



**West African Ornithological Society**  
**Société d'Ornithologie de l'Ouest**  
**Africain**



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MOON WATCHING - A MEANS OF MIGRATION STUDY.

L. Grines.

The purpose of this note is to encourage members of the Society in Nigeria, and elsewhere in West Africa, to take up this field technique of observing migration and to suggest that a network of observers begin co-ordinated work in September this year. The possible dates for 1969 would be 23rd September to 27th September; 23rd October to 27th October and 21st November to 25th November. The observations and equipment are fairly simple but the mathematical calculations necessary to reduce the data often prevent workers using the technique. These are, however, easily programmed for a computer and have been compiled and tested using published data by Nisbett (Wilson Bulletin 1959, 71 : 237).

The method has been fully developed and exploited by Lowery and Newman, who coordinated a network of observers in North America. Over ten thousand hours of observations represent 325 localities scattered over the North American continent were obtained. They were able to correlate movements with the general weather pattern and found that the bulk of the night migration generally proceeds with the wind, although there was notable exceptions. There was no evidence that topographical features influenced the flight directions as had earlier been suggested based on some moon watching observations made by Winkenwerder in 1902. A major finding was that night migrants do not in general fly in compact groups. Apart from the flight directions they were also able to calculate an index for the density of migration from the data collected and this showed a maximum just before midnight, which has been later confirmed by radar work. (Lowery & Newman, 1955, Avian Biology, Chap.8; 1964, A new Dictionary of Birds).

When a bird passes through a cone of light reaching an observer from the moon, its movement is visible as a silhouette against the lunar disc. Observations are best made with a low power telescope (15x to 20x) but a good field glass will give results. As comfort is essential in making reliable observations the glass should be mounted rigidly and in such a way that the observer finds most comfortable e.g. a tripod straddling a suitably inclined chair. To prevent eye strain and fatigue at least two observers are essential and positions should be frequently changed. Any passage of birds seen by one observer is recorded by the other together with the time the observation was made.

The apparent flight direction of an object is estimated by visualizing the illuminated disc of the moon at a 12 hour clock, with 12 o'clock at the top. The "hour" at which the bird enters the lunar disc and leaves it are noted to the nearest "half hour" e.g. entering at 1.30 and leaving at 8.00. This information is recorded for each bird together with the time of observation to the nearest minute.

In order to obtain the flight direction of a bird in the horizontal plane the elevation and azimuth of the moon - its position in space with re-

spect to the observer - are required. These need only be measured at one location as their values for a second location, for a given time, may be calculated using a computer provided the moon is visible simultaneously from both stations. All that is required from the second location is the latitude and longitude and the time of observation.

Observations are limited to the 5 days centred about the full moon and although this restricts the usefulness of the method it would mean less pressure on members time. By limiting the measurements to five nights each month and minimizing the number of bits of information for each observation to three (hour of entry, hour of exit, and time of observation), it is hoped that many will help in the project. During the nights selected for the moon watching, as many hours of observations as possible should be made. It is important to know the period during which the moon is observed and all interruptions must be recorded. This enables corrections to be made when estimating the density of migration from the observed movements.

Much of the night movement recorded are not birds but mostly bats, moths and other insects, but with practice these can be distinguished. Such unwanted observations will be minimized if observations are made from a site where there are few trees. As the telescope is focussed for distant objects the non-bird objects usually appear blurred as they cross the line of sight and their time of flight across the disc will be quite fast. Also near objects are often seen outside the disc of the moon before they cross the disc and such an observation would be important in deciding whether or not to accept a silhouette as a bird on migration.

Preliminary observations have been made at Legon and birds have been seen crossing the disc of the moon. One notable observation was at 10 p.m. on 2nd May 1969 when five birds (probably waders) crossed the disc in close formation. The hour of entry was about 8 and of exit 2.30 giving a westerly flight direction in the horizontal plane.

Members of the Society who would be willing to group themselves in pairs and participate in a moon watching programme should write direct to me. Further details will then be sent. Details of the computer programmes may also be obtained if required.

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