

ON THE SUBSPECIFIC VALIDITY OF ANSER GAMBELLI HARTLAUB

WITH THREE ILLUSTRATIONS

By NAGAMICHI KURODA, Sc. D.

In the past, *Anser albifrons albifrons* (Scopoli) (1769—type locality: North Italy) and *Anser albifrons gambelli* Hartlaub (*Anser Gambelli* Hartlaub, 1852—type locality: Texas and southern United States; synonym, *Anser frontalis* Baird, 1858—type locality: Interior of North America, juv.!) have been known as two subspecies of *Anser albifrons*. Some ornithologists (Lord Rothschild, M. Delacour, and others) consider that *gambelli* is based merely upon larger individuals of *albifrons*, Dr. Hartert writes that it is a doubtful form of *albifrons*, and some (Swarth and Bryant, and others) believe that it is a good subspecies.

Hartlaub (1852) described three specimens from Texas and southern parts of North America as follows:

Anser Gambelli, Nob.—(Notice provisoire.)—*Synon.* *Anser albifrons* Americ. septentr.

Nous avons examiné trois exemplaires de cette espèce d'Oie, dont deux provenaient du Texas et l'un du sud de l'Amérique du nord. Ce dernier est *presque* adulte; les deux du Texas sont des jeunes. L'énorme grosseur et la forme différente du bec nous force de séparer cette espèce de notre *albifrons*. Voici les dimensions comparatives:

	A. Gambelli	A. albifrons
Longit.rostri a fr.....	2" 4" [= 59.3 mm.]	1" 6" [= 38.1]
A rict.....	2" 4" ½ [= 60.3]	1" 8" [= 42.3]
Altitud. rostri later.....	1" 2" [= 29.6]	10" ½ [= 22.2]
Circumferent.rostri ad bas.....	3" 6" [= 88.9]	2" 11" [= 74.1]
Longit. tars.....	2" 8" ½ [= 68.8]	2" 2" [= 55.0]
Dig. Med.....	2" 10" [= 72.0]	2" 6" [= 63.5]

Le congrès des ornithologistes, à Berlin, en 1851, a approuvé la séparation spécifique de cette Oie américaine.

It is a very regrettable fact that the above description of Hartlaub does not include the wing measurements.

Last year (1928), through the courtesy of Dr. Stresemann, of the Zoological Museum, Berlin, I was shown in that institution three mounted birds which are said to have been Hartlaub's specimens. As no particular one had heretofore been selected as the type of *Anser gambelli*, Dr. Stresemann in my presence so designated one of the three (Zool. Mus. Berlin Coll. no. 17430).

Measuring these birds myself, I found the measurements much smaller than those given by Hartlaub and wholly identical with those of *albifrons*. My measurements, in millimeters, are as follows.

Zool. Mus. Berlin No.	Locality	Date	Sex	Age	Total length (about)	Exposed culmen	Bill from gape	Tarsus	Middle toe and claw	Wing	Tail	Greatest height of bill at base
14942	"Nord America"		"Ad." = ♂?	juv.	735	50.5	53.5	67.5	67.5	395	106.5	29.5
17430 (type)	"Alvarado, Texas"	Jan., 1828	"Juv." = ♂?	ad.	705	52.5	51	66.5	71	404	122	28.5
17431	"Alvarado, Texas"		"Juv." = ♀?	ad.	710	52	53	75.5	77.5	408	119.5	29

The newly selected type specimen is a very old bird, having most of the underparts covered with black patches of large size, with a rather smaller bill than in

the young male (no. 14942) that Hartlaub seemed to consider as an adult. The latter bird seems to be a young of the year, as it has no black spots on the underparts, and the chest is slightly marked with shaft spots of grayish brown (juvenile feathers). The white frontal patch is small in area and the feathers at the base of the upper mandible have a faint, white linear patch only. There is a distinct blackish brown patch at the base of the upper mandible, close to the whitish line. No. 17431 seems also an adult female (but not an old bird) with fewer black spots (only five in number) on underparts. My measurements (given above) show that they are all three typical *albifrons*.

It is very doubtful that there would really be such great differences (10 mm.) between Hartlaub's measurements and mine of exposed culmen and length of bill from gape, if taken from the same bird. The discrepancies are too great to be explained as due to differences in methods of measurement followed by different people. Questions now suggest themselves that may be summarized as follows.

1. Was Hartlaub's description really based upon the three birds examined by me, and supposed to have been his specimens?
2. Were not the original type specimens of *gambelli*, described by Hartlaub in 1852, replaced by the above specimens since then?
3. Is it not likely that the original types are at some other place than the Berlin Museum?

I think that the doubts I express are reasonable; for the two forms, *albifrons* and *gambelli*, do migrate in winter to Texas and other southern parts of the United States, as stated by Swarth and Bryant (1917).

Last year (1928) I examined specimens of *Anser albifrons* in several museums in Europe and America. At the Berlin Museum there are only the above mentioned three *albifrons*. In the several museums in North America most of the birds labeled as "*gambelli*" are typical *albifrons*. I measured some examples from Korea at the United States National Museum, Washington, D. C., which had been reported by A. H. Clark as "*gambelli*". In these birds the exposed culmen varies from 49 to 55 mm., being of no larger size than in *albifrons*.

At the Naturhistoriska Riksmuseum, Stockholm, I examined the head of an adult collected in Kamtschatka in 1927. In this bird the exposed culmen is 51.5, and height of bill at base 28 mm., as in typical *albifrons*. There is one skin and one head preserved in the British Museum (Natural History) that are of great size and coincide with the description of *gambelli*. Their dimensions, in millimeters, are as follows:

Brit. Mus. Reg. No.	Locality	Date	Sex	Exposed culmen	Bill from gape	Tarsus	Middle toe and claw	Wing	Tail	Greatest height of bill at base
1848.3.13.112	"Repulse Bay"	.....	Ad.	61.5	62.5	78	80	425	129	30.1
1892.2. 1.365	"Arctic Coast, E. of Ft. Anderson"	6.vii. 1865	♀ ad.	59	60.5	....	....	.....	.....	31.5

These two are evidently larger birds than the three preserved in the Berlin Museum.

On a visit to the Museum of Vertebrate Zoology, University of California, Berkeley, in 1928, I examined a large series of geese labelled as "*Anser albifrons*

gambeli". Later, through the kindness of Dr. Joseph Grinnell of the said museum, one of the finest adult males was sent to Tokyo, together with measurements of the entire series. The specimen received bears out the conclusion of Swarth and Bryant (1917) that two forms (larger and smaller) occur in North America. While I thus agree with the general proposition advanced by those authors, still after my careful examination of specimens, I differ from them in certain particulars, as detailed beyond.

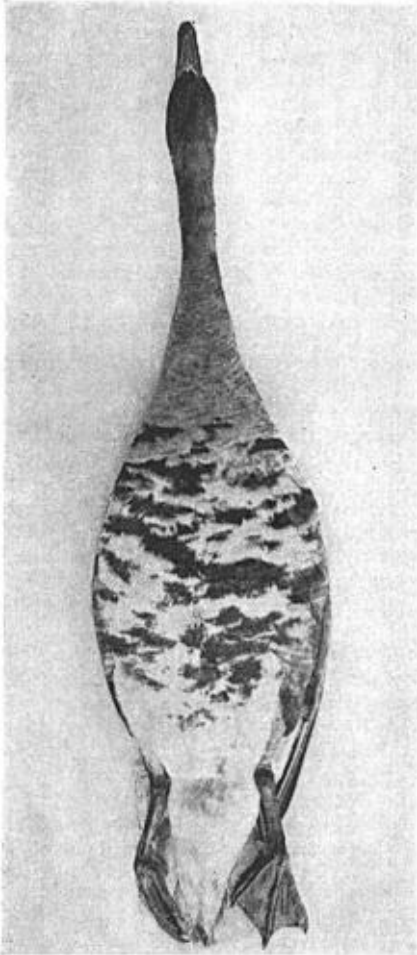


Fig. 60. SKIN OF AN ADULT MALE TULE GOOSE (*Anser albifrons gambelli*) COLLECTED ON BUTTE CREEK, SUTTER COUNTY, CALIFORNIA, NOVEMBER 19, 1916; MUS. VERT. ZOOL. NO. 27134.

Wing, 468 mm.; tail, 146; tarsus, 84.5; exposed culmen, 58; anterior end of nostril to tip of bill, 32.5; bill from gape, 62; height of mandible at base, 32.4; middle toe, 78; middle toe and claw, 92. Number of "teeth" on one side of upper mandible, 27. Number of tail-feathers, 16.¹ The total length is given by the collector as "854 mm.", and the spread of wings is "1667 mm."

In general appearance the so-called "Tule Goose" is similar to *albifrons*, but it is distinguishable from it by enormously larger size. The tarsus of the Tule Goose is much thicker and longer (width in central part 16 mm. in dried state instead of 11 to 12.1 mm., as in *albifrons*; length of tarsus 84.5 mm. instead of under 79 mm., as in the latter form). The bill of the Tule Goose is thicker; nails on upper and under mandibles wider and longer (length of nail on upper mandible 16 mm., that of lower mandible 15.5 mm., instead of 13.1 to 14.1 on upper mandible, 10 to 12 on lower mandible, as in *albifrons*). The bill is rather less slender than that of *albifrons*, and length of exposed culmen including nail on maxilla of adult male is $3\frac{1}{2}$ times that of nail, as in females of *albifrons*, instead of 4 times, as in adult males of the latter form.

Coloration is essentially as in *albifrons*, but the entire crown of head and nape is very dark umber brown, nearly black, blacker than most examples of *albifrons*. Feathers at base of both mandibles near the white patch and throat are much blacker. The above-mentioned characters are taken from an adult male from Butte Creek, Sutter County, California, November 19, 1916; Mus. Vert. Zool. no. 27134; shot by Geo. Neale.

This specimen was measured by myself as follows:

¹ Editorial note: This bird, which was skinned by myself, appeared to have lost some tail feathers. See Swarth and Bryant, 1917, p. 212.—H. S. Swarth.

As the result of my examination of this adult male of the "Tule Goose", I agree with Swarth and Bryant in their assertion of the occurrence of two forms of *Anser albifrons* in North America.

The opinion of Dr. Hartert, of Tring Museum (Vög. Pal. Fauna, II, pp. 1281-1282), on the validity of *Anser gambelli*, is, I think, very important, so I insert herewith the English translation, as follows:

In the Cat. B. Brit. Mus., XXVII, p. 95, and in the A. O. U. Check-List , the white-fronted geese of North America and eastern Asia (Japan) were separated on the basis of greater size, especially of the bill. As Alphéraky in "Geese of Europe and Asia," p. 46, previously stated, and examination of the series in the British and Tring museums and some smaller private collections confirmed, by no means all American and very few eastern Asiatic specimens are greater than European ones; on the other hand, I have examined very small examples from Japan and Korea.² *Gambelli* could, therefore, be placed in the synonymy of *albifrons*, since it is not [only] in North America that surprisingly large specimens with bills to 60, wings to 448 and 475 mm. are produced; whilst I could point out no example from eastern Asia that would not thus be equaled from western Europe. The probability is, nevertheless, that in the far north of eastern America a large billed form exists, as a series of breeding birds from Greenland and Iceland would show.

After this was written, there appeared an article by Swarth and Bryant in *Univers. California Publ. in Zool.*, XVII, No. 11, pp. 209-222, with illustrations, in which the white-fronted geese of North America are critically treated. The professors come to the conclusion that two forms exist there, *A. albifrons albifrons* and *A. albifrons gambelli*; that they both meet in their winter range; but that the latter have a very much more easterly breeding range. They believe that the two are not only separable by the bill dimensions, but also that *A. a. albifrons* is lighter, particularly the head and neck being grayer, the bare eyelid grayish brown, the rectrices 16, wing 384 to 422, culmen 44-52 mm.; on the other hand, that *A. a. gambelli* is larger, the coloring on the whole darker, the neck brown, the head blackish, the naked upper eyelid yellow or orange, rectrices, male, 18; female, 16; wing 420-475, bill 53 to 62 mm. These points I am unable to verify. The coloration is variable, as brownish and grayish examples are found in Europe; the characteristic is thus not unqualifiedly useful. The upper eyelid of one specimen obtained in Ireland I found dark yellow! Naumann called it reddish yellow or also only reddish gray. Also it is not correct that all the smaller white-fronted geese have only 16 rectrices; 4 or 5 times I found European males with 18 rectrices, also a similarly bedecked female, which also was certainly slightly larger than a female should be; Naumann also found 18 once. Two subspecies can be recognized first when, the breeding place being established, both forms have separate nesting grounds.

In agreement with Dr. Hartert I can criticize some details of the conclusions of Swarth and Bryant, but as regards Hartert's doubt of the occurrence of two forms in North America, that matter seems to be settled beyond question. A specimen in the British Museum is of the utmost importance in this connection, an example of the larger form, collected July 6, 1865, on the "Arctic Coast, E. of Ft. Anderson". I presume that that goose was obtained on its breeding ground, and it supplies proof of the hypothesis of Swarth and Bryant that *gambelli* might be found to breed in Arctic America east of Alaska.

The statement of Swarth and Bryant that the naked skin at edge of eye-lid of the "Tule Goose" is yellow or orange, and that of *albifrons* is grayish brown, is not invariably true, as Dr. Hartert points out. I once had in captivity a Japanese example of *albifrons* with yellow eyelids, but I think this condition is rare in

² Clark (*Proc. U. S. Nat. Mus.*, 38, 1910, p. 151), however, called Korean specimens *A. a. gambelli*, without, nevertheless, specifying the reasons.

albifrons. Regarding general coloration, Dr. Hartert may be correct, but the crown of the head in the one specimen of "Tule Goose" at hand, lately sent by Dr. Grinnell, is of the blackish color described by Swarth and Bryant, much blacker than in any skins of *albifrons* secured in Japan and Korea. After all, the difference between the two forms is remarkable, in size of body, in length of wing, and in

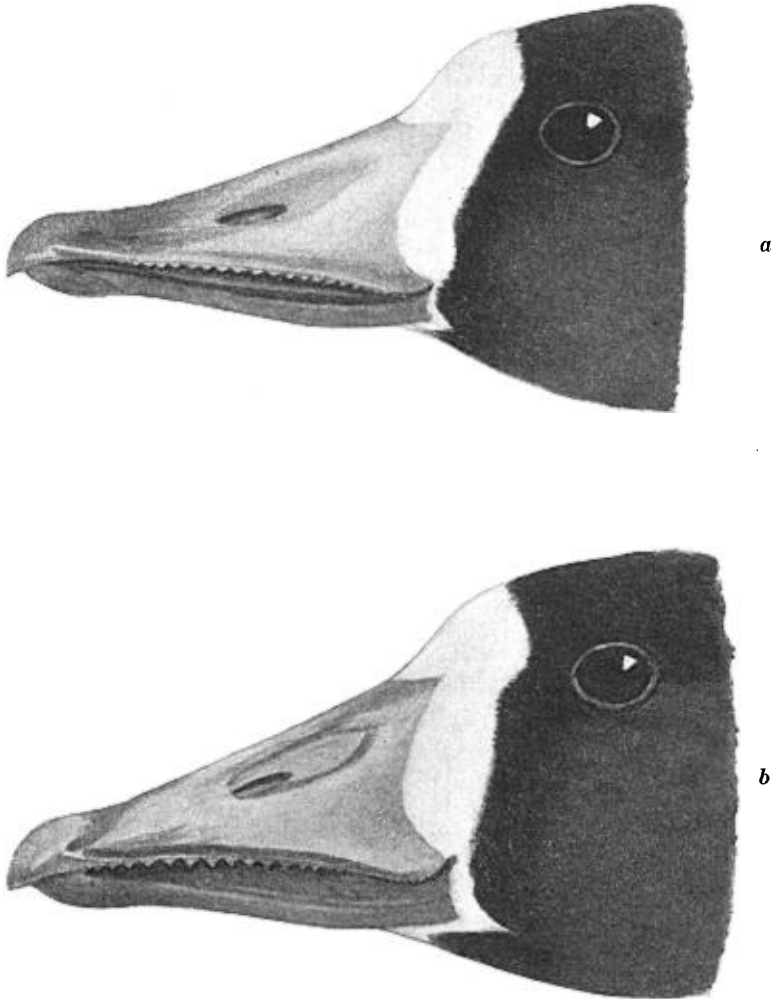


Fig. 61. *a*. HEAD OF ADULT MALE OF *Anser albifrons albifrons* (ONE OF THE LARGEST YET OBTAINED IN JAPAN); N. KURODA COLL. NO. 39. *b*, HEAD OF *Anser albifrons gambelli*; MUS. VERT. Zool. NO. 27134. BOTH FIGURES NATURAL SIZE.

Drawn by Mr. S. Kobayashi.

thickness of tarsus. As regards number of tail-feathers, I cannot accept the statement of Swarth and Bryant, for *albifrons*, male and female, often has 18 tail feathers, and at the same time the male "Tule Goose", no. 27134, Museum of Vertebrate Zoology, has only 16 feathers! [But see footnote, p. 175.]

The last question remaining to discuss is the scientific name to be given to the

big form of *albifrons* in North America, the so-called "Tule Goose" or "Timber Goose". Messrs. Delacour and Hachisuka, who visited the Museum of Vertebrate Zoology, Berkeley, two years ago, examined the series of these large geese in that collection. Their conclusion, as they told me, was that if the types of *gambelli* in the Berlin Museum are not different from typical *albifrons*, then these birds represent an undescribed form. Though I have investigated the three geese in the Berlin Museum and am convinced that they are all really *albifrons*, I am still compelled to believe Hartlaub's original description. Until the questions that are put at the beginning of this paper are solved clearly, I shall call the "Tule Goose" *Anser albifrons gambelli* Hartlaub (not *gambelli* as by many American authors). I beg of any persons who are interested and who may have information bearing upon the question as to whether or not the assumed type specimens of *gambelli* in the Berlin Museum are really such, that they will communicate with me or else publish their findings themselves. If those birds really are the original specimens, and the measurements in the original description of Hartlaub are determined to be mistaken, then I believe that the name *Anser frontalis* Baird (1858) given to two young examples (from Selkirk settlement and Fort Thorn) may be applied to the larger American subspecies of *Anser albifrons*, the "Tule Goose".

The comparative measurements of both forms are as follows.

Adults of *Anser albifrons gambelli*^a from California

Sex	Wing	Tail	Tarsus	Exposed culmen	Height of bill at base
8 ♂ ♂	430-475	124-144	80-84	54.3-62	28.8-33.7
3 ♀ ♀	422-443	131-141	78-81	51.2-58	28.8-32.5

Adults of *Anser albifrons albifrons* from Japan and Korea.

Sex	Wing	Tail	Tarsus	Exposed culmen	Bill from gape	Height of bill at base	Number of tail feathers
9 ♂ ♂	380-440	118.5-135	65-79	46.5-57.5	53-59	26.5-30	16-18
17 ♀ ♀	368-419	118.5-133	64-76	43-53	49.9-54.5	25-29.5	16-18

As shown by the above measurements, specimens of *albifrons* from Japan and Korea are on the average larger than those from Europe, and it seems probable that some from eastern Asia show increase in size, as mentioned by Alphéraky. But in Japan, there are very few larger ones, old males (or very exceptionally old females), and there are none to be compared with the "Tule Goose" of North America. The largest examples of ♀ and ♂ from Japan, show the following measurements: wing 419, 440; exposed culmen 53, 57.5; tarsus 76, 79. The tarsi especially, in both sexes, are shorter than in *gambelli*.

A key to the two forms may be constructed as follows:

- Size larger (wing 422-475); tarsus longer (78-84.5) and thicker (16 mm. in skin); bill larger (culmen 51.2-62); coloration darker.....*gambelli*.
 Size smaller (wing 368-440); tarsus shorter (64-79) and thinner (11-12.1mm. in skin); bill smaller (culmen 43-57.5); coloration paler.....*albifrons*.

Distribution of *A. a. gambelli*.—The specimens upon which the present paper is based are mostly from Butte Creek, Sutter County, California (obtained in November and January), one from Repulse Bay (Lat. 66°20' N., Long. 86°30' W.) in Keewatin, North Canada, and another from the Arctic Coast, E. of Ft. Anderson (obtained in July), also in North Canada. It seems to breed in the high

^a Measured by Dr. Grinnell, excluding no. 27134, from a series of *gambelli* preserved in the Museum of Vertebrate Zoology, for the present paper.

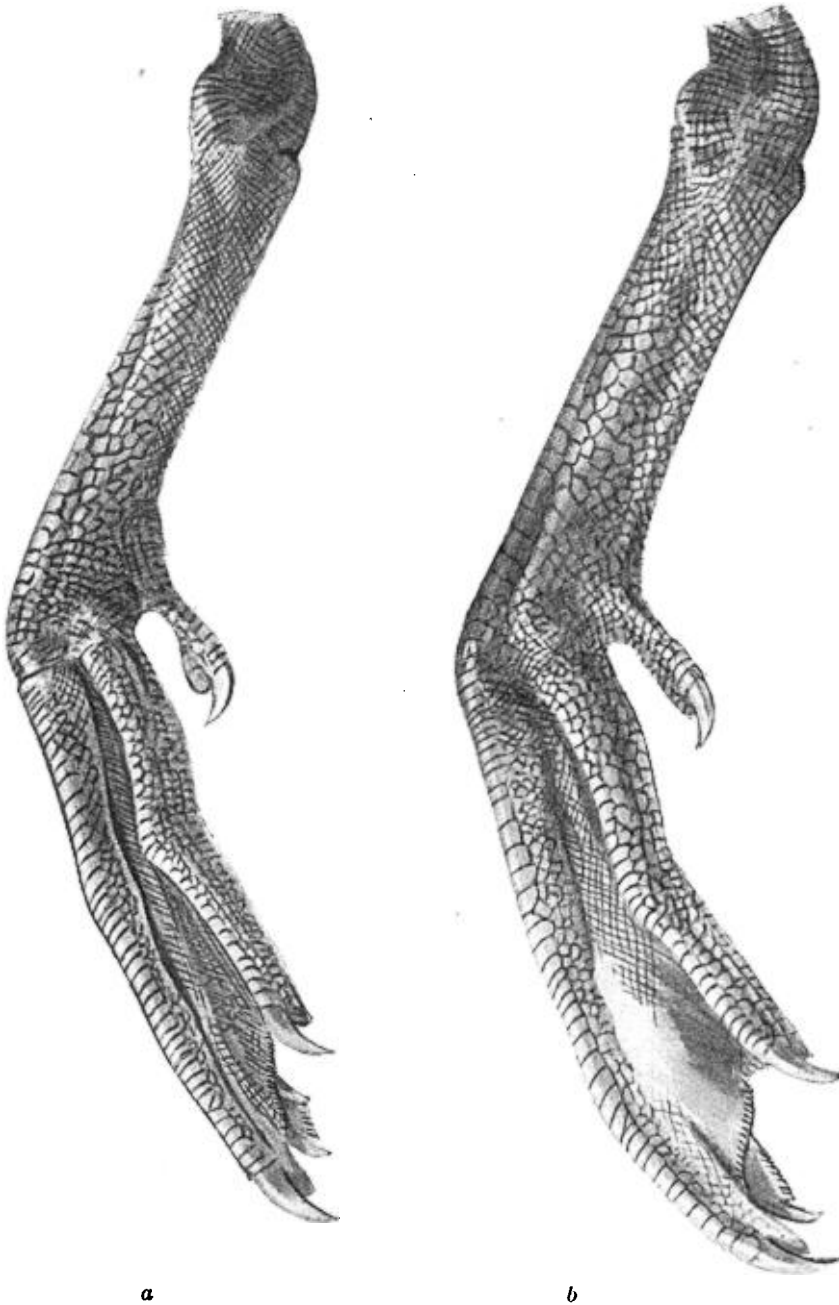


Fig. 62. FEET OF TWO FORMS OF *Anser albifrons*, BOTH NATURAL SIZE: a, *A. a. albifrons*, MALE (ONE OF THE LARGEST YET OBTAINED IN JAPAN); N. KURODA COLL. NO. 39. b, *A. a. gambelli*; MUS. VERT. ZOOL. NO. 27134.
Drawn by Mr. S. Kobayashi.

north, in Arctic North America and to migrate to the United States in winter, south to California, Texas, etc.

In finishing the present paper I have to express the deepest gratitude to Dr. Joseph Grinnell and Dr. E. Stresemann, and many thanks also to other ornithologists, as Mr. Bannerman, Mr. Allan Brooks, Mr. A. H. Clark, M. Delacour, Count Gyldenstolpe, Mr. M. Hachisuka, Mr. James Moffitt, Dr. C. W. Richmond, Mr. J. H. Riley, Lord Rothschild, Dr. Uchida, and others, who have given me every assistance. I wish also to thank Prince Takatsukasa, who has called at my house and has given me several suggestions regarding the specimen from Berkeley.

BIBLIOGRAPHY

- Alphéraky, S.
1905. The Geese of Europe and Asia, being the Description of most of the Old World Species. London, Rowland Ward Ltd., x + 198 pp., 1 frontispiece, 24 col. pls.
- Baird, S. F.
1858. Birds. Report of Explorations and Surveys, to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean, IX, Part II, pp. 762-763.
- Hartert, E.
1920. Die Vögel der paläarktischen Fauna, Band II, pp. 833-1764.
- Hartlaub, G.
1852. Descriptions de quelques nouvelles espèces d'Oiseaux. Paris, Revue et Magasin de Zoologie, 2e série, IV, pp. 1-7.
- Kuroda, N.
1928. Notes on the Validity of *Anser gambelli* Hartlaub, in Review of some Japanese and Formosan Birds. "Tori," VI, No. 26, pp. 1-2. (In Japanese.)
- Moffitt, J.
1926. Notes on White-fronted and Tule Geese in Central California. Condor, XXVIII, September, 1926, pp. 241-243.
- Salvadori, T.
1895. Catalogue of the Birds in the British Museum, XXVII, pp. 88-89, 95-97.
- Swarth, H. S., and Bryant, H. C.
1917. A Study of the Races of the White-fronted Goose (*Anser albifrons*) occurring in California. Univ. Calif. Publ. Zool., vol. 17, no. 11, pp. 209-222, pl. 13, 2 figs, in text.

Fukuyoshi Cho, Akasaka, Tokyo, Japan, March 14, 1929.