BUTTERFLY MIGRATION.

C.N.Smithers, Australian Museum, Sydney.

The last 15 to 20 years has seen an enormous increase in the interest taken in insect migration. Members of several orders of insects are known to migrate, the population movements sometimes being on such a scale as to receive mention in the press. These spectacular movements, however, are only a small part of the much less conspicuous, regular movement which is taking place. Insect migration has been more studied in butterflies and in the economically important locusts than in the other insect orders.

When butterflies are actively migrating they tend to have a more or less fixed line of flight, at least over short distances, although they may stop to feed at flowers; migrating individuals can often be recognized as such by this flight. Several means are open to us in our attempts to establish the direction and times of population movement. Individual butterflies can be observed and a note made of flight details, including such things as direction, time, weather conditions, etc. It is often found that a number of observations of isolated individuals will indicate a general similarity in flight direction over quite a period although this would not be suspected by casual observation. The times of arrival and disappearance of a species from various parts of the country may confirm suspected movement.

Labelling and releasing, which has been carried out for many years overseas, was only started on an organized basis in Australia last year and at present is somewhat restricted; the main species being marked is Danaus plexippus, the Wanderer or Monarch. Specimens for labelling are either collected in the field or reared in the laboratory through the larval and pupal stages to the adult. The adults are marked by sticking a paper label (bearing the words "Return Museum, Sydney" and a serial number) on the underside of the hind wing. Labels can be made small enough not to inconvenience even fairly small species.

Basically, the techniques used in the study of insect migration are similar to those used in bird studies. Differences are due to the differences between the biology of insects and birds. Butterflies are shorter lived, having one or more generations a year. There are many more specimens of butterflies in a population than those of birds. This usually means that we can mark more butterflies (in one exceptional case we have marked 1400 Wanderers in a day) but that the loss of marked specimens by death is greater than in birds. Our recaptures cannot be as great as in birds

(there are fewer people collecting butterflies in relation to the number of butterflies in flight) and we cannot hope to mark as high a proportion of the population as in birds.

Marking, however, is still well worth while as an indicator of distance, direction travelled and time of movement; it is, of course, used in conjunction with other methods of collecting data and not alone.

Butterfly migration is a very complex matter; the return flight (in those species in which it has been observed) is often made by individuals which may be one or several generations removed from those which previously made the journey. Quite often hibernation or aestivation (partial or complete) is included in the cycle.

We know of about 30 species of insects which migrate in Australia but this number is clearly only a tiny fraction of those which do undertake periodic movement. In its native country, America, the Wanderer undertakes journeys of up to 1800 miles; the indigenous Australian Caper White probably migrates for hundreds of miles. Marking and observation by observers over a wide area, co-operating in a single scheme, will, we hope, eventually tell us something of the tremendous population movements which take place in insects. Of about 9000 Wanderers marked so far, we have heard of about 90, which is not unsatisfactory in a scheme which has been running for less than a year.

It would be greatly appreciated if anyone capturing a marked butterfly could return it to me, at the Australian Museum, College Street, Sydney, with details of the place, date of capture and name of captor.

TETHERING OF MIST NETS.

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Experienced mist netters have recently been trying out a trial shipment of tethered nets. Blowing of nets has long been a problem and this method of tethering, originated by the British Trust for Ornithology, appealed as being an answer to the problem insofar as it is possible to find an answer. It must be realised of course that a strong wind blowing on a net (tethered or otherwise) will render it inoperative.

Tests with the tethered nets indicate that in some conditions where netting with normal nets is quite impossible