Those not-so-dumb animals

Wayne M. Getz

The Honey Bee. By James L. Gould and Carol Grant Gould. *W. H. Freeman: 1988. Pp. 239. £14.95, $32.95.*

HONEY bees are the *sapiens* of invertebrate evolution, or so we are led to believe by James and Carol Gould. Some myrmecologists may not agree with them; but, whatever your persuasion, you will be convinced after reading this book that honey bees are remarkable organisms, living in an even more remarkable society.

Like its companion volumes in the Scientific American Library, *The Honey Bee* is printed on high-quality paper and includes beautiful colour pictures and illustrations. A small line drawing of a worker bee is cleverly placed on the right-hand corner of consecutive obverse pages, so that in flipping through the book from back to front the reader is treated to a cinematic illusion of a dancing bee.

The first chapter is a succinct but charmingly written history of beekeeping, the second a brief introduction for the uninitiated to the life of the honey bee. The remaining chapters are woven around the particular research interests of the first author, James Gould, an ethologist at Princeton University. Thus, the title is misleading, because the book primarily deals with communication, navigation and learning. But this choice of topics is appropriate because the book complements rather than competes with other recent accounts of the honey bee, notably T.D. Seeley's *Honeybee Ecology: A Study of Adaptation to Life* (Princeton University Press, 1985) and M. Winston's *The Biology of the Honey Bee* (Harvard University Press, 1987). The Goulds, however, underplay the importance of olfactory communication in mediating the organization of honey bee colonies; and they ignore a number of fascinating sociobiological issues which relate, for example, to brood care and kin recognition.

On the whole, the writing is absorbing — especially in the section where the reader is guided through the wonders of a four-layered hierarchy of honey bee navigational systems which respectively rely on vision, ultraviolet radiation, polarized light and magnetic fields for determining flight orientation. There is also an intriguing exposition of the honey bee dance and the controversy, which brewed in the late 1960s and early 1970s, over Nobel laureate Karl von Frisch's interpretation of the dance as a communication system. Unfortunately, one section is marred by an excessively long description of how, as a student, James Gould — using some cleverly and some not so cleverly designed experiments — was able to vindicate von Frisch.

As explained in the book, variations in the dance constitute a language that enables returning workers to communicate with great precision the location of nectar, pollen, water and propolis, as well as sites for bivouacked swarms to establish new hives. What, though, can we deduce about the intelligence of honey bees from studying their ability to communicate spatial information through this dance? The Goulds raise the possibility that a bee behaves as though it has a mental map of the area in which it forages and is able to reference this map while performing the dance. As they point out, this level of intellectual reasoning in a mere bee is heresy in our hubristic world of smart human beings and dumb animals.

The second half of the book is devoted to making a case for some spark of intelligence in the bee with its one-million-neuron brain. But, on the penultimate page, the Goulds get cold feet and draw a parallel with chess-playing machines that can delude us into believing they are intelligent when, indeed, we know that these computers are only electrons whizzing around in circuits. (Or is that how humans think as well?)

This final prudence is understandable, but it is not in keeping with other parts of the book where controversial hypotheses are stated as fact. For example, I would like to see the evidence that "a single cell in the olfactory lobe can encode an odor". I also reserve judgement on the comment that "far and away the most complex communication system in nature other than our own is found in a mere bee" until we have decoded, among other things, the song of the humpback whale.

For all that, *The Honey Bee* has much to commend it. In particular, it provides a highly readable account of why this insect is considered by some to be the cleverest creature in the invertebrate world. □

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Kastanienbaum

Beneath the spreading chestnut tree
we study late and long
the humble Myxophyceae
in systems right or wrong.

They thrive in mud or watershed—
non-saline or marine
and vary from a purple-red
to shades of bluish-green.

Their only chorophyll is *a*.
They flourish in the light.
They fix their CO_2 by day
and nitrogen by night.

Some cells are sheathed or capsulate;
some lack all forms of dress,
but, sexless, do not hesitate
to show their nakedness.

We must attempt to settle now,
but cannot soon decide
on what they should be called, and how
they should be classified.

With varied principles at stake
we argue endlessly
around the bench, beside the lake,
beneath the chestnut tree.

In the Faculty Club Lounge

He totters to his chair, an aged don
Whom critics, in their time, once scowled upon.
On issues past, his fantasies and state
Were subjects of derision and debate . . .
But now, no more.
Subsiding in his seat
He takes the weight of ages off his feet.
His spectacles slip wryly from his nose.
He turns from retrospection to repose,
And contemplates his fellows from a haze
Of old cigars and even older baize.
His effigy, in marble and in bronze,
Unrecognized by later crops of dons,
Discreetly gathers dust beside the stairs.
And, from that landing too, surveys his heirs
Who used his textbooks once, though now no more
Except to prop an argument, or door.
They know him only, in this latter age,
By petty footnotes on a yellowed page.

His faculties and focus all but gone,
He daily, dimly, donly dodders on.

From *The Biology of Algae and Diverse Other Verses* by Ralph A. Lewin, an expanded version of his original *The Biology of Algae and Other Verses* published by Boxwood, price $12.50.