The Brookfields bird uttered a soft note followed immediately by a harder one—"wee-chick". At Kabala only a low soft chirp was heard.

ZEBRA WAXBILL (Estrilda subflava)

One or two pairs were watched feeding on the seeds of long grass growing by a stream near the Court Messengers' barracks at Bo on 8/11/53. Some juveniles may have been with them. The males first caught my eye by the extent of orange below, the vivid eyebrow, the red rump with darker tail. In the field they appeared grey rather than brown above. Until the red rump and orange vent are seen, the female in colour looks rather like a small warbler.

Notes on a Small Collection of Sphingidae from Nigeria

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With one photograph

I N April, 1953, I made a short visit to West Africa, and on the evening of 22nd April I had the opportunity to work a mercury vapour light trap of the "Robinson" type from 8-11 p.m. at a locality near Ibadan, about one hundred miles inland to the N.N.E. of the Port of Lagos.

In these few hours we caught—among many other insects—sixty-five hawkmoths of the family Sphingidae, which were later found to belong to nineteen species. The whole collection is shown—reduced in size—in the accompanying photograph. The following is the list of identifications,

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for which I am largely indebted to Mr. E. Pinhay of the Coryndon Museum at Nairobi, and to Mr. Fletcher of the Natural History Museum in London.

Family SPHINGIDAE

Atemnora westermanni Bsd.	(2)
Herse convolvuli Linn.	(3)
Hippotion celerio Linn.	(6)
eson Cram.	(1)
osiris Dalm.	(2)
Lophostethus demolini Angas	(I)
Nephele accentifera Beauv.	(5)
aequivalens Wlk.	(8)
funebris Fab.	(18)
peneus Cram.	(I)
Platysphinx piabilis Dist.	(I)
Polyptichus carteri Butl.	(3)
poliades Jordan	(4)
retusus Roths.	(1)
rhadamistus Fab.	(3)
Temnora elegans Roths.	(I)
fumosa Walk.	(2)
sardanus Walk.	$(2)^{\cdot}$
spiritus Holl.	(I)

The collection was of interest to me from three points of view. First as a comparison with the general scarcity of Sphingidae in Britain : secondly from the point of view of migration and distribution of the species : and thirdly as a random sample of an insect population which might throw light on the problem of the relative abundance of species.

The first point requires little extra comment except that our total British list of Sphingidae is only seventeen species, of which several are very rare.

From the point of view of migration, out of the seventeen British species just mentioned eight are migrants. Of the nineteen species in the collection under discussion only two are known to migrate as far as Europe. The classification of the species so far as I have been able to obtain information is as follows :



Sixty-four Hawk-Moths, representing nineteen species captured in one night-22 April 1953-at Moor Plantation near Ibadan, Nigeria.

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- I. All Africa and the Palearctic region (including the British Isles): *H. convolvuli* and *H. celerio*.
- II. All Africa and Madagascar : H. osiris and A. westermanni.
- III. All Africa but not Madagascar : N. accentifera.
- IV. Southern half of Africa : L. demolini and P. piabilis.
- V. East and West Africa : N. peneus, T. sardanus, N. aequivalens and N. funebris.
- VI. West Africa only : H. eson, T. elegans, T. spiritus, P. retusus, T. fumosa, P. rhadamistus, P. carteri and P. poliades.

The proportion of species only known in West Africa is high in this sample, but other long distance wanderers such as *A. atropos* and *Daphne nerii* occur in the district although not in our particular samples.

From the point of view of statistical biology the collection is of particular interest, as the number of species represented by 1, 2, 3 individuals as given below :

No. of individuals per species 1, 2, 3, 4, 5, 6, 7, 8-18

No. of species 7, 4, 3, 1, 1, 0, I - I is in accordance with the pattern of many other samples of populations of insects of different groups, taken in different parts of the world, and by many different methods.

It will be seen that the number of species with one individual is larger than that with two : the number with two larger than that with three ; and so on. Three species make up nearly 50% of the total individuals ; and over one third of the species are represented by a single individual each.

I have elsewhere (see *Journal of Ecology*, 1947, 34 : 253-272) discussed the mathematical theory of such relative abundance, and if the pattern follows the "Logarithmic Series" (which has been found to be a close approximation in other cases) the expected number of species with 1, 2, 3, etc. individuals would have been as follows :

Individuals per species 1, 2, 3, 4, 5, 6 and over

No. of species (calculated) 8, 3.5 2.0 1.3 0.5 3.7

", ", ", (observed) 7 4 3 I I 3 The very close resemblance of the observed and calculated series is quite obvious. Thus this new collection supports our general ideas on the relative abundance of species in mixed wild animal populations.

It would be of very great value if some local entomologist could trap Sphingidae with some similar form of light trap at least once a week throughout a year. We would then learn much more about the species, their relative abundance, and their seasonal distribution.