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# The Hornet Among Us

The Japanese giant hornet is not the largest insect in the world, but perhaps the most fierce. It can grow to two inches in length, with a wingspan of three. It has a brown thorax, and a yellow and brown striped abdomen. Its mandibles are jagged, lined with sharp, incisor-like protrusions. Its eyes are large dark holes, which make it seem alien, some thing that has no place in our ordered world.

It can fly 60 miles in a day, at speeds of over 25 miles an hour. Its wings beat about 1,000 times a minute. It can lift more weight, relative to size, than any of us can imagine. Its stinger is a quarter of an inch long, and barbless, which means it can sting repeatedly. Its venom can melt human flesh. The venom is loaded with at least eight different chemicals, some of which damage tissue, some of which cause pain, and at least one that's sole purpose is to attract other hornets to do more stinging.

Here's how the hornets work: scouts zoom around, searching for honey bee hives. This is all they do, from when they wake in the spring to when they hibernate in the fall. When a scout finds a hive, it leaves pheromone markers around it, which draw other hornets. When the others arrive, they begin systematically slaughtering the bees. A Japanese giant hornet can kill 40 honey bees in an hour. A nest of Japanese giant hornets, around 30 or so, can destroy an entire honey bee colony in a few hours. The hornets seize the bees one by one and literally slice them apart. They cut off their heads and limbs and wings and keep the juicy, most nutrient-rich parts, which they chew into a paste to feed to their larvae. They eat the bees' honey and devour their young. They do not take over the bees' hives or carefully consume all they have killed. They take only the flight muscles and other juicy bits and leave the heads and limbs lying around.

Hornet's nests are founded by a queen in a dark sheltered place, either underground or in the hollow of a tree. The fertilized queen creates cells from chewed-up treebark and lays an egg in each cell. The queen spends her entire life laying eggs. The eggs transform into larvae, and the larva spin silk over the openings in their cells. In two weeks they complete metamorphosis and hatch. The first generation are workers. They hatch from fertilized eggs, and are female. The females take over construction of the hive. They spend their time tending to the home, caring for the young, shoring up walls and feeding. Unfertilized eggs become males. The males are called scouts, or drones. They spend their entire lives searching for bees' nests to destroy.

Fully formed nests of the Japanese giant hornet are the size of a small child. They can have hundreds of workers. The workers are smaller than the queen, but very aggressive to intruders. Recently, population growth in Japan, and the resulting decimation of the Japanese giant hornet's forest habitat, has caused a population growth in the yellow hornet. The yellow hornet has moved into the cities of Japan, where it drinks from discarded soft drink cans and pilfers trash for leftover food. Over 40 people a year die from its stings.

The Japanese giant hornet has no natural predators, except man. In Japan, they are a delicacy. They are eaten raw or deep-fried, or the amino acids on which they live are harvested and manufactured into a sports energy drink.

The Japanese honey bee does have a defense against the giant hornet, though it does not always work. Sometimes it fails and the bees are destroyed, their heads ripped off and their children eaten and the remains of their bodies strewn about the hive they once called home.

But if the bees are quick enough, if they act according to the plan created for them over millions of years, here is what they do: when a scout appears, they wait until the last possible second, in the last instant before it spreads its pheromones, before it summons the army that will destroy the hive.

At some unspoken sign, some chemical signal like a flare going off in the night, the bees surround the hornet scout so tightly it cannot get away. As one, they begin vibrating their bodies. They rattle themselves so hard that they begin to heat up, to burn inside, to turn themselves to fire. Because the bees can withstand higher temperatures than the hornet, the hornet dies. It inevitably kills a few of the bees before it does, but the hive is saved.

The Old English word hyrnetu means "large wasp, beetle." The Middle English harnete was probably influenced by the word horn, either as "horner" to suggest the sting, or "horn-blower" to suggest the buzz.

In the Hebrew the word tsir'ah means "stinging." In Exodus 23:28 God told Moses "And I will send hornets before you, which shall drive out the Hivite, the Canaanite, and the Hittite."

Deuteronomy 7:20 tells us "Moreover the LORD your God will send the hornet among them until those who are left, who hide themselves from you, are destroyed," and Joshua 24:12 says "I sent the hornet before you which drove them out from before you. . .*but* not with your sword or with your bow."

Biblical scholars believe the word hornet is not literal. In the first two verses, it is a metaphor for panic, a physical manifestation of the fear of the wrath of God. In Joshua, the word hornet means army.

Army ants also spend much of their lives searching for things to destroy. Like an army, they raid in swarms, or columns, depending on the species of ant. In swarms, great fans of raiders sweep along the ground searching for food. Column raiders branch out in small foraging groups, but both techniques utilize overwhelming numbers to envelop prey. Both rely on chemical trails to organize, like orders sent ahead. Both are deadly effective.

While the ants are raiding, birds follow along, eating the flying insects the ants flush from the ground. The larger colonies of ants eat up to 100,000 prey animals each day. They kill lizards and scorpions and centipedes. They kill grasshoppers and mantises and spiders. When they encounter prey, they simply swarm over them. The venom in their stings liquifies the victim's tissues. They cut the bodies into pieces to carry. Some species swarm trees and eat small birds and their eggs. Others hunt mainly the nests of other ant species and wasps. Still others hunt underground, devouring worms and arthropods and young vertebrates.

Because of how much they consume, the ants must migrate. They are constantly moving into new territory, constantly flushing prey, swarming over it, destroying and dismembering. Larger animals that they cannot consume are killed anyway, and left to rot, leaving a swath of death in their wake.

Like an army, they hunt while they move. Soldiers link their bodies to form protective barriers or use their large mandibles to protect the smaller workers while they sting their prey. Scouts constantly search for more prey, laying chemical trails, marking the path for the colony to follow. Other scouts split off from the group to forage, or to find a new home for the night. When they move, they take everything

with them: food, larvae, eggs, and the queen, who is too big to walk and must be carried.

Army ants belong to the subfamily of ants called Dorylinae, after the Greek word for spear. Their colonies can contain 20 million ants, and function as a super-organism. There is no one controlling intelligence. They act out of instinct, driven by chemical composition. Only the queen can see. The workers are all blind. Millions of years of convergent evolution have lead the ants to this point. They march along the forest floor destroying everything in their path, each mind alike, each behavior the same.

There is a wasp in certain parts of the world that paralyzes its prey, usually a spider, and lays its egg in the paralyzed body, which it buries alive. When the egg hatches, the larva feeds on the body of the spider. The spider is alive all this time, as the larva eats it. It can do nothing to get away. Its stomach is eaten. Its eyes are eaten. Its body is eaten, and after the larva has devoured all the edible parts of the spider, it spins a silk cocoon and pupates.

There is a spider that uses a hand-held net to scoop up prey. It folds itself into a stick, blending in with real sticks, and lies in wait a few inches above the ground, net ready. When prey wander by, it unfolds itself from the stick and scoops its little net down and wraps its prey up.

There is a species of fire ant that builds rafts. Thousands of ants lock themselves together, and they go floating gently down the stream. The ones on the bottom die, but the colony survives. These fire ants were indigenous to South America, but have now invaded the Phillipines, China, and the southern United States. They have no natural predators. When they attack, they first bite, digging in with their mandibles, to make themselves hard to remove. Then they sting again and again with stingers left over from a million years ago, when they evolved from wasps.

There is a species of spider that mimics ants so it won't be eaten. There is a species of ant that creates traps like a spider, and when prey appears the ants spring from hiding and pull the prey's legs off so that it cannot run away. There is a species of centipede that is covered with spines and shoots cyanide from its mouth. There is a species of centipede that can grow as long as your forearm. There is a species of bug in Africa that subsists on blood. When it mates, it stabs the female in the abdomen to release sperm directly into her bloodstream, and the female has had to evolve, over the years, a defense so that reproducing won't kill her.

Ingenious the ways in which nature kills. The ant wears armor. The hornet wields a sword and attacks from the skies. The spider creates elaborate traps for its prey. The hornet works in teams; the ant works in armies so vast numbers lose meaning. Even the lowly bee has developed measures of counterattack.

They have all evolved, over millions of years, the ability to destroy. This means it was something they worked at. They got better and better and better, and they are good at what they do.

There is only one animal that is better, and has worked harder.

When Rome fell to the barbarians, while the city was sacked and burned, while a thousand years of darkness set upon the western world, someone, looking at everything they had ever known fall, must have thought that the invaders in all their glorious multitudes looked like swarming ants. When Masada was surrounded, one of the besieged surely believed the Romans were hornets, alien, so far removed from humanity that they were of another world. When the Greeks stood at the narrow neck of Thermopylae, they must have seen the hordes coming for them, wave after wave after wave, as non-sentient, some form of mindless drone. And when the airplanes lit the night skies over Baghdad, a child, huddled in a corner somewhere, certainly believed that some creature from nightmare, from legend or lore or myth, had arisen like prophecy.

But in their secret hearts they must have known what was coming for them, must have seen, somewhere in the collective conscious, soldiers marching along dusty roads and cities at siege and the dead in the streets. They must have known the feel of tanks rumbling over the earth and the sound of airplanes droning through the skies. They must have seen, in our past and present and future, black lines of smoke twisting toward the clouds as the spear was raised and the sword fell and the hordes came from the mists on the river, howling and rattling their shields, the hornet driven before them.

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**PAUL CRENSHAW'S** stories and essays have appeared or are forthcoming in *Best American Essays, Best American Nonrequired Reading*, anthologies by W.W. Norton and Houghton Mifflin, *Glimmer Train, Ecotone, North American Review* and *Brevity*, among others. He teaches writing and literature at Elon University.