Crone

DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR BIOLOGY
HARVARD UNIVERSITY

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September 12, 1983

Dr. Hugh D. Crone, Head
Personnel Protection Group
Department of Defence
Materials Research Laboratories
Cordite Avenue
Maribyrnong, Victoria
P.O. Box 50
Ascot Vale, VIC 3032

Dear Dr. Crone:

Thank you for your kindness in letting me know your reaction to the bee excrement hypothesis in your letter of 21 June. A Princeton graduate student working in India has been sending us authentic feces of Apis cerana and in the future will send some dorsata and florea as well. We want to compare these, with respect to a number of characteristics, to yellow spots on leaves from sites of alleged yellow rain attack. We have some samples of yellow rain on leaves provided by G. Neish at Agriculture Canada. These come from an attack said to have occurred in April 1982 in Laos. Aside from the simple measurements of size distribution we plan to compare bee feces with yellow rain in respect to (1) uric acid content, (2) frequency of bee hairs, (3) differences in pollen composition from spot to spot from spots from the same alleged attack or, in the case of authentic feces, from the same small area. It is our impression, not yet confirmed, that at least in some collections adjacent spots of bee feces can have different pollen compositions. It is my understanding, also yet to be confirmed, that even within the same nest the pollen diet of two bees can be quite different, as a result of heterogeneous collections of pollen being stored within the nest. If the yellow rain spots are a cw agent, one would expect that adjacent spots would have essentially identical mixtures of pollen types. Even knowing what we already know and looking at spots of yellow rain on leaves side by side with cerana feces from India it seems to me almost ludicrous to think that yellow rain spots could be anything but bee feces. Still, some friends who I respect in the US Government seem unconvinced, although open-minded. I hope you

are continuing to do additional tests as well so that this point can be put to rest. The question of whether trichothecene warfare is going on at all is more difficult. You will see in the enclosed draft letter to Science that I am skeptical of that too.

Why do Hmong tribespeople so often and so uniformly give Westerners bee feces (or spots indistinguishable from bee feces) without realizing what they actually are (or at least very closely resemble). Either they are not familiar with this aspect of their natural environment or they are pulling our leg. This gets us back to your initial conclusions about the possibility that the samples are, in a sense, fakes.

I enclose some items which may be of interest. Please show this letter and the enclosures to Shirley and give her my best regards.

I would greatly appreciate knowing your current thoughts on all this. Also if it would be possible for you to send me some yellow rain spots on leaves I would like to take a look at them. They could be sent without special arrangements through the regular mail if marked 'dried botanical specimens for scientific study - no commercial value' and shipped with some naphthalene crystals. If there is anything I can do that may be of use to you please let me know.

Sincerely,

Matthew Meselson
Professor of Biochemistry

MM/db

Enclosures

Crane

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Professor Matthew Meselson
Department of Biochemistry and
Molecular Biology
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Dear Matthew,

Your Scientific American article certainly leaves no loopholes for doubt, and the matter is settled; or the yellow spots matter is. The chemical warfare allegations are obviously a completely separate issue, and whether there was any seed of truth in the allegations is something we may never know.

Looking back, I kick myself for missing the obvious. Initially I believed the yellow spots must be man-made, as they were so regular. The possibility of insect droppings did not suggest itself to me, but now I see yellow faeces everywhere. We were fortunate we had a good consultant to do the morphological typing of the pollen. My attempt to use the presence of uric acid as a marker of insect origin did not work too well, and your use of a protein dye was a better approach.

On another topic, our Royal Commission on the effects of chemicals on Vietnam veterans has just reported, as you are no doubt aware. They have failed to find any chemically-induced problems in veterans, and are outspokenly critical about the pseudoscience that has supported some claims. There is no doubt that the Agent Orange - veterans' health connection is non-existent, excepting any specific future problems in very heavily exposed groups. On the separate issues of ecological and human health problems in Vietnam we have less information, but what is available suggests that ecological damage may be the one major consequence of Agent Orange usage. As an early critic of the herbicide usage, you may have different views.

Finally, I would be glad of any comments you may have on the draft chapter (enclosed) from the book I have written as a private venture. It is to be published by Cambridge University Press and the m/s has just been deli vered to them. I can incorporate minor amendments to the text, but any comments would be welcome; the book might survive to another edition. Do not show the text around too widely at the moment, in case anyone is tempted to plagiarize it.

There is nothing particularly confidential about any of the above comments, but they are my personal ones, not necessarily the Department's.

Yours sincerely,

Hugh

(HUGH CRONE)

Encs.

WE. Crone

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Telephone 319 4499 Our Reference: 64/9/36 Date: 4 January 1984

Prof. Matthew Meselson
Dept. of Biochemistry and Molecular
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CAMBRIDGE. MA. 02138. USA.

Dear Matthew,

I believe your draft manuscript cites our findings satisfactorily. However, I would point out that the pollen typing was done for us under contract, but we have not released the name of the investigator in order to protect him from the media. In fairness to him, therefore, I would like the wording on p. 7 to be not "Crone cited; Crone also recorded, etc" but "The report cited; These were also recorded, etc". Perhaps you could adjust the text so that it does not read as if I personally did the examinations of pollen type.

The three samples typed were one from leaves (Pack 1) and two from Ma Fuang (Pack 4). The latter were subdivided on the basis of superficial visual and SEM examination. In fact I now believe these samples did not really differ. Therefore there was one sample from leaves in good condition, and two samples from the one specimen from Ma Fuang, which was in poor condition. In other words, two samples, one containing *Harpullia*-like grains and the other resembling *Rapanea*.

As a general comment on your draft, I found that discussion and background comment were rather mixed with experimental work and results. For instance, the paragraph on the Chinese report (pp 2-3) seems to be in the middle of the descriptions of your actual work. A division between discussion and technical matter might help to improve clarity.

In the legend to Fig. 1, the reference to "f" under "f" presumably should be a reference to "e".

Finally, what puzzles me is your, and everyone else's, sole concentration on bees. I have seen a yellow droplet of pollen suspension fall from what looked very much like a hoverfly. Hoverflies (Syrphidae) are known flower-feeders, as are many other Diptera. Also, what about Lepidoptera? Insects that are purposefully taking nectar may also take pollen grains into the gut accidentally. Have any of your entomological colleagues at Harvard examined in detail the feeding habits of hoverflies?

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Shirley sends her greetings, and we wish you a happy new year.

Yours sincerely,

(H.D. CRONE)
Head, Personnel Protection Group