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INTELLIGENCE REPORT

ON

JAPANESE CHEMICAL WARFARE

Volume I

271334

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GENERAL

ORGANIZATION

POLICIES AND INTENTIONS

TACTICS

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Office of the Chief Chemical Officer

GHQ, AFPAC

APO 500

TOKYO, JAPAN

15 May 1946

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GENERAL HEADQUARTERS
UNITED STATES ARMY FORCES, PACIFIC
OFFICE OF THE CHIEF CHEMICAL OFFICER

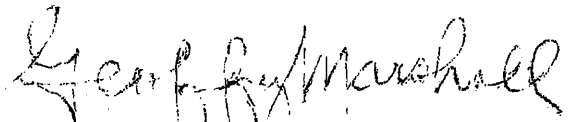
APO 500
15 May 1946

SUBJECT: Intelligence Report on Japanese Chemical Warfare.

TO : The Assistant Chief of Staff, G-2, GHQ, AFPAC.

1. Transmitted herewith is Volume I of Intelligence Report on Japanese Chemical Warfare. Volumes II to VI, inclusive, have been transmitted previously.

2. Volume I is the final volume of six and completes the formal report prepared by this section in compliance with various directives and instructions from your office and from the Chief of the Chemical Warfare Service. Copies of these directives and instructions will be found appended to Volume I, which also includes a summary of the complete report.



GEOFFREY MARSHALL
Colonel, CWS
Chief Chemical Officer

Copy No. _____

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Volume I

GENERAL

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Intelligence Report On
Japanese Chemical Warfare

1. GENERAL

a. Authority

This report has been prepared under the general supervision of the A. C. of S., G-2, SCAP, by the Chief Chemical Officer, GHQ, AFPAC in compliance with instructions from the Chief, Chemical Warfare Service and the A. C. of S., G-2, SCAP, copies of which are published herein as Appendix A.

b. Purpose

The purpose of this report is to give a comprehensive description of Japanese Chemical Warfare activities and to present an evaluation of Japanese capacity to wage large scale Chemical Warfare. A further object of the investigation has been to ascertain whether the Japanese possessed knowledge, techniques, materiel or procedures superior to our own and worthy of adoption.

c. Scope

This report, by itself, is by no means the entire story of Japanese Chemical Warfare. Throughout the period of operations Chemical Warfare technical intelligence officers operated in the forward areas in the Southwest Pacific Area collecting intelligence information and captured Japanese materiel. This information was published in many reports, summaries and digests, and in a handbook on Japanese Chemical Warfare Materiel. These reports were extremely valuable to the troop commanders and the War Department but naturally presented a very small part of the whole picture.

With the surrender of Japan and subsequent occupation, an unparalleled opportunity was afforded to investigate every phase of Chemical Warfare activities engaged in by the Japanese. Accordingly, all research establishments, manufacturing plants, arsenals, supply and storage installations, and schools in Japan and Korea connected with Chemical Warfare were visited, studied and reported upon. Samples of materiel were collected, examined and prepared for shipment to the United States. Many Japanese officers and scientists were questioned.

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Volume IV of the Report on the Scientific Intelligence Survey in Japan, September and October 1945, published 1 November 1945 by the Scientific and Technical Advisory Section, GHQ, AFPAC, presents a general preliminary survey of Japanese Chemical Warfare. Copies are on file in the Office of the Chief, Chemical Warfare Service, Washington 25, D. C., and the Office of the A. C. of S., G-2, GHQ, AFPAC, APO 500. Close liaison existed between the Chemical Warfare officers of the Scientific and Technical Advisory Section and this section.

Report of investigation of nature, means and intent to use bacteria as a weapon of war as indicated in par. 2 e of Appendix A 2 is not included, having already been rendered in Volume V of the Report on the Scientific Intelligence Survey in Japan, September and October 1945, published 1 November 1945. Copies are on file in the Office of the Chief, Chemical Warfare Service, Washington 25, D. C., and the Office of the A. C. of S., G-2, GHQ, AFPAC, APO 500. Additional investigation of the subject was made by Lt. Col. Arvo T. Thompson, and separate report is understood to have been made by him direct to the Chief of the Chemical Warfare Service. Investigation of Japanese balloons used to bomb the United States has been conducted by the A. C. of S., G-2, GHQ, AFPAC, APO 500. While no evidence was developed to link the balloon attacks with Bacteriological Warfare, neither was that possibility eliminated.

Chemical Warfare activities of the Japanese Air Force were separately investigated and reported upon by the Chemical Section, Air Technical Intelligence Group. Copies are on file at Wright Field, Dayton, Ohio.

Japanese Naval establishments were studied by the Naval Technical Mission to Japan. Copies of their report are on file in the Navy Department.

This report is published in six volumes as indicated below. The volumes, with the officers who wrote the reports, are:

Volume I General; Organization; Policies
 and Intentions; Tactics

Lt. Col. John M. MacGregor and
Lt. Col. John E. Beebe, Jr.

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- Volume II Chemical Warfare Research and
Development Work of the Japanese
(With separately bound Appendix A)
- Major Jake T. Nolen, Captain Joe C.
Woosley and 1st Lt. E. J. Hardgrave
- Volume III The Manufacture of CW Materials by
the Japanese
- Major Jake T. Nolen, Captain Joe C.
Woosley and 1st Lt. E. J. Hardgrave
- Volume IV Japanese Chemical Warfare Supply
System and Storage Installations
- Major Leon A. Kief
- Volume V Japanese Chemical Warfare Equipment
and Materiel (In eight parts A to H,
separately bound)
- Lt. Col. John E. Beebe, Jr., 1st Lt.
A. J. Felgendreger and 2d Lt. D. W.
Crawford
- Volume VI Japanese Chemical Warfare Training--
Offensive and Defensive
- Lt. Col. John W. Fitzpatrick

d. Sources

Material on which this report is based comes from many sources, principally: Interrogation of former Japanese Army and Navy officers; information furnished by the Japanese from available records and the memory of responsible officers pursuant to requests made by SCAP; physical examination of installations; laboratory examination of materiel; inventories of stocks; the few documents available; and general impressions acquired throughout the course of the investigation. Documentary evidence has been very difficult to obtain as many records were burned during incendiary raids and most of the remaining records were destroyed by government order on 15 August 1945 following the decision to surrender and prior to occupation by American troops.

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Evidence thus obtained has been contradictory and incomplete in many cases. While every effort has been made to secure complete information and to cross check for accuracy, many gaps and unexplained conflicts exist. Facing the possibility of trial as war criminals, witnesses were understandably reluctant to volunteer information, particularly as to policies, intentions and actual use of gas. Many witnesses possessing valuable information are no longer living or are not available in Japan. These facts must be borne in mind in evaluating the completeness and accuracy of the report.

Individual reports of interrogation, visits to installations, War Department targets and specific phases too detailed for inclusion in this report are on file in the following offices: Office of the Chief, Chemical Warfare Service, Washington 25, D. C.; A. C. of S., G-2, GHQ, SCAP, APO 500; and Chemical Section, GHQ AFPAC, APO 500.

A list of the War Department Targets assigned to the Chemical Section, GHQ AFPAC, for investigation and covered by this report is included herein as Appendix B.

c. Credit

Credit is due to the following organizations whose facilities have been extensively used and whose officers and men have contributed much in time and effort to make this investigation a success:

- (1) 5250th Technical Intelligence Company. Teams from this organization accompanied the Armies in the initial stages of the occupation and visited innumerable Japanese military installations, locating new items of Chemical Warfare equipment and materiel, and reporting upon many War Department targets assigned to the Chemical Section for investigation.
- (2) The laboratory sections of the 98th and 99th Chemical Service Companies and their successor, the 10th Chemical General Service Company, now reorganized as the 10th Chemical Service Company. These laboratories examined all new items of equipment found and reported them in Volume V of this report. The Depot Section of the 10th Chemical Service Company prepared the materiel for shipment to Edgewood Arsenal, Maryland, for detailed study.

- [REDACTED]
- (3) The Army, Corps and Division Chemical officers in Japan and Korea who have assisted by locating, identifying and making disposition of Japanese Chemical Warfare materiel and installations.
 - (4) The Photographic Division, GHQ, AFPAC Signal Office. The Theater Photo Officer, with limited supplies and facilities reproduced 50,000 prints of photographs of new items published in Volume V.
 - (5) Japanese Liaison Section, G-2, SCAP. This section located and brought in from all over Japan former Army and Navy officers for interrogation, and caused the Japanese to furnish information requested by this section.

2. POLICIES AND INTENTIONS

a. Sources

Most of the information concerning policies and intentions was obtained by interrogation of high ranking Army and Navy officers. All must be considered in the light that those interrogated feared prosecution as war criminals. That furnished by General Hideki Tojo is considered generally reliable. He was the one person in closest touch with broad questions of policy, as he was Premier from October 1941 to July 1944; War Minister from July 1940 to July 1944; Chief of the Army General Staff from February to July 1944; and Home Minister and Munitions Minister throughout his premiership. Information from other sources has been used to supplement that furnished by General Tojo.

A list of the persons interrogated is published herein as Appendix C.

b. Research

The Japanese Army initiated Chemical Warfare research in 1919 and by 1925 Chemical Warfare was recognized as a weapon. Adequate funds and facilities were provided, and research continued until the end of the war. Navy research was carried on concurrently and independently. Neither utilized civilian university or industrial personnel or facilities to any appreciable degree.

c. Manufacturing

Production of toxic agents and munitions was carried on by both the Army and Navy until mid-1944. At that time the decision not to initiate the employment of toxic agents was made and the plants were converted to other purposes. Defensive equipment was manufactured at an accelerated rate until the end of the war although production fell off due to bombings.

d. Training

The Japanese Army conducted extensive training in Chemical Warfare from 1933 to 1945. Offensive training, however, was discontinued in 1942 at the Narashino Chemical Warfare School, and emphasis was placed on anti-gas defense and training of officers for mortar battalions. Most offensive chemical warfare field units were inactivated or lost their chemical warfare identity at this time. School officials attributed this change of policy to the Emperor who was apprehensive that troops would use gas without authority.

e. Strategical and tactical use

(1) Responsibility

It is necessary to bear in mind where the responsibility for decisions and operations was vested. While the Emperor was consulted on such questions as peace and war, Military and Naval decisions were made solely by the Chiefs of the Army and Navy General Staffs respectively. A majority of those interrogated stated that the Emperor's personal decision would have been necessary before gas could be used against the Western powers. This was considered necessary because of the ability of the Western powers to retaliate with the consequent far reaching effects on the homeland and civilian population.

Gas was used against the Chinese, however, on the authority of the Chief of the Army General Staff, probably without the prior concurrence of the Emperor, as an operational policy solely within the scope of the Army.

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This policy was at least condoned by the Government then in power and by each succeeding Government, which could scarcely have been unaware of the facts, for on 5 May 1938 China notified the League of Nations of the imminent Japanese use of poison gas. On 14 May 1938 the League Council passed a resolution condemning the Japanese use of gas against China, and on 30 September 1938 the League Council adopted a resolution calling for an investigation of the alleged use of poison gas by Japan.

(2) Against the United States and British Empire

When Japan attacked the Western powers the Army issued an order to field commanders not to employ gas against us. Early Japanese successes made their use unnecessary and ours unlikely. As the tide turned and American forces began closing in, the Army General Staff wanted to employ gas. General Tojo says this was especially true of the Marianas campaign. General Tojo, who says he expressly forbade the General Staff to use gas, and was supported by Field Marshall Sugiyama, who succeeded him as War Minister in July 1944, gave the following reasons for his decision: (a) Japan was obligated by her commitments under international law and treaties; (b) Japanese production of toxic agents could never hope to equal the great productive capacity of the United States; (c) as an island empire with densely populated areas, Japan was particularly vulnerable to retaliation from the air with the consequent disastrous results.

Fearing that Germany would in desperation resort to gas, the Japanese Army in the summer of 1944 recalled all stocks of gas munitions in the field from the hands of troops to rear echelon depots. The Japanese reasoned that if the Germans used gas, the Allies would retaliate against Japan as well. They therefore wanted to take

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precautions against irresponsible use by isolated units in desperate situations which might provoke full scale retaliation. The Japanese were even prepared to overlook small scale local tactical use by the Allies to avoid general gas warfare. Retaliation would have been attempted in the event of large scale attacks.

(3) Against China

Evidence from Chinese sources alleges that the Japanese employed gas against the Chinese from 18 July 1937 to 8 May 1945. The Chinese documents further allege that the following agents were employed: Mustard (H), Lewisite (L), Phosgene (CG), Hydrogen Cyanide (AC), Chlorpicrin (PS), Diphenylchlorarsine (DA), Diphenylcyanarsine (DC) and Chloroacetophenone (CN). Photographs in one document show persons alleged to be Chinese soldiers who have lesions which look like typical mustard burns.

Evidence obtained in Japan during the course of this investigation shows that in October 1937 the Japanese Army established a field chemical warfare laboratory in Shanghai to collect intelligence on the state of Chinese preparedness for chemical warfare. In May 1938 the Japanese used DC and CN in the Szechow Campaign and again the same year in the Hankow Campaign, the same agents were used. The Commander of the Central China Expeditionary Force at that time, Field Marshal Shunroku Hata, stated that Imperial General Headquarters in Tokyo had approved his request to use tear and sneezing gases. He denied, as did all other Japanese officers interrogated, the use of casualty agents such as H, L or CG. The policy to use DC and CN in China remained in effect until late 1944, at least, according to Generals Hata and Tojo. All Japanese Army officers interrogated insisted that DC and CN were not poison gases within the meaning of international law and treaties on the subject because they contended that neither death nor permanent injury resulted from their use. However, a captured Top Secret Japanese Army document, appended hereto as Appendix E, describes in

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Chapter VI the deaths of Chinese soldiers by asphyxiation from the use of "special toxic smoke", the name they applied to both DC and CN. (See page 124, below)

(4) In the home islands

By the time an invasion of the home islands was imminent, production of toxic gases had been discontinued. The possible strategy of defense of the beaches against a hostile landing with gas was considered and rejected. Stocks on hand were too small for extensive operations, the Japanese Air Force had been reduced to impotence so that planes were no longer available to use it in the most effective way, and the few available planes were needed to carry HE for Kamikaze attacks against invasion ships and could not be spared to deliver gas attacks.

As a final consideration, the extreme vulnerability of all Japanese cities had been demonstrated by the devastation wrought by incendiary bombs dropped by B-29 and carrier based planes over all parts of the home islands. Under such conditions, the Japanese fully recognized their helplessness and complete inability to withstand gas attacks, having almost no gas proof shelters, no protective clothing suitable for prolonged wear, and inadequate and inferior gas masks for the civilian population.

The location and condition of captured toxic munitions indicated storage in normal supply depots without special strategic significance.

f. Civilian Anti-Gas Defense

Civilian anti-gas defense was organized and administered by the Anti-Air Raid Defense Association, the headquarters of which were in turn supervised by the Home Ministry. This organization was set up on a neighborhood basis.

No courses in anti-gas defense measures were run for civilians though the approaching need for gas masks was emphasized and occasional instruction was given in putting on and removing the mask. The emphasis placed upon anti-gas measures is indicated by the fact that nearly ten million gas masks were distributed to civilians in the major cities of Japan since 1941.

Commanders and civilian staff members of this body were given instructions on the recognition and characteristics of war gases; first aid to casualties and the fit, adjustment and care of the mask. Periods of instruction to this group averaged two to three hours. No supervision of training was carried out. Plans were made to treat gas casualties. Only four public gas shelters had been built in Japan.

Following is the distribution of gas masks to civilians in the principal Japanese cities. No planned civilian distribution was made other than shown.

DISTRIBUTION OF CIVILIAN GAS MASKS

Cities	1941	1942	1943-45	Total
Tokyo	652,000	2,296,000	789,200	3,737,200
Kawaguchi			25,000	25,000
Kawasaki	29,000	102,000	30,000	161,000
Yokohama	93,000	328,000	64,000	485,000
Yokosuka	18,000	65,000	70,000	153,000
Nagoya	128,000	450,000	181,000	759,000
Kyoto	105,000	369,000	126,000	600,000
Osaka	313,000	1,102,000	200,000	1,615,000
Sakai			70,000	70,000
Fuse			50,000	50,000
Anegasaki	17,000	61,000	37,000	115,000
Nishinomiya			37,000	37,000
Kobe	93,000	328,000	196,000	617,000
Hiroshima	34,000	117,000	35,000	186,000
Kure	22,000	81,000	25,000	128,000
Shimonoseki	18,000	66,000	30,000	114,000
Moji	13,000	47,000	20,000	80,000
Kokura	16,000	59,000	20,000	95,000
Tohata	7,000	28,000	10,000	45,000
Yahata	25,000	89,000	40,000	154,000
Wakamatsu	8,000	30,000	15,000	53,000
Niigata	7,000	51,000		58,000
Sasebo	19,000	70,000	24,000	113,000
Nagasaki	24,000	86,000	30,000	140,000
Muroran	9,000	36,000	21,000	66,000
Total	1,650,000	5,861,000	2,145,200	9,656,200

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g. Conclusions

From the foregoing it must be concluded that after the middle of 1944, the Japanese had no intention of initiating chemical warfare. During the early stages of the war with the Allied powers, the Japanese saw no need to employ chemical agents, and use by the Allies appeared unlikely. The policy to employ chemical agents in China having been established at least as far back as 1938, it was not considered necessary to modify this policy. As the Japanese lost the initiative and it became apparent that the American forces possessed the ability to regain their lost territory and in addition attack the homeland, they re-estimated the situation and definitely concluded that the initiation of chemical warfare would be disastrous. By mid-1944 the decision was definitely made to avoid gas warfare if at all possible. They fully understood the immense superiority of American productive capacity and as an island empire their vulnerability to air attack. Undoubtedly the combined warning and promise of President Roosevelt gave them great comfort.

3. CHEMICAL WARFARE ORGANIZATION

a. Responsibility

Seldom in history has the military establishment of any nation been clothed with the power possessed by the Japanese. The Constitution of 1889 gave to the Army and Navy the opportunity to control the government and the Army eventually did. Not only had the Chiefs of the Army and Navy General Staffs and other Army and Navy leaders direct access to the Emperor, but they also had the right to appoint and withdraw the War and Navy Ministers in any government. Either could thus, in practice, prevent a government from being formed, or bring about its fall at any time. The War and Navy Ministers were by Imperial Ordinance senior officers on the active list.

Although Imperial General Headquarters was established in 1937 to coordinate the Army and Navy, in effect they continued to function separately since there was no common superior short of the Emperor. They maintained liaison where necessary at the top, and very little lower down. Areas of authority were often confused, divided or overlapping. The Army and Navy Chiefs of Staff issued operational orders directly to their Armies or Fleets, each independently of the other. The War and Navy Ministries had little control over the general staffs and none over field Armies or Fleets, but operated the administrative and supply services. By a process where an officer of the General Staff would also occupy a

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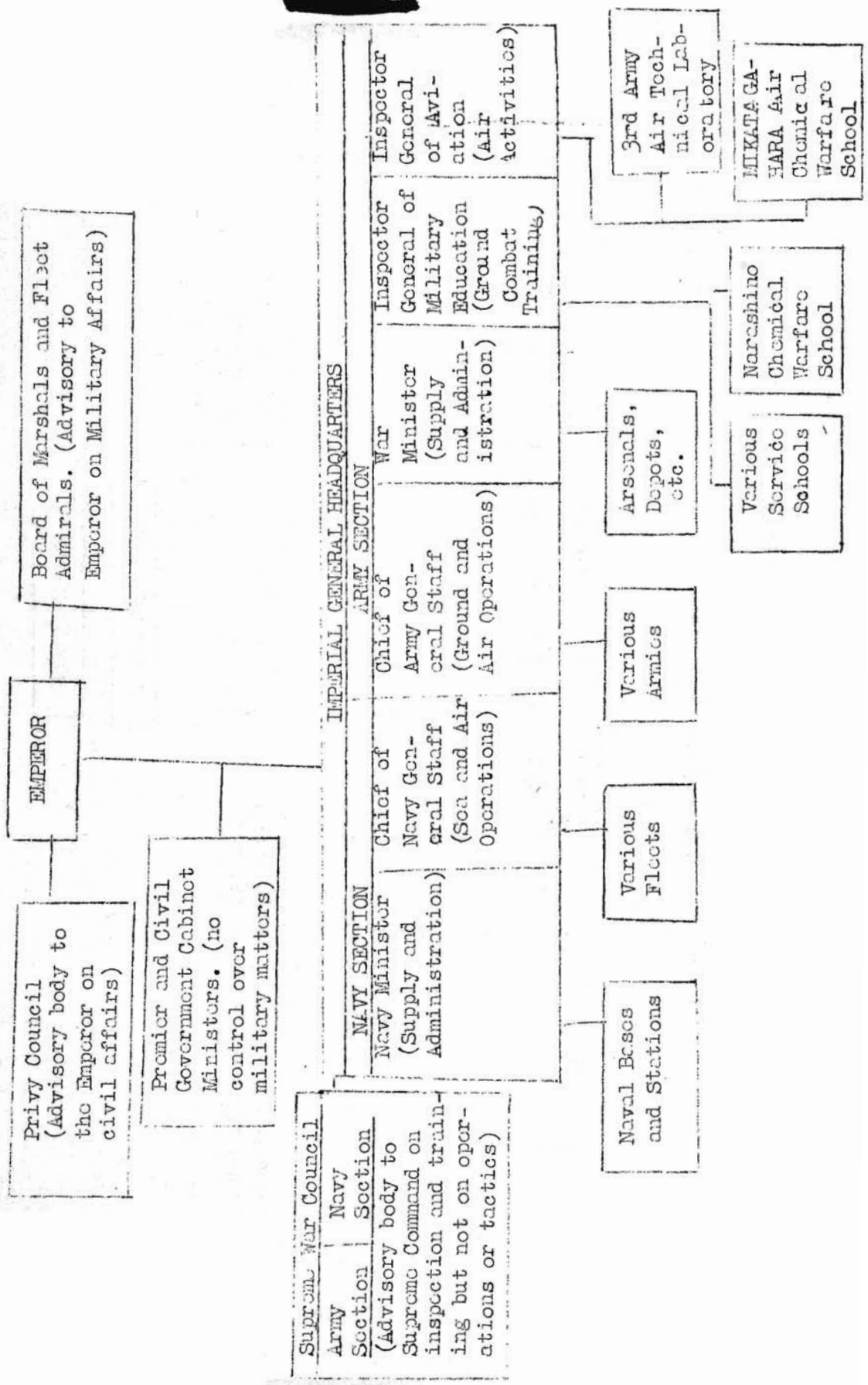
corresponding position in the War Ministry, the Army coordinated these two groups. Neither had a separate Chemical Warfare Service as such.

The figures and charts published in the other volumes of this report do not all agree with those shown here. This is particularly true of those showing Imperial General Headquarters, the War Ministry, the Navy Ministry and the Chiefs of the Army and Navy General Staffs. Although all were part of Imperial General Headquarters, they functioned independently and in some cases held dual roles. For example, the War and Navy Ministers were also part of the Cabinet and Civil Government. The Japanese by preference avoided sharply defined organizations and areas of responsibility, a characteristic which was the cause of constant difficulty in conducting the government. Liaison conferences were held twice a week in an effort to overcome this obstacle. The Premier, War, Navy, Foreign and Finance Ministers, the Chiefs of the Army and Navy General Staffs and possibly other Cabinet officers depending on the problems met at these conferences. The military members became dominant and overawed the civilian members so that conflicts were reconciled in a manner generally favorable to the military. To decide momentous questions, such as peace and war, an Imperial Conference would be held, attended by the Emperor, the persons attending Liaison Conferences, all other Cabinet officers, the President of the Privy Council and the Lord Keeper of the Privy Seal.

Three organization charts are given here. All show primarily Chemical Warfare installations and none are complete. Figure 1 shows the Empire, Army and Navy organization. Three installations of interest to Chemical Warfare are shown.

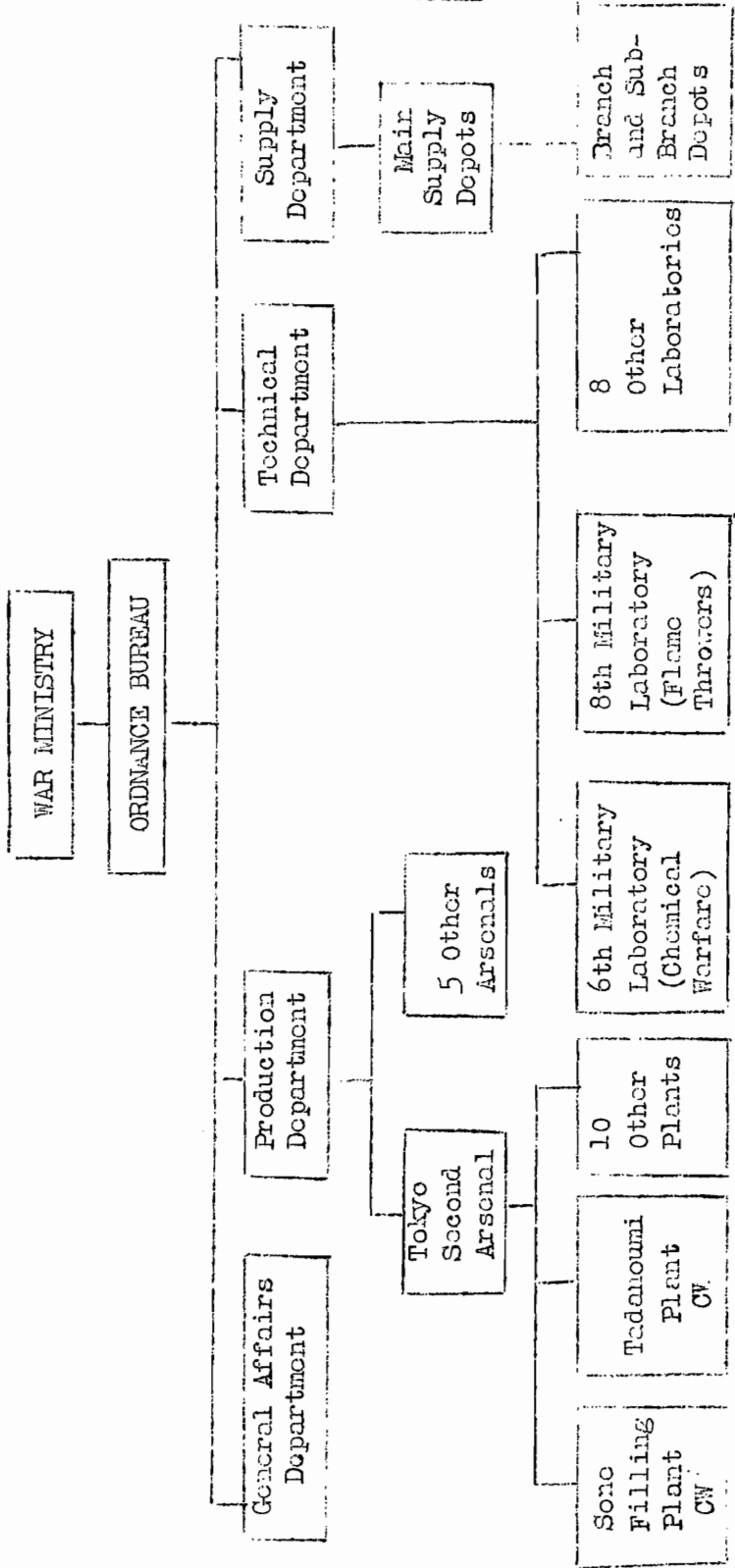
Figure 2 shows the Chemical Warfare organization in the Army Ordnance Bureau. Figure 3 shows the Chemical Warfare organization in the Navy Ministry. There are other Departments, Arsenals and Sections other than those shown, but they do not deal with Chemical Warfare. Bombs were distributed and stored in Naval Air Arsenals all over Japan.

Figure 1. Military Organization of Japanese Empire
 Three installations of interest to Chemical Warfare shown



Supreme War Council
 Army Section
 Navy Section
 (Advisory body to Supreme Command on inspection and training but not on operations or tactics)

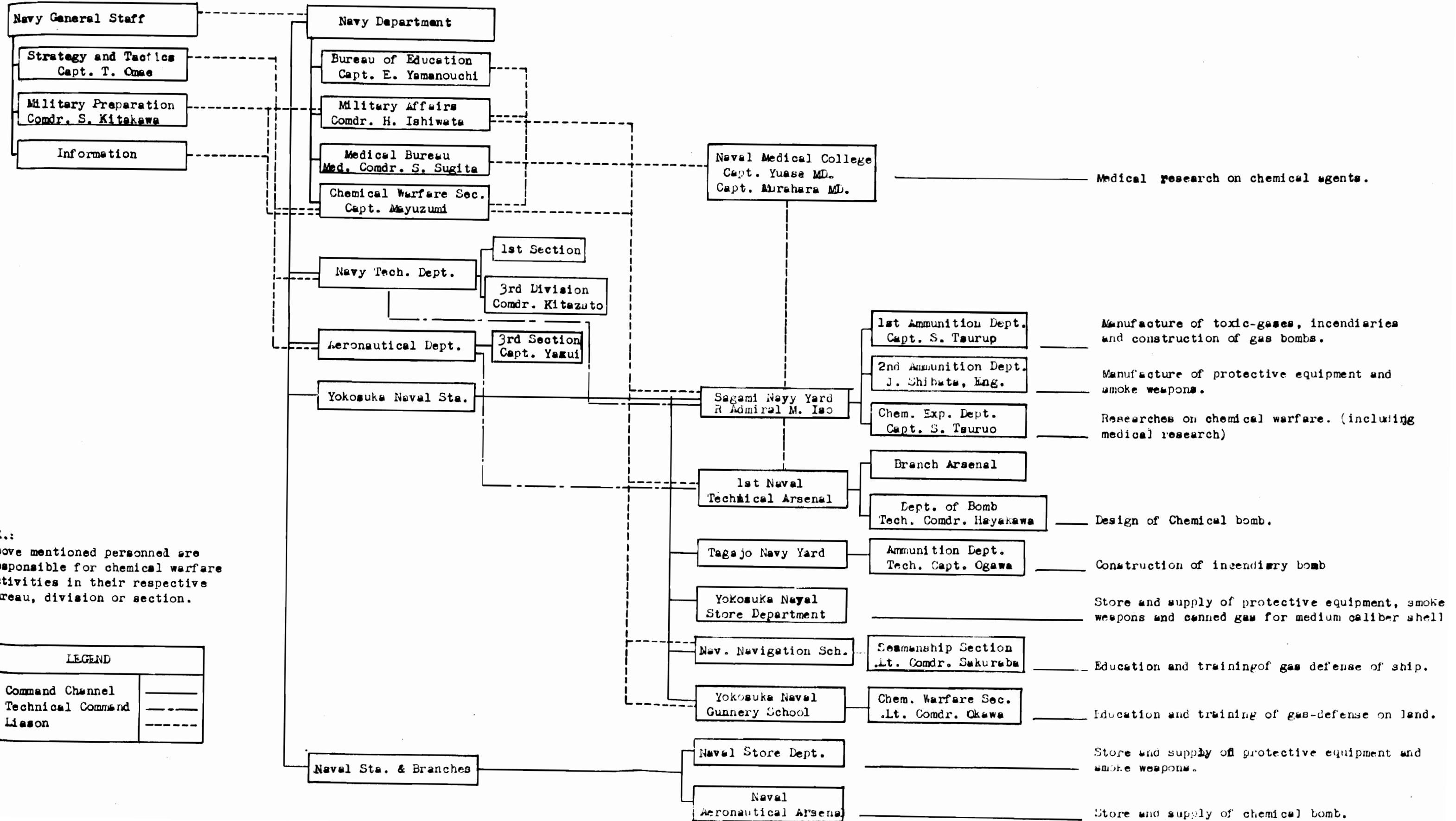
Figure 2. Organization of the Ordnance Bureau of the War Ministry



Only those sections of interest to Chemical Warfare are shown. There were other departments than given above. Only the two plants of Tokyo Second Arsenal shown above produced Chemical Warfare Munitions, and the two laboratories shown conducted Chemical Warfare research. Chemical Warfare supplies were stored in all of the main supply depots, but principal stocks of shell and candles were stored in the branches of Hiroshima Supply Depot.

FIGURE 3

NAVAL CHEMICAL WARFARE ORGANIZATION
(1 AUG. 1945)



NOTE.:
Above mentioned personnel are responsible for chemical warfare activities in their respective bureau, division or section.

LEGEND	
Command Channel	————
Technical Command	- - - - -
Liason	- - - - -

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Further details of research organizations are given in Volume II. Volume III contains full information on manufacturing organizations. Volume IV shows supply organization in detail. Troop organization of chemical units and unit chemical officers and men are treated in Volume VI and par. 4 below.

b. Industrial organization

Strict control over raw materials and production was exercised by the Munitions Ministry which was headed by General Tojo during his tenure as Premier. By a process of allocation, chemical warfare munitions and equipment were produced, generally, as follows:

Toxics	- by Army and Navy Arsenals
Shell	- by Arsenals
Bombs	- by Arsenals
Incendiaries	- Components by both Arsenals and private industry. Filling was done at Arsenals.
Smoke	- Components by both Arsenals and industry. Filling at Arsenals.
Flame throwers	- by private industry
Gas masks	- Army masks by private industry. Navy facepieces by private industry. Canisters and assembly at Arsenals. Civilian masks by private industry.
Protective clothing	- by both Military and private establishments.
Decontamination equipment	- by private industry.
Miscellaneous items such as detector kits, spray tanks, etc.	Mostly by private industry.

Navy production was generally more self-contained in its own Arsenals than Army.

4. TROOPS

The Japanese Army and Navy both had chemical troops. The Navy troops consisted of an anti-gas company which operated under the combined Naval Brigade assigned to the defense of a Naval Station or Base. In addition there were unit gas officers and men

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in all Navy operating echelons. These Navy Chemical Units and unit gas officers and men never saw action in this war in their Chemical Warfare role.

The Army had several types of field gas units which saw action as gas units in China.

Three gas battalions were activated in Manchuria in 1941 and inactivated the following year. Each battalion had a strength of 521 officers and men, with a headquarters, three companies and a supply section. 105 trucks and 27 tanks and gas spraying trailers were provided to carry out the mission of projection of blister gases and toxic smokes.

Five independent gas companies were activated in Manchuria in 1941 and inactivated in 1943. Each company had a strength of 413 officers and men, organized into three combat and one supply section. Portable gas sprayers and toxic smoke candles were provided to disperse blister gas and smoke.

A field gas section of 119 officers and men was activated in China in 1937 and continued until the end of the war. This section used portable sprayers and toxic smoke candles to disseminate blister gas and smoke.

The Morita Detachment, a battalion with a strength of 1,031 officers and men was activated in China in October 1937 and inactivated in August 1940. Attached to the Central China Expeditionary Force and successively attached to more than 12 different divisions, this unit saw action and used toxic smoke candles in campaigns around Szechow, Hankow and south of Shanghai.

Four Chemical Mortar battalions were activated in 1937. Two operated in China near Hankow, and one was at Wewak. Each battalion was equipped with twelve 90 mm light mortars and consisted of a headquarters, three companies and a supply unit. Total strength was 829 officers and men, and 115 vehicles.

The China Expeditionary Force Chemical Section was activated in February 1945 and continued until the end of the war. Composed of 79 officers and men its function was to bring the field forces to the point where they could successfully wage gas warfare.

The Chemical section of the Kwantung Army was activated in March, 1941 and continued until the end of the war. With a total strength of 1,555 officers and men it included a headquarters,

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a gas battalion, a chemical mortar battalion, and a gas research unit. Its mission was to train the Kwantung Army in gas warfare and to be used as combat troops in offensive gas warfare.

Motorized decontamination companies were assigned to 15 of the 178 divisions of the Japanese Army. Fourteen of the divisions were assigned to defend the homeland, Korea and Formosa. The 15th was in Manchuria. All 15 decontamination companies were inactivated in 1944 when it was thought the Allies would not use gas. Each company had a strength of 187 officers and men, with the mission of area and clothing decontamination. Lime spreading armored trailers, light tank prime movers, and steam and hot air decontaminating trucks were organic equipment.

Horse-drawn decontamination units had the identical mission as the motorized units and had 227 officers and men with 100 horses.

Four field chemical sections were activated in 1937 and sent to China where they functioned for a year. Specialists from the Narashino Chemical Warfare School and the Sixth Military Laboratory were included. The mission was to carry out offensive and defensive research in chemical warfare in the field, and to collect intelligence on Chinese Chemical Warfare capabilities. A section had a strength of 110 officers and men. In 1941 a section functioned for a year in Manchuria.

5. SUPPLY

The Japanese having no separate Chemical Warfare Service, supply was handled by all four Bureaus of the War Ministry having supply functions. Vehicles, munitions, weapons and some miscellaneous items were issued by the Ordnance Bureau from its homeland depots to ports of embarkation to field depots and ultimately to the requisitioning division. In like manner, the Intendance Bureau issued gas masks and protective clothing, the Veterinary Bureau handled Veterinary gas casualty kits, and the Medical Bureau issued gas casualty kits and other anti-gas medical supplies. Each of these bureaus was not only responsible for storage and issue, but also for procurement and manufacture. Each maintained its own depots, branch depots, sub-branches and dumps.

Total quantities of supplies on hand at the end of the war indicated an inability to conduct successfully either offensive or defensive chemical warfare. Distribution was in normal supply depots.

6. RESEARCH AND DEVELOPMENT

From an overall viewpoint, the research and development work of the Japanese resulted in failure. Lacking a Chemical Warfare Service as such, and not utilizing civilian scientists or educational or industrial facilities, virtually no new developments not known to the world twenty years ago were made. There was no coordination between the Army and Navy, which went their separate ways. Outstanding failures were to develop new agents and suitable permeable protective clothing. Research continued all through the war and facilities were good, but the best minds were not applied to this work.

7. MANUFACTURING

Detailed reports on manufacturing have previously been submitted. Japanese Chemical Warfare productive capacity was low compared to ours, and production methods were generally not as advanced. Engineering ability was not of the caliber required for large scale mass production. Shortages of critical material likewise hampered production. All toxic production was done in Army or Navy Arsenals, and each had only one plant.

8. TRAINING

Japanese Army Chemical Warfare training was under the direction of the Inspector General of Military Education, one of the top officers of the Japanese Army. Chemical Warfare training was unpopular with the officers of the higher echelons who were generally apathetic to the subject. Few commanders realized the importance of gas warfare, and its place on the training program was unwelcome. Commanders also objected to the length of the courses at the Narashino Chemical Warfare School.

This school, organized in 1933 was splendidly equipped, well staffed and effective in the fulfillment of its mission until the end of the war. A total of 3,074 officers were graduated between 1939 and 1945, with 1945 the peak year of an ascending curve. Students were carefully selected for exceptional mental and physical ability.

Offensive use of gas was not taught after 1942, reportedly on the orders of the Emperor. In 1943 Chemical Warfare courses at the school were discontinued with all personnel stressing mortar training. The Chemical Warfare course for officer candidates had been discontinued in 1940.

██████████

From 1943 to 1945 mobile teams of officers and non-commissioned officers from the Narashino school were formed to conduct retraining and refresher courses of one week's duration on the various fronts and in the homeland.

From the overall point of view, the chemical warfare doctrine taught was sound and training well conducted.

9. TACTICS

The Japanese Army conception of the employment of chemicals and smoke was very similar to our own. Gas was regarded as an auxiliary arm and its tactical application followed conventional lines. Although the peculiar value of gas in the defense was recognized, the many opportunities for use in the offensive were realized and constantly emphasized in instruction and field maneuvers.

In the course of this investigation, two official publications of the Inspectorate General of Military Education dealing with actual experiences from the use of gas in China were located. These documents, classified Top Secret, have been translated and are published herein as Appendices D and E. A third document covering basic principles of Japanese gas tactics was reproduced from memory by Colonel Takeshige Yokoyama, formerly Assistant Commandant at the Narashino School. Translation is published herein as Appendix F. All three documents are rich in sound tactical doctrine, and the first two represent the only recorded planned combat use of gas in World War II available. The lessons pointed out in these documents might well have been taken from our own manuals and service school texts, and are proof that our theories are sound. It should be remembered that all Japanese Army official documents were ordered burned on 15 August 1945, rendering the location of tactical and training manuals most difficult.

The Japanese emphasized thorough planning and preparation, surprise, employment of mass and close coordination. Gas was not in itself relied on to deliver the decisive stroke, but rather to aid the infantry in overrunning enemy positions or defending their own. Knowledge of meteorological conditions and characteristics of different agents were well understood and always considered. The use of screening smokes to cover amphibious operations, river crossings and assaults was recommended and often employed.

[REDACTED]

10. INCENDIARIES

The Japanese apparently failed to realize the importance of incendiary munitions until after they had felt the weight of our incendiary attacks, and their development of incendiary munitions was far behind that of our own and the other major Allied and Axis Military powers. By that time it was too late, for they not only lacked technical skill and productive capacity, but also the air power necessary. No suitable targets were within striking distance.

Numerous Japanese Army officers, speaking of our incendiary attacks, stated that they had a far greater dread of the fire bomb than of HE as the fires were almost impossible to put out and it was more difficult to take cover from fire bombs. Talks with civilians resident in the bombed areas indicate that they received a lesson they will never forget.

11. GERMAN INFLUENCE

The Japanese claim to have received no technical aid from Germany or Italy during the war and this investigation unearthed no evidence to the contrary.

12. CONCLUSIONS

a. Japanese Chemical Warfare was sub-standard and inadequate to the needs of a modern first-class military power. At no time during the war were the Japanese capable of participating in large scale chemical warfare with a first-class military power.

b. The lack of a separate Chemical Warfare Service resulted in the failure to develop an integrated, balanced and coordinated program. This is apparent from the failure of its research and development installations to develop: (1) Any new war gases or chemical weapons not known to the world twenty years ago; (2) protective clothing capable of sustained wear and adequate to protect against blister gases; (3) gas masks which would afford competent protection against newer, highly toxic war gases developed by other nations; (4) production facilities and techniques capable of efficient, high volume production.

c. Tactics were sound and training generally well-conducted, but the efforts were met with a lack of enthusiasm at the higher echelons.

[REDACTED]

d. The Japanese successfully used harrassing agents in local tactical situations against the Chinese over a period of years. It should be borne in mind that the Chinese were greatly lacking in gas masks and other protective equipment, hence were easy victims to gas attack, whatever the agent employed.

c. The Japanese are fortunate that the Allies did not choose to employ all-out gas warfare. Allied use of gas would certainly have saved many casualties and undoubtedly shortened the war.

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APPENDIX A

This report on Japanese Chemical Warfare has been prepared following an investigation pursuant to the following instructions, copies of which are part of this Appendix:

1. Letter, Subject: "Post-Hostilities Chemical Warfare Mission", from Office of the Chief Chemical Warfare Service, Washington 25, D. C., file SPCVO 679 Pacific, dated 25 September 1945.

2. Check Sheet, Subject: "U. S. Governmental Intelligence", from G-2 (Tech Intel), GHQ, AFPAC, to Chief, CWS (Attn: Tech Intel O.), 13 Nov 45, and Notes 1 and 2 thereto.

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ARMY SERVICE FORCES
OFFICE CHIEF OF CHEMICAL WARFARE SERVICE
WASHINGTON 25, D. C.

SPCVO 679 Pacific

25 September 1945

SUBJECT: Post-Hostilities Chemical Warfare Mission

TO: Chief Chemical Officer
Hq. USAFPAC
APO 500, c/o Postmaster
San Francisco, California

1. The post-hostilities Chemical Warfare intelligence mission as indicated by the War Department A. C. of S., G-2 consists of two separate and distinct projects:

a. An investigation of Japanese research establishments, training centers, munitions dumps and equipment depots to obtain all possible information concerning the trend and extent of CW research, CW doctrine and intentions, kinds and quantities of munitions and equipment.

b. An investigation of chemical manufacturing plants, both those engaged in manufacturing CW and commercial chemical products.

2. A detailed statement of the information desired with respect to each product is inclosed.

3. It is understood that there is sufficient qualified personnel in the Theater for the accomplishment of the first project.

4. For the second project a list of selected personnel was forwarded by radio 60713 dated 6 September 1945. Following instructions in Urad C 14023 dated 13 September 1945 no further action will be taken pending further instructions from the Theater. It is pointed out, however, that many of these officers soon may become surplus here and hence be eligible for discharge from active duty. It is desirable that your decision and reply be made at an early date.

5. On the basis of the intelligence obtained under these two projects, it is hoped to have prepared three comprehensive documents:

SPCVO

a. A narrative account covering the entire story of Japanese chemical warfare as determined through intelligence sources from the beginning of the war through the final exploitation of the military targets involved in project one.

b. A hand book, illustrated with photographs of drawings, giving complete descriptions of all items of Japanese CW equipment and material.

c. A summary of the Japanese chemical industry as related to war economy, including a separate chapter or appendix for each major product.

6. Since most of the information for the above publications will originate or be confirmed in projects one and two, it is believed desirable for the subject matter for these publications be prepared in your Theater with an opportunity given this office to supplement it with information obtained from other Theaters before it is put in final form.

7. Separate and distinct from the intelligence mission described in projects one and two, above, is the problem of control and continued operation of the Japanese chemical industry. This is presumed to be entirely a Theater function. At any rate it is one on which this office has no information or statement of War Department policy. It is assumed that the sole responsibility of this office in this matter is to obtain, insofar as possible, qualified personnel for the duties indicated.

8. A list of officers considered suitable for such duties (separate and distinct from the list referred to in paragraph 4 above) is being compiled and will be submitted when requested. It is presumed that these officers, if requested will be needed on a longer term basis. It is likewise desirable that your needs be made known promptly.

9. All requests for personnel should state whether request is for permanent assignment or temporary duty and approximate length of temporary duty.

FOR THE CHIEF, CHEMICAL WARFARE SERVICE:

ALDEN H. WAITT
Brigadier General, CWS
Acting Chief, Chemical
Warfare Service

1 Incl
Detailed statement

~~SECRET~~

SCOPE OF CW TARGET INVESTIGATION

1. CW RESEARCH ESTABLISHMENTS -- The exploitation of these targets should determine the nature and extent of Japanese CW research. All pertinent documents should be impounded and all leading scientific personalities should be interviewed to determine the trend of their research and the progress they have made toward the development of any possible new agents. Special watch should be maintained to detect any German influence in their research and development. It is of prime importance to determine whether the Japanese had any information concerning the new German agents.

2. CW STORAGE DUMPS AND DEPOTS -- An inventory should be made of stocks of all items in order that a record may be had of the kinds and quantities of Japanese CW equipment and munitions. Information should be sought from attendants as to whether offensive munitions had ever been stocked in large quantities outside the Japanese home islands. If so, where? The location of gas munitions dumps should be noted with reference to their use against a landing operation if that had developed. Special attention should be given to determining the key to the markings of CW munitions.

3. CW TRAINING CENTERS -- From such installations should be obtained copies of all CW training, tactical, and technical manuals with complete information concerning current CW doctrine and the current CW organization in the Japanese army. Documents, together with interviews with leading military personalities, should reveal the extent of Japanese preparedness and capacity for gas warfare and their intentions with reference to the initiation of gas warfare or retaliation.

4. MANUFACTURING PLANTS -- Such plants naturally divide themselves into two categories:

a. Plants Engaged in the Manufacture of CW Products -- Concerning these it is desirable to know the kinds of materials manufactured, capacity of the plants, stocks of raw materials and finished product on hand, processes used with detailed descriptions and drawings of new processes. In this connection special attention should be paid to any evidence of German influence.

b. Plants Engaged in the Manufacture of Commercial Chemical Products, such as Synthetic Rubber, Synthetic Oil, Plastics, Fine Chemicals, Pharmaceuticals, etc. -- From these investigations, reports are expected on any new

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chemical products developed by the Japanese, including information as to plant processes, raw materials, maintenance, and manufacturing equipment, supplemented, when possible, by flow sheets, drawings, photographs, specifications or other documentary material. Similar information is desired concerning new processes of manufacturing standard chemical products. As above, any indication of German influence should be noted. In addition to the examination of the products themselves, to complete the exploitation of these targets under both categories mentioned, it is believed that it will be necessary to interview a number of the leading Japanese chemical industrialists. It is hoped to obtain from this survey an accurate estimate of the manufacturing capacity remaining in the Japanese islands for the manufacture of CW agents and the principal commercial chemical agents.

[REDACTED]

APPENDIX B

List of War Department Targets assigned to the Chemical Section, GHQ, AFPAC for investigation. This report, in its six Volumes, covers these targets insofar as Chemical Warfare activities are concerned:

Target No.	Name	Place
1	Nippon Soda Co., Ltd	Aizu, Nagasaki Ken
5	Area 12 mi W of Kobe	Kobe, Japan
15	Great Japan Chloride Co., Ltd.	Amagasaki, Hyogo Ken
20	Great Japan Chloride Co., Ltd.	Amagasaki, Hyogo Ken
35	Gas Factory	Fujisawa, Kanagawa Ken
38	Senko Co., Ltd.	Fukagawa, Sorachi Ken
63	Nippon Soda Co., Ltd.	Hakodate, Oshima Ken
75	Gas Factory	Himeji, Hyogo Ken
78	Naval Arsenal	Hiratsuka, Kanagawa Ken
85	Japanese Army Ordnance Depot	Hiroshima, Hiroshima Ken
86	Synthetic Chemical Works	Hiroshima, Hiroshima Ken
103	Hodogaya Soda Co., Ltd.	Hodogaya, Kanagawa Ken
111	Japanese Army Arsenal	Iwahana, Gumma Ken
113	Nippon Soda Co., Ltd.	Iwase, Toyama Ken
115	Kirin Brewery	Juso, Osaka Fu
147	Nippon Soda Co.	Kawasaki, Kanagawa Ken
148	Showa Electro Chemical Co.	Kawasaki, Kanagawa Ken
162	Japanese Naval Station	Kisarazu, Chiba Ken
182	Nisshin Milling Co., Ltd.	Kobe, Hyogo Ken
197	Asahi Glass Co.	Kokura, Fukuoka Ken
198	Japanese Army Arsenal	Kokura, Fukuoka Ken
209	Shionogi Co., Ltd.	Kase, Aichi Ken
218	Navy Arsenal	Kuro, Hiroshima Ken
226	Kuro Island Gas Factory	Kuro Island, Hiroshima Ken
240	Kyoto Imperial University	Kyoto, Kyoto Fu
251	Navy Arsenal	Maizuru, Kyoto Fu
319	Aichi Tokei Co., Ltd.	Nagoya, Aichi Ken
320	Army Arsenal	Nagoya, Aichi Ken
322	Great Japan Cellophane Plant	Nagoya, Aichi Ken
323	Nissan Chemical Plant	Nagoya, Aichi Ken
338	Japanese Army CW School	Narashino, Chiba Ken
342	Nippon Soda Co., Ltd.	Nihongi, Saitama Ken
360	Shionogi Co., Ltd.	Nishi-Yodogawa, Kyoto Fu
363	Nihon Synthetic Chemical Ind. Co., Ltd.	Ogaki, Gifu Ken
365	Army Arsenal	Oji Tokyo To
415	Nippon Soda	Osaka, Osaka Fu

Target No.	Name	Place
417	Nippon Soda Co.	Osaka, Osaka Fu
418	Mitsui Enterprises	Osaka, Osaka Fu
421	Nissho & Co., Ltd.	Osaka, Osaka Fu
423	Army Arsenal	Osaka, Osaka Fu
468	Kondo Chemical Co., Ltd.	Sakai City, Osaka Fu
508	Taki Fertilizer Co., Ltd.	Shikama, Hyogo Ken
511	Nitto Sodium Sulphate Co.	Shimonoseki, Yamaguchi Ken
522	Shiojiri Gas Factory	Shiojiri, Nagano Ken
635	Chemicals Bureau, Munitions Ministry	Tokyo, Tokyo To
636	Mitsui Ltd.	Tokyo, Tokyo To
640	Great Japan Fertilizer Co., Ltd.	Tokyo, Tokyo To
643	Shigomasa Mask Manufactur- ing Works	Tokyo, Tokyo To
644	Yodogawa Industry	Tokyo, Tokyo To
645	Japanese Army Scientific Research Institute	Tokyo, Tokyo To
646	Chemical Research Lab.	Tokyo, Tokyo To
648	Fujikura Industries Co.,Ltd.	Tokyo, Tokyo To
649	Nippon Soda Co.	Tokyo, Tokyo To
713	Nippon Soda Co., Ltd.	Toyama, Toyama Ken
729	Uraga Filling Plant	Uraga, Kanagawa Ken
730	Fujikura Industries Co.,Ltd.	Urawa, Saitama Ken
768	Yokohama Rubber Co.	Yokohama, Kanagawa Ken
780	Yokosuka Area	Yokosuka, Kanagawa Ken
770	Nippon Soda Co.	Yokohama, Kanagawa Ken
809	Torakichi Nishikawa	Fukuoka, Fukuoka Ken
810	Kanji Terano	Fukuoka, Fukuoka Ken
843	Gen-itsu Kita	Kyoto, Kyoto Fu
844	Shinkichi Horiba	Kyoto, Kyoto Fu
845	Shigoru Komatsu	Kyoto, Kyoto Fu
880	Riko Majima	Osaka, Osaka Fu
881	Ichitaro Namari	Osaka, Osaka Fu
909	Shin-ichiro Fujise	Sandai, Miyagi Ken
910	Ryozaburo Hara	Sandai, Miyagi Ken
911	Fusao Ishikawa	Sandia, Miyagi Ken
912	Matsusuke Kobayashi	Sandai, Miyagi Ken
1021	Seiji Kondo	Tokyo, Tokyo To
1022	Fusajiro Kotora	Tokyo, Tokyo To
1023	Bonnosuke Kubota	Tokyo, Tokyo To
1024	Koichi Matsubara	Tokyo, Tokyo To
1025	Teikichi Sato	Tokyo, Tokyo To
1026	Keita Shibata	Tokyo, Tokyo To
1027	Yuji Shirata	Tokyo, Tokyo To
1028	Isaburo Wada	Tokyo, Tokyo To
1067	Kazuo Ando	Fukuoka, Fukuoka Ken


Target No.	Name	Place
1068	Sutozo Kuriyama	Fukuoka, Fukuoka Ken
1069	Koiji Oda	Fukuoka, Fukuoka Ken
1088	Giichiro Fuseya	Sendai, Miyagi Ken
1089	Kyosuke Nishigawa	Sendai, Miyagi Ken
1097	Naoto Kamcyama	Tokyo, Tokyo To
1098	Kyuhci Kobayashi	Tokyo, Tokyo To
1099	Toshio Maki	Tokyo, Tokyo To
1100	Mototaro Matsui	Tokyo, Tokyo To
1356	Kyushu Imperial U.	Fukuoka, Fukuoka Ken
1410	Kyoto Imperial U.	Kyoto, Kyoto Fu
1418	Mitsui Mine Miiku Dye Mfg. Plant	Miiku, Kumamoto Ken
1429	Nagoya Imperial University	Nagoya, Aichi Ken
1453	Army Chemical Warfare School	Narashino, Chiba Ken
1468	Technical Research Institute	Osaka, Osaka Fu
1525	Tohoku Imperial U.	Sendai, Miyagi Ken
1619	Inspectorate of Chemical Warfare	Tokyo, Tokyo To
1659	Tokyo Army Medical School	Tokyo, Tokyo To
1660	Tokyo Imperial U.	Tokyo, Tokyo To
1661	Army Medical College	Tokyo, Tokyo To
1662	Naval Medical College	Tokyo, Tokyo To
1663	Main Medical Supply Depot	Tokyo, Tokyo To
1664	War Ministry Medical Adm. Bureau	Tokyo, Tokyo To
1665	Kitazato Institute for Infectious Diseases	Tokyo, Tokyo To
1666	Tokugawa Institute of Biological Research	Tokyo, Tokyo To

[REDACTED]

APPENDIX C

The following former officers of the Japanese Army and Navy were interrogated to obtain information concerning the Chemical Warfare policies and intentions of the Japanese. The substance of their testimony is published in Volume I. Copies of reports of interrogation are on file in the Office of the Chief, Chemical Warfare Service, Washington 25, D. C.; A. C. of S., G-2, SCAP, APO 500; Chemical Section, GHQ, AFPAC, APO 500.

General Hideki Tojo
Field Marshal Shunroku Hata
General Masakazu Kawabe
General Hayao (Shun) Tada
Admiral Shigetaro Shinada
Lt. Gen. Kaneshiro Shibliyama
Maj. Gen. Kanemasa Akiyama
Colonel Toyooki Morita
Colonel Takeshige Yokoyama
Colonel Keizo Miyazaki
Captain Sadao Tsuruo
Colonel Tadaharu Okano
Lt. Col. Susumu Sekiguchi
Lt. Col. Shinroku Iwakoshi
Lt. Col. Teruto Kunitake
Commander Yasuo Kitazato



Appendix D

This Appendix consists of a translation of a captured Japanese Army document published by the Inspectorate General of Military Education October, 1938, subject: "Lessons From the China Incident", No. 5, Chemical Warfare Section, dealing with experiences of the Japanese Army using smoke and toxic smoke against the Chinese. Maps from the original document have been reproduced and are included. A table of place names mentioned in the document giving both the Romanized Chinese and the Chinese Characters precedes the translation.

Romanized ChineseChinese Character

Chien-Shien Bridge	- - - - -	慶興橋
Chen-Chä-Tsong	- - - - -	鎮家莊
Chang-Chä-Geow(Tsao)	- - - - -	張家角
Chang-Ku-Hill	- - - - -	張鼓峰
Chien-Da-Low	- - - - -	權大樓
Chü-Wuo	- - - - -	曲沃
Cho-Ko River	- - - - -	長江
Chu-Tsong	- - - - -	朱庄
De-Chin	- - - - -	茨涇
Ging-Chä-Tun	- - - - -	金家屯
Ho-Tai-Tze	- - - - -	後臺子
Hon-I	- - - - -	洪儀
Huai-Nan	- - - - -	淮南
Hwang-Chä-Kon	- - - - -	黃家崗
Ku-Toi-Wang	- - - - -	古推王
Ku-Chen	- - - - -	固鎮
Kwang-Sei	- - - - -	廣四
Lu-Chä	- - - - -	陸家橋
Lung-Tö-Tan	- - - - -	新頭填
Lai-Hill	- - - - -	賴山
Liu-Chä-Shen	- - - - -	劉家行
Liu-Tsong	- - - - -	劉庄
Meng-Chä-Tsong	- - - - -	猛家莊
Pai-Chä-Tung	- - - - -	自家郢
Pai-Moi-Ho	- - - - -	白卯河
Pai-Sä-Tsii	* - - - -	北渚宅

Romanized ChineseChinese Character

Pai-Ten-Tsii	- - - - -	北店宅
Sä-Chao-Hill	- - - - -	沙草峰
San-Chä-Wang-Tzen	- - - - -	三家王陳
Shang-Yo	- - - - -	上空(寮)
Sheo-Wang-Chä	- - - - -	小王家
Sheo-Chu-Tsong	- - - - -	小朱庄
Shien-Tai-Tze	- - - - -	前臺子
Shie-Ho-River	- - - - -	三解河
Shim-Ten-Ge	- - - - -	新店集
Shi-Ho-Ge	- - - - -	寺後集
Shon-Kow	- - - - -	香口
Shou-Hsien	- - - - -	壽縣
Soo-Chow-Creek	- - - - -	蘇州河
Su-Shien	- - - - -	宿縣
Sze-Wai	- - - - -	四會
Tä-Wa-Fon	- - - - -	大瓦房
Tä-Chiang-Tsung	- - - - -	大場鎮
Tä-Ping-Bridge	- - - - -	大平橋
Tan-Shek-Bridge	- - - - -	丹石橋
Tien-Tsin-Puko	- - - - -	津浦
Tsoon-I-Hill	- - - - -	松乙峰
Tsai-Nin-Tsii	- - - - -	蔡寧宅
Tung-Yu-Meo	- - - - -	東嶽廟
Tze-Kao-Tsii	- - - - -	池海宅
Wang-Chä-Tsong	- - - - -	王家庄
Wang-Chä-Shen	- - - - -	王家巷

Romanized Chinese

Chinese Character

Wen-Hun-Tong	- - - - -	文 崗 堡
Wang-Chä-Low	- - - - -	王 冢 樓
Whai-Ho-River	- - - - -	澮 河
Whu-Chä-Yuan	- - - - -	胡 家 園
Whon-Saen-Pu	- - - - -	荒 山 埠
Wu-Sung-Tsung	- - - - -	吳 淞 鎮
Young-Shen-Tsung	- - - - -	揚 行 鎮

"Lessons from the China Incident"

No. 5, Chemical Warfare Section

Army Top Secret
Serial No. 2211

Prepared Oct. 13, 1938
By Inspectorate General
of Military Education
44 pages including covers
and illustrations.

This booklet contains lessons dealing with chemical warfare which are derived from experiences in the field in the China Incident. It is intended as reference data in giving the Japanese Army instructions about chemical warfare.

Masataka Yamawaki

Chief of Staff,
Inspectorate General of
Military Education

October 1938.

Table of Contents

Chapter I Smokes

- 1 Morale training
- 2 Effects of smokes
- 3 Plans and preparations
- 4 Cooperation among various branches of service
- 5 Special advantages of smokes in combat at close quarters
- 6 Flame and incendiary shells

Chapter II Special smokes

- 1 Morale training
- 2 Effects
- 3 Plans and preparations
- 4 Operations

Example No. 1
Breaking through fortified position under cover of special smokes

Example No. 2
Turning the combat situation to our advantage under cover of special smokes

Example No. 3
Driving out the enemy by using special smoke candles Type A

Example No. 4
Successful offensive operations at dusk under cover of smoke

Chapter III Lessons derived from the Conflict at Chang-Ku Hill

- 1 Some considerations on the use of gas by the Soviet Army
- 2 Lessons regarding our use of gas
- 3 Lessons from our defense measures against gas
- 4 Some examples of combat in the present conflict

Chapter I SMOKES

1. Morale training

The efficacy of a smoke screen differs according to the time and place, therefore before you use it you must use accurate judgment as to its possible effects and seek ways to make the best use of it. However you must not let such considerations interfere with your determination to carry on the combat, and even if you are not fully assured of the advantages of a smoke screen you should in no way relax your attack. Moreover the effects of a smoke screen decrease as time passes and repetition of screening brings about a lesser degree of success. The troops at the front should always be on the alert to achieve the best possible results by the first smoke screening.

2. Effects

- (1) If you advance under cover of smoke you will incur smaller casualties as the firing by the enemy is impeded by the smoke screen, but repetition of an insufficient smoke screen at one place is unwise as it gives the enemy time to make preparations for firing through the smoke. We shall then in the course of advance become the target of a barrage by the enemy especially at river crossing points.
- (2) When a smoke screen is spread in an adequate way over the front of the enemy and endures for 30 to 40 minutes it will inhibit firing by the enemy and cause confusion in the enemy lines which will then give us the best opportunity to assault them.

In the course of offensive operations across the ~~Sochow Creek~~ ^{Sochow Creek} waged by the 3rd Division the first attempt to cross the river was made 31st October under cover of a smoke screen which persisted about 40 minutes, but failed because of several unfavorable conditions. The following day a second attempt was made and this time the smoke screen lasted over an hour and a half, and better success was obtained.

- (3) In the case of an enemy that obstinately resisted our attack, when we approached 70 metres from their position we started screening by smoke at a bugle mess call and as the enemy stopped firing apparently troubled by the smoke, we made a charge on the enemy at a bugle charge call and captured the position.

We observed that the enemy was frightened by our bugle charge calls. (Combat at Ging-Chă-Tun) The Chinese Army had little knowledge of gas defense, consequently they were not only troubled by the smoke, but they misunderstood the smoke as poisonous gas.

- (4) Even in an adverse wind smoke can be used to our advantage by spreading it over the flanks of the enemy, thus supressing their fire. But if we are not careful, the smoke may be used by the enemy to their benefit. (Battle on the east side of Young-Shen-Tsung and Battle of Chang-Chă-Geow near the De-Chin Creek)

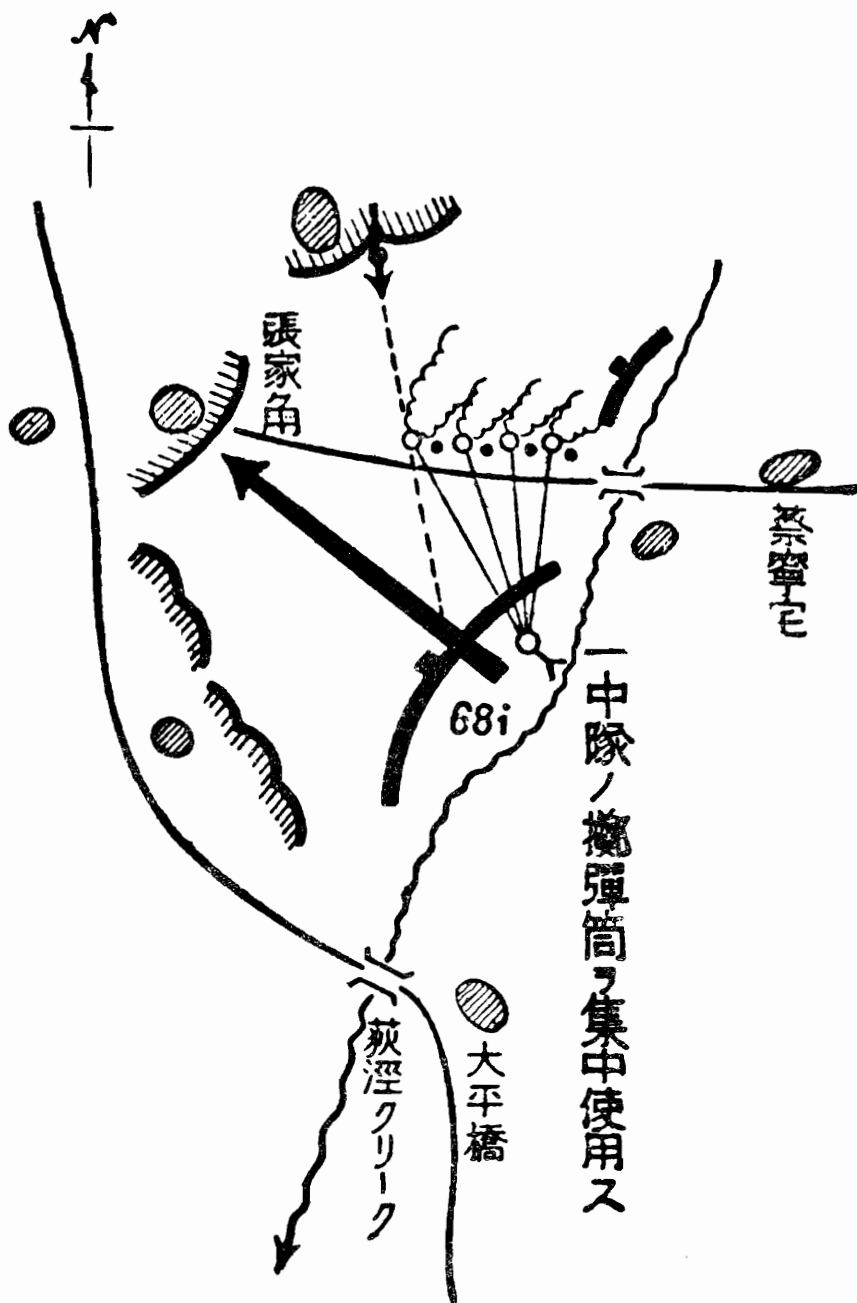
Chan-Cha-Geow

De-Chin
Creek

Ta-Ping Bridge

The Hand Grenades of a
whole Company were concentrated

Tsai-Win-Tsai



五 部落ノ配置 觀測所ノ設置ト相俟チテ一部ノ射撃及煙ヲ巧ニ利用セバ
 敵ヲ一方ニ牽制シ更ニ企圖スル突入點ニ對シ煙ヲ使用（重擲彈筒ヲ以テ
 煙彈ヲ集中スル等）セバ益 敵ヲ混亂ニ陥レ攻撃ヲ成功セシムルコトア

敵ノ機關銃ニ側射セラ
 レ前進困難トナルヤ
 二、三米ノ逆風ヲ利用
 シ擲彈筒ノ煙彈ヲ以テ
 縱煙幕ヲ構成シ敵ノ側
 射ヲ避ケツツ一舉張家
 角ニ突入之ヲ奪取セリ

The enemy machine guns firing on our flank made our advance almost impossible. Whereupon taking advantage of the adverse wind of 2 to 3 metres, we formed a smoke screen lengthwise by smoke grenades, broke through into the position of Chang-Tsa-Tsao.

- (5) Making good use of the position of a village, and by a well selected observation post, you can divert the attention of the enemy by limited fire and a smoke screen. Furthermore if you spread a smoke screen by concentrating heavy smoke grenades over the point at which you wish to penetrate, it will throw the enemy into confusion. (battle at Tan-Shek Bridge)
- (6) Fire from enemy heavy weapons and snipers had better be checked by our heavy weapons, light machine guns and rifles. Attack can be made upon the enemy while the enemy fire is thus checked. If this method is carried out at the right time, infantry alone will be able to break through lightly fortified positions.

In a case like this the use of smoke candles is not advisable, as they may interfere with our own fire and inhibit the forward movement of our troops.

3. Plans and preparations

It has often happened that in smoke screening the plan and practice do not agree, therefore when you mean to use a smoke screen you must carefully work out your plan and make your preparations as complete as the battle situation permits.

- a. Under enemy fire the smoke soldiers usually give no thought about the smoking time of the smoke candles and go on igniting the candles one after another, which shortens greatly the duration of a smoke screen. (Amphibious operations at Wu-Sung):
- b. Under enemy fire the accumulation of smoke candles necessary to carry out our plan is often found difficult.
- c. In smoke screening to cover a river crossing operation there is often a difference in the

effectiveness of the screen between the front of those units that attempt the passage and other units.

Example where screening plan and practice were successfully carried out:

Screening plan:

1. The operation will be divided into two parts. Each battalion should closely cooperate in making a dense smoke screen and following close to the screen move forward into the enemy position. Separate smoke squads should take care of screening against enemy flank fire.
2. Wind direction
We assume it to be 1 or 2 metres east wind.

Main point of procedure:

1. First part (for the 1st line position)
In case of making a river crossing and penetrating the enemy's position.
 - (1) Each battalion should order the company at the first line to make a screen over the whole front line, while the 1st battalion makes a vertical screen to cover the left flank against enemy fire.
 - (2) Number of smoke candles required:
2nd and 3rd battalions, 60 candles each
1st battalion, 60 candles together with 30 substitute smoke candles.
2. Second part (for the 2nd line position)
 - (1) Under cover of smoke screen formed in the manner outlined above, advance should be made to the line already designated, while if necessary the 1st and 2nd battalions make a vertical screen to cover the flank.
 - (2) Number of candles required:
1st battalion - 60 candles together with 30 substitute candles
2nd battalion - 80 smoke candles
3rd battalion - 60 smoke candles
 - (3) If the wind is north or south, each battalion forms its separate smoke squads and forms a smoke screen in the most effective way according to wind direction.

Screening plan to assist the attack on enemy's positions in the neighborhood of Liu-Cha-Shen (OJ 1st 1937)

In case of need

Pai-Ten-Tsui
180 Candles

150 Candles

Pai-Sa-Tsui Wen-Hung-Tong
130 Candles
(Together with,
6 substitute
candles)

Liu-Cha-Shen

Remarks

1. The Figures such as 180 candles show the number of smoke candles supplied to each infantry battalion.
2. The following Diagram shows the condition of the creeks.

II Front	High tide Low tide Mud	300 M 1.80 M	III Front	High tide Low tide Mud	2.50 M 1.50 M	Ist Front	High tide Low tide Mud	2.50 1.30	Possible to wade through river
	Unpassable on foot			Impossible to climb the banks Destroy the banks by Artillery guns			Possible to climb over the bank		

(日一月十年二十年和昭於)

第一 第二 次ニ分チ各大隊連繫シテ
濃密ナル煙幕ヲ構成シ之ニ盾隨敵
陣ニ突入ス尚側防火器ニ對シテハ縱
煙幕ヲ發煙班ヲシテ構成セシム

二 風向

一 二米東風ト豫想ス

一 第一次(第一線陣地ニ對スルモノ)

渡河及突入ヲ強行スル場合

1 各大隊ハ第一線中隊ヲ以テ全線ヲ蔽フ如ク
發煙シ得ニ第二大隊ハ左方ヨリスル側防ニ對
シテ縱煙幕ヲ構成ス

2 使用發煙筒

Ⅱ 各六〇本以内

Ⅰ 六〇本(別ニ代用發煙筒三〇本)

二 第二次(第二線陣地ニ對スルモノ)

1 右要領ニ基キ發煙シ所命進出線ニ進出ス
時ニ第一第一大隊ハ各側防ニ對シテ要スル
縱煙幕ヲ構成ス

2 使用發煙筒

Ⅱ 八〇本

Ⅲ 六〇本

Ⅰ 六〇本(別ニ代用發煙筒三〇本)

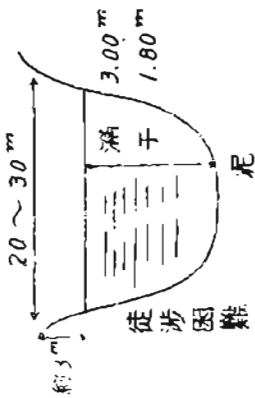
三 風向北(南)風ナルトキハ各大隊毎ニ
發煙班ヲ編成シ風向ニ應ジ煙幕ヲ構
成セシム



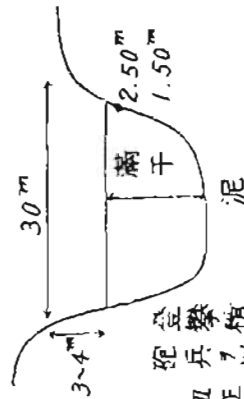
備考

一 右圖中二八〇本等ハ各歩兵大隊配當發煙筒數ヲ示ス

二 「フック」ノ状態左ノ如シ



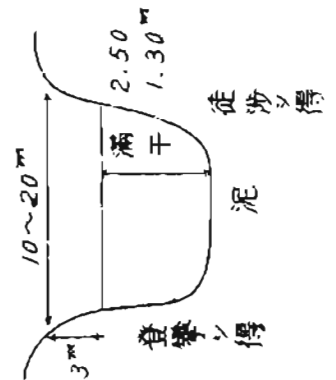
Ⅱ 正面



Ⅲ 正面

登攀稍困難ナリ
砲兵ヲ以テ岸壁ヲ破壊セシム

Ⅲ 正面ニ三條



Ⅰ 正面

約 10000

4. Cooperation among various branches of the service

If the advance is made unhesitatingly and opportunely under cover of an effectively formed screen, we can inhibit the enemy's fire and bring about comparatively quick and easy victory without incurring great casualties.

However, it must be noted that if the area covered by the screen is small or the duration of the screening is too brief or the same method of screening is repeated at the same area, the result will not be so satisfactory and the casualties may be great.

It is imperative that if we are to have the greatest benefit of a smoke screen with the least casualties, thorough preparations must be made by each branch of the service and close coordination among the activities of various branches of the service must be planned in advance. Some of the essential points to be considered in this respect are as follows:

a). Infantry

- (1) The infantry should boldly advance keeping close to the screen and in spite of enemy fire be determined to fight the battle to a finish.
- (2) The target of attack and the route leading to it must be definitely marked out and recognized beforehand in order that unflinching advance toward it can be made.
- (3) With the dispersion of the screen, enemy fire, especially from their flanks will revive suddenly, therefore we must be prepared to counter-attack them with our own heavy weapons and grenades, simultaneously cooperating with the artillery.

In a case like this, we should have well fortified shelter for our heavy weapons so that we can exchange fire with the enemy fire from shelters or pillboxes. Tanks will play an important role in this kind of battle.

b). Artillery

- (1) Most artillery fire will usually be done before the smoke screen is started, therefore the target should be accurately recognized and all the necessary data be carefully calculated in order that even

after the screen is formed they can continue firing through the screen.

- (2) Under cover of the screen on the first line the artillery will move forward close to the enemy position. Plans must be carefully worked out in advance as to the method of fire to cover our soldiers after they break into the enemy position.

c). Engineers

- (1) Their function is to build a bridge over a river under cover of a smoke screen in close cooperation with the infantry. In operations connected with crossing a river, preliminary protective fire, smoke screening, bridge building, barrage to cover the advance of infantry and the final advance into the enemy position follow one another without any interval, hence thorough preparations must be made in advance.
- (2) All engineering operations such as the preparation of crossing a river and the arrangement of firing positions for heavy weapons which are to furnish protective fire should be carried out carefully under any circumstances whether it be at night or whether there be a smoke screen or not.

(One of the aides de camp to Central China expeditionary forces).

5. Special advantages of smokes in combat at close quarters

In offensive operations against a strongly fortified position held by an enemy of superior strength we often have to use guns of large calibre to smash the vital points of the enemy position, especially their sheltered machine gun positions (pillboxes).

In battles of this kind the infantry may have to be removed some distance away from the enemy positions to prevent unnecessary casualties from our artillery, but such a procedure will often give the enemy time to recover fighting strength before our infantry can approach close enough to penetrate them.

On such an occasion various kinds of smoke and flame weapons can be employed to our advantage by suppressing

enemy fire, especially those machine gun positions which remain defiladed to our fire. This will help our infantry to break through the enemy position before the enemy can recover his fighting strength.

When the infantry of the first wave, though at close quarters to the enemy, find it difficult to deal a decisive attack upon them, the use of various kinds of smoke will be found as effective as flame and explosives.

(Battles at Liu-Cha-Shen, Ta-Ch'ang, and
Soochow Creek)

6. Flame throwers and incendiary shells

Flame throwers and incendiary shells can be employed with satisfactory results in the mopping up of obstinate enemy pillboxes and also in attacking key positions to the windward, because in the latter case the smoke generated by the flame will blind the enemy and envelop their firing.

For instance, in the attack on Usunchin, some incendiary shells were thrown into the villages to the windward and the smoke and flames thus generated were used to our advantage, while in the battle at Soshu River glass bottles filled with petroleum with oil-soaked cloth-stoppers were thrown into the enemy for similar purposes and found effective.

(Battles at Wu-Sung-Tsung, Young-Shen-Tsung, and
Soochow Creek)

Chapter II SPECIAL SMOKES

1. Morale training

As regards morale training there remains little to be added to the instructions already set forth in Para 1 of the foregoing chapter. We will only point out that as the effectiveness of special smokes changes more rapidly as time passes than ordinary smokes, we must be on the alert to take action while the smoke is still in effect.

Sometimes we note that soldiers hesitate to take immediate and timely action while the smoke screen is most effective. This is mainly because of their ignorance as to the effectiveness of special smoke and consequently they are afraid of countercurrent or travelling back of the smokes. However they ought to know that they are better protected and trained in chemical warfare than the enemy and should be intent upon inflicting the greatest possible blow upon the enemy.

For instance in the actual engagement No. 3 cited later in this booklet, we know of an unfortunate case where a certain unit hesitated to move forward even while the enemy stopped firing upon being molested by our smoke screen. Furthermore when the enemy headquarters in the rear was thrown into confusion by our smoke screen, this unit wasted some two and a half hours before starting action, consequently they failed to bring about a decisive victory.

2. Effects of special smokes

- (1) Against an enemy poorly equipped with gas protective materials, a small amount of special smoke let loose in the course of battle will cause fear and kill morale in the enemy rear echelon, which will often lead to retreat, thus enabling a comparatively small force to capture a strong position held by an enemy of superior strength.

However it must be noted that too few smoke candles used at the point of attack will bring about only a partial and unsatisfactory success, ending with capture of one single point or position and not a total victory. (See examples of actual engagements No. 1, 2, 3.)

- (2) In offensive operations against the enemy's position if you plan large scale use of a

smoke screen taking into consideration the meteorological and topographical conditions and at the same time study the best means to make the most of the screen, you will be able to secure a considerable success.

In the battle near ~~Chi-Wuo~~ waged by the 20th Division some 18,000 special smoke candles were accumulated for use over a length of 9 kilometres in front of the enemy's strongly fortified positions. On 6 July after studying the wind direction and other conditions we started screening by some 6 to 7,000 special smoke candles for some 5 kilometres in front of the enemy's left wing (the wind velocity was then 1.60 metres and the smoke traveled low to the ground and far into the enemy position; then it enveloped the hillside to the south; part of the smoke however because of disturbance in the wind direction drifted back toward us, so that some troops had to put on their gas masks; under cover of this screen we were able to penetrate about 3 kilometres into enemy's line and, except for minor resistance offered by the enemy in one of the villages on the slope of the hill, the enemy could do nothing to check our advance and we captured the whole position that night and started pursuit the following morning.

But in the case of the Independent Compound 4th Brigade, the story was entirely different. This Brigade happened to be adjacent to the unit mentioned above and since they did not use special smoke in their operations they met obstinate resistance by the enemy and had to repeatedly pound the enemy before they could oust them.

The casualties suffered by our 20th Division were on the average 30 or 40 to 100 in each attack on a village in the early part of this campaign, but in the present battle they lost only 10 soldiers in capturing the whole 10 villages, and this good success was because of the timely use of special smoke screens.

- (3) There are occasions where the troops in the rear are obliged to use special smokes for the purpose of self protection.

At a certain spot along the Yangtze River bank a trench mortar company and an independent engineer section were hemmed in by a strong enemy force and were in danger of complete annihilation, when an infantry section used only 4 special smoke candles to drive away the enemy and saved the troops.

3. Plans and preparations

- (1) When you want to use special smoke on a large scale it is imperative that you should set up a thorough program in advance and accumulate a sufficient quantity of the supplies and materials required, observe and study meteorological conditions and give training to the screening unit and other general units in order that they may be able to make the best use of special smokes.

In the operations around Chü-Wuo waged by the 20th Division the use of special smoke on a large scale was carefully studied, planned and carried out accordingly, but in the central part of the battle line the results of the special smoke screen did not come up to expectations as the troops neglected necessary preliminary training in the use of the smoke screen.

Example No. 2 shows how adequately a smoke operation was planned and carried out, though it was on a smaller scale.

- (2) However carefully a smoke screen is planned some unforeseen changes in the situation, especially meteorological conditions may force you to modify and adjust your plan in putting it into practice, therefore you should be prepared for any such changes.

In the course of the river crossing near Liu-Tsong waged by the 3rd Division, the wind direction suddenly changed and obliged them to abandon the plan of special smoke. They used non-toxic smoke candles instead and succeeded in crossing the river and breaking through the enemy line far into their rear elements.

In the battle near Chü-Wuo cited above, because of the abrupt change in wind direction, the 20th Division had to change their screening

plan and shortened the screening front to some 4 or 5 kilometres in front of the enemy left wing. But even then, part of the smoke drifted backward and caused serious disturbances to some of our troops that were not adequately protected against the smoke. Those soldiers who wore no gas masks suffered greatly and even evacuated their bowels.

- (3) In the course of battle, occasions may arise where special smoke can be used to obtain better results, therefore as much as circumstances permit you should have all the necessary protective equipment beforehand.

Examples No. 1 and 3 and the battle waged by a certain unit near Shon-Kow give an example of how special smoke deliberately adopted at opportune times by the commanders changed unfavorable battle situations to our benefit. The cause of their success lies not only in the use of special smoke candles at the right time in the right place, but also in the fact that they were fully equipped with gas masks.

We can cite an example contrary to the above. In the amphibious operations at the Pai-Moi-Ho river mouth, the troops brought with them a sufficient supply of special smoke candles, but unfortunately they neglected to carry their gas masks and eventually failed to make full use of the smoke screen.

- (4) In breaking through the enemy position under cover of special smoke the infantry in the first wave should select targets of attack at each successive stage of the battle and clear a route toward them and at the same time prepare for the advance of heavy weapons. The artillery should be ready to make any necessary changes in their firing positions following the movements of the infantry.

(See Example No. 1)

- (5) The use of special smoke is different from that of gas shells in that it is especially dependent upon the topographical and meteorological conditions of the battlefield, therefore a careful and accurate survey of these essential conditions is important in making plans for special smoke operations.

In the battle of ~~Chi-Wu~~ the 20th Division made an elaborate survey of meteorological conditions with the aid of a specially trained surveying squad, but even then because of meteorological "freaks" they suffered from some partial countercurrent of the smoke. In the battle of ~~Sho-Kow~~ they decided to use special smoke in their attempt to reverse their unfavorable combat situation, but in their hasty decision they had not sufficient time to make a thoroughgoing survey of the topographical and meteorological conditions, consequently they secured only a partial success. They succeeded in forming an effective smoke screen over the left flank of the enemy line, throwing them into great confusion there, but as regards their right flank, no effective screen was formed there, and our soldiers at the smoke generating points were hit hard by the concentrated fire from the enemy's right flank.

- (6) The right time for the use of special smoke must be decided from the point of view of field tactics, but it may be taken as a generally safe rule that because of meteorological considerations dawn or dusk is the most suitable time for the use of special smoke.

But even in the day time, if you have cloudy weather and favorable wind conditions, special smoke can be used to good advantage, hence commanders should always be on the alert to take advantage of any favorable opportunity in the course of battle and try to make the best use of special smoke.

4. Operations

- (1) In operations carried out under cover of special smokes, the infantry of the first wave should put on their gas masks and penetrate into the enemy's position, and be determined to deliver a decisive blow while the smoke screen persists.

Even if there is no countercurrent of smoke it is possible that some remnant of smoke will linger on the battle field, hence the troops at the first wave must have their masks on all the time and keeping close to the screen try to completely annihilate the enemy before they have time to recover their fighting strength. From the number of

battle instances, we gather that soldiers often do not like gas masks, hence fail to carry out closely coordinated operations combining special smoke and close combat.

- (2) If circumstances permit, the special smoke had better be employed by the infantry of the first wave.

On account of the prevailing instructional situation, training in gas warfare has been too much specialized; that is, attention is mainly directed to training of gas units. Consequently there is a general lack of interest in the use and effectiveness of gas warfare. But Example No. 1 is enough to convince you of the necessity of training all troops in gas warfare so that soldiers in the front lines are well qualified to use gas if circumstances call for it.

- (3) There are occasions where special smokes may be followed by or mixed with non-toxic smokes to supplement or augment their effectiveness with good results. (See Examples No. 1 and 2.)

To find out the wind direction and also to detect the possible conditions of screen formation, you had better start with ordinary smoke candles, which will give you some working suggestions as to how and when to use special smokes (as in the battle around ~~Tze-Kao-Si~~). Non-toxic smokes may be used in combination with special smokes to make up for the insufficiency of the latter.

In such a case as this, special smokes will be concentrated upon the important part or vital points of the enemy's position and screening will be started from the windward. If special smoke is followed by non-toxic smokes, the duration of the screen will be lengthened and the enemy will be forced to continue their protective measures which will allow our soldiers at the first line to move effectively under cover of the screen.

Example No. 1 Breaking through a strongly fortified position with the aid of special smoke candles.

1. Situation just prior to the battle.

- (1) The detachment at ~~Shang-Yo~~ started artillery fire at 6 a.m., 2 June 1938, and launched an attack at 8 a.m.

This was done in concert with the river-crossing operations waged by the main force of Katayama Brigade over the ~~Shang-Yo~~ River.

- (2) The organization of the detachment was as follows:
 - Infantry Commander - Major Mamiya
 - 3rd Battalion of 6th Infantry Regiment (consisting of 9th, 10th Companies, a section of 12th Company and half of the Machine Gun Unit).
 - 1st Battalion of 10th Heavy Field Artillery Regiment, and also half of the ammunition train of the same regiment.
 - 1 section of 6th Battery of 3rd Field Artillery Regiment.
 - 1 section of 2nd Company of 3rd Engineers Regiment.
- (3) The enemy in front of the detachment numbered some 500 to 600 strong and had been fighting obstinately in their strongly fortified positions which were scattered all over the area to the south of Shang-Yo.

2. Meteorological and topographical conditions in the battle.

Meteorological conditions

Cloudy with 2 to 3 metres northeasterly wind favorable for the use of special smoke screens.

Topographical conditions

Generally flat open plains except for slightly rising ground. The whole battle field was partly covered with wheat fields and partly with grassy plains.

3. Brief account of development of battle especially with regard smoke ejection conditions.

- (1) At 8:20 a.m. the infantry of the first wave moved forward to the enemy's positions in the face of fierce fire. The fire from the 3 villages in the central front line was severe and accurate, moreover the flanking fire from one village and from the top of the embankment on the right was very hot and caused many casualties. They managed to advance to a line about 200 metres from the enemy, but because of the enemy's barrage they could not move any further and around 9:20 a.m. the battle came to a stalemate.
- (2) At this point Major Mamiya, the detachment commander, sought for all possible means to continue the advance and finally decided to resort to the use of special smokes. It was then 2 p.m. Luckily the day was cloudy with about 3 metres northeasterly wind, and there being no serious land obstacles to

interfere with the travel of the smoke screen, the screening conditions were excellent.

Upon the ejection of special smoke, the infantry of the first wave completed preparations for attack, and as soon as the screen was seen penetrating deep into the enemy's line, the whole infantry charged the enemy's positions.

- (3) By our special smoke the enemy was thrown into utter confusion; some soldiers were seen intoxicated and prostrate, moaning on the ground while many others fled in disorder throwing away their arms. By 3:15 p.m. the infantry of the first wave completely captured the first enemy line.

The detachment then mopped up the neighboring ground that night and made preparations for offensive operations against the enemy's second line for the following day.

The appended map shows the situation of the screening conditions of the battle.

Map of Smoke Ejection
Using Special Smokes
(1345 June 2nd)

Smoke Candle 2
Special Candle 5
Green Candle 5

North Example 1
Easterly
Wind
2.3 Meters

For Shen-Yo

Smoke Candle 8
Special Candle 12
Green Candle 10

Interval of
Candles
About 50 Meters

Remarks

(1) Number of candles used
Smoke Candles 15
Special Candles 30
Green Candles 25

(2) Smoke Candles used
before Ejection of
Special Smoke
To Survey the
wind direction
and screening
condition

(C)

(B)

(A)

Smoke Candles 5
Special Candles 8
Green Candles 15

Shan-Yo River

For Shin-Fen-Ge

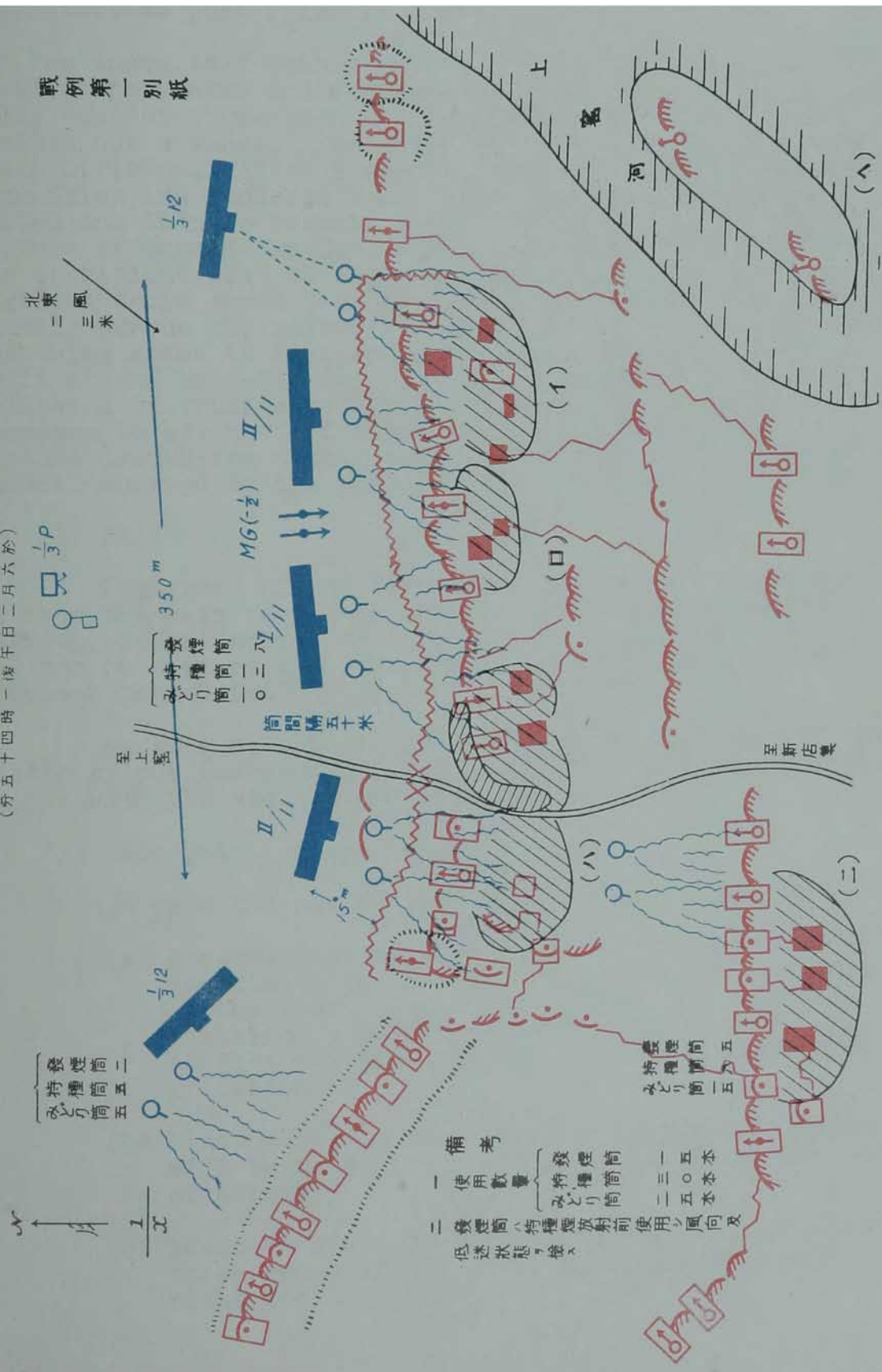
(D)

(F)

特種煙放射狀況要圖

(於二月六日午夜十四時五十分)

紙別第一例戰



備考

- 一 使用數量
 - 持煙筒 一五本
 - 發煙筒 二〇本
 - ひとり筒 三五本
- 二 發煙筒、持煙筒放射前使用之風向及低迷狀態ヲ接ス

Example No. 2 The use of Special Smoke whereby the battle situation was turned to our advantage.

1. Situation just prior to the battle.

The enemy that abandoned their fighting line on the Shang-Yo River retreated and reorganized their defense line on the hills east of Shou-Hsien and prepared to offer a last stand against our advance. The enemy consisted of the 176th and the 174th Division, Kansai Students Corps and Civil Guards Corps of Shou-Hsien and numbered some 2,500 strong. They are what we called the Chinese Regular Army. We decided to attempt the capture of Shou-Hsien Castle and the order and main points of the operations plan were as follows: Under cover of dusk the regiment would cross the Shang-Yo River June 2d and immediately closely pursue the retreating enemy so that they might have no breathing space to reorganize in any of the defense lines built around Huai-Nan Coal Mines; in the night of 3rd June following instructions from the Brigade the regiment would commence to advance and after overcoming enemy resistance capture Chou-Hsien Castle the following day. The plan of attack received by the regiment was in outline as follows:

(1) Plan

The front of the first line on the left flank will be made the main target of attack, and if wind conditions permit, special smokes will be used to enable the two battalions to capture the enemy position at one stroke and approach Chou-Hsien Castle.

As soon as a break is made through the walls of the Castle by our bombardment, the infantry will break into the castle with the aid of tear gas candles.

(2) Main point of operations

In case the use of special smoke is called for:

- (a) A commanding officer will be appointed who is to coordinate the operations of the two battalions at the front line. He will consult with the battalion commanders and decide the number of candles required and the details of their application.
- (b) Final decision about the use of special smokes will be made after survey at 6 a.m. on the day of attack.
- (c) Adequate kinds of special smokes will be ejected to screen over the first front lines both on the right and left flanks.

The time to start smoking is set at 6:25 a.m. In the meantime the infantry of the first wave will wait at the line of departure with gas masks on.

- (d) As soon as the special smoke screen envelops the enemy lines the infantry will immediately assault them.
Time of attack is fixed around 6:30 a.m.
- (e) After the enemy positions are captured the infantry will immediately proceed toward the castle keeping close to the smoke screen.

The gas officers of the regiment will form detailed plans for cooperation with the chemical warfare units on the basis of the general plan of offensive operations described in the foregoing paragraphs.

Plan of use of special smokes in and about Hakuka Town 6 kilometres to the east of Chou-Hsien Castle.

1. Policy

- (a) In case of favorable wind conditions a special smoke screen will be formed over the front of the first line battalion on the left flank of the regiment in cooperation with the chemical warfare unit.
- (b) In case of need each unit may use special smoke candles to form a local screen.

2. Main points of procedure

- (a) Smoke screen operational unit
To give assistance to the two battalions in the first line, Morita's unit is ordered to act as a smoke screen operational unit. This unit is broken up into two sections;
For the first battalion a section commanded by Lt. Isoda
For the second battalion a section commanded by Lt. Kiyono
- (b) The battle field to be screened
The smoke will be generated in such a manner as to envelop the whole enemy within the combat area of the battalions and large enough to cover also the outer flanks. It should also be so arranged that in case the wind changes direction to north or south the

screening area will be switched over to other front of the battlefield.

- (c) The smoking point
The exact smoking point depends upon the wind direction, but roughly speaking it should be, if possible, in front of the infantry of the first line or on the flank. (That is to say it is almost along the embankment of the river and approximately 200 metres before the enemy line)
- (d) Density of the screen
The interval between smoke operators is about 25 metres, and the amount of smoke to be ejected is about one and a half candles per operator. In consideration of malfunctioning or blind candles occurring, the operators should be on the alert to regulate and attain the density of the screen required.
- (e) Time schedule for smoking, firing and attack.
Ascertain the wind direction by smoke candles 6:00 a.m.
Ejection of special smoke 6:25 a.m.
Attack by the infantry 6:30 a.m.

The squad of special smoke operators will advance to their predesignated smoking positions under protection of the infantry and under barrage of the artillery.

Upon completion of preparations, they should start smoking and the infantry of the first wave will try to penetrate into the enemy line, keeping close to the screen.

In the meanwhile, the artillery will continue firing to destroy the machine gun posts of the enemy, and be ready to take advantage of any opportunity to move forward under the cover of the screen. In this way the artillery will maintain close cooperation with the movement of the infantry.

- (f) Reporting the findings of survey of meteorological conditions, especially wind direction. The meteorological observation squad surveys wind direction every 20 minutes after 5:00 a.m. and keeps the regimental gas officers advised as to the findings of their survey.

3. Meteorology and topography of the battle field

Meteorology

The sky was overcast with clouds with 3 to 4 metres east wind at dawn, which however, toward noon shifted to southeasterly wind and finally changed to a strong west gale of 15 metres. Thus the use of special smoke became impossible in the afternoon.

Topography

The whole area was full of elevations and especially the area in front of the 2nd battalion had hills ranging from 105 to 170 meters. The rest of the field was farms and grassy plains.

A number of villages were scattered about the area, mostly in the low lying parts.

4. Brief account of the development of battle and the conditions of screening.

- (1) The chemical warfare unit arrived a little later than the time appointed, but immediately took to making the necessary preparations at the line where the two battalions of the first line were posted.

At 7:30 a.m. offensive operations were started by the two battalions, the composition of which were as follows:

2nd battalion of first line on the right flank of the regiment composed of 8th and 5th company (of which one section was short) 1 section of 3rd Machine Gun Company and half of the force of Morita's Unit.

1st battalion of first line on the left flank of the regiment composed of 3 armour-piercing guns, 1 section of 3rd Machine Gun Company, 1 section of field artillery or howitzers and remainder of Morita's Unit.

9th and 10th companies were posted in the rear as reserve forces.

With 3 to 4 metres southeasterly wind the meteorological conditions were suitable for the use of special smokes. The chemical warfare unit moved immediately to the left flank of 1st company and Isoda's section started smoking using first smoke candles and then special smoke candles. Dense clouds of smoke were formed and travelled low over the ground and finally enveloped the entire enemy positions. As soon as the effects of special chemical smoke were detected the 1st company made a vigorous assault on the enemy line under cover of the smoke. Their movement was greater than that

of 2nd battalion.

- (2) The smoke screen was dense enough to cover about 2000 metres, thus the Chinese soldiers were greatly confused and many of them were seen abandoning their fortified positions. Soon the whole enemy began to retreat in an attempt to reorganize resistance around the hills 105 and 170, where they seemed to have secondary defense lines. At this time the 2nd battalion occupied high ground to the east of hill 105 and the headquarters of the chemical warfare unit was situated on the first line half way between the two battalions. With the lapse of time the enemy on hill 105 recovered fighting strength and their flanking fire by machine guns from pillboxes grew fierce and made further advance impracticable.
- (3) Under these circumstances the chemical warfare squad headquarters decided to make a second ejection of special smoke especially to envelop the hill 105. This attempt soon took effect and the front line of 1st battalion made a further advance. Kiyono's section, cooperating with the 2nd battalion, made all efforts to move forward and waited for a chance to spread a screen, but unfortunately the wind conditions deteriorated, which limited the use of smoke. Finally they had to move over to the front of the 1st battalion, where with the timely and accurate command of Captain Mishioka, gas officer of the division, they succeeded in forming a screen over hill 105.
- (4) As the day advanced the wind shifted and became contrary to us, moreover because of the upward atmospheric currents, the use of smoke screens became utterly futile, and the units at the first line were forced to stay in their present positions. The regiment however, continued pounding the enemy who finally succumbed to our persistent attack and retreated into Chou-Hsien Castle under cover of dusk.
- (5) The regiment took advantage of this situation and made rapid pursuit after the retreating enemy. After overcoming obstinate resistance

offered by the enemy the 1st battalion broke through the east gate of the castle at 6:00 a.m. the following morning and the whole castle surrendered at 7:30 a.m.

- (6) The quantities of materials employed in the present battle were:
- | | |
|-----------------------|-------------|
| Special smoke candles | 194 candles |
| Smoke candles | 40 candles |
- (7) The appended map shows the screening conditions achieved in this battle.

Map of Special Smoke Screen Operation in the
Neighborhood of Pai-Cha-Tung 6 Kilometers to
The East of Shu-Hsien (Jung 4th)

Example 2

Whon-
Saen-Pu

South
Easterly
Wind

South
Westerly
Wind

Headquarters

Major Morita
Capt. Nishioka
1st Lt. Ueda

Kiyono's
Section

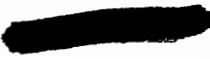
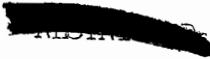
Number of Candles Used:

Special Candles 194
White (Non-Toxic Smoke) 40
Rifle 400
L.M.G. 500

Isoda's Section

East Wind 3.4 M

Screening Begun 07.25
Ejection Begun 07.30
Assault Begun 07.35



"Example where we routed the enemy with the aid of special
smoke candles A"
(Battle waged in the neighborhood of Ku-Chen)

1. Situation just prior to the battle.

- (1) The Morita detachment that had been ordered to attack and capture Ku-Chen started action 18th May and occupied the reconnaissance outposts of the enemy on the right bank of the Shie-Ho River early in the morning. In the dusk of the same day they began to attack the enemy's main position on the left bank and around midnight of the 19th penetrated into the enemy's line at Shi-Ho-Ge through one of its corners, and then pursued the retreating enemy. About 7:30 a.m. they pressed forward without meeting much resistance from the enemy, crossed the Whai-Ho River at Wang-Chä-Shen and gathered in the eastern district of Ku-Chen.
- (2) The organization of the Morita detachment was as follows:
Infantry Commander Major Morita.
2nd battalion of 2nd reservist infantry of Imperial Guards Division(2 companies short)
5th and 7th company of 1st Railroad Regiment
"Ka-mark" Unit* (less the 13th field gas company)
- (3) A part of the 809th troop of the 15th Division that had retreated from the western area of Tientsin-Puko Railroad Line was lined up in their fortified positions on the east and south of Ku-Chen, while a part of the 149th troop of the 25th Division that came down from Su-Shien quarters was entering Ku-Chen and their total strength was estimated to be some 500 equipped with 5 heavy machine guns and more than 10 light machine guns.

2. Meteorological and topographical conditions of the battle-field.

Meteorological

Clear and warm with about 3 metres east wind; suitable conditions for the use of special smokes.

Topographical

For the most part even and open wheat fields; Ku-Chen City stands on an elevated area about 1 metre high. The river is about 30 to 50 metres wide in the neighborhood of the city and though it is only 1 metre deep the river bed is covered with a thick layer of mud and made passage on foot impracticable.

*The character "Ka" means chemical. Romanji spelling for "Ka-mark" is "Ka Go".

3. Brief account of the development of the battle especially with regard to the condition of smoke ejection.

- (1) In order not to give the retreating enemy the time to reorganize our pursuing troops immediately changed from marching file to deployment and around 9 a.m. started advancing toward the enemy lines. We were, however, met with obstinate and strong resistance by the enemy, which gradually increased in strength and threatened to envelop us on the right flank.
- (2) Around 10:40 a.m. our support troops in the rear were moving up along the railroad tracks on the northwestern side of Wang-Chã-Tscng, the main force of which was then directed to deploy along the left bank of the river on the southern side of Ku-Chen City and to attack the enemy, while a part of the troops attempted to make a detour on the southwestern district of the City to come out behind the enemy's line, thus to cut off their avenue of retreat. However the enemy's firing from the opposite bank of the river was so fierce that our operations were greatly hindered and with the increase of the enemy force in front of the detachment the battle finally came to a stalemate.
- (3) In the areas in front of the "ka-mark" unit the wind condition, velocity and direction became favorable for the use of smoke candles, and the detachment commander decided to resort to the use of special smoke candles (A).* The soldiers on the first line were ordered to crawl forward on their bellies and at 300 metres from the enemy's line around 1:55 p.m. they used smoke candles to ascertain the wind direction, velocity and the possible conditions for screen formation, after which at 2:00 p.m. the major smoking operation was started.
- (4) Dense clouds of chemical smoke** enveloped the whole area of the city, which soon stopped the firing of the enemy. Then the soldiers on the first line under cover of the screen assaulted the enemy positions and delivered a decisive blow on the enemy, who were running away in great confusion. Mopping up was done of those enemies who lay prostrated in houses and shelters suffering from the smoke. Complete capture of the city was accomplished at 2:30 p.m.

* The Romanji spelling for "Special smoke candles (A)" is Tokushu Hatsuen To (Ko).

** Romanji spelling for "chemical smoke" is Ka En.

(5) The accompanying map shows the picture of the development of the battle.

Map of Battle Around Ku-Chin
(May 19)

Road for
Su-Shien

Shen-Chu-Tsong

Approx.
1,000 Meter
Farm Field
Tung-
Yu-Moo

300 Metres

Ku-Chin

Neng-Cha-Tsong

Position Previously
Prepared

Retreating From Shi-Ho-Ge

Chen-Cha
-Tsong

Chu-Tsong

No-Tai-Tze

Shien-

Tai-Tze Shai-Ho-River

Shoo-Wang-Cha

Itagakie
Section
Wu-Cha-Yuan
Ta-Ta-Fon

Example 3

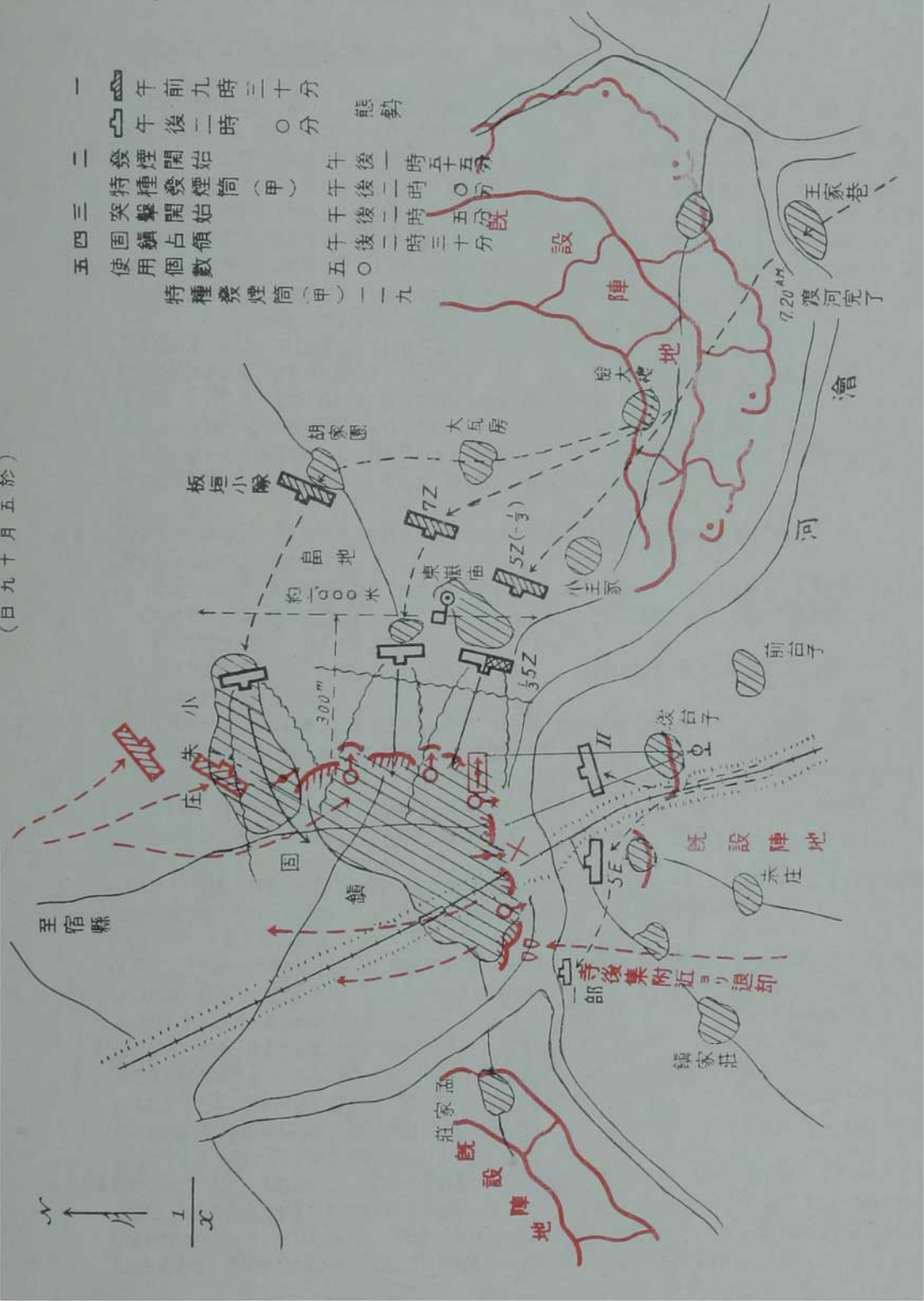
- (1) 0930 Position of the Troops
1400
- (2) Screening Started at 1355
Special Smoke Candles (H) 1400
- (3) Assault Began 1405
- (4) Capture of Kuchin 1430
- (5) Number of Candles Used 50
Special Smoke Candles 119

Positions Previously
Prepared
Chien-Da-Iow

River-Crossing
Completed at
0720
Wang-Cha-Shen

固鎮附近戰鬥經過要圖

(於五月十九日)



"Example where successful attack was made at dusk with the aid of a smoke screen"
Battles waged in connection with the river-crossing in the neighborhood of Liu-Tsong.

1. Situation prior to our attack.

The enemy that had been offering untiring and persistent resistance to our attack in their reconnaissance outposts in the neighborhood of Lung-Tö-Tan made a sudden retreat to the left bank of the Shang-Yo-Ho River on the night of 1st June 1938 with the object of inhibiting our westward movement by their stronger main defense lines. At dawn June 2nd closely pursuing the retreating enemy the main force of our regiment moved up to the right bank of the river and attempted a crossing in the dusk. Simultaneously the 1st battalion of the 6th infantry regiment pressed close to Lu-Chä bridge at 11:00 a.m. The 68th infantry regiment and other troops were at San-Chä-Wang-Tzen in the evening of the same day while one detachment had already crossed the river and threatened to advance further westward.

2. Meteorological and topographical conditions

Meteorological

Cloudy for the most part of the battle; at dawn 2:50 metres easterly breeze, which later changed to north-easterly wind.

Sunrise around 6:00 a.m. Sunset around 8:00 p.m.

Topographical

Though the river bed was covered with a layer of mud, passage on foot was practicable and the crossing point was best at 700 metres downward to the west of Liu-Tsong. The areas on both sides of the river were swampy dotted with wheat fields and grassy plains.

3. Account of the development of the battle with special regard to conditions for smoke ejection.

(1) The regiment decidēd to cross the river in the dusk of June 2nd under the barrage by our artillery and also under cover of special smoke screens and to prepare for further advance after occupying the towns of Wang-Chä-Low and Ku-Toi-Wang. At 8:30 p.m. the 2nd battalion (less one company) formed the first combat wave and advanced over swampy ground from the line of departure into a hail of shells and bullets.

Prior to this, the 2nd Field Artillery Battalion (less the 5th battery) bombarded the enemy positions to open an avenue of attack for the infantry. Its bombardment lasted for one hour between 6 and 7 p.m.

(2) Closely following the advance of the infantry the chemical warfare unit carrying a large amount of chemical warfare materials moved up in spite of the fierce firing from the enemy and reached a position close to the bank of the river, where they immediately made preparations for smoke operations and waited for final order from the smoke unit commander.

The battalion commander Major Morita stayed at the battalion headquarters at the line of departure and was in close and constant communication with the gas officers of both regiment and division.

About 7:00 p.m. the observation of the wind conditions showed that the wind gradually changed from east to northeast, moreover the position of the forward company was so close to the enemy's line that from all points of view the use of special smoke seemed impracticable.

(3) At this time they decided to abandon the idea of special smoke and promptly began to make preparations for formation of a smoke screen on a large scale. In concert with the renewed firing by the artillery, smoke operations were started. Aided by a favorable wind, large clouds of white smoke travelled steadily over the battle field and soon the neighboring area at the crossing point at the river bank to the west of Liu-Tsong was enveloped with a dense screen. At this juncture 3 light tanks from the "Ka-mark" 1st company moved forward to the front line on the right flank and ejected smoke, which increased the density and volume of the existing screen. The moment the effectiveness of the smoke reached its peak the infantry on the first combat line started crossing the river and threatened to come out behind the enemy's line.

(4) By the forced attack of our charging infantry, the enemy were unable to hold their strongly fortified positions and began to retreat. As soon as the enemy's resistance was reduced to casual and scattered firing, the engineers began building a bridge and filling sandbags which were required by the main regimental force to cross the river.

(5) The accompanying map shows the smoke operation carried out on a large scale at dusk, June second.

Map of the Screening Operation Conducted on
a Large-Scale near the Liver
Crossing Point at the Slang-Yo River
(June 2nd)

Example 4

Wang-Cha-Low

North
Easterly
Wind

"Ka" Mark 1st Company

1st
Combat
Line

For Lung-To-Tan

Maj. Morita
Cap. Nishioka
1st Lt. Ueda

"K" Mark Unit

Communication
Conducted by
Signal Flag

Liu-Tsong

Whang-Cha-Ion

Ku-Toi-Wang

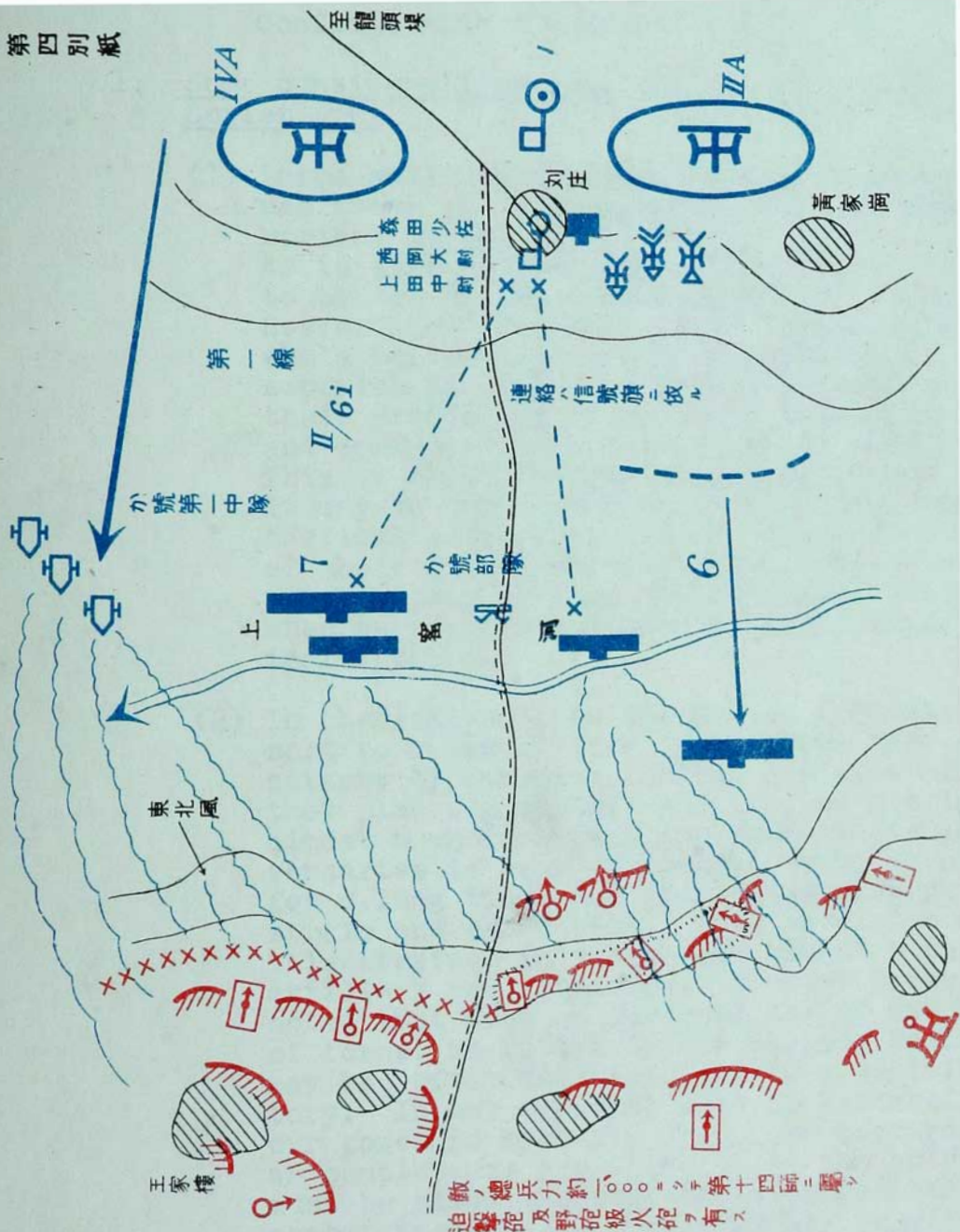
The enemy belonged to the 14th Division and
was about 1,000 Strong Equiped with Mortars
and guns equivalent to Field Guns.

Remarks

- (1) Screening began 0825
- (2) Interval of smoke operators 25 Meters
- (3) Because of sudden change in wind
direction employment of special
candles was suspended.

圖要使用使模規大煙近附點河密上

(日二月六年於)



敵ノ總兵力約一〇〇〇ニテ第十四師ニ屬シ
迫撃砲及野砲級火砲ヲ有ス

備考

1. 發煙開始時刻 午後八時二十五分
2. 發煙手ノ間隔 二十五米
3. 風向急變ニ依リ持種筒放射中止ス

Chapter III "LESSONS FROM THE CHANG-KU HILL INCIDENT"

Conflict with the Soviet Army.

1. Some considerations upon the use of gas by the Soviet Army.

- (1) Large-scale, thoroughgoing and concentrated use seems to be the general rule in chemical warfare by the Soviet Army. As is evident from Example No. 1, it appears to be one of the characteristics of the Soviet Army that they favor large-scale and whole heartedness in their operations. Our experiences of battle with them confirm their propaganda of "numerical superiority and concentrated and large scale operation". This is their guiding principle on the field. It may be still open to question how much tactical skill they show in the manipulation of their overwhelming fighting strength, but we must bear in mind their guiding principles when we prepare ourselves against their chemical attacks.
- (2) In chemical warfare the Soviet Army will resort to a war of attrition. They make gas attacks by surprise, but at the same time they plan a prolonged ejection of gas lasting almost a whole night, and force their adversaries to wear protective masks or clothing for a long time, and thus cause them physical strain and exhaustion. They have also used this strategy in their bombardment both by artillery and airplanes. It must however be noted that such an isolated use of one kind of force, no matter on how large a scale it may be, often does not lead to a decisive victory. In any event we must do everything in our power to make our defensive preparations as complete as possible, while the soldiers must be given thorough training in morale and combat tactics, so that they may acquire a strong will and power to endure hardships, which are often important in chemical warfare.
- (3) The Soviet Army employs gas spray from the air by preference, and whenever they see that our anti-aircraft defense is insufficient, they will attempt gas spray from extremely low altitudes.
We have long known that aerial gas spray is

one of the favorite tactics of the Soviet; example No. 7 confirms this impression. In the matter of training in defensive action, they seem to give comparatively more importance to defense against aerial spray than other forms of defense, as the story of the two captured soldiers shows. As regards the standard altitude from which they attempt gas spray, we have not enough data to make any conclusive statement, but a number of experiences tend to indicate that where anti-aircraft defense is weak or aerial attack is least expected they will drop down to an extremely low altitude, some 150 metres above ground, and spray gas over the ground forces. (Refer to examples No. 6 & 7)

- (4) In bombardment by gas shells, they will adopt a surprise attack and concentrated method.

In bombardment by artillery, the Soviet Army seems to have made a very effective use of the findings of land-survey or of the data obtained from firing different kinds of guns, and they always start firing by surprise. Though the accuracy of their firing was far from satisfactory, they concentrate a considerable number of shots upon specified targets. If instead of shrapnel shells they fire gas shells, the result will be a large concentration of dense gas. (Refer to example No. 5)

2. Lessons regarding our use of gas.

- (1) Use of gas against the Soviet Army, especially their Far Eastern Army, is favorably considered.

We used to be under the impression that the Soviet Army had been well trained in gas defense, but this impression has been corrected as a result of interrogations we made of some of the captured Soviet soldiers. Judging from their confessions, the preparedness of their armies both in materiel and training seem to be yet imperfect and if we use gas against them, the result will be successful. (Refer to the confessions made by a commander of artillery of the 36th Snipers Division who abandoned his line and surrendered to us in Outer Mongolia)

- (2) Even if the enemies are sufficiently protected against chemical warfare, in the course of severe fighting there may present opportunities where gas may be used by surprise and with success. Our army that took part in the present Conflict had at first a sufficient supply of defensive materiel and maintained strict vigilance for a gas attack by the enemy, but in the course of long battles, our vigilance slackened and though we had no means of ascertaining, we knew that because of damage and consumption the materiel situation became tight, and replacement by new supplies extremely difficult since all transportation means were engaged in moving ammunition to the front. Much the same situation must have prevailed in the enemy and this must have offered opportunities for surprise attack with gas.

3. Lessons regarding our defensive measures.

- (1) We have already given some descriptions about defensive measures and here we will make only a few remarks to supplement our previous statements. It is often found effective to strike the enemy while they are in the initial stage of making a gas attack. During the present conflict we have often observed that if the Soviet army was beaten at the outset of battle, they were apparently discouraged and showed less vigor in all their subsequent actions. In this manner many of their attempted large-scale operations were successfully frustrated. The same thing can be said of their chemical warfare attempts. Thus all possible efforts should be made to cause their attempted gas attack to flounder before it is fully developed. (Refer to example No. 4)
- (2) The more fierce battle becomes the greater is the need of vigilance against gas attack. As we have already pointed out before, it is in the thick of battle rather than at its outset that vigilance against gas attack has to be maintained more intensely. As a matter of practice, however, as battle goes on soldiers are apt to be exhausted both physically and mentally and become less alert in their

vigilance against gas attack; it is at such a juncture that the most critical moment of gas warfare arrives. It is therefore important that you should keep this point in mind and see that soldiers are so trained that on the battlefield even when physically exhausted they will not slacken their precautions against gas attack.

(3) Thorough preparation and training in defensive action .

It is evident that the Soviet army has been attempting to develop their chemical warfare strength, but as is ascertained by statements of captured Soviet officers and men their training and preparations are as yet incomplete. The fact that with their presumably full-fledged educational institutions, the Russian army still has difficulty in attaining its objectives, warns us that unless we make more strenuous efforts in chemical warfare training we shall fail to build up a strong chemical warfare force in the Japanese army.

(4) In the course of the present conflict we have accumulated a large number of significant examples which are of educational value in our army training, and in the following passages we have selected some of the most typical cases, from which we have drawn lessons and observations.

Example No. 1 Concentrated and large scale operations of the Russian army

(a) The present incident was only a localized conflict over the boundary--frontier between Siberia and Manchuria---and the battle was waged over a restricted area with a large expanse of swampy field and a number of pools and lakes scattered over the Russian territory. There was only one route running between the Manchurian boundary and the "Pochet" inlet. In spite of these topographical features, the Soviet mobilized and made concentrated use of 3 sniper divisions, 1 cavalry division and 2 mechanized brigades accompanied by some 150 fighters and bombers.

(b) In the later stages of the conflict, at the two fronts, hill 52 and Sä-Chaø Hill, both of which not wider than 2 kilometres, they concentrated from 20 to 60 tanks and made repeated attacks, and some 120 artillery

pieces fired incessantly all day long, using enormous quantities of munitions. Their air force also made repeated raids every day with 10 to 20 planes, and sometimes 16 heavy bombers or 40 light bombers or 50 fighters.

Example No. 2 "Battle of attrition" Soviet tactics.

Throughout the conflict the Soviet army seemed to have conducted their artillery firing and aerial bombardment without obvious teamwork with the combat forces at the front lines. They did not suspend their firing and air-raids even while their infantry and tanks were engaged in their offensive operations. On one hand it suggests a lack of concerted action among various operational forces, but on the other hand it furnishes us with an example of "tactics of attrition" typical of the Soviet Army, which aims to destroy the fighting strength of the adversary by concentrated and large scale employment of material power. It is, however, the consensus of opinion of the commanding officers of the front lines that such firing and bombardment uncoordinated with the infantry and other ground forces often fail to attain their objectives.

Example No. 3 Co-ordinated action among artillery, infantry and tank forces.

We have on record an example where the Russian army successfully conducted co-ordinated operations of various fighting forces. In the afternoon of August 7th in the course of their attack against hill 52, some 50 artillery pieces made a concentrated bombardment for a matter of 20 minutes which was then followed by a charge of 40 tanks and 1 infantry battalion. This attack was conducted so skillfully that though our center front line held firm, the left flank was threatened with a break through. After desperate defensive action, which was waged under the direct command of the battalion commander using the reserve troops, the enemy's attack was repulsed, but in the course of battle we suffered heavy casualties including the death of the commander himself.

Example No. 4 General behavior of Russian army after their spear-head is beaten.

In this connection we have noted the following characteristics.

- (a) Even if their concentrated artillery fire is at its height, when our artillery succeeds in directing concentrated fire upon them, they usually cease fire.

- (b) In the course of the advance of their artillery through our defensive lines, if we direct our concentrated fire upon its spear-head, the succeeding artillery would not dare to attempt a further advance but would turn around and beat a retreat.
- (c) The Soviet tanks advance by many lines covering a fairly deep area, but if tanks of the first line receive concentrated fire or 2 or 3 of them be destroyed, all of the rest of them either halt or retreat.
- (d) If the tanks under cover of which the infantry is advancing are destroyed the infantry will not venture to advance alone.

Example No. 5 Soviet artillery tactics

Some of the characteristics of Soviet artillery tactics, seen especially from the point of view of chemical warfare.

- (a) Their fire is directed more by the survey of the terrain and by the signals from their observation planes than by fire observation and direction centers on the ground.
- (b) They make a combined employment of various kinds of artillery. It was often our experience that where we had been receiving fire from ordinary field artillery, we suddenly began to receive fire from 120 or 150 mm howitzers.
- (c) Generally speaking the Soviet artillery fire is more or less formal, that is, shows little elasticity. Once started they seem to continue firing regardless of whether they have covered the target or not, and all the time in the same direction and with the same methods.
- (d) They seem to be able to carry on concentrated fire on a large scale if they are stronger than a battalion. In this regard it is noteworthy that in their

attack against Hill 52, in spite of difficult terrain they arrayed some 50 artillery pieces consisting of different kinds of guns and concentrated fire for some 20 minutes.

Example No. 6 Some aspects of Russian tactics of aerial attack.

On this subject the following points may be of some interest to chemical warfare.

- (a) About 10:00 a.m. two or three reconnaissance planes would fly over our lines and survey the position of our troops and then from about 2 o'clock in the afternoon their aerial attack with a force of fighters and bombers would begin, with repeated attacks until dusk. This was their almost daily routine.
- (b) The altitude from which their bombardment was carried out was usually above 2,000 metres and their targets were invariably our front lines, artillery positions, important communication points (such as bridges, railroad stations and river crossings) and also dumps.
- (c) If there were anti-aircraft guns, their strafing by the fighters was usually conducted from a height of about 700 metres, but if not, they would come down to about 150 metres.
- (d) In the course of the present battle, we have never seen the so-called attack from extremely low altitude by Russian planes.

Example No. 7 Some information about the preparedness of the Russian Far Eastern Army in gas warfare (defense), obtained from interrogations made of captured soldiers.

We had only two captured soldiers in the present conflict and they were ordinary soldiers, therefore their statements cannot be regarded as giving any accurate picture of the situation of defensive measures of the Russian

Army. Nevertheless they give us some general idea as to the gas defense preparedness of their Army.

Both of these soldiers were enlisted in the 32nd Sniper Division stationed at "Radzudorie" and had received $1\frac{1}{2}$ years regular military training. One (A) was a gunner in an independent machine gun battalion while the other (B) was a pointer in a divisional artillery regiment.

Synopsis of their statements.

(1) They have never had the opportunity of participating in maneuvers of any kind in which actual gas was used, nor had they been given field training in gas defense. Only one of them was once subjected to physical experiment inside a gas chamber filled with actual tear gas.

(2) B had never been given training in passing thru a contaminated area, while A had only once walked through a simulated contaminated area with his feet wrapped with grass. They had never been taught the essentials of decontamination nor the use of bleaching powder. They had never seen nor heard of bleaching powder.

(3) They had heard of the existence of gas (toxic smokes) but had never seen them. No smoke candles or shells had ever been used in the course of their field training.

(4) They were given lectures on the essentials of aerial gas spray tactics, but no exercises were carried out in which gas spray was projected by airplanes. In the case of gas spray from the air they were taught to behave as follows:

- A) For one machine gun squad (3 gunners) one protective cape is supplied, which the first gunner will use in case of aerial gas spray, so that he can continue firing, while the rest of them will cover themselves with the ordinary rain coats. If their guns are contaminated they will pull on their rubber gloves and remove the gas from their guns with gasoline. To move out of a contaminated area they use protective socks or stockings which correspond to the gaiters of our light protective clothing or our horse gaiters or in case of need they would use long rubber boots. This was taught only by lecture but never by practice.

B) When an immediate attack of enemy planes is detected he was taught to take shelter and mask himself and horse, put on protective clothing and stockings, and then put protective gaiters on the horse. If attacked unawares by aerial gas spray, he should halt and quickly envelop himself in his protective cape, then don mask and stockings; after the enemy's planes are gone gaiters will be put on the horse and he will evacuate the contaminated area.

(5) They have never been taught any other procedures of individual protection. They showed complete ignorance as to the use of gas-masks and decontamination pouches which were given them upon arrival at the first combat line.

(6) Gas-masks and decontamination pouches were the only protective materials given them in the present battle and they knew nothing about other items.

Example No. 8 Some considerations about the preparedness of our troops against gas warfare.

(1) The maintenance of anti-gas equipment and medical supplies necessary for gas casualties of our army was at the outset of the battle far from perfect, but thanks to the considerable efforts and decision of the staffs timely emergency measures were taken to supplement our equipment with improvised substitute devices and materials. But we suggest that the staffs in charge of chemical warfare at the Headquarters should re-examine the practical value and effectiveness of such measures with the view of improving and amplifying preparedness.

(2) At the outset of the battle, our troops maintained keen vigilance against the enemy's attacks. They were in some respects so nervous in their vigilance that in some cases such as the first Russian charge with tanks, a thin veil of smoke travelling toward our lines was mistaken for gas, whereas as was ascertained later it turned out to be gas exhausted from the moving tanks. In other instances, also, the whitish brown smoke produced by the enemy's diving airplanes (presumably exhaust gas) was mistaken for gas spray.

Interrogations of some of the officers and men at the front reveal that at first they were confident of their preparedness against gas attack, but in the course of battle as the enemy showed no sign of waging gas warfare and as the fighting became more severe, causing heavy casualties and our officers and men became exhausted both physically and mentally, there was a tendency to slacken gas vigilance.

~~RESTRICTED~~

Appendix E

This Appendix consists of a translation of a captured Japanese Army document published by the Inspectorate General of Military Education April, 1939, subject: "Lessons from the China Incident," No. 7, Chemical Warfare Section, dealing with experiences of the Japanese Army using toxic smoke against the Chinese. Maps from the original document have been reproduced and are included. A table of place names mentioned in the document giving both the Romanized Chinese and the Chinese Characters precedes the translation.

Romanized ChineseChinese Character

Bi-Chä-Hill	- - - - -	筆架山
Bai-Ma	- - - - -	白馬灣
Canton	- - - - -	廣東
Chu-Yao	- - - - -	西沃
Chih	- - - - -	赤湖
Chien Hill	- - - - -	光山
Dao-Kuang-Chuan	-- - - - -	道貫泉
Fu-Cha-Wan	- - - - -	傅家灣
Hu-Chä	- - - - -	胡家灣
Hsia-Yü	- - - - -	下餘
Ho-Tä-Wan	- - - - -	何大灣
Hankow	- - - - -	漢口
Hwa-Lin-Now	- - - - -	華林廬
Hui-Chow	- - - - -	蕙州
Hwang-Dien	- - - - -	黃店
Hson-Föng-Chien	- - - - -	洪峰尖
Kao-Hu-Hill	- - - - -	考虎山
Kung-Shan-Yen	- - - - -	狹山岩
Lu-Chä-Wan	- - - - -	路家灣
Mao-Wu-Young	- - - - -	毛屋揚
Pu-Shang-Hill	- - - - -	鋪上山
Shang-Mä-Tsong	- - - - -	上馬莊
Shin-Dien	- - - - -	新店
Shin-Tseng	- - - - -	沈村
Shin-Chow	- - - - -	新州

Romamized ChineseChinese Character

Sheo-Pao-Tong	- - - - -	蕭波洞
Sü-Chow	- - - - -	徐州
Sui-Chong	- - - - -	瑞昌
Shi-Po-Kow	- - - - -	石陂口
Tä-Tze-Chi	- - - - -	大子磯
Tä-Now-Shang	- - - - -	大腦上
Tzeng-Tze-Tsung	- - - - -	城子鎮
Tsan-Tien	- - - - -	讀天山
Ta-Chi-Now	- - - - -	打溪腦
Tä-Chao	- - - - -	大橋
Tä-Ling	- - - - -	大嶺
Tai-Chä-Hill	- - - - -	戴冢山
Tä-Hill	- - - - -	大山
Ting-Chä	- - - - -	頂冢
Wang-Chä-Tseng	- - - - -	王家村
Won-Jen-Now	- - - - -	望人腦
Wu-Kwei	- - - - -	烏龜山
Wu-Hill	- - - - -	武山
Yangtze	- - - - -	揚子江
Yuo-Chä-Wan	- - - - -	岳家灣
Zan (Chan) Shui	- - - - -	斬水

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Chemical Warfare

INTRODUCTION

Since the publication of "Lessons from Chinese Incident", No. 5, further documents and materials dealing with same subject have been accumulated. The battles from which they are derived range from the Battle of Sü-Chow to those around the Hankow and Canton areas. We have reshuffled and arranged some of the important data and are presenting them in this booklet as a sequel to the former issue.

We may mention for your guidance that the Chinese army appears to be insufficiently equipped with protective equipment against chemical weapons and their training in gas defense is also still in the embryonic stage. Since our data emanate from experiences of using special smokes combined with non-toxic smokes against the Chinese Army, we have to be cautious in evaluating these data; it is still premature to form a definite prediction on the basis of these data as to the future possibilities of chemical warfare. Nevertheless with these precautions in mind, the present record of our experience may be of some value and help to our army to gain insight into some of the basic principles and the nature of chemical weapons. For your information, we mean by special smokes both special smoke candles and shells.

Chapter I MORALE TRAINING

The troops or units headed by commanders who are well informed about chemical warfare usually make the most effective use of chemical weapons. When the staffs, especially company or section commanders are able and form correct judgments and timely decisions, their troops choose the right time for attack and score great success in battle.

In order that special smoke may be utilized to the utmost advantage, personnel of the combat team should have their masks on and make an unflinching advance to break into the enemy's line. Needless to add that whether be it officers or privates their undaunted fighting spirit wins half the battle.

1. One of the major causes of failure in the use of chemical weapons is lack of faith in their effectiveness or undue misapprehension and dread about their toxic qualities with consequent failure to make a timely attack through the smoke screen.

It suffices to add that correct understanding of the use of chemical weapons, right judgment of the battle situation and personal example by the commanding officers will encourage the soldiers and lead to a successful attack.

2. There are number of cases where the commanders had full knowledge of chemical warfare and encouraged their troops in attack operations, but because of heavy casualties incurred by the troops (one company was hit so hard that it was reduced to 20 or 30 soldiers) their fighting spirit deteriorated and the operation failed. This happened because of a lack of sufficient coordination between the use of special smokes and the general use of other forces. This means that the commander should at the beginning clearly define the objective of smoke operations in the light of the general operational plan, and should avoid any haphazard use of smoke. All preparations should be made with this plan in mind, and once they are completed all possible efforts should be made to accomplish it. (Refer to example No. 6)

Hence a certain division declared as a guiding principle that "under no circumstances should special smoke candles be used without being accompanied by a plan of attack at close quarters".

Chapter II EFFECTIVENESS OF SPECIAL SMOKES

1. Against an enemy inadequately protected and untrained and inexperienced in chemical warfare, a small number of chemical soldiers will bring about remarkably good results, especially in psychological effect.

If smoke is used with good results in the early stage of battle, its psychological effects upon the morale of the enemy in all subsequent engagements are remarkable. A mere sign of smoke operations on our part often may suffice to disorganize the enemy and save us the trouble of actual smoke production.

A number of experiences gained from local uses of smoke screens in the mountain battles of the Hankow operation show us that under a favorable meteorological conditions, if the enemy is insufficiently protected, the use of smoke may bring about the following results:

- (1) Smoke candles placed at an interval of one metre over a distance of 100 metres will produce enough smoke to envelop an entire area about 1000 metres deep.
- (2) Smoke candles placed at an interval of 2 metres over a distance of 50 metres will produce enough smoke to envelop an entire area about 300 metres deep.
- (3) Above all, the psychological effects of smoke are particularly noteworthy. We are told of instances where a single special smoke candle was enough to send the enemy into panic and enabled us to capture enemy's positions on the tops of hills, and finally favorably turned the battle to our advantage; with the aid of 3 special smoke candles we repulsed some 200 of the enemy who attempted a night surprise attack.

The successful case of the Hata detachment or that of the 6th or the 9th divisions furnish us with examples of how effective the use of smoke in the initial engagement is followed by further success because of its psychological effects. Often the enemy took to their heels at the mere sight of smoke before we launched upon any actual offensive action. The application of special smoke at the right time in the right place makes for far greater progress in breaking through the enemy's lines, the capture of his positions, and further advance of our troops, and our casualties will be smaller than if special smoke is not used.

2. Effective as special smoke candles are in checking the enemy's counter attack or in defending against enemy attacks, the primary objective of smoke weapons should not be restricted to defense, but rather its main purpose should always be directed to offensive action accompanying attack by the infantry. It follows that the moment the enemy attack is successfully checked, you should seize the opportunity to take the offensive.

The examples quoted in the previous passages are exceptionally remarkable in that only 3 special smoke candles sufficed to drive off more than 200 of the enemy. On another occasion a small supply detachment in the rear successfully defended itself with a few special smoke candles when it was attacked by a strong enemy force.

3. Special smoke shells, compared with candles, are less subject to the influence of meteorological and topographical conditions, hence are suitable for surprise attack and also effective in overcoming enemy positions on hills, flanks, and at distances beyond the effective range of ejection of candles. However you must be careful not to make scattered and haphazard use of special smoke shells. The targets should be carefully selected and defined beforehand and concentrated aimed fire should be employed; this is specially the case where guns and ammunition supply are limited.

- (1) It is one of the advantages of special smoke shells that they can be used by surprise at any time or place at your will and are little subject to the influences of meteorological and topographic conditions. At dawn or dusk the ejection of smoke candles often fails to envelop high ground such as hill-tops or mountain peaks; in such cases special smoke shells can be used to better advantage. (Refer to examples No. 9, 10, 11)
- (2) Shrapnel shells are usually found ineffective unless they hit the targets or fall very close to them, whereas gas shells are more effective in that they are more diffusive and widespread and persist for a longer period of time. (Refer to example No. 10)

4. The effects of special smoke vary according to interactions with the meteorological and topographical conditions, therefore to be able to use it to utmost advantage the prevailing meteorological and topographical features and conditions must be carefully surveyed beforehand.

In dawn operations against an enemy occupying high ground, you will find it impossible to envelop him with smoke of special smoke candles because of inversion of temperature and mountain winds, hence you should wait until the wind velocity increases in the daytime, then you can start screening with more success. Against an enemy hiding in woods or jungles the effects of ejection of smoke by candles are also uncertain; you have more favorable results from special smoke shells. In any event you must take into consideration the meteorological and topographical conditions when you decide the time and method in the use of chemical weapons. (See examples No. 4 and 5)

Chapter III. PLANS AND PREPARATIONS

1. Even when you happen to use special smoke candles locally and unexpectedly, that is, without any predetermined plan, you must spare no efforts to clearly define your targets and to coordinate your action with the operations of all other forces. Then you will be able to overcome the principal points of the enemy's positions and also destroy effectively their flank cover firing positions. If, on the contrary, you use your smokes in a haphazard way, it will not only be a waste of your materials and efforts but will also allow your enemy to reinforce his protective measures. We commend to the attention of higher chemical commanders that the greater the scale of chemical operations the greater is the need of elaborate planning and strict control and supervision in carrying it out.

Example No. 2 furnishes a successful case of smoke operations conducted in disassociated and local spots and yet with good results. Example No. 6, however, is an unfortunate case where the smoke was used in a haphazard way which only made the enemy more cautious and efficient in his defense against chemical warfare.

Instances are also numerous, where though a smoke screen was formed by an expert chemical unit, the troops were not able to make effective use of it, because the battle situation was so urgent that there was no time to plan a thorough coordination between the infantry and artillery and some of the infantry company commanders were not informed of the details of operational plan.

2. The effectiveness of a smoke operation is determined by a number of factors such as the targets of purpose of the operation, the strength of the smoking unit, materials, weather conditions etc. It often happens that one or the other of these factors may hinder the operation and make it impossible to form a smoke screen large enough to cover the entire front of the enemy's line. Hence each commander at the first combat line should try to make an estimate of the situation, estimating accurately the probable efficiency of a screen and carefully watch the rapidly passing stages of battle; and as soon as an opportunity presents itself he should employ all possible means at his disposal to supplement the screen or to reduce the enemy's flank cover firing or if necessary try to hinder the firing from the enemy's rear echelons. Preparations for such operations should be made at the outset of a battle.

In the China Incident special smoke was as a rule used locally; that is, in disassociated and localized spots or phases of battle; this was our general principle, which, however, was one of the causes that made many of our smoking operations a failure. For instance, in some battles the screen formed was not large enough to envelop the entire battle ground; consequently though the enemy at the front line was thrown into confusion and stopped firing, the screening of their flank cover firing was neglected and we missed the opportunity to attack.

When a smoke screen is disturbed by unforeseen changes in meteorological conditions heavy weapons should be employed to help reduce their fire. In the matter of forming a screen over the enemy's line, special care should be taken in screening over both flanks, for they attempt to escape from our gas by shifting their line to the windward.

In World War I, the ejection of gas over wide front lines was usually accompanied by supplementary ejection of non-toxic smokes or firing of shrapnel shells at and about both flanks.

3. In chemical warfare the major operations are conducted by field gas units, but at the front line often a smoke operational section or squad is temporarily organized to take care of smoke screening. Therefore each commander, whether company, section or other smaller unit, must study the application of field gas units and the organization and training of smoke operational units from the personnel of his own troops. In other words, his own troops should all be given thorough training in gas warfare so that in case there is no trained gas unit at his disposal chemical warfare can be carried out effectively by his own soldiers.

4. In preparing for smoke operations, the accumulation of necessary smoking materials, assistance in completing preparations and the advance of the smoke operational unit or field gas unit to the line of departure of smoke call for close coordination between the infantry at the first line and the smoke operational company, section or squad. When it comes to actual operations, the two forces should cooperate with each other like one body. This concerted action can only be secured if commanders of each body maintain between themselves close liaison from the beginning of the planning thru the preparation and execution. They should also carefully observe each development in the combat situation, and if circumstances permit, give preliminary exercise to their troops in order to better familiarize them with the essential procedures.

It is sometimes brought to our attention that during the preparatory period, from the accumulation of materials to the advance of the smoke operational force or field gas unit to the point of departure of smoke, the infantry fails to give full support and shows little enthusiasm in their cooperation. Of course the ultimate purpose of their cooperation consists in the actual ejection of smoke and in the use of its cover for attacking the enemy, which is the culmination of all the preliminary preparations. But it must not be forgotten that really effective cooperation starts from the very outset of planning and preparation.

In selecting the point of departure of smoke, special considerations must be paid to the terrain and natural features which may be used as shelter because the smoking points are likely to become the targets of enemy fire at the outset of the operation. Moreover, at the time they start smoking, they especially need protective cover from the artillery and heavy weapons at the front line. If necessary some shelters must be constructed with the aid of the troops at the front line.

5. As regards the time required for making the necessary preparations, it varies with the scale of the operation, the number of candles required, the state of the enemy's activity, the terrain, the number of personnel at our disposal and the location where smoking materials are deposited. But roughly speaking, in case of a dawn offensive operation by an infantry battalion, one night's preparation is considered sufficient.

In the case of localized use of smoke in the daytime of an urgent nature, which is to be carried out with the materials a smoke operational section or gas unit happens to have at its disposal, about two hours preparation are long enough if the other factors are favorable.

In case of large scale smoking operations where a fairly high degree of density is required, about 2 days time for preparations is considered necessary.

We mean by a large scale operation of highly dense smoke those cases where several candles are called for every metre and the dimension of the screen is more than sufficient to envelop the entire front of a regiment in action. Where lesser density is required, for example 2 candles for every metre, one night's preparation is considered sufficient provided preliminary arrangements among the troops or units concerned have already been made. (refer to the example in which 20th Division used smoke in the battle around Chü-Yao).

6. The selection of the points for starting smoke must be made as near as possible to the enemy, and after taking into full consideration the relation to and position vis-a-vis the targets of attack.

If conditions, especially the situation of the enemy or topographic features, are such that the first line of smoking points has to be made at some distance removed from the enemy, you may be forced to operate your smoking by 2 or 3 stages, that is, move up your smoking line by relays closer to your target.

Chapter IV. OPERATIONS

1. It may be said that half of the success of smoking operations may be determined by the thoroughness of planning and sufficiency of preparation. But the ultimate success in the utilization of the screen once formed depends largely upon the operation itself, especially upon the timely and determined attack upon the enemy by the soldiers of the first combat wave. Once special smoke is ejected, because of its specific nature, the attacking force should not lose a moment in going into action. The longer it delays the lesser the chances of success. (See examples No. 1 and 7)

As a commentary on the results of the use of smoke screens in these instances, the initial attack was made by the gas unit or the smoke operational soldiers themselves who unhesitatingly advanced into the smoke they had formed, thus encouraging the combat soldiers into immediate action. The opportune decision and action of these gas soldiers should be taken as a good example for all soldiers of the first wave.

2. After breaking through the enemy's line under cover of your smoke screen, you must not rest content with the capture of one localized position or line, but immediately proceed to the next phase of combat. To reassemble in some small village or other after an operation is likely to offer an easy artillery target for the enemy's rear echelon.

After the completion of an attack where gas-masks are worn, the commander should choose the appropriate time in giving orders to the soldiers to unmask, and should not let prolonged wearing of the mask be the cause of undue inconvenience in preparing for future action.

3. In an attack upon the enemy's special firing points, such as a pillbox, you will send the most daring and resourceful soldiers to sneak close to them and throw in special smoke candles either through the ventilator or the steel door which they will first break with explosives. Reduction of pillboxes in this manner will facilitate all subsequent action. (Refer to examples a & b of No. 8)

Example No. 1 Smoking operations in the course of
battle waged in and about Tã-Now-Shang

Main Points

- (1) Vigorous morale and sustained attack obtained success with the use of smoke.
- (2) Supplementary smoke had to be formed as the first screen formed was not large enough to envelop the entire front of the battle ground.
- (3) Too premature unmasking committed by the attacking force.

1st Battalion of Formosan
2nd Infantry Regiment

1. Development of the battle.

With the objective of capturing the enemy's position at Tã-Now-Shang, the battalion assembled September 4 at Hwa-Lin-Now and started offensive operations at dawn on the 5th under cover of special smoke candles, the main target being the left flank of the enemy's line.

Smoke started at 7:20 a.m. with 95 special smoke candles. The smoke departure line was about 30 to 40 metres long and the screen formed was about 200 metres in length, which was, however, barely sufficient to envelop about two thirds of the enemy's front. Some smoke candles had to be set in action in the valley to the north of Sheo-Pao-Tong to take care of the remaining third.

2. Result of the operation.

The enemy, who had been offering persistent resistance since the previous day soon began to show signs of confusion, though the screen was yet not large enough to envelop the entire line. Seeing that enemy fire had almost ceased, the first company, wearing masks, advanced through the screen into scattered enemy fire and captured the positions. The casualties suffered by the company were only 3 wounded soldiers. In the course of the uphill advance some soldiers had to remove their masks because of difficulty in climbing the hill, but as some special smoke still persisted, they were affected by it and had to hurriedly put their masks on again.

3. Weather and meteorological conditions

Cloudy but later cleared.

Wind velocity was about 3 meters.

4. Preparedness of the enemy against gas warfare.

They carried no protective equipment.

"
Ta-Now-Shang

About 300 Meters

"
Ta-Now-Shang

Captured 0750 Sept. 5th

Hwa-Lin-Now

Sheo-Pao-Tong

Sheo-Pao-Tong

Assault Began
0720 Sept. 5th

For Sui-Chong

圖經過ノ概要

大膽上附近奪取ノ目的ヲ以テ九月四日夕華林驛附近ニ
シ五日拂曉重點ヲ左翼ニ保持シ特種發煙筒ヲ使用シテ

一六七時二十分實施シ特種發煙筒九十五箇ヲ使用シ發煙
三、四十米、煙化正面約二百米ニシテ敵陣地ノ約三分
ヲ蔽フニ過ギザルヲ以テ更ニ蕭波洞北側谷地ニ若干ノ
發煙ヲ實施セリ

果利用ノ狀況

ヨリ頑強ニ抵抗セル敵モ發煙全正面ヲ蔽ハザルニ動搖
概木制壓セラレタルニ至レルヲ以テ第一線中隊ハ多少
穴ヲ冒シ煙ヲ被ルヲ意トスルコトナク裝面シ突撃ニ移
斜面ヲ幕進シ敵陣地ヲ完全ニ占領シ多數ノ敵ヲ擊滅セ
第一線中隊ハ僅カニ二、三名ノ負傷者ヲ出セルノミナリ
前進中攀登困難ノ爲一時脫面セルモ尙若干ノ特種煙筒
アリテ却ツテ害ヲ被リ更ニ裝面シテ突撃ヲ實行スルニ

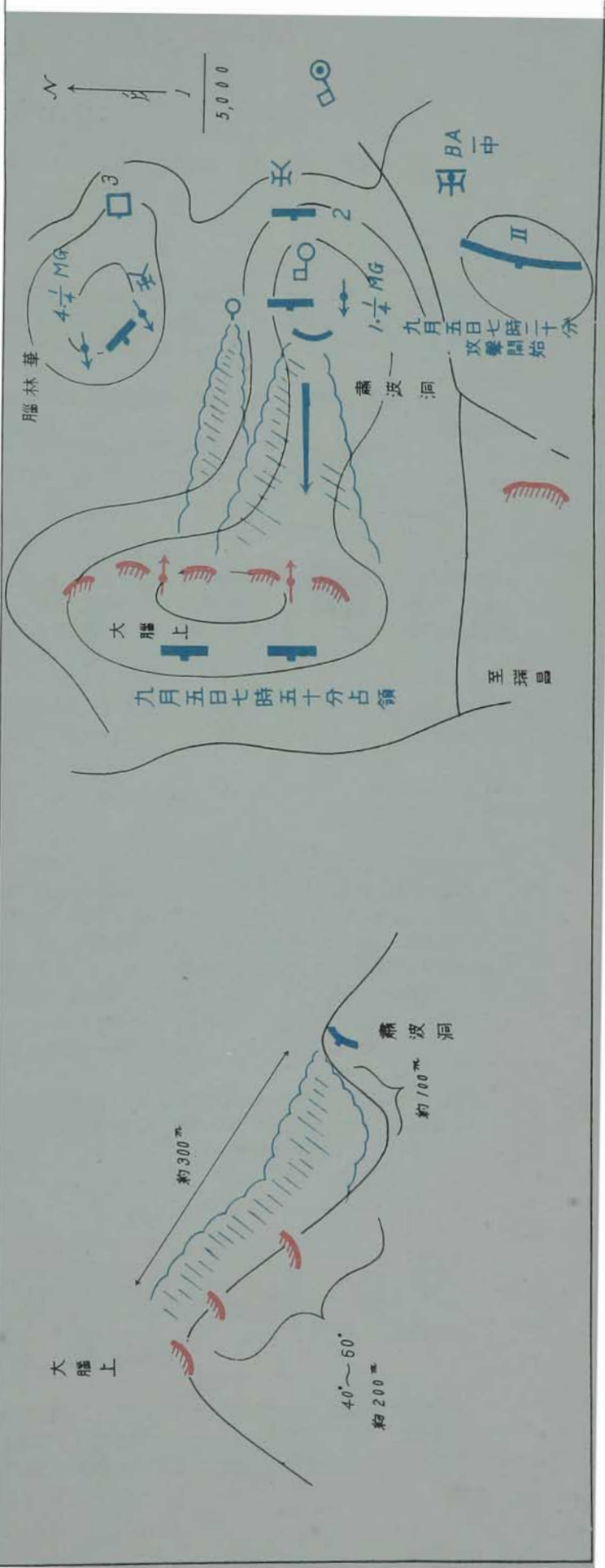
候、氣象

晴

三米

防護狀況

保護



Example No. 2 Special smoke candles used in the battle
around Tzeng-Tze-Tsung

Main Points

- (1) Successful use of special smoke candles which enabled us to break through the enemy's line with negligible casualties.
- (2) Preparation and thoroughness in planning and operations.

3rd Battalion of Formosan
2nd Infantry Regiment

1. Development of the battle.

With orders to capture Wu-Kwei Hill the battalion moved along the embankment of the Yangtse River 21 August and made preparations for offensive operations in the western district of Wang-Chä-Tseng village.

Preparations being completed in the night of 21 August operations were started at 6:30 a.m., 22nd August with 600 special smoke candles.

2. Plans and preparations

The battalion commander decided to start smoking operations at dawn of the 22nd in concert with the bombardment by the navy airplanes. On the evening of the 21st orders were issued to the Field Gas Section and also to the Smoke Operational Section of the Battalion regarding preparations and detailed instructions were issued to the smoke operational unit, the company of the first combat line and the heavy weapons unit regarding operations.

The commander of the smoke operational unit immediately made a careful survey of the land and also meteorological conditions and carefully worked out the details of the plans and preparations.

3. Operations

The meteorological conditions were excellent and the screen persisted and travelled low and soon enveloped the entire enemy line. The enemy fire, which had been fierce, soon stopped and they began to retreat.

The battalion pursued the retreating enemy; the smoke operational unit also took part in the pursuit. The enemy's main positions in the neighborhood of Tzeng-Tze-Tsung were soon

captured and mopped up. By noon of the same day our force penetrated about 4 kilometres into the enemy's line on the east side of Wu-Kweik-Hill.

In the course of this battle the casualties suffered by the battalion were very light; only two slightly wounded soldiers, while the enemy had a large number of gas casualties. They left a mortar and a number of machine guns behind on the ground.

4. Weather and meteorological conditions.

Fine with eastnortheast wind of 3 metres velocity and accompanied by some inversion of temperature.

5. Protective equipment of the enemy.

The enemy was utterly unprotected.

Yangtze River

Wu-Kwei-Hill

Shin-Gaow

Position where
smoke ejection
conducted by

Mao-Tu-Young

Bai-Wa-Lake

Gas Section and
also smoke section

Tzeng-Tze-Tsung

Shin-Tseng

Fo-Ta-Wan

Preparation completed at 0500

The position of the
dump

15 Candles

Arrival at 2300

Yang-Cha-Tseng

1st Operation
23rd August

Preparation
point of the
section.

Chik Lake

Departure at 20.00
21st August

良好損害僅少ニシテ迅速ニ敵陣地ヲ突破セル戦例

高周密ニシテ成果良好ナリシ戦例

臺灣歩兵第二聯隊第三大隊

經過ノ概要

關山占領ノ命ヲ受ケ八月二十一日揚子江岸

地區ヲ前進シ王家村西方地區ニ於テ城子鎮

攻撃ヲ準備ス

十日夜攻撃ヲ準備シ二十二日六時三十分

發煙筒約六百筒ヲ使用シテ攻撃ヲ行フ

準備

二十二日早朝海軍飛行機ノ爆撃ト共ニ發

ヒ突撃スルニ決シ二十一日夕野戰瓦斯小隊

發煙小隊ニ命令ヲ與ヘ準備、實施ニ關シ發

、第一線中隊、重火器部隊等ニ對シ綿密ニ

ル所アリ

隊長亦細密ニ現地ノ偵察ヲ行ヒ且從來ノ氣

等ヲ考慮シ計畫、準備ヲ周密ニシ必勝ヲ期

利用ノ狀況

ノ氣象狀況恰適ニシテ低迷セル煙ハ敵陣地

敵ヒ發煙時迄猛射ヲ續ケアリシ敵モ射撃ヲ

テ退却スルモノアリ

機ヲ失セズ突撃ニ移リ發煙部隊主力亦之ニ

城子鎮附近ノ陣地ヲ奪取シ掃蕩ヲ行ヒ引續

ニ進撃シ同日正午迄ニ烏龜山東側ノ線迄約

敵陣地ヲ突破ス

敵ノ中毒者多數ヲ撃滅セルノミナラス追撃

自動火器若干ヲ擄獲セリ

ニ於ケル我が損害ハ輕傷二名ノミニシテ完

固ナル陣地ヲ占領セリ

氣象

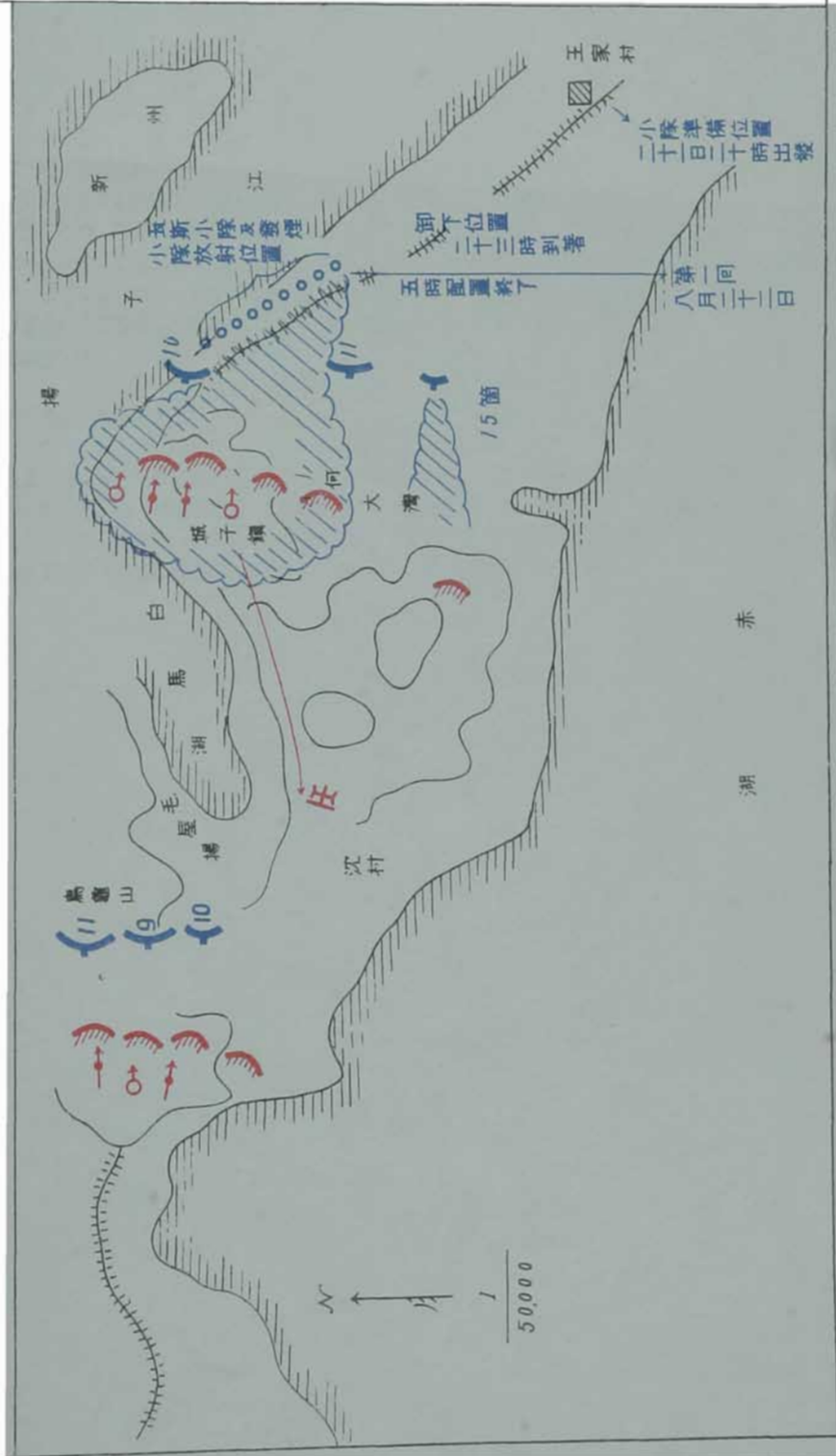
北東

采

霧アリ

敵狀況

68



Example No. 3 Smoke operations in the battle near Tã-Tze-Chi conducted by the 2nd battalion of the 68th Infantry Regiment.

1. Development of the Battle.

With the objective of protecting navigation on the Yangtze River, the 2nd battalion of the 68th Infantry Regiment was mopping up the area in the vicinity of the river. On September 5th at 5:50 a strong enemy force attacked the center of the battalion and penetrated through the gap between the two companies of the first combat line. They advanced close to the battalion headquarters and threatened to overrun it. The main force of the battalion having moved into the front line, there was scarcely any reserve force available, whereupon the commander decided to use special smoke candles. They were found effective; about 5 candles sufficed to drive the enemy away.

2. Results of the operation

The smoke candles were set in action at close quarters and at the time when the enemy least expected them. They threw the enemy into utter confusion. They retreated leaving behind a large number of disabled soldiers.

Example No. 4 Use of special smoke candles in the battle around Tsan-Tien Hill.

An example of smoke operations conducted under favorable meteorological conditions.

2nd Battalion of Formosa 1st Infantry Regiment.

1. Development of the battle.

The regiment which had been attacking the enemy's line surrounding Tsan-Tien Hill since August 1938 captured the enemy's reconnaissance outposts that linked up 3 hills, and launched offensive operations upon the enemy's main positions.

2. 2nd Battalion, which had attacked and captured Dakeino in cooperation with artillery bombardment, launched offensive operations against Santen-Hill, sending the 5th and 7th companies to the first line. The battalion was short one company, but had incorporated in it an infantry heavy weapons company.

Our first combat wave advanced to within about 50 meters of the enemy's line, which, however, was strongly fortified and fitted with loopholes. Offering stubborn resistance, the enemy fire made our further advance impossible. Moreover, the enemy, occupying the crest of a steep hill held an advantageous position over us.

The battalion decided to resort to special smoke candles and after making a careful study of the ground and meteorological conditions concluded that the wind direction, velocity and temperature were suitable for forming a screen along the hill-sides. About 1600, 20 special smoke candles were set in action from the valley to the right of the front line.

Large clouds of special smoke travelled upward along the hill-slope and soon enveloped the entire enemy's line at the crest of the hill.

2. Results of the operation.

The company in the first wave, keeping close to the smoke screen, charged into the enemy's line and soon captured its main points.

As soon as the smoke penetrated the enemy's line, they became disorganized and many of the enemy began to break ranks and run.

3. Weather and meteorological conditions

Fast wind. Wind velocity at the hill crest was about 5 metres, on the hill-side and in the valley about 3 metres. No inversion of temperature occurred.

4. Preparedness of the enemy against gas warfare.

They lacked protective equipment.

RESTRICTED

Situation around 1600
August 21st

Tsan-Tien-Hill

Screenin;
Section

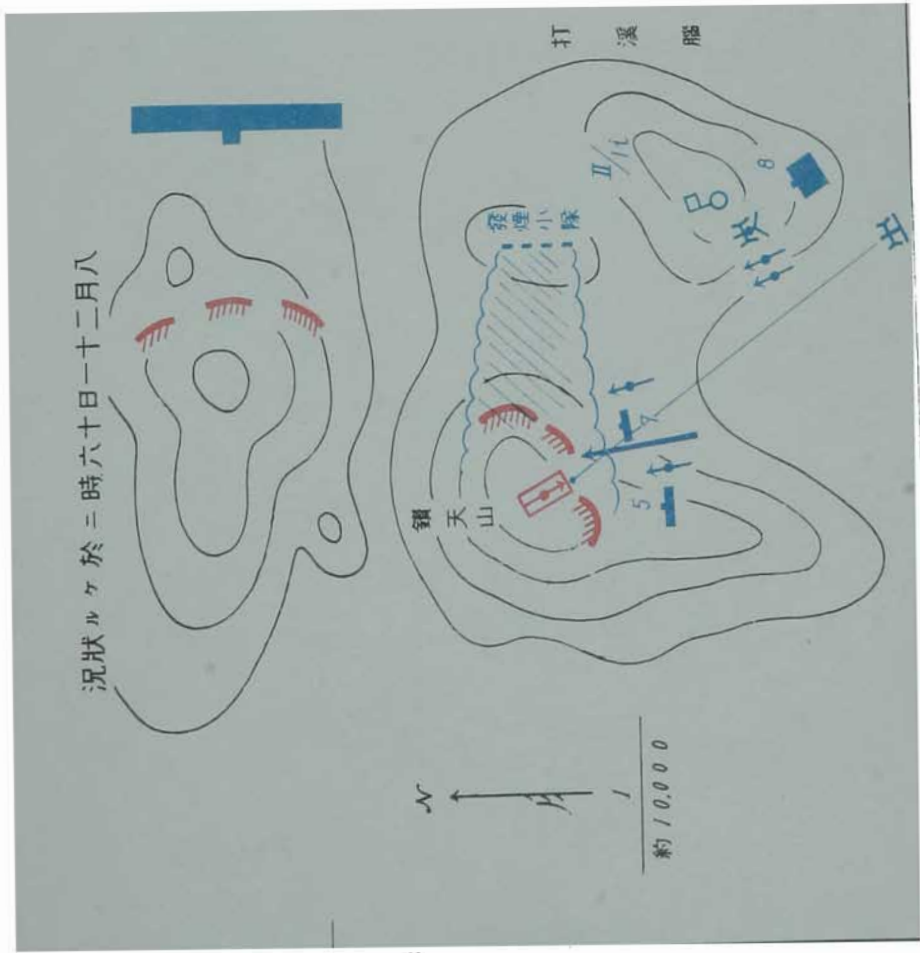
Ta-Chi-Now

RESTRICTED-

-107-

昭和十三年八月曹家山、鑽天山附近ノ敵陣地ヲ攻撃中ノ聯隊
 二十二日△一八一・七高地、△二一八・〇高地、△二一七・〇
 高地ヲ連スル敵警戒陣地ヲ奪取シ引續キ敵主陣地ニ對シ攻撃ヲ
 開始セリ
 砲兵協同ノ下ニ打溪腦ヲ奪取セシ第二大隊（第六中隊欠、歩
 兵中隊ヲ屬ス）ハ第五、第七中隊ヲ第一線トシ鑽天山ノ敵陣
 地ヲ攻撃ス
 砲兵第一線敵前五十米ニ近接セシモ急峻ナル山頂ヲ利用セル銃
 陣地ニ據レル敵ハ頑強ニ抵抗シ突撃ヲ敢行シ得ズ
 大隊長ハ特種煙ヲ使用スルニ決シ當時ノ風向、風速並ニ氣温
 轉ノ状態ヨリ煙ノ山腹斜面ニ沿ヒテ流動スベキヲ判断シ十六
 時第一線ノ右側方谷中ヨリ特種發煙筒二十箇ヲ同時ニ點火シ發
 煙ス
 發タル特種煙ハ谷底ヨリ山腹ニ沿ヒ適度ニ擴散シツツ山頂ニ
 向ヒ流動シ全ク敵陣地ヲ包蔽セリ
 成果利用ノ狀況
 第一線中隊ハ機ヲ失セズ煙ニ肩接シ敵陣地ニ突入シ主陣地ノ
 要點タル鑽天山ヲ奪取セリ
 特種煙ヲ受タルヤ敵ハ周章狼狽シ陣地ヲ放棄シ後退セリ

天候、氣象
 向東
 雲 山頂 五米
 谷地及山腹 三米
 温度轉ナシ
 敵防衛狀況
 防護



Example No. 5 Use of special smoke shells in the battle waged on the western side of Wu Hill

A successfully coordinated use of special smoke shells and ordinary shrapnel shells in overcoming the enemy hiding in a woods.

2nd Company of the 4th Mortar Battalion.

The 2nd Battalion of the 1st Regiment of the Hata Detachment attacked the enemy frontally, but our right flank was threatened by the enemy artillery that continued firing from their position near Tä-Chao village. The detachment tried to overcome their artillery with ordinary shrapnel shells, but without success, as they were hidden in a woods. At this juncture, our mortar company decided to use special smoke shells and by firing 10 rounds of special smoke shells succeeded in routing the enemy out of the woods into an open position near the village of Tä-Chao. As soon as the enemy came out into an open field our mountain artillery annihilated them with ordinary shrapnel shells.



Ta-Chao

Wu-Hill

Won-Jen-Now

Bi-Cha-Hill

-109-



Example No. 6 Lack of sufficient understanding of chemical weapons and consequent misuse of special smoke candles committed by the commander.

The commander lacked knowledge of the effects of special smoke candles, and consequently they were set in action without due regard to the meteorological conditions and ended in utter failure. The commander used the smoke in the daytime when the upward atmospheric current was at its height. Consequently the smoke formed all flew up in the air and soon dissipated. No only was no screen formed to cover the advance of the combat troops, but the flying smoke offered an obstacle to our artillery fire observation.

Example No. 7 Smoking operations were satisfactorily carried out but the first wave combat force lacked the courage to make timely and successful use of the screen.

In offensive operations against strongly fortified enemy positions, all minute details of preparations were carefully studied and arranged such as: a sufficient number of special smoke candles and shells were concentrated with other requisites, smoke operational units as well as the combat units were thoroughly trained, the targets to which the candles and shells were to be applied were clearly defined beforehand, a careful survey of the land and meteorological conditions was made, coordination of the actions of various different units and close observation of the operation was maintained. The result was a fairly large and dense smoke screen formed over the entire enemy front, but the first combat wave lacked the determination and courage to make a bold advance into the enemy's line and the whole operation ended in failure.

Example No. 8

- a. Offensive operations against the enemy occupying hilltops near Shin-Dien came to a stalemate because of the obstinate resistance offered by the enemy's pillboxes located at vantage points. A sergeant resolved to charge these posts singlehanded, and, carrying a special smoke candle with him, sneaked close to the enemy's pillbox, and at a distance of about 30 metres from the pillbox ignited the candle. Soon the pillbox was enveloped with the special smoke; when the fire was thus reduced, the sergeant went round behind the pillbox and killed the 5 soldiers who were then suffering from the effects of the special smoke in the pillbox.
- b. Successful smoke operations in attack at close quarters against pillboxes.

Use of special smoke candles in the battle in the southern district of Hui-Chow.

55th Infantry Regiment

1. Development of the battle

(1) After successful amphibious operations at Baiyas Bay the regiment continued its advance and came up to Shang-Ma-Tsong at 12:05 on the 14th of October.

The enemy, occupying mountain regions, offered obstinate resistance from their fortified positions fitted with pillboxes.

The regiment, after making an attack at dusk on the 14th and a further attack at dawn on the 15th, captured the enemy's positions. In the course of the battle special smoke candles were used.

(2) Details of the operations

- (a) The company that used the smoke candles:
 - Fukuda's Section which was composed of 1 infantry section and one machine gun section.
 - The targets:
 - The enemy's large pillboxes, which were about 20 metres wide in front.
 - Time when the smoke was set in action:
 - About 0900 on 15 October.
 - Number of candles used:
 - 7 Special smoke candles
 - 2 Tear gas candles

Main points of the operational procedure:
Sneak close to the pillbox, mount upon it and cast the smoking candle through its ventilator, then stuff the ventilators with mud or clay. Usually a pillbox had 5 or 6 ventilators.

- (b) Company: 10th Company
Target: Pillbox 7 metres wide in front, and 3 metres deep.
Time: 22:50 on the 14th
Candles: 2 special smoke candles, 1 tear gas candle
Procedure: Sneak close to the pillbox and breaking the steel door cast the smoking candles into the pillbox.
- (c) Company: 11th Company
Target: 2 storied pillbox, about 10 metres in diameter.
Time: 23:00 on the 14th
Candles: 2 special smoke candles, 2 tear gas candles.
Procedure: Sneak close to the pillbox and forcing open the steel side door, throw the smoking candles into the pillbox.
- (d) The commander of 3rd Machine Gun Company accompanied by 3 soldiers.
Target: Pillbox.
Time: 23:40 on the 14th
Candles: 1 Special smoke candle
Procedure: Sneak close to the pillbox and at 5 or 6 metres to the wind-ward, set the candle in action so that the smoke thus formed will travel into the pillbox through its loopholes.

2. Results of the operation

As soon as the enemy stopped firing our non-commissioned officers and enlisted men wearing their masks charged into the pillboxes.

Generally the enemy stopped firing some minutes after ejection of the smoke. Some tried to escape through the loopholes. Those remained behind in the pillbox were found writhing on the floor affected by the gas.

. Weather and meteorological conditions.

On the night of the 14th, we had thunder and rain. Wind velocity was 7 or 8 metres.

Morning of the 15th, the weather was fair, with north-asterly wind of 1 and one half meters.

. Preparedness of the enemy against gas warfare.

(1) Most of the officers from company commanders up carried gas masks directly fitted with canister.

(2) No protective equipment was installed in their pillboxes or positions.



For Eui-Chow

Situation around 2200 Oct. 14th

Te-Ling

Wheat Field

概況ノ概要

昭和十三年十月十二日「バイアス」海ニ上陸セル敵ハ途中敵ヲ撃破シツツ十月十四日十二時五分上馬ニ進出セリ
 ハ惠州南方山地一帯ニ特火點ヲ有スル堅固ナル陣ヲ構築シアリテ頑強ニ抵抗ス
 敵ハ十四日薄暮攻撃ニ引續キ十五日黎明攻撃ヲ以テ此ノ陣地ヲ奪取セリ
 陣ニ特種煙ヲ使用シテ特火點ヲ肉薄攻撃セル數アリ
 特種煙使用ノ狀況左ノ如シ

用兵小隊	日標	使用時刻	使用數	使用要領
八小隊 兵小隊 一隊	A 特火點 大特火點 ニシテ約 五面米約	十五日 九時 九分	特種發煙筒 七筒 みどり筒 二筒	肉薄攻撃ニシテ特火點上ニ登リテ特種發煙筒ヲ投入スルニシテ敵ノ陣地ヲ閉塞スルヲ期ス
十中隊	B 特火點 正火點 米約七 行三米	十四日 二十時 五十分	特種發煙筒 二筒 みどり筒 一筒	肉薄攻撃ニシテ敵ノ陣地ヲ閉塞スルヲ期ス
十一中隊	C 特火點 近距離 階式米	十四日 二十時 三十分	特種發煙筒 二筒 みどり筒 一筒	肉薄攻撃ニシテ敵ノ陣地ヲ閉塞スルヲ期ス
三隊長 以下隊	D 特火點	十四日 二十時 四十分	特種發煙筒 一筒 みどり筒 一筒	肉薄攻撃ニシテ敵ノ陣地ヲ閉塞スルヲ期ス

成果利用ノ狀況

敵射撃ヲ中止スルヤ何レモ直チニ裝面セル下士兵ハ兵突入シ内部ヲ掃蕩セリ
 何レモ使用後數分ニシテ射撃ヲ中止シ一部ノ敵ハ蹙眼ヨリ逃走セントセリ
 内部ニ殘留セシ敵ハ苦悶ノ狀ヲ示セリ

天候、氣象

十四日夜 雷雨

風速七乃至八米

十五日朝 晴

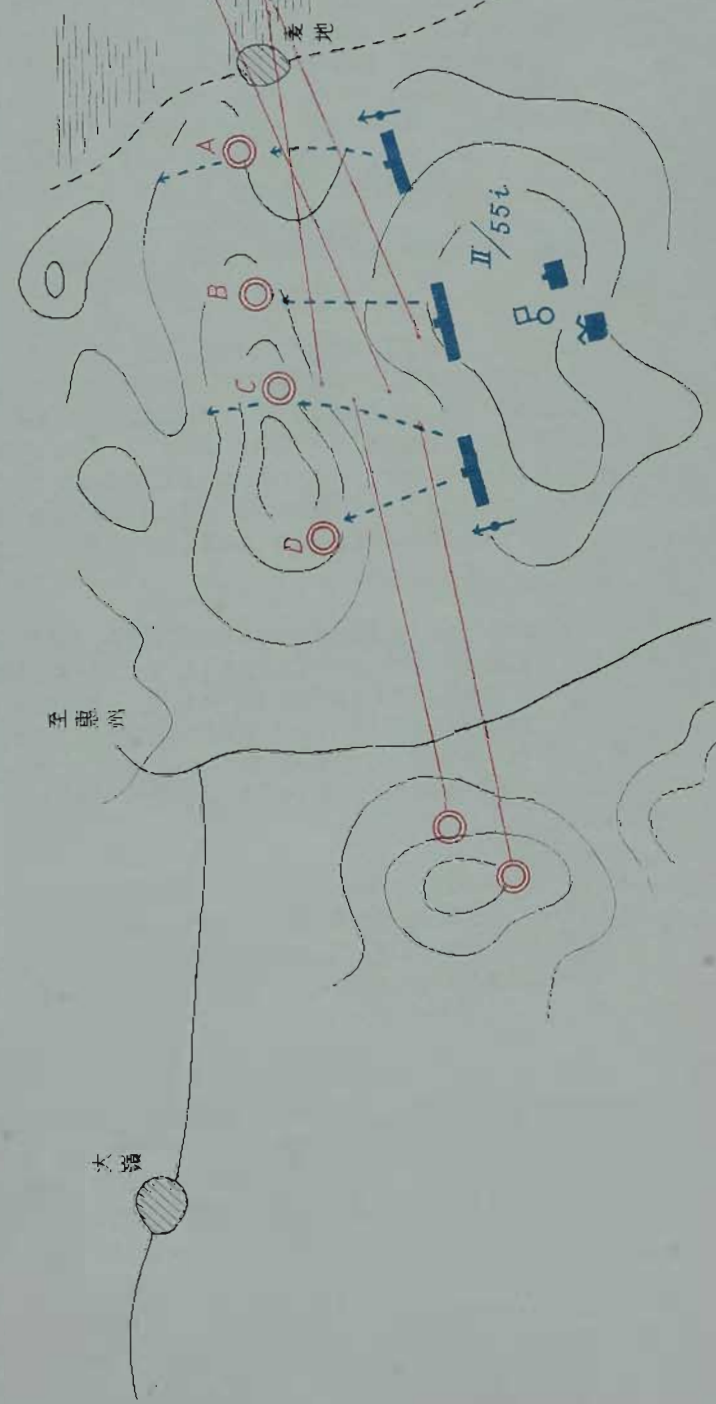
風向北東

風速一・五米

敵防護狀況

中隊長以上直結式防護面ヲ有スルモノノ如シ
 特火點ニ防護設備全然ナシ

十月十四日二十二時於ケル狀況



Example No. 9 Successful coordination of smoking operations in crossing a river in front of the enemy's line.

4th Mortar Battalion of the
23rd Infantry Regiment

1. Development of the battle

(1) Pursuing the retreating enemy toward Hankow, the 23rd Infantry Regiment reached the river bank in the neighborhood of Dao-Kuang-Chuan, at the point where the bank collapsed in the last flood. The enemy occupied Tai-Chä Hill and attempted to check our advance by small fortification, which had good command over the whole flooded area, which was about 1300 metres in width. The current drift was estimated to be 3 or 5 metres.

The regimental commander resolved to attack the enemy by forcing a crossing of the river.

(2) While preparations for crossing the river were underway, the regimental commander arrayed 1 field artillery battalion, 1 mountain artillery battalion, 1 armour-piercing artillery battery, 1 field anti-aircraft artillery battery and the 4th mortar battalion on the south side of Dao-Kuang-Chuan and ordered them to commence firing with shrapnel shells. The 4th Mortar Battalion continued firing shrapnel shells from 1810 to 1840.

(3) The commander of the 4th Mortar battalion suggested to the regimental commander that special smoke shells might be employed to our advantage. This suggestion was adopted and when the first crossing operation was undertaken at 1840 and the landing craft came up to 1000 metres off the enemy line they fired special smoke shells, some 80 shots in 2 minutes and 40 seconds.

(4) The special smoke produced by the shells was carried by the cross wind and travelled low and persistently over the whole area, soon enveloping about 300 metres of the enemy's front line. The enemy fire soon stopped.

2. Results of the operation

(1) Ten minutes after the firing of the special smoke shells, the first landing force reached the opposite bank of the river. Upon landing they rushed into the enemy's line and captured the small fortifications. Our only casualty was one wounded soldier.

(2) The enemy's fire was reduced to a large extent by the concentrated firing of shrapnel shells by our field and mountain artillery and mortars, but by the time our landing force boarded the landing craft, the enemy still continued machine gun fire, which was finally silenced by the special smoke shells.

3. Weather and meteorological conditions.

Raining the whole day, but the smoking operation was carried out when the rain stopped. We had an east wind of 4 metres velocity.

4. Preparedness of the enemy against gas.

No information was obtained.

For Kwang-Dien

Dao-Kuang-Chuan

Embarkation
Point

Current drift
5 Meters

Situation about 1840 October 25th

Number of Shells used:
Special Smoke Shells 80

Number of Guns employed: 4
(Inclusive of Supplementary Guns
carried by trucks of other units,
which the quick pursuit required.)

Wind Velocity
4 Meters

Number of shots:
About 7 shots per minute

Tai-Cha-Hill

For Fan-Kow

二十五日道貫島(漢口東北方八村)附近決戦
 進出敵ハ幅千三百米ノ大氾濫地帯(流連三
 四米)ノ對岸戴家山小要塞ニ據リテ我ヲ拒止

長ハ直チニ此ノ敵ヲ渡河攻撃スルニ決ス
 敵ハ渡河ヲ準備スルト共ニ野砲兵一大隊、山
 砲一大隊、遠射砲一中隊、野戰高射砲一隊、迫
 撃大隊(第一、第二中隊欠)ヲ道貫島南側附近
 迄シ榴弾ヲ以テ敵ヲ射撃セシム迫撃第四大隊
 八時十分ヨリ約三十分間榴弾射撃ヲ實施ス

敵第四大隊長ハ特種發煙彈ヲ使用スルヲ有利
 ト認メ意見ヲ具申シ容レラレ八時四十分第

渡河部隊(III/231)ノ渡河開始後(渡舟ガ敵前約千
 達セシトキ)特種發煙彈射撃ヲ開始シ二分四
 角ニ八十發ヲ發射ス

敵陣ハ風速適度ナル側風ニ依リ良ク低迷流動
 示ニ陣地内ノ敵ヲ御座シ正面約三百米ヲ包蔽
 シ射撃ヲ全ク停止セシメタリ

利用ノ狀況

特種發煙彈射撃開始後約十分ニシテ第一回渡河
 部隊ニ到着シ上陸ト同時ニ突撃ヲ敢行シ戴家
 山要塞占領ノ端緒ヲ開ケリ我が損害僅カニ一名
 ヲ失

山砲及迫撃砲ノ榴弾集中射撃ニ依リ敵ハ相
 成セラレアリシモ我方渡河部隊ノ乗船時ニハ
 動火器殘存シ射撃ヲ繼續シアリタリ

時四十分ノ特種發煙彈射撃以後ハ特火點内ノ
 火器ニ至ル迄全ク沈黙セリ

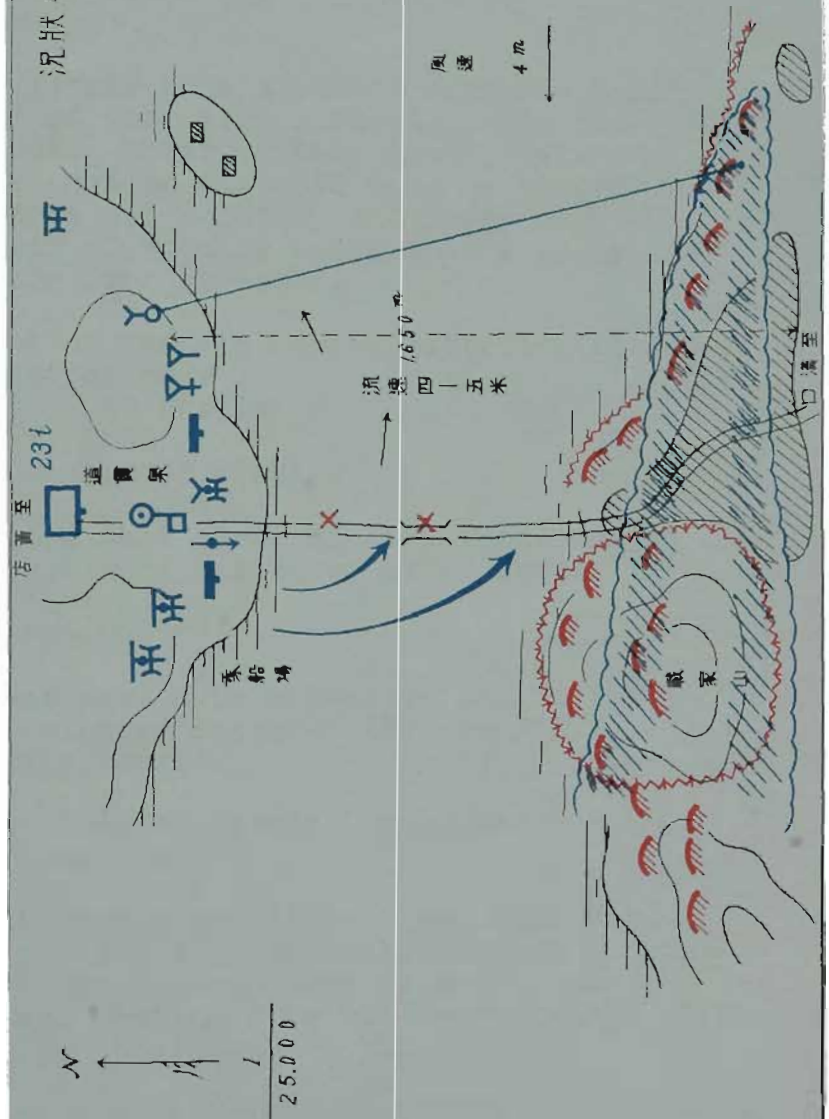
氣象

止ミタル時期

米

渡河狀況

狀況ルケ於ニ分十四時八十八日五十二月十



使用彈數	特種發煙彈八十發
使用砲數	四門 (急迫ノ爲他部隊ノ自動貨車ニ携加榴弾ヲ携行セル砲數トス)
發射速度	一分間約七發

Example No. 10 Successful use of special smoke to overcome stubborn enemy resistance from strongly fortified hill-top positions.

2nd company of the 4th Mortar Battalion of the Formosan 1st Infantry Regiment.

1. Development of the battle.

(1) Since 5 September, the 1st Regiment had been pounding the enemy stationed on the hill-tops from Ta Hill hills to Kung-Shan-Yen peak.

The enemy was firmly holding their strongly built pillboxes on the peaks of the hills connected with one another by deep trenches. Their machine gun resistance was obstinate and could not be silenced even by concentrated shrapnel fire from our mountain and heavy artillery. Only with the aid of special smoke shells projected by our mortars was their fire overcome.

(2) The 2nd company of the 4th Mortar Battalion fired special smoke shells as follows:

Number of shots: 59 shells
Time of firing: 1800
Duration of firing: 45 minutes

It is to be noted that these special smoke shells were fired in the intervals of firing by other guns.

2. Results of the operation

(1) The first combat wave made effective use of the smoke screen and in 50 minutes captured the enemy's positions on the mountain tops.

(2) With the first round of special smoke shell the enemy showed signs of confusion.

(3) The enemy on the southern slope of the hill withdrew to the fortified positions on the hilltops and attempted to reorganize, but as we pursued them closely, they had no time to reorganize and continued to retreat together with those from the machine gun positions on the hilltops.

(4) The enemy withdrew from Hsueh-Fong Chien (double-peaked hill) line but returned there in about an hour's time.

3. Weather and meteorological conditions

Southeastern wind of 3 or 4 metres.

4. Preparedness of the enemy against gas.

The enemy was not protected against gas warfare

Situation From 1800 to Around 1930 Sept. 5th.

Ting-
Cha
Ta-Hill

Shi-Po-Kow

Chien-hill

Fu-Shang-Hill

Bi-Cha-Hill

Hson-Fong-Chien

12 Rounds

King-Shan-
Yen 47 Rounds

Ksia-Yu

敵ニ互ル敵陣地ヲ攻撃中ナリ

敵ハ拱山岩、双峯尖等ノ山頂ニ相當深キ壕ヨリ成
 へ掩蓋機關銃座ヲ有スル陣地ヲ占領シ頑強ニ抵抗
 シ山砲、重砲等ノ普通榴彈射撃ヲ受クルモ動搖ノ
 兆ナシ依ツテ迫撃砲ノ特種發煙彈ヲ使用シ高地
 ノ敵ヲ制壓スルニ決ス

、迫撃第四大隊第二中隊ハ特種發煙彈ヲ以テ左ノ
 如ク射撃ヲ實施ス

發射彈數	五九	備考 他ノ各種火器ノ射撃ヲ利用シ實施セリ
射撃開始時期	十八時	
射撃時間	四十五分	

成果利用ノ状況

、第一線部隊ハ遺憾ナク此ノ成果ヲ利用シ攻撃前進ヲ開始シ五十分ニシテ拱山岩山頂ヲ奪取セリ

、特種發煙彈ノ最初ノ射撃ヨリ陣地内ノ敵兵動搖シ始メタリ

、南斜面ヨリ後退セル敵ハ拱山岩山頂ニ停止セントセシモ停止スル能ハズ掩蓋機關銃座内ニ在リシ機關銃モ共ニ西方ニ後退セリ

、双峯尖上ノ敵ハ後退セルモ約一時間後復歸セリ

天候、氣象

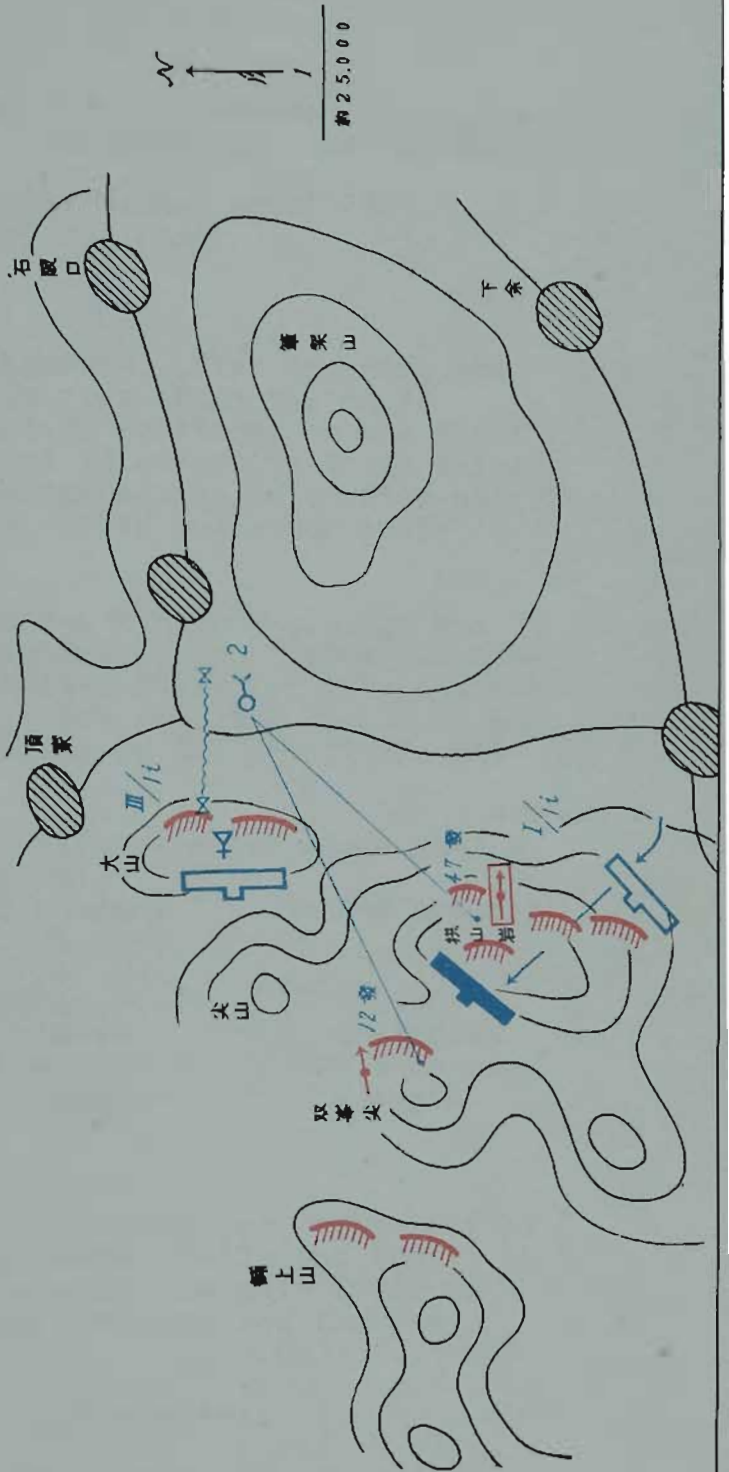
向南東

風速三乃至四米

敵防護状況

無防護

九日五月十八日概リヨ時三十九分至九時



Example No. 11 Special smoke shells successfully used to reduce enemy fire from the flanks.

4th Mortar Battalion of 23rd
Infantry Regiment

1. Development of battle.

(1) The 23rd Infantry Regiment, after smashing the enemy in the southwestern district of Zhen Shuion 21 October holding firm the vantage positions on the right bank of the river, was engaged in extending their gains, while the enemy was making preparations to counter-attack under cover of woods, groves, hills and other suitable terrain.

At this juncture the 4th Mortar Battalion was assigned to reinforce the regiment. The regimental commander decided to have the mortar battalion fire special smoke shells to reduce enemy fire from the flanks so as to facilitate the river crossing by the main force and permit further advance.

(2) The mortar battalion fired special smoke shells according to the following plan:

	1st company	2nd company
Number of guns	6	6
Number of shells	52	72
Time of firing	0914	0930
Duration of firing	1 minute	2 minutes
	40 seconds	20 seconds
Rate of fire	5 shots	5 shots

2. Result of the operation.

The strongly fortified enemy positions on the flanks were destroyed by our special smoke shells and their fire was silenced. In the meantime the main force of the regiment crossed the river and attained the pre-determined line.

3. Weather and meteorological conditions.

Fair with northeasterly wind, wind velocity being 1.5 or 1.7 meters.

4. Preparedness of the enemy against gas warfare.

Not definitely ascertained.

Situation about
0930 Oct. 21st.

Hu-Cha-Wan

Fu-Cha-Wan

Kao-Fu-Hill

Lu-Cah-Wan

Yuo-Cha-Wan

At 0800 the
troop party
advanced

The River is
300 Meters
wide at the
river bend
and 50 CM deep

Crossed
the River

Ki-Shui

歩兵第二十三聯隊ハ十月二十一日藤水西南

ニ於テ敵ヲ撃破シ右岸要點ヲ確保シ戰果ヲ

戰中ニシテ敵ハ樹叢地帯、丘陵及地物等ヲ

利用シ我ヲ拒止シ逆襲ヲ企圖シツアリ

聯隊第四大隊ノ配屬ヲ受ケタル聯隊ハ特種發

煙ニ依リ側防機能ヲ制壓シ主力ノ渡河及其

後ノ攻撃ヲ容易ナラシムルニ決ス

追撃第四大隊ハ特種發煙彈ヲ以テ左ノ如ク

攻撃ヲ實施ス

區分	第一中隊	第三中隊
使用砲數	六	六
發射彈數	五二	七二
射擊開始時刻	九時十四分	九時三十分
射擊時間	一分四十秒	二分二十秒
發射速度	五發	五發

渠利用ノ狀況

發煙彈射撃ニ依リ敵陣地ノ堅固ニ構築セラ

ル側防機能制壓セララルルヤ此ノ機ヲ利用シ

主力ハ渡河ヲ實施シ所命ノ線ニ進出セリ

候、氣象

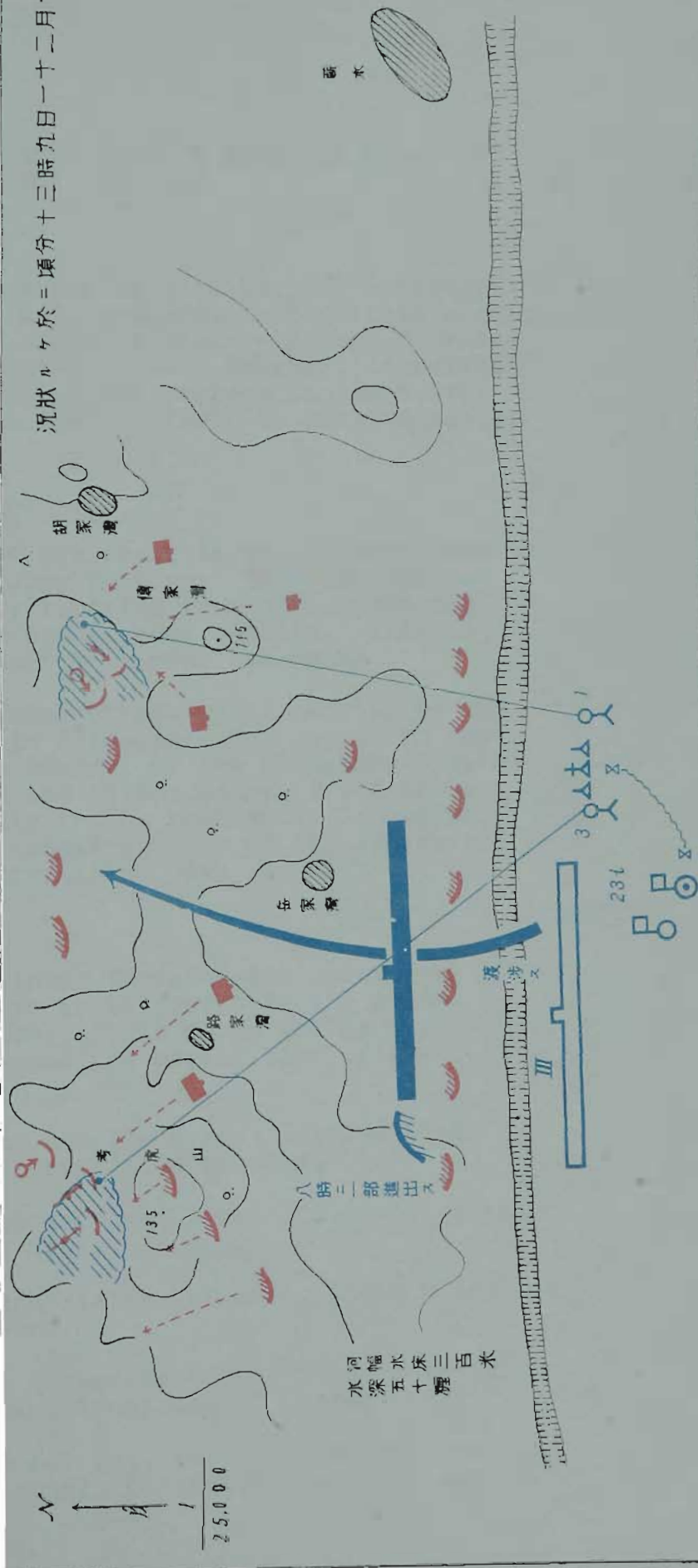
晴、東北東乃至東

風一・五乃至一・七米

防護狀況

明

十 月 二 十 九 日 十 三 分 頃 於 ケ ル 狀 況



Chapter VI THE CHINESE ARMY AS SEEN FROM THE POINT OF VIEW OF CHEMICAL WARFARE.

1. General

Evidently they have begun to give serious consideration to chemical warfare and made attempts to institute chemical warfare training and to organize equipment, but they are yet only in the experimental stage. However, stimulated by the bitter experiences of the present Incident, the Chinese Army will double their efforts to achieve better defensive measures.

2. Defensive equipment

(1) Their protective equipment is not standardized and varies widely from army to army. Their gas-masks for instance, are mostly imported from abroad and the great majority of these are of poor quality. This is particularly true of their home-made gas-masks.

(2) Although the number of gas-masks carried by the troops differs greatly in different army groups in the armies not under direct control of the Chungking Government, only the officers are given gas-masks and these are very defective; while in the regular armies under the direct control of Chungking, many of the soldiers in the front lines are furnished with gas-masks.

3. Defensive Training

Instruction and training in defensive operations seem to be very primitive as is proven by the actual examples enumerated below. It is worth noting that they seem to have neglected the morale side of instruction.

(1) Some soldiers at the front line carried their gas-masks without canisters fitted to them.

(2) Some did not uncover the lid of the canister and were asphyxiated by the mask.

(3) Some died by asphyxiation sticking their noses and mouths into the ground.

(4) Some wore their gas-masks but because of their not being air tight became incapable of combat.

(5) Mistaking smoke for gas, at the sight of smoke they abandoned their strongly fortified positions and retreated.

(6) Some carried their masks, but lost their head in the turmoil and could not put on their masks.


(7) When prisoners were told to demonstrate the use of masks, their movements were very slow and awkward and they seemed completely indifferent to the air-tightness of the masks.

(8) Although the Chinese armies when attacked with special smoke would generally abandon their positions, they would soon return unless we broke through their defense lines while the screen persisted.

When the soldiers came in contact with special smoke, some seriously affected persons bled through their noses and mouths and died from asphyxiation.

(9) The fact that the Generalissimo himself and his higher commanding officers often issued instructions such as the following to the armies shows how primitive their education in chemical warfare was:

- "1. When the enemy undertakes to make a smoke screen, you must not, in any event, mistake it for toxic gases and make an unnecessary fuss about it but hold calmly to your position and receive the attack.
2. Most of the gases which the enemy uses are non-persistent ones; therefore our army, if it can take simple defensive measures against them, can meet them when the time comes, rout the enemy and defeat the purposes of the enemy's operation.
3. Each unit should always be provided with gas-masks. If the supply of masks is insufficient emergency manufacture must be carried out and full preparations made. The enemy's gas attacks must be repelled at all times."



Appendix F

This Appendix consists of a translation of a booklet titled, "Gasu Yoho;" literally translated, "The Methods of Use of Gas;" reproduced from memory by Colonel Takeshige Yokoyama, formerly Assistant Commandant at the Japanese Army Chemical Warfare School, Narashino, Chiba Prefecture. The original document was an official publication of the Japanese Army, but is not available, having been destroyed when documents were ordered burned by the Japanese Government on 15 August 1945.

Preface

This report contains the basic principles of chemical warfare tactics which I can reproduce to the best of my recollection.

The booklet titled "Gasu Yoho", literally translated "The Methods of Use of Gas", was a little pamphlet of some 10 pages, in which some of the fundamental principles regarding the employment of gas weapons on the field were written. It was published sometime before 1938, so it was an old book, and it was a little later that it was adopted as a manual of gas tactics by the army.

Since the publication of this booklet studies and research in the offensive use of gas was discontinued so that no amendments or revisions of any kind have been made to this book. However I believe there are a number of people who out of personal interest continued further research in this matter and held different and advanced views on this subject.

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Use Of Gas

Chapter One

General Rules

1. Gas should not be used unless the use of it is authorized by a directive from the Imperial General Headquarters.
2. Before you begin a gas warfare operation, you should calculate the amount of gas to be used, survey the meteorological and terrain conditions, consider the quality of the enemy, estimate the possible effect of the gas or determine the objective of the gas attack. The time and method of operation and the kind of gas to be used should be chosen after taking into full consideration the above factors.
3. The effectiveness of gas is greatly affected by the changes in the meteorological conditions and unfavorable terrain, therefore it is generally considered desirable that gas should be employed in as large amount and large concentration as possible. But there are cases where a small amount of gas may be used locally for the purpose of misleading the enemy.
4. Meteorological conditions exercise a great influence upon the effectiveness of gas, especially the non-persistent gases. Of the meteorological factors, the wind direction and the wind velocity are the most important.

When you want to wage gas warfare on a large scale, you should first make a careful study of the meteorological conditions of the field and fix the most appropriate time for starting the operation.

5. It is extremely difficult to make a meteorological survey or estimate in the field especially in and about the enemy positions, but as this is of utmost importance in gas warfare, the commander of each unit, especially commanding officers of the small troops on the first combat line should make all possible efforts to determine the meteorological conditions in the neighborhood of the enemy lines.
6. In the case of a non-persistent gas, special attention must be paid to the vertical distribution of atmospheric temperature. The inversion of atmospheric temperature tends to make non-persistent gas hug the ground, hence it is important to measure the height and strength of the inversion. When the atmospheric inversion occurs in an altitude above a man's stature, it is of no importance from a chemical warfare point of view. What concerns us is the inversion that occurs close to the ground or at least not higher than a man's stature.

7. The effectiveness of gas varies greatly according to different terrain conditions; Forests and the valleys tend to make the gas accumulate and gain in effectiveness. On the contrary, on high land such as the summit of a hill, non-persistent gas will easily disperse and drift away and will not attain the necessary concentration. An open field is favorable for the spreading of the non-persistent gas, but where there are no grasses or vegetables on the ground or even if there are if they are too short in height, non-persistent gas spread there will lose in effectiveness.
8. Among the several important things to be investigated and estimated, the quality of the enemy against which the gas is to be used, especially their anti-gas equipment and the degree of their education and training, is the most important and needs to be most carefully investigated. This will help you to form a correct estimate as to the probable effect of the gas.
9. The objective of the use of gas lies in causing enemy casualties, both personnel and horses, harassing their combat actions and eventually, in coordination with other arms of combat to bring about victory in the battle. In any event it is absolutely important that the gas warfare should be carried out in coordination with all other arms of combat; that is, as part of a general operational plan and at the most important tactical opportunity.
10. The best time to start gas warfare is when the tactically important moment arrives and the weather conditions are favorable.
11. The method of employment of gas depends to a large extent upon the equipment of our army, but other things equal, the method of employment should be adapted to the prevailing meteorological and terrain conditions and also to the position of both the enemy and our troops.
12. The target of the gas attack should be in the first place the personnel and horses of the enemy. Under team work with other combat arms the specific power of the gas will be best employed when it is concentrated upon such targets as no other means of combat can easily attack.
13. One great advantage of the gas attack by airplane is that it can be waded over a wide and distant area and by surprise at any time and in any place. But to do this effectively it takes a large number of planes.
14. The firing of gas shells is comparatively little affected by the meteorological conditions and the terrain features, hence it can be effectively used in a surprise attack. This is one of the most important methods of attack in chemical warfare.

15. Gas ejection is the most suitable form of employment when a large amount of gas is to be used. If we eject the right kind of gas in the right concentration under favorable meteorological conditions, we shall be able to secure a wholesale victory over a wide battlefield. But as this method depends much upon the then ruling meteorological conditions, it sometimes happens that even our troops are harassed by our own gas.
16. You can not depend too much upon the harassing effect of gas sprayed by the gas spreader as even in the case of persistent gas the effectiveness does not last long, moreover it is often extremely difficult to spray gas near the enemy's line. Preparations must be made beforehand in order that the contaminated area will be covered by our other fire, which will defeat the enemy's attempt to decontaminate the area.
17. The spray of gas had better be withheld as long as possible; theoretically the best time to start spraying the gas is after the direction of the movement of the enemy or their position are ascertained and the target of the gas attack is more or less clearly defined. Depending upon the battle circumstances in some cases the gas may be spread beforehand and you will spray additional gas from time to time to supplement its effectiveness.
18. In some cases the gas may be sprayed in small amount and in scattered manner for the purpose of misleading the enemy.
19. The units that are best suited for the employment of gas are the air corps, artillery, mortars, or the field gas unit, but in the case of gas ejection it is usually the infantry units at the first front line that conduct the operation.
20. When gas shells are to be used, it is considered wise to shoot off the whole amount of shells required within the shortest possible time. With the medium calibre gun, at least 100 gas shell, like any other shells, must be fired per hectare* of the target area if we are to secure any tangible result. The time required for firing them is, in the case of a non-persistent gas, with 2 minutes.

* A hectare is about $2\frac{1}{2}$ acres.

Chapter Two

Offensive Use of Gas

21. Before you attack the enemy you must make careful and thorough preparations and investigations. Elaborate your plan of attack and accumulate the equipment and materials required. The units that are to conduct the gas attack will be posted in their required positions, and if circumstances permit they will be given preliminary training. When everything is ready await the arrival of the tactically important moment.
22. The commanding officer will decide whether or not to use gas after he has carefully considered the general situation, especially the strength of the enemy's positions, their quality, the kind and quantity of gas, the meteorological and terrain conditions, the ability of our gas warfare units and our operational plans.
23. Once the employment of gas is decided by the commanding officer the troops will be selected for waging gas warfare. They will be posted at the predesignated positions. The necessary equipment and materials will be accumulated and the meteorological survey will be made.
24. Precautions will be taken so that the whole plan of gas attack may not be defeated by any unforeseen changes in the meteorological conditions.
25. While the preparation is underway you should try to avoid the use of gas as much as possible; you will take all possible means to keep our attempted gas attack strictly secret. However if no strict secrecy is particularly called for, gas may be used, prior to the opening of major gas operations, to overcome the firing of the main artillery of the enemy or to interrupt their command system, thus to harass the movement of the central forces of the enemy.
26. When gas is used to cover the charge of our infantry into the enemy's positions, special consideration must be paid in selecting the kind of gas to be used, so that the movement of our soldiers will not be impeded.
27. To support the charge of our infantry, we may fire non-persistent gas shells by artillery or mortar guns, or eject the same gas by the infantry units at the first combat line. Sometimes these two forms of attack may be employed simultaneously.

In such a case as the above, the respective functions or missions of the artillery, mortars, and infantry should be clearly fixed and the time of operation be carefully calculated, so that when gas warfare is started there will be complete team work among the different kinds of gas attack.

28. In an attack on deep enemy positions airplanes may be used to spray the gas to overcome the enemy's rear positions, their strong points in the rear echelon as well as their main artillery and tank forces; artillery may be used to fire gas shells to overcome the enemy's artillery, their observation points and other important points close behind their first line; mortar guns may be used to fire gas shells to overcome the first combat line; the infantry will eject the gas in concert with the other forces mentioned above.
29. In combat within the enemy positions a uniform and large scale gas warfare is impossible as there is likely to be too much confusion at the front. In such a case as this the use of gas will have to be limited to a localized spray of gas by the infantry or to the mopping up operations. However in such an area of combat as both flanks of the battle ground where there is little danger of the gas harassing our own soldiers, a large amount of gas may be used. In any event the use of persistent gas must be strictly supervised by the senior commanding officers.
30. In a meeting engagement (encounter when neither side is prepared for a combat), it is in the nature of things that unlimited use of the gas is impossible. But in the earlier stage of the battle, while the battle situation is still unsettled, it is important to take the lead in the combat and a small amount of gas is found often effective in harassing the enemy and reducing their fighting strength, thus enabling us to take the tactical opportunity. In an engagement of this kind the gas attack can best be conducted by airplanes, light artillery or mechanized gas units.
31. The aim of the gas attack in a meeting engagement is the prevention of the advance of the enemy, defeating of the enemy's attempt to capture tactically important positions, or interception of the lines of communication and liaison among the enemy. Depending upon the circumstances, persistent gas may be used to protect our flanks.

Chapter Three

Defensive Use of Gas

32. In defensive operations gas may be used to make up for the insufficiency of our fighting forces or to fill up the gaps in our defense lines, or, in cooperation with our gunfire, to annihilate the enemy or weaken the strength of the enemy and finally discourage them from making further advances, or to prevent them from attempting to make flanking or enveloping movements.
33. While the enemy is preparing for offensive movements persistent gas can be sprayed against them by airplane or ejected by our long range artillery in order to interrupt their further preparations, to overcome the firing of their artillery, or frustrate their attempt at deployment. By forcing the enemy to take anti-gas defensive measures or causing direct gas casualties among the enemy, their fighting strength will be greatly reduced.
34. When the enemy advances gas may be sprayed by airplane or fired by gun against the enemy's first combat wave, and at the same time against the enemy's artillery positions, especially their observation positions, thus to overcome firing of their superior artillery strength. Persistent gas may be used most effectively, but it had better be avoided when we intend to make counter-offensive operations later.
35. Against possible flanking and besieging operations of the enemy, we had better make preparations for gas spray to cover our flanks. The gas may be sprayed beforehand on such areas or terrain which the enemy is likely to use in their combat or under cover of which they may attempt to approach upon us.
36. Persistent gas in the defensive operations is found very effective, but it must be borne in mind that the harassing efficacy of the contaminated area is not always absolutely sure.
37. The width of the contaminated area varies with the different battle situations, but in any event it must be at least large enough and more than cover the entire front of the effective tactical unit of the enemy. And also it must be deep enough so that the enemy cannot break through the area by one single effort.
38. The intervening space between the contaminated area in front of the enemy's line and the front border line of our position must at least be large enough in order that any unexpected change in the wind direction will cause no harassing effects upon our own soldiers.

39. Those areas which the enemy is likely to use to make preparations for attack will often be sprayed with gas beforehand, or we may fire gas shells at opportune time to disperse the enemy. As soon as the enemy begins to approach to make charges upon us we will repel them by our sudden and concentrated gunfires. In a case like this irritant gas may be ejected to interrupt the advance of the enemy. While the enemy flinches a counter offense may be made upon him.
40. When the enemy captures an important point or position and his continued occupation means a large menace to our troops we may concentrate persistent gas shells or drop from the air persistent gas bombs upon the enemy to force him to abandon the point or position.
41. Persistent gas can be used to our advantage in intercepting enemy reinforcements or to protect our flanks.

Chapter Four

Gas In Other Forms of Combat

42. In the pursuit of the retreating enemy, persistent gas may be used effectively to interdict the retreating enemy. It is considered wise to assign the mechanized gas unit or mortar unit to the pursuit units.
43. As soon as we perceive signs of retreat in the enemy we will drop non-persistent gas bombs on those areas where the enemy gathers or on the important points of passage on the route of retreat so that the enemy will be thrown into terror and confusion.
44. The gas unit assigned to the pursuit unit should try to make best use of its speedy mobility and come out behind the enemy and contaminate the strategically important points or intercept his route of retreat.
45. Against an enemy that occupies the high ground to cover the flanks of the area where the retreating enemy gathers, or the route or retreat, instead of direct attack it is enough to block them by means of persistent gas or aerial spray of gas. The main force of our pursuit troops should be concentrated upon the pursuit of the main force of the enemy.
46. In the event of our retreat either non-persistent or persistent gas may be used to harass the advance of the pursuing enemy.
47. It is considered advantageous to assign the mechanized or mortar gas units to the rear guard units.

48. Airplanes may be used to spray gas upon the main pursuing forces of the enemy in file or their powerful flanking forces to check their advance.
49. In the defense of a river or coast, gas may be sprayed beforehand to restrict the crossing or landing points of the enemy's amphibious operations. This shortens the length of the defense lines and makes up for the insufficiency of our defense forces.
50. The enemy may be harassed in his preparations for landing or river crossing operations by means of our persistent gas, which may be fired by our artillery or sprayed by our airplanes. In this case the main targets will be the dump of the materials and equipment required for the landing or crossing operation, or the enemy troops in close formation or the enemy artillery positions and their observation points, whose task is to cover the landing operations of the enemy.
51. As soon as the enemy begins to land or cross the river the gas will be used against their forces on the other bank of the river or on the landing crafts and cause terror and confusion among them.
52. In river crossing operations, persistent gas may be used to intercept the enemy's reinforcements thus to protect both flanks of the river crossing points.
53. In the defence of our position in the forest, persistent gas that hangs long in the forest may be used to protect our flanks and also to prevent the enemy's besieging movement or his attempt to approach upon us under the cover of the forest. But it must be borne in mind that gas which pervades the entire forest may drift toward our own positions, whereby our own combat actions may be harassed. Special precautions must be taken against such an unexpected effect of the gas.
54. In an attack upon enemy positions in the forest, it is advisable to fire persistent gas shells into the forest instead of making a direct attack with our infantry soldiers, as the enemy will be forced to abandon the forest of his own accord.
55. In mountain battles our defensive actions may be most effectively carried out if we attempt to intercept the important routes of communication or destroy the vantage points of the enemy. For this purpose persistent gas is most effective.
56. In an attack against an enemy on high ground or in mountains, especially those occupying the summit of a mountain, it is important to plan good team work of the artillery gunfire and infantry actions under the effective cover of persistent gas.
57. In an attack against an enemy on the mountains, those points, occupation of which is not important for us, but the enemy's flanking actions from there harass our operations greatly, we will contaminate such points with aerial gas spray or firing gas shells so that the enemy can not hold their positions there.

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