

although the type would have looked more like the original on a paper less porous. In addition, we have Dr. Gunther's "Preface", containing a reprint of a letter by Miss Batten, which relates to the Guildhall Diary, and some pages of good reproduction of manuscript, including Sir Isaac Newton's celebrated letter of November 28, 1679, on the path of bodies descending to the earth, and Hooke's "Survey of Wharves" from the B. M. drawings (already reproduced recently by Mr.

Perks). The matter in this volume is thus selected from the period 1661-93, and brought together rather by Dr. Gunther's whim than by any considered scheme. Still, Heaven forbid that we should cavil at matter reproduced in facsimile and without comment, however little it may have to do with the diary. But from Dr. Gunther's scholarship we crave a respite. Surely his shining temple to the Goddess of Inaccuracy should by now be complete. E. N. da C. A.

Bird Behaviour

The Nature of a Bird's World

By Eliot Howard. Pp. vii+102. (Cambridge: At the University Press, 1935.) 7s. 6d. net.

MR. ELIOT HOWARD has devoted more time to the study of bird behaviour than any other ornithologist of his time. But this 'behaviour' has always been in relation to that manifested during the sexual cycle, from the onset of the emotions relating thereto, up to the care of the young; and always his interpretation of that behaviour is in terms of psychology, with which the average ornithologist does not greatly, if at all, concern himself. But that is all the more reason why he should explore this new field of observation. The psychologists will certainly find in these pages a very helpful source of inspiration.

During the rising tide of the sex emotions, Mr. Howard shows us, birds display no more than a blurred sense of awareness, a sort of premonition that something has to be done. But, it is to be noted, these 'premonitions' always have a frame of reference to the sexual cycle, and display an orderly sequence. The gradual development of the hormones formed in the reproductive glands is accompanied, at first, by an apparent confusion of impulses. Leaves or twigs will be seized, only to be dropped again, or, in the case of the male, displayed before the female during his more amorous moments, as if to arouse in her the desire for mating and nest-building; and these dumb signs he will presently fortify by the posturings characteristic of his species at such times. Even the first attempts at 'mating' are, so to speak, half-hearted and unaccomplished. Their final consummation is quickly followed by nest-building, incubation and the care of the young wherein; there is less hesitancy and confusion of impulses than in the earlier stages.

The apparent capriciousness of birds' behaviour, especially conspicuous at the onset of the sexual

cycle, is, as Mr. Howard shows us, not the outcome of mere contrariness of moods, but has always a frame of reference to the appropriate phase of the cycle, and, he suggests, to the amount of the flow of hormones from the sex glands into the blood. This much seems to be attested by the fact that the manifestations of sexual activity are quickened by a few days of warm weather, and as easily quenched, or suspended, by a sudden spell of cold.

Mr. Howard completely abandons the conception, which, even now, is commonly held, that birds behave 'instinctively', and in this we agree with him. In many parts of his book, indeed, he seems to prefer to speak of their behaviour as being governed by 'impulses' traceable to the sex hormones, which is surely a most reasonable and probable interpretation. He describes experiments he has made to test the responses made by a bird to unexpected situations, such as moving a nest containing young to a new site, though no more than a few inches away; or placing another nest containing blown eggs on the site of the nest it has just left to hunt for more food, and shifting the nest with young to a short distance away. Its behaviour in response to this last experiment has some surprising results.

But are such experiments of any real value, since the bird is confronted with a situation entirely outside its experience, and outside the possibility of occurring in Nature? The relatively small, smooth brain of a bird is sufficient for its needs, but quite unequal to cope with such artificially created situations. As a test of mental capacity, it is interesting, and perhaps no more than this was intended.

Here is a book which will yield up its good things only to those who read it with concentrated attention. But it is a book which *must* be read, both by ornithologists and psychologists, and with profit to both. W. P. P.