# On movements of the swift, *Micropus a. apus* L., during the breeding-season.

(Preliminary communication.)

JUKKA KOSKIMIES.

In Central Europe, attention has frequently been directed to the migration-like movements of the swift, *Micropus a. apus*, during the summer months. A number of the latest observations have been mentioned by NIETHAMMER (1938, p. 183) and by the Editors of „Der Vogelzug" (1941, p. 164). [1]) As stated by NIETHAMMER a review of the literature as well as a satisfactory explanation of this phenomenon, is still lacking. The observations, in most cases published as separate notes in different periodicals, have been interpreted in very different and indefinite ways. The greater number of the observers have regarded the summer-time movements of the swift merely as a regular migration, and then, depending on the direction of the flight and the more or less subjective estimation of the observer, either as „late spring migration" or „early autumn migration". For instance in four different years, movements occurring on June 27—28th, have twice been interpreted as the former, twice as the latter! The frequent observations from Eastern Prussia have also been explained as migration:

„Sehr auffällig und schwer zu erklären ist die Tatsache, dass auf dem Kurischen und Frischen Nehrung nicht selten schon Ende Juni und in den ersten Julitagen regelrechter Seglerzug nach Süden festzustellen ist. — Es können dies nur Vögel sein, die nich gebrütet oder ihre Brut verloren haben, denn Junge sind dann noch nicht flügge, vor allem nicht im Nordosten, woher die Vögel anscheinend doch kommen." (TISCHLER 1941: I, p. 517).

HURRELL (1937), for his part, interprets movements observed in July, as an after-nesting dispersal flight of young (compare TISCHLER!) swifts. NIETHAMMER (l. c.) uses vague words „die Erscheinung eines zugähnlich weiten Umherstreichens nicht brütender Seglerscharen (die mit der Brut aussetzen?) Ende Juni — Anfang Juli . . .".

[1]) A more thorough account of the observations known, including the complete bibliography, will be published later on.

In some quite obvious cases the movement has been explained as a permanent or temporary flight reaction, caused by unfavourable weather conditions. This view, particularly put forward in the oldest communications, has also been held by GROEBBELS (1932, p. 809), on the basis of two observations only. In the later reviews, however, as well as in connection with most of the separate observations, the weather conditions are placed in no causal connection with the movements of the swift during the breeding-season.

The material for the investigations, carried out in order to explain the above-mentioned movements, includes about 80 observations derived from literature, concerning evident summer-time movements of swifts in different parts of Europe. [1]) In addition to observations on a real movement, a number of observations concerning the appearance of the swift in localities where it usually never occurs, have also been taken into consideration. These observations are also a proof that a movement has occurred.

In the following, a short summary of the observations so far known is given.

The time of appearance of the movements comprises the whole breeding-season of the swift. After the spring migration, in the first half of June, movements occur quite rarely. Most observations date from the last week of June and the first week of July. After this, they regularly decrease in number until the end of July, at which time, in Central-European conditions, the normal autumn migration begins. The number of individuals which take part in the movements, ranges from a few to several thousands. The direction of flight varies greatly, the directions S—W—N, however, have most frequently been observed.

The breeding-time movements of the swift, described above *are evidently weather-flight reactions, by means of which the birds avoid the center of approaching bad weather, temporarily moving to localities, where the weather is more favourable.*

This statement is based, not only on the opinion of many observers, but also on analyses of the weather conditions on the days in question, made by the aid of synoptic weather-charts.

[1]) At the time of writing, the war-time issues of most of the foreign periodicals are not yet accessible Consequently, the material possibly appearing in those, must still remain outside this preliminary communication.

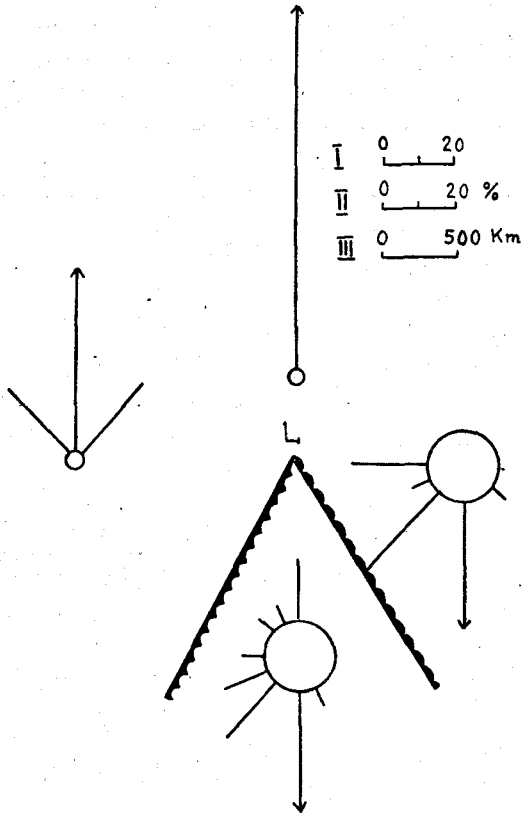


*Fig. 1.* The directions of the movements on the different sides of the cyclone (highly conventionalized). The scales: I. The number of cases observed (= the diameter of the circle). — II. The number of movements observed in different directions as a percentage of all the cases (= the length of the arrow). — III. The average distance of the movement localities from the center of the cyclone (= the distance of the circle from the center of the cyclone [L]).

Besides the observations concerning actual movements, the reports on swifts appe aring in localities where they are not usually to be seen take place, likewise, with scarcely any exception, simultaneously with a period of bad weather, very often immediately before a change of weather. The regular occurrence of wandering swifts outside their breeding-localities just before the beginning of a period of bad weather, has led to several popular names for the swift in different parts of Europe, indicating its „weather-forecasting" potentialities (Regenschwalbe, Wolkenschwalbe, Donderzwaluw, rengenspirun, regnspira, regnsölu etc.).

The movements of the swift during the summer months coincide, almost without exception, with the passage of cyclones characterizing the general weather conditions. [1])

Flg. 1 shows the direction of the movements on the different sides of the cyclone. As a cyclone approaches, movement southward or southwestward occurs. Directly on a level with the cyclone movement

[1]) The structure and characteristics of a cyclone need not be touched upon in this connection, as this matter is to be found in every textbook of meteorology.

chiefly in a southern or southwestern direction, likewise, is to be observed. „Behind" the cyclone, after its passage, as well as on its north side the swifts observed have moved more or less northwards. By knowing the general course of the aerial currents of a cyclone, it is easy to show that *the movements are regularly directed against the wind.* This fact has also been mentioned in connection with many field observations. By flying continually against the wind the birds easily avoid the cyclone by way of the south-side, that is to say by way of the side of the so-called warm sector of the cyclone.

Are the activation and movement of swifts by a approaching cyclone caused chiefly by the direct physiological effect of the cyclone or by a more indirect effect, brought about by means of the lack of food caused by the cyclone? This question must still be regarded as open. It is, however, at least evident that the cyclone does produce an effect on the food conditions of the swift. This species is known to be a highly-specialised bird, which feeds solely on the insects of the aerial plancton. As a cyclone approaches (at least during the so-called warm-front rain, preceeding the warm sector of the cyclone) the number of insects in the air decreases to such a degree that the swifts can not longer satisfy their food requirements, which are especially large because of the continued labour of flying. After the activation caused by the lack of nourishment, they move southward, the direction of their flight being determined by the wind direction. In many cases at least, they return to their starting point after the bad weather has passed over.

How long a distance do the swifts fly during their weather-flight movements? There is no certain information about this, but having regard to the flight achievements and the very long period of diurnal activity of this species, it is not difficult to estimate that the swift, during one day, is well able to fly at least 1000 kilometers. Under certain weather conditions, swifts often occur in such quantities far from the breeding-localities, that they must have collected from very wide areas.

Where do the swifts which appear in the middle of the breeding-season, come from? Is there regularly among the swifts so large a number of non-breeding individuals, that in the middle of the breeding-season movements comprising several thousand individuals can take place? Or are the wanderers breeding individuals, which

temporarely interrupt their breeding in order to avoid the cyclone causing bad weather and lack of food.

It is evident that *the majority of these wanderers are young, generally non-breeding birds from the preceding year.* These birds appear to be — especially during bad weather — very little tied to their regular habitats (WEITNAUER 1947). The participation of breeding individuals in the movements seems to be more uncommon, but there are definite observations to be stated about that also (WEITNAUER l. c.). Theoretical grounds too certainly exist to suggest that *the breeding adults swifts can also take part in these movements.*

Experimental investigations, made among others by the author, [1]) have shown that the adult swifts are much more sensitive to hunger than nestlings. Even by a fast of 2—3 days they are weakened in a very critical manner and on the 4th fast-day they die in most cases. This fact shows that *the adult swifts are not able to resist a lack of food caused by a long period of unfavourable weather.* Practically unbroken rain periods of, for instance, 5 days during the breeding-season of the swift occur, as is known, rather frequently. If they were continually to cling to the breeding localities, they would starve to death. Then the whole brood would be doomed, too. Catastrophes of this kind are not uncommon in connection with the breeding of swifts (and swallows).

If the adult birds, on the other hand, avoid the cyclone by the aid of flying, as they are well able to do, they continually get food. By returning, after the bad-weather period, they can continue to breed — even though they may have been absent for as long as a week. *The nestlings of the swift* — in contrast to the adult swifts and the young of smaller birds in general — viz. *are very tenacious against hunger.* Thus, the young used in experiments have well withstood a fast period of 7 days, even under rather severe experimental conditions.

The young of the small insectivorous birds are generally known to be very sensitive to lack of food. A fast exceeding 2 days may be quite exceptional. Considering this, the ability to resist hunger, peculiar to the swift, must be regarded as a very remarkable specialisation of the general metabolism of this bird.

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[1]) In this connection these investigations will not be touched upon closer. The most important results will be published before long.

On account of this fact the flight of the adult birds from the breeding localities on the approach of a cyclone does not bode the destruction of the brood, but rather its salvation.

**Literature:** Groebbels, F., 1932, Der Vogel. Bd. 1. Berlin. — Hurrell, H. G., 1937, Influence of weather on dispersal of swifts and swallows after nesting. Br. Birds 30: 355—356. — Niethammer, G., 1938. Handbuch der deutschen Vogelkunde. Bd. 2. Leipzig. — Tischler. F., 1941, Die Vögel Ostpreussens und seiner Nachbargebiete. Bd. 1. Königsberg/Berlin. — Weitnauer, E., 1947, Am Neste des Mauerseglers *Apus apus apus* (L.). Orn. Beobachter 44. Beiheft, p. 133—182.

## Tiedonantoja. — Meddelanden.

**Punarinta, *Erithacus rubecula* (L.), pesinyt rakennukseen Helsingin Seurasaaressa.** 18. VII. 1947 löysin punarinnan pesän Helsingin Seurasaaresta. Se sijaitsi saaren itärannalla ulkomuseoon kuuluvan Konginkankaan Niemelän torpan savusaunassa kourupalkkikaton alla, tasan 2 ½ m:n korkeudella, pihaan päin olevan sivuseinän puolella lähellä rakennuksen päätyä. — 19. VII. kävin jälleen paikalla. Pesässä oli hyvin pieniä poikasia, joille lintu kanniskeli hyönteisiä. Paikalla en koskaan huomannut muuta kuin yhden punarinnan.

Torpan alueella kasvaa enimmäkseen mäntyjä — kookkaita, harvassa seisovia puita, lisäksi joku pihlaja, koivu ja kuusi. Pihatantereen kasvillisuus on niukanlaista, vain joidenkin heinäkasvien lisäksi tapaa siellä esim. maitikkaa, syysmaitiaista ja vähän myös mustikanvarpuja.

Lintu pysytteli visusti torpan rakennusten tienoilla, ja kummallinen piirre siinä oli sen äänettömyys. Ei edes pesän luona se päästänyt kuuluville minkäänlaisia varoitusääniä. Lisäksi lintu vaikutti hyvin kesyltä. Se päästi katselijan aivan lähelle, jopa vain 1,3 m:n päähän, ja antoi tarkastella itseään varsin kauan. — Lintu menetteli siis monessa suhteessa meikäläisestä, arasta, yleisestä punarintatyypistä poikkeavasti.

Kourupalkkien muodostaman, pesään johtavan käytävän suun leveys oli alhaalta likipitäen 18 cm, keskikohdalta n. 11 cm. Aukon korkeus oli n. 10 cm. Pesä sijaitsi heti ylimmäisen sivuseinähirren takana, välikaton päällä. Kun poikaset olivat elokuussa jättäneet pesän, siinä oli yksi hedelmätön muna.

Pesä oli kooltaan hyvin suuri, tehty sammalista, heinistä ja korsista sekä kuivista koivunlehdistä ja sisustettu heinillä ja hienoilla juurilla. Sen keskustana olevat sammal ja lehdet oli ympäröity runsaalla määrällä heiniä. — Pesää ja munaa säilytetään Helsingin Yliopiston kokoelmissa.

Pesän sijaintipaikka on meikäläisissä oloissa hyvin erikoinen. Kuten tunnettua, punarinnan pesä on tavallisesti maassa tai aivan lähellä sitä, jos-