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majority of these nonprofits clearly qualify for exemption because they are religious or charitable under any reading of the Constitution. And most tax-exempt educational institutions, being clearly instructional, also qualify without question. That leaves about \$225 million worth of property

Park Avenue is a venerable but obvious example). But they are judgments that should be made, with the nonprofits getting the benefit of a doubt. The dollars actually involved in these decisions are insubstantial. But as the committee suggests, they can be vital to the institutions, many of which help to shape the character and commerce of New York life.

The Editorial Notebook

The Deepening Mystery of Yellow Rain

Yellow rain is the deadly toxin weapon that the Administration says is being used under Soviet tutelage in Laos, Cambodia and Afghanistan. But the more evidence it produces, the more inconsistencies appear. Another possible explanation for the fungal toxins found in yellow rain and its victims is that yellow rain is merely moldy pollen, and that the funguses that produce the toxin also contaminate South Asia's food supply.

If yellow rain is a weapon supplied by the Soviet Union, that's more than a crime: it's a violation of two solemn treaties on chemical and biological weapons. If the Russians would cheat on these for such petty advantage, how can they be trusted to keep any arms control agreement?

The Administration has produced three reports to buttress its charge. The victims' many accounts make it hard to doubt that chemical agents of some kind — tear gas at the least — have been used against them. With the discovery of yellow rain toxins in 1981, the Administration said it at last had the "smoking gun."

The scientific core of its case is six samples found to contain toxins produced by funguses known as *Fusaria*. The toxins have also been found in patients who report they were victims of chemical attacks.

The amounts of toxin detected are minute, at most 175 parts per million. To deliver a lethal dose would require so huge a load of yellow rain that you might as well drop rocks. Presumably the level of toxin would be higher in fresh yellow rain, but the Administra-

Its Toxic Samples Remain a Hypothesis In Search of Proof

tion has never explained how much higher, or how an effective dose could be delivered to a clothed human intent on taking shelter.

There is a more serious lacuna in the Administration's case. If 175 parts per million of yellow rain are toxin, what are the other 999,825 parts? A recent report from Australia's Defense Ministry gives a surprising answer: pollen. Australia, given samples said to be from an attack in February 1982 in Thailand near the Cambodian border, found them to be pollen contaminated with *Fusaria*.

Low levels of toxins were therefore probably present, but the Australians didn't even bother to look; in their view, toxins at the parts-per-million level "quite definitely" have no military meaning. They declared the sample a "fake" that "sheds no light at all" on the yellow rain question.

But since it seems no different from most of the Administration's samples, it may shed a lot of light. Sharon Watson, an Army mycotoxin expert, concedes that all the examinable toxin-containing samples also contain some pollen. Contrary to Washington's initial belief, *Fusaria* are evidently common in Southeast Asia: a Canadian scientist found them in "most samples" of Thai plants and soil he tested.

Pollen is one of their favorite substrates. And both the Australians and Thais report finding the fungus in samples of yellow rain.

There is also a strange seasonality in the Administration's data. Yellow rain attacks are reported throughout the year, but those from which proven toxic samples or blood were obtained all occurred between February and early April, the time of maximum flowering in the tropics. Control samples of vegetation contain no toxins — but were gathered in September. If toxic yellow rain is seasonal, that would be a further hint that it may be a natural phenomenon.

Another troubling feature of the evidence is that most animal tests show *Fusaria* toxins are rapidly cleared from the body. Yet the toxins have been detected in victims' blood weeks after an attack. That suggests a more regular source, like contaminated food. Indeed one victim, who had quite large doses of toxin in his stomach and intestines at autopsy, also had high levels of aflatoxin, a well-known contaminant of food. An obvious inference is that Cambodia's food supply is contaminated by both toxins.

Reading the book of nature is tricky. You can so often find what you expect to find. The Administration has built its yellow rain theory in a vacuum of medical and botanical knowledge about Southeast Asia. It deserves credit for trying to identify the agents being used against the people of these countries. But it has placed too much emphasis on a still-uncertain hypothesis.

NICHOLAS WADE

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May 5, 1983

YELLOW RAIN

Q: What is your reaction to today's New York Times article, "The Deepening Mystery of Yellow Rain?"

A: The article suggests -- wrongly that "yellow rain" may be a natural phenomenon in Southeast Asia. This possibility has in fact been studied, and rejected, by responsible scientists who have seriously studied the question. It should be noted that sample evidence from attack sites and victims is just a part of total evidence available, that toxins are being used as weapons. Let me quote from the conclusions of a recent article by Professor H.B. Shiefer, a Canadian scientist who is Chairman of the toxicology group at the University of Saskatchewan who personally conducted an on-the-spot investigation, says:

"The events that are reported to take place at the time of alleged chemical warfare attacks cannot be explained on the basis of naturally occurring diseases. Neither mycotoxicoses nor other diseases occur in Thailand, and presumably in the immediately neighbouring countries, which are able to cause the rapid onset of symptoms or the effects on all forms of life (human, animal and plant life) that are said to occur."

"It appears that a number of agents or a combination thereof have been employed, one being generally known as "Yellow Rain." Most of the features described with "Yellow Rain" are consistent with trichothecene mycotoxicosis....

There is no doubt that fusarium fungi, theoretically capable of producing trichothecenes, occur naturally in Southeast Asia, but this investigator did not find any toxins in the undisturbed environment, nor did he find signs of occurrence of diseases caused by these toxins in this region."

Q: Is it true all samples contain pollen?

A: It is not true.

Q: Is it true all samples came from the same time frame of the year - the months of February to early April?

A: No - new sample data now being prepared for release will show that toxin in samples associated with toxin agent attacks is not a seasonal phenomenon. New evidence based on chemical tests have been obtained from victims of November and early January attacks. Control samples collected in March proved negative. If this were a natural phenomenon these samples would of course have been positive.

We have previously reported identification of toxin in blood samples collected from victims of attacks taking place in September, November and January.

It is true that increased numbers of samples are collected in the February - April time frame each year: this is because February - March - April is the height of the dry season when most offensive operations end, therefore, toxic attacks occur.