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U. S. NAVAL TECHNICAL MISSION TO JAPAN
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SAN FRANCISCO, CALIFORNIA

RESTRICTED

From: Chief, Naval Technical Mission to Japan.
To : Chief of Naval Operations.

Subject: Target Report - Japanese Chemical Warfare.

Reference: (a)"Intelligence Targets Japan" (DNI) of 4 Sept. 1945.

1. Subject report, covering Target X-11 of Fascicle X-1 of reference (a), is submitted herewith.

2. The investigation of the target and the target report were accomplished by Major F.W. Lamb, AUS.

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Captain, USN

30689

JAPANESE CHEMICAL WARFARE

"INTELLIGENCE TARGETS JAPAN" (DNI) OF 4 SEPT. 1945

FASCICLE X-1, TARGET X-11

DECEMBER 1945

U.S. NAVAL TECHNICAL MISSION TO JAPAN

SUMMARY

MISCELLANEOUS TARGETS

JAPANESE CHEMICAL WARFARE

This report considers, first, the toxic gas filling operations at the SONE Branch of the TOKYO Second Military Arsenal, including a record of all types of munitions filled, together with estimated production figures through 1945; second, an investigation of the Dockyard Testing Laboratory, SASEBO Navy Yard, including the testing procedure for determining gas mask serviceability. The remainder of the report deals with Japanese chemical warfare material.

TABLE OF CONTENTS

REFERENCES

Location of Target:

1. TOKYO Second Military Arsenal, SONE Branch: Located east of SONE, KYUSHU, at map reference 1401-1198.
2. Dockyard Testing Laboratory, SASEBO Naval Station: Located at map reference 1278-1110.
3. Naval Cave 24, SASEBO, KYUSHU: Located at map reference 1278-1110.
4. Naval Warehouse 11, SASEBO, KYUSHU: Located at map reference 1278-1110.
5. Naval Warehouse 44, SASEBO, KYUSHU: Located at map reference 1278-1110.
6. KOKURA Supply Department: Located in KOKURA, KYUSHU, at map reference 1394-1201.
7. KOKURA Arsenal: Located in KOKURA, KYUSHU, at map reference 1392-1203.

Japanese Personnel Interviewed:

1. Colonel FUTATSUGI, TOKYO Second Military Arsenal, SONE Branch, is a capable officer and evinced a willingness to assist to the limit of his ability. He was not, however, conversant with all technical details discussed.
2. Captain KOBAYASHI, TOKYO Second Military Arsenal, SONE Branch, is an experienced technician, and made all possible effort to enable the investigator to exploit the target.

Other Reports:

1. "Report on Scientific Intelligence Survey in JAPAN," Volume IV, Chemical Warfare.
2. NavTechJap Report, "Japanese Chemical Warfare," Index No. M-C.

LIST OF ILLUSTRATIONS

INTRODUCTION

The average officer in the Japanese military service seems to view offensive chemical warfare as something outside the contemporary rules of wars. This may have been a studied attitude assumed during interrogation. (Needless to say there would be no hesitancy in employing this weapon when it would be to the Japanese advantage.) Many, too, have the impression that this phase of warfare could be punishable as a war crime and consequently deny any knowledge or connection with preparations for employing toxic gases.

Although defense preparations for chemical warfare were made at all installations, these were usually of a perfunctory nature. At no military bases was sufficient equipment on hand to equip all personnel, and collective protection was almost entirely lacking.

It is evident that the Japanese had no desire at all to provoke the UNITED STATES into initiating chemical warfare, in the general sense. During the last year of the war most offensive preparation had been curtailed. No evidence of bacteriological warfare was uncovered at any target.

THE REPORT

I. CW ACTIVITIES OF TOKYO SECOND MILITARY ARSENAL, SONE BRANCH

1. General Information

The SONE Branch of the TOKYO Second Military Arsenal is located east of the town of SONE, KYUSHU, at map grid coordinates 0198 (AFPac L772, WAKAMATSU, Sheet 4248-1). Colonel FUTATSUGI is in charge of the arsenal, and he was assisted in this interview and investigation by Captain KOBAYASHI. This plant, together with two sister branches at SAKANOICHI and ARAS, operated directly on TOKYO orders. All output of this SONE branch was shipped to the KOKURA Supply Depot for further distribution. In 1938 this arsenal began filling gas munitions. In April 1944 TOKYO ordered the cessation of this phase, and by May 1944 all gas filling operations had ceased. During this period their Red and Yellow Agents were shipped from TAPANOUMI in HIROSHIMA Ken and their Blue from NIHONGI in NIIGATA Ken.

2. Classification of CW Agents, Army

a. Colonel FUTATSUGI outlined the following list of Japanese Army Chemical Warfare Agents:

Gas	Japanese Name	Japanese Classification
Mustard	Yellow #1	Blistering Agent
Lewisite	Yellow #2	Blistering Agent
Mustard Lewisite	Yellow Agent	Blistering Agent
Phosgene	Blue Agent	Choking Agent
Phosgene-Arsenic Trichloride	Blue-White Agent	Choking Smoke
Hydrocyanic Acid	Brown Agent	Internal Poisoning Agent
Diphenylcyanarsine	Red Agent	Sneezing Agent
Chloracetophenone	Green Agent	Tear Agent

b. Whereas the concept of this color code for Japanese Agents was well understood, it did not seem to be previously reported that the color, instead of identifying a type of gas, identifies a particular gas. In other words the Colonel stated that these gases are the only gases the Japanese Army would use for military purposes. Naturally more efficacious agents under study would not be on this list, but if, for example, the term "Yellow Agent" is employed it would mean, conclusively, a mustard-lewisite mixture. The Nature of the green agent was not known by the Colonel as the arsenal had never used it, but there is little doubt that green agent is chloracetophenone.

c. The blue-white agent, a mixture of phosgene and arsenic trichloride, is interesting. ORD-ONI Technical Intelligence Bulletin, issued in May 1945, lists a blue type agent, a phosgene-chlorine mixture. Apparently that item is incorrect and should read "phosgene-arsenic trichloride mixture".

d. It follows that the color on a gas shell or bomb indentifies the type of agent, as previously reported. It might be noted that a white band following a yellow explosive band indicates a steel shell or bomb. Also the following table explains the weight discrepancy markings:

Mark	Percent of Weight from Normal
∓	Within 0.5%
+	Not heavier than 1.5%
++	Not heavier than 2.5%
−	Not less than 1.5%
−−	Not less than 2.5%

3. Storage Experiments with Brown Agent

Experiments were conducted with brown agent, hydrocyanic acid, at this arsenal, to determine if the gas could be loaded into shells without decomposition occurring. Shells filled with this agent, however, were found to blow up in about one year, from internal pressure. It was not understood if a violent or mild action occurred. The formula for decomposition was believed to be essentially $2HCN \rightarrow H_2 + N_2 + 2C$. The same action resulted even with copper powder added as a stabilizer.

If the experiments had been successful, brown agent would have been loaded, with methylformate mixed in to lower the volatility. The Japanese have glass grenades filled with hydrocyanic acid and by lining the shell walls with some material such as porcelain, positive results could be obtained.

4. Yellow Agent Loading Plant

This plant, which still had the odor of lewisite, was set up with five assembly lines, and was filling about 1000 75mm shells a 12-hour day at the time it ceased operations. The filling room was not gas tight and a ventilating system pumped out gas vapors into the outside air through fifty foot high ventilating chimneys. Apparently escaping gas from this and other type agent filling plants was not sufficiently concentrated to injure unprotected personnel in the arsenal and contiguous areas.

Gas was brought into the plant in small drums of mustard and lewisite, (in winter these were first warmed in a water bath) and then forced by air pressure into a mixing vat where the two gases were mixed together 50-50 by weight, and finally led by gravity flow to a small tank. From there the agent was drawn as needed into a conventional overflow type measuring device and fed into the shells. Small carts, with room for six shells and burster tubes, were pushed into a small partially enclosed and ventilated box for filling one by one, and then pushed out for sealing.

5. Blue Agent Loading Plant

This plant was similar to the Yellow Agent Plant. A mixing vat was available for mixing in arsenic trichloride to give blue-white agent, but the gas was cooled by circulating brine to 20°-30°C during the operation. The shells too, were chilled in a brine bath before loading.

Production was about 100 shells per 12-hour day, though perhaps more could have been filled if the orders had required it.

6. Red Agent Loading Plant

This plant again was similar in principle to the others. Diphenylcyanarsine was heated by steam for liquefication and kept in the liquid state until loa loaded into the shells.

Production figures were 500 shells per 12-hour day, though again this was not necessarily peak operation.

7. Incendiary and Smoke Loading Plants

The incendiary filling for bombs was a white phosphorous, carbon disulfide rubber mixture. Production was over a 12-hour period, 240-50 kg bombs.

In operation the carbon disulfide (CS_2) and phosphorous (P) were dumped into a water-filled mixing vat. The CS_2 dissolved the P and remained at the bottom while the water floated on top and prevented spontaneous ignition of the phosphorous. This incendiary mixture was then forced into a supply tank where it could be led into the bombs. This was done by a kind of water pump which consisted of a cylinder and piston. As the piston moved through the water filled cylinder, it forced water into the supply tank, which in turn drove an exact amount of incendiary mix into a bomb. On the piston's return trip through the cylinder, the action would be repeated. Sufficient rubber pellets were added to the bomb before filling.

Filled bombs were tested in water tanks for leakage and packed for shipment in diatomaceous earth. This material was used as a safety pack in the event of future leakage.

Smoke bombs and shells were filled with a titanium tetrachloride or sulphur trioxide-chlorsulfonic acid smoke agent, using the same system as for the yellow agent.

8. Production Figures

(All records had been destroyed but the following table gives estimated production figures)

Gas	Bomb or Shell	1938	1939	1940	1941	1942	1943	1944	1945
Vomiting (Red)	75mm M92 shell		1,000	5,000	5,000	7,000	10,000	5,000	
	90mm Mortar M95 Shell	1,000	5,000	5,000	20,000	100,000	20,000	6,000	
	100mm Howitzer M93 Shell			5,000	3,000	10,000	8,000		
	150mm Howitzer M93 Shell	100	100	100	1,000	6,000	5,000		
	M97 15 kgm Bomb		200			2,000		1,000	
Blister (Yellow)	75mm M92 Shell	2,000	1,000	5,000	10,000	20,000	28,000	5,000	
	M94 Light Mortar M95 Shell		1,000	5,000	20,000	20,000	10,000		
	100mm M92 Shell		200	1,000	5,000	15,000	5,000	10,000	
	150mm M92 Shell			500	8,000	10,000	4,000	5,000	
	M97)								
	M100) 50 kgm Bomb	200		500	2,000	500	1,000		
Choke (Blue)	Light Mortar test Shell		1,000						
	150mm test Shell			1,000					
	M100 50 kgm Bomb				500*	500*	60		
B&N (Brown)	Light Mortar test Shell		100						
	150mm test Shell				100				
	M100 50 kgm test Bomb					100			
Incendiary	Light Mortar Shell		3,000				1,000		
	75mm Shell		500	3,000	7,000	8,000		500	
	Hand Grenade	5,000		15,000	43,000	30,000	3,700		
	M100 50 kgm Bomb		500	1,700	16,000		16,000	4,000	1,800
Smoke	Light Mortar Shell							5,000	
	100mm Shell						4,000	1,800	
	M100 50 kgm Bomb					1,000	2,000	2,000	

*Blue-White

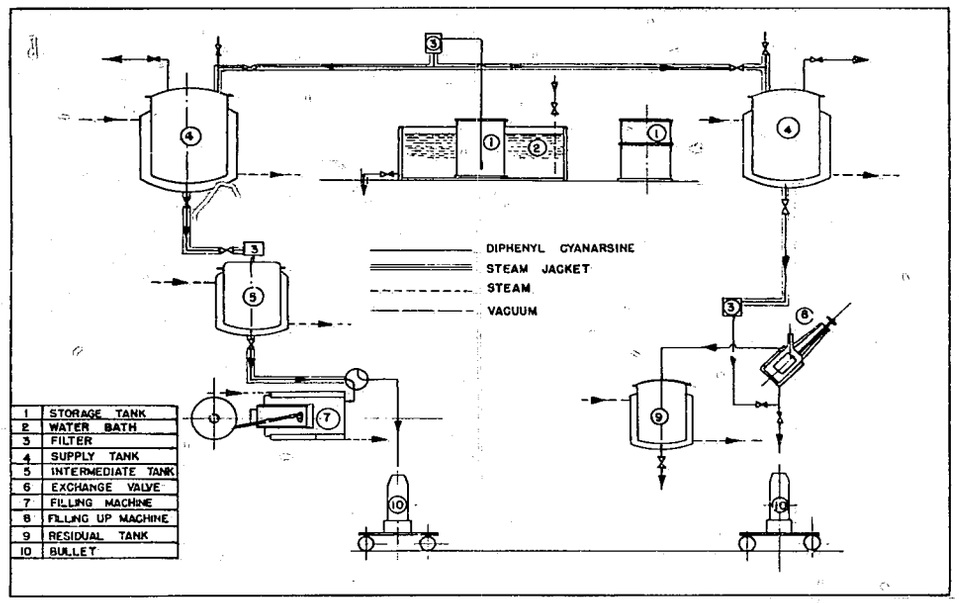

Figure 1
Red Agent Filling Operation Plan

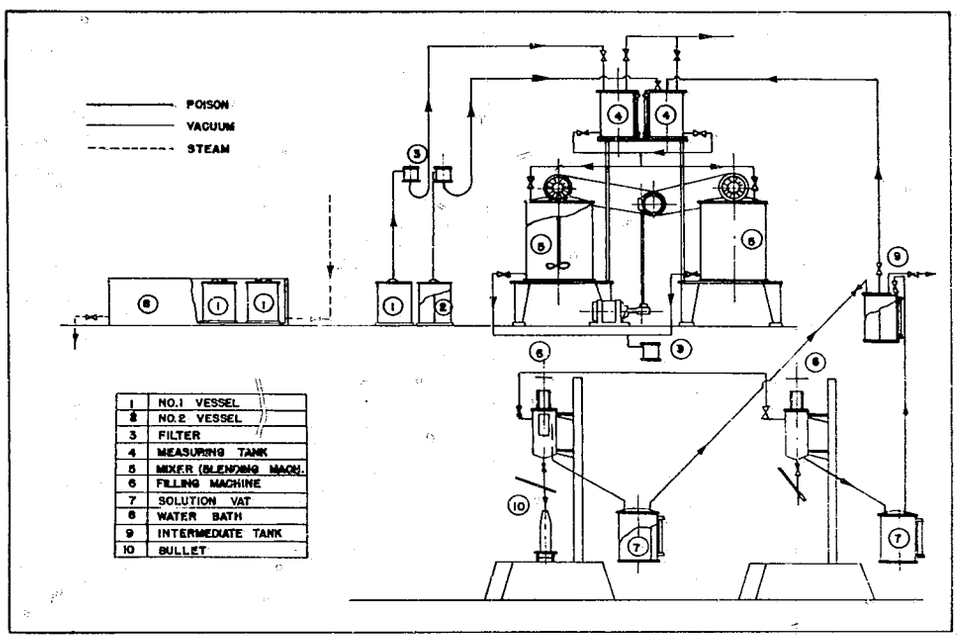

Figure 2
Yellow Agent Filling Operation Plan

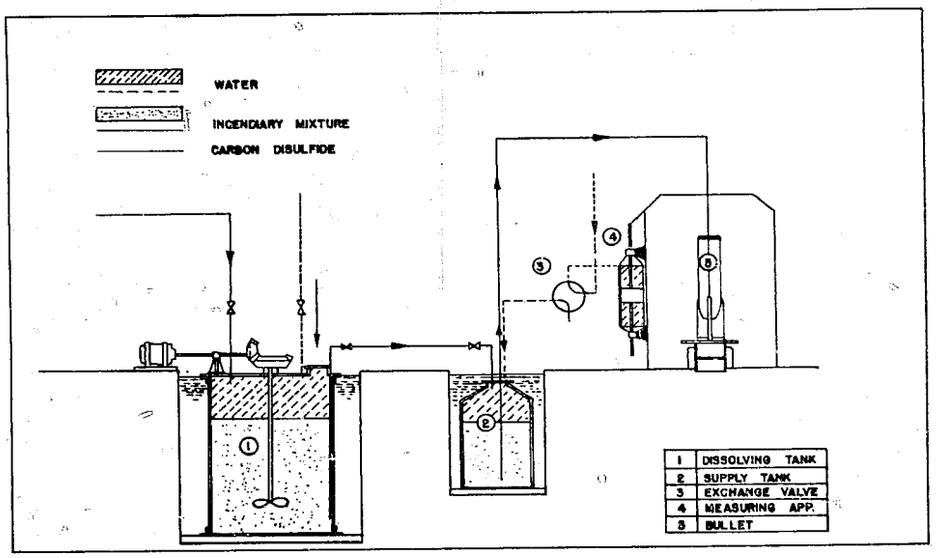

Figure 3
Incendiary Filling Operation Plan

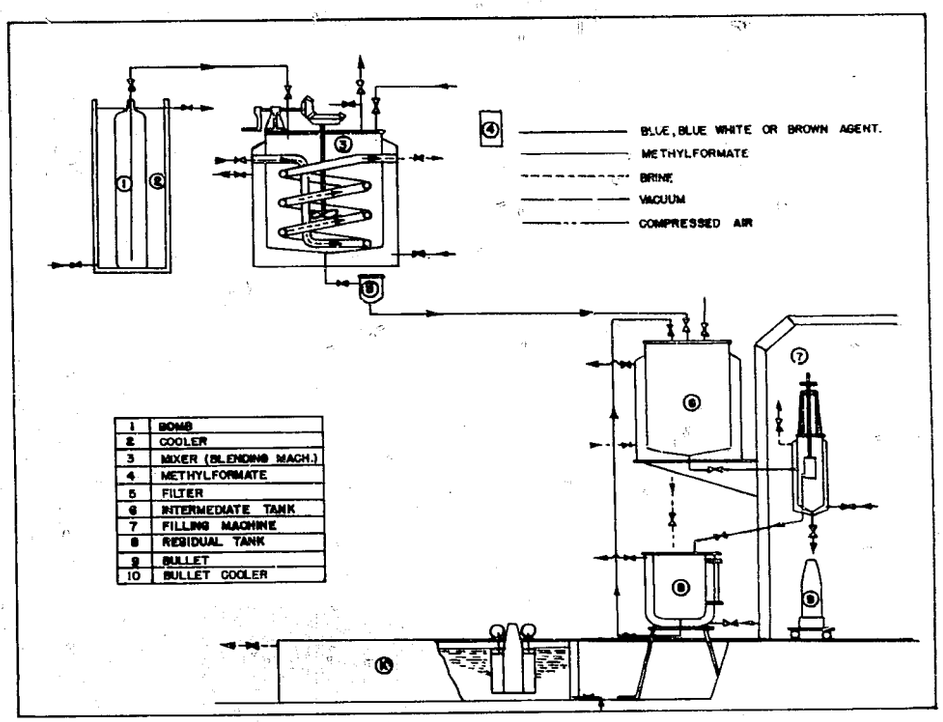

Figure 4
Blue, Blue-White or Brown Filling Operation Plan

II. DOCKYARD TESTING LABORATORY, SASEBO NAVAL STATION

1. General Information

This laboratory, located primarily in buildings 31X and 32X SASEBO Navy Yard, was engaged in the following assignments:

a. Stability tests on smokeless powder.
b. Tests on compounds used in the manufacture of explosives.
c. Tests on HE primers, igniters, and fuzes.
d. Repair of hygrometers.
e. Assembly, repair, and tests of gas masks.
f. Minor miscellaneous assigments connected with explosives.

The investigation was conducted with the aid of Mr. TOMOZAWA a former technical Naval Lieutenant who had been assigned to this laboratory.

2. Equipment

The laboratory was well equipped for the mission for which it was designed. All routine equipment was plentiful and of good quality. Special equipment included a guillotine-like hammer for explosive sensitivity tests, a precision built projector to observe high speed explosion pictures, and an apparatus for subjecting torpedo primers to varying aqueous pressures.

3. Smokeless Powder Test

Samples of smokeless powder were given a stability test to determine the serviceability of the particular lot under examination. This was done by heating a 1.3 gram sample to 70°C, or thereabout, and allowing any fumes evolved to pass over a potassium iodide starch paper. If the paper turned brown in less than 10 minutes the sample was considered probably unserviceable, and given another qualifying test. In this second test, a 50 gram sample was heated in a 80°C thermostat, and observed until the temperature of the sample reached 82°C. If the elapsed time was under 600 hours the lot represented by the sample was rejected.

4. Gas Mask Assembly Section

Up to the termination of hostilities, an average of 300 Navy gas masks (Types 93 and 97) a day were being assembled here from component parts manufactured at the SAGAMI Arsenal in HIRATSUKA, KANAGAWA Ken. Repair work was also accomplished, and the output of additional assembling stations was brought in for distribution.

5. Gas Mask Testing Section

During assembly each mask was given the following tests:

a. Resistance Test: A flow of 30 liters of air a minute was forced through each canister. If the back pressure varied from 17MM of water the canister was rejected.

b. Air Tight Test: Air under an excess pressure of 50 CMS of water was led into the sealed canister. If the water column dropped as a result of leakage the canister was rejected.

c. Filter Test: Air flowing at the rate of 30 liters per minute was led through a chamber of burning joss sticks (moxa) and then through the canister. Any evidence of smoke passing through resulted in rejection of the canister.

d. Gas Test: A five percent mixture of carbon dioxide in air was allowed to flow through the canister and then to bubble through an aqueous solution of calcium hydroxide. If a precipitate appeared in less than 150 seconds the canister was rejected.

e. Facepiece Test: The facepiece, with the outlet valve sealed, was placed on a face form which allowed ammonia gas to pass through. The mask was then covered with a cloth cover impregnated with an acid solution of phenolpthalein. Red spots appeared on the cover at any points where ammonia might be leaking through.

f. Hose Test: The hose was plugged, on one end, and subjected to a partial vacuum through a column of water. If any air leaks were present, the column of water would drop.

g. Outlet Valve Test: A partial vacuum protected by the outlet valve was created by water siphoning from a bottle and manifested by a manometer. Any leak in the outlet valve would be indicated by a drop in pressure. The standard was a partial vacuum supporting 10 CMS of water.

III. CHEMICAL WARFARE SAMPLE AGENTS

1. General Information

This kit of sample CW agents was uncovered in Naval Cave 24, SASEBO, KYUSHU. Directions for use were not included, but a list of safety precautions was pasted on the front cover.

2. Description

The kit is contained in a wooded box 12" by 2 1/4" by 5 1/4", blue-grey in color, with a hinged lid, and a carrying strap. Inside, nine tubes of the following agents are securely held in place:

No.	Agent	Color Band
1.	Chloracetophenone	Green
2.	Chlorpicrin	Green
3.	Diphenylcyanarsine	Red
4.	Adamsite	Red
5.	Mustard	Yellow
6.	Lewisite	Yellow
7.	Phosgene	Blue
8.	Hydrocyanic Acid	Black
9.	Chlorine	Blue

Apparently each tube contains a very dilute sample of the actual war gas. A color band on each tube indicates the type of agent and an inclosed chart lists the agent characteristics.

3. Operations

The exact method of using this kit is not known. It is believed that the agents are present in too dilute a concentration for dispersion by detonation. Perhaps each tube is merely broken off at the tip, and cautiously sniffed, to recognize each characteristic odor.

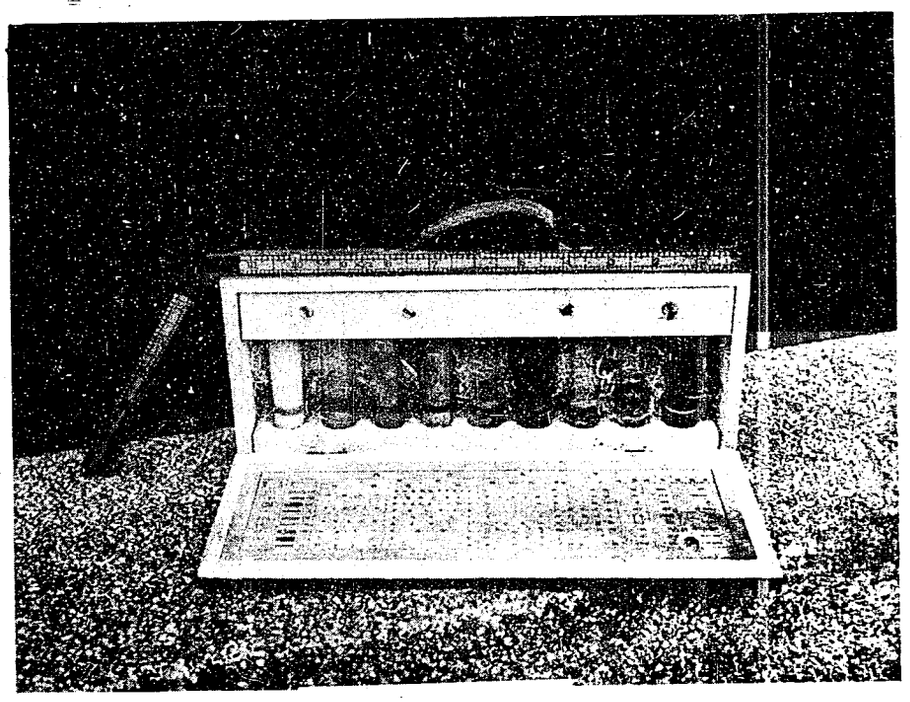

Figure 5
Sample CW Agents Kit

IV. MARK 5 DECONTAMINATION POWDER

1. General Information

This powder was first uncovered in Naval Warehouse 11, SASEBO, KYUSHU. It is apparently intended as a noncorrosive decontaminating agent.

2. Description

The powder is packed in a rubberized box 9" by 9" by 6" with a 2 1/4" blue-green stripe circling the center.

3. Operation

The powder is carried by individuals in a rubberoid pouch for ready first aid or material decontamination.

V. MARK 6 DECONTAMINATION POWDER AND ACCESSORIES

1. General Information

These sets were stored in Naval Warehouse 44, SASEBO, KYUSHU, and are intended for purifying contaminated water of lewisite or bacteria. The latter for defense against bacteriological warfare.

2. Description

The powder is contained in a four compartment black plastic cylinder 3 3/4" long and 1 1/2" in diameter. A brown cover on one end protects three types of powder in their respective compartments, and a black cover on the other protects the fourth type. Accessories, which may not necessarily be required, include a rubber bag with filter, a kit for testing the purity of the water, and a comparator panel.

3. Operation

The water contaminated with lewisite or bacteria is placed in a container and all the powders in the brown cover end of the container are added. The mixture is then stirred for 10 minutes and the powder in the black end added. After stirring for five additional minutes, the water is allowed to stand for at least 15 minutes. Then the sediment remaining is either filtered off or the mixture allowed to stand until a clear liquid is obtained and then decanted. The water after this treatment would then be suitable for drinking.

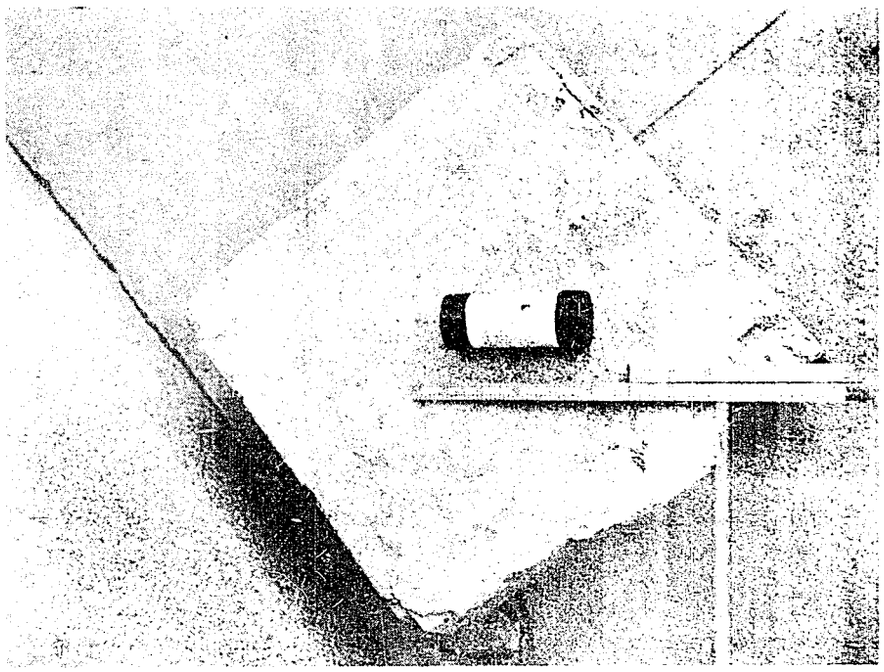

Figure 6
Mark 6 Decontamination Powder

VI. DECONTAMINATION GUIDE WHEEL

1. General Information

This wheel was found in the SASEBO Navy Yard, and is marked SAGAMI Navy Arsenal.

2. Description

The rear side of the wheel contains three tables and instructions for use of the wheel. Table 1 is for contaminated material, and lists five classes varying from leather and rope to hard wood and concrete. Table 2 gives five de-

grees of decontamination. Table 3 lists five degrees of contamination from heavy to light. The front side of the wheel contains two additional tables: Table 4 is the time elapsed since contamination, and Table 5 is the methods used, each of the five tables having five divisions. This latter side also lists on a concentric circle, temperatures of decontamination by various methods from -20 degrees C to 100 degrees C. A sliding wheel has, in the form of another concentric circle immediately underneath, the time required for decontamination from 10 minutes, or less, up to two months.

3. Operation

In operation the guide is zeroed and then adjusted by moving the sliding wheel in accordance with the data selected from the five tables. The wheel then gives, directly, time required for decontamination at a given temperature.

VII. TYPE 17TH YEAR AIR DEFENSE GAS MASK MODEL A

1. General Information

Samples were discovered at the KOKURA Supply Depot at map reference - 9401, KOKURA, KYUSHU.

2. Description

This mask is similar to the type 16th Year Air Defense Gas Mask Model A; the face piece and head straps, however, are manufactured from rubber.

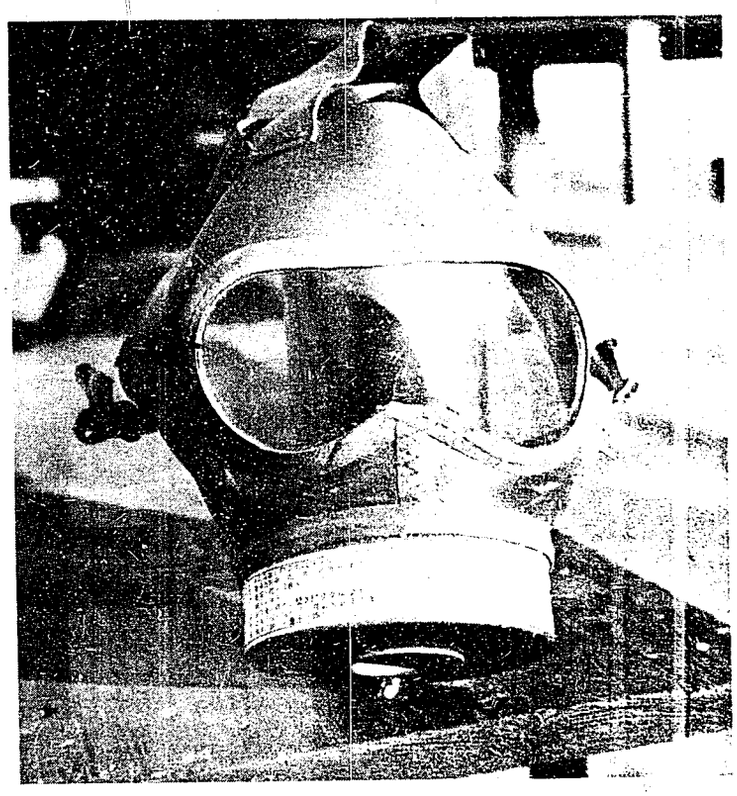

Figure 7
Type 17th Year Air Defense Gas Mask Model A

VIII. TYPE 99 LIGHT ARMY GAS MASK OR ARMY ASSAULT MASK

1. General Information

Samples were discovered at an army warehouse at map reference - 9906L, MOJI, KYUSHU.

2. Description

This mask has also been referred to as the Type 91 so that exact nomenclature is uncertain. It is inferior to the Type 95 and 99 Army Gas Masks, and except for superior materials and workmanship, this mask is almost exactly the same as the Type 2A Civilian Mask. The carrier contains a box of antidim disks, an antifreeze syringe, an inner mask attachment, and a canister plug screw cap. This inner mask fastens inside the face piece, covering the nose, and thus prevents fogging of the eyepieces in cold weather.

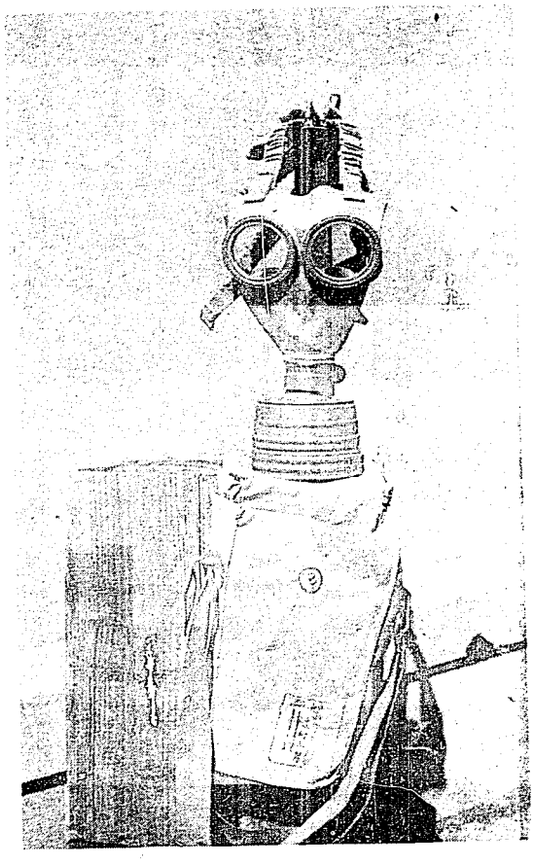

Figure 8
Army Assault Mask, Outside View,
With Carrier

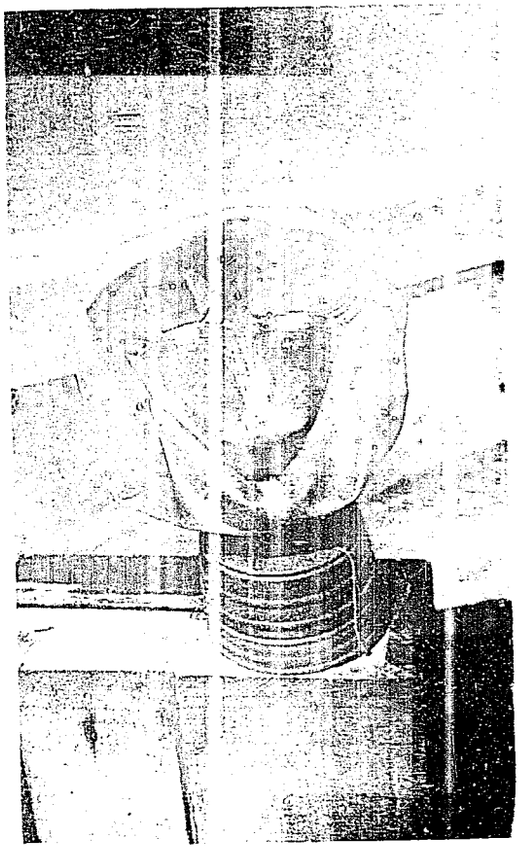

Figure 9
Army Assault Mask, Inside View

IX. MODEL 1 LIGHT GAS MASK

1. General Information

Samples were discovered at the KOKURA Supply Depot at map reference - 9401, KOKURA, KYUSHU.

2. Description

This mask is similar in design to the type 16th Year Air Defense Gas Mask Model B.

Figure 10
Model 1 Light Gas Mask, With Carrier

X. TYPE 3 NAVY GAS MASK

1. General Information

These masks were uncovered in Naval Warehouse 11, SASEBO, KYUSHU.

2. Description

The mask is designed to cover only the nose and mouth, with the canister attached directly to the facepiece. The facepiece is manufactured of black rubber.

3. Operation

The mask might protect the wearer from inhaled war gases under average conditions, but without eye protection it would have only limited use. It may be intended only as a dust or smoke respirator.

XI. NAVY GAS MASK, TYPE 97, NO. 1, REVISION 2

1. General Information

Samples were discovered at a naval warehouse at map reference - 9706E, MOJI, KYUSHU.

2. Description

This is a diaphragm-type gas mask, similar in all other respects to the Navy Gas Mask Type 93 No. 2. The diaphragm, positioned where the outlet valve ordinarily is placed, is of rubber, 9 cm in diameter. The outlet valve is situated on the left side of the face-piece. To distinguish this model from the Type 93 No. 2, a 3/4" white band is painted around the sides of the fiber carrying case.

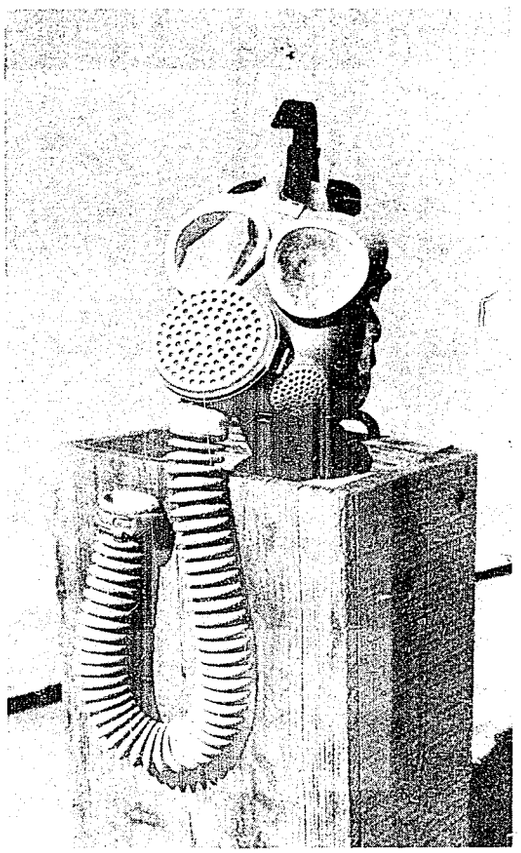

Figure 11
Navy Gas Mask, Type 97, No. 1,
Revision 2, Outside View

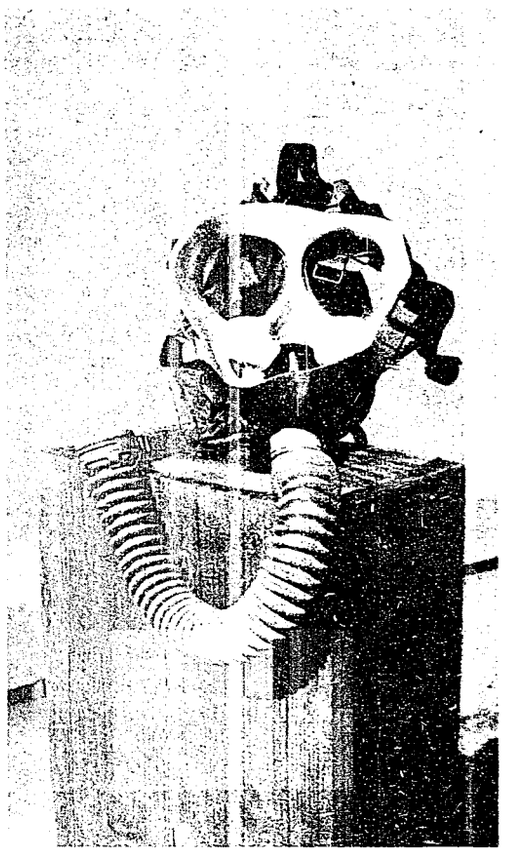

Figure 12
Navy Gas Mask, Type 97, No. 1,
Revision 2, Inside View

XII. OXYGEN GAS MASK, MODIFICATION 1

1. General Information

This mask was discovered in Naval Warehouse 11, SASEBO, KYUSHU. It is probably not intended for defense against chemical warfare agents.

2. Description

The mask is specially designed with twin hoses leading to a respirator and canister which, while in use are carried on the back. The respirator is a large rubber "U" shaped bag about 1 1/2' long and 1' wide. The canister for the generation of oxygen is mounted in the "U" of the respirator bag, and can easily be replaced as required.

XIII. IGNITION MATERIALS FOR SMOKE CANDLES

1. General Information

The ignition materials were discovered in Naval Cave 24, SASEBO, KYUSHU.

2. Description

Ten ignition sticks and 10 scratch blocks are packed in a sealed metal box 6" by 4 1/2" by 1 3/4". The ignition sticks are metal cylinders 3 1/2" long and 3/4" in diameter, and have a match head on one end.

3. Operation

As the name suggests, the set is designed for igniting smoke candles; probably the "special smoke candle" type. The ignition sticks are, of course, ignited by scratching the match head with the scratch block and the stick, in turn, used to ignite the candle.

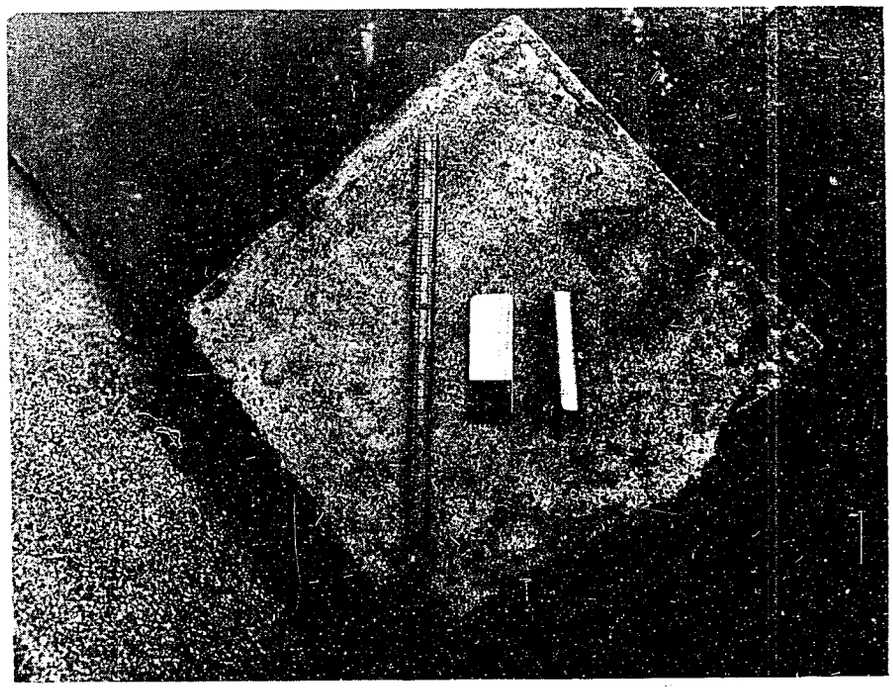

Figure 13
Ignition Stick for Smoke Candles, with Scratch Block

XIV. IGNITION MATERIALS FOR TEAR GAS CANDLES

1. General Information

These ignitors were discovered in Naval Cave 24, SASEBO, KYUSHU.

2. Description

Ten ignition sticks and 10 scratch blocks are packed in a sealed metal box 10" by 1 1/4". The ignition sticks are rods 9 1/2" long and 4/10" in diameter. The scratch blocks, in the sample examined, contained no abrasive.

3. Operation

As the name suggests, the unit is designed to ignite tear gas candles. The ignition sticks are ignited by scratching the match head with the scratch block, and the sticks, in turn, are used to ignite the candles.

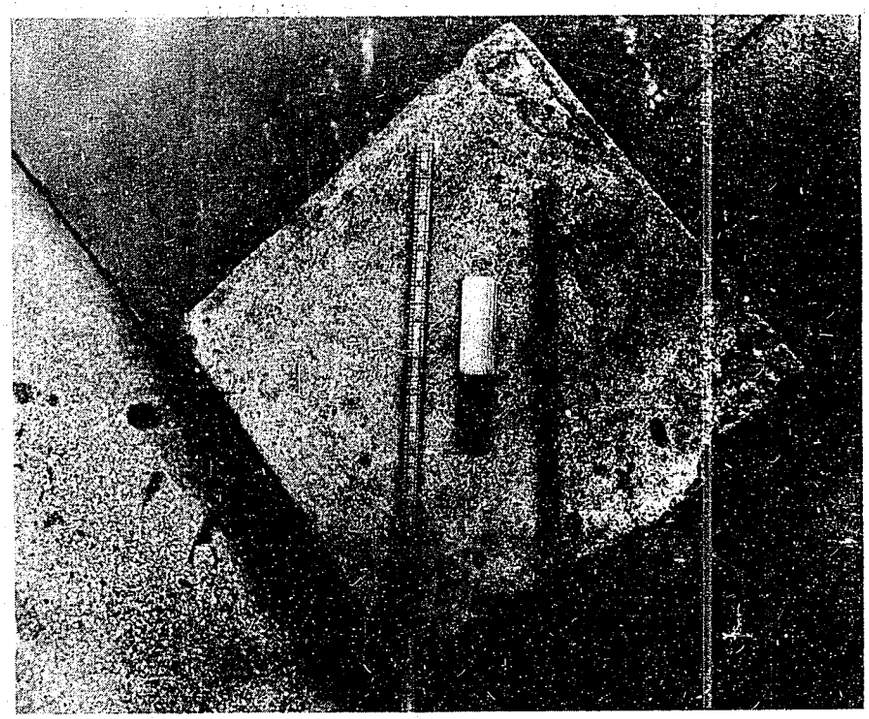

Figure 14
Ignition Stick and Scratch Block for Tear Gas Candles

XV. TEMPORARILY DESIGNATED MARK I INCENDIARY CANDLE (A)

1. General Information

A collection of "Temporarily designated Mark I incendiary candles, A-medium" were found in Navy Cave 24, SASEBO, KYUSHU, and a collection of "A large" were discovered in the 21st Naval Air Depot, OMURA, KYUSHU. The medium candle was manufactured in February 1945.

2. Description

The candle is painted blue-grey with a 1 1/4" purple band near the top. A metal handle is attached to the side for ease in carrying, and a full set of

directions is glued around the center. The lid, covering a well sealed ignitor, is securely taped in place. The medium candle is a cylinder 11" long and 4 1/2" in diameter, while the large candle is the same length, but 5 3/4" in diameter.

3. Operation

The candle apparently is a thermite pot designed for burning through and destroying dud or delay action bombs. In use it would be placed directly on top of a bomb and then ignited by a fuse connected to the ignitor.

Figure 15
MK I Incendiary Candle, A Medium

XVI. INCENDIARY ELECTRON TRAINING BOMBS

1. General Information

Samples were discovered at the KOKURA, Arsenal at map reference - 9203, KOKURA, KYUSHU.

2. Description

These bombs are magnesium cylinders filled, apparently, with thermite. Two sizes, 2 kgms and 5 kgms with deminsions of 22 cms by 8 cms and 38 cms by 9 cms respectively, were found. The bombs were intended only for training purposes.

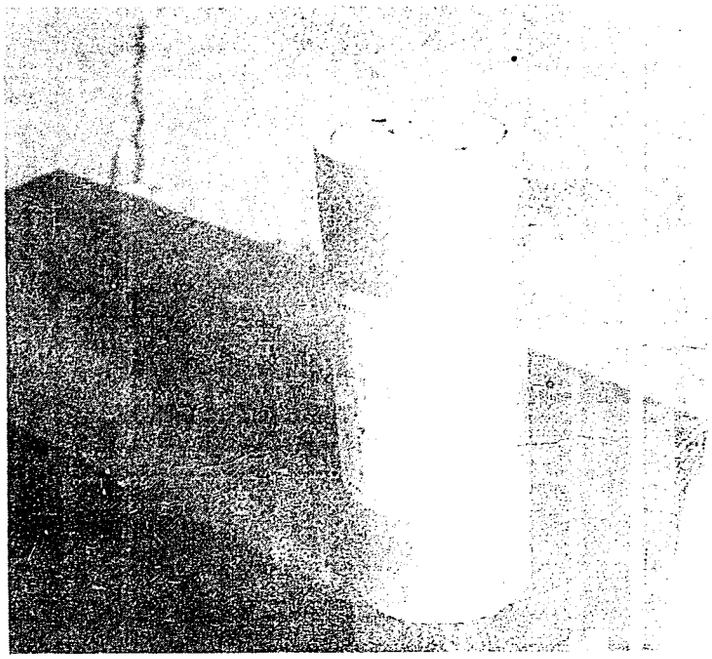

Figure 16
Incendiary Electron Training Bomb, 2 Kgm.

XVII. SIMULATED BLISTER GAS BOMBS

1. General Information

Two types of bombs were uncovered in Naval Cave 24, SASEBO, both of which were designed to train troops in anti-gas procedure or to simulate actual combat conditions.

2. Description

The first type contained simulated mustard gas in a glass cylinder, with rounded ends, 7" long and 2" in diameter, and designed with a glass well, centered, to receive a detonator. The second type was a simulated blister gas contained in glass sphere of 3 1/4" diameter.

3. Operation

The former bomb could be detonated to disperse its contents in training exercises, and the latter thrown against the solid object.

XVIII. MODEL 3 SMALL SMOKE CANDLES, MODEL B

1. General Information

These candles were stored near the KOKURA Supply Depot, KOKURA, KYUSHU (Map reference 9203). The sample examined was manufactured in September 1944.

2. Description

These candles are similar in design and size to the Type 94 small smoke candles. The dimensions being 19 cms long and 5.5 cms in diameter.

3. Operation

This candle is apparently intended as an improved model of the Type 94 small smoke candle. It has an average burning temperature of four minutes, and would seem to be an extremely efficient smoke-producer.

XIX. SPECIAL SMALL TYPE SMOKE CANDLES, TYPE 2

1. General Information

This type of candle was discovered at the FUKUOKA Naval Air Group warehouse, in SUSENJI, KYUSHU.

2. Description

The candle is 3 1/4" long and 7/8" in diameter. The striker, a bamboo stick, is taped to the side, and the match head is sealed with a soldered cap. A wire screen surrounds the outside wall, apparently to maintain rigidity after ignition. Six metal supports were bent up along the side. A similar type 6" long is also known.

3. Operation

In use the match head cap is pulled off, the wire supports bent out to form a vase, and the candle ignited by the friction of the striker across the match head. The burning time is not known. A wet sample burned slowly for 2 1/4 minutes.

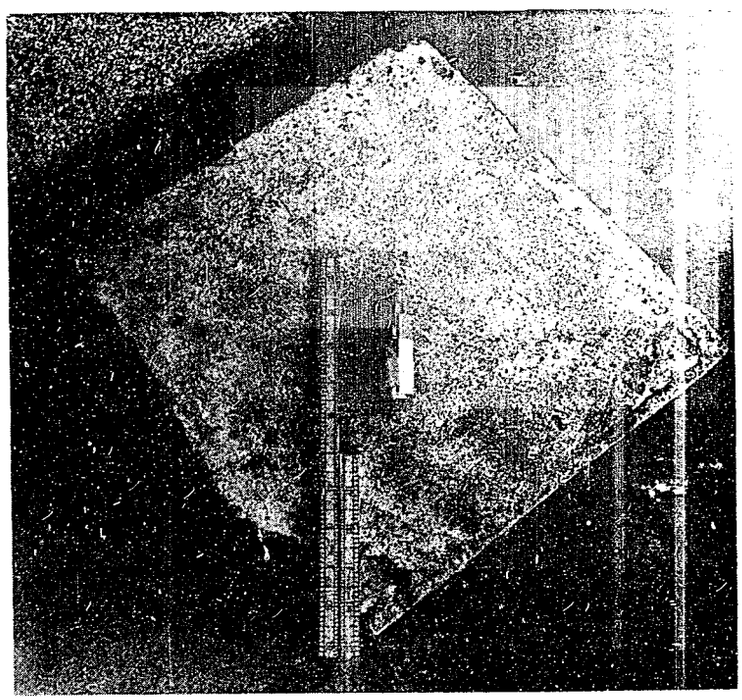

Figure 17
Special Small Type Smoke Candle, Type 2

XX. SNIFF TEST AGENTS, A AND B

1. General Information

These sets were discovered in Naval Cave 24, SASEBO, KYUSHU. The "A" type unit examined was manufactured in October 1943.

2. Description

The "A" type unit consists of five each of 10 different simulated agents in glass vials, together with a metal punch for puncturing the vials, in a cardboard box 10 1/2" by 4 1/2" by 4". Each vial is numbered and painted with a color code as follows:

No.	Agent	Code
1	Chloracetophenone	Full green tip
2	Benzylbromide	One green ring
3	Chlorpicrin	Two green rings
4	Diphenylcyanarsine	Full red tip
5	Adamsite	One red ring
6	Mustard	Full yellow tip
7	Lewisite	One yellow ring
8	Phosgene	Full blue tip
9	Hydrocyanic acid	Full black tip
10	Chlorine	One blue ring

Each vial is 3" long and 3/4" in diameter with a concave base to facilitate breaking. A table is inclosed with the characteristics of each agent. The "B" type units contain only the agents No. 4, 6, 7, 8, and 9, which are packed in a cardboard box 9" by 4 1/2" by 4".

3. Operation

Apparently the vials are filled with either the actual CW agent or a compound approximating the odor of the agent. In use, the vials are broken and the contents sniffed to familiarize the trainee with the agents' characteristic odor.

XXI. TEAR GAS GRENADE, TYPE A, SMALL AND LARGE

1. General Information

These grenades were discovered in Naval Cave 24, SASEBO, KYUSHU.

2. Description

This grenade is a tear gas candle manufactured as a metal cylinder, and has a metal cover securely taped on. Under the cover, a scratch block is placed with the abrasive surface turned out and over a match head ignition device. Around the match head four ports are symmetrically placed which permit egress of tear gas. The grenade is 2" in diameter, the small type 2 1/2" long, and the large 3 1/2" long.

3. Operation

The grenade is designed as a hand thrown candle for disseminating tear gas.

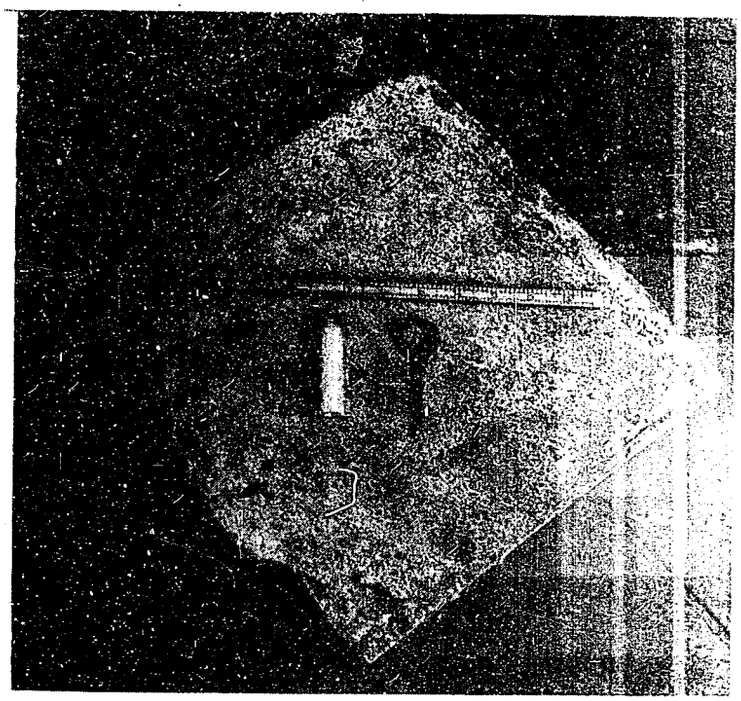

Figure 18
Sniff Test Vial and Punch

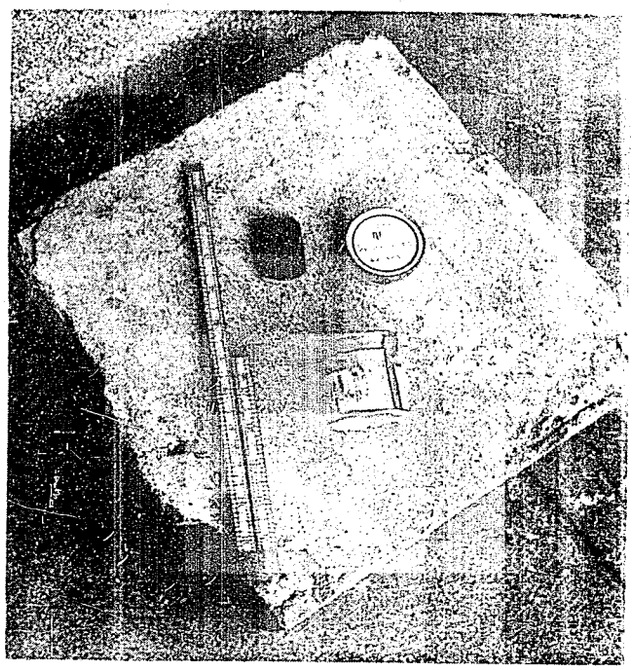

Figure 19
Tear Gas Grenade Type A Small

XXII. TESTING APPARATUS, TEMPORARILY DESIGNATED TYPE 3

1. General Information

This apparatus was stored in Naval Warehouse 11, SASEBO, KYUSHU.

2. Description

The apparatus is contained in a wooden box approximately 2' by 1 1/4' by 1', and consists of four gallon cans of detector paint, heavy sheets of detector paper, absorbent paper, testing paper, comparator panels, and accessories.

3. Operation

The apparatus is apparently designed for the purpose of detecting liquid blister gases under varying conditions.

Note: Samples of all enemy material discussed herein have been sent to the Ordnance Investigation Laboratory at INDIANHEAD, MARYLAND, for technical investigation.