

vanced towards the *fjord*; but probably no single individual of those who began the exodus lives to share its fate—only the inherited impulse survives in the offspring. These animals may live in captivity for two years; mine, at least, did so; but, so far as I know, no one else has succeeded in keeping them nearly so long; and the reasons are curious. In the first place, they fight with each other incessantly, and irrespective of sex; and secondly, they invariably defile their supply of water, so that unless this can be made *running*, they are sure to perish.

I turned out my little colony on Richmond Green, at an hour when the almost ubiquitous boy was still abed, and I watched their behaviour with a box-compass and a butterfly net. The former article proved unnecessary, as they boxed the compass for themselves, and the latter inadequate, as they ate their way through the gauze with remarkable rapidity. I should add, however, that they were all eventually recaptured, and that I derived no information as to their sense of direction from the experiment. Dr. Wilson states that naturalists generally believe that the lemmings seek a "land of promise," or rather of past fulfilment. I was under the impression that the credit (or is it the reverse?) of the idea belonged to me, but under a sun which sees so little that is new, I may well be mistaken; yet, singly or jointly, rightly or erroneously, I still believe that these migrations were formerly of benefit to the species. That they are not so now, is obvious; but the chief interest seems to lie in their periodicity, the marvellous fecundity which supports them, and the remarkable faculty which directs them.

W. DUPPA-CROTCH.

Asgard, Richmond, January 14.

P.S.—Absence from home prevented me from noticing the letter of Prof. Romanes. To the former of his two queries I reply that all the migrations which I have noticed during twenty years have *crossed* my lake, which lies nearly north and south, whereas had they followed the valley and watershed they would have been spared this labour and risk. The same argument applies to Lake Mjosen and others. As regards the second query, whether I believe in a sub-tropical Atlantis or not seems to me to have as little bearing on a possible land-connection between Norway and Iceland as on the Goodwin Sands. It has been suggested to me that at the close of the latest glacial epoch the lemmings may have found it necessary to migrate to the warmer western shores of the peninsula: this, however, leaves the presence of the animals in Iceland unexplained, save by the rather vague action of flotsam and jetsam. In any case, I only wish to adopt the most convenient hypothesis, until it is disproved or supplemented by a better one.—W. D.C., January 18.

IN discussing the much-debated subject of the westward migration of the Norwegian lemming, the primary cause—as it appears to me—has been altogether overlooked.

This is, that the whole of Norway north of the Jotunhjem region—that is, the whole of the country of the Norwegian lemmings—is simply the steep and narrow westward slope of a long ridge of mountains.

When Mr. Collett says that "the wanderings take place *in the direction of the valleys*," he simply repeats in other words the usual description of their general westerly course.

They breed in the uplands, and when very prolific the increase must descend or perish, as they consume all the vegetation of their birth-region and no further supplies of food are obtainable either northward, southward, or eastward; but downwards, *i.e.* westward, the vegetation increases steadily as they proceed, and the descending autumn snow-line pushes onward behind them. Their devastation of meadows and oat-fields proves the urgency of their downward or westward course.

There are lemmings also on the eastern slopes of the Kjölen range, *i.e.* in Sweden. We are told that the Swedish lemmings proceed to the Gulf of Bothnia and are there drowned. To do this they must travel in the eastward and southward directions of a much longer slope than the steep westward course of the Norwegian lemming. A glance at a good map of Sweden and Norway will show all this.

W. MATTHIEU WILLIAMS.

The Grange, Neasden.

#### The New Forest Bill, 1892.

IN connection with the petitions in favour of this Bill, to which the signatures of persons interested in the New Forest

are being obtained, I am frequently asked, "What is the necessity for the Bill, and what is its object?" The facts of the case may be shortly stated as follows. The "Woods and Wastes" of the Forest comprise about 63,000 acres of land, the whole of which were, prior to 1698, open and uninclosed; but under the authority of the Acts 9 and 10 William III. c. 36 (1698) and 48 George III. c. 72 (1808), the Crown was empowered to inclose, and keep inclosed, freed and discharged from all rights of common, such quantity of land in the Forest as would amount to 6000 acres, for the growth of timber. By the Act of 14 and 15 Vict. c. 76 (the Deer Removal Act of 1851), the Crown was authorized to inclose and plant with trees any quantity of land, not exceeding 10,000 acres, in addition to the 6000 acres already in inclosure under the authority of the Acts before mentioned. The powers conferred by these Acts are not repealed by 40 and 41 Vict. c. 121 (the "New Forest Act, 1877"), but the rights of inclosure are by sec. 5 of the last cited Act limited to "such lands as are at the date of the passing of this Act inclosed, or as have, previously to such date, been inclosed by virtue of commissions issued in pursuance of the said Acts or some of them." The New Forest Act of 1877 practically secured the New Forest to the public, but the Act is virtually repealed by the 10th section of the Ranges Act, 1891 (and other Acts therein referred to), under the authority of which the War Department, with the consent of the Commissioners of Woods and Forests, can take possession of any part of the Forest for military purposes, and exclude the public from the enjoyment of any tract so taken. Already it is proposed to take 800 acres for a rifle range and the site of a camp, and there is nothing to prevent the exercise of such rights throughout the district, and the conversion of the Forest into a second Aldershot. Wherever a portion of the Forest is taken, the rights of the commoners, if they complain, will be bought up and extinguished; and thus, by taking different areas at different times, the Commissioners may before very long extinguish the common rights, and reduce the Forest into private ownership. It is clear that the proposed inclosure of 800 acres, and the user of the Forest generally in the way described, is in direct violation of the spirit and intention, as well as of the express provisions, of the New Forest Act of 1877.

The object, therefore, of the New Forest Bill is to make it clear that the Forest shall not be deemed to be within the provisions of the 10th section of the Ranges Act, 1891, and that the provisions of the New Forest Act, 1877, shall remain in force.

The rights secured by the Act of 1877 and the preservation of the Forest as an open space are of the greatest importance to naturalists, artists, and the general public, and every possible effort should be made to secure the passing of the Bill by signing petitions in support of it.

H. GOSS.

Entomological Society, 11 Chandos Street,  
Cavendish Square, W., January 26.

#### A Brilliant Meteor.

LAST night, at 10h. 55m. G.M.T., I had the good fortune to witness the flight of a magnificently brilliant meteor. I was standing outside in the south-east re-entering corner of this building, and happened to be looking up at the constellation Leo, when the meteor suddenly flashed into sight from over the roof of the Observatory, a little east of the zenith, and not far from the stars  $\kappa$  and  $\iota$  Ursæ Majoris, passed east of Procyon, and did not disappear till it had reached a position about 5° east of Sirius. An immediate reference to the map showed the positions of its appearance and disappearance to be about 9h. + 48° and 7h. - 15°.

For the greater part of its course it presented the appearance of a broad band of deep yellow light, but after it had passed about two-thirds of its path, it widened out into an elongated mass, distinctly rounded on the front, and of a full violet colour. From the middle of this round front the yellow band again emerged, and was finally lost to view about 15° or 20° further on. The violet mass would be about 5° in length. The whole apparition occupied 4 or 5 seconds, and the band of light was seen for an instant complete on the sky, stretching over some 65°.

About 10 minutes later a small meteor shot out from a point near the stars  $\mu$  and  $\lambda$  Ursæ Majoris, and disappeared in the direction of Procyon.

THOMAS HEATH.

Royal Observatory, Edinburgh, January 25.