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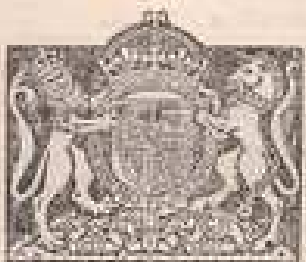
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PROTECTION AGAINST GAS

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By Command of the Army Council,

A handwritten signature in dark ink, appearing to read 'J. J. Guier'.

THE WAR OFFICE,
30th July, 1941

DISTRIBUTION

All Arms Scale D (a)

CONTENTS

SEC.	PAGE
1 Characteristics and effects of war gases—	
1. Classification	1
2. Table of war gases	1
2 Means of recognizing gas weapons—	
1. Projectors	1
2. Mortars, shell and air bombs	1
3. Generators	2
4. Aircraft spray	2
5. Cylinders	2
3 Personal anti-gas equipment—	
1. General	2
2. Personal equipment	2
3. Respirator fitting	2
4. Eye-shields; detectors, gas, individual, capes and ointment, anti-gas	3
4 Unit anti-gas protection and equipment—	
1. Gas alarm signals	3
2. Vehicle equipment	4
3. Sacks, paper, gas-proof	4
4. Detectors, gas spray	4
5. Signs, warning, gas	4
6. Bleach powder	5
7. Detector paper, Type "A"	5
8. Suits, anti-gas light	5
9. Overboots, anti-gas	5
10. Gloves, anti-gas	5

Continued on page III of cover

FIELD SERVICE POCKET BOOK PAMPHLET No. 8, 1941

PROTECTION AGAINST GAS

1. Characteristics and effects of war gases

1. (a) *Classification*.—War gases are divided into four groups:—
- i. Choking.—These attack the lungs and breathing passages and may cause death.
 - ii. Nose.—Nose gases are toxic smokes causing irritation to the breathing passages. They are not lethal.
 - iii. Tear.—These cause the eyes to smart and water, but are otherwise harmless.
 - iv. Blister.—These are normally liquids which give off vapour continuously. Contact with the liquid or continued exposure to vapour will cause blisters to develop. Death may follow exposure of the lungs to high concentrations of the vapour, or inhalation of minute droplets formed by explosion of a projectile filled with blister gas.

(b) Gases are also described as persistent or non-persistent. Persistent gases are liquids which evaporate slowly. Non-persistent gases disperse quickly when released.

(c) Smoke, a strange liquid, an unknown solid or powder on the ground, any feeling of choking or irritation of the nose or eyes, or an unusual smell will be treated as a war gas until proved otherwise.

2. The table on pages 15 and 16 gives the characteristics and effects of some of the more common gases of these groups. All ranks should know what action should be taken in the event of exposure to or contamination by them.

2. Means of recognizing gas weapons

1. *Projectors*.—A loud explosion can be heard when they are fired. The drum can be seen in the air and makes a swishing noise during its flight. The noise of burst is small. Range may be up to 4,000 yards. Sparks may be visible at night.

2. Some types of mortar bombs, shells and air bombs make little noise on bursting and should not be mistaken for "duds." Others may have a large H.E. content and consequently a loud burst.

3. *Generators*.—When set off smoke is visible for some distance, but the first effects of the gas may be the only other warning.

4. Aircraft spray may often be seen leaving aircraft at the lower altitudes in the form of a plume.

5. *Cylinders*.—When gas is emitted from cylinders a loud hissing noise can be heard for some hundreds of yards. Their employment is governed by the direction and strength of the wind.

3. Personal anti-gas equipment

1. *General*.—Every individual is personally responsible for his own protection against gas. He is provided with articles of equipment for his protection and personal decontamination (see Sec. 7, 2).

2. *Personal equipment*, which is carried by every individual in the field, consists of the following (number or amount of each in brackets) :—

Respirator	(1)
Eye-shields, anti-gas ...	(6)
Cape, anti-gas	(1)
Detectors, gas, individual ...	(2 pairs)
Ointment, anti-gas	(2 pots or tins containing 2 ounces each)
Cotton waste... ..	(1 ounce)

In addition officers and N.C.Os. each carry one pad of detectors, gas, ground.

3. *Respirator*.—This gives complete protection to the eyes, nose, throat and lungs against all known war gases, provided it is in good condition and fits properly.

Method of fitting

Stage 1—Preliminary adjustment.

- Issue a normal size respirator, slacken off all the elastic bands of the head harness, so that the ends are about 1 in. from the buckles, and then instruct the wearer to put on the respirator.
- Tighten each of the elastic bands, so that the facepiece is held firmly but comfortably in contact with the skin, with all the bands exerting an equal pull. The wearer's chin must fit closely into the chin of the facepiece.

Stage 2—Examination of size.

Examine whether the size is correct. If the wearer's eyes appear approximately midway between the top and the bottom of the eyepiece, the size is correct.

If the eyes are much below the centre of the eyepiece in a normal size, it must be exchanged for a small size; if much above the centre in a normal size, a large size is required.

Stage 3—Final adjustment of correct size.

Examine under the chin, then round the cheeks, temples and forehead to ascertain that the facepiece is firmly on the face.

Stage 4—Test for gas tightness.

Squeeze the connecting tube so that no air can be drawn through it. Instruct the wearer to attempt to breathe in. If the facepiece is drawn on to the face, and no air can be drawn in round the side of the facepiece, a gas-tight fit has been obtained.

If the wearer can draw air in round the facepiece, further fitting or adjustment is required. After men have been fitted correctly, a roll will be made giving the man's name and size of facepiece.

Notes.—1. Men who require to wear spectacles should be fitted with facepieces Mk. IV Special I or Special I Mc, or Mk. V and issued with special Mk. III spectacle frames with flattened side members.

2. Respirators should be tested in a gas chamber as soon as possible after they have been fitted. This test should be repeated at intervals of not more than three months.

4. Eye-shields; detectors, gas, individual, and capes are issued primarily for protection against aircraft spray. The cape will normally be carried in the "rolled position"; eye-shields and detectors will always be worn in the open. The shoulders of the capes will be painted with detector paint.

The detector, gas, individual, changes to a red colour where drops of spray fall on it. A "large" drop of spray tends to elongate or run down the surface of the detector. "Large" drops will penetrate clothing.

Ointment, anti-gas, is carried for personal decontamination; its employment is given in Sec. 7, 2.

4. Unit anti-gas protection and equipment

1. Gas alarm signals (see A.F. A3022 Anti-gas protection).
i. Local alarm. A wooden rattle is issued to all platoon and equivalent sub-unit H.Q. for this purpose.

The rattle will be sounded by the sentry to give warning to those in the immediate vicinity of the presence of gas other than aircraft spray. Those within hearing should adjust respirators and later carry out personal decontamination if contaminated by liquid blister gas.

ii. *General alarm.* A hand-operated siren issued to all company and equivalent H.Q. This will only be used in places where it is not liable to confusion with existing civilian air raid warning signals or where special authority has been given for its use. On the order of the commander a continuous blast will be sounded to denote a gas attack, other than aircraft spray, of sufficient intensity to affect neighbouring units. Respirators will be adjusted by all who hear it. The signal will not be taken up by those outside the hearing of the local alarms until the commander is sure it will affect the area for which he is responsible.

iii. *Spray alarm.* This is a verbal warning consisting of the word "spray" passed by word of mouth. The individual should examine his individual detector and carry out personal decontamination if necessary.

The respirator should not be adjusted unless vapour can be smelt.

iv. *Gas clear.* These words will be passed verbally. This signifies that individuals should test for gas and remove respirators if it is safe to do so.

2. *Vehicle equipment.*—Detector paint is issued for all vehicles, and should be applied over an area equivalent to 18-inches square on the bonnet or some other place that the driver can see, care being taken not to break the disruptive camouflage painting, and to avoid surfaces exposed to considerable heat. The paint turns red where drops of liquid blister gas fall on it.

A tray painted with detector paint and mounted on a bracket is provided for each forward control vehicle.

After contamination a vehicle detector should be cleaned with petrol or paraffin before repainting.

3. *Sacks, paper, gas-proof.*—These are carried in all vehicles and are for the removal of contaminated clothing. Each sack will hold four or more complete outfits.

4. *Detectors, gas spray.*—Carried in unit transport. These are metal frames with slots into which detector paper can be fitted. The paper will turn red where contaminated by liquid blister gas. When not available, a sheet of metal or wood covered with detector paint may be used. For use see Sec. 5.

5. *Signs, warning, gas.*—Carried in unit transport. They are triangular pieces of painted metal bearing the word **GAS**.

They are for marking contaminated areas and should be placed about 20 yards from the area with the arrow pointing towards it. The date and time should be marked on the sign before being placed in position.

6. *Bleach powder* is carried in unit transport for decontamination purposes.

7. *Detector paper, Type "A."*—Issued in envelopes and must be kept out of contact with air until used. Turns a faint yellow or brown colour in the presence of arsine.

8. *Suits, anti-gas, light.*—Consist of a jacket and pair of trousers. They are intended for the protection of D.Rs., transport drivers, men on anti-aircraft duties, tank crews, men working on contaminated ground or requiring special protection.

9. *Overboots, anti-gas.*—Worn in conjunction with the light suit for movement over contaminated ground.

10. *Gloves, anti-gas.*—For handling contaminated material. Canvas overmittens can be worn outside the gloves for heavy work.

5. Protection in camps and bivouacs

The chief consideration is the protection of personnel, equipment and stores against spray. All possible use of shelter provided by trees and woods should therefore be made.

Detectors, gas spray, should be in position at all times, and be arranged in groups of nine so as to form a square of about 18 inches.

These groups will be placed at convenient intervals (maximum 200 yards) throughout the area. A sentry will be detailed for every three or four groups of detectors, and will visit each group at ten-minute intervals. In order that he may inspect the detectors in darkness he should be provided with a torch.

6. Tactical protection

1. *Surprise* is of paramount importance in chemical warfare but can be countered by efficient organization and training, by maintenance of protective equipment in good condition, and of a high standard of gas discipline. Surprise may be attained by use of new gases, new methods or on a larger scale than hitherto experienced.

2. *Intelligence.*

(a) Intelligence reports should include the following items with regard to gas:—

1. Location and time of attack.

- ii. Weather conditions at time of attack (direction of wind, damp or dry, warm or cold).
- iii. Hostile weapon used and bearing.
- iv. Type of gas.
- v. Duration of attack.
- vi. Area affected or contaminated.
- vii. Any unusual effects on personnel or material.

(b) The following materials are required for examination:—

- i. Samples of any gas or smoke ground weapon, spent or unexploded projectiles, or generators.
- ii. Samples of ground or other materials contaminated with C.W. agents.
- iii. Enemy respirators and protective equipment of all kinds.
- iv. Specimens of our own respirators or protective equipment for examination with respect to the effects of enemy C.W. agents.
- v. Any suspected objects which have a C.W. significance.

Materials should be sent or reported to the nearest formation headquarters which has a C.W. technical officer.

Gas intelligence is recorded on maps in accordance with F.S.P.B. Pamphlet 3, Plate II. The date of contamination should be recorded against the marked area.

3. Effects of weather on gas.

(a) *Non-persistent gas*.—Chiefly affected by wind, the most suitable wind for its use being one between 4 and 12 miles an hour. Non-persistent gas is best used on clear cloudless nights, especially between midnight and dawn, or on cloudy overcast days or nights. Rain has little effect on non-persistent gas unless very heavy.

(b) *Persistent gas*.—Persistence is decreased by high temperature, wind or heavy rain.

Persistent gas will be dangerous for a length of time depending on the weather, the terrain, the time of day, the length of time men are exposed and the initial degree of contamination.

1. Danger by contact.

The heaviest contamination on a road will not stop marching troops. In areas of heavy contamination on grass or scrub, where liquid may

come above the uppers of the boots men can safely march after 1 day, unless the temperature is very low. In winter 3 days may have to elapse. On a very hot day, marching is safe after 3 or 4 hours.

For heavily contaminated grassland to be safe for men lying, sitting or handling materials, 10 days should be allowed in average weather, a month in very cold weather and 3 or 4 days in very hot weather.

For contamination such as spray, there is no danger in crossing any area.

Lying or sitting in it for long periods may be dangerous up to 24 hours after contamination, but there should be little danger as early as 4 hours after contamination, provided that men do not remain on the ground for more than one hour, and first apply ointment prophylactically to the bare skin.

ii. Danger from vapour.

This is greatest on warm days, or in the morning after a night shoot.

Men in an area which has been heavily contaminated are in danger from vapour if they remain there for more than a certain period. The longer the time since the contamination was put down, the greater will this period be. If the men touch no liquid contamination, these periods are roughly:

Time after contamination	Safe period of continued occupation for unprotected men
0-3 hours	15 minutes
3-6 hours	1 hour
24 hours	No danger from vapour

These are not exact figures and vary considerably with the weather conditions, e.g. on a hot day the safe period of occupation may be considerably less, though the danger will not be present for so long a time.

The safe period of occupation given above is doubled if the respirator is worn, unless men are very hot, when no increase in the time of exposure is safe.

The distance downwind of a contaminated area which is safe depends on the weather and the

size of the area. It should be safe 100 yards downwind of one large bomb, and, save in the most extreme conditions, 500 yards downwind of the largest area.

The main danger from vapour comes from men carrying liquid on their clothing into a confined space such as a hut or dug-out.

The times of persistence in the above examples are rough guides only and refer to mustard gas; Lewisite is less persistent.

4. Effects of ground on gas.

(a) *Non-persistent gas.*—Flat, wet or marshy ground is favourable for gas clouds, which tend to follow valleys and to hang in built-up or enclosed areas or in woods, especially if in leaf. If travelling with the wind, the cloud will, however, tend to rise and pass over such areas, returning to ground level beyond.

(b) *Persistent gas.*—Wet or muddy ground increases persistence, which also varies with the nature of the surface, being less on hard impervious surfaces than on loose pervious ground in which "under-surface" persistence may be set up.

5. Contaminated areas.

(a) Areas encountered in the advance should, if possible, be avoided. The area should be reported by the sub-unit discovering it, which should not allow it to delay them. The delimiting and marking off should normally be left to sub-units in reserve. Detailed reconnaissance may be necessary with a view to later occupation.

(b) In the attack, it may be necessary to make arrangements for carriage of anti-gas equipment, detailing of parties to delimit contaminated areas for passage of reserves, relief of leading units, and location and distribution of reserve clothing.

(c) In the defence, contamination may sometimes be avoided by use of alternative positions. These must be upwind of the contaminated area, and they and the routes to them must be reconnoitred before use to ensure that they are free from contamination.

(d) Personnel forced to remain in a vapour concentration may diminish the effects of exposure by tightening the cuffs of the anti-gas cape, stuffing a handkerchief or cloth round the neck, and folding or tucking in the skirt of the cape tightly round the legs. Men should, as far as possible, refrain from movement. Only the minimum number should

remain on duty and they should be relieved frequently. Prophylactic properties of anti-gas ointment may be utilized to protect exposed skin, bearing in mind its limitations in this respect.

6. Field organization.

(a) *Unit.*—The gas officer is responsible to his C.O. for the anti-gas training of the unit, and for the condition of the protective equipment on charge to the unit. The I.O. is responsible for advising his commander during battle and for collecting and transmitting gas intelligence.

(b) *Brigade.*—The I.Os. duties include gas intelligence.

(c) *Division.*—There is a General Staff officer (C.W.) at divisional H.Q.

(d) *Corps and higher formations.*—One or more General Staff officers (C.W.), technical officers (C.W.), and R.A.F. meteorological officers. The technical officers (C.W.) assist the General Staff officers on all technical matters of chemical warfare, especially on the storage and use of gas, the examination of enemy C.W. material and on protective equipment.

7. Decontamination

1. Rules to be observed in dealing with blister gases:—

- i. Avoid. Mark the contaminated areas, and use alternative routes.
- ii. Limit the spread by avoiding contact with any contaminated object or area.
- iii. Whenever possible allow the contamination to weather.
- iv. Decontaminate ground, equipment or stores only when weathering is impracticable, or the area or article is urgently required.

2. *Personal decontamination* (see A.F. A2022. Anti-gas protection).—Every individual is responsible for his own personal decontamination. The essence of personal decontamination is the immediate removal of free contaminant by cotton waste and the immediate application of anti-gas ointment; when necessary, the removal of contaminated clothing should follow as soon as possible.

The sequence of personal decontamination is as follows:—

PART I

- I. Cotton waste. Remove any free liquid on the exposed skin with cotton waste;

Ointment. Rub anti-gas ointment vigorously into the affected parts of the exposed skin for not less than half a minute. Leave a visible film of ointment on the hands, but remove surplus from other parts of the skin.

- iii. **Eye-shields** (if contaminated). Prepare fresh eye-shields, remove contaminated eye-shield, and put on the new one.

PART II

- iv. **Clothing** (not applicable to small drops of spray). Swab off free liquid on cape or equipment; remove or cut away contaminated clothing. Rub ointment into skin covered by clothing on which liquid blister gas has fallen. Put on fresh clothing as necessary and available.
- v. **Detectors and weapons.** Change individual detectors if necessary or swab off free liquid and mark the spots. Decontaminate any weapons affected.
- vi. **Ointment.** Wipe off surplus ointment from the hands with a clean swab, then rub more ointment in for half a minute.

The sequence can easily be remembered by the initial letters **C O E C D O**.

The action required by Part I should be automatic, and will be carried out by every individual immediately contamination occurs. This can be done on the move.

To carry out Part II of the sequence it will be necessary to halt and action will therefore be controlled by the local commander, except when individuals are by themselves. When the tactical situation permits, Part II should be done under cover or on clean ground. If this is not possible men must take care not to put their rifles or equipment on ground which is obviously contaminated.

The following is a guide to the usefulness of anti-gas ointment as an antidote to liquid mustard gas:—

If applied within one minute of contamination—Blisters will be prevented.

If applied before the skin begins to redden—Blisters will be less serious.

After reddening has started—Do not apply, but wash skin with soap and water.

It is possible to use ointment No. 2 as a prophylactic against blister gas vapour, but it has an irritant effect if left on the skin. It may give protection in cool weather for five hours, but in hot weather this period will be much reduced.

It may also be used instead of anti-gas gloves when handling contaminated material. Before handling, the ointment should be rubbed into the hands until it vanishes, and then more ointment applied to ensure that a visible covering of ointment is kept on the hands while the material is being handled. After handling the contaminated material, any remaining ointment should be wiped off, and fresh ointment rubbed in until it vanishes.

Liquid mustard gas, except in the form of small drops of spray, will penetrate:—

The skin in 2 minutes.

S.D. clothing in 10 minutes.

Capes, anti-gas, in 1½ hours.

Uppers of boots in 3-4 hours.

Stout soles of boots in 24 hours.

A strong concentration of vapour will percolate through clothing in about 30 minutes.

In the case of Lewisite the above times will be considerably less.

3. **Clothing and equipment.**—When contaminated by large drops of liquid blister gas, clothing should be sent to a decontamination centre in sacks, paper, gas-proof.

Unless web equipment is heavily contaminated, all free liquid will be removed by a swab and ointment, anti-gas, applied to the contamination on both sides of the equipment, when it may continue to be worn. If heavily contaminated, treat as for clothing.

If contaminated by vapour they can be cleaned by "weathering" (hanging out in the air for 24 hours or until the smell goes).

For the decontamination of clothing affected by liquid blister gas, the normal method is treatment with boiling water (*see Note*).

The water should be boiling before the articles are immersed and should be kept boiling. 1½ gallons of water are required for each pound of clothing.

A grid is necessary to keep the articles off the bottom of the boiler.

When washing soda is advocated 2 oz. should be used to every 10 gallons of water (*see table below*).

The time various articles should be kept boiling is shown below.

Boots, rubber, knee	...	...	2 hours.	No soda.
Web equipment and canvas	...	...	1 hour.	Soda.
Ground sheets and waterproofs	...	...	1 hour.	No soda.
Clothing, cotton and linen	...	...	$\frac{1}{2}$ hour.	Soda.
Clothing, woollen (clean)	...	...	1 hour.	No soda.
Clothing, woollen (greasy or oily)	...	...	2 hours.	No soda.

Note.—Suits and anti-gas capes should be immersed for half an hour in water, without soda, which is kept just off the boil.

4. Respirators.—Remove container and eyepieces.

Boil facepiece and connecting tube for three hours. Remove any liquid gas from the eyepiece and container, apply anti-gas ointment and remove. Boil haversack for one hour. Add soda if available.

5. Leather.—Do not boil.

Weathering will remove vapour contamination. If contaminated by drops, soak in cold water for one hour, then place in water which is kept as hot as it is possible for the hand to bear for four hours. Service boots can be rendered safe for normal usage by similar treatment for two hours, no preliminary immersion in cold water being required.

Remove and dry naturally.

6. *Weapons and metal articles.*—All ranks are responsible for the decontamination of weapons in their charge.

Personal anti-gas ointment will be used for the decontamination of rifles; for other weapons a special issue of ointment is made (8 ounces per weapon).

When decontaminating a rifle:—

- i. Rub ointment on the hands.
- ii. Unless the sling is heavily contaminated it should remain on the rifle, all free liquid being removed with a swab and ointment applied to the contamination on both sides of the sling.
- iii. Swab off gross contamination.
- iv. Apply ointment and remove after ten minutes.
- v. Oil rifle.
- vi. Again rub ointment on hands and remove.

If petrol or paraffin is available they should be used for all metal work, ointment being applied to the woodwork only.

All weapons and metal articles should be similarly treated.

8. Protection of food supplies against gas

1. *General.*—The main danger arises from exposure to blister gas. The principle of protection is, therefore, to keep supplies covered at all times. This can be done by utilizing break-bulk shelters, covering stacks or dumps with gas-proof tarpaulins, covering supplies with ground sheets or other gas-proof material when being transferred from one means of transport to another, built-on canopies for loading and unloading ships and trains, protection of the food supplies themselves by special pack, and cooking of food under a gas-proof cover.

2. *Food packs.*—Food supplies are provided in canned, cased and wrapped packs which give protection against gas in diminishing degree. The complete field service ration is available in a special anti-gas pack consisting of hermetically sealed cans and canisters with reclosure means. These cans should be retained for storing small quantities of other food-stuffs after distribution.

3. *Detection of contamination.*—Detectors, gas spray, should be placed at intervals around stacks and stores of food supplies and regularly inspected. Where only light or vapour contamination is suspected, advice on the gas danger can be obtained from the Technical Officer (C.W.) at formation headquarters.

4. *Decontamination.*—Canned foodstuffs are safe but the cans should be decontaminated by petrol or bleach before opening. Three-ply cases may be treated with bleach and weathered, but other cases should have their contents turned out, and the latter may have to be condemned if contamination is heavy. The wooden case must be burnt. Wrapped and open foodstuffs should be carefully inspected and, if in doubt, set aside for examination by the Technical Officer (C.W.). If only light or vapour contamination is suspected they may be made safe for consumption by airing for 24 hours and cooking, or, in the case of fruit, vegetables, etc., washing until no smell remains.

Foodstuff exposed to non-persistent gases may be rendered safe for consumption by exposure to air for 24 hours.

5. *Disposal of contaminated supplies.*—These will be segregated and labelled with the special "contaminated"

label (a purple St. Andrew's Cross on a yellow background). They will be reported on A.F. W3334 to higher authority.

9. First aid treatment for animals

1. An efficient respirator is now issued for the protection of horses and mules to which they become accustomed after two hours' training.

2. Choking gases.—Adjust respirator. If affected by the gas move slowly out of the affected area.

3. Nose gases.—Have little effect on horses, etc. Brush and wash coat as soon as possible.

4. Tear gases.—Animals not affected.

5. Blister gases.—As with humans success depends on the speed of treatment.

- i. Fix the tail after lightly dusting with bleach powder.
- ii. When the contaminated area cannot be defined brush into the skin, all over the body, a paste made of bleach powder and water. Continue applying for five minutes and then wash off. As this paste is irritant avoid the eyes, nostrils, and lips.

Alternatively scrub with water, soda and soap for 20 minutes, using plenty of water, or hose down with water.

iii. Irrigate the eyes freely with water or with a solution containing one teaspoonful of salt or bicarbonate of soda to one pint of water. Continue irrigation for 10 minutes.

iv. Respiratory tract.—Plenty of fresh air is required. Rug and bandage up to keep body warm. Feed from the floor. Nostrils frequently sponged.

v. If it is suspected that animals have eaten contaminated fodder, feed as much as possible. Later when animal is off his feed tempt with boiled feeds, carrots and green food. Linseed and oatmeal gruel should be given.

vi. Legs.—Smear legs with bleach paste or anti-gas ointment, paying particular attention to hollow of heel. If bleach powder is not available, wash down with petrol or water.

WAR GASES

Gas (1)	Type (2)	How detected (3)	Effects on body (4)	Immediate action (5)	First aid (6)
1. Chlorine gas; Phosgene	N.P.	Slight of misty haze.	Coughing, choking, or difficulty in breathing. Cough may cease temporarily but symptoms may recur up to 24 hours (delayed action).	Put on respirator.	1. Adjust respirator, if it fits, put wet cloth over face. 2. Make casually a strict-cher case—give warm, moist tea; keep warm. 3. No alcohol. No stimulants. No artificial respiration. 4. Transfer to nearest medical post.
2. Must gas	N.P.	By effects produced in body in 3 to 5 min. Generally appear as a thin cloud. If used as part filling of H.B. bottle or shell, a noticeable cloud is produced.	Pain in chest and throat; itching in face and head. Feeling of suffocation and depression. Vomiting may occur.	Put on respirator.	1. Adjust respirator. 2. Alcohol may be given. 3. By all available medical services. Recovery in case to two hours. Note.—After respirator has been put on, symptoms tend to become worse, but respirator must be kept on. Alcohol for nose and tea as above. If condition persists: one teaspoonful of bicarbonate of soda or salt to 1 pint of water. They dissolve up mucus.
3. Tear gas	P. and N.P.	By effects in eyes produced immediately.	Stinging pain in the eyes with immediate onset of tears. Do not to open the eyes unless liquid enters them.	Put on respirator.	1. Adjust respirator. 2. Do NOT resort to medical services. 3. Flush eyes.

Gas (1)	Type (2)	How detected (3)	Effects on body (4)	Immediate action (5)	First aid (6)
4. Mustard gas: (a) Mustard gas	P.	Yellow or brown oily liquid, which gives off an irritable vapour; smells like garlic or onion. Detectors turn RED when in contact with the liquid.	<p>Liquid</p> <p>Eyes: Redness often followed by permanent blindness. Skin: No immediate effect after about 2 hours, followed by blisters in 8 to 12 hours.</p> <p>Vapour</p> <p>Eyes: Pain, redness and temporary blindness. Lungs: Hoarseness and coughing. Skin: No immediate effect. Redness and irritation followed by blisters in 12 to 24 hours.</p> <p>Liquid</p> <p>Eyes: Intolerable pain, possible permanent blindness. Skin: Redness followed by blisters over 1 hour, later mustard gas, but not bubbling.</p>	<p>Spray and LAYERS</p> <p>Eyes: Blinds should always be worn in the eyes.</p> <p>Skin: Soak off with cotton waste and apply carbolic acid ointment.</p> <p>Chlorine: Large doses—remove all outer clothing as soon as practicable. For a few small drops—on as soon as necessary.</p> <p>Variants: Put on respirator if necessary and move out of affected area if possible.</p>	<p>Lotion</p> <p>Eyes: Wash out for 10 mins. with plenty of water and referable to medical services.</p> <p>Skin: Soak off (liquid) with apply ointment.</p> <p>Blisters: Cover with a dressing. Do not prick.</p> <p>Variants: Eyes and hands; immerse in water and referable to medical services.</p> <p>Skin: Wash with soap and water and change clothes where possible. Do NOT use ointment. No. 2 or bleach if the skin has started to bubble.</p>
(b) Lewisite	P.	Oily liquid, pale yellow or ochraceous. Green, oil-soluble vapour which smells like gunpowder and irritates the nose. Detectors react in 10 minutes for mustard gas.	<p>Liquid</p> <p>Eyes: Intolerable pain, possible permanent blindness. Skin: Redness followed by blisters over 1 hour, later mustard gas, but not bubbling.</p>	<p>Put on respirator.</p>	<p>1. Administer respirator.</p> <p>2. Make casualty a stretcher case; give plenty of fluid and keep warm.</p> <p>3. Transfer to nearest medical post as soon as possible.</p>
5. Arsenic or Arsenic	P. and S.P.	May be either a grey, or black powder or an irritable gas. The powder is contact with moisture gives off an irritable gas. This gas varies detector paper Type A from WHITE to a YELLOW or BROWN colour.	No immediate effects. Mild cases, first symptoms are headache, fatigue, fever and lower slight tremor. For severe cases, vomiting and diarrhoea, and later passing of blood in the urine.	Put on respirator.	<p>1. Administer respirator.</p> <p>2. Make casualty a stretcher case; give plenty of fluid and keep warm.</p> <p>3. Transfer to nearest medical post as soon as possible.</p>

SEC.	PAGE
5 Protection in camps and bivouacs	5
6 Tactical protection—	
1. Surprise	5
2. Intelligence	5
3. Effects of weather on gas	6
4. Effects of ground on gas	8
5. Contaminated areas	8
6. Field organization	9
7 Decontamination—	
1. Principles	9
2. Personal	9
3. Clothing and equipment	11
4. Respirators	12
5. Leather	12
6. Weapons and metal articles	12
8 Protection of food supplies against gas—	
1. General	13
2. Food packs	13
3. Detection of contamination	13
4. Decontamination	13
5. Disposal of contaminated supplies	13
9 First aid treatment for animals	14
Table—War gases	15