

The Supposed "Fascination" of Birds by Snakes.

I HAVE been making further inquiries from my naturalist friends, and find Capt. G. D. H. Carpenter's observation recorded in NATURE of November 29 last (p. 244) is confirmed, together with the interpretation there suggested.

Dr. G. A. K. Marshall writes:—"The mobbing of snakes by small birds, and even by fowls, was frequently mentioned to me by residents in South Africa, and my general impression is that I have observed it on various occasions without specially noting it, and I cannot now recall the details of any particular case."

Mr. S. A. Neave, with a wide African experience, felt that the facts recorded by Capt. Carpenter were familiar to him, and associated in his mind "with parties of small finches and weaver birds in open, grassy places," but he was unable to remember any particular instance.

Mr. J. C. Kershaw, for a long time resident in Macao, China, and a traveller in the Malay Archipelago, Australia, and the West Indies, writes:—"I have often seen snakes pursued and annoyed by birds, just as cuckoos and hawks are by small birds, but never saw any sign of 'fascination' by the snake to obtain prey."

Mr. Kershaw has observed the mobbing of all kinds of snakes, and in many countries. "In China *Lanius schach* and *Dryonastes perspicillatus* especially raised an outcry over snakes. I remember one day hearing some shrikes (*L. schach*) making a great hubbub in a tall, thick bush; investigating, I found a snake (some 6 ft. or 8 ft. in length) in the upper part, and threw a clod of turf at it, striking it (by a fluke) about the middle of the body. The shrikes flew off, but the snake remained motionless for nearly half a minute, and then suddenly darted off. The light clod could not have really hurt it."

Mr. J. Williams Hockin, with a very long experience of South India, writes:—"The only case of birds *v.* snake I can remember is seeing a cobra attacking the nest of a ground thrush in a coffee tree at 3 ft. from the ground, and being clamorously assailed by the parents." A little later my friend kindly supplied further details of his observation:—"The cobra attack on ground thrushes (*Geocichla*, the slate and buff, not *Pitta*, the ruddy and kingfisher blue one) occurred in the Ellembelary Coffee Estate, three miles from Mep-pādi Village, in Malabar Wynaad, at an elevation of 3500 ft. So far as I can remember, it was eggs and not young birds the snake was after, but I cannot be sure. It was between 1894 and 1899. As you suppose, I was more humanitarian than scientific in those days, and got off my horse and went into the coffee to drive the snake off. The nest was on the top of a tree about 3 ft. high, the top forming, with those around it, a flat sheet of coffee. The snake was round the stem with its head over the edge of the nest, and the parent birds on each side, shrieking for all they were worth and fluttering round about on top of the boughs. On my approach the snake glided away, and the coffee was too thick for me to get at it. I do not think it took anything. The coffee in Wynaad was topped at 3 ft. or so, and all suckers removed when they appeared, so as to keep an even sheet of cover on the ground."

Not one of the above-named naturalists had seen anything like the traditional "fascination" of birds by snakes. Mr. F. Muir, however, told me that he had seen a bird—I believe in East Africa—sitting on a branch with its bill open and unable to move, while a snake approached and swallowed it. This may be an instance of "fascination." Weak-minded birds may sometimes act in this suicidal manner, just as some human beings may be paralysed by fear and unable to

defend themselves or to escape from danger. But another interpretation is suggested by the following extremely interesting observation recorded by Dr. G. A. K. Marshall:—"When happening to look over a low stone wall near Estcourt, Natal, in 1897, I chanced to observe a small snake in the very act of striking a frog. After being bitten the latter hopped off at a great pace, and I was rather surprised to see that the snake made no attempt at pursuit, but merely followed in a very leisurely manner. Seeing that the frog had come to a standstill at a considerable distance off, I crept along under the wall, so as not to disturb the snake, and on getting near the frog I looked cautiously over the wall to see the end of the tragedy. The snake was still some way behind, approaching steadily, and on reaching its victim stood watching it for some moments with its head raised, the frog meanwhile sitting trembling in front of it. At last the snake seized its prey, and succeeded in swallowing it after but feeble resistance. It seemed clear that the trembling and inability to escape on the part of the frog were simply due to the action of the poison injected at the snake's first bite. It immediately occurred to me that these observations might supply a simple explanation of many of the stories of 'fascination' by snakes."

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THE SCIENTIFIC BASIS OF RATIONING.

AN ideal ration is one which provides the adult with sufficient potential energy to meet all the demands made by the organs of his body for transformation into the kinetic form, and enough building material to make good the wear-and-tear of essential cells; a complete ration for children and adolescents must also make provision for the requirements of growth. Three methods of determining the quantities needed to fulfil these conditions are available. The first is to follow as closely as possible the system of an engineer, viz. to study the efficiency of the human machine as a transformer of energy when measurable amounts of work are performed under determinate conditions. The second is to measure the total energy transformed by the body under various conditions, also determinate, although not necessarily permitting of an exact evaluation of the amount of mechanical work done. Lastly, when it is neither possible to measure directly the energy transformed nor to evaluate the work done, the composition of diets consumed by samples of men engaged in different occupations throws light upon the probable needs of different classes.

These methods have been enumerated in a descending order of importance so far as the accuracy of the information which, under favourable conditions, they might yield is concerned; so far as practicability is involved, under normal conditions of life, the order is reversed. We shall refer briefly to the data available under each heading.

(1) The only type of work respecting which numerous and exact measurements both of energy transformed and of external work done are available has been that carried out with a stationary bicycle, the wheels of which are rotated against a known resistance. The best series of experiments is due to Benedict and Cathcart,¹ whose

¹ "Muscular Work: a Metabolic Study." (Washington, 1913.)