

some 2,500 aeroplanes; England, 1,550; Italy some 1,100, the United States 1,947, and Canada very few.

I should like to point out what my object is in giving these figures. To-day the only useful expenditure for the defence of a country is upon the air force. The bombs which we used in the war would weigh from twenty to fifty pounds. To-day the French Goliath aeroplanes carry bombs weighing 500 kilograms, and they have super-bombs weighing from 1,000 to 1,800 kilograms. In addition there is the small incendiary bomb weighing about one kilogram. During the war it is estimated that the enemy poured upon London about three hundred tons of bombs. To-day they could pour that amount on the city in one day.

Having dealt briefly with the great increase in the development of aeroplanes and bombs, I shall speak very briefly on the development of gas. The first gas used in the war was chlorine, which caused some six thousand deaths on its first use. This gas is produced in a cloud which could easily be detected, and in such a way that we could defend ourselves against it. But the next development was a gas that could not be detected. It was a derivative of chlorine, carbon oxychloride, fifteen times stronger than chlorine, which was known to us as phosgene, and against which we developed gas masks as a protection. In addition there was the development of "mustard gas." In addition to those two gases there had been produced for use in war, chloropicrin. It is now ready for use, and if I could do only one thing, make people shudder at the horrors of the next war so that they will do all they can to help prevent future wars it will be time well spent. Another gas, diphenylchlorarsine—three drops will kill—causes oedema of the lungs, dropsy of the lungs, oedema of the spleen, necrotic changes in the vascular walls, particularly in the aorta. It also produces changes in the blood and the haemoglobin becomes methaemoglobin. It is a gas against which our masks would be no protection whatever. The gas will penetrate the mask and cause its removal, making available the use of a more deadly gas with which it may be mixed. One part of this gas combined with ten million parts of air will put a man out of action in one minute. In 1918 this gas was used on a herd of goats and it killed all but four, which were in such agony that they smashed their skulls against a fence. This gas can be used in five-pound generators, six hundred forming a load for a commercial aeroplane. One thousand of these generators

[Mr. Ross.]

can gas an area of sixty kilometres. Two planes could carry forty tons, sufficient to destroy the population of London.

The next is cacodyl isocyanide. One breath of this gas is absolutely fatal to human beings.

The next is lead tetraethyl. It is a bromine. It cost the lives of thirty-eight workmen at the time it was being manufactured in the factory in New Jersey.

There is another gas called diethyl telluride which will penetrate the skin without injuring it. This gas is one hundred times greater in its effects than strychnine.

Then there is a bomb, the electric incendiary bomb, which dropped from an aeroplane will set free a substance known as thermite. It develops a heat up to three thousand degrees, which will pierce through iron, steel and earth to gas mains, which would be set on fire, adding to destruction. Two pounds of this gas in bombs would be sufficient to destroy the whole city of Ottawa. Water has no effect on this substance except to intensify its action.

I think these facts will be interesting to the house and the country. They show the great development that has taken place since the war of 1914-1918. They help to show the great dangers there will be in the next war. The attack will come from the air with bombs carrying these fatal substances I have mentioned, against which we have absolutely no protection. The only defence we have is in our air force. A bombing aeroplane could put a whole nation out if it wanted to, and the only defence in war at the present time is fighting aeroplanes which we are not producing. These aeroplanes will not guarantee to us perfect protection, but they drive the bombing planes to such a height that the certainty of the direction of the bomb is not assured. Further, the bombing plane may be driven away from its objective. In any future war the attack will not be against the men at the front, but upon the industrial areas, the defenceless men, women and children in the areas back of the lines. Aggression will be so speedily carried out that unless protection is afforded, the people will have no way of shielding themselves against invasion. Therefore I believe the house might well agree that the air service represents the most important part of the estimates for the Department of National Defence. I am not asking for an increased expenditure upon air protection, but I do not believe the air defence should be crippled, and when we do vote moneys for defence the country and parliament should know wherein our true defence lies.