

III. MOULTING *A. ANSER* ALONG THE GOTLAND COAST

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The investigation was carried out by Rolf Beinert and Lambart von Essen, Swedish Sportsmen's Association, with financial support from the Research Committee of the National Swedish Environment Protection Board.

Summary

Every year in the 1960's and 1970's 4000 – 5000 *A. anser* have gathered for moulting along the coast of the island of Gotland in the Baltic Sea. Between 1965 and 1975, 870 moulting geese were caught and ringed in order to elucidate their origin and migratory routes. On the basis of belly markings probably about 50 percent of the geese were one or two years old, the rest older. Some of the geese had orange-coloured bills, which has been said to be characteristic of the subspecies *Anser anser anser* with a western distribution, and some pink (light red), characteristic of the subspecies *Anser anser rubrirostris*, Swinhoe, with an eastern distribution.

The investigation has shown with many examples that some of the moulting geese originate from breeding areas south and south-west of the Baltic. From the 195 recoveries (22%) it is shown that the geese are using two different migratory routes to their winter quarters: one along the Atlantic coast towards the south of Spain, the other directly south to the Mediterranean coast of Africa. However a part of the population obviously seems to stay over the winter in the middle European countries.

The recoveries are counted up to the end of 1980 and it is shown that 60% of the recovered geese were shot or found dead in a period up to three years after they were ringed, and 95% in a period up to eight years. 89% are reported as shot, while for 11% the cause of death is unknown.

The moulting place on Gotland is considered to be very important to the non-breeding *A. anser* population from large areas of the southern part of the Baltic.

Since 1977 one of the most important feeding grounds for the moulting *A. anser* – two islands off Rone – has been protected as a Nature Reserve. In addition a tongue of land on the southwest coast – Nasudden – is protected from public trespass.

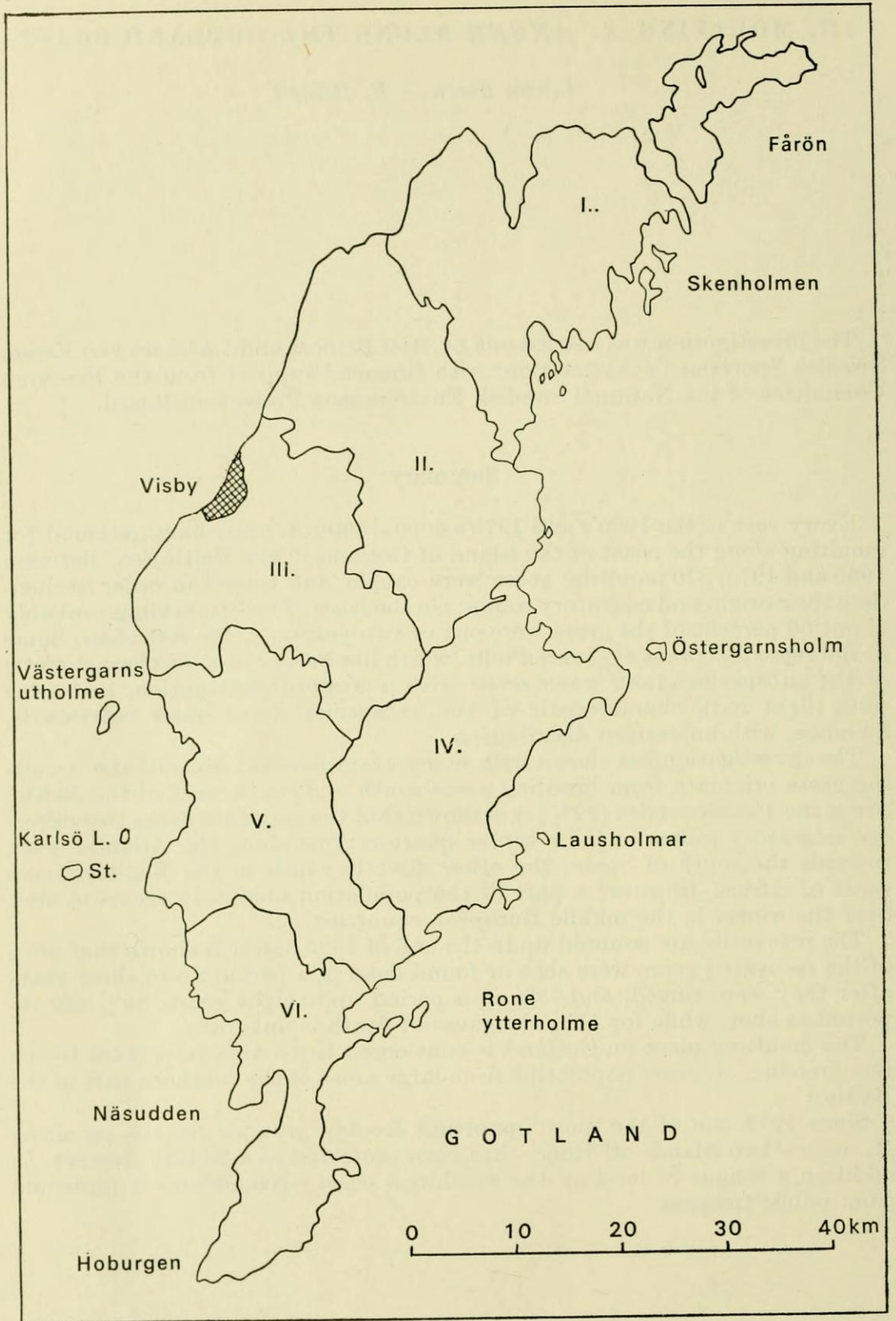


Figure III|1: The island of Gotland

The occurrence of the Greylag Goose on Gotland

For a long time Gotland has been a breeding area for the Greylag Goose (*Anser anser* L.). Even during the first half of the 20th century, when the Greylag Goose was extinct in inland southern Sweden and when there were only few geese along the Swedish east coast, there was a relatively numerous population breeding on the islets along the east coast of Gotland (Ekman, 1922, Berg, 1919). During the period 1960–70 the breeding population was estimated at about 100 pairs each year (Högström, 1971). During the period 1970–80 there was a marked increase, and in 1980 the population was estimated at about 300 pairs (Beinert).

The southern coastal areas of Gotland have also been used as moulting areas by a considerable number of non-breeding Greylags, particularly during the last few decades. The flat, grass-covered islets and spits along the coast have been good grazing places. In addition, the geese have been relatively undisturbed there, and if they were disturbed it was possible for them to swim out into the open sea for refuge.

The largest numbers of geese have been found at Rone Ytterholme and Grötlingboholm along the south-east coast, and at Näsudden on the south-west coast. During certain years a large number of geese have also gathered at Vastergarns utholme (Figure 1).

The geese arrive in the area in late May and early June and leave gradually during July. During the latter part of June and the beginning of July the geese are unable to fly due to the moulting of wing-quills.

During the 1950's the large gatherings of geese drew more and more attention as their grazing was considered to be harmful to the grazing by cattle and sheep in those areas. Landowners claimed compensation from public funds for the deterioration of their grazing.

The number of geese that gathered for moulting in the early 1960's was estimated at 3000–4000. It is only in the 1970's that yearly counts from aircraft have been carried out. Due to bad weather conditions counts were

Table III/1.

Number of moulting Greylag Geese along the shore of Gotland

Plats	5/7 1973	8/6 1974	19/6 1975	24/6 1976	20/6 1977	27/6 1978	28/6 1979	27/6 1980
A) Gotland south-west (Näsudden etc.)	1530	1560	2100	2880	2230	2200	1200	1100
B) Gotland south-east (Rone ytterholme etc.)	1130	1880	1015	2250	1050	1850	2350	680
C) Gotland north-east (Skenholmen etc.)		260	155	250	200	200	50	350
<i>Total</i>	2660	3700	3270	5380	3480	4250	3600	2130

incomplete during the first years, but from 1973 until 1980 they have been more or less complete (Table 1). It is however probable that some small flocks of geese were not observed and included in the count. On the basis of the aircraft count the total number of moulting geese in Gotland is estimated at 4000 – 5000.

The purpose of the investigation

At the very start of the investigation it was clear that the majority of moulting geese came from areas other than the Gotland breeding area. In order to elucidate their origin, migration routes and winter quarters, geese were annually caught and ringed at their haunts along the south coast of Gotland in the period 1965–75. *Rolf Beinert* started the work in 1965, but from 1966 onwards the work was carried out by *Beinert* in cooperation with *Lambart von Essen*.

Capture and ringing. Notes on the birds

The latter part of June, when almost all geese had shed their wingquills, was the most suitable time for catching them. At that time the geese were gathered in large flocks.

The flocks were reached using a fast motor-boat. The geese then tried to escape by diving. In the clear water it was possible to see the birds swimming and when they came up to the surface to breathe, it was possible to catch them in a vag net. To succeed, the water surface should be quite smooth and the boat should be easily steered. The best time of the day for catching the geese was at early dawn. In order not to scare the birds away from their grazing places we avoided catching them in the vicinity of these. The total number of Greylags caught during the period was 870.

The birds were ringed with rings from the Swedish Museum of Natural History. For some birds sex, belly markings, bill colour, and weight were noted. As only a few birds were sex-determined, sex distribution has not been included in this investigation.

In order to get an idea of age-groups the occurrence of black feathers on the belly was noted for 458 of the birds caught. On captive Greylags it has been noted that yearlings and one-year old birds have light bellies without black spots, whereas older geese have varying amounts of black spots. *Fabricius* (1962) has reported that black spots occur to a greater extent in the gander than in the female. There are also some individuals with a dark greyish belly wash. Consequently, birds without black spots have been presumed to be one year old, and those with black spots or dark greyish bellies to be two years old or more. These were divided into three groups (Table 2). Group 1 probably contains mainly two-year old birds, groups 2 and 3 birds more than two years old.

According to various sources the western subspecies of the Greylag goose (*Anser anser anser* L.) has an orange-coloured bill, whereas the bill of the eastern race (*Anser anser rubrirostris*, Swinhoe) is light red (pink). The colour of the bill was noted for 381 of the birds. It was shown that in the area there

Table III/2.

Belly markings and bill colour of a number of Greylags examined in the hand

Year	Belly markings					S:a	Colour of the bill				Total
	pull 0	0	1	2	3		G	M	R		
1969	5	15	12	14	14	60					
1970		35	25	18	31	109	59	15	22	96	
1971		15	11	13	18	57	15	25	17	57	
1972		20	10	13	15	58	20	14	23	57	
1973	2	18	21	26	26	93	47	9	34	90	
1974		15	15	10	16	56	23	23	10	56	
1975		7	6	3	9	25	13	9	3	25	
Total	7	125	100	97	129	458	177	95	109	381	
%	1.5	27.3	21.8	21.2	28.2	100%	46.5	24.9	28.6	100%	

Belly markings: 0 = No black markings

1 = A few black spots (max. 10)

2 = A moderate number of black spots or greyish wash

3 = Richly black-spotted

Colour of the bill: G = Bill orange

M = Intermediate

R = Bill pink

Geese in columns 0 and 1 are presumed to be up to two years old, those in 2 and 3 are presumed to be older.

were both geese with yellowish bills and with clearly light red (pink) bills. The distribution is shown on Table 2.

On 18–20 June 1968 100 of the geese were weighed. The following result were obtained:

The average weight of 11 geese without black spots on the belly (probably one year old) 3.04 kg

The average weight of 89 geese with black spots on the belly 3.29 kg

(probably more than one year old)

The average weight of the 100 geese 3.27 kg

Recoveries of ringed geese

Until 31 December 1980, 195 of the 870 ringed geese (22%) had been shot or found dead (Table 3). The geographical distribution of recoveries is shown in Figure 2. The distribution between countries and months is shown in Table 4. Two geese reported from Mecklenburg and one from Zealand (Denmark) which were identified living, have been included in the table. The ones from Mecklenburg were ringed in Gotland on 26 June 1973 and controlled at Göstrow on 8 April 1976 and 17 May 1976, respectively. The first-mentioned goose was then breeding.

It is evident from the map (Figure 2) that the Greylag Geese moulting in Gotland use two different migration routes, one along the Atlantic coast to the south of Spain, and the other across eastern Germany, Poland to Czechoslovakia and Austria. It also appears that flocks of geese from this

Table III/3.

Numbers of ringed Greylags, recoveries and the duration of life after the year of ringing

Ringed year	num- ber	Recoveries number, %		Recoveries up to 30 June after the following number of year														
				0	1	2	3	4	5	6	7	8	9	10	11	12		
1965	28	10	36	4	1	1	3		1									
1966	48	7	15	2	1	1	1		1					1				
1967	147	40	27	10	11	5	4	4	2	1	1	1						1
1968	182	42	23	7	11	11	5	1	1		2	1	2	1				
1969	60	17	28	2	4	2		2	5	1	1							
1970	110	27	25	8	4	2	2	3	3	1	3	1						
1971	57	11	19	4	1			2	1	1		2						
1972	58	10	17	2	2	1		1	1	1	2							
1973	93	12	13	4	2		1		3	1	1							
1974	62	12	19	3	2	3	1	1	1	1								
1975	25	7	28	5			1	1										
Total	870	195	22%	51	39	26	18	15	19	7	10	5	3	1				1
%		100%		26.2	20.0	13.3	9.2	7.7	9.7	3.6	5.1	2.6	1.5	0.5				0.5

contingent continue their flight across Italy to the Mediterranean coast of Africa.

The length of life and the year of ringing have been compiled in Table 3. It shows that about 60% of the recovered birds died within three years of ringing and about 95% died within eight years of ringing.

Recaptures in Gotland of Greylag Geese ringed in other countries

Some of the geese caught had been ringed in other countries, and as this is particularly interesting all the cases are reported here.

1. Controlled on 1 July 1968, ringed as a gosling on 13 June 1967 near Copenhagen.
2. Controlled on 1 July 1968, ringed as a gosling on 21 June 1967 near Copenhagen.
3. Controlled on 20 June 1968, ringed when moulting on 28 June 1962 at Vejlerne, Jutland, Denmark. The goose was shot on 7 October 1971 in Mecklenburg, East Germany.
4. Controlled on 27 June 1969, ringed as a gosling on 24 June 1958 in Funen, Denmark. The goose was shot on the river Guadalquivir, Spain on 8 October 1974 at the age of 16 years.
5. Controlled on 25 June 1974, ringed as a gosling on 10 June 1973 on Rügen.
6. Controlled 2 July 1974, ringed as a gosling on 10 June 1973 on Rügen.

The following geese ringed abroad were shot on Gotland at the end of July or beginning of August:

Table III/4.

Distribution of the recoveries – country and month

Country	Month	7	8	9	10	11	12	1	2	3	4	5	6	Date un-known	Total
Sweden		7	18	3								1	2	1	32
Denmark			22	8	6	1				1				2	40
German Democratic Republic		11	11	5	1				2	1	1	1		1	34
Germany, Federal Republic of			2	3	6										11
Holland					1	2	3							4	10
Belgium															0
France					2	2			4						8
Spain				1	3	11	6	4	3	1				6	35
Poland				1					1	4	2				8
Czechoslovakia			1		3	1		1							6
Austria					4		1		2					1	8
Yugoslavia								1							1
Italy						2									2
Algeria							1	1							2
Tunisia								1							1
Total		18	54	21	26	19	11	8	12	7	3	2	2	15	198

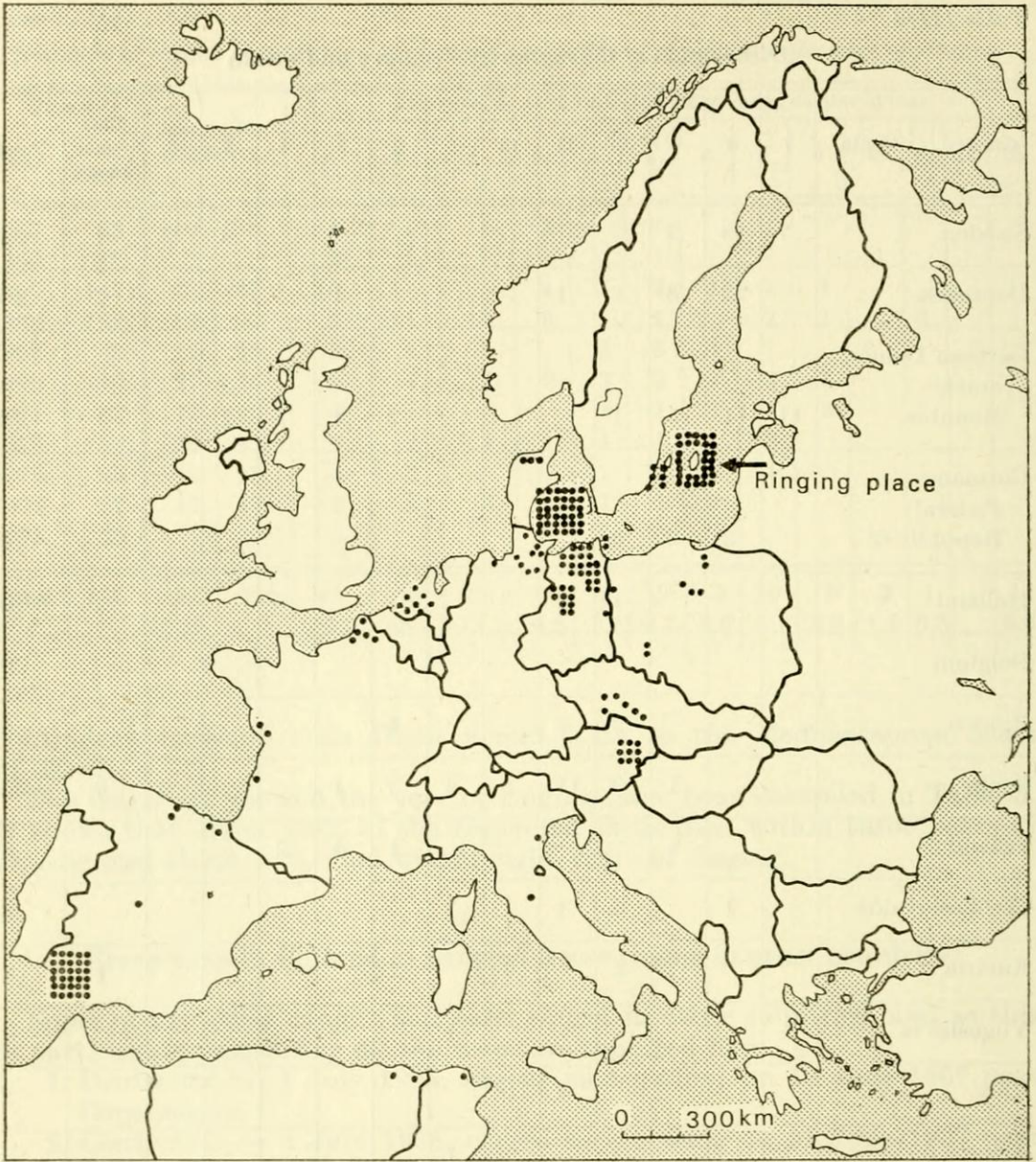


Figure III|2: Recoveries of 198 Greylag Geese ringed at Gotland 1965 – 1975

7. Shot in August 1968 at Klintehamn, Gotland, ringed when moulting at Vejlerne, Jutland, Denmark on 28 June 1962.
8. Shot on 1 August 1973 at Nas, Gotland, ringed as a gosling at Seewiesen, Bavaria in 1965.
9. Shot on 20 July 1979 at Hablingbo, Gotland, ringed on Zealand on 23 June 1978.
10. Shot on 23 July 1979 at Nasudd, Gotland, ringed at Nesper-Ems, West Germany, on 18 June 1972.

Thus, recapture No. 8 shows that a goose born at the research station of Seewiesen, Bavaria in 1965 was present on Gotland eight years later.

We can also mention here that a goose caught and ringed at Gotland on 25 June 1974 and shot in Mecklenburg on 17 July 1976 was described as "a pair with goslings". It is probable that this pair was breeding there, as it was in the middle of July.

This means that there is much evidence that many of the greylag geese that moult at Gotland were born, or have been breeding, further south, e. g. in Denmark, Mecklenburg (GDR) or Bavaria (FRG).

Stig Carlström (Blekinge) has reported that flocks of 15–20 greylags can be seen at Torhamn (south-east Blekinge) around 20 May every year, flying in north-easterly direction. It is supposed (and is probable) that the flocks are on their way to Gotland.

The importance of Gotland as a moulting place for Greylag Geese

During the last two decades the breeding population of greylag has shown a marked increase along the whole of the Swedish east coast. This increase has been particularly marked in the archipelago of Lulea, the Hudiksvall area, the archipelago of Stockholm, Kalmarsund and the archipelago of Blekinge. In addition new breeding areas have been established along several stretches of coast (Nilsson, 1981 and others).

In several lake areas in the south of Sweden the Greylag Goose has started breeding again and has become more numerous. Until now some areas in Skane, southern Småland, Västergötland, Lake Takern in Östergötland and parts of Södermanland have been colonized.

Leif Nilsson estimated the total population of breeding Greylag Geese in Sweden during the years 1979–1980, at 1600–2100 pairs (1981).

In some localities along the coast, geese have gathered in growing numbers in late summer. The grown broods have successively gathered in large flocks at the end of July and in August. In 1980 there were about 1000 geese at each locality. Some such localities are Lövsta Bay in northern Uppland, Tullgarn in Södermanland, Braviken in Östergötland and Warnanas in Kalmarsund (the straits between the mainland of Sweden and the island of Öland). A feature common to these localities is the presence of large cornfields, where the geese can feed on ripening corn. There are also relatively calm water areas (bays) for resting during the day and night there.

In spite of the general increase in the number of Greylag Geese only two new small gathering places of geese during moulting time have been reported. One locality is Lillfjärden in Hudiksvall, where about 200 greylags have gathered for moulting together with an approximately equal number of Canada geese during the last few years. The other locality is Lake Takern, where according to K. Strand, a growing number of non-breeding geese have stayed the summer during the last few years. These geese leave Lake Takern soon after they are able to fly again, that is at the end of July.

Thus it seems that the Greylags have established new moulting places only at these two localities. This means that in our country there is no other moulting place of the same size as that in Gotland, nor is there any account of such a place in the rest of the Baltic countries. Earlier there was a moult-

ing place in Denmark, at Vejlerne in the north of Jutland, which received large numbers of geese, even geese coming from south-eastern countries (*Paludan*, 1965). During the 1960's the number of geese at that locality declined drastically, so now that locality and two more localities are moulting places for mainly local Greylag Geese populations in Denmark.

No major moulting place has been reported from Finland. E. Kumari writes in a letter from Estonia in 1978 that number of greylags is steadily increasing, although they are not gathering at a moulting place. No reports of the establishment of any major moulting place have been made in Poland or in East Germany.

The three Swedish moulting places at Gotland (principally Rone Ytterholme), Hudiksvall (Lillfjärden) and Lake Takern have one feature in common: nutritious grass growing in the immediate vicinity of an open beach. At the Rone and Takern localities there are grass meadows grazed by cattle and at Lillfjärden there are mown lawns. It seems to be an imperative requirement that the beach should be open, as the geese are easy victims of predators, mainly foxes, during this period, and they are also disturbed by human activities. For this reason they need to have a clear view, so that they have time to swim out into the lake or sea. At Lillfjärden in the centre of Hudiksvall the geese have adapted to the "harmless" people on the lawns, and there are no boats that disturb them on the water.

As has been proved by ringing, Gotland is an important place for Greylag Geese from southern countries. The fact that non-breeding geese find a suitable moulting place in the north applies to other goose species as well, such as the Canada Goose in North America and the Bean Goose in Russian and Asia (*Owen*, 1980). Gotland and the islets around it can evidently offer the ecological environment that Central European greylags need for a moulting place. Such localities are probably scarce.

During the last two seasons of moulting, Greylag Geese in Gotland have decreased: in 1980. 2. 125 were counted and in 1981. 1. 800. The decrease in 1981 may partly be due to the disastrous starvation that occurred in the wintering area in Spain. However, it seems urgent from the international point of view also, that as far as possible the geese on Gotland are left in peace at those localities most frequented during moulting in June and early July.

Since 1977 one of the most important feeding grounds for the moulting greylags – two islands at Rone – is protected as a Nature Reserve. In addition tongue of land at the south-west coast, Nasudden, is protected from public trespass.

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