

BOOK NOTICE.

THE PSYCHICAL POWERS OF ANTS.*—By E. Wasmann, S. J.

In this folio volume of 135 pages, which appears as "Zoologica, Hef 26," the author has given us his 95th contribution to the knowledge of guests and parasites of the ants and termites. As the title shows, the work is of a philosophical nature and deals with the mental side of ant-life, being in the main concerned with a refutation of the theory recently advanced by A. Bethe, who ascribes to ants and other invertebrates in general, no higher psychological rank than that of mere "reflex-machines."

The introduction reviews in brief the views of various earlier writers on the subject, and indicates the author's position, in that while rejecting Bethe's reflex theory, he also avoids the tendency exhibited by many naturalists to ascribe to ants powers of mind approaching those of man. Next follows a chapter devoted to an analysis of Bethe's theory, and showing Dr. Wasmann's reasons for the rejection thereof. In this connection the author writes: "It appears to me a reliable criterion that the animals concerned are not mere reflex-machines, but are guided, at least in the higher activities of life, by sensory perception and sensation on a foundation of inherited instinct is to be found in this: the possession of special sense organs in combination with a central nervous organ, as well as their manifold and suitable employments through which the animal turns impressions from the outside to use in the necessities of its life."

The succeeding chapter considers the question, "How do ants know one another?" And here much evidence is brought forth to show that the recognition is due to sensory perception, and is not automatic. The antennæ (especially the tips) are concerned in the discrimination, and Dr. Wasmann agrees with Forel that the detection of odour is very largely depended upon therefor. The subject next approached is "How do ants find their way?" Reference is made to the well-known fact that with many species a definite path is followed during journeys to and from the hunting-grounds, while in other species the wanderings are made much at random. Not only are ants able to follow their paths, but they also discern the direction in which the trail leads; *i. e.*, if it is running towards the nest or from it. Bethe has advanced his theory of the

* Die psychischen Fähigkeiten der Ameisen. Von E. Wasmann, S. J. Stuttgart, Erwin Nägele, 1899.