

The Social Life

What humans can learn from social insects.

by **ROB DUNN, PH. D.** • Posted August 31, 2006 01:13 PM

Humans have spent millennia suspecting there is something to be learned from the social insects. Everyone from Aristotle to the indigenous Kayapo of Brazil has held them up as positive role models. Even the Bible exhorts readers to "Go to the ant, thou sluggard."

At this summer's [International Union for the Study of Social Insects](#)—July 30 through Aug. 4 in Washington, D.C.—almost 1,000 scientists gathered, as they do every four years, to report on what they'd found after, well, going to the ant (and the bee and the wasp and a half-dozen other orders). To be around so many like-minded social insect—studiers is a departure for this bunch (or rather, colony), who are accustomed to having

to justify what they do for a living: When in mixed company, they can be overheard saying things like, "But ants represent 40 percent of the biomass in many forests" or "Without bees, agriculture would be nearly impossible."

However, for this week, the community of social insect biologists—of which I am a member—needn't justify anything. Rather, we talk shop over beers while an ant biologist from Arizona croons "I Am Woman" into a karaoke mike.

There are a few thousand biologists in the world who study social insects, which works out to about one for every 20 species. There are bee people, ant people, termite people, and even, way at the end of the bar, the occasional wasp person. Each group is further specialized: Among the ant people there are those who study only sex ratios or dominance or war or neurobiology or recognition or castes or invasion and so on. At meetings it is easy to find coffee shop conversations focused entirely on, for example, the metapleural gland.

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unintelligible—"It's all about the numerator. Everyone has been focusing on the denominator." By the third day, old friends give up on the meetings and slip away to the nearby National Zoo to gaze at the large, furry, embarrassingly asocial mammals.

Even for people who spend their days thinking about social insects, much of what is reported at the meeting is surprising, odd, or simply remarkable—as in the case of a study showing that honeybees can learn to navigate mazes as long as scientists adorn maze doors with helpful signs.

Other choice findings from this year are:

- Smaller species of exploding ants are more likely to suicidally combust than larger ones.
- Some species of worker ants poke holes in their nest when it gets too hot.
- Japanese honeybees can kill wasps that invade their colonies by swarming them and beating their wings to generate heat, effectively cooking the wasps to death.
- Worker carpenter bees are lazier than other worker bees, letting their queen handle dangerous jobs.
- Despite being only 3 percent of the way through their samples of mites hosted by army ant colonies, Carl and Marian Rettenmeyer have found three new families and 149 species of mites, all of them previously undiscovered.

In one of the most unexpected findings of the conference, Ted Evans at the Commonwealth Scientific and Industrial Research Organisation in Canberra, Australia, discovered that some termites tinker with language, communicating the size of the wood they are feeding on through knocks, bumps, clicks and wiggles.



Honey pot ant workers sharing food, while swollen repletes hang overhead. ©Alex Wild 2004

Worker termites have vibration sensors on their antennae and legs through which they can perceive communications of alarm. Evans was able to show that when termites drum on smaller wood blocks they produce a higher pitched sound, which recruits more workers to the wood. (Smaller wood pieces are thought to be preferred nesting material.)

Observations of the humans attending the conference were, to an insider at least, just as rewarding as reports on the behavior of research subjects. For instance, there were brief flare-ups in the turf wars between different camps of invasive ant specialists and in the usual assortment of long-standing bee feuds, as well as the odd disagreement about whether it is appropriate to distinguish termite species based on the chemicals in their poop.

The meeting closed with a session on conflict resolution in insect societies. Experts expounded on what prevents colonies from deteriorating into little more than a bunch of individuals looking out for number one. If we are to learn anything from the social insects, we might imagine we would find it here.

Increasingly, however, we are realizing that more often than not colony life is less than harmonious. Daughters look out for their own interests more than was once thought, and deception appears to be the rule rather than the exception. Insect societies are held together not by the benefits of cooperation so much as by the ties of nepotism, policing and dominance—emphasis on the dominance. Workers police their sisters in order to prevent them from laying eggs, or starve them to keep them from becoming queens. Some species of workers use smell to ferret out sisters that are cheating the system by producing eggs. Queens are no better, and in general try to control everything, sometimes beating workers to get more out of them.

In the end, insect societies appear to be as corrupt as our own.

The more complete version of the biblical phrase I mentioned earlier is "Go to the ant, you sluggard. Consider her ways, and be wise." Maybe the wisdom comes not from learning directly from the social insects but rather in learning that they too struggle. The ants, bees, wasps, termites, and even the odd social thrips or aphids, are beset by the same dilemmas as their ostensibly more sophisticated primate brethren. As in any hierarchy, the queen imposes her will, the workers suffer for what is not always their greater good, and in the process, there is war, peace, agriculture, death, and by the billions, birth.

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