WALL STREET JOURNAL
6 September 1985

The 'Bee Feces' Theory Undone

By William Kucewicz

Harvard biochemist Matthew Meselson now admits that his original "bee feces" theory of Southeast Asian yellow-rain deaths—that deadly toxins were not biochemical weapons but natural contaminants of feces—"is not very attractive anymore." But you wouldn't know it from an article he and four colleagues have published in Scientific American this month.

In that piece, Meselson & Co. repeat at length their view that yellow rain is "a phenomenon of nature, not of man." They do not, however, report what Prof. Meselson acknowledged in a telephone interview last week: that samples of bee feces he and a colleague brought back from a celebrated expedition to a Thailand jungle last year show no traces of the mycotoxins that are widely believed to have killed thousands of people in war-torn areas on the frontier of the Soviet empire.

It had been Mr. Meselson's hypothesis, first laid out at a meeting of scientists in Detroit in 1983, that the deadly tricothecene mycotoxins discovered by other scientists in the bodies of Southeast Asians were a naturally occurring phemonenon of the region. Bee excrement and foodstuffs, this theory held, hosted the growth of the organisms. The U.S. government has maintained, on the other hand, that yellow rain is a Soviet-supplied toxin used in Laos, Cambodia and Afghanistan in violation of the 1972 Biological Weapons Convention.

No Mention of Results

Profs. Meselson and Thomas Seeley of Yale got to test their hypothesis in Thailand with the help of a $256,000 "genius" award to Mr. Meselson from the MacArthur Foundation (though the areas they visited were not ones ever associated with a chemical attack). The two academics returned in March 1984 to say they had been "crapped on" by Asian honeybees. "We were caught in one of these yellow rain showers," they said. "It lasted about five minutes and deposited approximately 200 spots per square meter." The scientists collected samples of the bee droppings, along with foodstuffs from Thailand, "for chemical analysis to test the possibility that mycotoxins reported in environmental samples and the blood of refugees occur naturally in Southeast Asia." They concluded their joint statement, saying: "A detailed scientific report of our findings will be published."

Their article in Scientific American, however, includes no mention of the results of those chemical tests.

"They were all negative," Mr. Meselson responded in the interview. He said that he had sent 13 twin samples of food and feces from Thailand to two laboratories in Canada and Britain. (Mr. Meselson is not expert at conducting such tests himself.) The chemists didn't find any of the trichothecene mycotoxins previously identified in yellow rain.

There wasn't room to include these negative results in the article, Mr. Meselson explained. He said that the editors at Scientific American had set strict length limitations and "lots" of data had to be left out.

Mr. Meselson said that he now generally accepts the work of Canadian toxicologist Bruno Schiefer showing that trichothecene mycotoxins don't occur naturally in Southeast Asia—at least not to any significant extent that might cause a health problem. That means the Harvard scientist, whose theories have become the watchword of Western doubters and Soviet propagandists who challenge the U.S. government's position, must now square his own stance. If yellow rain poisons aren't springing up on their own, and if refugees indeed are suffering and dying from them, who's the perpetrator? For scientists who've cautioned against accusing the Soviets over the matter, it's a dilemma—and one that the critical omission in Scientific American would allow them to skirt.

Mr. Meselson's out, in the interview, was to suggest that perhaps there were no toxins to begin with. This takes the whole debate back two years, reopening issues that were seen as settled at the time Mr. Meselson first suggested that the toxins were natural products. A 1983 essay by Lewis Thomas in Discover magazine, for example, calls for more exploration of the natural-occurrence thesis in the following words:

"There is no question in anyone's mind about the existence of mycotoxins produced by the Fusarium fungus in the samples taken from the leaves and rocks in places where yellow rain attacks are said to have occurred. Nor is there any doubt about the reports by Chester Mirocha, an acknowledged specialist in mycotoxins at the University of Minnesota, that high levels of trichothecene toxins (and their metabolic derivatives) were present in the blood and tissues of patients from the same areas. What remains in question is whether this fungus species has always existed in nature in Southeast Asia, and whether its toxin might be present in the kinds of plant foods consumed by people during seasons of near starvation."

The only thing left to dispute, in short, was the hypothesis Mr. Meselson has now abandoned after negative results with his own samples, and in the face of the work by Mr. Schiefer. The Canadian's latest findings show that the unnatural combination of three different mycotoxins found in the yellow rain samples collected by the U.S. government and ABC News is a "superb" killer—much more potent than the toxins individually or in other combinations, a cocktail put together by someone who knew what he was doing.

Mr. Meselson, it would seem, can support reopening the old inquiry only by directly challenging the findings of Minnesota's Prof. Mirocha and Joseph Rosen of Rutgers. Does he think their laboratory work in error? "I'm not saying that," he replied.

Prof. Meselson did find it telling that a U.S. Army laboratory at Aberdeen, Md., failed to find the toxins in yellow rain samples that previously tested positive by Mr. Mirocha. While Mr. Meselson uses the Aberdeen negative test results as a foil, he fails to mention that that same Army laboratory did find the toxins on two Soviet gas masks retrieved from Afghanistan in 1982.

Profs. Mirocha and Rosen, meanwhile, stand by their work. In subsequent tests on toxin-infected corn, for instance, they have never turned up any "false positives," which would have indicated that their techniques were faulty. Besides, they both noted, the U.S. Army's laboratory had great difficulty setting up its own testing procedure and delayed a year and more the analyses of many yellow rain samples; during that time, the toxins could have been consumed by bacteria in the samples or otherwise deteriorated. Even Mr. Meselson admitted that that's possible.

So what are we left with? Mr. Meselson has found bee feces, and the U.S. government has found dead bodies. Indeed, detailed medical data about a yellow rain casualty appeared in the April 1985 issue of the peer-review Journal of Forensic Science. The authors are Charles J. Stahl, the former chief pathologist for the U.S. military and now a professor at East Tennessee State University; James B. Farnum, another East Tennessee pathologist; and Christopher C. Green, formerly the Central Intelligence Agency's yellow rain expert, who holds an M.D. degree. These medical experts concluded that the yellow rain victim died from a chemical warfare agent and not from any natural infection.

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As they explain for the first time, an encampment of Khmer Rouge guerrillas at Tuol Chrey in Cambodia, near the Thai border, was hit by an artillery bombardment from Vietnamese forces on Feb. 13, 1982. Three shells exploded upwind of the camp, and the soldiers smelled a sweet, perfumelike odor and experienced the rapid onset of incapacitation. There were at least 100 casualties. They suffered from tearing of the eyes, blurred vision, bitter taste, nasal obstruction, vomiting, rapid heartbeat, muscle tremors, and, in some cases, collapse or paralysis.

One of the victims, taken to a hospital, soon showed signs of recovery and was released. It was known that he had been a victim of an earlier yellow rain attack the previous September. On March 11, 1982, he was again admitted to a field hospital after his condition worsened. Five days later, he died after vomiting and urinating blood—typical signs of trichothecene poisoning. An autopsy was performed, and tissue samples were sent to the U.S.

Both Profs. Mirocha and Rosen found traces of the mycotoxins in the samples. Pathologic examinations of the tissues showed severe damage to the heart, lungs, kidneys, stomach and liver. The victim died from "acute pulmonary edema." All of these symptoms are associated with trichothecene poisoning. The "pattern of injury," said the pathologists, "suggests the direct effects of toxic agents, as well as the possibility of hypersensitivity reaction related to the previous chemical exposure on 19 Sept. 1981."

The Corpses Remain

Meanwhile, the Soviet Union has had a field day with the bee-feces conjecture. The Russians have used this theory in their disinformation campaign to cover up their chemical-warfare crimes in Southeast Asia and Afghanistan. Most recently, Joseph Adamov, a Radio Moscow "commentator" who speaks English with a Brooklyn-like accent, told an American television audience on CBS's "Face the Nation": "There is a fantastic anti-Soviet campaign on in the United States today, including the so-called spy dust, which is completely absurd, just like that yellow rain was, that turned out to be the excrement of bees."

Nicholas Wade of the New York Times shares the same sentiments. In a recent editorial-page article, he wrote: "Yellow rain is bee excrement, a fact so preposterous and so embarrassing that even now the Administration cannot bring itself to accept it." He called the U.S. government's evidence "a speck of dubious data."

What remain, of course, are the corpses and refugee reports.

Rep. Jim Leach (R., Iowa) was at the scientific meeting in 1983 when Messrs. Meselson and Seeley first announced their bee-feces hypothesis. Mr. Leach's response was direct: "We have the bodies, we have the witnesses. When you listen to a father describing his son dying in his arms from a yellow and white rain falling from the skies, you are not one to disbelieve."

Mr. Kucewicz is a member of the Journal's editorial board.