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The invasions of the Kittiwake (*Rissa tridactyla*) into Finland in February and March 1959 and 1962

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VÄLIKANGAS (1930) published a detailed account of a kittiwake invasion observed in Finland in March 1927. According to him, such invasions had previously occurred in Finland in 1894 and 1911.

In February and March, 1959, and again at the same time in 1962, further invasions of the kittiwake were observed in Finland. The following information concerning these invasions has been obtained from the Zoological Museum, University of Helsinki, the Game Research Institute of the Finnish Game Foundation, the Natural History Museum at Oulu, Mr. Aimo Komonen (Rovaniemi), various publications and newspapers, and private persons, to all of whom I express my gratitude.

Observations in 1959

The observations made in 1959 are listed from north to south as follows:

1. Kittilä, Kinisaapa. 2. III. A dead specimen was found (A. Palo). — Game Research Institute.
2. Muonio, church village. 2. VIII. One flying specimen was seen chased by a flock of magpies. — Newspaper Lapin Kansu 12. III. 1959.
3. Rovaniemi, Marraskoski. 24. III. A dead specimen was found on the ice (O. J. Kettunen). — Lapin Kansu 27. III. 1959.
4. Rovaniemi, Olkkajärvi. 5. IV. A dead specimen was found on the ice (E. Kenttälä). — Lapin Kansu 7. IV. 1959.
5. Rovaniemi, Viirinkylä. 3. III. A dead specimen was found on the ice (Ollila). — Lapin Kansu 7. III. 1959.

6. Ylitornio., Portimojärvi. 5. III. A specimen flew into an electric cable and was killed. — Lapin Kansa 7. III. 1959.

7. Ranua, Saukkojärvi. 1. III. A specimen in poor condition was caught by hand and died after a few minutes (A. Koukkula). — Lapin Kansa 7. III. 1959.

8. Ii, Olhava. 9. III. A specimen was observed during a few days at the mouth of the river (A. Haatainen). — Lapin Kansa 10. III. 1959.

9. Oulunjoki, Madekoski. 12. III. A dead specimen was found. — The Museum of Natural History, Oulu.

10. Raahe. 28. II. Two specimens were seen flying. — Club »Ameba».

11. Raahe, Kallansaari, 22. III. A dead specimen was found. — Club »Ameba».

12. Raahe, Rantakatu. 24. III. A dead specimen was found. — Club »Ameba».

13. Raahe. 24. III. Two specimens were seen flying. — Club »Ameba».

14. Raahe. 12. IV. Seven specimens were seen flying (an uncertain note). — Club »Ameba».

15. Larsmo. 24. II. A specimen in poor condition was caught by hand, but revived and was set at liberty (BÄCK 1959).

16. Yksipihlaja. 26. II. A specimen was seen. On 27. II it was found dead (BÄCK 1959).

17. Kokkola, Kallinen, 25. II. A specimen in poor condition was caught by hand, but revived and was set at liberty (BÄCK 1959).

18. Reisjärvi. 28. II. A dead specimen was found (BÄCK 1959).

19. Alahärmä. 28. II. A specimen was seen flying along the river Lapua to the north. It was reported as *Larus canus*, but it may have been *Rissa tridactyla* (K. Kuoppala). — Newspaper Helsingin Sanomat 5. III. 1959.

20. Vaasa, Vaskiluoto. 3. III. A specimen was seen flying (BÄCK 1959).

21. Malax, Penikkaström. 1. III. A specimen was seen flying (BÄCK 1959).

22. Pörtom. 27. II. A dead specimen was found (BÄCK 1959).

23. Karstula, Korppisenjärvi. 3. III. A dead specimen was found (HUKKI 1960).

24. Töysä, Tuuri station. 25. III. A dead specimen in poor shape was found (SAARINEN 1959).

25. Laukaa, Vihtavuori. 5. III. A dead specimen was found in a field (VALOVIRTA 1959).

26. Vesanto, Horontalpaie. 4. III. A dead specimen was found on the ice (V. Rantalainen). — Game Research Institute.

27. Kuusjärvi, Outokumpu. 25. III. A dead specimen was found (LEHTONEN 1959).

28. Rauma rural commune, Sorkankylä. 20. III. A dead specimen was found (V. Rantalainen). — Game Research Institute.

Observations in Sweden in 1959

On March 30, a young *Rissa tridactyla* was shot at Härnösand on the Swedish coast of the Gulf of Bothnia (SELANDER 1960). This specimen may have belonged to the invasion of spring 1959, but it may equally well have been a solitary vagrant. This supposition is supported by the fact that it was a young bird (cf. VÄLIKANGAS 1930).

No other observations have been reported from the central and northern parts of Sweden. On the other hand, there are records of kittiwakes on the west coast of the country. These birds are quite regularly observed there, however, during migration periods (ANDREASSON & ÄNGERMARK 1960, ERIKSSON 1960, GRAEN 1960, NYSTRÖM & GRAEN 1959, ÄNGERMARK 1961), so there cannot be any question of an invasion.

The general features of the 1959 invasion

In fig. 1 are seen the Finnish observations (dots) and the Swedish observation (circle) of the occurrence of the kittiwake in spring, 1959. Fig. 2 shows the invasion of the kittiwake in 1927, according to VÄLIKANGAS (1930).

In 1959, the first specimens of the kittiwake were observed in this country on February 24–28 on the coast of the Gulf of Bothnia and in its immediate neighbourhood. Most of the birds were seen flying but even at that time a few dead specimens were found. In the first days of March several dead specimens were found in the valleys of the rivers Kemi and Tornio, but as far north as Muonio one specimen was

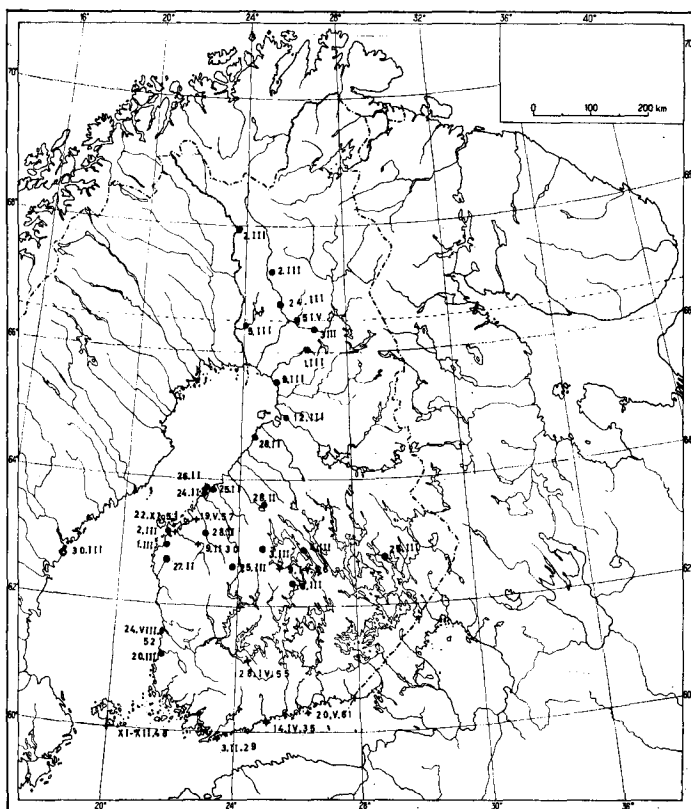


Fig. 1. The occurrence of the kittiwake in Finland in 1928–61. ● observations in February–April 1959, + other observations in 1928–61, ○ Swedish observations.

seen flying. At the same time some dead specimens were also found in central Finland, and several more in the end of March and beginning of April. Living specimens were believed to have been seen at Raahe as late as March 24 and April 12. The observations are clearly concentrated in the western parts of the country and in central Finland. They are confined to the districts of the rivers Tornio and Kemi, the Gulf of Bothnia, and the lake district of the inner part of Finland. On closer examination the fact emerges that almost all specimens have been encountered by a river or lake, or the sea. It is noteworthy that there is not a single observation from the thickly inhabited south of Finland, so the invasion must have been confined to central Finland.

The first observations were made on the coast of the Gulf of Bothnia, but immediately afterwards some specimens which had already been dead for some time were found in Lapland. In view of the sparse population of northern Finland and the considerable number of observations, it appears evident that the invasion came from the north-west or from the north, across north-western Norway and northern Sweden. From the coast of the Gulf of Bothnia some specimens started wandering into the interior of Finland, but perished in the hard winter conditions. A similar fate overtook some specimens on the coast of the Gulf of Bothnia, where there was open water only in extremely small areas. In their natural surroundings, in the ocean, kittiwakes feed on young cod and herring and small invertebrates, but even in the Gulf of Bothnia it was almost impossible to get such food at that time of year. Driven by hunger, the birds tried to find food in inhabited areas, but even there the difficulties were great. Shortage of food must be considered the reason for the death of the birds rather than the winter weather conditions, which were not even average hard in Finland that year because of the early spring. A very small proportion of the kittiwakes may have got back to the coast of Norway. A hint of this is given by the observation made at Raahe, according to which 7 specimens were seen flying on April 12. In the case of these specimens there cannot be any question of a new invasion.

In his paper of 1930, VÄLIKANGAS did not mention the age of the birds which took part in the 1927 invasion. The age of only five birds, found dead, was known out of all the specimens observed during the 1959 invasion. They were all young birds which would have bred that year for the first time.

The kittiwake invasion observed in March, 1927, came over to Fin-

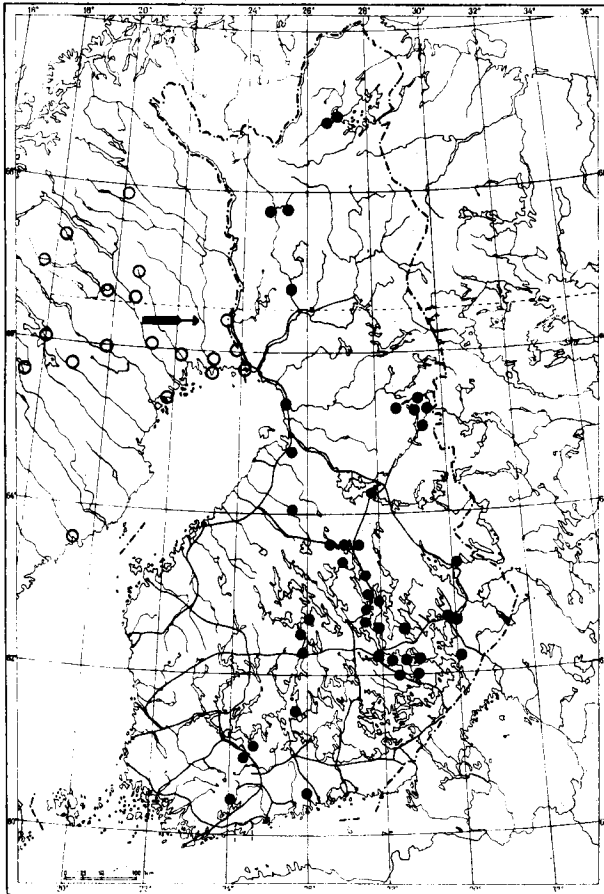


Fig. 2. The invasion of the kittiwake into Finland in 1927 (according to Välikangas, see text).
 ● observations in Finland, ○ observations in Sweden.

land, according to VÄLIKANGAS (1930), from the west across northern Sweden. The centre of this invasion was clearly in central and eastern Finland, extending down to the coast of the Gulf of Finland. The 1959 invasion probably came from somewhat farther north than the 1927 invasion, but its centre was clearly in the western parts of the country. Both in regional extent and number of specimens it was less important than the earlier invasion. If the kittiwakes observed in 1927 at Kaamanen, Inari (VÄLIKANGAS 1930), were part of the same invasion as was observed in southern Finland, that invasion was considerably stronger

than the one in 1959. That year, moreover, return migration was observed (namely, on March 18 and 19, 1927, thousands of kittiwakes were observed flying to the north-west at Kaamanen, Inari), but could not be definitely established in 1959. Both invasions took place during the spring migration, but the 1959 invasion was about 2–3 weeks earlier than the invasion in 1927. One reason for this might be the fact that in 1959 the spring was earlier than usual.

Observations in 1962

The following records were mainly collected by Mr. Aimo Komonen. The observations are listed from north to south.

1. Inari, Tsiuttajoki. 2. III. A specimen was seen flying during a heavy snowstorm (B. M. Aikio).
2. Sodankylä, Sompio. 4. III. A specimen was found on Taritsioja, where a few days earlier a puffin (*Fratercula arctica*) had been seen (Lalli).
3. Kittilä, Tepasto. 6. III. A dead specimen was found, but some days before two specimens had been seen on a river (according to V. Salkio).
4. Kittilä, Kiistala. A specimen was seen flying from north to south, sometimes taking short rests on the ground (A. Rautava).
5. Muonio. 6. III. A numb specimen was found (Pohjolan Sanomat 8. III. 1962).
6. Muonio, Torassieppi. In February six specimens were seen flying (A. Kotakorva).
7. Kittilä, Kuivasalmi. 7. III. A dead specimen was found on the ice (S. Loukinen).
8. Kittilä, church village. 6. III. A dead specimen was found (J. Rönkäharju).
9. Sodankylä, Moskujärvi. 3. III. A specimen was seen and on 4. III it was found dead (F. Riipinen).
10. Kolari. 23. III. A dead specimen was found (according to S. Sulkava).
11. Kittilä, Alakylä. A specimen was seen flying above yards (A. Leinonen).
12. Rovaniemi, Raudanjoki. 20. III. A dead specimen was found on the ice (M. Annanpalo).
13. Kemijärvi, Ylikylä. 6. III. A dead specimen was found (H. Pekkarinen).
14. Turtola, Pello. 8. IV. A dead specimen was found (according to S. Sulkava).
15. Ylitornio, Raanujärvi. 4. III. A specimen was seen flying above a yard searching for food (T. Romakkanieni).
16. Rovaniemi, Maijasenkylä. 9. III. A dead specimen was found on the ice (E. Martti).
17. Kemijärvi, Särkikangas. 20. I. A specimen was seen feeding on refuse (I. Koponen).
18. Kemijärvi, Kuusivaara. 3. III. A specimen was seen feeding on refuse (P. Hakuinen).
19. Rovaniemi, Oikarainen (village). 24. II. A specimen was seen feeding on fish (refuse). It was flushed at a distance of about five metres (P. Alaraudanjoki).
20. Rovaniemi, Saarenkylä. In February a flying specimen was seen, pursued by a great flock of magpies (T. Tolonen).
21. Rovaniemi, town. 15 (?). II. A specimen was seen flying above a playground and sitting on the roof of a school (A. Heikinheimo).
22. Oulu, town. 3. III. A specimen was seen flying over the harbour (E. Kaakinen).

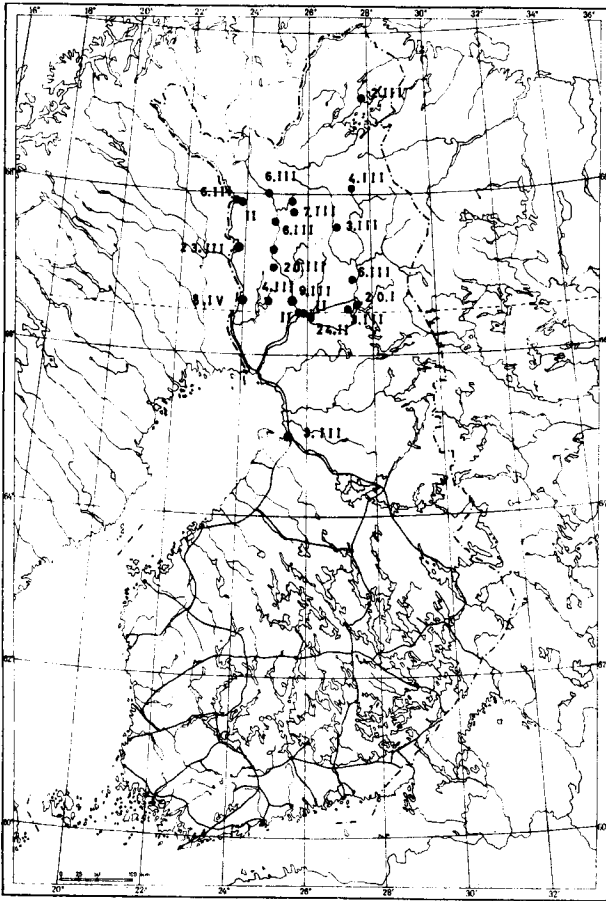


Fig. 3. The occurrence of the kittiwake in Finland in January-March 1962.

The general features of the 1962 invasion

The observations of the kittiwake in 1962 are shown in fig. 3.

As early as January 20, a kittiwake was reported to have been observed feeding at Särkikangas, Kemijärvi. This specimen cannot possibly have belonged to the clear invasion observed in northern Finland during the end of February and beginning of March. During February, kittiwakes were observed at Muonio and Rovaniemi. The observations made in the city and rural commune of Rovaniemi may be of the same specimens, for all the records (3) are of a living specimen. It is not

outside the bounds of possibility that the specimen observed at Kemijärvi in January might have survived for about a month in unaccustomed conditions and during that time flown from Kemijärvi to Rovaniemi (a distance of less than 100 kilometres). Most of the observations were made during a short time in the beginning of March, coinciding with those observations for which no exact dates were given. The last observation was made on March 20, when one specimen was found which had been dead for a long time. In all, 7 dead specimens were found, while the other observations were made on living specimens. Some of the living specimens were in extremely poor condition. Most of the observations (15) were made in the basin of the river Kemi. Other observations (7) were made on the shores of the river Tornio and Lake Inari and on the coast of the Gulf of Bothnia. The observations show a clear concentration in the neighbourhood of waterways and especially in unfrozen places (cf. distribution in 1959 p. 84).

Because of the difficulties of getting food the birds sought out inhabited districts, where they were seen feeding on refuse heaps, among other places.

The 1962 invasion, like those of 1927 and 1959, must have come from the west or the north-west, which seems to be the most likely direction in this case. According to the data available to the present author, the invasion only extended as far south as Oulu.

The age of three of the specimens found dead was established with certainty: these were all old birds (no neck-stripe). As observations were only obtained for so few specimens, no far-reaching conclusions can be drawn.

The centre of the 1962 invasion is clearly in the north, in the district of the river Kemi, thus differing clearly from the 1927 and 1959 invasions. The 1962 invasion must have been very considerable, in view of the relatively large number of observations and the sparse population of northern Finland. It seems likely that there was no return migration comparable to that of 1927. At least the data available provide no evidence of such a return.

Factors influencing the 1959 and 1962 invasions

The reason why kittiwakes, birds of the Arctic Ocean and thus alien to the Finnish fauna, appeared in Finland in February and March,

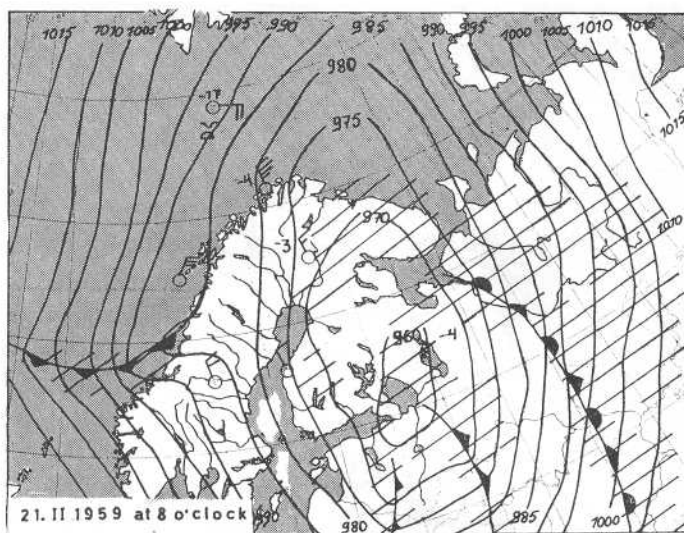


Fig. 4. Weather conditions in the northwestern parts of Europe on 21. II. 1959 at 8 o'clock (according to the Finnish Meteorological Office).

1959 and 1962, may be found in the weather conditions in the north Atlantic at that time.

Especially in 1959, January and March were exceptionally stormy in the north Atlantic. The meteorological establishment of northern Norway had to issue over 100 storm warnings to ships. The heavy storms on the north-west coast of Norway which arose during the night of February 18—19 reached their climax on February 21 (fig. 4). A strong north-western air-current brought arctic air masses over the Norwegian mountains. The weather sequence in northwestern Europe on February 25 and 26, 1962, can be seen from figs. 5 and 6. On February 26, arctic air-masses were carried by strong winds from the north to northern Norway and northern Finland.

According to COOKE (1945), kittiwakes migrate to their breeding places in March and April. COOKE's observations concern the situation on the west coast of the Atlantic, so it is possible that the time reported does not fully apply to the European coast. In addition, the arrival of spring, which was early in 1959, may have influenced the migration. The invasions of 1959 and 1962 differed in time by only about 10 days, which may be causally connected with the advent of spring. It is obvious that in both years migrating kittiwakes got caught in the heavy

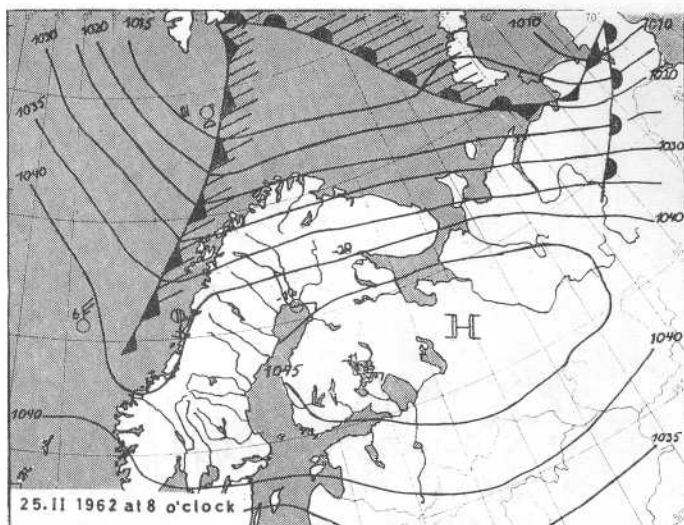


Fig. 5. Weather conditions in the northwestern parts of Europe on 25. II. 1962 at 8 o'clock (according to the Finnish Meteorological Office).

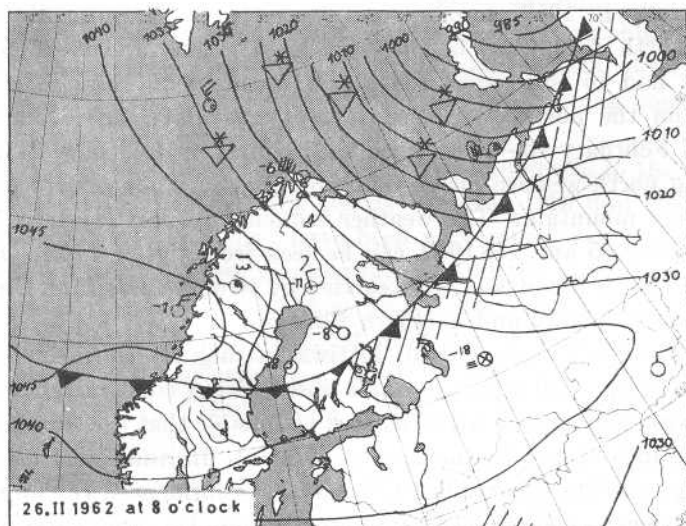


Fig. 6. Weather conditions in the northwestern parts of Europe on 26. II. 1962 at 8 o'clock (according to the Finnish Meteorological Office).

storms mentioned above, which pushed them over the mountain range in Norway to northern Sweden and northern Finland. In Finland, the strength of the storm was not more than about 4–5 beauforts. Struggling against the storm and the cold on the mountains, the birds would have weakened, so it is no wonder that a considerable number of them perished on reaching continental conditions where it was extremely difficult to obtain food.

In 1959, coinciding with the Finnish kittiwake invasion, a similar occurrence of the fulmar (*Fulmarus glacialis*) was observed on the west coast of Sweden (LARSSON 1960), which was attributed to the storms in the Atlantic.

Both in 1959 and 1962, the time interval between the storms and the arrival of the birds in this country (in 1959 February 18–21 to February 24) would have been sufficient to allow the kittiwakes to cover the distance from north-western Norway over to northern Finland. The observations made in 1962 of living birds in northern Finland are especially valuable in this respect (in 1959 only one observation, at Muonio on March 2).

The observations made at Kemijärvi and Rovaniemi in January and in the middle of February, 1962, form quite a separate problem. As mentioned above (p. 87), these may have referred to one and the same specimen, which would then have been a solitary vagrant, or there may have been an earlier, smaller invasion into this country. Because of the small number of observations, the question must remain open.

Observations of the Kittiwake made in Finland in 1928–1961 (with the exception of the early part of spring 1959)

After excluding records relating to the 1959 invasion, the present author has been able to trace only 10 observations of the kittiwake in the period 1928–1961. These few observations are listed in the following (fig. 1).

1. Jussarö. 3. XI 1929. A young specimen was seen in the outer islands (E. J. Fabritius) — Zool. Mus.
2. Ylistaro. 9. II 1930. A young specimen was shot on the ice of a lake (W. Ekman). — Zool. Mus.
3. Helsinki, Hietaniemi. 14. IV 1935. A young specimen was seen on the ice searching for food (REINIKAINEN 1935).
4. Lemland. XI–XII 1948. A specimen was shot (M. Donning). — Zool. Mus.
5. Pori (rural district), Yyteri. 24. VIII 1952. Two young specimens were seen among *Larus canus* and *Larus ridibundus* (TENOVUO 1954).

6. Vaasa, Brändö bro. 22. IX 1953. A specimen was seen flying (L. Österblad). — (BÄCK 1954).
7. Tyrväntö, Lahdentaka. 28. IV 1955. A young specimen was seen among *Larus canus* (A. Haapanen).
8. Saarijärvi, Summasjärvi. 9. IV 1956. A dead specimen was found on the ice (H. Pietiläinen). — Zool. Mus.
9. Oravainen. 19. V 1957. A specimen was seen (BÄCK 1958).
10. Pernaja, Aspskär. 20. V 1961. A young specimen was seen flying (L. Aarnio, K. Eriksson, K. Keynäs & A. Vuorjoki).

Observations were made both in autumn (in August—December) and in spring (in February—May). Most of the specimens (8) were seen on the coasts of the Gulf of Bothnia and the Gulf of Finland and in Ahvenanmaa. There are only three observations from the interior. In one case, a dead specimen was found (at Saarijärvi), which affords proof of the fact that these typical sea-birds cannot survive in continental conditions. The age of 7 of the 11 specimens observed was established, and they were all immature. So the specimens must be considered vagrants and not regular migrants. This seems the more probable because there were only 10 observations during the whole period of 33 years.

Discussion

J. A. PALMÉN (1876) includes the kittiwake among the arctic coastal birds whose main migration route in Europe runs from the Arctic Ocean along the coast of Norway down to the coast of western Europe, etc., but which also use the route from the White Sea across Lakes Onega and Ladoga down to the Gulf of Finland or even, though only occasionally, the route from the White Sea to the Gulf of Bothnia, for example, through Kuusamo and Lake Oulu. HORTLING, too, (1927, 1928) has regarded the occurrence of the kittiwake in Finland as a sign of normal migration. Analysing the invasion of the kittiwake in 1927, VÄLIKANGAS (1930, 1931) arrived at the conclusion that the spring observations of the kittiwake in Finland are to be reckoned as an occasional phenomenon, probably due to snowstorms driving the birds over the mountains from the coast of Norway. According to him, even the specimens observed in spring and autumn cannot be considered to represent regular migrants, but are vagrants.

As mentioned above, there are only 10 certain observations apart from those relating to the 1959 invasion, of the occurrence of the kitti-

wake in this country; these, however, were made both in autumn and in spring. A significant point about these observations is the fact that all the birds whose age was established were young specimens. COOKE (1945) has proved in his investigations that before their first breeding season kittiwakes may wander quite long distances. Thus, according to ringing observations, some specimens have wandered across the Atlantic and must be included among the so-called transatlantic migrants (cf. also DEMENTIEFF 1946, DROST 1951, SCHÜZ 1952). This also explains the observations of young specimens in Finland. They are just like those mentioned above, and during their wanderings have come to Finland. Often such juveniles seem to try to make their way with other larine birds. It is worth noticing that all the observations are concentrated in districts near the sea and sea gulfs; getting lost inland seems to mean inevitable death, especially during the winter time. Hence we cannot speak of a migration of kittiwakes across Finland.

A very interesting question, in view of the considerations referred to above, is the age of the specimens observed. In his investigation VÄLIKANGAS (1930) does not give any information on this point. In the case of the specimens found dead during the 1959 and 1962 invasions the age of the birds could be found out. The specimens of the 1959 invasion whose age was established, were young ones which would have bred that year. The kittiwakes examined in 1962 (3) were old specimens. So it seems obvious that the specimens met with during the invasions were typical migrants which would very likely have bred that summer.

Summary

In February and March, 1959, the kittiwake, which breeds on cliffs in the Arctic Ocean and on the coast of the north Atlantic, was observed in central and northern Finland at the places indicated in figure 1. In the beginning of March, 1962, this species was again observed in this country. On that occasion the observations were concentrated in northern Finland. In 1959, 28 observations were reported, and in 1962 22, while between 1927 and 1961 (with the exception of the year 1959) there were only 10 observations. Both in 1959 and 1962 there was a clear invasion of the species into Finland after an interval of 32 years (1927—59).

The invaders came to Finland through north-western Norway and

northern Sweden, extending as far south as Rauma in 1959 and Oulu in 1962. In 1959 the centre of the invasion was clearly in the western part of the country and in 1962 in northern Finland. It is significant that in both cases several specimens perished for lack of food. In 1959, a few specimens probably flew back to the breeding places from the Gulf of Bothnia.

On an earlier occasion a corresponding invasion was observed in Finland in 1927 (fig. 2), and its centre was primarily in the eastern part of the country, extending down to the Gulf of Finland (VÄLIKANGAS 1930). In respect of number of specimens, this invasion was stronger than the invasions of 1959 and 1962.

Both in 1959 and 1962, the storms in the north Atlantic pushed migrating kittiwakes over the mountains in Norway and Sweden as far as Finland.

In some cases the age of the specimens which were found dead during the invasions could be established, and it was found that the birds were either young ones which would have bred that year (1959) or old birds (1962).

Most of the other specimens (all whose age was established) observed in this country in the period 1928—1961 were young specimens, vagrants which had reached Finland accidentally. There was certainly no question of a regular migration, though the specimens were observed during the migration period.

So the investigation has led to the conclusion that the kittiwake does not occur in Finland (and obviously not generally in the Baltic area) as a regular migrating bird but only as an occasional species. The specimens occasionally observed have belonged to two different categories:

(1) immature vagrants, solitary specimens of which are met with both in autumn and in spring

(2) mature birds, which during their spring migration have been driven off their regular migration route by storm.

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Selostus: Pikkukajavan (*Rissa tridactyla*) invaasiot Suomeen helmimaaliskuussa vv. 1959 ja 1962.

Helmi–maaliskuussa 1959 havaittiin Keski- ja Pohjois-Suomessa Jäämeren lintuvuorilla ja Pohjois-Atlantin rannikoilla pesivää pikkukajavaa useilla paikkakunnilla, jotka on merkitty kuvaan 1. Pääasiassa maaliskuun alussa 1962 tavattiin jälleen mainittua lintulajia maassamme. Tällä kertaa havainnot keskittyivät Pohjois-Suomeen. V. 1959 oli ilmoitettuja havaintoja 28 ja 1962 vastaavasti 22, kun niitä vv. 1928–61 (lukuunottamatta v. 1959) (kuva 1) oli vain 10 kpl. Sekä v. 1959 että v. 1962 oli lajin selvä invaasio Suomeen 32 vuoden tauon (1927–59) jälkeen.

Invaasiot tulivat Suomeen Luoteis-Norjan ja Pohjois-Ruotsin kautta ulottuen v. 1959 Raumalle ja v. 1962 Ouluun saakka etelässä. V. 1959 oli invaasion painopiste selvästi maan länsiosissa ja v. 1962 vastaavasti Pohjois-Suomessa. Huomattavaa oli kummassakin tapauksessa lukuisien yksilöiden menehtyminen ravinnon puutteessa. V. 1959 lienee muutama yksilö selvinnyt takaisin Norjan rannikolle Pohjanlahdelta.

V. 1927 havaittiin edellisen kerran vastaavanlainen invaasio Suomessa (kuva 2), jonka

painopiste oli lähinnä maan itäosissa ulottuen aina Suomenlahdelle saakka (VÄLIKANGAS 1930). Tämä invaasio oli yksilömäärältään suurempi kuin vv. 1959 ja 1962 invaasiot.

Sekä v. 1959 että v. 1962 Pohjois-Atlantilla vallinneet myrskyt painoivat muuttomatkaltaan olleita pikkukajavia Norjan ja Ruotsin tuntureiden yli Suomeen saakka.

Invaasioiden aikana löydettyistä kuolleista yksilöistä on määritetty ikä joissakin tapauksissa, jolloin on saatettu havaita, että linnut ovat joko sellaisia nuoria lintuja, jotka olisivat pesineet k.o. vuonna (1959), tai vanhoja lintuja (1962).

Maassamme vv. 1928–61 havaitut muut yksilöt (11 kpl) olivat suurimmaksi osaksi (kaikki ikäsuhteiltaan ilmoitetut) nuoria yksilöitä, jotka ovat satunnaisesti tänne joutuneita harhalijoita. Ei myöskään tässä tapauksessa ole siis kysymys säännöllisestä muutosta, vaikka yksilöt onkin havaittu muuttoaikoina.

Tarkastelu johtaa siis tulokseen, että pikkukajava ei esiinny Suomessa (eikä ilmeisesti yleensääkään Itämeren piirissä) säännöllisenä muuttajana vaan satunnaislajina. Satunnaisesti esiintyneet yksilöt ovat kuuluneet kahteen eri kategoriaan:

1. imatureihin harhallijoihin, joita tavataan yksittäisinä yksilöinä sekä syksyllä että keväällä

2. sukukypsiin lintuihin, jotka ollessaan kevätmuutolla ovat joutuneet joukoittain myrskyn ajamiksi harhautuen normaailta muuttoreiltään.

Significance of interspecific and intraspecific bird calls in the predator-prey relation ¹

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With the help of experiments arranged with attraps, many important results elucidating the instinctive behaviour released by visual stimuli have been yielded in the field of modern ethology. Innate defence reactions for avoiding danger from the natural enemies of the species play a very central rôle among these instinctive functions. The well-known experiments with hawk-goose models releasing a fear reaction when sailed the short neck first are classic in the field.

In describing these reactions »innate» we mean that they are instinctive activities not based on learning, which are immediately discharged in response to certain comparatively simple combinations of stimuli. The above mentioned experiment with a hawk-goose model, for instance,

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