

CHEMISTRY

Where spring is still silent

Triana has a handicap that will take some time to overcome: Located at the junction of Indian Creek and the Tennessee River, this small Alabama community is just 10 kilometers downstream from a former DDT plant.

Triana is a poor community, and many of its 600 members engage in subsistence farming and fishing. Fish caught in the waterways of Triana have levels of DDT_T — total DDT residues, including DDT and its metabolites, DDE and DDD — up to 100 times the U.S. Food and Drug Administration's tolerance level. Not surprisingly, Center for Disease Control (Atlanta, Ga.) officials have measured in Triana townspeople some of the highest documented human tissue levels of DDT.

Wheeler National Wildlife Refuge, upstream from Triana, also shows signs of massive DDT contamination. Here, "Nearly a decade after the cessation of DDT manufacturing at the facility responsible, concentrations of DDT residues in the local fauna are still high enough to suggest avian reproductive impairment and mortality," report W. James Fleming III and colleagues of the U.S. Fish and Wildlife Service in the July 25 *SCIENCE*. At Wheeler, Fleming and colleagues have discovered that DDE-contaminated black ducks are producing fewer and thinner-shelled eggs, that double-crested cormorants — thousands of which used to winter at Wheeler — are rarely seen and that the muscle lipids of Mallard ducks contain up to 6,900 parts of DDT per million. Moreover, earthworms collected near the DDT plant site contain DDT_T levels of 5.2 to 74.2 ppm. "These concentrations do not imply lethality, but approach or exceed dietary levels that were shown to impair reproduction in experimental studies of several bird species," Fleming and colleagues report.

The story of Triana and Wheeler is a classic DDT tragedy. From 1947 to 1970, the once widely used pesticide DDT was manufactured on a site leased from the U.S. Army at Redstone Arsenal, Ala. (The plant initially was leased to the Calabamba Corp., then to Olin Mathieson Chemical Co.) A ditch carrying waste from the factory ran directly into Wheeler, where it joined a waterway leading to Triana. In the 1960s, attempts were made to avert the effluent flow by constructing settling ponds. In addition, caustic agents — lime and ferrous sulfate — were administered to contaminated areas in an attempt to speed DDT degradation. By 1970, because of government pressure and increased public concern, DDT production at Redstone ceased.

But the DDT persists — in the tissues of fish and game birds and in the "fist-sized chunks of crystalline material lying on the ground near the plant site." This persistence "emphasizes the need for safeguards and well-planned programs for disposing of all toxic chemical wastes," Fleming and colleagues conclude.

A compound with an iron hand

When red blood cells die, after about a 90-day lifetime, they leave behind iron in the bloodstream. Since the body has no efficient means of eliminating this iron, persons undergoing chronic blood transfusion therapy (and, therefore, receiving extra red blood cells) for conditions such as Cooley's anemia and leukemia run the risk of lethal iron overload. The drug now used to counteract iron buildup, desferrioxamine, is an inefficient and costly drug that must be continuously injected over a six-to-eight-hour period daily.

Now, Raymond J. Bergeron of the University of Florida College of Pharmacy at Gainesville and colleagues have synthesized a powerful iron-grabbing compound that has potential for treating iron buildup in simple tablet or liquid form. A report on the synthesis of the drug — N¹,N⁸-bis (2,3-dihydrobenzoyl) spermidine — along with encouraging preliminary animal tests will appear in the September *JOURNAL OF MEDICINAL CHEMISTRY*.

BIOMEDICINE

Joanne Silberner reports from the American Veterinary Medical Association convention in Washington, D. C.

Dogs and multiple sclerosis — good news

Three years ago, reports appeared in newspapers and magazines of a scientific study linking small pets with the development of multiple sclerosis in humans. The reports were based on two studies that told of finding a higher frequency of small dog or cat ownership among persons with MS than among persons free of the progressive neurological disorder. A recent study fails to confirm these findings.

Janet Scarlett, a researcher at the Mayo Clinic in Minnesota, studied 123 MS patients and 246 matched controls, and found no significant relationship between MS and dog ownership. She looked at persons who had been in contact with dogs; persons who kept their dogs indoors versus those who kept their dogs outdoors; and the amount of contact with pets. "There's no evidence linking MS to dog ownership," she concludes.

Cats and leukemia — bad news

The news is not so good for cat owners.

Michael J. Burridge, a veterinarian and epidemiologist at the University of Florida in Gainesville, says, "We can't ignore the possibility of transmission of feline leukemia virus to man."

At the heart of Burridge's warning is the ability of feline leukemia to be transmitted from cat to cat, and its effectiveness in human tissue culture. While no virus or viral antibodies have been isolated from human blood, Burridge feels infected cats should be eliminated.

Though some studies have failed to show a correlation between cats and leukemia, a three-state study in the early 1960s showed "a significant relationship between exposure to sick cats and the subsequent development of leukemia," Burridge says. And an 11-year-long study of veterinarians shows an inordinate amount of leukemia, he reports.

"We've got to be aware of the possibility of transmission until further study is done," he says. "If euthanasia is not acceptable, the owner of an infected cat must be made aware of the possible public health consequences. Veterinarians should recommend at the very least isolation from uninfected cats and people, especially from children and anyone with a suppressed immune system." Burridge is studying children and immunosuppressed persons to see if they are more prone to leukemia.

Chickens and atherosclerosis

Marek's disease virus (MDV), a member of the herpes virus family that does not affect humans, causes atherosclerosis in chickens, says a research group from the New York State Veterinary College and Cornell Medical School. The group, led by Catherine Fabricant, studied the arteries of chickens infected with MDV on high and low cholesterol diets and found atherosclerosis present regardless of diet. Uninfected birds, even on a high cholesterol diet, did not develop this disease.

The character and distribution of the chicken atherosclerosis "bears a striking resemblance to chronic human atherosclerosis," says Fabricant. Her laboratory is now looking into how the virus induces atherosclerosis.

Fabricant found the correlation between MDV and atherosclerosis after she noticed the formation of cholesterol crystals in tissue culture infested with a feline herpes virus. Wanting to study the relationship between herpes virus and atherosclerosis, she turned her attention to chickens, since cats do not normally get atherosclerosis.

Could a herpes virus be at work in human atherosclerosis? "People are just beginning to look at it in humans," answers Fabricant. Studies are underway at Baylor University, Cornell, and other places, she says.