., Ripon, Wis. Apptd. 2/26/25;accptd. 3/7/25. BA Group, E.A.
Calderwood, Howard N.	O.C.,CWS	6 So. Randall Ave., Madison, Wis. Apptd. 1/26/25; accptd. 2/19/25. BA Group, E.A.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
CAPTAINS (Cont'd)		
Chisholm, Stanley L.	O.C.,CWS	Add. chgd. from: 128 Melrose St., Melrose Highlands 77, Mass. to: 6733 31st St., Berwyn, Ill. BA Group, Chemical Div., E.A.
Conn, Wallace T.	O.C.,CWS	Add. chgd. from: 168 Jackson St., Lawrence, Mass. to: 122 East Capitol St., Washington, D.C. BA Group, Chemical Div., E.A.
Johnson, Henry S.	O.C.,CWS	23 Trumbull St., New Haven, Conn. Temp. add.: Univ. of Porto Rico, Rio Piedras, P.R. Apptd. 2/9/25; accptd. 2/28/25. BA Group, E.A.
Jones, Russell M.	O.C.,CWS	Add. chgd. from: 1967 Biltmore St., N.W., Washington, D.C. to: 130 Webster St., N.W., Apt. 10, Washington, D.C. BA Group, School Bn., E.A.
Killeffer, David H.	Unassigned	52 E. 41st St., New York City. Apptd. 3/19/25; accptd. 3/25/25.
Latshaw, William H.	O.C.,CWS	624 Hamilton Road, Crafton Branch, Pittsburgh, Pa. Prom. from 1st Lt. 3/12/25. BA Group, 3rd CWS Proc. Dist.
McClure, John	O.C.,CWS	1312 No. Pennsylvania Ave., Roswell, N. Mex. Apptd. 1/26/25; accptd. 2/4/25. BA Group, E.A.
Manning, John R.	Unassigned	1109 A.O.U.W. Bldg., Little Rock, Ark. Apptd. 2/26/25; accptd. 3/12/25.
Nair, John H.	2nd C.A.	193 Jasper St., Syracuse, N.Y. Trans. from SC-Res 2/24/25. TA Group,
Naudain, Glenn G.	O.C.,CWS	Mellon Institute, Pittsburgh, Pa. Apptd. 2/16/25; accptd. 2/24/25. BA Group, E.A.
Rupert, Frank E.	O.C.,CWS	157 Westford Circle, Springfield, Mass. Apptd. 3/6/25 accptd. 3/12/25. BA Group, E.A.
St. Clair, Grover L.	9th C.A.	Hq. 9th Corps Area, Presidio of San Francisco, Cal. (Warrant officer, USA) Trans. from BA to TA Group 3/27/25.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
CAPTAINS (Cont'd)		
Smith, Earle C.	O.C.,CWS	Add. chgd. from: Hotel York, Denver, Colo. to: 525 Cooper Bldg., Denver, Colo. BA Group, E.A.
Smith, James H.	O.C.,CWS	36 Ericsson St., Rochester, N.Y. Died 3/1/25. BA Group, Chemical Div., E.A.
Streeter, Elford D.	O.C.,CWS	P.O. Box 671, Port Arthur, Texas. Apptd. 2/5/25; accptd. 2/17/25. BA Group, E.A.
Talbot, Montgomery H.	O.C.,CWS	15 Agawam Road, Waban, Mass. Apptd. 2/28/25; accptd. 3/11/25. BA Group, 1st CWS Proc. District.
Van Tassell, Edward D.Jr.	Unassigned	390 Newtonville Ave., Newtonville, Mass. Apptd. 3/18/25; accptd. 3/25/25.
Waddingham, Albert B.	9th C.A.	Add. chgd. from: 1302 Cherokee Ave., Los Angeles, Cal. to: 1310 Cherokee Ave., Los Angeles, Cal. TA Group.
Wallace, Edwin S.	O.C.,CWS	c/o Central Carbon Co., Monroe, La. Dec. reapt. Com. exp. 3/18/25. BA Group, Technical Div., OC-CWS.
Wood, Charles G.	O.C.,CWS	Box 765, Warren, Arizona. Apptd. 1/15/25; accptd. 1/26/25. BA Group, E.A.
FIRST LIEUTENANTS		
Alley, John D.	Unassigned	417 Avenue D., East Pittsburgh, Pa. Apptd. 3/6/25; accptd. 3/16/25.
Bandelin, Louis A.	O.C.,CWS	1912 West Prospect St., Racine, Wis. Apptd. 2/21/25; accptd. 2/27/25. BA Group, E.A.
Beam, Raymond O.	Unassigned	119 E. Liberty St., Punxsutawney, Pa. Apptd. 3/13/25; accptd. 3/21/25.
Brown, Raymond R.	9th C.A.	Box 411, Orange, Cal. Trans. from BA Group, Replace. Center, E.A. to TA Group 3/26/25.
Buckland, Bertel G.	O.C.,CWS	Edgewood, Md. Apptd. 2/10/25; accptd. 2/17/25. BA Group, E.A.
Cox, Thomas W.	O.C.,CWS	Box 336, Waynesboro, Va. Apptd. 2/26/25; accptd. 3/5/25. BA Group, E.A.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
FIRST LIEUTENANTS (Cont'd)		
Dickinson, Sheldon J.	O.C.,CWS	University Club, Madison,Wis. Apptd. 2/26/25; accptd. 3/6/25. BA Group, E.A.
Diven, John M.	O.C.,CWS	235 W. 71st St., New York City. Appt. exp. 3/18/25. BA Group,Technical Div.,OC-CWS.
Eldridge, Arthur C.	9th C.A.	Add. chgd. from: 1033 Palm Ave., So. Pasadena, Cal. to: 1873 Los Robles Ave., So. Pasadena, Cal. Trans. from BA Group, Property Div., E.A. to TA Group 3/27/25.
Harris, Loyd E.	Unassigned	1633 Madison St., Madison, Wis. Apptd. 3/2/25; accptd. 3/13/25.
Horsch, William G.	O.C.,CWS	Add. chgd. from: Madison Road, Scarsdale, N.Y. to: 1521 Hiland Ave., Coraopolis, Pa. BA Group, Chemical Div., E.A.
Kemble, Herbert C.	O.C.,CWS	25 South St., Camillus, N.Y. Apptd. 2/13/25; accptd. 2/23/25. BA Group, E.A.
Keyser, Merril D.	O.C.,CWS	Hq. 1st Corps Area, Army Base, Boston, Mass. (Mr. Sgt., CWS) Apptd. 2/25/25; accptd. 2/27/25. BA Group.
Loss, Harold D.	2nd C.A.	Skaneateles, N.Y. Apptd. 2/13/25; accptd. 2/21/25. TA Group.
Sanderson, Clifford W.	O.C.,CWS	114 Hopkins Place, Longmeadow, Mass. Apptd. 3/6/25; accptd. 3/12/25. BA Group, E.A.
Travers, Frank A.	O.C.,CWS	Add. chgd. from: 2310 E. 2nd St., Long Beach, Cal. to: 3717 E. 2nd St., Long Beach,Cal. BA Group, Production Div., E.A.
Weigand, Herman	Unassigned	605 Walnut St., Leavenworth, Kas. Apptd. 2/15/25; accptd. 3/12/25.
SECOND LIEUTENANTS		
Adams, Wilbur C.	O.C.,CWS	6300 Enright Ave., St. Louis, Mo. Apptd. 2/10/25; accptd. 2/18/25. BA Group, E.A.
Anderson, Winslow S.	O.C.,CWS	Add. chgd. from: 154 High St., Portland, Maine to: Box E, State College Station, Raleigh, N.C. BA Group,Chemical Div.,E.A.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
SECOND LIEUTENANTS (Cont'd)		
Bartlett, Leland D.	8th C.A.	311 E. Yandell Blvd., El Paso, Texas. Apptd. 2/13/25; accptd. 2/26/25. TA Group.
Blumenstiel, Monroe A.	O.C.,CWS	204 Dartmouth St., Rochester, N.Y. Apptd. 3/7/25; accptd. 3/13/25. BA Group, E.A.
Breth, Henry E.	O.C.,CWS	Carlisle Place, Chillicothe, Ohio. Apptd. 2/3/25; accptd. 2/12/25. BA Group, E.A.
Browning, Charles A.	O.C.,CWS	Bingham Military School, Asheville, N.C. Apptd. 2/3/25; accptd. 2/13/25. BA Group,E.A.
Campbell, Thomas P.	Unassigned	818 Patterson Bldg., Denver, Colo. Trans. from AS-Res 3/14/25.
Canar, Alford G.	6th C.A.	3900 Broadway, Chicago, Ill. Apptd. 2/24/25; accptd. 3/2/25. TA Group.
Carswell, Harry E.	Unassigned	823 Irving Court, Madison, Wis. Trans. from FA-Res 3/23/25.
Carter, Albert S.	O.C.,CWS	Chemistry Bldg., University of Wisconsin, Madison, Wis. Apptd. 2/28/25; accptd. 3/6/25. BA Group, E.A.
Caveness, Hugh L.	4th C.A.	603 Alston Ave., Durham, N.C. Apptd. 1/29/25; accptd. 2/25/25. TA Group.
Davis, Hugh L.	O.C.,CWS	204 E. Fairchild St., Iowa City, Iowa. Apptd. 2/7/25; accptd. 2/17/25. BA Group, E.A.
de Leeuw, Philip M.	O.C.,CWS	4942 N. Spaulding Ave.,Chicago, Ill. Trans. from Inf-RES 2/4/25. BA Group, E.A.
Donner, Joseph	O.C.,CWS	6745 Dorchester Ave., Chicago, Ill. Trans. from Edgewood Arsenal to 4th CWS Procurement District. BA Group.
Dunlap, Theodore E.	2nd C.A.	College of Agriculture & Mechanic Arts, University of Porto Rico, Mayaguez, P.R. Apptd. 1/9/25; accptd. 2/24/25. TA Group.
Eichelberger, Mark W.	O.C.,CWS	7427 South Shore Drive,Chicago, Ill. Apptd. 2/11/25; accptd. 2/18/25. BA Group, E.A.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
SECOND LIEUTENANTS (Cont'd)		
Filson, George W.	Unassigned	621 N. Lake St., Madison,Wis. Apptd. 3/6/25; accptd. 3/17/25.
Fonda, Lyman D.	O.C.,CWS	111 N. 3rd St., Goshen, Ind. Apptd. 2/16/25; accptd. 2/20/25. BA Group, E.A.
Hardin, Leo J.	7th C.A.	Grady,Ark. Temp. add. 150 N.Grant St., W. Lafayette, Ind. Trans. from Inf-RES 3/6/25. TA Group.
Horton, Frederic A.	O.C.,CWS	984 N. Church St., Rockford, Ill. Apptd. 2/9/25; accptd. 2/13/25. BA Group, E.A.
Ladd, Byron A.	O.C.,CWS	Melvin Village, N.H. Apptd. 2/28/25; accptd. 3/10/25. BA Group, E.A.
Lazier, Wilbur A.	O.C.,CWS	128 N. Orchard St., Madison, Wis. Apptd. 2/28/25; accptd. 3/7/25. BA Group,E.A.
McFadden, Herbert J.	O.C.,CWS	Add.chgd. from: 229 E. 6th St., Loveland, Colo. to: 1600 Emerson St., Denver, Colo. BA Group, E.A.
Mack, Gordon C.	O.C.,CWS	Patent Office, Div. #6, Washington, D.C. Apptd. 2/7/25; accptd. 2/19/25. BA Group, Technical Div., OC-CWS.
Smith, Robert C.	9th C.A.	1111 West Washington Ave., Santa Ana, Cal. Trans. from BA Group, Mechanical Div., E.A., to TA Group 3/26/25.
Marshall, Housden L.	Unassigned	University of Maryland, College Park, Md. Trans. from Inf-RES 3/16/25.
Merrill, Henry B.	Unassigned	968½ 37th St., Milwaukee,Wis. Apptd. 3/12/25; accptd. 3/19/25.
Mulrooney, Thomas W.	Unassigned	800 West St., Wilmington, Del. Trans. from CA-Res 3/18/25.
Owen, Benton B.	O.C.,CWS	Ethyl Gasoline Corp., Dayton, Ohio. Apptd. 2/14/25; accptd. 2/26/25. BA Group, E.A.
Philips, Frank M.	Unassigned	c/o Tennessee Military Institute, Sweetwater, Tenn. Apptd. 3/18/25; accptd. 3/27/25.
Proctor, Bernard E.	O.C.,CWS	179 Mt. Vernon St., Malden, Mass. Trans. from CA-Res 2/27/25. BA Group, Replace. Center, E.A.

NAME AND RANK	ASSIGNMENT JURISDICTION	REMARKS
SECOND LIEUTENANTS (Cont'd)		
Reynolds, Robert B.	O.C.,CWS	Add. chgd. from: Guntersville, Ala. to: Chemistry Bldg., University of Wisconsin, Madison, Wis. BA Group, E.A.
Schoenwetter, Wm. G.	Unassigned	201 Main St., Hamburg, N.Y. Apptd. 3/16/25; accptd.3/23/25.
Shreiner, Claude L.	Unassigned	321½ West Hopocan Ave., Barberton, Ohio. Trans. from Inf-RES 3/16/25.
Swanson, Edwin E.	O.C.,CWS	Manson, Iowa. Apptd.2/10/25; accptd. 2/20/25. BA Group, E.A.
Swartz, Carl E.	O.C.,CWS	University of Wisconsin, Chemistry Bldg., Madison, Wis. Apptd. 2/28/25; accptd. 3/7/25. BA Group, E.A.
Tambling, Robert L.	6th C.A.	Box 92, Princeville, Ill. Apptd. 3/11/25; accptd.3/18/25. TA Group.
Taylor, Robert H.	O.C.,CWS	1575 Washington St., Denver, Colo. Apptd. 1/21/25; accptd. 2/11/25. BA Group, E.A.
Tyson, Harry D.	Unassigned	Holt, Ala. Apptd. 3/12/25; accptd. 3/20/25.
Walker, Burnham S.	Unassigned	19 Myrtle St., Boston, Mass. Apptd. 3/18/25;accptd.3/23/25.
Wilson, Glenn T.	O.C.,CWS	Fowler, Colo. Apptd. 2/12/25; accptd. 2/20/25. BA Group,E.A.
Kern, Joseph W.	9th C.A.	1314 Carpinteria St., Santa Barbara, Cal. Apptd. 2/18/25; accptd. 3/2/25. TA Group.

RESERVE OFFICERS PLEASE NOTE.

It is requested that any errors or omissions noted in these lists of Reserve Officers, be reported to the Personnel Section, Office, Chief,Chemical Warfare Service, Munitions Building, Washington, D.C.

TABLE OF CONTENTS