

**Article XVII. — REPORT ON BIRDS RECEIVED
THROUGH THE PEARY EXPEDITIONS TO
GREENLAND.**

By FRANK M. CHAPMAN.

From the Peary Expeditions to Greenland the Museum has received, through Mr. Morris K. Jesup, nearly 500 specimens of birds, contained in the following named collections :

1. Peary Collection ; 82 specimens, collected at various localities by Lieutenant Peary and his associates.

2. Dyche Collection ; 244 specimens, collected by Prof. L. L. Dyche, who accompanied the Peary Expedition of 1895 as the Museum's representative, largely at Holsteinborg from June 9 to July 20. This collection includes 29 specimens of the rarer Greenland birds purchased from the natives and the Danish Governors, Müller and Kock.

3. Figgins Collection ; 162 specimens, collected by Mr. J. D. Figgins, naturalist of the Peary Expedition of 1896. Mr. Figgins's field notes are given in the present paper, followed by his initials.

While these collections do not contain birds new to science, they include several particularly interesting series of young birds, notably of *Uria* and *Rissa*, and of adults—especially of *Somateria* and *Falco*—which add materially to our knowledge of the plumage changes or relationships of these species.

1. *Colymbus holbœlli*. HOLBÆLL'S GREBE.—One immature specimen without data.

[“The only specimens of this species seen were two skins procured from natives. It is undoubtedly rare, as the natives make no attempt to preserve any but the rarer species.”—J. D. F.]

2. *Gavia lumme*. RED-THROATED LOON.—Three adult specimens ; a female from Holsteinborg, July 6 ; a male from the north side of White Strait, July 27, and a specimen without data.

[“A pair of these Loons is to be found on almost every large fresh-water pond near the coast. They are very inquisitive and

are easily decoyed by waving a bright-colored cloth. The nest is placed in the grass on some projecting point or small island ; the grass being so short that the nest is in full view."—J. D. F.]

3. *Fratercula arctica*. PUFFIN.—One specimen from Holsteinborg, and one without data.

["At all the large breeding-places visited, the Puffin, Brünnich's Murre, and the Kittiwake were found in company, but each occupied its own, well-defined section of the cliff. The Kittiwakes usually occupy a deep recess of the cliff near the water ; the Brünnich's Murres, all of the other section to a height of about 300 feet ; above that, the Puffins are found. As the nests were in inaccessible locations, I could learn nothing of their breeding habits."—J. D. F.]

4. *Fratercula arctica glacialis*. LARGE-BILLED PUFFIN.—One specimen from Mauson Island.

5. *Cephus grylle*. BLACK GUILLEMOT.—Thirty-six of the 37 Guillemots from Holsteinborg are referable to this species, the remaining one being typical *mandti*. Among these 36 birds there is considerable variation in the size of the bill, and in several examples it is fully as small as in *mandti*. *C. grylle* is also represented by two specimens from Disko Harbor, July 28.

6. *Cephus mandti*. MANDT'S GUILLEMOT.—One male example from Holsteinborg, June 19 ; three from White Strait, July 26, and one from Hudson Strait, July 25.

["At all the places visited in North Greenland these birds were observed. They are usually found in small flocks of ten to twenty. The nest is a mere depression in the gravel, well back in crevices of the rock near the water. They are very curious and will swim round and round the ship while at anchor, each time approaching a little nearer. When disturbed, they duck their heads a few times and quickly dive, to appear again beyond range of shot-gun. Among the sailors, they are known as Sea-Pigeons."—J. D. F.]

7. *Uria lomvia*. BRÜNNICH'S MURRE.—Seven adults, collected by Professor Dyche at Holsteinborg, July 5, show some

variation in the development of the basal portion of the upper mandible, and all are darker in color than a single specimen from Iceland.

A series of 26 young birds, collected by Mr. Figgins at Parker Snow Bay, August 10 and 11, presents marked variation in color, and also affords material for a study of the growth of plumage in this species.

Newly hatched birds, apparently not more than a day or two old, vary in the color of the back from uniform pale cinnamon-brown to uniform glossy black, but the prevailing color of this region is black tipped with cinnamon-brown. The crown and hind neck are mixed black and white or black and brown, while the side of the head shows an intricate pattern of black and buff in which there is much variation. The abdominal region is usually white, but in some specimens is obscured with dusky.

The series does not show the complete development of plumage, but includes material which warrants some treatment of this subject.

A drawing of the feather tracts is presented as a map on which may be traced the development of plumage, the numbers there given corresponding to the numbers of the various stages now described. (See Figs. 1 and 2.)

Downy stage, newly hatched chick.—Completely covered with down with the exception of a small bare space on either side of the base of the neck.

Stage 1.—The first indication of the plumage succeeding the natal down is to be seen in the *pteryla alaris* where the primaries and secondaries emerge simultaneously; at the same time new feathers are appearing in the *pteryla humeralis*, those in the posterior half of this tract being slightly more advanced than those in the anterior half.

Stage 2.—Feathers now appear through the *pteryla ventralis*, the pectoral portion of this tract being somewhat more developed than its extremities, and the exterior lateral margins being somewhat more advanced than their inner borders. The greater wing-coverts now appear.

Stage 3.—Barely have white feathers started in the *pteryla ventralis*, when black feathers may be observed in the *pteryla dorsalis*, those in the posterior third of the anterior half being

slightly in the lead. The median and minor secondary coverts are now observable and the *pterylæ crurales* show new feather growth.

Stage 4.—The *pterylæ* in which feathers have already appeared show marked development before new growth appears through-

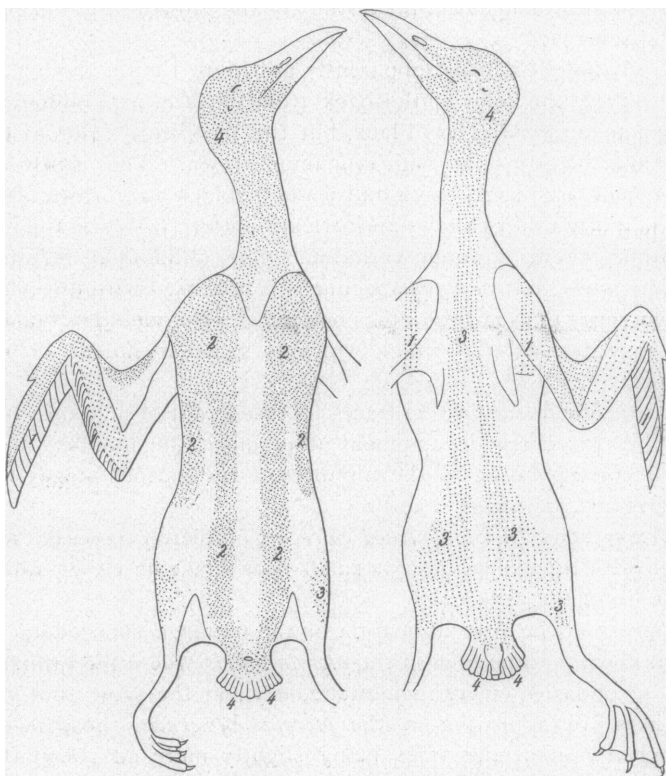


Fig. 1.

Fig. 2.

Diagrams of pterylosis of *Uria lomvia*, to illustrate growth of plumage. Fig. 1, ventral surface. Fig. 2, dorsal surface. The numbers on the pterylæ refer to the stages as described in the text.

out the *pteryla capitis* and the primary coverts and rectrices can be discerned.

Stage 5.—So far as new growth is concerned this stage is marked by the appearance of the inferior wing-coverts. Specimens are lacking to show the subsequent development of the plumage; the down has largely disappeared from the central

portions of the body, but is still abundant on the thighs, crown, sides and back of the neck, and throat, these parts of the body, with the under wing-coverts, being evidently the last to acquire the second, or flight plumage. The difference in size between stages 1 and 5 are shown by the following measurements: Stage 1, culmen, 55; middle toe, 1.05; stage 5, culmen, 70; middle toe, 1.40 in. In spite of this increase in stage 5, the egg-tooth is still present.

[“These stupid birds make no attempt at nest-building, but each deposits its single egg on the bare ledges of rock. They crowd the ledge until there is a continuous scramble to retain a footing, and many eggs are destroyed during these struggles. As soon as incubation is completed, the young are transferred to the water, and mother and young immediately leave the breeding locality; often going quite a distance to sea. The young are perfectly at home in the water and are very expert divers.”—J. D. F.]

8. Alca torda. RAZOR-BILLED AUK.—Twenty-three males and 11 females, collected by Professor Dyche at Holsteinborg, June 19 to July 5, are remarkably constant in size and color, there being but slight individual and no apparent sexual variation.

9. Alle alle. DOVEKIE.—Four specimens from English Gulf, July 31; 3 from Parker Bay, August 10; 7 from Cape York, August 9, and 3 without data. Nine of the Cape York and Parker Snow Bay specimens are birds of the year, two of which have almost acquired their second plumage, the downy natal plumage having nearly disappeared. One of these (No. 67755, ♀, Parker Snow Bay) resembles the adult winter bird in being wholly white below, the throat and upper breast washed with dusky, while the remaining eight young birds have the throat and breast blackish, as in the summer adult. I am at loss to account for this difference in color of birds of the same age. It apparently has not been previously described.

[“To me, the Dovekie was the most interesting, as well as the most numerous bird observed, and it is surprising that they survive the persecution to which they are subjected. During years when game is scarce, the natives depend almost entirely on the Dovekie for food, and they are caught by the thousands and

stored in great piles for winter use. Without the Dovekie, the little tribe of North Greenland Eskimos would long since have perished of hunger. The ground about their villages is thickly strewn with the bones of the Dovekie, giving abundant proof of the millions which have been devoured. When on the water, they are entirely safe from the natives, but seem to be very stupid when on land and are then easily captured with nets. When one alights on a rock, it is immediately joined by others, until there is a struggling mass, as if it were the only rock in the neighborhood on which to alight. At such times they are easily approached and the quick use of a net or a well directed stone usually results in the destruction of a number. The Dovekie is very peculiar for its flight lines; those leaving the nest being on a lower plane than those approaching. Each day they select a different line of flight and each flock follows exactly the line of its predecessor. While at Meteorite Island in 1896, not a Dovekie was seen, but in 1897 thousands were seen every day during my stay. At this point, Melville Bay is thickly studded with icebergs and each day the Dovekie would select a new line of flight, and when deflected by the firing of guns, would immediately return to the proper course and continue it as far as I could see them from the 600-foot cliffs above. The nest is placed among the loose boulders at the foot of the cliffs and the eggs and young fall an easy prey to the Foxes, Ravens, and Glaucous Gulls."—J. D. F.]

10. *Megalestris skua*. SKUA.—[“Three or four individuals on the south side of Olrik Bay, and as many more off Disko Island, were the only ones noted. They were very shy and nothing was learned of their nesting habits.”—J. D. F.]

11. *Stercorarius pomarinus*. POMARINE JAEGER.—Three adults in the light phase of plumage, from Holsteinborg.

12. *Stercorarius parasiticus*. PARASITIC JAEGER.—Six adults, five in the light, and one in the dark phase of plumage, from Holsteinborg.

13. *Stercorarius longicaudus*. LONG-TAILED JAEGER.—Two adults in the light phase of plumage, from Holsteinborg.

14. *Pagophila alba*. IVORY GULL.—Two immature and one adult, collected by Kock at Sukkertoppen, October and November, 1892.

15. *Rissa tridactyla*. KITTIWAKE.—The collection contains eight adults and a large number of nestlings, taken at Parker Snow Bay, August 10 and 11, by Mr. Figgins. The series of young in connection with several specimens collected by the writer on Bird Rock, Gulf of St. Lawrence, represents every age from the newly hatched bird to one full feathered and about to fly, and therefore furnishes excellent material for a study of the growth of plumage in the immature bird of this species.

GROWTH OF PLUMAGE.

Without attempting a description of the pterylosis of the Kittiwake, which the nature of the specimens at hand (dried skins) does not warrant, I present two figures of its pterylæ, drawn from a plucked skin, in order to graphically illustrate the development of its plumage. (Figs. 3 and 4.)

Beginning with the newly hatched chick its gradual feathering may be described under stages, the age of which cannot, unfortunately, be stated, but some idea of the increase in size may be gained from the measurements of the exposed culmen and middle-toe with nail, given with each stage.

Downy stage, newly hatched chick.—Culmen, .49; middle toe, .80 in. Entirely covered with down with the exception of small naked spaces on the sides of the neck (*a*), and sides of the body under the wings (*b*), these apteriæ being separated from each other by the lateral extension of the *pteryla gularis* at its junction with the *pteryla humeralis*. Later these spaces become covered with down.

Stage 1.—Culmen, .60 (egg-tooth present); middle toe, 1.20 in. Feathers, tipped with the down they are replacing, are just protruding from the skin on the *pteryla humeralis*, the lateral branch of the *pteryla ventralis*, and the radio-ulnar portion of the *pteryla alaris*, where apparently all but the lesser secondary coverts can be seen. Feathers seem to appear simultaneously on the parts named, there being no appreciable difference in the size of the feathers growing on them.

[November, 1899.]

Stage 2.—Culmen, .64 (egg-tooth absent) ; middle toe, 1.25 in. The first indication of primaries is now observed, the black lesser wing-coverts are evident, and the entire anterior portion of the *pteryla dorsalis*, the lateral extensions of the *pteryla gularis*, and the *pteryla femorales* show new feather growth.

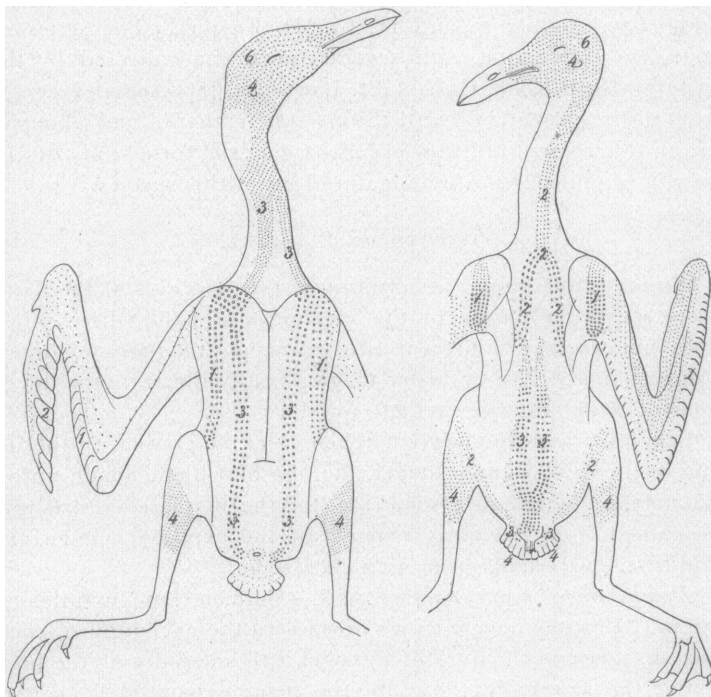


Fig. 3.

Fig. 4.

Diagram of pterylosis of *Rissa tridactyla*, to illustrate growth of plumage. Fig. 3, ventral surface. Fig. 4, dorsal surface. The numbers on the pterylae refer to the stages as described in the text.

Stage 3.—Culmen, .71 ; middle toe, 1.41 in. The primaries have grown rapidly and are now somewhat in advance of the secondaries, their superior coverts have appeared, and feathers are now for the first time observable on the thumb, the main portion of the *pteryla ventralis*, from the point of the bifurcation on the neck to the vent, the posterior portion of the *pteryla dorsalis*, and *pteryla caudalis*, where only the contour feathers are to be seen, the rectrices not being as yet evident. At this stage the

down of the apteriæ all over the body is being replaced by the down of the fully grown bird, the feathers, as in the case of those growing from the ptery-læ, appearing from the same pit as the natal feather which precedes them, and for a short time adheres to the tip of the new feather.

Stage 4.—Culmen, .78 ; middle toe, 1.45 in. The black tips of the rectrices are now just discernible ; black is also evident in the auriculars, marking the first appearance of new feathers on the *pteryla capitis*, and feathers are growing on the *pterylæ crurales*.

Stage 5.—Culmen, 1.01 ; middle toe, 1.70 in. New feathers are now growing throughout the *pteryla capitis*, except at the base of the bill, the inferior primary coverts are appearing, and, in short, all the feather tracts are now supporting new and growing feathers.

Stage 6.—Culmen, 1.10 ; middle toe, 1.75 in. No new tracts are involved in this stage, which simply marks the completion of the plumage in which the bird makes its first flight. The last parts of the bird to acquire the new plumage are the extreme anterior parts of the *pteryla capitis*, about the base of the bill, and the lower portions of the *pterylæ crurales*.

Generally speaking, therefore, it seems that in the young Kittiwake feathers appear first on the middle of the body ; that the secondaries appear before the primaries ; that all the wing feathers are evident before the tail is observable, and that the last portions of the bird to complete the new plumage are the anterior parts of the head and extremities of the feathered part of the tibiæ.

RELATIONSHIPS WITH *Rissa tridactyla pollicaris*.

The large number of adult Kittiwakes in the Museum collection has led me to make a comparison of the Atlantic form with that found in the North Pacific (*R. t. pollicaris*), the standing of which has been lately questioned by Mr. Howard Saunders.¹

Among my series of 25 adult Atlantic birds, there are specimens having the hind toe fully as much developed as in any one of my six examples of *pollicaris*, and I quite agree with Mr. Saunders that this character is too inconstant to be considered of even subspecific value. As Dr. Stejneger² has pointed out,

¹ Cat. Birds B. M., XXX, p. 310.

² Orn. Ex. in the Comm. Is., p. 80.

however, the black apices of the primaries are of greater extent in the Pacific bird than in examples from the Atlantic, and the

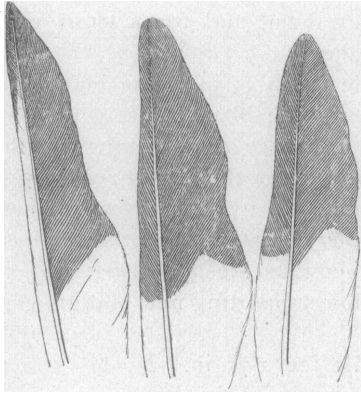


Fig. 5. Tips of three outer primaries of *Rissa tridactyla*. Two-thirds nat. size. Coll. Am. Mus. Nat. Hist., No. 67725.

specimens under consideration support his statement. Measurements of the black tip of the first primary of 25 Atlantic and 5 Pacific specimens gives the following result: Atlantic, extremes, 2.00–2.70 in., average, 2.35 in. Pacific, extremes, 3.00–3.30 in., average, 3.15. Thus the specimen of *tridactyla* having the most black at the apex of the first primary is still less black in this region than the specimen of *pollicaris* having the least black, and this difference, though slight, seems to

be constant enough to warrant the continued subspecific separation of the Atlantic and Pacific birds. These differences are well shown in Figures 5 and 6.

[“The largest colony visited was on the south side of Saunders Island, where about 2000 pairs occupied a deep bay-like depression of the cliff. The nest is composed of fine grasses, very compactly built, and having the appearance of being repaired and added to each year, which resulted in many of the nests being more than a foot high.

Two constitutes the usual brood, but only one is sometimes found.”—J. D. F.]

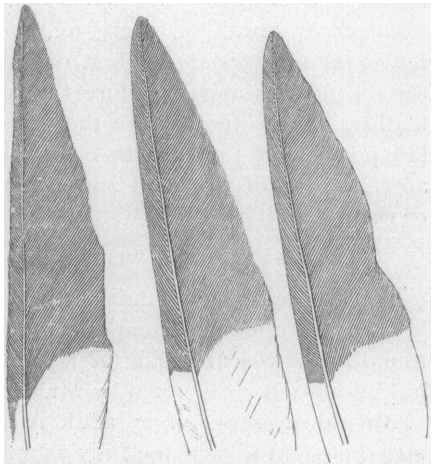


Fig. 6. Tips of three outer primaries of *Rissa t. pollicaris*. Two-thirds nat. size. Coll. Am. Mus. Nat. Hist., No. 61516.

16. *Larus glaucus*. GLAUCOUS GULL.—Three adults from Holsteinborg; two from Parker Snow Bay, August 11; two from north side of White Strait, July 26; two from Kahkoktah Cove, September 1; one from Duck Island, August 2; one bird of the year from Anniversary Lodge, September 11, and one from Bowdoin Bay, September 9.

[“High up on nearly every cliff which is near the sea, one or two pairs of these Gulls were found breeding. In all cases, the nest is inaccessible from below, but it is sometimes possible to reach it from above. The nest is usually in a depression of the ledge of rock, fine grass being used as a scant lining. Two young were found in all nests examined, and they always varied greatly in size. Several pairs of the old birds were always seen about the breeding places of the Dovekies and Murres, swooping down upon the defenceless young.”—J. D. F.]

17. *Sterna paradisæa*. ARCTIC TERN.—Five adults from Holsteinborg; 13 from Disko Bay and Island, August 3, and 6 from Olrik Bay, August 14; 1 immature in the *S. portlandica* plumage from Jacobshaven without date of capture.

[“About the south end of Disko Island this Tern was abundant in 1896, but in 1897 none were seen. I could learn nothing of their breeding habits at this point. The shores of Disko Island are high and abrupt and offer no suitable locality for breeding, unless the birds repair to the higher ground, which I think is doubtful.”—J. D. F.]

18. *Fulmarus glacialis*. FULMAR.—In a series of 32 Fulmars, 25 represent the light phase, 6 the gray, and 1 is intermediate. It is interesting to observe that irrespective of color phase the downy under plumage is of a uniform slate color.

Comparison of the specimens included in this series raises a doubt as to the validity of the so-called *Fulmarus glacialis minor*, the differences in size claimed for this form being in my opinion ascribable to sexual and individual variation. In support of this view I append the following tables of measurements which show the extent of sexual and individual variation in series taken at the same place on the same day :

MEASUREMENTS OF MALE FULMARS.

LOCALITY.	DATE.	Length	Wing.	CULMEN.		Phase.
				Length	Depth at Base.	
Holsteinborg	June 19, 1895	19.75	12.50	1.50	.75	Light.
"	" "	19.00	12.40	1.50	.68	"
Godhaven	July 21, 1895	19.50	12.50	1.45	.72	"
"	" "	19.50	12.75	1.50	.70	"
"	" "	19.25	12.75	1.50	.78	"
"	" "	19.50	13.00	1.45	.80	"
"	" "	19.75	13.50	1.45	.80	"
"	" "	19.25	13.25	1.52	.82	"
"	" "	19.50	12.75	1.55	.80	"
"	" "	20.00	13.00	1.50	.75	Gray.
"	" "	20.35	13.40	1.50	.80	"
Upemvik	Aug. 3, 1896	.....	11.50	1.40	.75	Light.
" .....	" "	.....	12.00	1.40	.75	"
" .....	" "	.....	13.00	1.45	.78	"
" .....	" "	.....	12.75	1.50	.80	"
Average		19.58	12.75	1.48	.77	

MEASUREMENTS OF FEMALE FULMARS.

LOCALITY.	DATE.	Length	Wing.	CULMEN.		Phase.
				Length	Depth at Base.	
Holsteinborg	June 15, 1895	18.00	12.12	1.35	.70	Light.
"	" "	19.00	12.90	1.45	.72	"
"	" "	18.00	11.75	1.38	.68	"
"	" 26 "	19.75	13.50	1.50	.70	Gray.
"	" 16 "	17.00	12.00	1.50	.67	"
Godhaven	July 21, 1895	18.35	11.12	1.40	.70	Light.
"	" "	18.80	12.80	1.50	.78	"
"	" "	18.50	12.10	1.30	.70	"
"	" "	18.75	12.50	1.45	.75	"
"	" "	18.00	12.50	1.30	.70	"
"	" "	17.25	10.50	1.32	.74	"
"	" "	17.50	12.50	1.35	.72	"
"	" "	17.75	12.25	1.35	.72	Gray.
"	" "	18.00	12.30	1.40	.70	"
"	" "	19.50	12.50	1.50	.78	"
Average		18.28	12.22	1.40	.72	

[“Abundant all over Davis Strait; it is to be seen more than one hundred miles from shore and seems at all times to be free from the cares of nest building and rearing of young. During the heavy storms or while circling back and forth over the ice-fields, it seems perfectly contented. The only place I saw it alight on land was at Saunders Island, where I believe it breeds. They were very high up the cliff at that point and many were circling near the top, which is a usual habit. The top of the island at that point was inaccessible, and I am unable to state positively as to their breeding. I am informed by the sailors of whaling vessels that it breeds on the north side of Jones Sound, which is on the American side of Davis Strait.”—J. D. F.]

19. Merganser serrator. RED-BREASTED MERGANSER.—One adult female, Holsteinborg; two young in down without data.

20. Anas boschas. MALLARD.—One adult female and one young in the down, Holsteinborg, July 18.

21. Anas penelope. WIDGEON.—One adult female, near Holsteinborg, October, 1894. (Secured from Müller.)

22. Harelda hyemalis. OLD SQUAW.—One adult male and one adult female, Holsteinborg; one adult female, Olrik Bay, August 15.

23. Histrionicus histrionicus. HARLEQUIN DUCK.—Two adult males, Sukkertoppen, October, 1892 (Kock); one adult male, Niakornat, August 5, and four adults without data.

[“On the south side of Olrik Bay two pairs were found breeding in 1896. Seven young about half grown were found in one brood, and about the same number, but very recently hatched, in the other; while securing some specimens of the larger birds the smaller brood left the lake and entered the grass where I was unable to find them. The nest is a very compact structure of moss and fine grasses. It is very shallow and not more than three inches above the water.”—J. D. F.]

24. Somateria mollissima borealis. GREENLAND EIDER.—This Eider is represented by forty specimens, in five plumages, which may be described as follows:

Downy young (10 specimens, Holsteinborg, July 30, Wilcox

Head, Aug. 6 and 10).—These specimens are in the well-known grayish brown plumage in which the sexes appear to be indistinguishable.

Immature male, nuptial plumage (2 specimens, Holsteinborg, June 19 and 22).—These birds bear a general resemblance to breeding females from which, however, they differ in many respects. The whole abdominal region is grayish brown, uniformly and narrowly edged with buffy, while in the female the sides are buffy conspicuously barred with black, and the centre of the abdomen is grayish brown unmarked. The immature male further differs from the female in having a whitish band across the upper breast, a large black or blackish patch on the sides of the head, and in the absence of the bars on the upper parts, which are grayish brown more or less narrowly margined with pale buff, the lower back being blackish with slight indications of rufous edgings. Material to show the character of the plumage succeeding the one just described is unfortunately lacking; in both these specimens, however, new black feathers are appearing in the upper tail-coverts, the scapulars and anterior part of the back, presenting, therefore, a condition similar to that found in specimens of *Somateria spectabilis* of the same age.

Adult male, nuptial and post-nuptial plumages (12 specimens, Holsteinborg, June 13 to July 19; north side of White Strait, July 26; Greenland, July 28).—The well-known nuptial plumage, which requires no description, is evidently followed, as in the case of *Somateria spectabilis*, by a post-nuptial plumage resembling, in a general way, that of the winter female. In nine of the twelve specimens this post-nuptial plumage is more or less evident. It begins to appear as early as June 13 and is first shown on the anterior part of the back, No. 64310, taken on the date mentioned, having new black feathers growing in that region. In No. 64306, June 28, black feathers are appearing in numbers on the anterior parts of the back, scapulars, and upper tail-coverts, and new blackish feathers are replacing the white ones of the neck, all around, and on the throat and cheeks. By July 6, the molt has reached the breast, sides, and anterior half of the back, and its most advanced state is shown by No. 64118, July 28, which is in much the same condition as No. 64329, *Somateria spectabilis*, Holsteinborg, June 21,

elsewhere described. In addition to the new black or blackish feathers which have appeared or are growing on the rump, scapulars, anterior half of the back, neck all around, throat and sides of the head, grayish brown feathers are coming in on the crown, barred black, white and rufous feathers on the breast, and black rufous barred feathers on the sides. As with *Somateria spectabilis* my material does not fully show the nature of this post-nuptial plumage, but a specimen of *S. mollissima*, No. 853, Denmark, Dec. 2, 1875, indicates that, as suggested with *Somateria spectabilis*, the adult black and white plumage is re-acquired during the late autumn.

This Denmark specimen is in mature plumage, but has throughout the anterior parts of the body, including the head and neck, numerous blackish feathers which are apparently the remains of an old plumage almost replaced by new buffy, white, or greenish feathers, which are still appearing in the parts named.

Female, winter plumage.—This plumage is represented by one specimen in the Dutcher Collection, No. 64781, Montauk Point, L. I., March 25, and two specimens of *S. mollissima* in the U. S. Nat. Mus., No. 113193, Bergen, Norway, Dec. 20, and No. 85983, Spitzbergen. These birds are similar in color to *S. spectabilis* in corresponding plumage. The upper parts are black or blackish broadly margined with rufous; the under parts are fuscous or blackish obscurely barred on the middle of the abdomen, with the sides conspicuously barred with black and rufous and the wing-coverts more or less tipped with white.

As with *Somateria spectabilis* the breeding plumage appears to be acquired by a wearing and fading of the plumage, producing a remarkable change in the bird's appearance, one which it is difficult to believe could be accomplished solely by the agencies of bleaching and abrasion.

Female, breeding plumage (16 specimens: 2, Holsteinborg, June 19; 10, Duck Island, July 31; 1, north side of White Strait, July 26; 3, Wilcox Head, Aug. 6).—With the exception of the two Holsteinborg specimens, this series is very uniform in coloration. The upper parts and breast are barred and margined with pale rufous or buff, the head, throat, and neck all around are evenly streaked with buffy and black, the latter prevailing on the crown; the centre of the abdomen is grayish brown or fulvous.

unmarked ; the sides are conspicuously barred with buff and black ; the wing-coverts show more or less evident white tips. These birds are in very worn plumage and were evidently breeding ; in fact, the specimens taken at Wilcox Head are said by Mr. Figgins, their collector, to have had young. The two Holsteinborg specimens above referred to are in less worn plumage and one especially resembles winter birds, and its condition forms a transition stage between the rich rufous and black winter plumage and the faded black fuscous and buff breeding dress.

It is possible that this species may breed later than *S. spectabilis*, only 3 of the 16 females showing traces of molt. In these, new rufous and black feathers of the winter plumage are appearing in the tertials.

RELATIONSHIPS WITH *Somateria borealis*.

Comparison of 16 adult male Eiders, of which 12 are from Greenland, 1 from Iceland, 1 from Denmark, and 2 from Norway, shows that the only apparent color difference between the New and Old World birds is to be found in the breast, which in *mollissima* is vinaceous-buff and in *borealis* cream-buff. This difference is striking, but I cannot state whether it is not wholly or in part seasonal, my specimens being unfortunately not comparable as regards date, the Old World birds having been taken in the winter, while those from Greenland were secured during the summer. I believe, however, that the difference in color mentioned is, in part, at least, characteristic and will always serve to distinguish birds in full plumage. The only noticeable difference in size is to be found in the length of the bill, which is greater in *mollissima* than in *borealis*, as the following measurements show :

S. mollissima, four specimens : Length of bill, from posterior margin of naked side of culmen to tip, extremes, 2.98-3.20, average, 3.05 ; depth of upper mandible at base of feathered ∇ on culmen, extremes, .90-1.04, average, 1.00. Ratio of length to depth, .32.

S. m. borealis, twelve specimens : Length of bill from posterior margin of naked side of culmen to tip, extremes, 2.55-2.80, average, 2.67 ; depth of mandible at base of feathered ∇ on culmen, .96. Ratio of length to depth, .32. The accompanying

figures (Figs. 7 and 8) indicate the difference in the shape of the bill.

I do not observe any constant difference in the falcation of the tertials, as has been claimed to exist between these two races, but, in my opinion, the differences above mentioned are quite sufficient to warrant us in recognizing the New World Eider under the name *Somateria mollissima borealis* (Brehm).

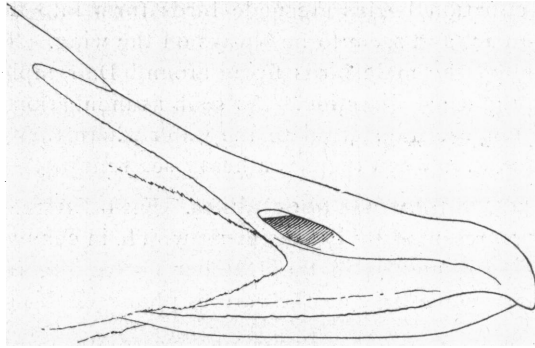


Fig. 7. Outline of bill of *Somateria mollissima*. Nat. size. Coll. U. S. Nat. Mus., No. 113190.

Anas borealis

Gm., based on Pennant's description of the Gulaund Duck of Iceland, supposed by Salvadori to be "the same as *Somateria mollissima*," I do not consider identifiable.

My thanks are due Dr. C. W. Richmond for the loan of specimens of *Somateria mollissima* from the collection of the U. S. National Museum.

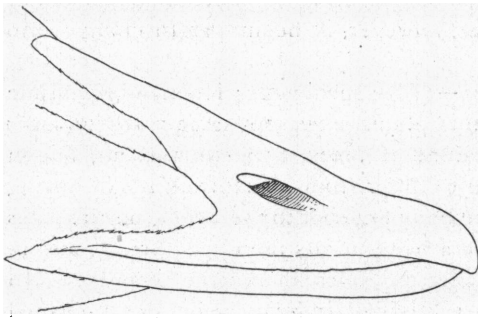


Fig. 8. Outline of bill of *Somateria m. borealis*. Nat. size. Coll. Am. Mus. Nat. Hist., No. 64307.

["This handsome Duck was found breeding at all the places visited. It prefers the small islands lying some distance off-shore, but also breeds on the mainland. Its nest is usually well up the cliffs, and in some cases quite a distance from shore. One nest

containing four eggs was at an altitude of about 450 feet, and more than three-quarters of a mile from shore.

Dalrymple Rock is the favorite breeding-place of this species ;

it is much broken, and the many ledges offer fine nesting sites. There is a heavy growth of grass on these ledges, and the nest, when it has been used for many years, is a depression in the sod, lined with the down from the breast of the female. As soon as incubation begins the male birds form into flocks of from 4 or 5 to 20, and seem to be always on the wing. There is a constant line of the male birds flying around Dalrymple Rock, all going in the same direction. As soon as incubation is completed, the young are transferred to the water where they seem perfectly at ease, even when there is a heavy sea running."—J. D. F.]

25. *Somateria spectabilis*. KING EIDER.—The King Eider is represented by 17 specimens, which, in connection with a series of 21 examples in the Dutcher Collection, from Long Island, throw some light on the various plumages this species assumes.

PLUMAGE OF THE MALE.

Fully grown males are shown in five plumages, as follows: Immature, first nuptial, post first nuptial or second year, second nuptial or mature, post second nuptial, and second winter.

Immature or First Fall Plumage.—(Three specimens: Dutcher Collection, No. 64791, Amagansett, L. I., Dec. 7; No. 67931, Montauk Point, Nov. 25; No. 67928, Montauk Point, Nov. 25.) Specimens in this plumage are practically indistinguishable in size, color, or in the shape of the bill from June females taken at Holsteinborg; No. 67928, however, is beginning to change into the

First Nuptial Plumage.—(Five specimens: Holsteinborg, June 12–22.) Specimens in this plumage present some variation *inter se*, in regard to the amount of black or white present, but in general they may be said to differ from immature birds in having more or less white on the body anterior to the wings, on the sides of the lower neck, and in a band across the upper breast, and in the presence of black along the sides and in the scapulars. In two specimens there is a decided indication of the v-shaped throat mark.

This plumage is apparently followed by one in which birds of the second year, and mature birds in the fall and winter, are indistinguishable. Before describing this, however, I may first mention the

First Nuptial or Second-Year Plumage.—(Nine specimens, Dutcher Coll., Long Island, N. Y., Nov. 25 to March 19.) In this plumage the top and sides of the head are ruddy chestnut brown, obscurely barred with black, the throat and a band around the neck dusky, the scapulars and sides black, while the rest of the plumage resembles that of the immature bird in the first fall.

As has just been stated, there is ground for the belief that this plumage represents the post-nuptial dress of the mature bird, and as far as the change has occurred, the specimen, No. 64329, described above, agrees with the Long Island birds. How long this plumage is worn and whether that of the adult is regained before winter, appears to be unknown. Specimens in mature breeding dress are, I believe, unknown on our coasts in the winter, and whether the Long Island specimens are all birds of the second year or in part adults in winter plumage, is uncertain. Judging from the appearance of the sides of the culmen, three of the birds are adult, this marked space being as large as in some mature specimens in breeding dress, while in the remaining six examples it is as small as in immature birds. These facts would indicate that the adult bird might wear the brownish plumage until the spring molt, but, on the other hand, a male, No. 26894, in the Museum Collection, taken by Müller at Manortalik, Greenland, Feb. 22, 1881, is in full breeding costume.

However this may be, there seems no reason to doubt that the adult male does assume for a greater or lesser period the plumage here described, and there is also evidence showing that it represents the first nuptial of the second year, as was stated in describing birds of that age. This evidence is to be found in several of the immature June males from Holsteinborg, which are molting into a plumage resembling that of the Long Island winter birds.

From this post-nuptial or second year's plumage, the birds evidently pass directly into the mature breeding plumage. This is well shown by several examples in the Dutcher Collection which present several stages of the spring molt. This apparently begins late in December and is first shown in the upper tail-coverts, scapulars, extreme anterior portions of the back, lower hind neck and sides immediately in front of the wings, and thence backward along the flanks. No. 64793, Montauk Point,

Jan. 3, 1894, is in the condition above indicated. New black, upper tail-coverts and scapulars are appearing, numerous black feathers are coming in on the sides and flanks, and on the region before the wings and anterior to the interscapulars there are large numbers of growing white or creamy feathers having a black tip, which later would have been worn off. In No. 64795, the molt is more advanced in the parts already mentioned, while patches are beginning to appear on either side of the rump, the lower throat is white and the black ▼-shaped mark on the upper throat is strongly outlined, while scattered through the anterior half of the top of the head are numerous ingrowing bluish feathers of the adult plumage. No. 64783, Montauk Point, March 19, 1887, is in a far more advanced condition. The head, neck all around, and breast are in mature plumage with only a little of the winter plumage remaining; the upper tail-coverts are wholly black, the lateral rump patches white, while molt is in progress in the scapulars and along the sides.

Second Nuptial or Mature Plumage.—(Three specimens: Holsteinborg, June 21, July 6, and one, R. E. Peary, no date or locality.) This plumage is too well known to require description; the condition of No. 64329, however, supports Mr. Murdoch's statement that after the breeding season males assume a plumage resembling in a general way that of the female.¹ This specimen was taken at Holsteinborg, June 21, and the early date indicates that the males may begin to molt as soon as the female commences to incubate. It was evidently in mature plumage, as the black border at the lower part of the large, rounded side of the culmen, greenish patches at the base of the bill, cream breast, and adult plumaged posterior parts of the body show. Throughout the anterior parts of the body molt is in active progress and the feathers of the adult plumage are being replaced by buffy or rufous black-barred feathers resembling those of the immature bird. This change is most striking on lifting the feathers of the breast, which, superficially, is cream-colored, unmarked, but is found to have numerous new barred feathers sprouting at the bases of the cream-colored plumage of the breeding plumage. The black scapulars are being replaced by

¹ Report of the Expedition to Point Barrow, Alaska, p. 121.

new feathers of the same color, but in the posterior parts of the body, molt can be detected only in the upper tail-coverts and in the white patches at either side of the rump, where new black feathers are appearing.

The material studied, therefore, while unfortunately insufficient to definitely explain the plumage changes of the King Eider, indicates with considerable clearness (1) that males of the first year have a distinctive nuptial plumage; (2) that this is followed by a post-nuptial or winter plumage of the second year, which they begin to acquire by molt in June; (3) that from this second year's plumage they begin, late in December, to molt into the mature breeding plumage, which is thus acquired the second year; and (4) that this mature plumage is in part replaced through a molt, which begins in June, by a post-nuptial plumage, affecting the brighter parts of the plumage, and from which, by a second fall molt, they probably return, as in the case of *S. m. mollissima*, to the fully mature dress.

PLUMAGES OF THE FEMALE.

Twenty specimens represent the female in three quite different plumages: the immature, post-nuptial or adult winter, and breeding, which may be described as follows:

Immature or First Winter Plumage.—(Eight specimens, Dutcher Coll., Montauk Point, Nov. 22 to Jan. 22.) Examples in this plumage are to be distinguished from adults of the same season chiefly by their paler coloration throughout; the upper parts and sides are brownish fuscous, rather narrowly edged with buffy or ochraceous instead of black, widely edged with rufous; the belly is grayish, however, instead of blackish, the wing-coverts are very narrowly, if at all, tipped with white.

As with the males, the molt apparently begins in January and the bird evidently passes into the adult nuptial plumage, which appears to be acquired as early as April 27. No. 64795 *bis*, taken at Montauk Point on this date, being in

Post-nuptial, or Adult Winter or Spring, Plumage.—(Three specimens. No. 26253, Point Barrow, Alaska, May, 21, 1882; Nos. 64121, 64122, Peary, Greenland, no date.) This plumage is characterized by the blackish abdomen, rufous, black-barred breast, black upper parts, margined and more or less barred with rufous,

and white-tipped greater and median wing-coverts. No. 64795 *bis*, Dutcher Collection, Montauk Point, April 27, has nearly acquired this plumage, but the wings still agree with those of the immature bird.

Although this plumage represents the mature spring dress, it apparently is not the breeding plumage; six June females from Holsteinborg differing materially from those just described as follows:

Breeding Plumage.—(Six specimens, Holsteinborg, June 12–29.) These birds are in very worn plumage, closely resembling that of the immature. Each is acquiring new feathers on the scapulars, upper tail-coverts, upper breast, and along the sides, and these new feathers agree in color with those on the corresponding parts of the birds just described as in adult winter and spring dress, from which they have apparently changed to this breeding plumage by a wearing and fading of the feathers.

26. *Chen hyperborea nivalis*. GREATER SNOW GOOSE.—One adult specimen in worn plumage procured by Peary.

27. *Anser albifrons*. WHITE-FRONTED GOOSE.—One adult from Holsteinborg without date. (Secured from Müller.) The measurements are as follows: Wing, 16.50; tarsus, 2.90; culmen, 2.10. The bird, therefore, seems to be quite as near to *gambeli* as to *albifrons*.

28. *Branta bernicla*. BRANT.—One adult male, Holsteinborg; one adult without data.

29. *Phalaropus lobatus*. NORTHERN PHALAROPE.—Two adults from Holsteinborg and one without data.

30. *Tringa canutus*. KNOT.—One adult female, collected by Müller at Jacobshaven, June 3, 1894, and one immature specimen without data.

31. *Tringa maritima*. PURPLE SANDPIPER.—One adult male, Disko Island, August 3, one young in down, Holsteinborg, July 14; and four specimens without data.

[“Occasionally seen on the low sandy shores of the bays.”—J. D. F.]

32. **Numenius phæopus.** WHIMBREL.—One specimen, secured from natives at Jacobshaven.

33. **Charadrius dominicus.** GOLDEN PLOVER.—An adult male, collected by Governor Müller at Jacobshaven, July 2, 1894.

34. **Ægialitis hiaticula.** RING PLOVER.—One immature specimen without data.

35. **Arenaria interpres.** TURNSTONE.—One immature specimen from Holsteinborg, August 10; one adult from north Greenland, June 3; and one without data.

["Three specimens, taken at Saunders Island, were all that were observed."—J. D. F.]

36. **Lagopus rupestris reinhardti.** REINHARDT'S PTARMIGAN.—Two females in summer plumage, Disko Island, July 28; one male, Nuwatak, September 1, and another, Bowdoin Range, August 26, both changing into winter plumage; one female, November 23, one male, April 25, both in full winter plumage; two half-grown young, Disko Island, July 28.

["It is a mystery how the Ptarmigan exists. It is usually found on the higher ground where the vegetation is confined to lichens and a little grass; at one place a brood of about ten was found where the rocks and ground were entirely barren for miles around, except for a little moss in the damp places. Their mottled summer plumage affords them perfect protection from the sharp eyes of the Gyrfalcon, and the natives also, were it not for their habit of running when approached. The native boys kill many of them with stones, in the use of which they are experts at short range."—J. D. F.]

37. **Falco islandus.** WHITE GYRFALCON.—From Governor Kock, now at Frederickshaab, Professor Dyche purchased a beautifully prepared and well labelled series of 27 Gyrfalcons, and in addition to these birds, the Museum has received from Lieutenant Peary, 6 Gyrfalcons from Godhaven, making, in all, 33 specimens. So far as the relationships of the Greenland birds are concerned, a careful study of this fine series fortunately supports the current view of their distinctness, originally advanced, I
[November, 1899.]

believe, by Hancock in 1854.¹ That is, there are two forms, a light one (*islandus*) and a dark one (*rusticolus*). *F. islandus*, of which there are 18 specimens, is light colored at all ages; the under tail-coverts are immaculate, the tail is barred with fuscous and white bands of equal width, with white bands broader, or the fuscous bands may be entirely wanting. Fourteen specimens are immature, four are fully adult. The former have the under parts more or less streaked with fulvous, though white always predominates. The upper parts are striped with linear or guttate markings, or the feathers may be fuscous margined with white. In adult birds the under parts have few or no markings, and the upper parts are crossed with semicircular or broadly sagittate bars of slaty black

38. *Falco rusticolus*. GRAY GYRFALCON.—The series of 14 dark Gyrfalcons (*F. rusticolus* Auct.) presents much variation. Four examples are dark enough to be referred to *F. r. obsoletus*, one of them being fully as dark as the darkest of three specimens from Ungava, Labrador, kindly loaned me by Mr. Ridgway, and warrant the addition of *Falco rusticolus obsoletus* to the Greenland fauna. These birds are connected with the lighter specimens in the series by finely graded stages. Only one bird of the fourteen is adult, that is, in the barred plumage. This specimen is in molt and apparently shows, as Hancock stated, that the change from the linear to transverse markings is accomplished by one molt. Mr. Ridgway has also loaned me several examples of *F. r. gyrfalco*, but the material is insufficient to shed new light upon the relationship of the birds to *F. rusticolus*.

39. *Falco rusticolus obsoletus*. BLACK GYRFALCON.—As above stated, 4 of the 14 Gyrfalcons in the series of 33 are referable to this dark form, one being from Godhaven and three from Sukkertoppen.

40. *Falco peregrinus anatum*. DUCK HAWK.—One adult male and two newly hatched young, from Holsteinborg, June 30.

41. *Nyctea nyctea*. SNOWY OWL.—Two adult specimens, without data.

¹ Ann. and Mag. Nat. Hist., Ser. ii, XIII, p. 110.

42. *Corvus corax principalis*. NORTHERN RAVEN.—Three immature examples, taken at Holsteinborg, July 12 and 18, and one from Upernivik, August 3, are just completing the acquisition of their glossy adult plumage.

[“The only nests of the Raven found were within a few rods of the nest of the Gyr Falcon, and no Gyr Falcon nest was found without its nearby partner the Raven. I was told by Lieutenant Peary and the natives that this is the case almost without exception; why they do this I am unable to say unless the supply of discarded bones from the Gyr Falcon’s nests is the attraction to the Ravens. It was impossible to reach the two nests of the Raven I found, so I learned nothing of its structure.

“The Raven becomes very tame and enters the village, and, true to the tradition of its family, is ever searching for plunder, and they give the natives much trouble when drying meat. When on the wing they are usually found in pairs, their favorite haunts being the fjords and small islands near the coast. They are easily attracted by imitating the call of our common crow or their own notes, the natives being very expert in the latter. During the long winter the Raven is the only bird found in North Greenland.”—J. D. F.]

43. *Plectrophenax nivalis*. SNOWFLAKE.—Ten adults from Holsteinborg, all in worn breeding plumage. Two adults from Disko Island, August 3, show the post-nuptial molt well under way, the new brown-tipped feathers being evident throughout the *pteryla dorsalis*, and the brown-tinged feathers of the *pteryla ventralis* are also appearing. The tail and wing feathers are also being replaced by those of the winter plumage.

A fledgling from Holsteinborg, June 17, has the wings well-grown and the tail half-developed, while a series of six young of the year from Disko Island, August 3, are beginning to acquire their winter or second plumage.

The changes of plumage which this species undergoes have already been treated at some length in a former volume of this Bulletin¹, in a paper based largely on the material above mentioned.

[“The Snow Bunting in Greenland reminds one very much of our English Sparrow. It spends almost its entire time in the

¹ Vol. VIII, 1896, p. 9.

villages, where it is very common. Soon after its arrival the pure white feathers of the breast are badly soiled with dirt and grease and it is a very different looking bird to our neat winter visitor. About the village there is an abundance of grass which furnishes suitable nesting sites. Arriving after the young had left the nests I could learn nothing of their breeding. While crossing Davis Strait in the fall of 1897 a number of Snow Buntings came aboard ship during a heavy gale. They seemed to be nearly exhausted, and as the Strait is about 700 miles wide at that point, many must perish in attempting the passage."—J. D. F.]

44. *Calcarius lapponicus*. LAPLAND LONGSPUR.—Four adults from Holsteinborg; two adults and one young in nesting plumage from Disko Island, August 3.

["The habits of this bird are much the same as those of the Snow Bunting; one nest found, composed of fine grasses, contained two young nearly ready to fly."—J. D. F.]

45. *Acanthis hornemanni*. GREENLAND REDPOLL.—One adult specimen, without data.

46. *Acanthis linaria rostrata*. GREATER REDPOLL.—Two males and two females from Holsteinborg, the latter taken June 14 and 15 respectively, are labelled as having contained eggs about one fourth of an inch in diameter.

47. *Anthus pensilvanicus*. TITLARK.—One adult specimen, collected by Müller at Jacobshaven, September 13.

48. *Saxicola œnanthe*. STONECHAT.—Two adult males, Holsteinborg; one adult female, Anniversary Lodge, September 12; one female in nestling plumage, Upernivik, August 3; and one female without locality. Greenland specimens of the Wheat-eat *average* considerably larger than those from England, but there appears to be no difference in color between birds from these localities.

["This was decidedly the shyest bird observed. It is next to an impossibility to approach within shot-gun range. They are usually found about deserted villages, often entering the stone houses, and as they are insectivorous the reason for this habit is evident."—J. D. F.]