Book Reviews

Insect Sociology at a Threshold

The Insect Societies. EDWARD O. WILSON. Belknap (Harvard University Press), Cambridge, Mass., 1971. xii, 548 pp., illus. $20.

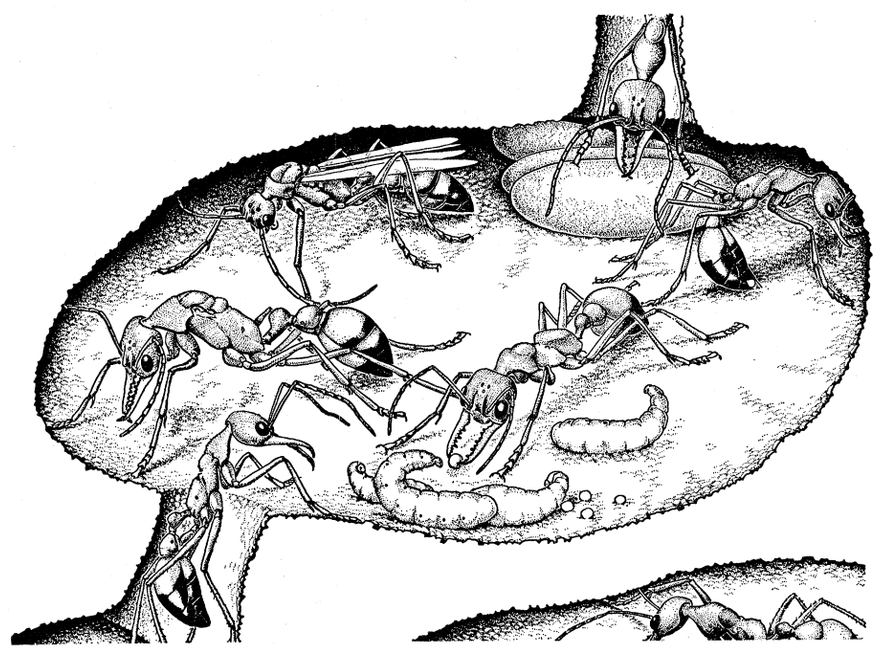
Many eminent naturalists have written about social insects, for the subject has a perennial fascination, but it has been specially interesting to compare the present volume with a somewhat similar one by another Harvard professor, published nearly 50 years ago, namely Wheeler's *Social Life among the Insects*. It was Wheeler's book that first aroused my curiosity about social insects, and the interval between the two books covers the whole period in which they have been one of my principal fields of study. The comparison reveals what new fields have been opened up and what are the main shifts in research and in interpretation.

Probably the most striking changes are in the application of experimental, especially physiological and chemical, methods to the study of social insects and the development of genetical theory and mathematical analysis for the study of their evolution and population dynamics. It is not certain that Wheeler would have altogether appreciated these developments, but they have had the advantage of attracting to this field people who are not entomologists in the old, narrow sense. What Wheeler would certainly have delighted in is the vast increase in our general knowledge of social insects, the discovery of many new types of social organization in bees or of many new kinds of social parasitic ants and wasps.

The general increase in knowledge is indeed such that this may be almost the last occasion on which one man will attempt a comprehensive review of the whole subject. The termites always raise a special difficulty for such a review, for although they show many striking analogies with the Hymenoptera they are basically very different, and they have, of course, a large independent literature. In spite of the difficulties, *The Insect Societies* gives an extraordinarily complete and up-to-date account of the natural history of social insects with their great proliferation of genera, species, and behavorial types. Almost everything one wants to know about these insects is found in it if the requisite knowledge exists. The literature of the subject is immense—there are nearly 2000 references in the bibliography of the book—and Wilson, though primarily a myrmecologist, is well enough acquainted with the other groups to give very good accounts of them.

But I suspect that this aspect of the book, though very important to the reader, is not what Wilson would most like to be studied and remembered. A high level of scholarship is attainable by many if they live long enough and work sufficiently hard, but original ideas cannot necessarily be supplied by perseverance alone. These Wilson presents especially, perhaps, in chapters 17, 18, and 21, where the evolution of social behavior and the population dynamics of colonies are discussed. In these fields modern genetics, selection theory, and biomathematics are being developed to explain the evolution of insect societies and their diversity both in size and in longevity. This is one of the growing points in the study of social insects and an undertaking to which Wilson is making important contributions.

The theory of the evolution of social behavior with concomitant development of altruism has now, as Wilson's discussion makes clear, reached an interesting point where it can be tested by field observations of a type that seem not impossible to make. It is still mainly theory, but it may well be thoroughly tested in the next few years. The key point is that social behavior has evolved at least ten times as often in the Hymenoptera as in any other insect group and that this is almost certainly a consequence of their haploid-diploid sex-determination mechanism which produces sisters genetically more closely related to one another than to their mother. In this situation where there is great genetic homogeneity, doing good to close relations is almost as advantageous (in the selective sense) as doing it to oneself, and altruism may become practical politics. We now want information on such topics as how often



A view inside the earthen nest of a colony of the primitive ant *Myrmecia gulosa*. To the left are the mother queen and a male. To the right is a worker laying a trophic egg while another worker offers one of its own trophic eggs to a larva. Queen-laid eggs, which will be permitted to hatch, are scattered over the nest floor. To the rear of the chamber are three cocoons containing pupae of the ants. [Drawing by Sarah Landry, reproduced from *The Insect Societies*]

the queens mate and with whom. This in turn suggests that we should find out more about the dispersion of colonies. We also want observations on the behavior to one another in the colony of social insects of different degrees of genetic relationship. This information might well be obtainable for some species in favorable circumstances.

The situation in the theory of population dynamics is much the same. We have a number of models and have an idea what to look for. Testing the theory may take some time but is not at all impossible in principle.

There are of course many other topics on which there has been a dramatic increase in our knowledge. Most of our knowledge of the influence of pheromones on social life, including the chemical identification of specific substances, has been obtained in the last 25 years. In termites pheromones are crucial in the determination of caste, but in the other groups they are more prominent in their influence on behavior. A whole new subject—one to which Wilson has also made many contributions—has grown up from the study of the substances used by ants to mark their trails. The old idea that ants interpret their world and also communicate more by smell than by sight or sound is beginning to have a real foundation.

A curious footnote to studies of this sort has to do with caste determination in the honeybee. It has long been known that larvae, whatever their source, if less than three days old turn into workers if put in worker cells but into queens if put on the royal jelly in a queen cell. Yet it has so far proved impossible to identify the substance in the royal jelly which has this effect. The jelly is a great mixture of substances, its main constituent seems to be purely nutritive, and the active constituent is still unidentified.

The study of social insects has always provided a very rich field for the naturalist, but it has now been developed to the point where many of the problems have become suitable for the attention of geneticists, physiologists, and biochemists. For specialists in those fields who need a guide to the facts and their background and suggestions for problems to which their skills might be applied, Wilson's book will be an ideal source. For the entomologist it is inspiring reading as well as an important textbook.

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Families

Class Context and Family Relations. A Cross-National Study. LEONARD I. PEARLIN. Little, Brown, Boston, 1971. xvi, 224 pp. $7.95.

Although dramatic images and impressions of the subject are generously distributed by the Italian film industry, there has been no systematic sociological study of urban family life in Italy. Pearlin's book is welcome as a complement to the available stock of materials on Italian peasant and village family patterns and for its revealing focus upon similarities and differences between the middle class and the working class. In addition, the conceptual framework is inviting, for the author wants to explore the effects of conditions and experiences outside the family upon its internal relations. How, for example, do the working conditions of the father influence parental values, aspirations for education, the imposition of discipline, and the expression of positive feelings toward the children?

Still another merit of the book is that it offers comparisons of data from Italy with those from the United States, by the frequent juxtaposition of patterns exhibited in Turin in 1962 with those found in an earlier, similar investigation conducted in Washington, D.C., by one of the author's colleagues at the National Institute of Mental Health. The Turin materials consist of responses gathered in interviews with 861 mothers and fathers who have fifth-graders in school. The sample was stratified to provide equivalent representation of middle- and working-class respondents and of boys and girls, and to eliminate the bulk of recent migrants, many of them peasants from the south.

Social class differences in Turin take on a shape remarkably similar to that found in Washington, D.C. While many child-rearing values are shared across country and class, it is typical in both countries for middle-class parents to give higher ratings to "dependability," "self-control," and "consideration for others," whereas working-class parents feel more strongly about "obedience" and "being neat and clean." Pearlin summarizes this by arguing, as Melvin Kohn argued earlier in *Class and Conformity* (1969), that middle-class parents stress "self-direction" and working-class parents especially value "conformity to external regulation." For another example, it is reported that in both Washington and Turin middle-class parents express more positive feelings (hugs, kisses, praise) toward their children than do working-class parents. Similarly, in both places one finds a positive association between social level and parental aspirations for a college education for the children, although in Italy the class differences are much more pronounced.

Some of the reported findings bring in additional sources of variation in child-rearing patterns. In both countries and in both classes mothers employ physical punishment more than do fathers, and, surprisingly, employed mothers more than housewife-mothers. Mothers also express affection more actively than do fathers, but this difference in sex role behavior is more pronounced in the middle class.

How are the class differences in family patterns to be explained? Pearlin's answer is: in good part by the conditions, requirements, and experiences of the father in his job. Fathers who work with things rather than ideas, are closely supervised at work, and have little chance to rely on their own initiative come to prize obedience and conformity in their children; fathers who work with people or ideas and rely largely on themselves at work come to place a high valuation on self-control in their children. Similarly, if a father exercises a lot of power at work, or is closely supervised, he brings home an image of interpersonal relations that helps him feel it is proper to employ physical punishment freely in disciplining his children. Some of Pearlin's findings are quite intriguing; for instance, both Washington and Turin fathers who are dissatisfied with their jobs or feel unsuccessful in them tend to shift the expression of affection from their sons over to their daughters.

All in all the research was well-conceived and carried out, the analysis of data is performed with skill—even with gusto—and the writing style is usually quite concise. There are shortcomings, to be sure. Many of the tabular materials to which Pearlin gives serious attention and prolonged interpretation reveal statistical associations between variables which would occur by chance much more frequently than at the usually accepted rate of 5 percent or less, so the author is subject to the charge of overinterpreting his data. The quality and interest of the various chapters is quite uneven; chapter 8, "Husbands and wives," and chapter 9, "Kinship relations," are not as good