

The Balance of Nature

In the 1960's, in an attempt to eradicate malaria, the World Health Organization embarked on a major campaign to rid the tropics of the mosquitoes that carry the disease. Borneo was to be one of the regions cleared, and a massive spraying campaign was initiated throughout the worst affected areas. The chosen pesticide was DDT, a highly toxic and cancer-causing chemical since banned in most western countries, but still widely used in the Third World.

Initially the program was successful and the mosquito population fell dramatically, but it was not only the mosquitoes that died. Numerous other species were poisoned by the DDT, among them a minute wasp that preyed upon caterpillars living in the thatch of local houses. With the wasp gone, the caterpillar numbers increased to plague proportions, devouring the roofs of houses and causing them to collapse. Nonetheless, the spraying program continued. The dead mosquitoes were eaten by gecko lizards which, as they became sick, proved easy prey for the local cats. As a result the cats accumulated large quantities of DDT, passed on from insect to lizard to cat. The cats began to die in the thousands – and the local population of rats exploded. The rats not only ate local crops, but brought an even greater menace – bubonic plague. In desperation the Borneo government called for cats to be parachuted into the worst affected regions.

Today, the mosquitoes have returned to the sprayed areas and malaria is still rife. Many pesticides are now ineffective, the mosquitoes having developed resistance to them, but as in other parts of the world, the spraying goes on unabated and the subtle balance of nature continues to be disrupted.

Balancing risks on the backs of the poor

Amir Attaran, Center for International Development Kennedy School of Government Harvard University
Nature Medicine, 2000

Few chemicals stir the feelings of the 'man on the street' quite like DDT (dichlorodiphenyltrichloroethane). Since Rachel Carson's *Silent Spring*, conservationists in rich, developed countries have waged a decades-long campaign, no less persistent than DDT itself, to convince governments and citizens that DDT is an irredeemable pollutant. They have been very successful: Every industrial country, without exception, has ceased using DDT.

However, DDT remains one of the few affordable, effective tools against the mosquitoes that transmit malaria, a plague that sickens at least 300 million and kills over one million, mainly children, in economically underdeveloped areas of the tropics each year. Such a toll is scarcely comprehensible. To visualize it, imagine filling seven Boeing 747s with children, and then crashing them, every day.

DDT became emblematic of the toxics movement because of its effects on the non-human environment. Ecological studies have demonstrated that bioaccumulated DDT could cause thinning of eggshells and reproductive failure in birds of prey. The fault for this lies in the massive agricultural use of DDT. Dusting a single 100-hectare cotton field, for example, can require more than 1,100 kg of DDT over 4 weeks. In contrast, DDT spraying for malaria control is less intensive, less frequent and far more contained. The current practice is to spray the interior surfaces only of houses at risk, leaving a residue of DDT at a concentration of 2 g/m² on the walls, ceiling and eaves, once or twice a year. Half a kilogram can treat a large house and protect all its inhabitants. Doubtless some fraction of this escapes to the outdoors, but even assuming it all did, the environmental effect is just 0.04% of the effect of spraying the cotton field.

Reliance on DDT reached its zenith, and malaria, its nadir, with a campaign to eradicate malaria from large parts of the world in the 1950s and 1960s. The early results were impressive: in less than two decades, spraying of houses with DDT reduced Sri Lanka's malaria burden from 2.8 million cases and 7,300 deaths to 17 cases and no deaths. India and South America achieved similarly impressive reductions, and several countries fully eradicated malaria¹. Even in sub-Saharan Africa, where mosquitoes are most difficult to control, DDT spraying resulted in great reductions in malaria. Unfortunately, many of these successes were short-lived. American funds, which underwrote the eradication campaign, soon lapsed, and overuse of DDT in agriculture bred DDT-resistant mosquitoes. Back in malaria's grip, Sri Lanka returned to a half a million cases by 1969.

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Questions

Name _____

Date _____ Per _____

1. Why was DDT used in Borneo?
2. What is a positive result of using DDT? What is a negative result of using DDT?
3. Wasps were also killed by DDT. What chain of events happened after the wasps were killed?
4. What chain of events happened after the gecko lizards ate the dead mosquitoes?
5. Were the unintended results of using DDT worse than the initial problem? Explain.
6. Is using DDT to kill mosquitoes still effective? Explain.
7. Why did many countries stop using DDT?
8. How many people are affected by malaria each year? How many of them die each year?
9. How is DDT spraying for malaria different than spraying for agriculture?
10. How effective was the spraying of DDT in terms of cases of malaria and deaths? And then later?