

OFFICE OF THE SECRETARY OF DEFENSE 4

28 Jan 1963MEMO FOR Dr Johnson

Attached are Mr Strofer's comments. He offered to discuss them with me while they were in draft form. I told him that although I would be pleased to assist, I would prefer that you have the benefit of his unmodified views.

I am taking his comments in consideration in preparing a proposed reply. I plan on having the proposed reply available on 29 Jan.

Very respectfully,
C. M. Davenport, Jr.

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*File Ecological Study
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DEPARTMENT OF DEFENSE
OFFICE OF CIVIL DEFENSE
WASHINGTON 25, D. C.

24 JAN 1963

MEMORANDUM FOR DR. GERALD W. JOHNSON

SUBJECT: Review of Hollister Study (U)

A brief review has been made in this office of the draft report "The Biological and Environmental Consequences of Nuclear Attacks Using "Clean" Weapons" as you requested. Our general reaction is that the study is quite superficial and unnecessarily vague. In this respect, the paper adds very little to the DODDAC study of October 1962, which covers the immediate and short-term fatalities and casualties among people and livestock as well as providing the quantitative input to the study in question.

Although it is well-recognized that there is a great deal yet to be learned about the biological and ecological effects of nuclear radiation exposures, it seems that the analysis could have treated these matters more quantitatively than has been done. Furthermore, the report seems to avoid commenting on the significance of such results as are arrived at. I am somewhat at a loss as to why this should be the case since a considerable part of our knowledge in these areas was developed in the AEC.

To be more specific in commenting on the aforementioned weaknesses, we have keyed the following comments to the conclusions of the study:

(a) The first six conclusions are restatements of the results of the DODDAC work and do not pertain directly to the presumed objective of this report. On the other hand, the scope of the present study is not clearly defined in the text and the intended objective must be inferred from the topics treated, of which there appear to be two: (1) exposure dose from internal emitters; (2) the effects of ionizing radiation on terrestrial ecosystems.

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(b) The seventh conclusion states that survivors of clean-weapon attacks survive with a lower lifetime gamma exposure dose -- "a factor relevant to the subsequent state of their health." The statement is derived from the DODDAC results. It must refer to the potential decreased incidence of late somatic effects (leukemia, life-shortening, etc.) and genetic effects. Yet these biological effects are not discussed in the report and no indication is given of the potential significance of the difference in exposures. Quantitatively the difference in average dose is a factor of about 3, or for the most severe attacks, about 200 R for the clean weapon as against, about 600R for the normal weapon. The unanswered question is what is the likely significance of the difference in terms of the outcome for the survivors and their descendants?

(c) Conclusion 8 restates the generality that clean weapons will expose plant life to lower doses than normal weapons. As an example, it is stated that crop damage may be lessened by clean attacks. However, there is no analysis in the text to back this statement, the only quantitative information (Table IX) referring to pine trees. Even these data are not related to the attacks studied so that the reader is not able to judge how pine forests would have fared.

(d) Conclusions 9 through 11 apparently refer to the question of the uptake of internal emitters but only in general terms. The implications in terms of the "fate of agriculture" are not drawn. The text is somewhat more quantitative, indicating that internal exposures from clean weapons would be about 4 percent of those from normal weapons. But Table VII shows that the estimated total dose from Strontium and Cesium for normal weapons is at most 30 to 130 rads. This suggests that the problem is not significant for either weapon type. Conclusion 13 bears somewhat on this question by proposing that if the population had better shelters, the internal emitter dose might become relatively more important, but the absolute significance is not estimated.

(e) The 12th Conclusion deals with the thyroid exposure to I-131. The estimates do not represent the state of the art because, as pointed out, the upper part of the stated range is unlikely because the milk cows will not survive. Both Carl Miller and George LeRoy have made calculations that account for this fact. Their results give an upper limit of several thousand rads, well below the ablative doses for either children or adults. The whole problem is somewhat overplayed because this sort of damage could so easily be prevented by blocking the thyroid with stable iodine.

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(f) The last conclusion lends some support to the position that radiological effects from normal weapons are not a significant limit on the pursuit of agriculture and then seems to present an apology for failing to be more definite. It is of some interest, for example, that the Subcommittee on Postattack Ecology of the NAS Advisory Committee on Civil Defense is of the opinion that the ecological effects attributable to fires would be much greater than those attributable to nuclear radiation. The fire problem is invariant in the matter of clean versus normal weapons.

In summary, it would appear that the draft report is unnecessarily reluctant to do the necessary calculations, perform the essential comparisons, and make reasonable estimates of significance. As I mentioned to you in a recent conversation, we hope to do a more definitive job in this area shortly that may give you some additional information.

Walmer E. Strope

Walmer E. Strope

Director for Research

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