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Sir -

In "Yellow rain and the bee faeces theory"[1], Rosen et al. fail to substantiate their contention that environmental samples from southeast Asia provide evidence of chemical warfare. They base their argument on reports by Mirocha and Rosen of finding trichothecene mycotoxins in six samples obtained from alleged chemical attack sites[2,3]. In arguing that the toxins they reported were not of natural origin, Rosen et al. astonishingly cite the fact that the U.S. Army Chemical Systems Laboratory has found no trichothecenes in samples from southeast Asia. This incorrectly implies that the Army's samples were controls. In fact, at least 60 of the Army's samples, like those of Mirocha and Rosen, were from alleged chemical attack sites. As far as we know, the Army laboratory has not found trichothecenes in any sample from such sites. Mirocha and Rosen have known of this since at least October 1983, when one of us (MM) wrote to them asking "Why does the Army find no positives out of 60 samples while Mirocha plus Rosen find six out of six positive?" The evidence for trichothecenes at sites of alleged chemical

warfare is inconclusive at best: 6 positives out of 6 samples versus 60 negatives out of 60 samples.

Rosen et al. ignore the fact that it is pollen, not trichothecenes, which is the consistent and confirmed finding in samples of yellow rain, the alleged chemical warfare agent. Since 1979, many samples have been turned in by Hmong refugees from Laos, and then examined by U.S. and other investigators. In November 1982, the head of the U.S. Army Laboratory cited above stated - "Most of the samples that are of yellow rain are fairly dry and they have a high level of pollen grains in them"[4]. Indeed, to our knowledge, all samples of yellow spots and powders from sites of alleged chemical attack that have been examined under the microscope, including those analysed by Mirocha and Rosen, consist largely of pollen. This is also true of honeybee faeces. Moreover, our analysis of the pollen types in samples of the alleged agent collected by Hmong in April 1981 and in March 1982, and comparison with pollen gathered by local honeybees strongly support the identification of yellow rain as the faeces of southeast Asian honeybees[5].

Rosen et al. also ignore descriptions of the alleged agent by Hmong refugees. Summarizing interviews with Hmong for the period 1978-1982, the official reports of Secretaries of State Alexander Haig and George Shultz state that the alleged agent is yellow and falls like rain[6,7]. This resembles the mass defaecation flights of the giant Asian honeybee Apis dorsata which two

of us (M.M. and T.D.S.) observed in Thailand in March 1984[8]. Although now realized to be common, such flights were previously unknown to bee scientists, perhaps because the flights are too high to be noticed, even though hundreds of thousands of bees may be involved. Further, nearly all the Hmong to whom we showed bee faeces on leaves failed to identify them. Some said they were "kemi", a Hmong term for the alleged chemical warfare agent.

Thus, our conclusion that yellow rain is probably the faeces of honeybees and not a chemical warfare agent is supported by Hmong accounts of its appearance, by pollen analysis, and by observations of honeybee behavior in southeast Asia.

Relevant studies of the yellow rain phenomenon done in several countries, particularly in government laboratories, have still to be made public. It is to be hoped that the responsible officials will make every reasonable effort to move further investigation of this problem into the normal channels of scientific communication.