Rosen

D R A F T

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Sir:

In his letter about Yellow Rain, Chem. Br., Joseph Rosen accuses me of "...an absolute misrepresentation of the facts.." - in stating that he was criticized by chemists at a 1983 meeting in Cambridge, Massachusetts, for not performing a prior glassware blank in the same glassware he used to analyse a sample of yellow rain. Rosen says the criticism can't have happened because it isn't on the tape recording of the meeting. Rosen fails to say that the chemists working group meeting at that conference, and hence the criticism, was not recorded on the tape. I have checked my memory with those present. Why didn't Rosen?

Sir-

There are three critical omissions in the argument that yellow rain is a chemical warfare agent, presented by Rosen, Cohen, Mirocha and Schiefer in "Yellow rain and the bee faeces theory".[1]

First, Rosen *et al.* ignore the descriptions of the agent by its alleged victims, Hmong tribespeople who have come out of Laos. Hmong accounts of alleged attacks from 1978 through mid-1983 almost invariably describe the color of the suspected agent when seen on the ground as yellow. It is often said to have fallen like rain to form wet deposits which dry to a yellow crust or powder.[2-4] This is also what we observed at two sites in Thailand while studying honeybee defaecation in March, 1983.[5,6] Such mass defaecation flights of the giant asian honeybee *Apis dorsata* were previously unknown to bee scientists, perhaps because the flights are generally too high to be noticed, even though hundreds of thousands of bees may be involved. Most of the Hmong to whom we showed bee faeces on leaves failed to identify them and some said they were "kemi", a Hmong term for the alleged chemical warfare agent.

Second, Rosen *et al.* ignore the consistency with which pollen has been found in samples of the alleged agent. Since 1979, numerous samples have been turned in by the Hmong and examined by U.S. and other investigators. In November 1982, the head of the U.S. Army chemical analytical group studying the

samples stated that "Most of the samples that are of yellow rain are fairly dry and they have a high level of pollen grains in them...".[7] At the same time, the chief State Department intelligence officer studying yellow rain stated that "It contains pollen, and not windborne pollen, but pollen that would be commercially collected or is collected, if you will, by insects...".[4] To the best of our knowledge, all samples of yellow spots and powders from sites of alleged attack examined under the microscope are seen to consist largely of pollen. This is also true of honeybee faeces. Moreover, detailed taxonomic analysis of the pollen in samples of the alleged agent collected by Hmong in April 1981 and in March 1982 strongly supports the identification of yellow rain as the faeces of southeast Asian honeybees.[8]

We conclude that the yellow showers, spots and powders alleged at least since 1978 to be an agent of chemical warfare are most probably the faeces of local honeybees.

Third, Rosen et al. omit information particularly critical to their principal argument. They contend that yellow rain cannot be honeybee faeces because trichothecene mycotoxins such as they report finding in several samples from alleged attack sites are unlikely to occur naturally in such materials. Mirocha has reported the analysis of six environmental samples from alleged attack sites in southeast Asia[9]; Rosen has reported the analysis of one other such sample[10]. They report finding trichothecenes (0.089 to 143 ppm) in all six. As evidence that the reported toxins were not of natural origin, Rosen et al. cite

the failure of the U.S. Army Chemical Systems Laboratory to detect any trichothecenes in samples from Southeast Asia. From what we know of the methodology and performance of the Army laboratory in analysing for these compounds, we agree that its work provides substantial direct evidence that they are not frequent components in the types of samples tested. But what Rosen et al. omitted to say is that more than 60 of the samples analysed for trichothecenes by the Army are from alleged or suspected attack sites. It is the finding of pollen, not trichothecenes, which is the consistent and confirmed finding in samples of yellow rain. In October, 1983 one of us (M.M.) wrote to Rosen and Mirocha asking, inter alia, "Why does (the Army) find no positives out of ca. samples while Mirocha plus Rosen find six out of six positive...?" No answer was received. It seems unlikely that native witnesses reliably identified attack sites in collecting the Mirocha and Rosen samples but were uniformly unreliable in doing so for the Army samples. A serious possibility raised by this lack of independent confirmation of the analyses is that trichothecenes were not present in the Rosen and Mirocha samples when they were collected in the field. In that case, arguments about the natural occurence of these compounds would be irrelevant.

There remain important unresolved aspects of the yellow rain phenomenon. Relevant studies done in several countries, particularly in certain government laboratories, have not been reported. It is to be hoped that responsible officials will make every

reasonable effort to move further investigation of the problem into the normal channels of scientific discourse.

745 words

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