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Dear Matt,

This is in response to your letter of 9th November which enclosed rev 2 of the 15th October Sci Am draft and Jim McCullough's comments; to Michael's letter of 20th Nov, enclosing Chuck Bay's comments; and to your telephone call yesterday. *and paper*

Your letter of 9th Nov

- 1) I had indeed seen the Chinese statement at the UN Disarmament Commission (if that's the one you mean). Were the officials you mentioned stressing the importance of the statement as a whole--it had to do with all aspects of disarmament--or just the rather brief bit in it on CW ?
- 2) Chassis-mounted aero-engine devices for various different purposes have been described in the Soviet literature over the years. Krasnaya Zvezda for 5 June 1965, page 6, describes a tracked-chassis device ('MAG') for wide-area dissemination of insecticides. Tekhnika-molodezhi, 1968(5):11, describes the 'TRU-100' fire-fighting equipment as an obsolete jet aero-engine mounted on a ZIL-157 truck chassis, the engine being used to aerosolize water. But I haven't come across a reference to ice-melting applications.
- 3) Heaven knows what was behind that Now! story; am inquiring. A copy is enclosed.

The 15 Oct (rev 2) draft

- 4) Regarding page 5 line 18, will you be asking at the Pentagon when BZ was abandoned ?
- 5) On page 8, 9 lines from bottom, the "woven" should be "nonwoven" -- a typo that has survived several drafts.
- 6) According to published figures I've only just come across, NAIAD is about an order of magnitude more sensitive than the M8 to nerve gases.
- 7) On page 10 line 18 you now have the expression oxime "derivative". Could we have "compound" ?
- 8) I like your rewrite of the middle of page 19. But, regarding lines 17-18, the joint statement from which you are quoting was in fact read to the CD on 31 July; and the 10th round of the bilaterals lasted from July 16 to August 31. Didn't you gather also that there had been further progress after the joint

statement had been issued ? Maybe the sentence should open "By July 1979, at the time of the tenth round of the talks, agreement ..." ?

9) On page 20, lines 6-5 from bottom, the "elimination" may be misleadingly ambiguous, for it could subsume conversion of dedicated plant to peaceful purposes as well as demolition. Only the latter, presumably, could be adequately verified by national technical means.

Jim McCullough's comments

10) Regarding the first of his page 2 comments, your change of "can be" to "is" at line 18 looks fine. As to his other comment, we don't want to suggest that the Congress is not part of the U.S.

11) How quickly a lethal dose of VX is absorbed through the skin depends, I would suppose, on the amount of skin surface that is contaminated; but it will always be slower than uptake via the lungs.

12) I'm not worried by our usage of 'gas mask' and 'respirator' (which anyway can mean something else). And though 'nerve gas' may be loose, 'nerve agent' is spuriously precise.

13) On page 6 towards the bottom we could replace "in both European and Asian forward areas" by "both in Europe and near the Sino-Soviet frontier".

14) On page 8 line 13 we could replace "indefinitely" by "for ~~as~~ long periods".

15) A sentence such as the following could be added to page 21 line 19: "In the meanwhile the danger will continue to grow that additional countries around the world may move to acquire chemical weapons of their own" or some such.

Bay's comments

16) As he says, most of his comments are gut reactions: they don't bear very strongly, it seems to me, on the logic of the article and therefore don't require much in the way of amendment. But, as tips of icebergs heading at us, they need considering rather carefully. So, largely as an aide-memoire to myself but also with regard to your day at the Pentagon, I will set out my reactions to each comment in turn:

17) 1/10: Here he wants us to endorse, at the outset of the article, the idea of like-with-like CW deterrence. As I see it, one of the purposes of our article is to show that it is an idea whose validity can reasonably be questioned. The language you have used in the intro is neutral on this issue, and shouldn't be tampered with.

18) 2/4: What is meant by "substantial" of course emerges later in the draft. Evidently Bay feels that on important criteria the stockpile is not substantial. It would be instructive to know what those criteria are--positioning ? munitions mix ? age? His own article seems to suggest that the US has no retaliatory capability worth talking about. But this may just be an over-selling of binaries on his part.

19) 2/14: It would indeed be interesting to note this. But, as academics, we are hardly in a position to know what the military talk about among themselves.

20) 3/4-6: This comment is no doubt inspired by a belief that the abstention from CW during WW2 is evidence for like-with-like CW deterrence. Maybe it is. But

other explanations for the abstention are also ~~px~~ tenable. Non-assimilation has always seemed to me the best. As for the Laotian allegations--and there doesn't seem to be anywhere in the draft where a reference to them would fit-- is he suggesting that the Vietnamese/PL used CW because they weren't deterred? Presumably not.

21) 3/26: You raised this yourself. No less to the point would be reference to evidence that delayed disorders do not develop.

22) 3/31: But, more important, the prophylactics--P2S pills or the new pyridostigmine ones--apparently are not significantly debilitating.

23) 7/19-21: There are at least two possible explanations for the apparently continuing Soviet CW buildup apart from the one Bay is hinting at: (i) it is much easier to start a programme than stop it; (ii) appearances may be wrong. But we don't really need to go into this. Note that if explanation (i) has any validity, it undercuts the 'bargaining chip' argument which Bay advances in his paper for buying binaries. Or does he really believe that US weapons programmes can be switched on and off at will? In this regard it would be interesting to know more about the political setting in Arkansas for the binary production facility.

24) 7/26-29 & 8/11-15: In these two comments Bay is reacting against the structure of our argument. What we say is this: (i) protection against CW is possible without preventing most normal activities (ii) NATO has enough of this protection to negate the mass-destructiveness of CW (iii) the price of that negating capacity is impediment upon normal activity (iv) which, in the sense of reduced combat efficiency, could be a price worth an adversary's while to exact. Bay seems to want us to start out by emphasising performance degradation. If we were to do that, we would be degrading one of the policy options that follows logically from (iv): that of improving protective equipments and drills so as to cut the price, thereby making chemicals less attractive than ~~xxx~~ competing weapons in Soviet eyes (which is the present British declared-policy stance).

Is the burden of Bay's comments here, then, that this policy option is not a realistic one? If so, his reasons should be probed. Perhaps the criticism which NATO CW people used to make of the US CW posture is still valid: that the US Army was unwilling to take the trouble of inculcating antigas doctrine, procedures, &c, and therefore took to a weapons-emphasis CW policy as an easy way out--despite the likelihood of two-sided chemical warfare immobilizing any future European war into WW1-type meatgrinding.

Maybe our draft doesn't stress the performance-degradation considerations sufficiently. But I don't see what else we can say.

(General Falter's equivalent in our MOD remarked the other day that the bearskins and heavy leather in which British soldiers fought at, say, Waterloo must have been at least as encumbering as present-day NBC protection.)

25) 8/21-22: What has USAEUR done with the 200,000 Mk3 NBC suits it has procured in Britain if it hasn't issued its forces with them?

26) 9/1-5: This passage may now be out of date. I am told that the Soviets have now actually introduced an air-permeable NBC suit (called 'OZKZ'), as well as a new, more comfortable respirator of the canister-attached type. But I'm not sure how reliable that information is.

27) 10/32: An earlier draft had the "fuller explanation" Bay wants, but we cut it out to preserve overall balance. Is he getting at anything in particular?

28) 11/1st para: If we do want to address "the tremendous logistical burden", we could do so at page 12 line 1 by adding a couple of sentences. But is it not self-evident?

- 29) 11/24: I'd be happy to replace "surging" by "moving".
- 30) 12/1st para: Has Bay any figures which would describe the Soviet horizontal NBC manning to compare with our implicit ca 100,000 for US forces ?
- 31) 13/29: Is Bay deliberately missing our point here (that the availability of competitive weapons will act to reduce both Soviet incentives to resort to CW and the military sense of retaliating in kind)?
- 32) 14/8-11: A comment we can rightly ignore.
- 33) 14-15/linking para: Maybe we should stress our point still more. Environmental transport and persistence of CW agents inevitably means that collateral-damage probability from CW will inevitably exceed that of conventional weapons, other things being equal. We could say that this puts CW into the same category as TNW.
- The underlying assumptions are those of the downwind-hazard illustration which, as far as I'm concerned, Bay is welcome to see. It would be interesting to know what his underlying assumptions are in thinking that what we say "appears very unrealistic".
- 34) 16/1: It's interesting the way Bay distances himself here from the draftsmen of FM 100-5.
- 35) 17/1st para: In his eagerness to attack our counterarguments, Bay has evidently not read this paragraph very carefully. Contrary to what his comment suggests, the arguments presented are not in support of NATO having no retaliatory capability at all. Indeed, the sentence spanning pages 16 and 17 explicitly admits possible war-fighting value for a NATO CW retaliatory capability. Rather, the arguments are directed against like-with-like CW deterrence. The reasoning is that if the existence of a retaliatory capability is to deter CW, the retaliation which it threatens must (because of deployed, alerted protection) be escalatory, in which case the capability may either be otiose or provocative. These are not arguments for unilateral CW disarmament: they are arguments against expanding what we have.
- I'm not sure that's the way we planned it originally, but I'm happy with it. If we wanted to make a case for unilateral CW disarmament, we would have to move onto a different plane of analysis: one in which longer-term considerations such as assimilation and proliferation could be taken into account as well as the shorter-term military-cum-strategic considerations. But our article isn't the best place for this.
- 36) 18/3: The basis for the "billions of dollars" is the SRI study and the estimate given by (?)Herrington during the American Academy meeting. Costs of demilitarization included.
- 37) 18/6-9: Is this comment inspired by a genuine concern that, without binary production, obsolescence and deterioration will impose de facto unilateral disarmament ? If so, and if his concern is justified, we ought to be responsive. I have tended to assume that Army spokesmen have exaggerated the deficiencies of the stocks in Germany. Is there any way in which we can probe this without getting into classified domains ? There were GAO studies a couple of years back which apparently went into it all: are they still secret ? The unclassified abstract that was released certainly suggested that the Army had been exaggerating. And what of all the money now being spent on rehabilitating unserviceable chemical munitions ?
- 38) 18/last para: By taking exception to "greatly improved", Bay is suggesting that the current billion-dollar CW defence upgrade programme will not provide a great improvement over the pre-1974 posture. Is he then suggesting that no

amount of money and effort can significantly improve protection ?

I wouldn't object to dropping the "sharply".

39) 19/5-11: Bay seems to be saying here that unless NATO has a capability for putting the Russians into rubber suits, its overall defence strategy will surely fail. No wonder the Cml C is unpopular.

40) 20/23-26: we ought to find out why Bay is so disparaging of the efficacy of antichemical defence. And why, moreover, there appears to be such a difference between US and British military opinion on this (or is it that I only get to talk with the wrong people?).

41) 21/1st para: What Bay has in his own paper on precedent-setting was about the only part of it I could agree with. But do we really owe a discussion of it to our readers ? As to his second point here, an agreement would surely be acceptable only if the associated risks were acceptable. Is he trying to put us out onto a limb ?

42) Downwind hazard illustration: As I say, he's welcome to a copy of my workings for this (as amended). If he is suggesting that sarin bombs have not yet been qualified for Phantoms, why are MC-1s listed in the F-4C flight manual ? Was DTC Test 69-14--which were MC-1/F4 trials, noted in the CB Obligations Report to Congress for 2HPY73--a failure ?

43) I started to write up a detailed critique of Bay's paper but it took too much time. Would there be any point, do you think ?

44) It's a bit much, I must say, for him to profess in his letter to you a sensitivity to hyperbole and the use of 'scare' words while at the same time launching that piece of ~~defamatory~~ defamatory invective (pp.26-28) against the likes of me. What did I do to upset him so ? We got on very well together at first.

45) The only bit of his paper I feel might benefit our article is the first sentence of the 68th footnote (p.49), on nonproduction verification: "In the opinion of experts, there are ways of assuring that single-purpose chemical agents are not being manufactured". I take it he means something other than tamper-proof seals: presumably, in view of the context, some sort of national technical means. Do you know what he is referring to ? And would it really be applicable to nonsupertoxic single-purpose chemicals, such as the binary reactants DF and QL ?

#### Your telephone call

46) The basis for my sentence about near-zero degradation of aircraft-turnaround performance is the enclosed article by "John Marriott" (pseud.) in NATO's Fifteen Nations (22(3):51- , 1977) at page 64, as amplified in an off-the-record conversation with a well-informed official. As you will see, this is an optimistic sort of article as regards the feasibility of antichemical protection. Maybe Bay would say that its author was selling a British bill of goods.

47) As for other material on the efficacy of protection, I haven't much. Most of my own impressions come from private conversations with CDE Porton people, who very rarely venture into print on such sensitive matters. One pertinent exception is enclosed: a short history of CDE put out to mark its 60th anniversary: note the last paragraph. Also enclosed is another article by Dodd. Plus a recent press item and the original copy from which New Scientist took it.

48) A copy of the last Pugwash CW Workshop report is enclosed. The next Workshop is scheduled for East Germany next Spring, to include a site-visit to a pesticide factory. The East Germans suddenly called it all off in August, but have now changed their minds again.

49) As to questions you might ask on December 10th, several possibilities arise out of some of the things I've written above. Others:

- a. How do Europeans feel now about taking in binaries ?
- b. What has come out of the LEACHE (long-term effects of antiChEs) project at Edgewood, referred to in an Obligations Report a few years ago ?
- c. Is CAMDS on stream yet at Tooele ?
- d. What does the TAB-followon antidote consist of, and how good is it against soman ?
- e. Is West German policy on CW still as set out in the 1970 White Paper ?
- f. What of the French chemical-weapons capability ?
- g. How confident are they in the new binary 155 round, now standardized without full testing ?
- h. Why do they think the Soviets have soman ? (Tabun poisoning is also refractory to pralidoxime; pinacolyl alcohol is not easy to make; &c)
- i. Is EA 5365--the principal candidate for the Intermediate Volatility Agent binary munition now in development--really a member of a new class of OP antiChE ?
- j. What is the logic behind the Highly Persistent Agent programme referred to in the latest Arms Control Impact Statement on CW ?

I expect I'll think of some more.

50) Meanwhile I await Geo Berdes' comments with some trepidation.

As ever,

*Julian*

J P Perry Robinson

encs.