To Bay

HARVARD UNIVERSITY
THE BIOLOGICAL LABORATORIES

16 DIVINITY AVENUE
CAMBRIDGE, MASSACHUSETTS 02138

14 March 1980

Colonel Charles Bay
1 Armitage Drive
Dugway, UT 84022

Dear Colonel Bay,

Here is a copy of the article by Robinson and me that will come out in Scientific American next month. I've delayed responding to the comments and advice you generously sent us until the final draft was done. I certainly agree with some of your points and, as you will see, took them into account. I have tried to more than double-check the factual accuracy of everything we have said but I know we will have made some mistakes nevertheless. There is one point you bring up which raises an interesting technical difference between nerve agents and many other toxic chemicals. You pose the question of why accidental releases of even rather large quantities of toxic chemicals such as chlorine have caused relatively few casualties. But there are two big differences between chlorine and, for example, GB in this respect. The first, of course, is the approximately 200-fold greater lethality of GB. Also important for clouds covering large areas is the great difference between the physiological detoxification time for chlorine and that for GB. For chlorine it is quite rapid but for GB it is many hours, at least as long as the travel time required for a large cloud to traverse a fairly distant downwind point. It is, of course, the product of the toxicity ratio and of the detoxification time ratio that matters here and this will be a very large number, perhaps on the order of 10^4. Robinson and I have taken this into account in our calculations. We have checked the results with people who think about these things on a professional basis. Your point about evacuation could in some cases be important but certainly the provision of gas masks to European civilians would be a far more effective measure. Short of that I think we are right to say that wide-spread chemical operations in Europe could cause civilian casualties numbering in the millions.

I too would very much enjoy discussing these matters at length with you if the opportunity arises.

Sincerely yours,

Matthew Meselson

Matthew Meselson
Professor of Biochemistry