

return. During the operator's time in the blind, the other bird was nowhere in evidence.

It was hoped that the following day would find us "sitting in" on the hatching, but a driving cold rain discouraged any work from the blind. As we had expected, upon our return the next bright day, we found only an empty nest with the flattened fragments of eggshells. Our time was limited and it was impossible to await hatching from other nests, so our "much movied" Loon family was soon located in the shelter of a quiet cove on the opposite side of the lake. From the bow of a canoe, both young were photographed as well as the frantic maneuvers of the adults in their vain attempt to distract our attention from their helpless offspring.

Considering our efforts well repaid, we postponed further work with the Loons for a later date, and returned to Milwaukee.

MILWAUKEE PUBLIC MUSEUM,

MILWAUKEE, WISCONSIN.

---

## ON A COLLECTION OF GYRFALCONS FROM GREENLAND

BY WALTER KOELZ

The bird collection of the University of Michigan contains eighty-one Greenland gyrfalcons. All but nine are in juvenile plumage; four are full fledged nestlings. Except for three specimens (two nestlings and one adult) taken by me along Smith Sound north of Cape York (about lat. 78° N.) and five from the Lehn-Schioler collection, Copenhagen, taken on the east coast at Carlshavn (lat. 72° N.) and Shannon Island (lat. 75° N.) all the rest are from the west coast from Upernivik (about 73° N.) to Frederikshaab (about 62° N.).

The three Smith Sound birds were taken as follows: two nestlings (male, female), Etah, August 13, 1925; adult male, Igloodahauny, August 20, 1925. The five east Greenland birds have the following data: Carlshavn, adult female, September 25, 1923; juvenile female, September 2, 1921; juvenile male, September 28, 1923; juvenile female, September 19, 1921; Shannon Island, juvenile male, September 9, 1920. Of the other birds, listing the localities from north to south, juveniles are present as follows: two from Upernivik, "summer" and December 21, 1925; two from Godhavn, September, 1923; fifteen from Christianshaab District, September 12 to November 5, 1925, and one February 25, 1926; fourteen from Egedesminde District, August 23 to November 4, 1925, and 1926, and two nestlings July 15, 1926; one from Holstenborg, fall, 1928; one from Kanga-

miut, March 12, 1918; four from Sukkertoppen, August 27 to September 27, 1923, and 1924; nineteen from Godthaab, August 15 to May 2 over several years; seven from Frederikshaab, October 30, 1921 to January 26, 1922. The eight adults from the west coast were taken as follows: Christianshaab District, male, September 30, 1925; Egedesminde District, female, January 20, 1926; Sukkertoppen, female, February 28, 1926; Godthaab, female, December 7, 1896, male, March 27, 1897, female, March 12, 1905, male, January 8, 1913; Fiskenaesset, male, February 10, 1913.

It is now generally believed that there is but one species of Arctic falcon, typically *Falco rusticolus* Linnaeus from Sweden. The range of *rusticolus* is given as Scandinavia to N. Russia.<sup>7</sup> The number of forms accepted in this species group is variable, but no one would probably find it necessary to recognize more than five variants. Subspecies *candicans* Gmel. is found in north Greenland and Arctic America; *islandus* Brunn is variously attributed to South Greenland, Iceland, and Arctic America; *obsoletus* Gmel., Labrador; *alascanus* Swann, Alaska; and *uralensis* Sew. and Menzb., Siberia.

Hartert in "Die Vogel der palaarktischen Fauna" recognizes the existence of several forms in Greenland but designates them all as *candicans*, probably because he believes that they all breed together. He says (p. 1066) that certain Greenland birds cannot be distinguished from Iceland birds and on page 1068 that some Greenland and Iceland birds cannot be separated by their plumage from Scandinavian birds. The differences in measurements between any of the forms are slight.

Even if it should be found to be true that these morphological forms are not segregated in breeding, it seems unfortunate that a subspecific name should be based rather on the population of a geographic unit than on a morphological form. Under such a system three birds of identical size and plumage have different names depending on whether they originate in Scandinavia, in Greenland, or in Iceland! Ornithologists in general are loathe to give up the geographical connotation of the subspecies concept, though botanists and some other zoologists have come to realize its inadequacy. Circumstances that contribute to retain it are connected with the ability of birds to move over vast areas, but it will certainly be found when variation in birds is intensively studied that geographical units have not so homogenous a population as has been supposed.

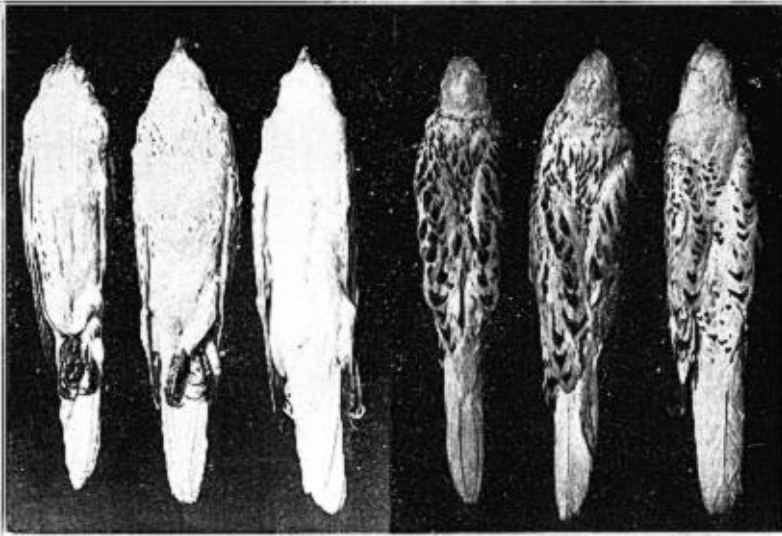


FIG. 4. *Falco rusticolus candicans* Gm. Left to right, juvenile male and juvenile female, taken from a nest at Etah, North Greenland, on August 13, 1925; adult male Igloodahouny, North Greenland, August 20, 1925.

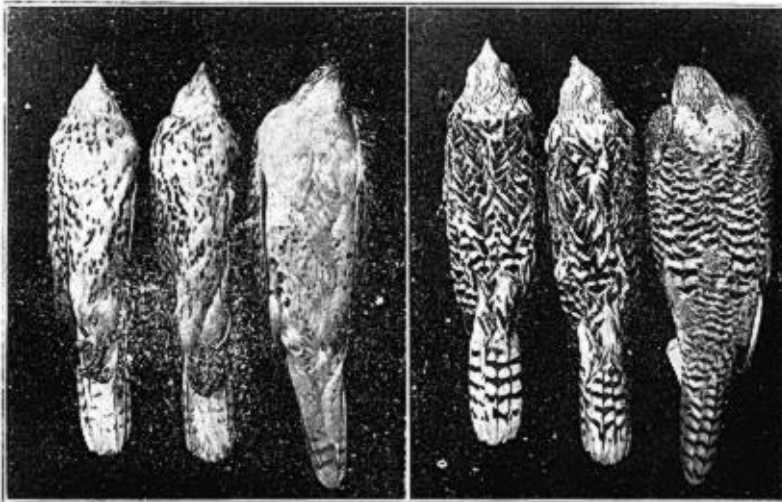


FIG. 5. *Falco rusticolus islandus* Brunn. Left to right, juvenile male and juvenile female, taken from a nest at Nivak, Egedesminde District, Greenland, on July 15, 1926; adult male Godthaab, Greenland, March 27, 1897.

My collection shows the three forms of gyrfalcon that Hartert assigns to Greenland. The two juveniles from Etah, North Greenland, and the August adult from Igloodahouny, North Greenland, would certainly be considered good examples of *candicans*, coming as they do from the northern limits of the species range. The juveniles are male and female, wings 330 mm. and 363 mm., respectively. (These values are low and it is likely that the quills are not full grown. The birds were still in the nest). A third was reared in the nest but fell off the cliff earlier in the season, according to Nukapingwa, who located the aerie.

The two birds are almost alike in color, (Fig. 4).<sup>\*</sup> The under parts are entirely white with a creamy cast, except for a band of narrow streaking of brown on the feathers of the breast (the male specimen has only the sides of the breast streaked), and broader streaks of the same color on the feathers of the sides. The under tail coverts and the tarsals are immaculate. The general tone is white above. The top and the sides of the head are faintly lined along the feather shafts with dark brown. The feathers of the back have a streak of brown along the shaft of the feathers, which broadens as it nears the tip to become rather pendant-shaped. On the shortest scapulars the drop becomes broader so that the feathers here may be described as brown with a broad border of white. The upper tail coverts are streaked like the breast. The tail feathers are pure white. The wing coverts are marked about like the scapulars; the short ones with a central field of brown and the longest ones with broken v-shaped crossbars. The wing feathers are white with dark shafts and a few broken bands of dark brown, chiefly near the tips. The adult has the entire under parts immaculate (Fig. 4). The back is chiefly white. The crown, sides of head, and fore part of the back are unspotted except for a few lines of black brown on the ear coverts and on a few feathers of the occiput. The upper tail coverts, the rest of the back, and the wing coverts are barred with arrow-shaped blotches of black brown. The tail is virtually pure white.

The plumages of adult and juvenile are thus different. Young birds have the markings paler, probably more numerous, and they tend to run lengthwise of the feather, especially on the short feathers.

The two nestlings from Nivak, Egedesminde District, collected on July 15, 1926, are also much alike (Fig. 5). They are marked male

---

<sup>\*</sup>Two young birds which were given to the Boston Society of Natural History by Capt. Donald MacMillan in 1924, were virtually like these. They also were reared at Etah, possibly by the same parents.

and female, wing 317 mm. and 315 mm., respectively, indicating that the feathers are not yet full grown. These birds are much darker than the young *candicans* described above and would be considered representatives of subspecies *islandus*.

The general tone of the under parts is buffy white. (The buff apparently fades out with age, though old specimens that have been blood-stained show local areas of such tone). All the feathers, including the undertail coverts and tarsals, have heavy pendants of dark brown at their tips, except the throat which is rather faintly streaked. The back is dark. The top of the head is heavily streaked with dark brown but the tone is decidedly lighter than that of the back. The short feathers of the back are brown with a narrow border of buffy white. An irregular V of whitish is cut out toward the free end, though often only one branch of the V is present. The longer feathers may have two or three such V's while the longest of the scapulars and tertials may be described as dark brown with notches of white about 1 cm. wide extending from opposite sides of the feather almost to the shaft, with intervening spaces of brown of about the same width. The outer web of the primaries and secondaries is dark brown with small islands of cloudy buff. The inner web is whitish with saw teeth of brown extending into it from the shaft, with the free border lined irregularly with pale brown. These saw teeth are shortest on the first primary. On the secondaries they usually extend to the margin of the web.

The two central rectrices of the tail are crossbarred with dark brown. The dark bands are about 8 mm. wide, the light ones slightly wider. The final band tends to be elongate. The outermost rectrices are barred only on the outer web. The bars of the inner web are broken into mottling which, however, still shows the position of the bars. The intervening feathers are longitudinally striped and mottled on the outer web with an occasional blotch or bar near the free border of the inner web.

Fortunately, I have a young bird taken at Frederikshaab on January 26, 1922, very similar in color to these two birds, which is molting to adult plumage. Comparing the new feathers with those of my fully adult specimens I find two birds which it would probably closely resemble. Both were collected at Godthaab, one female on March 12, 1905, and one male March 27, 1897. These two birds are almost identical in plumage. I shall describe the latter. (Fig. 5).

The under parts are white. The throat and breast are immaculate except for a black shaft line on an occasional feather of the side of the breast. The feathers of the belly and sides and the tarsals and the shorter undertail coverts have irregular arrow-shaped blotches near the tip; the longest feathers have one or more other blotches, chiefly on the outer web, along the shaft. The color of the blotches is black brown except on the long tarsals and on the under tail coverts where they are greyish brown. The longest undertail coverts have usually only a faint line of brown black along the shaft near its tip.

The general tone above is slaty. The top of the head is creamy, broadly streaked with black brown, its tone distinctly lighter than that of the back. The two spots of the hind neck are whitish with faint streaks. The feathers of the lower back, rump and upper tail coverts are slaty blue with darker transverse bands, the bands of light and dark about equal in width. The rest of the back feathers and those of the wings, exclusive of the primaries and secondaries are grayish white with transverse bands of gray brown, darker than those of the lower back.

The longest primaries are white on the inner web with saw teeth in brown extending to or nearly to the web margin. The outer web is brown with whitish notches along the free margin. The feathers become darker as they decrease in length, the areas of brown becoming greater and the white becoming mottled grey-brown.

The tail is whitish with narrow (5 mm.) gray brown crossbars, the crossbars fading to a slaty blue. The dark areas are about half the width of the light areas.

The collection contains specimens of every intermediate stage between the two types described and it also contains many examples that are much darker. In Fig. 8 are shown three birds, an adult (right) and two juveniles from East Greenland, all examples of *candicans*. The bird to the left is as light as the Etah juveniles. The central bird is about as dark as the form becomes. Darker birds show spotting on the undertail coverts, which has been considered the characteristic that separates *islandus* from *candicans*. The adult is comparable in plumage with this dark juvenile. In Fig. 6 (left) is shown another such dark *candicans* in juvenile plumage, along with a juvenile *islandus* and a light *rusticolus*.

The darkest of these Greenland birds (in juvenile plumage) may be predominantly dark in tone on all surfaces. The throat in such specimens is palest, being whitish, more or less heavily streaked with

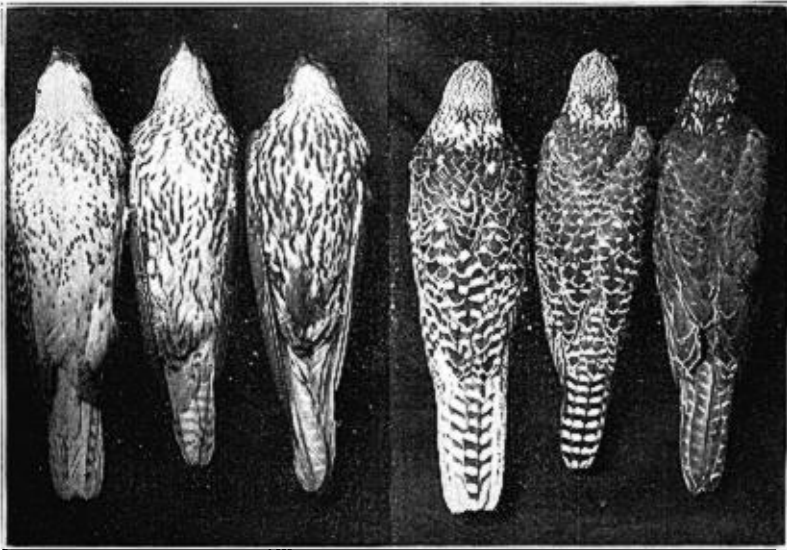


FIG. 6. Left to right, juvenile specimens taken at Godthaab: *Falco rusticolus candicans* Gm. (dark phase), female, April 2, 1926; *Falco rusticolus islandus* Brunn, male, October 10, 1925; *Falco rusticolus rusticolus*, female, February 5, 1926.

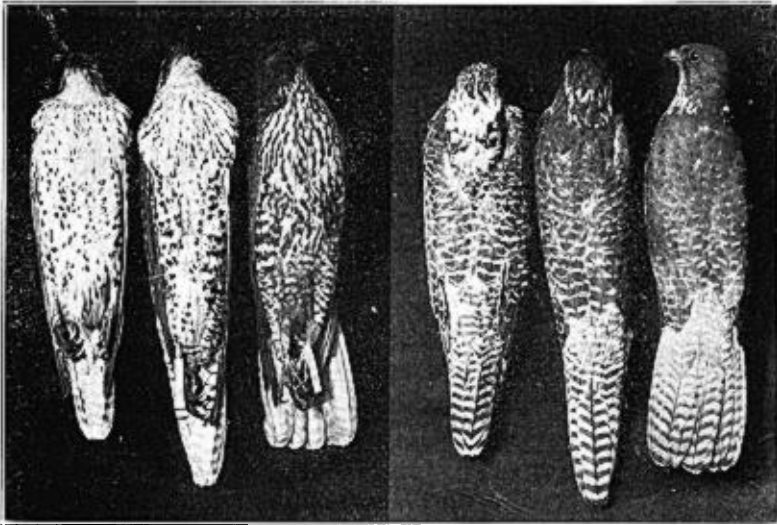


FIG. 7. *Falco rusticolus* adults, left to right, *islandus*, male, Godthaab, Greenland, January 8, 1913; *rusticolus* female, Karasanda, Lapland, April 14, 1896 (M. C. Z. No. 47845); *obsoletus* male, Stowe, Mass., 1881 (M. C. Z. No. 13560).

dark brown. There are distinct moustache patches, i. e., the side of the head from the crown to the throat is uniformly dark. The feathers of the under parts are dark brown with streaks or longitudinal spots of whitish, except those of the belly which are all brown with narrow rims of paler. The upper surface is almost uniformly dark. The feathers of the back are dark brown with narrow borders of lighter. The crown is as dark as the back, the only light tones being in the two nuchal "spots," where the feathers are broadly edged on the sides with whitish, and on the longest upper tail coverts where small scallops of whitish to brownish white are cut out of the borders of the feathers. All the tail feathers are broadly tipped with whitish. The two innermost rectrices may be completely dark, but there are always about twelve irregular lighter crossbars, 10x5 mm., usually indicated only as slightly paler areas. The outermost rectrices are predominantly dark. The outer web is bordered with a very narrow band of light brownish mottling, broadest as the base is approached. The inner web has twelve or more narrow bands of mottled buff to light brownish white invading the field from the border, not extending to the shaft. These bands are narrower than the dark areas that they separate. The intervening rectrices tend to have spots on the outer web and the barring of the inner web becomes less mottled as the central rectrices are approached. Fig. 9 shows the darkest bird of the collection, a juvenile female, taken by me at Godthaab on September 15, 1925. Fig. 6 (right) shows a bird paler, especially below, than the one described here. The other *rusticolus*<sup>1</sup>, from Sukkertoppen, is a little paler below than Fig. 9.

Two of these dark juveniles, a male taken March 5, 1926, and a female November 11, 1923, at Godthaab, are molting. The adult feathers are darker than those of my darkest adult, a male taken on January 8, 1913, at Godthaab (Fig. 7 left). This bird is in general like the adult *islandus* previously described but the breast is heavily streaked, the throat alone being immaculate. The entire upper surface is darker, the light areas being reduced in intensity and area and the dark areas being much darker, with no slaty blue except on the upper tail coverts.

The darkest adult is in color much like a specimen from Lapland, typical *rusticolus* (Fig. 7 center), except that the light color of the feathers of the nuchal patches is more brownish than in the bird from

<sup>1</sup>This is one of Lehn-Schioler's birds and was identified by him as *F. rusticolus rusticolus*.



Greenland and there is more white throughout. There is, however, a molting young bird which shows the same brownish tone in the nuchal feathers, so this may be no constant character. The darkest of the juveniles from Greenland would undoubtedly assume an adult plumage indistinguishable from *rusticolus* or even *obsoletus* (Fig. 7 right), as Hartert says.

## DISTRIBUTION

The specimens of the collection may be grouped according to locality, beginning north, as follows:

Locality	No. specimens	Date	Subspecies
East Greenland	5	September	<i>candicans</i>
West Greenland			
Etah	3	August	<i>candicans</i>
Upemvik	2	Summer Dec. 21	<i>islandus</i> , rather dark
Godhavn	2	September	one <i>candicans</i> , one rather dark <i>islandus</i>
Christianshaab Dt.	16	Sept. 21-Nov. 5 Sept. 12-Feb. 25	9 <i>candicans</i> , 5 rather dark <i>islandus</i> , 1 very dark
Egedesminde	15	Sept. 26-Jan. 20 July 15-Nov. 1	8 <i>candicans</i> , 2 dark <i>islandus</i> , 3 dark
Holstenborg	1	Fall 1928	<i>islandus</i>
Kangamiut	1	March 12	<i>islandus</i>
Sukkertoppen	5	Sept. 7, Feb. 28 Sept. 26, 27 Aug. 27	2 <i>candicans</i> 2 <i>islandus</i> , 1 dark 1 <i>rusticolus</i>
Godthaab	23	Aug. 15-April 5 Sept. 16-Mar. 27 Aug. 20, Mar. 5	10 <i>candicans</i> , all but 2 dark 11 <i>islandus</i> , 6 dark 2 <i>rusticolus</i>
Fiskenaesset	1	Feb. 10	<i>islandus</i>
Frederikshaab	7	Oct. 30-Dec. 20 Dec. 2-Jan. 26	4 <i>candicans</i> , 1 dark 3 <i>islandus</i> , 1 dark

To these data may be added sight records made by me in August, 1925, while with the MacMillan Arctic Expedition of 1925. On the 14th at Nawyardi, some five miles north of Etah, a gyrfalcon was observed at close range. The Eskimos later pointed out the aerie on a cliff about twenty feet high and said the young birds had just left the nest a few days before. On the 20th a flock of four birds was seen flying at Etah. Two juvenile birds were seen on the 25th on Bell Rock (about lat. 77° N.) where Captain MacMillan said they always nested. All these birds were very white and were certainly referable to the form *candicans*.

Mr. C. O. Erlanson, of the University of Michigan, informs me that he found a nest of gyrfalcons, located about 100 feet high on a cliff on the Nakajanga Peninsula (West Coast), lat. 66° 50', in the summer of 1927. Both adults came very close to the observer. Mr.

Erlanson says these birds were certainly not white, but rather of a grayish cast beneath with wings barred with dark and light. They were undoubtedly *islandus*, the form I should expect to find in this area.

It thus appears from these data that the breeding birds of the west coast of Greenland as far south as lat. 76° N. and probably from the east coast as far south or farther (the east coast is much colder) are *candicans*. From this point southward birds of all three types are known. Except for the two nestlings (*islandus*) from the Egedesminde District and Mr. Erlanson's two adults from Nakajanga none of the rest of the specimens collected in this area were certainly native to the areas in which they were taken. The adult male taken at Godthaab on March 27, 1897, (*islandus*) and the two juvenile females taken on April 2, 1926, and April 5, 1924, (dark *candicans*) may or may not have been breeding. (The young birds were just beginning to molt to adult plumage).

The *candicans* type is represented from every locality from which more than two specimens were taken. Beginning with Upernivik about lat. 73° N. *islandus* specimens are represented from every locality. One out of five birds from Sukkertoppen and two out of twenty-three from Godthaab (about lat. 66° to 64° N.) are very dark birds probably referable to *rusticolus* or *obsoletus*.

That the falcons may migrate extensively is true beyond doubt. This migration, furthermore, probably may be either northward or southward, so that birds bred in the south may be found far north of their breeding range. This is certainly true of other hawks. The *candicans* taken below lat. 76° N. all then are probably migrants. All had abundant time to get so far away from the supposed breeding range of the form except one young bird taken at Godthaab, August 15, 1926. If this bird is a bird of the year and was bred north of 76°, it traversed some 700 miles from the time it left the nest. This seems improbable inasmuch as the Etah birds were still in the nest on August 13; the Nawyardi birds had flown about that time; the Bell Rock birds still lingered at the site. Of course, the breeding range of *candicans* may extend several hundred miles to the south, in which case it would be more tenable to assume that this bird was a migrant. It is also possible that the date of capture is incorrect or that the bird is not of the year and not a breeder. It has further been suggested that non-breeding gyrfalcons may linger during the year in their winter quarters. We know this to be true in some birds.

*Islandus* is probably the breeding bird south of the range of *candicans*. The nestlings from Egedesminde are rather light examples. Their parents are said to have been light birds also, though how light is not known. Mr. Erlanson's birds seem to have been typical birds of the form. From this point southward I assume that the birds grow darker, so that around Sukkertoppen and Godthaab the darkest ex-

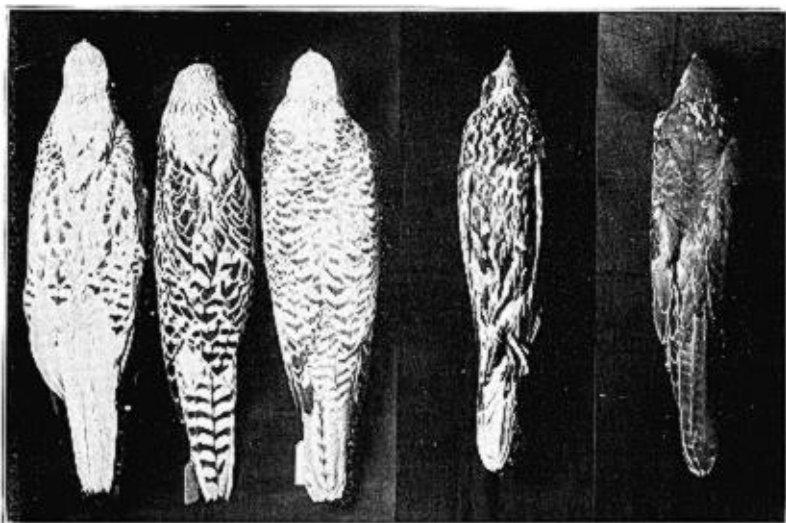


FIG. 8. *Falco rusticolus candicans* Gm. from East Greenland. Left to right, juvenile male, Shannon Island, September 9, 1920; juvenile female, Carlshavn, September 19, 1921; adult female, Carlshavn, September 25, 1923.

FIG. 9. *Falco rusticolus rusticolus* L. juvenile female from Godthaab, Greenland, September 15, 1925. This is the darkest bird in the entire collection, but unfortunately the high lights make the bird appear lighter than it is. (Compare with Fig. 6, right).

amples occur, whether regularly or only sporadically. These are the birds which seem close to the darkest forms known in the species group. (The effect of the Gulf Stream is strongest in this area. It is still felt somewhat north of Egedesminde, so that the southern flora is found on parts of Disco Island).

The distribution of the gyrfalcon forms in Greenland is in general like that of the redpolls. North of  $76^{\circ}$  (the range may be lower) is the palest form, *Acanthis hornemanni* of American ornithologists. Southward the birds grow darker until around Disco Island the dark bird, *Acanthis linaria rostrata* is found. It ranges south all along

the west shore. I found it very abundant at Godthaab, even far into the fiord. Two females in worn plumage taken by me at Etah in August are practically indistinguishable from southern birds, due to the abrasion of the lighter parts of the feathers. Some twenty-five examples in fresh fall plumage were also taken and these are of course much paler than the birds of the south. I have no doubt (there being no other differences in the two groups of specimens except that the northern birds have a somewhat longer wing and tail) that the two forms intergrade and I consider them both races of *Acanthis linaria*. The ptarmigan (*Lagopus rupestris*) in Greenland appears to vary in the same way, as Lehn-Schioler has shown.

SIZE. The various forms appear to be of the same size. Arranged according to sex as indicated on the label, the wing length in centimeters is given below for the individuals of the collection not including the four nestlings:

Sex	34	35	36	37	38	39	40	41	42	43
Male .....	1	1	9	8	2	2	5	8	2	
Female .....	1	0	3	3	2	3	9	13	3	1

Very probably the larger "males" and the smaller "females" are improperly sexed.

MOLT. It has been stated often that the falcons did not molt to adult plumage until several years old. These observations have been based mostly on captive birds. In the following table are given observations on plumage condition of birds taken after January first:

Place	Date	Sex	Plumage condition
Godthaab	Jan. 5, 1926	male	no molt
Godthaab	Jan. 8, 1913	male	adult
Egedesminde	Jan. 20, 1926	female	adult
Godthaab	Jan. 18, 1926	male	no molt
Frederikshaab	Jan. 26, 1922	?	molting upper tail coverts
Godthaab	Feb. 5, 1926	female	no molt
Ikamiut	Feb. 25, 1926	male	no molt
Sukkertoppen	Feb. 28, 1926	female	adult
Godthaab	Mar. 5, 1926	male	molting upper tail coverts on back and hind neck
Godthaab	Mar. 12, 1905	female	adult
Kangamiut	Mar. 12, 1905	female	no molt
Godthaab	Mar. 27, 1897	male	adult
Godthaab	Apr. 2, 1926	female	molting on the back
Godthaab	Apr. 5, 1924	female	molting upper tail coverts
Godthaab	May 2, 1910	female	no molt

In addition to these a female taken at Godthaab on November 23, 1923, had begun molting her upper tail coverts.

Of the fifteen birds collected after the first of the year five were fully adult. Of the remaining ten, six showed no signs of molting. It is possible then that the Greenland gyrfalcons retain juvenile plum-

age for at least a year. The upper tail coverts, and the feathers of the back and hind neck seem to be changed first.

MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN,  
ANN ARBOR, MICHIGAN.

---

### DR. ELLIOTT COUES—A SKETCH

BY MRS. H. J. TAYLOR

Elliott Coues was born in Portsmouth, New Hampshire, September 9, 1842. He died in Baltimore, Maryland, December 25, 1899, aged 57 years. He is buried in the National Cemetery at Arlington. When he was 11 years old the family moved to Washington, D. C. Aside from being stationed at various posts during his seventeen years of Army service, Washington was home throughout his life. Here he was graduated from Columbian University with the degree of A. B., in 1861. Two years later he received the degree of M. D. from the same university. Some years later this institution conferred on him the honorary degree of Ph.D.

While studying medicine Coues was a cadet in the United States Army. On receiving his degree in 1863, he was appointed Assistant Surgeon and ordered to duty in Arizona which had, in February, 1863, been made a territory. The population was 581, exclusive of Indians and Mexicans. Arizona ranks fifth in size among the states, having an area of 113,040 square miles; this gave about one white person for every 200 square miles. No wonder the detachment took with them eighty wagons laden with subsistence, twelve luggage wagons, a herd of 300 beef cattle and 800 head of sheep, 560 mules to draw the wagons, and 163 horses for cavalry and officers!<sup>1</sup>

Men sent to such a new country needed a good physician and they had one in Dr. Coues. But a man with his energy, zeal and brain could not express his life through a single channel and that one limited. His interest in birds began early; he was fortunate to have been under the tutelage of Professor Baird with whom he was connected in the Smithsonian Institution before he graduated from college. With his friend, D. W. Prentis, he published a list of birds of the District of Columbia, in 1861, and it was re-published in 1883.

Arizona with its wonderful rivers and incomparable canyons, its mountains, plains, and mesas, lay before this eager student as a rich and interesting field. “. . . Dr. Coues entered Arizona in 1864, and spent nearly two years studying the natural history of the Territory.”<sup>2</sup>

---

<sup>1</sup>Curtis, Capt. C. A. *Bird-Lore*, IV, 1902, page 6.