

January 13, 1970

Sir Harold Himsworth
13, Hamilton Terrace
London, N.W.8
England

Dear Sir Harold,

I hope you will excuse my delay in replying to your letter of December 8. My statement at the American Academy that massive exposure to CS can kill is based partly on theoretical considerations and partly on unofficial reports from Vietnam. One of these is the statement of Mr. David Neufeld quoted in the Mennonite Central Committee News Service Report which I enclose. I have heard a similar report from a military officer who states that there is a general understanding in Vietnam that deaths are not to be attributed to CS in official reports. I realize that it is possible that products of incomplete combustion of pyrotechnic CS munitions could cause death. However, the symptoms described by Neufeld and also those recounted by Dr. Vannema with whom you are no doubt familiar do not sound to me like carbon monoxide poisoning. Beyond that, the manner in which CS is often employed in Vietnam could easily lead to dosages in excess of those known to be fatal to experimental animals. All of this makes me very skeptical of the implication in the widely quoted statement from the November, 1968 issue of Army Digest that "...there has never been a fatality attributed to CS."

As you certainly know, at this stage of your investigation, CS is a quite reactive substance. It is an alkylating agent. The double bonded benzylidene carbon is highly electron deficient and should attack nitrogen, sulphur and other groups possessing available electrons. I presume it is the alkylating activity of CS which is responsible for its vesicant action seen under certain conditions. The enclosed Edgewood Arsenal Technical Report provides some information on this. The antigenicity of CS also probably results from its alkylating activity. One of the references to this given in the Edgewood report is to British work.

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You ask whether the reports of apparent CS death to which I referred at the American Academy were associated with "aerosol" or "particulate" material. I am afraid I do not have information on that point. An article by Wiegand in the March, 1969 issue of Military Medicine states the mass mean particle diameter of CS from a pyrotechnic grenade to be 2micra. I believe I have read that the diameter of CS1 and CS2 particles as used in Vietnam is very nearly the same. I have tried to recall the reference to this statement but I cannot at present, so you must not regard it as certain.

I enclose a copy of my current bibliography on CS, in case some of the items there may have escaped your notice.

If I learn anything more of possible interest to you, I shall certainly let you know. Conversely, I would greatly appreciate knowing your present assessment of the toxicology of this compound.

Sincerely yours,

Matthew Meselson

MM:ls

- Encl. 1) Mennonite Report
2) EATR 4075
3) Bibliography on CS

Himsworth, Harold

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BW
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16th Jan 1970

Dear Professor Tinsley,

This is just a brief note to acknowledge the safe receipt of your letter and its enclosures and to thank you for these.

I shall be communicating them to my Committee for their meeting of the 5th February. By good fortune Dr. Alje Venema happens to be in this country and he has kindly agreed to come along on the 9th. Also by coincidence the British Council for Social Responsibility in Science is coming on the same date. We should, therefore, be able to make some progress.

I shall probably be getting in touch with you again later but, in the meantime, my best thanks again

Yours sincerely,