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This Week's Citation Classic®

Wilson E O. *The insect societies.* Cambridge, MA: Belknap Press. 1971. 548 p.
[Museum of Comparative Zoology. Harvard University, Cambridge. MA]

The most advanced social insects, including termites, ants, and some species of bees and wasps, represent an independently evolved pinnacle of colonial life against which human social organization can be usefully compared. They are also important in ecology, being among the dominant small animals of the terrestrial environment. While exploring these themes, *The Insect Societies* also treats for the first time the unique caste and chemical communication systems in terms of the newly emerged field of population biology. [The *SSCI*® and the *SCI*® indicate that this book has been cited in more than 1,700 publications.]

Sociality at the Pinnacle

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There are, in my opinion, four pinnacles of social evolution: the colonial invertebrates, the social insects, the highly social vertebrates, and the human species. The second group, comprising termites, ants, and some species of bees and wasps, has held my attention since childhood. By the age of 16, in Alabama, I had assembled a sizable collection of ants and decided to build a career on their study. Twenty-five years later, now a member of the Harvard faculty, I look back with a sense of fulfillment on many scientific adventures enjoyed in the field and laboratories around the world. I participated in discoveries in ant systematics (including the first Mesozoic fossils), biogeography (leading to the development of island biogeography theory with Robert H. MacArthur[1]), caste systems (the first reconstruction of caste evolution), and chemical communication (shown to be the most complex discovered to that time in animals).[2]

During that quarter-century, 1945 to 1970, entomologists had acquired some remarkable new insights in the biology of the social insects. We came to understand how castes are determined and how caste systems evolved. With the aid of William D. Hamilton's kin selection theory,[3] we also understood—at least in part—why the systems evolved. And, with the aid of chemical microanalysis, we had begun to develop a clear picture of the remarkable medley of pheromones employed by different castes, the most complex chemical communication system known in any group of organisms. Finally, we knew much more about the ecology of the insects and had come to appreciate, in preliminary fashion, the ways in which they employ colonial organization to dominate the terrestrial environment.

By the late 1960s, it was clearly time for a synthesis of all this new information. Up to that time, I had enjoyed the thrill of discovery, as reported in technical articles. But the urge to synthesize was also in my bones. I am a clerk by nature; if things have not been put in some kind of order, I grow insecure and fretful. The synthesis of knowledge of social insects was an important task to satisfy this idiosyncracy. To start, the literature was scattered through mostly obscure journals, in several languages, and young investigators had a difficult time even getting started. Then, the new information had relevance to other fields of biology and offered a provocative backdrop for reflection on human sociality. Not least, i saw that social-insect studies could be integrated with the newly emerged field of theoretical population biology. Insect colonies are, after all, just highly organized populations. The best ideas from population genetics, demography, predator-prey models, and so forth, can be usefully applied to them, and they are poised to feed valuable new information back into the mainstream.

This is what, I believe, *The Insect Societies* accomplished. It also provided an introduction and vade mecum for young researchers and helped set the agenda in the field for the next two decades. For me personally, it imparted a momentum that led to the publication of *Sociobiology: The New Synthesis,* in 1975." In fact, the last chapter of *The Insect Societies* was entitled "The prospect for a unified sociobiology." Engrossed in my own rhetoric, I had to go on. Much later, in collaboration with Bert Holldobler, I wrote *The Ants* (1990),[5] an updated and more detailed account of that largest, most complex group among the social insects.

1. **MacArthur R H & Wilson E O.** *The theory of island biogeography.* Princeton. NJ: Princeton University Press. 1967. 203 p. (Cited 2.445 times.) [See also: Wilson E O. Citation Classic. *Current Contents®/Agriculture, Biology & Environmental Sciences* 19(36): 14; 5 September 1988.]
2. **Wilson E O.** Chemical communication in the social insects. *Science* 149:1064-71. 1965. (Cited 80 times.)
3. **Hamilton W D.** Genetical evolution of social behavior. 1 & 2. *J. Theor. Biol.* 7:1-52. 1964. (Cited 1.395 and 365 times. respectively.) [See also: **Hamilton W D.** Citation Classic. *Current Contents/Agriculture, Biology & Environmental Sciences* 19(40): 16, 3 October 1988. *CC/Arts & Humanities* 10(40): 16. 3 October 1988. and *CC/Social & Behavioral Sciences* 20(40):I6, 3 October 1988.]
4. **Wilson E O.** *Sociobiology: the new synthesis.* Cambridge. MA: Belknap Press. 1975. 679 p. (Cited 3,525 times.) [See also: Wilson E O. Citation Classic. *Current Contents/Agriculture. Biology & Environmental Sciences* 19(38):20, 19 September 1988, *CC/Arts & Humanities* 10(38):20. 19 September 1988. and *CC/Social & Behavioral Sciences* 20(38):20. 19 September 1988.]
5. **Holldobler B & Wilson E O.** *The ants.* Cambridge. MA: Belknap Press. 1990. 732 p.

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