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PHENOMENON

The Roach That Failed

The mighty German cockroach once threatened world domination. Where did it go? By Sam Schechner

In 1979, the police in Schenectady, N.Y., responded to a complaint about a barking dog. When they arrived, however, they found cockroaches streaming from the windows of a two-family home, raining down from trees and darting into the street. Inside, roaches had plastered every wall like stucco and had left bites all over a 64-year-old woman and her 24 dogs, which, it turned out, had been barking for good reason. The swarm comprised approximately one million German cockroaches, perhaps the largest household infestation ever recorded.

In those days, the war on roaches seemed hopeless. The insects were a ubiquitous fixture of kitchens and bathrooms, basements and streets; in 1985, *The Washington Post* reported that they had infiltrated the Pentagon. Roaches were linked to the spread of infectious diseases like salmonella poisoning and were at least partly responsible for the rising asthma epidemic in inner cities. It was frequently predicted, uncomfortably, that an army of roaches would survive even a nuclear holocaust.

But in the 70's and 80's, scientists were already honing a weapon — new bait eventually sold as Combat and other products — that would change the course of the war. Because of it, populations of German cockroaches, by far the most common household variety, have fallen precipitously in many urban areas. “They were decimated,” says Phil Koehler of the University of Florida. But could roaches go away for good? And would it really be good riddance if they did?

OF THE MORE than 3,500 species within the insect order Blattaria, only a small fraction cross paths with humans enough to be considered pests. Some, like the enormous American cockroach, or palmetto bug, live mostly in sewers or dark, dank basements. But *Blattella germanica*, otherwise known as the German cockroach, actually lives with us in our own homes. “They are an artifact of human existence,” says Dini Miller, an entomologist at Virginia Tech. In all likelihood, they moved in with humans in Africa, when we first started storing our food and living indoors. “Since then, they have evolved with us,” she said.

For almost as long, we have been trying to kill them and their Blattarian relatives. The Egyptian Book of the Dead, written more than 3,000 years ago, includes a spell invoking the ram-headed god Khnum to banish vile cockroaches. As the roaches spread around the world on ships, some sailors, finding their eyelashes eaten off in the night, ineffectually tried to kill them by burning sulfur. By the late 19th century, people were setting traps with molasses, and exterminators were advertising their services in local papers.

The 20th century brought synthetic insecticides and crack-and-crevice sprays, but nothing offered more than temporary relief, even



in wealthy urban areas. German roaches reproduce more rapidly than other roach species, and for almost every new chemical thrown at them, germanica has developed widespread resistance, usually within a decade. In the 50's, scientists thought DDT would finally wipe them out; less than 10 years later, they told tales of bugs swimming in vats of the stuff.

Then, around the time of the Schenectady infestation, researchers at American Cyanamid in New Jersey stumbled upon an idea. Casting about for other uses for an odorless, tasteless agricultural insecticide called hydramethylnon, they decided to try it on German roaches. The only catch was that it needed to be ingested. So they made bait.

“The field data were very promising,” says Jules Silverman, a researcher who helped refine the first hydramethylnon bait in the early 80's. “We would find greater than 90 to 95 percent reductions in cockroach populations, across the country.” Scientists, who had first tested the concept by dipping communion wafers in the poison, toyed with the idea of selling the wafers under the label Last Supper. In the end, they packed better bait in plastic pucks with the name Maxforce. (Combat, the consumer version, came out two years later.)

It wasn't until after the bait had been on the market for a few years that entomologists discovered why they worked so well: even if only 20 percent of an infestation fed on them, lethal doses would remain in their feces and carcasses, which would be fed upon by other roaches

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back in the cracks and narrow passages where they live. “There were no hiding places for cockroaches to escape the insecticide,” says Coby Schal, an urban entomologist at North Carolina State University.

Hard data on roach populations are scarce, but evidence is mounting that widespread adoption of bait in the 90's took its toll. In Miami, traditionally a warm, wet roach stronghold, the public housing authority has seen its work orders for cockroach problems drop from thousands per year to just a few hundred per year today. A decade-long survey of 55 federal buildings found that cockroach complaints between 1988 and 1999 fell by more than 93 percent. And although roaches long generated the most income for commercial exterminators, they have dropped down the list to No. 3, behind ants and termites, according to the trade magazine *Pest Control*.

The same pattern emerged in the consumer market as well. Sales of off-the-shelf bait exploded in the 90's, rising to as much as \$80 million per year. Then the bottom fell out. The market for all roach-control products — not just bait but also the more common roach aerosols — began to shrink in 1996, according to retail data cited by Clorox, which now owns Combat. “It appears that they may have been so successful that they dried up the market,” says Ken Harris, a founder of Cannondale Associates, a marketing consulting firm.

By the end of 2000, *Pest Control* found itself running a column titled “Are Cockroach Baits Simply Too Effective?” The U.S. consumer market for roach control continues to shrink by 3 to 5 percent a year, says Derek Gordon, vice president for marketing at Clorox. “And if we actually manage to drive ourselves out of business completely, frankly we'd feel like we did the world a service.”

THE RESPITE may be short-lived, however. Some pest-control operators argue that invasive species of ants have rushed to fill the household niche that cockroaches left behind. Others say that when operators turned from residual sprays to bait, they left us increasingly exposed to bed bugs, which have returned to suck blood at both fleabag and five-star hotels in the last few years.

Moreover, the German roach itself may rise again. At the National Conference on Urban Entomology in Phoenix this May, a blockbuster symposium sported a marquee-ready title: “The Resurrection of the German Cockroach.” Entomologists read papers and showed videos suggesting that while roaches have still not developed resistance to hydramethylnon, even after 20 years of heavy use, some have evolved to avoid bait containing certain sugars or additives.

The findings don't foreshadow a return to Schenectady. Most consumer bait still works; and Bayer, the chemical and pharmaceutical giant, has unveiled a formulation that caters to the new roaches' finicky tastes. But urban entomologists clearly have good reason to return to the roach business.

“I'm thrilled to death they've come back,” Dini Miller said at the event. The roach scientists in the audience applauded. ■

THE ETHICIST BY RANDY COHEN

Honor Bound



I received a nomination for the National Honor Society at my Catholic high school. I was asked for three letters of reference from nonrelatives, and I immediately thought of my father's gay partner. In the eyes of the school, he would not be recognized as a relative. My family insisted that I could not use him, because I should go by my definition of relatives. Could I ethically use him as a reference?

SAMANTHA CLARKE, NEW BEDFORD, MASS.

YOUR plan has the delectable savor of poetic justice: live by antigay bias; die by antigay bias. (O.K., not die, but squirm with frustration.) The church and its affiliates can't very well count your father's partner as a relative on the one hand while opposing his right to actually marry your father on the other. And yet, tempting as it is, you should not use your father's partner as a reference.

It is not that you must employ your personal definition of a relative. Rather, you should heed the spirit (if not the letter) of the rule. In this case, its intent seems to be to avoid soliciting letters from people so close to you that their comments would be biased.

If you're uncertain of the society's intent, clarify it. You can do so without any mention of sexual preference too: simply ask if a parent's unmarried partner is taboo as a reference. And there's another way the matter might resolve itself. Because your family lives in Massachusetts, your father can marry his partner, placing him unambiguously out of bounds as a reference.

FOLLOW-UP: Samantha Clarke decided not to use her father's partner as a reference.

HONESTY REWARDED: The National Honor Society admitted her.

JOY UNCONFINED: Her father and his partner recently wed.

I am a resident alien interested in politics. Obviously, I cannot vote for president, and my husband, also a foreigner, insists that I have a duty not to express my political views. Our 7-year-old daughter, an American, enthralled with some recently

acquired knowledge, is actively campaigning in the presidential election. Do I have a right to voice my opinions to her, or must I hold my tongue until I become a citizen?

CHRISTINE WUTHRICH, RIDGEWOOD, N.J.

Free expression is a cornerstone of American democracy, and it's not limited to citizens. In fact, I've even heard of residents here from other countries (France) offering their thoughts (criticisms) on American political life (our quirky wars) — and no reason why they shouldn't. We all benefit from the fullest exchange of ideas.

There are citizenship requirements for some forms of political activity — holding office, for example. In addition, you might find it prudent, if you are ever in circumstances where citizenship seems pertinent, to be candid about your status, but doing so need not deter you from expressing your views.

I work in the United States Senate. Recently we had to evacuate the building, and some senators were pushing their way past others. Is it all right for an elected representative to supersede others in exiting the building? ANONYMOUS, WASHINGTON

As I misconstrue the customs of our great deliberative body, senators are to proceed in order of seniority when fleeing danger and trampling their slow-footed constituents before them.

Send your queries to ethicist@nytimes.com or The Ethicist, The New York Times Magazine, 229 West 43rd Street, New York, N.Y. 10036, and include a daytime phone number.

Photograph by Catherine Chalmers