

## Cuckows' Eggs

WILL you kindly allow me space to thank Prof. Newton for the trouble he has taken in replying to my inquiries, although I must confess I am still unconvinced?

My omission of the name of the eminent oölogist in my last letter was entirely accidental, for I had no purpose in concealing it, but rather the reverse. My quotation was from a letter of Mr. Hewitson's, in the *Field* of March 17, 1868.

Mr. Newton mentions the eggs of the Black Cap Warbler and the Tree Pipit, as some indication of the existence of a condition which I doubted in my sixth question. I have not found the eggs of the Black Cap vary more than this, that in some the ground colour was of a warmer tone than in others. The eggs of the Tree Pipit, I freely admit, do vary greatly, but their variations are all confined to different shades of nearly the *same colour*—viz., purple; ranging from purplish red on the one side, to bluish purple on the other, but these variations have, nevertheless, so much similitude that there is no difficulty in at once recognising them.

Mr. Newton says: "If the eggs in question were not cuckows', what birds laid them?" My reply is, simply, that they were laid by the birds in whose nests they were found. It seems to me far more likely that an egg laid by a certain bird should vary slightly from the rest of her eggs in the same nest, than that another species should lay eggs varying to the extent mentioned by Dr. Baldamus—viz., from vinous red to greenish blue, olive green, plain brown, &c., or even pure white, or light blue green, mentioned by Degland and Gerbe, as quoted by Mr. Newton.

Mr. Newton will excuse me for saying that I did not refer to the German authors mentioned by him in the footnote to his letter, excepting where quoted by Dr. Baldamus, for unfortunately I do not possess a knowledge of the German language, and am therefore unacquainted with their writings.

The doubts I have expressed, and still feel, have nothing personal in them, but only apply to the theory and the evidence on which it is supported. It does seem to me singular that these extreme variations of colour in the eggs of the cuckoo should only have been remarked in Germany. They do not appear to have been observed in Britain. Mr. Newton does not say he has found them himself, and admits that the evidence on which these German eggs are pronounced cuckows' might have been more satisfactory. Mr. Hewitson says "few eggs differ less," and Mr. Dawson Rowley has remarked, in a letter to the *Field*, "I believe few men have taken with their own hands so many eggs of *cuculus canorus* as myself;" and yet his experience does not confirm the theory, but the contrary.

I cannot help feeling that we still want more positive information on this point. Were all the varied eggs alleged to be cuckows' really laid by that bird? I can easily conceive an enthusiastic naturalist, with a favourite theory to maintain, imagine when he takes out of the nest of the hedge-sparrow, or tree pipit, an egg rather larger than the rest, but marked and coloured in a similar manner, that it is that of the cuckoo. I hold, however, that nothing less than *positive proof* that it was deposited by a cuckoo will suffice. I admit this may be difficult to obtain, but it is not the less necessary. A dogma like the one in question must be based on evidence that is not only unimpeachable, but above suspicion, and this I think the advocates of the theory have not yet furnished.

May I ask you to be good enough to allow my orthography of the word "cuckoo" to remain? With all deference to so high an authority as Prof. Newton, I prefer and always use the common mode of spelling the word to the one adopted by him, as better representing the call-note, from which the name is derived.

W. J. STERLAND

January 17

## Dr. Livingstone's Discoveries

IN the conclusion of a letter which has lately appeared in your journal on the subject of Dr. Livingstone's recent letters, Dr. Beke gives the opinion that the river and lake chain which forms the main part of the great traveller's latest discoveries, is the head stream of the Nile. Though I am unwilling to differ from such an authority as Dr. Beke, yet there appear to me to be considerable difficulties in the way of his conclusions.

Will you allow me to show how it seems equally, if not more probable, that Dr. Livingstone, whilst he has ascertained the sources of the Nile, has also the merit of being the discoverer of the head streams of one of the great rivers which flow to the Atlantic, perhaps of the Congo. The Chambeze, the head stream

of the lake chain in question, has its rise somewhere in the eastern part of the great plateau or ridge which skirts the whole side of Africa, next the Indian Ocean. Dr. Livingstone crossed it in lat. 10° 34' south; from this it flows first westwards to Lake Bangweolo, then north to Lake Moero. The position of Lake Moero can only be determined as yet by reference to that of Lunda, the capital of the kingdom of the Cazembe, twelve miles beyond which town the lake is said to begin. Portuguese travellers are the only Europeans who are known to have previously visited this town, and the two routes from which we can assign it a position on the map, are those of Dr. Lacerda in 1798, and of Major Monteiro in 1831. These two travellers, with their escorts, have passed over almost the same route from Tete on the Zambesi to the Cazembe. From the former traveller there remain two astronomically fixed positions in the middle of this route, and the latter has published a volume which contains the distances and directions of his journey, but no astronomical positions. The route of Monteiro then, justified by the now ascertained position of Tete at the beginning, and by the positions formerly determined by Lacerda for its middle course, gives the place of the Cazembe town of Lunda, at its termination, in lat. 8° 40' S., lon. 28° 20' E.

Dr. Livingstone describes Lake Moero as beginning twelve miles below this position and extending for fifty miles to northward. Since he proceeded north from Cazembe town along the eastern shore of Lake Moero, in his attempt to reach Ujiji in the end of 1867, the great bulk of this lake must lie to westward of the meridian of Lunda. The centre of Moero would then be in the latitude of the south end of Tanganyika, and at about 120 miles to westward of its longitude. Dr. Livingstone has seen the river at its outflow from this lake and also at the point where it emerged from the "crack in the mountains of Rua," when, according to his own observation, the river turned to *north-north-west* to form Ulenge, a third lake or marsh in the country west of Tanganyika.

This north-north-westerly direction would carry this river quite out of the line of Tanganyika or of the Albert Nyanza; besides, both of these lakes appear to be closed in on the western side by high mountains.

The levels of the river also appear to present a great obstacle to its joining the Nile lakes.

Leaving the Valley of the Loangwa, Dr. Livingstone tells us that he ascended to a great plateau which extends for 350 miles square, southward of Tanganyika. This table-land is at an elevation of from 3,000 to 6,000 feet above the sea. The valley of the Chambeze crosses this plateau from east to west, and the river descends from it into the great valley of the Lakes Bangweolo and Moero, not far west from the point where it was crossed by Dr. Livingstone. The valley of the Chambeze is no doubt one of the greatest hollows in this plateau, and so the bed of the river here may be taken to be at the lowest general height of the plateau given by Dr. Livingstone—that is, 3,000 feet, or 200 feet above the Tanganyika. From the point at which the Chambeze was crossed, its course is for perhaps 200 miles westward to Lake Bangweolo, and in this part of its flow from the plateau to the valley the fall of the river must be considerable. Between Bangweolo and Moero the course of perhaps 120 miles to northward seems to be through a more level part of the valley. Still, here there must be another descent to Lake Moero. According to the Portuguese traveller, Monteiro, the kingdom of the Cazembe extends on the east and north-east to the land of the Auembas, apparently the same as the Luwemba of Burton and Speke on the south-east of Tanganyika. His country is described as low and flat, and this would seem to be confirmed by the absence of current in the marshy rivers visited by the Portuguese to the east of Cazembe's town, and also by the Lake Liemba of Dr. Livingstone, which he has found to be the termination of a long river-like arm of Tanganyika, stretching south-south-east to the north edge of the before-mentioned plateau. Lake Moero, then, cannot be above the level of Tanganyika, else its outflow would surely be over this level country, and not through the mountains to northward. From Lake Moero the river flows on through a "rent in the Mountains of Rua." In passing through this gorge, it appears certain that the river must have a further and rapid descent, lowering its bed still more beneath the level of Tanganyika.

In his letter of 30th May, 1869, from Ujiji, which has the brevity of a telegram, Dr. Livingstone says: "Tanganyika, Nyige Chowambe (Baker's) are one water, and the head of it is 300 miles to south of this. The western and central lines of drainage