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1942 "War on the Home Front" Poison Gas, Bombs, & Incendiaries Preparedness Booklet

Joel H. Hildebrand

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"WAR ON THE HOME FRONT"

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(Basic Facts Everyone Should Know About Poison Gas, Bombs, and Incendiaries; Principles of Action to be Followed)

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By JOEL H. HILDEBRAND

Chairman, Chemistry Department, University of California

Doctor Hildebrand received the Distinguished Service Medal for his service in France in 1917-18 with the following citation:

"Joel H. Hildebrand, Lieutenant Colonel, Chemical Warfare Service, U. S. Army. As Commandant of the Chemical Warfare Service experimental field (Hanlon Field), American Expeditionary Forces, a position of great responsibility and also of considerable personal danger, his profound knowledge of chemistry, coupled with his rapid grasp of military problems, enabled him to render services of the utmost value in determining the best means for using gas and gas materials in the field."

THESE PAGES are written at the request of the Executive Committee of the Commonwealth Club of California following an address by the writer delivered at the meeting of the Club, March 13, broadcast over KGO, on the topic, "Chemistry in Warfare." My aim, now as then, is to talk in plain language to ordinary citizens about some of the threats they face under the impact of war. This is not addressed primarily to Civilian Defense officials, or to physicians. It is not a set of minute directions regarding organization, equipment, how to distinguish between a dozen different toxic gases, and the like. I do not wish to usurp the authority of those officially charged with responsibilities in the face of enemy attack. They can procure information such as is issued through the office of Civilian Defense, Washington, D. C. The best thing I have seen is *"Bombs, What to Do and When to Do It,"* published by the Board of Fire Underwriters of the Pacific, San Francisco. I mean rather to give a few basic facts that everyone should know and principles of action that should be followed. I am more concerned about "defense psychology" than defense procedures.

It is mainly ignorance that is responsible for the excessive fear of poison gas under which many suffer. Such fears are increased by the nonsense spread by anxious but ignorant people, eager to pose as authorities. Several such have asked me to tell them in a short interview or in a letter what they will need to know in order to write a book of instructions, or to give lectures. Such persons should have muzzles, not megaphones.

Gas Attack Nonsense

Let me give several *examples of the nonsense* that has recently come to my attention.

1. "Phosgene burns should be treated with carbon sulfate." As a matter of fact, phosgene is not, like mustard gas, a skin burner; and there is no such substance as "carbon sulfate."

2. "In the event of a gas attack, the whole area must be permanently evacuated and the clothing of all persons within it destroyed." The truth is, first, that any gas but lewisite or mustard would evacuate the area before the inhabitants could. Second, mustard gas or lewisite could be quickly removed by street squads; using chloride of lime, or bleaching solutions and fire hose. Further, people who rushed into the street to evacuate the area would be leaving comparative safety and going where the gas would be strongest, and where they would be excellent targets for further gas, bombs or machine guns, and their running about would cause them to breathe the poison several times as fast as if they kept still. Finally, clothes contaminated by mustard gas are easily cleaned by dry-cleaning, washing, steam-pressing, or simply by airing. In fact, the whole statement is nonsense.

3. A physician had planned a de-gassing station with an elaborate series of treatments including "surgical operation on skin visibly affected." Now there is no visible effect on skin infected with mustard gas till many hours have elapsed. It is then too late to remove the stuff from within the skin.

4. "Sand to be used for putting out incendiary bombs must be 'sweet,' if it is beach sand, the salt must be washed out." As a matter of fact, the salt makes no difference. A sack of salt could be used in place of sand.

I suggest, therefore, that you do not believe everything you hear, especially if it sounds very alarming. Find out first whether the would-be authority really knows what he is talking about or is merely passing along something he has heard, probably somewhat inflated, like a fish story.

Gas Facts From Experiments

My statement about mustard gas, above, is not based on something I read in a book, but upon a number of experiments with it I have performed on my own body. I understand that certain physicians have not liked me to advise self-help, with soap and a bath, in place of the beautiful de-gassing facilities they have planned at a hospital. Come around, gentlemen, I have some mustard gas in my laboratory. I shall be glad to demonstrate on your arms the difference between washing the stuff off within 15 minutes and letting it stay for an hour while you stand in line waiting to be stripped, greased, washed with solution A, shaved, washed with solution B, skinned, smeared with "emollient," etc. Of course, if I have been bombed, burned and gassed, all at once, come and get me; do anything you want and salvage what you can.

Common Sense vs. Recipes. Many are anxiously trying to find someone to tell them what kind of a shovel to use; whether it is lewisite or mustard gas that smells like geraniums; how large a sack of sand should be; whether one should take refuge in the attic or the basement. And, naturally, the different experts do not always give identical answers, which is bewildering. Also, it is so hard to remember, even if once learned, which fruit, flower or vegetable resembles which gas, and it will be harder still during a raid. Let us, therefore, begin in a different way, trying to understand the problems and to apply a little common sense to solving them, rather than to remember complicated directions. What is a cook to do who has lost or forgotten the recipe for a cake, and does not know whether to use two eggs or four, a half-cup of butter or a whole? Perhaps it will be edible either way. What difference will it make? What do eggs and butter do in a cake? Once the functions of eggs, butter and baking powder, and a few other things are understood, a person can make a very good cake without a recipe.

Incendiary Bombs

Incendiaries are meant to start fires, as many as possible from one plane-load. They must be made of materials that generate heat at a high temperature for a long enough time to ignite the combustible stuff on which the enemy tries to drop them. This is not easy. A blow torch only slowly ignites a smooth board. A piece of phosphorous will usually burn out on a board surface, charring the board but not igniting it. A splash of gasoline might burn too quickly to ignite anything, while heavy oil is too hard to ignite. Thermite, iron oxide mixed with aluminum granules, which generates white-hot, molten iron, radiates its heat so rapidly that it may cool before it has set fire to anything. Magnesium has to get its oxygen from the air and burns for a longer time.

Flat Wood Surface Resists Fire

Remember, then, that it takes time for an incendiary to set fire to flat wood surfaces, and wool carpets do not burn at all well. Get to work calmly and sensibly to extinguish the incendiary, or at least to prevent the surroundings being set on fire while it burns itself out.

First, the best way to control any incendiary is to cover it with sand; any kind of sand; or ashes, or dirt from your garden if you have no sand, just as you would do to smother a fire if you had never heard of bombs. If your sand is already on hand, in sacks, each small enough to handle easily, that would be sensible. Water, whether applied by hose, pail, or wet blankets would, of course, put out the little blazes that may have started. If the bomb has been covered with sand you have it under control while you attend to anything else that may have started to burn. Just think the thing out in advance. Shut your eyes and visualize yourself acting like a veteran Londoner and then, if you ever have to, you probably will.

All of the instructions I have seen presuppose that Japanese raiders would use magnesium bombs, as have the Germans, and warn against using water lest the bomb "explode." Now, in the first place, the magnesium will not explode, but water and strongly burning magnesium yield hydrogen gas, which might mix with air and explode, if water is applied too rapidly. But, in the second place, any Japanese incendiary bombs that may fall are, in my opinion, unlikely to contain magnesium at all. Magnesium is expensive and hard to produce. Therefore, if the bomb does not burn with an intense white light, with much (non-irritating) smoke, you need not be so fearful about using water.

I regard phosphorous as far more likely in Japanese bombs. This burns with a more yellowish light, copious white fumes, somewhat irritating though not really toxic. It ignites spontaneously when dry. It is very inefficient against buildings, but very effective against dry brush and grain fields.

Poison Gas. Although poison gas seems to give more concern to most citizens than explosive bombs, the risk appears to me relatively slight for the following reasons. First, the enemy raiders should devote most of their limited carrying capacity to explosive and incendiary bombs which alone could harm military objectives. Gassing civilians in itself would do our enemies little good. Second, people who can remain behind closed doors and windows are excellently protected. It takes a lot of gas to kill people, even in the open. Third, if the enemy begins to use gas we can give it back with interest. On November 11, 1918 we were producing ten times as much mustard gas per day as Germany. We can do that again. I think it safe to say we can gas the Japanese the minute they try to gas us. That fact affords us much better protection than gas masks.

The most we should expect, therefore, at least at present, is a little gas mixed in with the other missiles for good measure, to add to the confusion and hamper rescue work and fire fighting. That is something to prepare for but nothing to put us into a panic.

Gas Symptoms

It does not seem to me at all necessary for a civilian who is not a chemist to feel that he must learn the names, odors, properties and treatments for a list of poison gases. What you smell during a raid may bear but little resemblance to hay, horseradish, or geraniums. Consider that even human beings often disguise their bodily odors by strange scents.

The possible substances, whether old or new, will behave in one of the following ways. *Tear gas* may hang around for hours, because it is really a slowly evaporating liquid or solid. It will make you cry, whether you feel like it or not, but the amounts necessary for that will do you no real harm. They will merely hamper your operations. *Sneeze*

gas would make you sneeze and cough, but would, in itself, do no further damage. It is to be feared only on the battlefield, when followed by one of the following. *Lung-tissue destroyers* may be true gases (e.g., phosgene) which drift away with the wind; liquids (e.g., chloropicrin, diphosgene) that evaporate about as fast as water, and hence may remain in traces for hours; or still less volatile liquids, (mustard gas, lewisite) that evaporate only about as fast as kerosene, and, if not destroyed, might give off their vapors in low concentration for several days. These last two are also skin-irritants, behaving much like poison oak, in acting slowly, with no pain at first, but producing blisters after two or more days.

You should know that the nose is such a delicate detector that it can perceive the sharp odors of all these gases in concentrations so low that you could breathe them for a while with no particular harm. There is no sense, therefore, in getting panicky just because you have caught a few mild whiffs of one of them. Do not run about the streets to escape the gas, for you would breathe it in far more rapidly in the air down on the street where the gas would probably be most concentrated. You will be best protected if you stay indoors, preferably in a room in the top floor, with windows shut, and cracks sealed, if it seems necessary, with strips of wet paper. If a trace of gas comes through, breathe through a thick wad of cloth, preferably moistened.

If You Touch Poison Gas—

If, after the raid is over, you touch anything that seems wet with an oily liquid that has a queer odor, or if you suspect that a mist from a bursting gas bomb has settled onto you, go at once to a bathroom, strip and throw your clothes out of the window and take a bath with lots of lather. If there is any kerosene, or lard, or oil, or cold cream handy, smear it on before using the soap, but do not waste any time hunting for it. Cleaning liquid can dissolve the poison oil, but is likely to evaporate leaving the oil behind, besides, it will not do you any good to breathe a lot of cleaning fluid vapors.

If You Breathe Poison Gas—

If you should be one of the few who get a big dose of poison gas in your lungs, take it easy. Absolute rest is the only medicine you need for some hours or days. Have yourself taken to a hospital. The staff there will know how to treat such injury as may develop. Comfort yourself with the thought that gassed soldiers fully recovered in World War I in much larger proportion than any other casualties. Moreover, gassing is, on the whole, far less painful than most other injuries.

Objects of Enemy Raids. In any contest involving strategy one should, of course, try to appraise what is going on in the mind of the enemy. A good poker player understands this. Let us make a few guesses about the objects of hostile raids to help us to deal with them intelligently.

First, no real invasion will be attempted unless bases can be established much closer than any now in enemy hands, hence any attacks he will make will be in the nature of hit-and-run raids.

Second, so long as we can menace his own shores and outposts, he will not risk sending his whole fleet, but will rely only on submarine torpedoings and shellings, and, possibly, striking at long range from a single airplane carrier, with light bombers only. Transoceanic heavy bombers in large fleets are still in the future.

Third, the objectives worth enough to justify the risk of a carrier include shipyards, naval stations, plane and munition plants, bridges, dams, forests and grain fields. Small dwellings, such as most of us live in, would not be the main targets. We are not that important. They would be hit, if at all, only by wild shots.

Raids to Stop Production

The purposes would include, also, stopping production. If the Japanese had a single plane somewhere in the wilds that could fly over Los Angeles several nights a week and bring all war production to a standstill for a blackout, the joke would be on us. We would brag about the perfection of the black-out while the Japs could chuckle over the perfection of work interruption at negligible cost to themselves.

Another Japanese purpose would be to assist certain senators in their effort to have our fleets recalled to do patrol duty just offshore, where the enemy could easily locate them.

Do We Want That Kind of Safety?

Still another would be to encourage the San Francisco Supervisors and other timorous citizens to demand that labor and materials be diverted from producing weapons and ships for our fighting forces, and rubber needed for bullet proof gas tanks and tires for jeeps, trucks and gun carriages to go instead into civilian gas masks. Some citizens and a lot of defense officials are unwitting allies of the enemy in helping him to achieve these objectives. You and I should get these matters clear in our minds and decide whether we want that kind of safety.

If a raid should occur, some citizens are going to get hurt and some killed. But what of it? We kill more people in a year with our autos than can ever be killed by enemy air raids. Autos are still about as dangerous as German bombs to English life. We take the former rather calmly; why get so jittery over the mere possibility of the latter? Being mangled by an auto is no pleasanter than being instantly killed by a bomb.

Winning the War or Personal Safety? Personal safety cannot long be guaranteed by putting on a gas mask and digging into a backyard bomb shelter while someone else beats off the Japs and the Nazis. If many of us do that the Japs and the Nazis will eventually dig us out, one by one, and put us to work, for them. Our only hope for personal safety lies in collective effort. Effort to produce and effort to fight.

Get your sacks of sand, your hose and spraying nozzle, your shovel and goggles, your blackout curtains, but do not for a moment think that these represent your share of war effort. To win requires soldiers, sailors, ships, tanks, planes and food, and then more soldiers, sailors, ships, tanks, planes and food. Where? Guarding our beaches and cities? No. In Australia. In Alaska. In Iceland. In the Philippines. In Russia. In Norway, perhaps. In France again. We cannot have these along with business as usual, or pleasures as usual. It is bombers abroad, not gas masks in San Francisco, that will win the war. Have we not brains enough to see it? We cannot buy victory. The price of victory is "blood, sweat and tears." Whose? The other fellow's?

Why Not Become Farm Laborer?

There are going to be crops of precious food next summer that will rot unless new hands are found. You and I are not fruit pickers; that, we have thought, is labor for Oakies and Arkies, Japs and hoboes. But these will not accomplish the job for us next summer. Ladies who wear stylish clothes and play golf, and bridge, and tennis, might well begin at once to get themselves in a frame of mind to don overalls, exchange a powder complexion for a sun-kissed tan, and color their finger nails with honest dirt in place of varnish. A queer idea? It takes queer ideas like that to win wars. The Russian women can do it.

Get Yourself a Job!

There are more ships and planes and tanks to be built. English women are doing it along with men. Many American men, former executives of businesses snuffed out by war, have not waited to be drafted to the new jobs that have to be done with hands, in overalls. But many more are needed. What are you and I doing in the meantime? Worrying about getting a gas mask? If we want to stop worrying, a production job would be far more effective than a gas mask. Work is the best known antidote for worry.

The persons dodging their opportunities to take part in this all-out war deserve no protection. "The ones to concern us are those flying our bombers, shooting our guns, making the tanks and planes. Lives are going to be lost; let us not sacrifice the wrong ones. A company of soldiers on Luzon are more important to the Nation than a whole city block with all its inhabitants. . . . One American bomber operating in the East Indies is today worth more to us than millions of civilian gas masks. . . . Civilian defense is a part of our task, but let us give it the proper place on the priority list; well above 'business as usual,' or society as usual, or personal convenience, but far below fighting and producing the means for fighting. Let us reject the turtle as our totem and return to the far-soaring eagle."*

*Closing quotation is from "This World"—San Francisco Chronicle, February 15, 1942.