

The South Polar Skua *Stercorarius maccormicki* Saunders in Greenland

FINN SALOMONSEN

(Med et dansk resumé: Sydpolarkjoven *Stercorarius maccormicki* Saunders på Grønland).

It is a well-known fact that the Great Skua *Stercorarius skua* (Brünnich) has a bipolar distribution, a number of geographical forms breeding in the Antarctic and Subantarctic areas. According to recent investigations, the southernmost of these forms, the South Polar Skua *maccormicki* breeds sympatrically with the Brown Skua *lönnerbergi* on the Antarctic Peninsula and the South Shetland Islands and should, therefore, be regarded as a full species. The breeding range of the different forms is outlined in Fig. 1.

It has been much discussed where the southern Great Skuas spend the winter, but very little is known about it. It appears, however, that a comparatively large number is pelagic and winter in the northern part of the Pacific, as well as in the Indian Ocean, while not a single specimen is known from the Atlantic north of Brazil. According to the Check-List of North American Birds (1957, p. 215) *chilensis*, *lönnerbergi* and *antarctica* are casually met with in the southern winter in the Pacific northwards to the coasts of Cali-

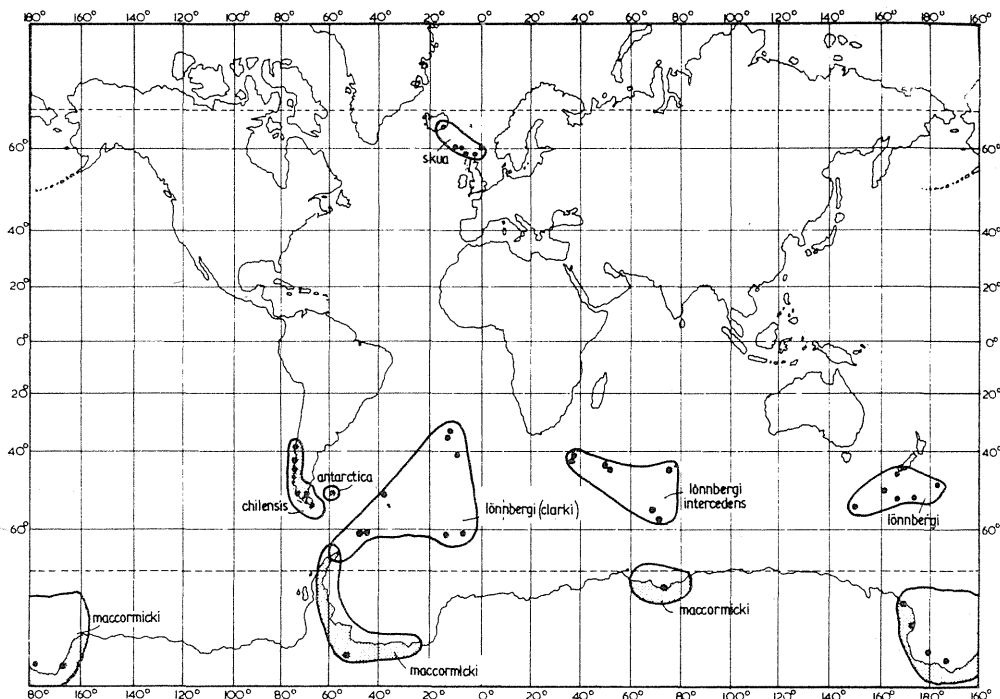


Fig. 1. Distribution of the Great Skua (*Stercorarius skua*, with various subspecies) and the South Polar Skua *S. maccormicki*. Note sympatry of the two species on the Antarctic Peninsula. (After Lockley 1974). Udbredelsen af Storkjoven (*Stercorarius skua*, med mange racer) og Sydpolarkjoven *S. maccormicki*. Bemærk at de to arter yngler sympatrisk på den Antarktiske Halvø. (Efter Lockley 1974).

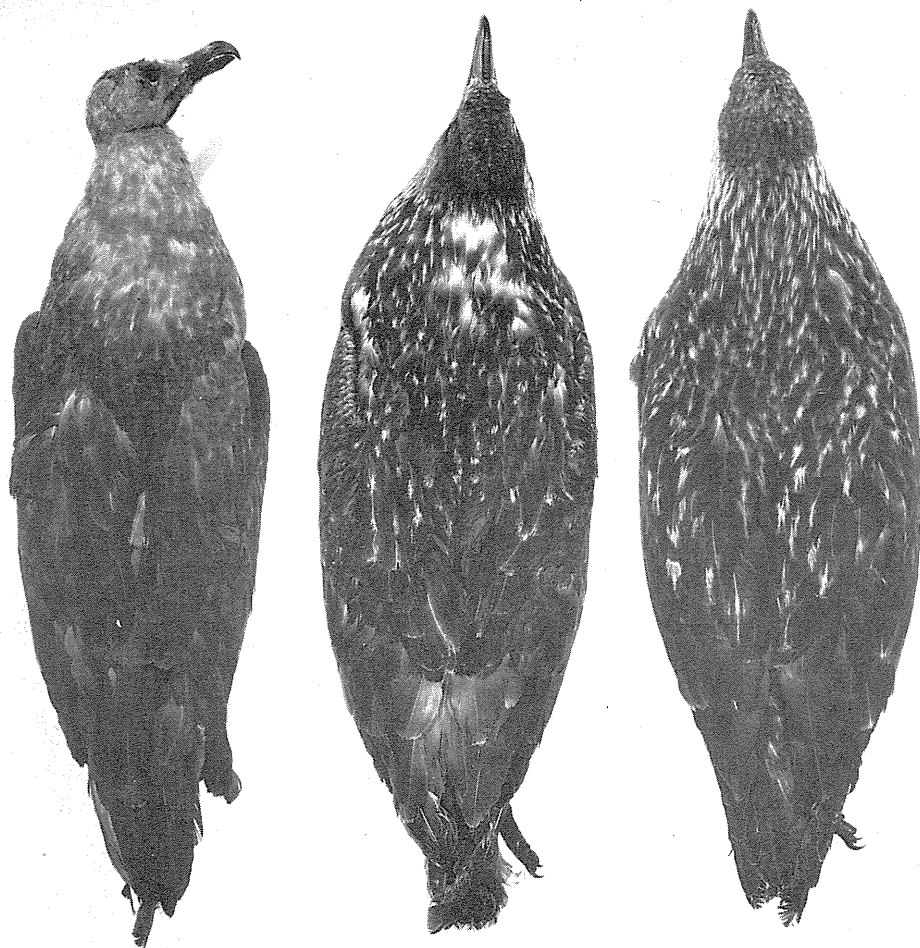


Fig. 2. Dorsal view of the Greenland specimen (from Ujarasugssuk) of *Stercorarius maccormicki* (left), compared with an immature (centre) and adult (right) specimen of *S. s. skua*. The material belongs to the Zoological Museum, Copenhagen.

Oversiden af det grønlandske eksemplar (fra Ujarasugssuk) af Stercorarius maccormicki (t.v.), sammenlignet med en ungedragt (midten) og en udfarvet fugl (t.h.) af St. s. skua. Materialet tilhører Zoologisk Museum i København.

fornia, Washington and British Columbia. The Great Skuas met with in South African waters have been referred to *antarctica*, *hamiltoni* and *lönnerbergi* (Clancey 1965, p. 309), while in Japanese waters *maccormicki* is the only one to occur (Check-List of Japanese Birds 1974, p. 132). Alexander (1954, p. 143) gives the distribution of *maccormicki* in the off-season as: »Antarctic Seas, occasionally north to the South Orkneys and accidentally to Ceylon, New Zealand and Japan«, while none of the remaining southern Great Skuas

apparently occur north of the equator.

Altogether, the picture is confusing and bewildering, but recent studies by the Belgian ornithologist Pierre Devillers (1976, in press) have shown that Alexander comes nearest the truth, since all records north of the equator are referable to *maccormicki*. This species is the only southern Great Skua which regularly migrates northwards and reaches the northern Pacific, at least in its immature stages (1-2 year old birds), while the other southern forms are all more or less stationary. The fact

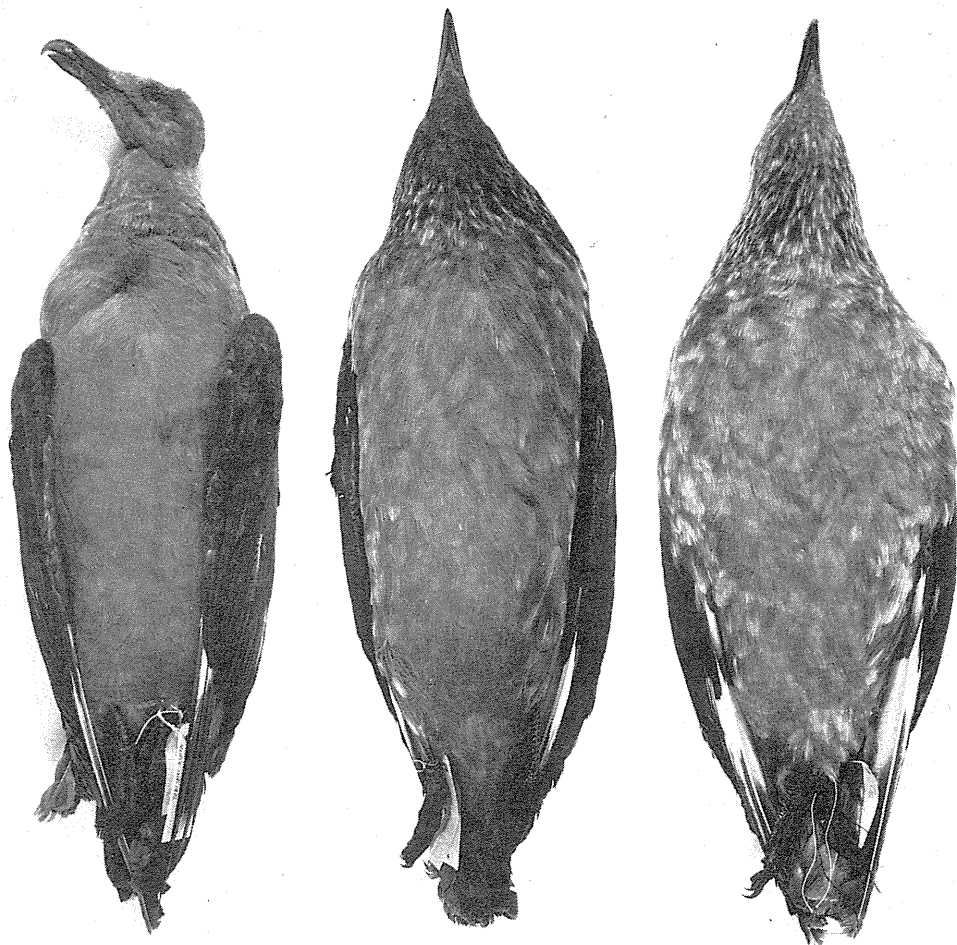


Fig. 3. Ventral view of same specimens as in Fig. 2.
Undersiden af de samme eksemplarer som vist i Fig. 2.

that the young birds are migratory, but the adult ones stationary, agrees with the situation in many other sea birds, like gannets, gulls and auks. It is noteworthy in this respect that all Greenland records of the northern Great Skua *S. s. skua*, which in recent years occurs in Greenland waters in increasing numbers, refer to immature, one or two year old, birds (Salomonsen 1967, p. 200). The paper by Devillers on the Great Skuas has not yet appeared, but was accepted by the editor of *The Auk* more than a year ago. Devillers very kindly sent me a copy of his manuscript.

It is of particular interest that *maccormicki* has not turned up in the North Atlantic. Fisher and Lockley (1954, p. 144) comment

on this as follows: »There is so far no formal proof that the southern bonxies of today penetrate to the North Atlantic. Bonxies have been seen between the equator and the West Indies in April and May, off the West African coast south of the Cape Verde Islands in November, January and February, and in the central part of the Sargasso Sea between October and December. But whether these are southern or northern is not certain, as none has been collected. Bonxies haunt American waters through the summer, for instance the fishing-grounds of Nantucket and the Newfoundland Banks; but the suggestion that these may — because of the season when they are seen — be southern birds must be resist-

ed.« It would, however, not be reasonable to expect that these Skuas should be commonly observed, even if they occurred regularly in the North Atlantic. Being aerial raptors, they are not particularly numerous, even on the breeding places. When scattered over the huge areas of the oceans they appear to have almost vanished. I refer to the three small species of skuas (*S. pomarinus*, *S. parasiticus* and *S. longicaudus*), which all winter in the oceans south of the equator, where they are extremely rarely met with. This holds good especially of *S. longicaudus*. Therefore, it would at any rate be erroneous to assume that more than rare observations or odd specimens should be known from the North Atlantic, even if *maccormicki* should winter there ordinarily.

In the middle of July 1902 a Great Skua was shot by a Greenland hunter at Ujarasugsuk, on the east-coast of Disko Island in the median part of the Greenland west-coast (on 69°50' N, 52°20' W). Inspector Daugaard-Jensen of the Greenland Administration, who at that time happened to be present in this little hamlet (abandoned years ago), bought the specimen and presented it to the Zoological Museum in Copenhagen, where it is now kept as a skin. The record was published by Bertelsen (1921, p. 174), and since then nobody has ever bothered about this specimen.

When Devillers last year studied the Great Skuas in the Copenhagen collection he discovered that the specimen from Ujarasugsuk actually was an immature *maccormicki* (cf. Figs. 2-3). He mentioned this most interesting discovery in his paper (1976), and I should not have gone into the subject again if a new Greenland record of the South Polar Skua had not turned up.

The 31st July 1975 a Great Skua was shot somewhere in the Godthåbsfjord (about 64°30' N, 51° W). It had been ringed with a Washington band (877-34271) and a black plastic ring. It turned out to be a *maccormicki*, which had been ringed as a nestling on the 20th January 1975 by Prof. David F. Parmelee of the Ford Bell Museum of Natural History, Minneapolis, Minnesota, on Shortcut Island in the Antarctic. At my request Prof. Parmelee gave me the following information (*in litt.*): »Shortcut Island is a short distance from the U.S. Palmer Station on An-

vers Island at 64°45' S, 64°05' W. A second nestling from another island close by was recently recovered in Baja California on the Pacific side of North America. All the skua sightings off both coasts of North America are now suspect.« The recovery of the South Polar Skua in Godthåbsfjord involves the longest journey of any bird ever recorded by ringing.

The two Greenland records of the South Polar Skua necessitate some comments. They are both mapped in Fig. 4, where also the ringing locality of the 1975-specimen has been shown. The broken line on Fig. 4 shows the most probable route which the specimen has chosen for its stupendous migration, from the Antarctic to the Arctic waters. When it was recorded in Greenland it had reached an age of only six months. This shows that it must have started migration very soon after it left the nesting place. It no doubt followed the strong western winds during the migration, perhaps passively drifted, as is usually the case with immature, unexperienced individuals of various Antarctic sea birds, like *Macronectes giganteus* and *Sterna paradisaea*, and probably also other species (cf. Salomonsen 1967 a, p. 34). It passed through Drake Strait and crossed the South Atlantic, before turning to the north, just as *Sterna paradisaea* does (Salomonsen 1967 a, Fig. 8). The other ringed specimen, recovered in Lower California, must have managed to slip north before reaching Drake Strait. This is perhaps the most common situation, according to the frequent occurrence of *maccormicki* in the waters of Japan and of western U.S. However, the occurrence of two specimens of the South Polar Skua in the waters of West Greenland strongly point to the fact that the immature birds of this species regularly winter in the North Atlantic, where they undoubtedly have been confused with specimens of the northern Great Skua *S. s. skua*.

In a way the South Polar Skua poses as a counterpart to the Arctic Tern *Sterna paradisaea*, which migrates from the North Polar countries to the South Polar regions and can boast of receiving more sun-light than any other creature. The South Polar Skua, however, is in the same enviable situation, only it migrates in the opposite direction of the Arctic Tern, from the South Polar to the North Polar regions. The Arctic Tern ranges further

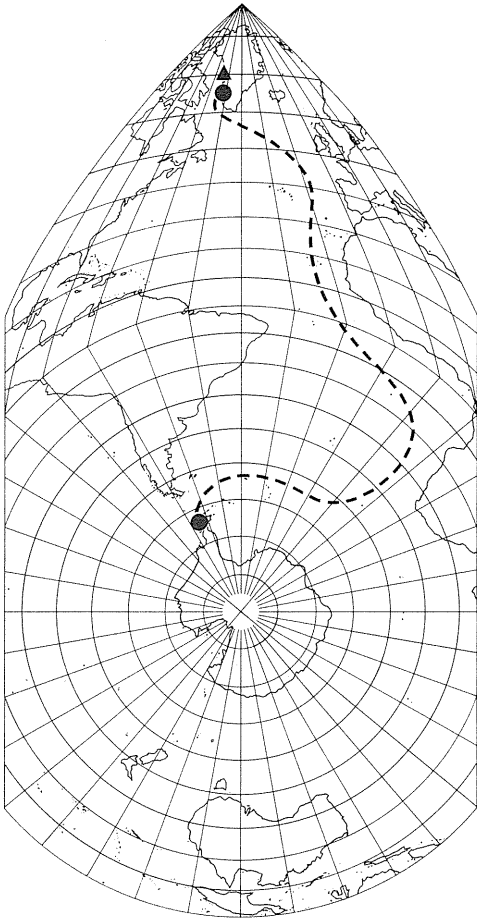


Fig. 4. World-map showing localities of the Greenland records of *Stercorarius maccormicki*. Solid triangle: Ujarasugsuk, Disko Island. Solid circle: Godthåbsfjord. The ringing locality (breeding place) of the specimen recovered in Godthåbsfjord is shown by another solid circle in the Antarctic, and the two localities are connected with a broken line indicating the most probable migration route. *Verdenskort med de grønlandske forekomster af Stercorarius maccormicki. Udfyldt trekant: Ujarasugsuk, Disko. Udfyldt cirkel: Godthåbsfjord. Ringmærkningslokaliteten (ynglepladsen) for eksemplaret genfanget i Godthåbsfjorden er vist ved en anden udfyldt cirkel i Antarktis, og de to lokaliteter er forbundet med en stiplede linie, som angiver den mest sandsynlige trækvej.*

north than any other sea-bird, breeding as far north as dry land extends (Salomonsen 1967 a, p. 3), while the South Polar Skua »has been observed farther south than any other bird«, observed on the Antarctic Continent

on 87°20' S (Voous 1960, p. 103). Compared with the migration of other Holarctic terns, that of the Arctic Tern is a »leap-frog migration« (this concept was defined and described by Salomonsen 1955). Similarly, the South Polar Skua carries out a leap-frog migration when compared with the slight movements of the southern forms of *S. skua*. A certain parallelism in the ecology of the Arctic Tern and that of the South Polar Skua therefore exists.

Bearing in mind how extremely rarely the South Polar Skua occurs in the northern oceans, at least in the North Atlantic, it is a question, whether it is a casual visitor there or whether it generally undertakes such a protracted migration. The moult of the South Polar Skua speaks in favour of an extensive migration. It is well-known that in widely wandering pelagic sea-birds the postnuptial moult is postponed to the period when the species arrives at its final destination and then takes place very rapidly. As an example can be mentioned that in the Holarctic species of the genus *Sterna* the complete postnuptial moult takes place from July to May, *i.e.* a period of almost 300 days. The only exception is *Sterna paradisaea*, which has a much more extensive migration than the other terns. The moult in *S. paradisaea* is postponed to the period after the arrival in the Antarctic region, where it takes place in January-February, a period not exceeding 60 days (Salomonsen 1967 a, p. 9). The same postponement of the wing-moult takes place in *Puffinus griseus*, *P. gravis* and *P. tenuirostris*, all being southern pelagic species migrating to the oceans of the northern hemisphere (Marshall and Serventy 1956, p. 943, Salomonsen 1967 a, p. 11, Langham 1971, p. 161). This particular moulting condition in these species must be explained as an adaptation to the extremely strenuous and demanding flight across the stormy seas of the greater part of the globe, a flight which can be successfully performed only if all remiges and rectrices function to perfection and are not weakened by growth or shedding processes. This requirement holds good of the autumn as well as of the spring passage. Consequently, the moult has to be restricted to the comparatively short resting period in the winter quarters. This implies that the moult must be considerably accelerated compared with con-

ditions in other related species.

This is exactly what has taken place in the South Polar Skua. The 1902-specimen from Greenland was collected in July, *i.e.* in the midst of the southern winter, when the bird had reached its final winter destination. The plumage is extremely worn and faded, and a heavy moult takes place everywhere, on body as well as in wings and tail. In the tail some feathers are growing, but it is difficult to see how many. In the wing three primaries are growing; the innermost three (nos. 1-3) are new and their growth concluded, nos. 4-5 are growing and are rather small, no. 6 has been shed and a new one has not yet started to grow; the outermost ones (nos. 7-10) are old and very worn. During flight the bird must have displayed a considerable moulting gap in the extended wing.

The simultaneous growth of no less than three primaries in *maccormicki* demonstrates a much higher growth rate than in other skuas or gulls. Stresemann and Stresemann (1966, p. 243) in their valuable treatise on the avian moult, give some examples of the moult of the primaries in the Great Skua *S. s. skua*. It appears that usually only one, sometimes two primaries are growing, but never three as in *maccormicki*. A bird from 20th August had primary nos. 1-2 growing and nos. 3-10 old; another bird from 24th September had primary nos. 1-5 new, no. 6 growing, nos. 7-10 old; a specimen from 24th October had nos. 1-2 growing, nos 3-10 old; another specimen from 13th December had nos. 1-5 new, nos. 6-7 growing, nos. 8-10 old; and finally a bird from 9th January had nos. 1-9 new and no. 10 growing. Most gulls (genus *Larus*) have a wing-moult similar to that of *S. s. skua*.

According to the examples of the moult in the northern Great Skua, given by Stresemann and Stresemann, quoted above, it appears that the moult extends from August to January, and that at most two primaries grow at a time. The fact that the only specimen of *maccormicki* examined had a very heavy body moult, and three primaries growing simultaneously and that the moult took place in the middle of the southern winter (July), strongly indicate that in *maccormicki* the moult is postponed until the birds have reached their winter-quarters, and that it takes place much more rapidly than in the northern Great Skua and in various gulls. As shown above, these

characters are adaptations to a world-wide migration, just as in the Arctic Tern and various shearwaters. Since these characters are hereditarily fixed, they demonstrate that *maccormicki* generally carries out such an extensive migration and habitually winters in the northern oceans. There is no doubt, therefore, that it is more common in the North Atlantic than hitherto expected. According to Devillers (1976), quoting Kuroda, the moult of migrating immature *maccormicki* in Japanese waters takes place in the southern winter, from late May to early August. It is true that the said characters of the moult hold good of the immature birds only. Probably the moult of the more stationary adult birds differs from that of the young ones.

One important question remains. Is it possible at all to distinguish the northern Great Skua from the southern ones in the field? All the Great Skua forms are very similar. A number of students have discussed the variation, of which Murphy (1936), Hamilton (1934) and Holgersen (1945 and 1957) probably are the best known. The most easily recognizable form is the large and dark *lönnerbergi* with a very stout bill. The Zoological Museum in Copenhagen possesses a large series of this form, collected by »The Galathea Expedition« 1950-52. However, since Devillers has shown that among the Antarctic Great Skuas only *maccormicki* occurs in the northern hemisphere, identification becomes easier.

The only two Great Skuas occurring in the North Atlantic are *skua* and *maccormickii*, and it is, therefore, necessary to distinguish only these two forms. In collections this distinction is fairly easy. *S. maccormicki* is a smaller bird than *skua*, and differs considerably in colour. It should be borne in mind that *maccormicki*, like the smaller species of *Stercorarius*, but contrary to *S. skua*, is dimorphic, having a paler morph with light (greyish to whitish) under-parts and a darker morph similar to *skua*. However, Fig. 2 shows that the upper-parts and wings in *maccormicki*, even in immature birds, are almost uniform brownish, while in *skua* they have a varying amount of reddish and straw-coloured longitudinal streaks. The head and throat of *skua* are dark, usually darker than breast and mantle, while in *maccormicki* they are distinctly lighter. The under-parts are

more or less tinged with rufous in *skua* and have distinct light longitudinal streaks on throat and on flanks, but are virtually uniform brown in immature *maccormicki*. Finally, *maccormicki* in the adult plumage (but not in the immature one) has a light area on the neck with golden needle-like, slightly glossy,

streaks, similar to the yellow nape patch in the three small species of *Stercorarius*, but missing in *S. skua*.

As already mentioned, *maccormicki* is smaller than *skua*, and *lönnerbergi* is larger. This appears from the measurements given in Table I.

Table I. Measurements (in mm) of various Greater Skuas. The figures in brackets are the means. *Mål (i mm) på forskellige kjoever. Tallene i parentes er gennemsnitsværdier.*

	Number of specimens	Wing	Exposed culmen	Tarsus
<i>Stercorarius maccormicki</i> (a)	32	380-420 (400.7)	49-53 (50.5)	57-65 (59.6)
<i>Stercorarius s. skua</i> (b)	12	385-405	47-55	65-72
<i>Stercorarius s. lönnerbergi</i> (a)	67	392-447 (415)	44-59 (53.2)	71-95 (77.0)

a) Reference: Devillers 1976.

b) Reference: Witherby *et al.* 1945, vol. V, p. 126.

According to these measurements, the tarsus most distinctly shows the differences between the taxa, the bills differ only on average, while the wing measurements in *maccormicki* and *skua* are similar, but those of *lönnerbergi* definitely larger. It should, however, be borne in mind that the three series of mea-

surements were taken by different students.

Since the visitors of *maccormicki* in the North Atlantic are immature birds I have taken some measurements of immature *skua* and compared them with those of the Ujarasugssuk specimen of *maccormicki* from 1902 (Table II).

Table II. Individual measurements of some immature *Stercorarius s. skua* and the Ujarasugssuk specimen of *Stercorarius maccormicki*. All measurements in mm. The specimens belong to the Zoological Museum in Copenhagen.

Nogle mål af unge Storkjoever S. s. skua plus Ujarasugssuk eksemplaret af Sydpolarkjoeven S. maccormicki. Alle mål i mm. Skindene tilhører Zoologisk Museum i København.

		Wing	Exposed culmen	Tarsus	Middle toe with claw
<i>Stercorarius s. skua</i>	m., imm.	391	46.5	72	71.8
<i>Stercorarius s. skua</i>	m., imm.	388	45.6	68.8	68.0
<i>Stercorarius s. skua</i>	f., imm.	411	51.0	70.2	73.5
<i>Stercorarius maccormicki</i>	imm.	380 (worn)	46.2	63.0	66.5

These few measurements show that the tarsus and middle toe are distinctly smaller in *maccormicki* than in *skua*, while the culmen and wing are virtually identical in the two species.

At any rate, in the field the differences in measurements are absolutely not usable for identification. The differences in coloration are difficult to observe in the field, at least as far as the immature birds are concerned. I therefore fear that it is necessary to collect

specimens, as has been done now in Greenland, in order to obtain further records of the South Polar Skua in the off-season in the North Atlantic area.

SUMMARY

Recent investigations have demonstrated that the South Polar Skua *Stercorarius maccormicki* is a separate species and that the immature birds spend the off-season (the southern winter) pelagically in

the northern part of the Pacific Ocean, while the species is quite unrecorded in the Atlantic Ocean north of Brazil-South Africa. However, two records are now available from Greenland, both from July, one record being a recovery of a bird ringed as nestling in the Antarctic continent, the other kept as a skin in the Zoological Museum in Copenhagen. These unexpected and surprising records call for a revision of the distributional pattern in the North Atlantic.

The moult in the immature birds of the South Polar Skua takes place at a very rapid rate and is restricted to the southern winter. This is demonstrated by Japanese off-season specimens and by examination of the skin kept in Copenhagen. The moult of the South Polar Skua takes place from late May to early August (*i.e.* about 45 days), while in the mainly stationary northern Great Skua *S. s. skua* it takes place from August to January (*i.e.* about 150-180 days). The rapidity of the moult and its postponement to mid-winter is a common character for many other pelagic sea birds with a world-wide migration and is an adaptation to the extremely strenuous and demanding flight across the oceans which cannot be carried out successfully if wings and tail are enfeebled by feather growth or shedding processes. Since this particular moulting pattern of the South Polar Skua is hereditarily fixed, this species must habitually undertake this stupendous migration and winter in the northern oceans, also in the North Atlantic including the arctic areas of Greenland. It should be regarded as a regular visitor in these regions, although it is very difficult to discover in the enormous expanses of water in the North Atlantic.

In addition, some notes are given about the possibility of identification of *maccormicki* and *skua* in the field.

DANSK RESUME

Sydpolarkjoven *Stercorarius maccormicki* Saunders, på Grønland

Undersøgelser i de senere år har vist, at Sydpolarkjoven *Stercorarius maccormicki* er en særlig art og ikke en underart af Storkjoven *S. skua*. De unge fugle af Sydpolarkjoven tilbringer vinteren (dvs. den sydlige vinter) på de åbne strækninger langt fra land i det nordlige Stillehav, mens arten overhovedet ikke er truffet i Atlanterhavet nord for Brasilien-Syd Afrika. Imidlertid forekommer nu to forekomster fra Grønland, begge fra juli, den ene en genfangst af en fugl ringmærket som redeunge på det antarktiske kontinent, mens den anden findes som skind i Zoologisk Museum i København. Disse uventede og overraskende forekomster kræver en omvurdering af udbredelsen i Nordatlanten.

Sydpolarkjovens unge fugle foretager fældningen overordentlig hurtigt, og fældningen er indskrænket til selve vintertiden (altså den sydlige vinter).

Dette er vist ved vintereksemplarer fra Japan samt ved undersøgelse af det grønlandske skind i Zoologisk Museum. Fældningen hos Sydpolarkjoven finder sted fra ultimo maj til primo august, dvs. dækker ca. 45 dage, mens den hos Storkjoven, der er strejffugl, finder sted fra august til januar, altså omkring 150-180 dage. Fældningens hurtighed og dens udskydelse til midt om vinteren er et fælles-træk hos mange andre pelagiske havfugle med verdensomfattende trækveje og er en tilpasning til den yderst anstrengende og krævende flugt over verdenshavene, der ikke kan gennemføres med held, hvis vinge- og halefjerene er svækkede gennem vækst- og afstødningsprocesser. Siden dette særlige fældningsmønster hos Sydpolarkjoven er arveligt, må arten regelmæssigt foretage disse enorme træk og overvintre i de nordlige have, også i Nordatlanten med de tilsluttende arktiske farvande om Grønland. Den må betragtes som en regelmæssig »vintergæst« (om sommeren) i disse egne, omend den vil være vanskelig at opdage over Nordatlantens enorme vandflader.

Til slut gives, i tabel I-II, nogle mål af de forskellige store kjovearter, og det diskuteres om det overhovedet er muligt at kende *maccormicki* og *skua* fra hinanden i felten.

REFERENCES

- Alexander, W. B. 1954: Birds of the Ocean. A Handbook for Voyagers. New and Revised Edition. — G. P. Putnam's Sons, New York (306 pp.).
- Bertelsen, A. 1921: Fuglene i Umanaq Distrikt. — Medd. Grønland 62, nr. 2, 141-214, one map.
- Check-List of North American Birds. Prepared by a Committee of the American Ornithologists' Union. Fifth Edition, 1957. — Amer. Ornith. Union, Baltimore, Maryland (691 pp.).
- Check-List of Japanese Birds. Fifth and Revised Edition, 1974. — Ornith. Soc. Japan, Gakken Co., Tokyo (364 pp.).
- Clancey, P. A. 1965: A Catalogue of Birds of the South African Sub-Region, pt. II: Families Glaucolidae-Pittidae. — Durban Mus. Novitates 7, 305-388.
- Devillers, P. 1976: The Skuas of the North American Pacific Coast. — The Auk 93 (*in press*).
- Fisher, J. and R. M. Lockley 1954: Sea-Birds. An Introduction to the Natural History of the Sea-Birds of the North Atlantic. — Collins, London (320 pp.).
- Hamilton, J. E. 1934: The Sub-antarctic Forms of the Great Skua (*Catharacta skua*). — Discovery Reports 9, 161-174.
- Holgersen, H. 1945: Antarctic and Sub-Antarctic Birds. — Scientific Results of the Norwegian Antarctic Expeditions 1927-1928 et sqq. No 23 (100 pp.).
- Holgersen, H. 1957: Ornithology of the »Brategg«

- Expedition. — Scientific Results of the »Bratigg« Expedition 1947-48, No. 4 (80 pp.).
- Langham, N. P. E. 1971: Seasonal Movements of British Terns in the Atlantic Ocean. — *Bird Study* 18, 155-175.
- Lockley, R. M. 1974: Ocean Wanderers. The Migratory Sea Birds of the World. — David & Charles, London (168 pp.).
- Marshall, A. J. and D. L. Serventy 1956: Moulting Adaptation in Relation to Long-distance Migration in Petrels. — *Nature* 177, 943.
- Murphy, R. C. 1936: Oceanic Birds of South America. — MacMillan Co., New York (2 vols., 1245 pp.).
- Salomonsen, F. 1955: The Evolutionary Significance of Bird Migration. — *Dan. Biol. Medd.* 22, No. 6 (62 pp.).
- Salomonsen, F. 1967: Fuglene på Grønland. — Rhodos, København (341 pp., one map).
- Salomonsen, F. 1967 a: Migratory Movements of the Arctic Tern (*Sterna paradisaea* Pontoppidan) in the Southern Ocean. — *Dan. Biol. Medd.* 24, No. 1 (42 pp.).
- Stresemann, E. and V. Stresemann 1966: Die Mauser der Vögel. — *Journ. f. Ornith.* 107, Sonderheft (448 pp.).
- Voous, K. H. 1960: Atlas of European Birds. — Nelson, London (284 pp.).
- Witherby, H. F. (Ed.) 1945: The Handbook of British Birds. — Witherby, London (5 vols.).

MS received 24th April 1976.

Author's address:
 Zoological Museum
 University of Copenhagen
 Universitetsparken 15
 DK-2100 Copenhagen Ø.