Sabretache

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From Dave Love

I hope this note finds all of you and your families safe and healthy. These are certainly difficult times with a great deal of uncertainty still present. Our governments struggle daily with what is the right course to follow, whether to continue with heavy restrictions or to ease up to help our economies and allow people to resume their work. At the end of the day, those in authority must decide how cautious or aggressive they want to be, knowing full well that whether their decision was the right one or not depends on what happens following that decision. I am very glad that I am one who has to make those choices.

Back in March, I indicated that we would be suspending our meetings until May at the earliest in the hope that significant progress would be made in controlling and defeating this pandemic. Well, while we, though social distancing and other measures, have made significant strides in controlling this beast, the plain fact is that we are still finding our way. It has become clear to me and probably to you that the only guarantee of our safety is to find a suitable vaccine and that appears to be some time in the future.

In talking to the executive, we mulled around cancelling all meetings for the rest of the year and then revisit things in 2021. This is certainly, for the sake of the safety of all members, the most prudent strategy to take but it doesn't have the flexibility should something significantly positive happen in the interim. So, we have decided that we will continue to suspend our meetings as long as it makes sense for our safety, but will revisit the situation every month. Should we find that we will not be having any meetings for the rest of the year, the executive will apply your 2020 membership dues to 2021, assuming of course, that you were fully paid up and in good standing in March when we suspended the meetings.

I am also looking into ways that we may hold virtual meetings. We have to factor in the number of potential 'attendees' at the meetings to ensure that the product we might use can easily and efficiently handle that number of people, how easy and practical the program is to operate and of course, whether it is cost effective. Given those criteria, it may be possible to perhaps hold a virtual meeting less frequently. In that way, we can collectively keep in contact with each other and enjoy some fellowship while we self-isolate. It could also allow us to carry out a show and tell, using our computer cameras. More of this as I find out more information. Your feedback is most welcome.

Lastly, I want to thank Dave Gale for his work as editor. He has done yeoman service in putting out several extra bulletins since March. And also, I give my thanks to those members who have contributed articles for the newsletters. I know Dave especially greatly appreciates your input and these articles present a greater spectrum of topics of interest to individuals in our society.

Dave

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CALGARY MILITARY HISTORICAL SOCIETY
The SOCIETY
is a non-profit registered society which fosters the study of the military and the police, and the heritage of
Canada, the British Empire, and the world
as well as the preservation of military artifacts and records.
The CMHS meets once every calendar month at: Petty Officers' Mess
HMCS Tecumseh
1820 - 24th Street SW

Acknowledgements and Thanks

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The May Extra #1 article was provided by Member Roy Akins
The May Extra # 2 article was provided by Member Garrett Lap
The May Extra # 3 is a reprint of 2015 newdsletter

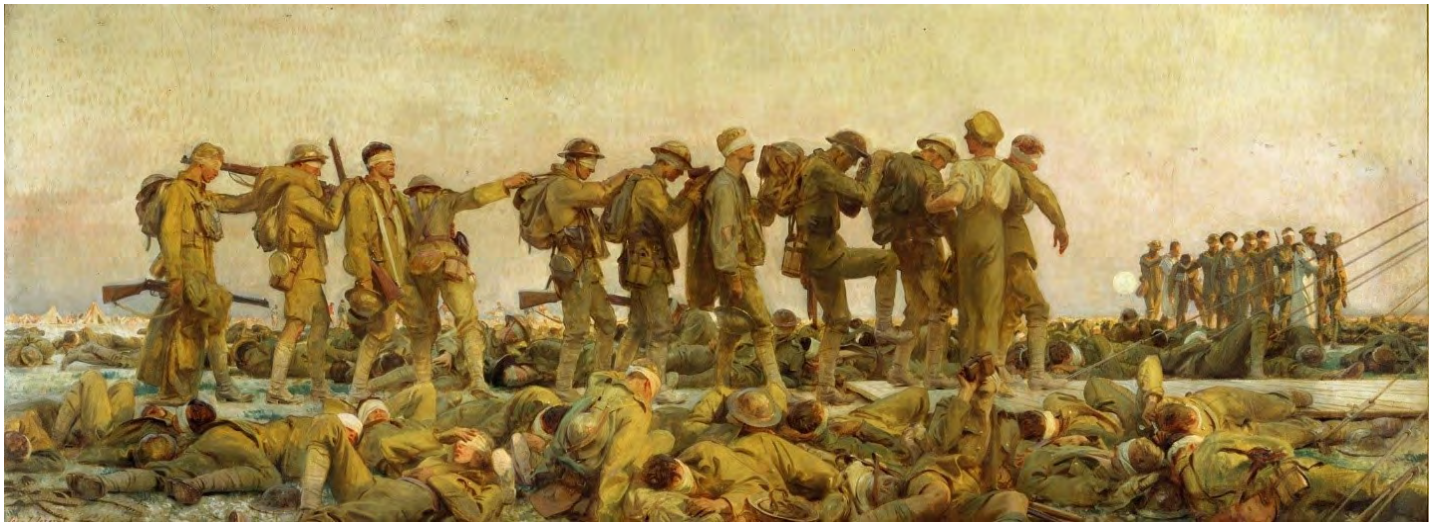
This June Extra #1 was provided by President Dave Love

Foreword

For some perverse reason, US President Donald Trump's earlier ridiculous (and dangerous) comments/suggestions about ingesting substances like Lysol or chlorine bleach to combat the COVID-19 virus internally reminded me of the use of poison gas during World War 1. Both Trump's 'suggestion' and poison gas tend to do the same thing to the human body, which drives home how shortsighted he continues to be (for those who may not have realized it, Donald Trump is definitely not one of my favourite people).

The following article is in three parts. Part 1 discusses the history of the use of poison gas in World War, how the different gases affected soldiers and a short summary discussion of the main gases used. Part 2 deals with tactics, methods of delivery of the gas and measures taken through the war to combat it. Part 3 discusses the impact of the use of poison gas in World War One as well as an odd gas-related anecdote experienced by one of my great uncles during his service in the war.

Gassed - Part 1



Gassed'
by John Singer Sergeant (1919

The use of poison gas in World War 1 was a major military innovation. Gases used ranged from disabling chemicals such as tear gas and the more severe, debilitating mustard gas, to killing agents like phosgene and chlorine. Even though in 1899 all countries who became actively involved in War World 1 signed a 'Hague Agreement' outlawing shells for the "diffusion of asphyxiating or deleterious gases" (even before they had actually been used on the battlefield), chemical warfare became a major component of the First World War. The killing capacity of gas was actually limited in a relative sense. Only about 3% of combat deaths were due to gas. However, the proportion of non-fatal casualties was much higher and poison gas, regardless of its actual effect, probably remained most soldiers' greatest fear. Because it became possible to develop effective countermeasures, gas was unlike most other weapons of the period. This was so because as the war progressed and as the use of gas increased, in many cases its effectiveness was diminished through new technology and anti-gas techniques. Thus, its main impact was psychological rather than destructive. Nonetheless, the widespread use of these agents of chemical warfare, and wartime advances in the development of high explosives, gave rise to an occasionally expressed view of World War I as "the chemists' war".

August, 1914

The earliest uses of chemicals as weapons in World War 1 were as tear-inducing irritants (lachrymatory) rather than disabling or fatal poisons. In August 1914, the French were the first to employ gas against the Germans, using grenades filled with tear gas (xylyl bromide).

October, 1914

Germany retaliated in October 1914, by firing 3,000 fragmentation shells filled with the lung irritant dianisidine chlorosulfate against British and French positions at Neuve Chapelle. However, because the chemical was largely incinerated by the explosive shell charges, concentrations achieved were so minimal they were barely noticed.

January 1915

Germany was the first to make large scale use of gas as a weapon when on 31 January 1915, 18,000 artillery shells containing liquid tear gas were fired on Russian positions at Bolinow, on the Rawka River, west of Warsaw. This again was ineffectual because instead of vaporizing, the chemical froze and had no impact.

April, 1915

By 22 April 1915, the German Army had 170 metric tons of chlorine deployed in 5,730 cylinders over a four-mile stretch of the front opposite Langemarck, north of Ypres. In what became the Second Battle of Ypres, at 17:00, the gas was released, forming a grey-green cloud that drifted across positions held by French colonial troops who quickly abandoned their trenches, thus creating a 7 km gap in the Allied line. The Canadian 1st Division was also affected. However, the Canadians held their ground. Because the Germans were wary of the gas, they did not plan for sufficient reinforcements to properly exploit a breakthrough before additional Canadian and British reinforcements arrived. More than 1,100 men were killed and 7,000 injured in the attack.

The Germans used gas on three more occasions during the battle – on 24 April against the Canadian 1st Division at St. Julien near Langemarck, on 2 May near Mouse Trap Farm (2.5 miles NE of Ypres) and on 5 May against the British at Hill 60 (4.6 miles S of Ypres). At this stage, defenses against gas were essentially non-existent but the lines were still held primarily by the Canadians.

Releasing chlorine gas from Cylinders during the 2nd Battle of Ypres
(note that the German soldiers have no protection from the gas)

An aerial view of the first German chlorine gas attack during the 2nd Battle of Ypres

While the British initially expressed outrage at Germany's use of poison gas at Ypres, they quickly took steps to develop their own gas warfare capability. 'Special Gas Companies', totaling 1400 men in strength, were raised and given instructions to prepare for a gas attack at Loos in September 1915. Interestingly, the men of the British Special Gas Companies were not allowed to refer to the word 'gas' in their operations, such was the stigma attached to its use. Instead, they referred to their gas canisters as 'accessories'.

From this start, in the end the British army embraced the use of gas to the point that they mounted more gas attacks than any other combatant. This was due partly to the British (and Commonwealth) spending most of the latter years of the war on the offensive. Also, the prevailing winds on the Western Front were most often from the west which meant the British had more favourable conditions for a gas release than the Germans.

September 24, 1915

The British military used chemical weapons for the first time against the Germans at the Battle of Loos. On the evening of 24 September 1915, 400 chlorine-filled cylinders were placed along the British front line. The gas was released by turning a cock on each cylinder, which began the following morning at 5:20 am. A mixture of smoke and chlorine gas was released intermittently over a period of 40 minutes before the infantry assault itself began. Releasing gas from cylinders in this manner meant that the user had to be wary of wind conditions so that the gas would move towards the enemy. However, in parts of the British line the wind shifted and quantities of the smoke and gas were blown back against the British, resulting in more British casualties than German and the failure of the attack. As it happened, all three chief armies - Britain, France and Germany – later suffered similar self-inflicted gas reversals.

December 19, 1915

Six days before Christmas, the Germans first used phosgene on Allied troops. More than 1,000 British soldiers were injured and 120 died.

July 12, 1917

Mustard gas was used for the first time by the Germans, causing more than 2,100 casualties. During the first three weeks of mustard-gas use, Allied casualties equaled the total number of 1916 casualties.

June, 1918

The Allies began using mustard gas against German troops.

October 13–14, 1918

A young Adolf Hitler was temporarily blinded during a gas attack near Ypres. Evacuated to a military hospital in eastern Germany, he spent the rest of the war recuperating. Partly from his experiences with gas during the First World War, he would not allow the use of gas in operations during World War 2.

In point of fact, apart from the major milestones mentioned above, gas became a commonly used weapon as the war progressed, not only during attacks but in everyday harassing operations which resulted in continuing gas casualties. For example, in the 'Final 100 Days', gas was used by both sides on a daily basis.

A wide repertoire of gas formulations were tried throughout the war. Following is a summary of those most widely used, by class and type.

Classes of Gas used in the Great War

Lung irritants – e.g. phosgene – cause irritation and damage to the deeper respiratory passages, and especially to the alveoli of the lungs, with resulting inflammatory exudation of fluid, and the production of acute pulmonary oedema and death by asphyxia.

Nasal irritants – e.g. tear gas - cause sneezing and irritation of the nose and throat, even in very low concentrations, without causing any material effects on the lungs.

Lachrymators – e.g. tear gas - extremely low concentrations exert an intense irritant action on the eyes, and cause so profuse a flow of tears and so much pain that vision becomes impossible. In stronger concentrations they act as lung irritants.

Vesicants – e.g. mustard gas - cause inflammation and blistering of the skin, associated with acute conjunctivitis, and intense inflammation of the respiratory passages.

The Most Common Types of Poison Gases used in the Great War

Benzyl bromide: a German lachrymator used in March 1915.

Bromacetone: powerful lachrymator used by the allies and Austria, moderately persistent, introduced in 1916.

Chlorine: used by both sides; acute respiratory irritant first used in 1915; forms hydrochloric acid on contact with moisture in the lungs inducing vomiting and fatal due to asphyxiation in concentrated doses.

Chloromethyl chloroformate: a respiratory irritant first used in 1915 and delivered by shells.

Chloropicrin: a more concentrated form of chlorine, introduced in 1916.

Cyanogen compounds: immediately fatal if concentrated; only mildly incapacitating when weaker. Causes dizziness, headache and pulmonary pains, leaves no permanent damage. Introduced in 1916 by the allies.

Dibrommethylethylketone: fatal lachrymator if concentrated. Used by Germany and Austria in 1916.

Dichlorethylsulphide (Mustard Gas)**:** introduced in 1917; used by all sides. Causes burning and blisters to skin and temporary blindness. If inhaled causes bronchial pneumonia resulting in death. Delivered by shell.

Diphenychloroarsine: powerful sternutator (nose, eye, respiratory irritant); solid chemical delivered by shells; it dispersed as fine powder, causing vomiting and headaches, introduced in 1917 by the Germans.

Diphenylcyonarsine: a stronger form of diphenychloroarsine, introduced in 1918.

Ethyldichlorasine: a German sternutator similar to diphenychloroarsine, but milder. Used in 1918.

Ethyl iodoacetate: a powerful highly persistent British lachrymator introduced in 1916; its effects ceased on leaving the gas-affected area.

Monobrommethylethylketone: a German/Austrian lachrymator used in 1916, more powerful than bromacetone.

Carbonyl chloride (Phosgene): acute respiratory irritant first used in 1915; especially dangerous due to its delayed action causing sudden death after as long as 48 hours after exposure. Many who died did not know they had been in contact with the gas.

Trichloromethylchloroformate (diphosgene): similar effect as phosgene; first used in 1916 by all sides

Xylyl bromide (tear gas): a powerful German lachrymator first used in 1915.

Germany remained consistently ahead of other gas warfare programs in the development of new war gasses, introducing diphosgene in May 1916 and mustard gas in July 1917.

Estimated production of gases (by type)				
Nation	**Production (metric tons)**			
	Irritant	**Lachrymatory**	**Vesicant**	**Total**
Austria-Hungary	5,080	255	—	5,335
Britain and Commonwealth	23,870	1,010	520	25,400
France	34,540	810	2,040	37,390
Germany	55,880	3,050	10,160	69,090
Italy	4,070	205	—	4,275
Russia	3,550	155	—	3,705
USA	5,590	5	175	5,770
Total	**132,580**	**5,490**	**12,895**	**150,965**

Chlorine became the first killing agent to be employed. The German chemical company, IG Farben, had been producing chlorine as a by-product of their dye manufacturing operations when, with the assistance of Prof. Fritz Haber of the Kaiser Wilhelm Institute for Chemistry in Berlin, it developed methods of discharging chlorine gas against enemy trenches.

However, it proved to be inefficient as a weapon. Producing a visible greenish cloud with strong odour, made it easy to detect. Being water-soluble. covering the mouth and nose with a damp cloth neutralized much of its effect. A suggestion was made by a Canadian officer, a chemist, to saturate the cloth with urine instead of water, the rationale being that ammonia in the urine would more effectively neutralize the chlorine. This proved dangerous when it became known that a combination of ammonia and chlorine will produce toxic fumes. Chlorine also required a high concentration of 1,000 parts per million to be fatal. Still, it was an effective terror weapon and the sight of the oncoming cloud of gas was a continual source of dread.

The deficiencies of chlorine were overcome with the introduction of phosgene by the Germans in late 1915. The firm Badische Aniline & Soda Fabrik produced the largest quantity of phosgene over the course of the war because the company's ready access to carbon monoxide from its ammonia plant facilitated the manufacture of approximately 7200 tons of phosgene per year. Although Germany out-produced the Allies in phosgene production, the French, British, and Americans all made phosgene using a variety of techniques. It was first deployed in artillery shells at Verdun, but was superceded within a year by the chemical diphosgene because diphosgene shells could be assembled in the field rather than in distant factories.

Colourless and having an odor reminiscent of "mouldy hay", phosgene was difficult to detect, making it a more effective weapon. It was often used with a bit of chlorine which helped spread the denser phosgene.

Phosgene was a potent killing agent, deadlier than chorine and was responsible for about 85% of all gas fatalities. Its effects were potent both airborne or by being ingested (it would dissolve in standing pools of water on the battlefield from which soldiers would then drink). Its potential drawback was that the symptoms of exposure often took 24 hours or more to manifest, meaning that victims were initially still capable of putting up a fight. But next day they would be incapacitated by the effects of the gas.

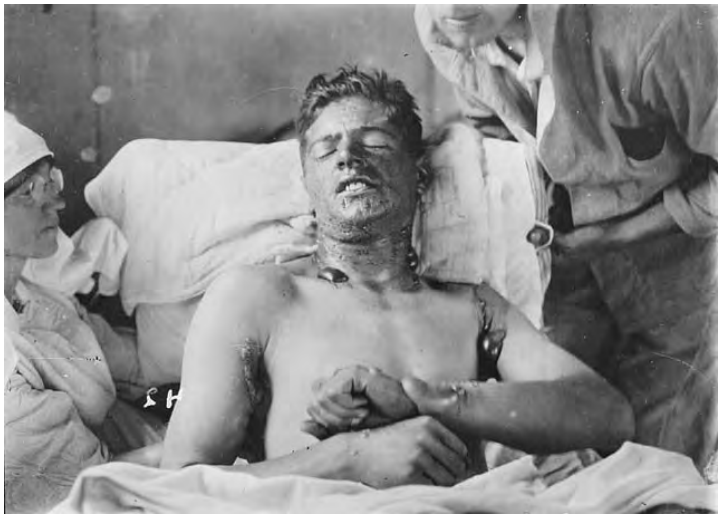
A fatal dose of phosgene eventually led to shallow breathing and retching, pulse up to 120, an ashen face and the discharge of four pints (2 litres) of yellow liquid from the lungs each hour due to drowning spasms. If ingested, it would dissolve the mucus lining of the stomach usually resulting in death.

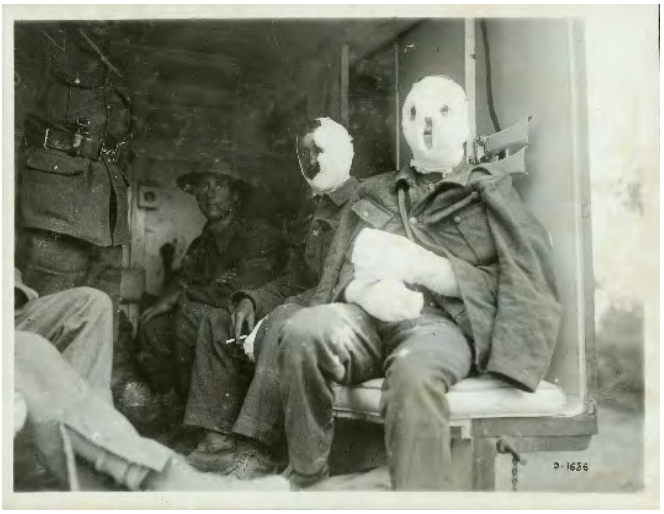
British emplacement after a German phosgene gas attack the previous day

The most widely reported and perhaps, the most effective gas of the First World War was mustard gas (Yperite), a vesicant (blister-causing), which was introduced by Germany in July 1917 just prior to the Battles of Hill 70 and Passchendaele. In its first three weeks of use, there were over 14,000 gas casualties in the British forces alone. Soldiers were told that their respirators would protect them, but this proved false, mainly because the gas was absorbed by the material in the respirators. It was not intended as a killing agent (though in high enough doses it was fatal) but instead was used to harass and disable the enemy and pollute the battlefield. Delivered in artillery shells, mustard gas was heavier than air and settled to the ground as an oily sherry-looking liquid and often took weeks to evaporate. Thus, every shellhole was a potential killing ground. This polluting nature meant that it was not always suitable for supporting an attack as the assaulting infantry would be exposed to the gas as they advanced.

The Canadian Corps first faced mustard gas during the Battle for Hill 70 in August 1917 and suffered hundreds of casualties. In all 1,122 Canadians were gas wounded at Hill 70, almost all from mustard gas. Matters were just as bad at Passchendaele, as the Canadians moved through the corrupted battleground.

Mustard gas burned and blistered any exposed skin, eyes, or other tissue. Victims usually began to vomit. Most were blinded, temporarily or permanently depending on degree of exposure. It caused both internal and external bleeding and attacked the bronchial tubes, stripping off the mucus membrane. All this was extremely painful and most soldiers had to be strapped to their beds while recovering. It usually took a person four or five weeks to die of mustard gas poisoning. Full recovery usually took longer. The medical services particularly struggled with this chemical epidemic because the exposed uniforms of the gassed soldiers had to be cut off early in the medical process. Oxygen was administered to those with ravaged lungs but there was never enough to meet the tide of casualties. Those blinded had their eyes washed out continuously.





Mustard gas casualties

As mentioned, a common fate of those exposed to all gases was blindness. It became a frequent spectacle to see lines of blinded soldiers, hand on the shoulder of the man in front, being guided by a sighted man to a dressing station.

Lastly, it quickly became evident that the men who stayed in their places suffered less than those who ran away, as any movement worsened the effects of the gas. Those who stood up on the fire step suffered less or not at all than than those who lay down or sat at the bottom of a trench, as most gases were denser than air. The worst sufferers were the wounded lying on the ground or on stretchers and the men who moved back with the advancing gas cloud.