

not looking for food or anything else, and did literally appear to be 'scared stiff,' as one might say. If it was mobbing, it was very different from such active mobbing as I have seen—one might call it 'passive mobbing,' for there was no attempt at offence either by word or deed. The feeble chirps sounded more like a faint protest than anything else."

It must be remembered, as Mr. S. A. Neave has pointed out to me, that in such cases the presence of numbers is in itself disconcerting, however feeble may be the powers of the mobbers. Capt. Carpenter's description suggests that the snake was disturbed and harassed.

I was mistaken in supposing that Mr. F. Muir's observation (quoted in NATURE of January 17, p. 385) was made in East Africa. He informs me that it was in Amboyna in the latter part of 1907 or early in 1908. Mr. Muir writes:—

"Is it not possible that birds are paralysed with fear rather than 'fascinated' in such cases? I had a parrot in Africa (now living at Brockenhurst with Dr. Sharp's family) which would fall off her perch if a dead or living snake was brought near to her; even a piece of rope suddenly brought into view would produce a fright which would paralyse her and prevent her even from screaming."

I have just received the following interesting record of observations by Mr. C. F. M. Swynnerton, writing from Chirinda, South-East Rhodesia:—

"March 29, 1918.

"For more than a year past I have lived in a house in an open space, but our old house was closely surrounded by trees, and, in the breeding season particularly, the mobbing of tree-snakes by birds was often, for a week or ten days together, a daily occurrence.

"Birds probably mob tree-snakes whenever they detect them, for I have seen such mobbings both out of the breeding season and when I was unable by a careful search to find a nest; but in most cases where a nest was concerned the birds—most commonly bulbuls in my observations—that were the parents of the fledglings were the first to detect the snake's approach to the nest and to start the hue and cry. Shrikes, sunbirds, flycatchers, warblers—in fact, any bird that happened to be near—would quickly join in and mob the snake, scolding all round it and occasionally darting in at it in the very manner in which they mob an owl. The mobbers remain, for the most part, out of striking distance of the snake, but some—and this applies especially, in my observations, to the 'puff-back shrike' (*Dryoscopus cubla*)—are very bold, both in the matter of darting in and in staying near the snake. A bird perched in front of the snake, as I have sometimes seen it, with its wings drooping and quivering with excitement, might well be taken by an ignorant person, who did not follow his observations up, to be fascinated by it; whereas it is, in reality, busy hurling at the snake every unpleasant name it can lay its tongue to. The mobbing sometimes continues for half an hour, sometimes for much longer, though the individual mobbers do not always—with the exception of the owners of the threatened nest—remain the same. Some tire and go off—anyway, temporarily—and their places are taken by others. The snake in general appears to take little notice of the birds, though it will commonly face a specially bold one; and I have seen it lunge sometimes, but unsuccessfully. Were it to succeed, I suppose the believer in fascination would be confirmed in his belief. Probably, too, even when apparently indifferent, it is sometimes embarrassed and delayed, for it will sometimes stay quite still for long together—except for the constant flickering of the

tongue. When it reaches the nest there is a great scene on the part of the parents, and they lose any fear of the snake they may have had before in their attempts to save their young. The latter, if nearly fledged, generally take fright as the result of their parents' actions, and not (as I have proved experimentally) from any instinctive fear of the snake, and flutter down. I have seen little bulbuls come down, thus unharmed from a nest 50 ft. up. Mostly I have shot the snakes before they have reached the nest, but I have seen young birds taken, and I have also taken them from inside snakes that had left a nest or were coiled about it. The snake in nearly every case has been *Disphoridus typus*, I believe, for I do not remember if I have actually taken it to Mr. Boulenger.

"For two or three seasons I watched all the mobbings I could, as I had noticed in the case of birds of which I knew the courting display that this tended to be repeated under the excitement of mobbing, and I felt that the converse would also be true. So I watched in order to get the displays of the different species. I obtained in this way a certain number of notes, but these do not bear on your question, referring, I believe, solely to this matter of display. The watching of these mobbings of snakes—which I supposed were well known—long ago convinced me that there was nothing at all in the 'fascination' idea. The birds show great daring and insolence, and it is hatred and indignation, and perhaps partly the desire to assist, and not 'fascination,' that draws them to the snake. It is the same, I believe, in the case of hawks and owls—for the birds will certainly recognise the latter as an enemy, apart from its rough resemblance to a hawk. I have taken a freshly eaten bird from an owl's stomach (*Syrnium woodfordi*) when it was barely twilight and small birds were still active." EDWARD B. POULTON.

Oxford, May 6.

As I was correcting the proofs of the above, the following letter from Capt. Carpenter reached me. The behaviour observed by him is, I believe, to be interpreted as due to the interplay between two opposing impulses, both beneficial—one based on the fear of snakes, the other on social stimuli which incite to combination for the purpose of harassing an enemy. It is only to be expected that such interplay will lead to different behaviour with different species of bird, and perhaps with the same species in the presence of different types of snake. Differences are, above all, caused, as Mr. Swynnerton shows, by the behaviour of the snake, which, when it attacks the nest, brings in a third impulse—the defence of offspring—and leads the parent birds to act as though they were altogether without fear. E. B. P.

May 13.

"I have only recently received the copy of NATURE for November 29, 1917, in which you printed Prof. Poulton's letter commenting on an observation of mine on the subject of 'fascination' of birds by snakes. Prof. Poulton suggested that this was a case of 'mobbing,' and has just sent me a proof of his second communication on this subject, giving instances of 'mobbing' noted by field naturalists.

"I wish to direct attention to the following point:—The mobbing of a snake or a bird of prey is most definitely a *voluntary* act on the part of the small birds:

"In the case which I described, however, the behaviour of the little finches strongly suggested that they were there *against* their will, or perhaps one should say their better judgment.

"The 'faint chirps' which I described were not the