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1984 **Journal**



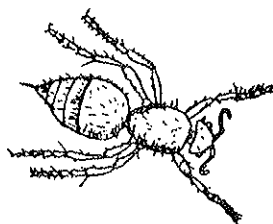
# The Best-Laid Plans of Wasps and Ants

*Is Mother Nature Perfect?*

BY JAY A. ROSENHEIM

**L**ike many aspiring naturalists growing up in the sixties, I was for years a fervent devotee of Mutual of Omaha's "Wild Kingdom." With the click of a dial I could travel to the rain forests of Brazil, where Marlin Perkins spoke only the truth from a safe distance while Stan wrestled with an impossibly huge, grotesque anaconda in a murky swamp.

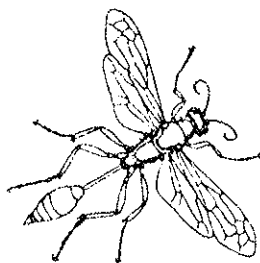
The snake is awesome in all respects, Perkins tells us. It grasps its prey in its tooth-lined maw, quickly wraps long, muscular loops of its body around the unfortunate victim and squeezes out the life-giving breath. It lives successfully with its tube-like body, having lost the tetrapod's legs altogether and dispensed as well with the pelvic girdle, which would normally limit the size of ingestible prey. It can eat young goats, able to swallow them whole with its eight-hinged jaws, and then survive months without another meal.



The snake is adapted, tuned, well-honed; it is a well-lubed gear in the machine of nature, driven by the permeating power of natural selection to near perfection. Cunning, keen, efficient; these are the adjectives applied to the beast. As presented by Perkins, the omnipotent anaconda is anomalous in one respect only: its apparent inability to squelch the pesky Stan.

As I grew and matured, my viewing interest shifted from "Wild Kingdom" to the more sophisticated nature specials. I saw the lives and work of Darwin and Mendel reenacted, heard discourses by famous comparative ethologists like Tinbergen and Lorenz, watched the waggle dance of the bees, and listened to the melancholy underwater music of the whales. Throughout it all there ran a common theme: how marvelous is this thing called nature! How beautiful the inhabitants of the earth! From the most miniscule bacterium to the lumbering elephant, the eloquent harmony of animals with their environments inspired awe. From the most trivial grooming behaviors of the monkey to the majestic, swooping dive of the falcon, their actions seemed to adapt them beautifully to their modes of life. This perception of the infallibility, the perfect degree of adaptation of wild animals stayed with me throughout my years at high school and into college. Although my respect for Mother Nature was perhaps increased by her seeming perfection, I must admit that the concept of her perfection also troubled me.

Was man truly alone in his state of imperfection? I could stub my toe, fall down and split my lower lip, ride my bi-



cycle into a tree, and do innumerable other non-adapted things. People wasted food, argued about who should drive for the carpool, watched T.V. until their eyes turned red, and frittered away their lives drinking coffee and smoking cigarettes. Despite the fact that we too were products of evolution (by all scientific accounts), we seemed to have exclusive rights to an entire array of foolishness. Was the ability to err a derived, "advanced" trait of *Homo sapiens*, or did our evolutionary ancestors, the "primitive" animals (Marlin Perkins' perfect ones) pass the trait on to us on the sly?

It was during the course of a summer spent observing the behaviour of a certain group of wasps that I learned the answer to this question. It is the ways of these wasps, who revealed to me so much about the true "nature" of Mother Nature, that I would like to discuss.

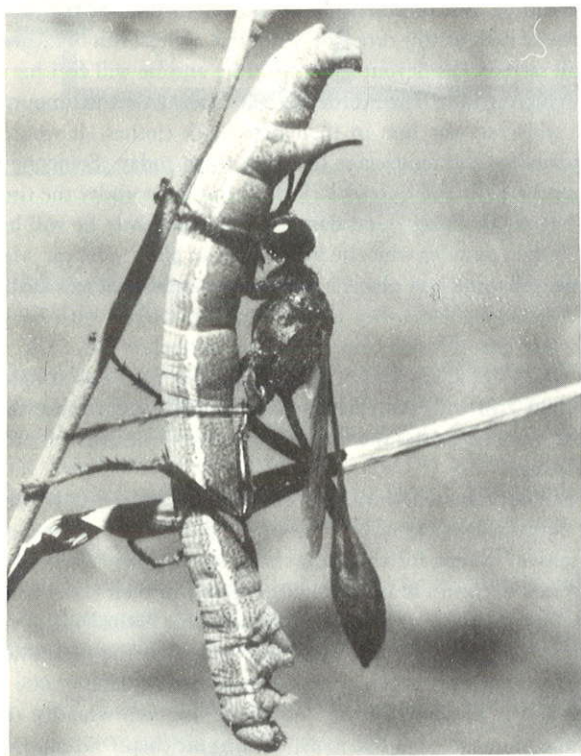
These wasps — by science dubbed *Ammophila* and placed in the family Sphecidae — are commonly called thread-waisted wasps due to their extremely elongated and narrow abdomens. They are solitary dwellers, spending their lives preparing small burrows in the soil into which they place a single egg and food for the larva (a grub-like immature form) that will hatch from the egg. Provisions for the larva take the form of one to several juicy inchworms. These green entrées are captured by the wasps in shrubs surrounding the nesting area, stung (paralyzed but not killed by the venom), and transported back to the empty nest which the wasp has already prepared. The wasps are quite accomodating, allowing me to observe and photograph them at close range. Because their sting (unlike that of the social yellow jackets and honey bees) is not designed to fend off vertebrate predators, they were unable to harm me. This enabled me to overstep their natural hospitality so far as to physically handle and mark them. They did, however, register their indignation at this treatment with loud buzzes punctuated by small nips with their well-developed mandibles.

When closely examined, the nesting and hunting behaviors of these wasps are actually quite intricate, but the wasps are so proficient at their business that they make it look simple. Ninety-nine percent of the time they function with the efficiency of computers: reliably and accurately. What about the remaining one percent? These few incidents taught me many things about nature, things that Marlin Perkins never mentioned on T.V.

One morning at 10:32 a.m. I saw a female *Ammophila azteca* flitting about the nesting area looking for a place to dig her nest. She walked and hopped about, turning in little spirals around particularly enticing patches of earth. At intervals she would stop searching, clear a small bit of ground (carrying off any dried bits of grass, pine needles, or other debris), and begin to dig. Each time, however, no sooner

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had she begun her excavation then her whimsical desires shifted, and she would abandon the site and go tripping off in search of another. In all fairness to this individual, I must point out that her process of repeated nest initiation and termination is standard for the species. Usually, though, within a short while and after a few false starts, the fanciful mock-diggings are over, and the typical wasp then buckles down and begins serious nest construction. The wasp that I was watching that morning continued unabated hour after hour to abandon her newly started burrows. This was very disconcerting for me, because I wanted to mark the location of her nest-to-be and get on to more important work. With the onset of the cool evening at 7:00, both she and I retired for the night, she without having constructed a nest, and I without having marked one.



*Ammophila Dysmica* with a green entrée.

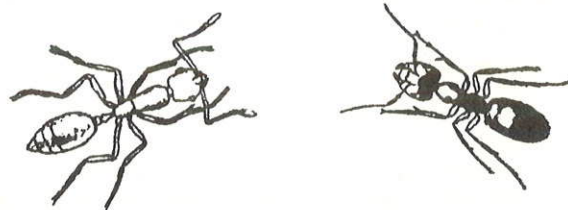
I cursed aloud (one needn't curse under one's breath when insects are the only living things listening) the following morning when, at 10:57, she reappeared and continued her nest-building charade. Her coy hops and dances around the nesting area were distracting and by this time fairly annoying too. What is more, she attracted a number of other insects intent upon laying their eggs in her nest (to the detriment of her own progeny), so that when she did finally settle down and dig at 12:34 p.m., she was surrounded by a large group of enemies.

This wasp's behavior was clearly non-adaptive in that it wasted her time and energy, and attracted parasites. Whether it was indecision, laziness, procrastination, or some other problem, I don't know, but reluctance to initiate a major project is behavior all too familiar to most students. (Have you started your term-paper yet?) I was in the habit of giv-

ing all the wasps on the site names, such as "Healthy," "Loner," "Surprise," "Dizzy," "Averagette," etc.; the reluctant wasp was, for obvious reasons, christened "Neurotic."

A very stable, consistent nester at my study site was Blue-Spot, a large female *Ammophila dysmica*. This species uses only one large caterpillar for provisions, and indeed the caterpillar is so large that it cannot be carried in flight, but must rather be dragged along the ground, a rather laborious process. Lugging the caterpillar across the nest site is also a risky business due to the abundance of an extremely aggressive, predacious ant, *Formica sibylla*, whose nests peppered the study site. The presence of these ants was a nuisance for not only the wasps but also the wasp-watcher, whose equipment, lunch-bags, clothing, and person were all of unending interest to these omnipresent invaders.

One evening at 5:36 Blue-Spot returned to a nest she had dug, hauling a large, plump caterpillar. She quickly removed the nest's temporary closure (*Ammophila* never leave unattended nests open, due to their vulnerability to parasitism) and pulled the caterpillar in. As she tidied up the interior of the nest by removing the loose sand and debris, a passing ant was attracted by her activity and decided, predictably, to investigate. Upon seeing the ant, Blue-Spot proceeded to shoo it away by hovering above the ant and descending to



administer sharp, quick bites. This commotion, coupled perhaps with the release of a chemical signal by the ant, resulted in the arrival of several other marauding ants, comrades of the first. This group of ants was not too much for a determined Blue-Spot to deal with, however, and after a prolonged struggle she succeeded in driving them away. The nest was by this time a shambles, the battle having caused large quantities of loose dirt to fall into the cell below. Blue-Spot again undertook the task of cleaning out the nest, and as she reached the conclusion of the process she did something very strange: she began to drag the caterpillar out of the nest! This was aberrant behavior indeed, for *Ammophila* never have reason to remove provisions from their nests. In her determination to clean her nest, Blue-Spot has classified the caterpillar as an additional item to be removed. Instead of simply laying an egg, sealing the nest, and living happily ever after, she sabotaged her own reproductive efforts. Her behavioral program had blown a fuse. The ants had driven her round the bend; like a Freshman faced with a tough question on a final, she blanked out, forgot what she was supposed to be doing, and flunked.

The caterpillar, bent into a "U"-shape, became stuck in the narrow tunnel of the nest, leaving Blue-Spot to ponder her predicament as the ants reassembled and finally carted away the booty. Ants such as these are often referred to as paradigms of insect sociality and cooperative living, so it was with great irony that they then succeeded in wrapping the

long caterpillar around a nail that I had driven into the ground to mark Blue-Spot's nest. With two groups pulling equally hard on opposite ends of the caterpillar, they exactly cancelled each other's efforts, and the tug of war did nothing to move the inchworm. Like a deadlocked task-force committee with two camps unyielding in their demands and unable to see the other's point of view, the ants pulled and pulled. Not realizing that they could free the caterpillar by all pulling from one end, the ants too finally gave up and retired in disgrace to their colony (to the jeers, I suppose, of their nest-mates). Who finally got the prized caterpillar, over which the war had been fought? Me.



A final story about these wasps involves the interactions of two neighbors. These two *Ammophila azteca* were nesting in peace until I barged in and, like an unbridled archaeologist, excavated both of their nests, which were situated within a few inches of each other. The wasps, upon returning to their nests each carrying a small, green caterpillar, proceeded to search in vain amidst the earthen rubble for their homes. In general these wasps are loath to release their hold on their caterpillars, but after a few minutes of futile searching, impeded in part by the necessity of holding the caterpillar, one of the wasps, Quinnette, laid her prize down. Now, as I said, the two females were searching in proximity to each other, and when Quinnette saw the other female flying about with a green caterpillar that looked just like her own, she immediately flew up and began fighting for possession of her neighbor's caterpillar. The two grappled, fell out of the air, and began rolling around in the dirt, buzzing wildly while Quinnette's own caterpillar lay inertly on the ground right where it had been left. Eventually Quinnette was repulsed, and they both resumed their searching. It looked like a case of a simple misunderstanding, rash actions resulting from precipitous decisions based upon incomplete information. For *Homo sapiens*, with the ability to communicate through language ("Cool down Quinnette, your bloody caterpillar is sitting right there!") these occurrences are still common; imagine what our case would be without speech!

And so I learned from *Ammophila* that while the animal world was truly beautiful and exceedingly impressive, it was not without its character flaws, foul-ups, confusions and misunderstandings. To this day I sigh with relief and comfort knowing that man is not alone in imperfection, which he may even excuse as the baggage bequeathed to him by evolutionary forebears. Man's faultiness represents an unseverable, nonadaptive appendage, another appendix, another tailbone. Perkins was inaccurate in his presentation of a faultless wild kingdom, his own ability to err perhaps derived evolutionarily from the very kingdom that he misrepresented.



## A PALPABLE MAN

The morticians are on strike so when the people come out from paying their private respects they'll have to cross a picket line. They will be angry about this, and about the nails the striking undertakers have put under the tires of the hearse. (When she told me about this she called it a "hearse.")

All those black suits and veils, pale faces, with their bodies trying to glide out onto the street elegantly, abstractedly, so sanctimonious in that well-dressed mass, will bump into undertakers in street clothes shortly; and one man, who knew "the deceased," will want to hurl thunderbolts at the obstruction, at the profane display of such earthly concerns — for this, at least this of all events, is still sacred! His devout heart will race and he will feel his own tie strangling him. The morticians will finally admit the mourners, who will cross the line in their best black clothes. It would be pointless for the morticians to retain them today. Someone will notice the nails and quietly kick them out from under the tires of the hearse, thinking "God-damn it." Nonchalantly he will brush off his right pant leg when he is through and glide to his car. Mainly people will think how obscene such a demonstration is and are likely to return any glances they receive from the strikers with haughty looks and grim hidden frowns. Rage is just below this. "His" wife will cry harder as she crosses the line and her son, who is holding her right arm with both hands, will say more comforting things to her when he crosses the line. (Death is so difficult, she said, for the living.)

The morticians will think that this whole business is unfortunate, but nevertheless, inevitable. They have bills to pay. They are not aggressive, except for the nails, because they don't have to be; perverted decorum is an invincible weapon in their case. There is a rhetoric devoted exclusively to life and one exclusively devoted to death — and the morticians know this: that the platitudes of death are explosive when combined with the mundane, one pinprick and it all goes "Terror!" These are the men who last touch us, who last wave good-bye to us, "so long ole chap," lid shut; these are the last men to form impressions of us. But it is only a business, a living. When they assembled that morning outside on the sidewalk they knew that the mourners would prefer to think of the dearly departed as a sort of sentimental vapor, rather than as a physically dead, palpable man. (Someone's got to lug the guts, I said.)

There are some things I don't know about these people. I don't know anything about the man in the casket or why the morticians are striking, for example. All I can see is lines meeting, puncturing each other. And somebody grinning, thinking "his last hitch," while a man glides to his car.

Jeff Peterson

Jeff Peterson recently completed a masters thesis on William Carlos Williams, and plans to continue his study of American modernism in the doctoral program at Berkeley.