

## LIFE AND SENSES OF THE HONEY BEE

### The Dancing Bees

An Account of the Life and Senses of the Honey Bee. By Karl von Frisch. (Translated by Dora Ilse.) Pp. xiv+184+30 plates. (London: Methuen and Co., Ltd., 1954.) 16s. net.

KARL VON FRISCH is one of the most distinguished of living experimental zoologists, and it is to him that we are indebted for the greater part of recent advance in knowledge of the behaviour and sense organs of the honey bee. It follows that the publication of a good English translation of the fifth revised edition of "Aus dem Leben der Bienen", a popular and completely up-to-date book by him, is something of an event.

The translation is strictly faithful to the original and has on the whole been admirably done by Dr. Dora Ilse; there are very few places where a slight awkwardness of phrase betrays that it has in fact been put into English by one who is not herself English.

The knowledge of German possessed by most biologists in Great Britain is not by any means so extensive and precise as it should be, and many of us who have perhaps battered an exhausting and uncertain course through the verbose entanglements within which the gems of discovery of the average German biologist are hidden will have come with relief and delight to the scientific papers of von Frisch. Here at last are experiments and results of an unrivalled perfection described with such simple lucidity and logic as to flatter us that our knowledge of the language is, after all, better than we thought. Quite apart from the language itself, what a delight it is to be able to see from the simple narrative style of von Frisch exactly how the investigation developed: to see the extraordinary flashes of insight, the weary plodding after statistical 'certainty'—and no less to be able to appreciate the long treks after false scents and up blind alleys. Nevertheless, if only because several of von Frisch's original papers are by no means easy of access, a great many biologists will welcome the concise simplified account of the beautiful investigations by himself and others, many of them his pupils, which Chapters 7–12 of this book provide. Even the most expert student of bees is likely to profit by reading it, for again and again a descriptive aside or apparently casual observation suggests some new approach to the problems of the evolution of bee organization, or reveals some hitherto unsuspected nicety of adjustment of behaviour to the needs of the colony.

About the rest of the book it is not easy to be quite so enthusiastic. The six introductory chapters are apparently written for readers who are presumed to know nothing at all about either biology in general or bees in particular. There are many gems of precise and vivid description here: thus the honey-stomach is aptly likened to a shopping bag, and a laden pollen collector is described as looking as if she were wearing 'plus fours'. But in spite of such happy phrases the general effect of the extreme simplicity of diction is to give a 'told to the children' air which is somewhat wearisome, and the question is whether a reader who needs this kind of thing will really be able to appreciate the more advanced sections. Although the book has had a great success in Austria and Germany, one wonders if it will meet quite the same

need in English-speaking countries, where there are already so many good popular accounts of the natural history of bees and other social insects; and it is against this competition that the book must be judged.

In writing such a popular book it is scarcely possible for an author to avoid all the pitfalls of over-simplification, and the very brilliance of von Frisch's powers of exposition has perhaps led him astray at times. Thus not many zoologists will agree to the description of *Amoeba* as "a little lump of mucus come alive". Again, in describing the star-shaped 'Polaroid' filter as a demonstration of one of the possible ways in which the compound eye could mediate appreciation of the polarization characteristics of light reflected from the blue sky, the author seems in several places to imply that the individual ommatidia must actually be functioning in this way, and he nowhere alludes to the neurological problems which such a theory raises. For if each of the eight sensory cells which go to make up an ommatidium is in fact registering and passing separately to the brain the information it receives, a radical revision of some present concepts as to the mode of action of the sensory fibres will probably be necessary, and many of our present ideas about the compound eye may have to be revised. There are other similar points in the work which might be questioned. But in spite of such, the book is undoubtedly a masterpiece of condensation and simplification by a very great zoologist summarizing a life-time of research—research which has been largely instrumental in initiating a re-appraisal of some of the basic ideas about invertebrate sense organs and behaviour.

Von Frisch is very reticent about theory, and generally prefers that the facts should speak for themselves and that others should do the theorizing. Perhaps it is for this reason that the brief chapter on "Mental Capacity" is somewhat misleading. Here he states that no example of 'really intelligent action' by honey bees has ever been recorded; whereas what he means is that the ability to cope with new problems is strictly limited to certain situations only. Their ability to remember colour, odour and relative position of landmarks is extraordinary, and their powers of combining these memories and associating them with a given passage of time is even more remarkable. Every such combination learnt involves some perception of relations, and when a bee makes a detour around an obstacle and afterwards straightens its path as a result of experience it is showing, within strict limits, an insightful action. Moreover, the author supports his conclusions by citing lack of 'intelligence' in other insects; but to do this he merely quotes a story about a 'mason bee' and fails to cite much striking evidence to the contrary—not only with the mason bees *Eumenes* and *Rhynchium*, but also the far more conclusive and precise experimental studies of adaptive behaviour in the hunting wasps *Philanthus* and *Ammophila*. Indeed, his treatment of social and semi-social insects other than *Aphis mellifica* is too brief to be of much value, and is perhaps the least satisfactory chapter of the book.

But in spite of such shortcomings, it must be said that there are not many scientists of like eminence who could produce such a good popular book. Quite apart from its general educative and instructional value, it will, if it leads biologists as a whole to give more attention to simplicity and clarity in exposition, have a most valuable effect.

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