

End of the row for Shell's pesticides?

A four-year-long dispute between the Environmental Protection Agency, the Environmental Defense Fund (EDF) and Shell Oil Co. became a bit more complicated this week. The dispute, involving the manufacture and distribution of the pesticides Aldrin and Dieldrin, has taken many complicated twists, but this one may mark the end of Shell's \$15 million per year business. The chemicals are produced by Shell, and are the sixth and seventh most widely used pesticides.

The three groups are engaged in a cancellation case before the EPA's administrative law court to determine whether Shell will be allowed to continue producing 10 million pounds per year of the chlorinated hydrocarbons for use primarily on corn crops in the midwestern United States. The EDF brought suit in 1970 to stop production due to evidence that the chemicals are long-lived in the environment and potentially carcinogenic to man.

After several months of presentation of evidence by EDF and EPA scientists, and during Shell's presentation last week, EPA Administrator Russell E. Train made a sudden announcement. He issued a notice of the agency's intention to suspend further production of the pesticides until the full case is resolved, probably some time next spring. The company was given five days to file for a hearing on the suspension issue, and manager M. J. Sloan said Shell lawyers would request a hearing. The administrative law court will decide whether to suspend production after 15 days of hearings.

Shell representatives are not happy in the wake of this sudden move. Sloan says the EPA has been "blatantly unfair" in not allowing Shell to present its full side in the cancellation case before initiating a suspension action, and that this represents a circumvention of the agency's own administrative procedures. "They spent from last October to May 1 of this year presenting their case. Then we started in May and we hadn't gotten to our toxicology data yet. All of industry is pretty well shaken by this type of action," Sloan says.

He says the EPA really has not proven that Aldrin and Dieldrin can cause cancer in humans. "Our contention is that Dieldrin does cause tumor formation in mice but mouse isn't like man." Sloan warned that if the suspension attempt succeeds and the company is prohibited from producing the pesticides, there will be "a sudden and severe effect on the price the American consumer pays for milk, meat and eggs." From 50 to 200 million bushels of corn could be lost to insect damage,

he says. Dieldrin and Aldrin are applied before or during planting to prevent cutworm, wireworm and white grub damage to corn seedlings.

EPA and EDF scientists feel the evidence against the pesticides is strong and the risks in removing it from the market small. In his notice of intention to suspend, Train states that Shell will have produced 10 million more pounds by the time the court case is resolved, and it would be able to market this during the 1975 season. A spokesman from the EPA administrator's office says the suspension move was made at this time because "Russell Train, after hearing and reading the evidence presented against the pesticides, felt the hazards were too great to allow 10 million more pounds to be produced and eventually put into the environment."

Train cites the following evidence in his notice: Although other chlorinated hydrocarbons have declined in use, Dieldrin use has been growing. Measurable amounts of Dieldrin were found in composite samples of 83 percent of all U.S. commercial dairy products, 88 percent of all garden fruits, and 96 percent of all meat, fish and poultry. More than 85 percent of all air samples taken nationally contained Dieldrin. Autopsy analyses show that for the year 1971, 99.5 percent of Americans sampled had detectable amounts of Dieldrin in their body tissues. Dieldrin has been shown to cause tumors and birth defects in mice (by Shell's own scientists) and in

rats at a variety of body sites. Infants and young children (considered more sensitive than adults to carcinogens) consume proportionately more Dieldrin in foods because of high dairy-product diets. Absolute data on human cancers are impossible to obtain and reliance on test animals is necessary. And finally, the EPA finds no agricultural necessity for the pesticides as Shell implies. Less than 10 percent of the total U.S. corn crop is treated with Dieldrin and Aldrin, and effective substitutes exist for them, EPA contends.

In light of this evidence, Train says, continued manufacture represents an "imminent hazard" to the environment and the public. EPA scientists have determined that the safest way to dispose of stores of the pesticides would be the regular use and dispersal on farmland and orchards rather than the burial, burning or chemical disposal of large quantities. If Shell wins the suspension case, it can produce next year's supply this fall as scheduled, and the stores would probably be used during the 1975 growing season, even if they lose the cancellation fight. "That is why," an EPA attorney says, "this was a crucial time for making the decision to suspend, and why we did it in the middle of Shell's testimony."

Shell attorneys argue that if the company loses the suspension fight, and is prevented from producing the 1975 batch, but eventually wins the cancellation case next spring, it will have suffered an unfair loss of revenue. But the company is not likely to win either battle, EPA and EDF spokesmen say. □

Bones from the past: A call for caution

It is a law of the jungle—and the lake and the tundra and the desert—that animals eat other animals. This bestial tendency to dine on each other's flesh may be a source of confusion for paleontologists, suggests James S. Mellett of New York University.

Often deposits of small vertebrate bones from Mesozoic or Tertiary times are found in sands and clays. The bones lack skeletal order or any evidence of the soft tissue that once surrounded them. They are broken and all jumbled together. Paleontologists tend to assume that the animals represented lived together in community at the spot. The jumbling, breaking and removal of soft tissue are often attributed to the action of water or of animals trampling the deposits.

Mellett proposes instead, that most or all of these deposits may represent bones that have passed through the alimentary tracts of carnivores and been left behind in their droppings. Mellett has compared the characteristics of the fossil deposits with bones

from the droppings of living carnivores and found similarities in appearance. His report is in the July 26 *SCIENCE*.

Water is unlikely to have done the breaking, Mellett believes. If swift-running water had broken the bones, they should show evidence of abrasion, and they do not. Also some of the deposits are found in ancient lake beds, where they would have been in relatively still water. The alimentation hypothesis also explains the relative absence of the bones of flying animals: These would have been harder for ground-running predators to catch.

Mellett names the process "coprocoenosis," which is proper scientific word-coining since it comes from the Greek word for feces. In light of the possibility of such a process, he says, paleontologists should be wary of interpreting such finds. The bones found may reflect the tastes of a particular predator and not the distribution of local population. The animals also might have been eaten some miles from where the bones are found. □