

SUBSPECIES OF THE GREATER SCAUP AND THEIR NAMES¹

RICHARD C. BANKS²

ABSTRACT.—The name *Fuligula mariloides* Vigors, presently used by many authors for a subspecies of the Greater Scaup, *Aythya marila*, was originally proposed for the Lesser Scaup, *A. affinis*, and may not be used in combination with the name *marila*. The name *mariloides* has been applied to a population of Greater Scaup in Kamchatka and the Commander Islands, supposedly distinguished by small size and dark dorsal color, or for that population and the one in North America, otherwise known as *A. m. nearctica*. Evidence for a subspecifically distinct population in eastern Asia is lacking, and *A. marila* is best considered to consist of only the Eurasian *A. m. marila* and the American *A. m. nearctica*. There is some interchange of the two subspecies in migration. Received 13 Dec. 1985, accepted 4 Mar. 1986.

The American Ornithologists' Union (AOU 1957) used the name *Aythya marila nearctica* Stejneger, 1885, for the North American subspecies of the Greater Scaup. More recent authorities use *A. m. mariloides* (Vigors, 1839) for the North American population (Bellrose 1976, Palmer 1976) or for a population in North America and eastern Asia (Johnsgard 1975, 1979). Others (Portenko 1972) recognize both an east Asian *mariloides* and an American *nearctica* in addition to the European *A. m. marila*, and still others (Vaurie 1965) treat *A. marila* as monotypic. Who is correct?

The name *Anas marila* was applied by Linnaeus (1761) to the Scaup Duck of Europe, the species now called in North America the Greater Scaup. In the intervening years the species has been placed in a number of genera, but generic placement will be ignored here. Generic names mentioned beyond, in full or as initials, are all synonymous with the modern *Aythya* and will be used without comment.

It was recognized early that the Scaup Duck of Linnaeus occurred also in the New World (Pennant 1785, Wilson 1814) and across northern Asia (Pallas 1831). It is only in retrospect that we are able to realize that many of the early references to American scaup applied, totally or partly, to another species, now known as the Lesser Scaup, *A. affinis*. Richardson (*in* Swainson and Richardson 1831) seems to have been the first to realize that 2 kinds of scaup occur in North America. Richardson wrote (p. 453): "Our specimens are smaller than English ones killed in the winter, the

¹ This paper is dedicated to John W. Aldrich on the occasion of his 80th birthday.

² Fish and Wildlife Service, National Museum of Natural History, Washington, D.C. 20560.

head, bill, wings, and legs, in particular, being proportionally smaller, and the bill less high at the base . . . but an attentive examination of a number of specimens disclosed no peculiarities which could characterize it as a distinct species, except its size. The undulated markings on the back and wings are darker and less extended than in the English specimens." In what amounts to a parenthetical statement, he also noted that "A variety, nearly corresponding with the English one in size, is also found in the fur-countries. . . ." Wing lengths given equate to 196 mm for the smaller birds, and 224 mm for both the larger American variety and the English birds. In describing the bill of the scaup, Richardson (op. cit.) referred to the unguis (nail) as "small and distinct" as in the Pochard, *A. ferina*, and the Canvasback, *A. valisineria*. This description indicates certainly that his basic account is about what later would be known as *A. affinis*.

Eyton (1838) distinguished the present *Aythya affinis* as an American species distinct from *marila*, which he apparently considered strictly an Old World species. Smaller size and the narrower nail on the bill formed the main bases of the separation, as these characters still do. The type, from "North America," is in the British Museum (Natural History) (BMNH) (Salvadori 1895, Warren 1966). One wonders if this is a bird that Richardson had studied; the name certainly applies to the birds he had discussed.

Vigors (1839) was the next to provide a name for a scaup population, although the name was used provisionally and the precise origin of the birds was not stated. In reporting on the birds collected during the voyage of the *Blossom*, under Captain F. W. Beechey, in 1825–1828, Vigors wrote as follows under the heading *Fuligula Marila*: "Several specimens of a bird nearly allied to this species, if not the same, were brought home by the expedition. They uniformly differ from the typical *Ful. Marila* in their smaller size, in the black colour on the breast being less intense and defined, in the undulating white markings being less diffused over the scapulars and back, and being wanting almost entirely on the wing-coverts. Dr. Richardson, whose judgement on these points, and whose experience respecting the birds of the Arctic region entitle him to every confidence, is inclined to consider these birds but as a variety of the European species. Following his opinion, I refrain from describing them as separate. It is however to be observed, that the true *Fuligula Marila* is found in North America, and there is therefore less reason to believe the birds alluded to above to be varieties resulting from climate or locality. Should the species prove to be distinct, the specific name of *Mariloides*, which has been suggested by Dr. Richardson, would be appropriate."

Publication of the results of the Beechey expedition had been delayed considerably, and Richardson (and perhaps others) had access to the

specimens well before Vigors's account appeared. Richardson was offered the opportunity to incorporate into his own work a list of species from the northwestern American coast, but declined because (Swainson and Richardson 1831:xiii) "very few of the specimens brought home on that Expedition had notes attached to them to indicate their locality, so that the native places of many are uncertain." It is obvious, however, that the small birds that Vigors had were the same as the smaller scaup that Swainson and Richardson (1831) discussed. Yarrell (1843) discussed two species of scaup, and used the name *mariloides* for the smaller American birds without mentioning the name *affinis*. Yarrell both described and figured a single specimen of what he thought was the smaller American scaup. That bird, which had been bought in a market in England, was later identified as a hybrid *A. ferina* × *A. marila* (Salvadori 1895). Both the description and illustration apply remarkably well to the Redhead, *A. americana*. Interestingly, Audubon (1844) gave Yarrell credit for the first good description of *mariloides*.

Eyton's (1838) name for the small American scaup, *affinis*, was routinely overlooked or ignored by British authors (e.g., MacGillivray 1852). However, Baird (*in* Baird, Cassin, and Lawrence 1858) recognized *affinis* as the name of the smaller species, and treated *mariloides* Vigors as a synonym. Schlegel (1866); Gray (1871); and Baird, Brewer, and Ridgway (1884) treated the two names in the same way. This synonymy would seem to have been firmly established.

Meanwhile, Swinhoe (1873) detected two size classes of scaup in China. The abundant, and apparently regularly occurring, form he recognized as *marila*. Some smaller birds brought to him, from one or two flocks, posed a problem in identification. Swinhoe first considered them to be *affinis*, because of their size and after consultation of works by Yarrell and Baird (presumably those cited above). Those birds, however, had extensive white wing markings that MacGillivray (1852) and Schlegel (1866) attributed to *marila* rather than to *affinis*, and the combination of size and wing characters led Swinhoe to reject either name as applicable. He stated: "Our bird, then, is not the American *F. affinis*; but it nevertheless must be the bird that Mr. Yarrell mentions under the head 'American Scaup,' which was brought home by Capt. Beechey from Behring's Straits, and was apparently identified with that species. Sir John Richardson suggests for this Pacific species the name *mariloides*, which is generally regarded as a synonym of *affinis*. But I think it can now be shown that *F. mariloides* is a species of itself, and a visitant to the Chinese coast. *Fuligula marila* also occurs here in abundance. . . ." This is the first suggestion in the literature that the birds from Beechey's voyage were from the Bering Straits, or that the name *mariloides* referred to a Pacific species. These

concepts may have been derived from the long title of the work in which Vigors (1839) proposed the name *mariloides*, but were counter to the then generally accepted notion that *mariloides* was an American form.

In a report on birds from the Commander Islands, Stejneger (1885) continued to associate *mariloides* with *affinis*, giving the former subspecific rank and assigning to it a range on the "Pacific coast of Asia, from Japan southward," where no scaup was known as a breeding bird. At the same time, Stejneger distinguished the North American population of Greater Scaup from the European birds, under the new name *A. m. nearctica*. Stejneger's account is confusingly written, but it is clear that he considered his specimens from Bering Island (one of the Commander Islands) to be *A. m. marila*, and he presented measurements only for those birds, not for the American form that he named. It seems obvious that he took his concept of the range of *mariloides* from Swinhoe (1873), not recognizing that the latter's discussion referred only to wintering birds.

Seebohm (1890) wrote of *marila* in Japan that "Fully adult males from Japan are precisely similar to those from the British Islands." He pointed out that the amount of white on the wing, used by MacGillivray (1852) and Schlegel (1866) as a specific character and by Stejneger (1885) as a subspecific character, was actually age related. Seebohm treated "*Aythya affinis mariloides* Stejneger" as a synonym of *marila*, which he considered monotypic. Thus Seebohm transferred *mariloides* from the synonymy of *affinis* to the synonymy of *marila*.

Salvadori (1895) presented synonymies for the scaup following Stejneger's (1885) distributional scheme but including both *nearctica* and *mariloides* as part of a monotypic species *marila*. The A.O.U. (1899) followed Salvadori in treating both *marila* and *affinis* as monotypic.

In a discussion of the European *marila*, Dresser (1903) gave specific status to both the American *nearctica* and the East Asiatic *mariloides*, without comment or more detailed delineation of range. Millais (1913) included "Kamtschatka and the Commander Isles" in the breeding range of *marila*, noting that "These Asiatic Scaup frequenting the two last-named places have been separated recently under the name of *F. mariloides* (Vig.)." The association of those breeding grounds with *mariloides* may have resulted from a careless reading of Stejneger's (1885) work, but amounted to a compounding of the errors of several previous authors. Millais cast doubt on the validity of both *mariloides* and *nearctica* as recognizable forms, but for the first time treated *affinis* as a subspecies of *marila*.

Hartert (1920) finalized the association of the name *mariloides* with the Commander Islands-Kamchatka breeding scaup. He noted but rejected Stejneger's arrangement of scaup populations, stating that: "I find

that all specimens from the Far East—i.e. from Japan and China and from the Bering Island—are (with few exceptions) smaller than European *N. m. marila*, the wings of 16 adult male examples measure 207–220 mm., in the European form 220–230 mm. Moreover, in nearly all cases the black barring of the upperside is coarser, thus giving the latter a darker appearance, which is particularly noticeable on the scapulars. . . . We must therefore, unless we suppress this form altogether, recognize a Far-East form breeding on Bering Island, and probably in Kamtchatka, wintering in China and Japan.” Hartert recognized three subspecies of *marila*—*nearctica* in North America; *marila* in Europe and northern Asia, with indefinite Asian limits; and *mariloides* breeding on Bering Island, probably Kamchatka and elsewhere, wintering in eastern Asia. He noted that the latter population is closely allied to *marila*, not to *affinis*. Hartert’s separation of *marila* from *mariloides* at a wing length of 220 mm is directly opposed to Seebohm’s (1890) and Salvadori’s (1895) analyses.

Peters (1931) followed Hartert’s classification of the scaup, and additionally fixed the type locality of *mariloides* by giving it as “No type locality = Bering Sea.” No reason for this decision was given and one might guess that Peters, as perhaps Swinhoe (1873) earlier, was influenced by the title of the work in which *mariloides* was named and also by Hartert’s use of the name for the Bering Island population. Hartert’s classification was also accepted by Hellmayr and Conover (1948). Dement’ev and Gladkov (1952), however, did not recognize any subspecies of *marila*, noting that the amount of variability in the supposedly differentiating characters was great. The A.O.U. (1957) again accepted the name *nearctica* for the North American population of Greater Scaup, following Peters (1931) and Hellmayr and Conover (1948).

Parkes (1958), noting that several authors had doubted the valid distinction of *nearctica*, examined the series of specimens in the American Museum of Natural History (AMNH) “and found that *nearctica* is readily recognizable by the coarse black barring of the upper parts, exactly as characterized by Hellmayr and Conover. . . .” He considered *mariloides* “of eastern Asia” to be intermediate in color but smaller than either *marila* or *nearctica*, citing Hartert’s measurements.

Delacour (1959) recognized two subspecies of *A. marila*, the nominate form in Europe and western Asia and *mariloides* in eastern Asia and North America, merging *nearctica* into the latter. His measurements of wing length give *mariloides* a greater range of variation than *marila*, and one that completely encompasses the latter. Palmer (1976) followed Hellmayr and Conover (1948) and Parkes (1958) in separating American from Eurasian birds on the basis of back color, but recognized only two subspecies. To the American population, however, he applied the name *mar-*

iloides, treating *nearctica* as a synonym. Thus he followed Delacour in the use of the name for the American population but not in the range allotted to it, dropping the Asian population whose birds were supposedly the basis of the name. Bellrose (1976) used the same names in the same fashion. Johnsgard (1975, 1979) followed the taxonomic arrangement of Delacour.

DISCUSSION

Two problems are revealed by the preceding taxonomic history. The first involves the allotment of the name *F. mariloides* Vigors, 1839 to either *marila* or *affinis*. The second is whether there is a recognizable population of scaup in the Commander Islands and Kamchatka.

It is quite clear that the small birds with the narrow unguis that Richardson discussed in 1831 and that Vigors named *mariloides* in 1839 were the same, and that Eyton named that form *affinis* in 1838, while Vigors's manuscript on the voyage of the *Blossom* was awaiting publication. Both European and American authors accepted *mariloides* as the smaller of the American species of scaup, often treating it as a synonym of *affinis*, into the 1870s and beyond. It was not until Swinhoe (1873), confused by Yarrell's (1843) description of a hybrid as *mariloides* and other misinformation, associated that name with birds "from Behring's Straits" that the concept of *mariloides* as an Asian population originated. This concept was repeated by Stejneger (1885), who nonetheless maintained the association of *mariloides* with *affinis*. Once *mariloides* was accepted as referring to an Asian population, it was logical to consider that the name was synonymous with *marila*, because *affinis* does not occur in Asia. Thus Seebohm (1890) and Salvadori (1895), even as they denied the validity of the taxon *mariloides*, associated the name with European *marila*. By 1920, the "fact" that the name *mariloides* applied to east Siberian birds, specifically those of the Commander Islands and nearby Kamchatka, was accepted, the only question then relating to the distinctness of the population. That "fact" was finally given some basis when Peters (1931) formally designated "Bering Sea" as the type locality of *mariloides*.

Although no locality was given for the scaup specimens that Vigors discussed, and no type was (or has been subsequently) designated, the specimens almost certainly originated in North America. Vigors (1839) wrote about 102 species of birds in his report on Capt. Beechey's voyage; 68 of these are American species, whereas only 3 are strictly Palearctic. Of the other ducks discussed, 5 are strictly American and 4 are Holarctic in distribution. The form of *Anas crecca* discussed was *carolinensis*, and the only wigeon mentioned was *Anas americana*. At least one duck, the Bufflehead, *Bucephala albeola*, "was found at San Francisco" and several

of the shorebird specimens also were taken there. Probably most of the waterbirds, including the scaup, were taken from large wintering flocks in the San Francisco Bay area or in Monterey Bay, California, as the *Blossom* spent parts of 2 winters in that vicinity (Rosewater 1968). I suggest San Francisco Bay, California, as the corrected type locality for *Fuligula mariloides* Vigors, 1839, *contra* Peters (1931).

The second problem is whether the east Asian and North American populations of *marila* are distinct from the European population and, if so, what the limits of their ranges are. The present consensus is that North American birds differ from European birds by having coarser and more extensive black vermiculation on the mantle (Hartert 1920, Hellmayr and Conover 1948, Parkes 1958, Delacour 1959, Portenko 1972, Palmer 1976), yielding a darker back overall. This character is restricted to adult males, a fact not always stated; no one has ever suggested that other sex or age classes could be distinguished. My examination of specimens supports this consensus, and the validity of *nearctica*, although the character does not provide 100% separation. A small proportion of American birds are nearly as white on the mantle as European birds, as noted by Bishop (1895).

The supposed characteristics of the eastern Asian population have been confusingly set forth by various authors, partly because of the confusion over the specific application of the name *mariloides* and partly because that population was compared to different populations at different times. Smaller size and darker dorsal color relative to European *marila* have been invoked as distinguishing features, as has paler color relative to American birds.

Swinhoe (1873) first reported small scaup from Asia, but gave no measurements or any basis for his characterization of the birds. Both Seebohm (1890) and Salvadori (1895) denied that Asian birds (including those sent to England by Swinhoe) were consistently smaller than European ones. Hartert (1920) repeated that Asian birds were smaller "with few exceptions," and provided ranges of measurements to support his statement. His figures divided European and Asian birds at a wing length (adult male) of 220 mm, not allowing for any of the "exceptions." Portenko (1972) suggested an average size difference and stated that "specimens with much shorter wings predominate" among Asian birds relative to those of Europe, although the ranges of measurements given virtually overlap. No other authors have given measurements specifically for the Asian population, except Stejneger (1885) for 2 males.

Available measurements from many sources (Fig. 1) do not indicate that Asian birds have shorter wings. Hartert's Far East sample is at the lower end of the range of variation, but overlaps most samples of European

birds and, as noted above, apparently omits any exceptional birds. Portenko's East Asian sample is small in wing length but so is his West Asian sample compared to others, and the means of his two samples differ only slightly. The mixed samples that include Asian birds, those of Delacour, Palmer, and Dement'ev and Gladkov, do not, except for the last, show any great tendency to include small birds. My own measurements of the chord of several samples (Table 1) (Fig. 1) show primarily that most other writers must have measured the flattened wing, and secondarily that there is no great amount of geographic variation. I conclude that there is no evidence indicating that eastern Asian *marila* are recognizably smaller than European or North American ones.

As indicated above, adult males of the European and North American populations can be distinguished by back color. Hartert (1920) considered East Asian birds to be darker than European ones, with those of America the same or even darker. Parkes (1958) and Portenko (1972) considered them to be intermediate. Delacour believed Asian birds to be the same as American ones, a view endorsed by Alexander Wetmore on examination of specimens in the British Museum (Natural History) (in litt. to L. L. Short, FWS files).

I compared 10 adult males from Siberia, Japan, and Bering Island in the AMNH and U.S. National Museum of Natural History (USNM) with larger series of European and North American birds. As a series the Asian birds seem to me to be more similar in dorsal appearance to European specimens than to American birds, although one winter bird from Japan and 2 worn breeding birds from Bering Island might be classed as intermediate. I also examined several first-year males from Asia and noted that they tend to be darker than the adults, approaching the American birds. It is possible that age classes were not adequately separated in some previous comparisons. I conclude that Asian birds cannot be distinguished from European ones on the basis of dorsal color any more than they can on size. I recommend, therefore, that only two subspecies of Greater Scaup be recognized, *A. m. marila* of Eurasia and *A. m. nearctica* of North America.

DISTRIBUTIONAL RECORDS

The Pribilof Islands represent a landfall for many migrant birds from both North America and Asia, and have provided the first and only American records of several Old World species or subspecies. I have examined 5 adult males of *Aythya marila* from the Pribilof Islands in the USNM and the University of Kansas Museum of Natural History. One specimen taken in late April and 3 in early June are dark dorsally like typical North American birds. One specimen, USNM 496822, taken 29

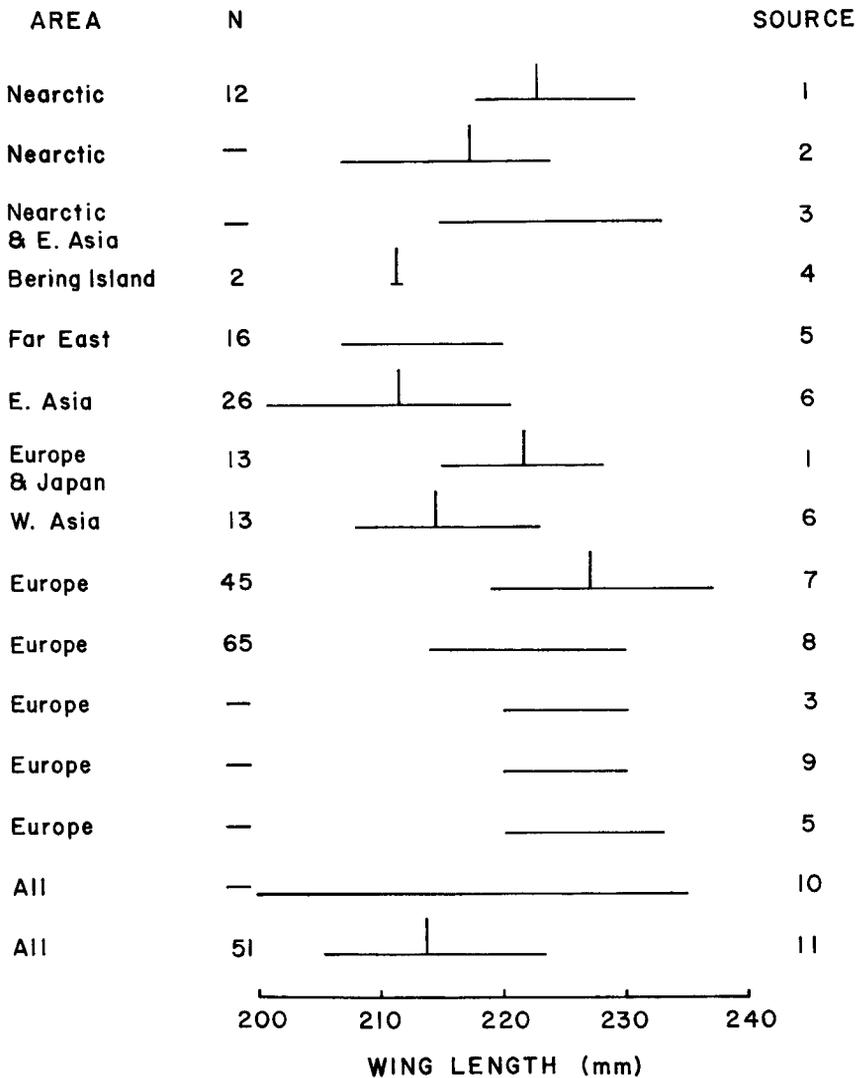


FIG. 1. Measurements of wing length of male (presumably adult, but not stated in every instance) Greater Scaup. Sources: 1, Palmer (1976); 2, Oberholser (1974); 3, Delacour (1959); 4, Stejneger (1885); 5, Hartert (1920); 6, Portenko (1972); 7, Cramp and Simmons (1977); 8, Bauer and Glutz von Blotzheim (1969); 9, Witherby et al. (1939); 10, Dement'ev and Gladkov (1952); 11, this study, Table 1. A dash under N indicates an unspecified sample size.

TABLE 1
WING CHORD (MM) OF ADULT MALES OF POPULATIONS OF GREATER SCAUP, MEASURED BY
THE AUTHOR

Area	N	Range	Mean
North America	25	205.5–222.5	215.7
Europe	12	206.5–218.0	214.6
Eastern Asia	10	205.0–223.5	210.9
Pribilof Islands	4	211.0–217.0	214.6
All areas	51	205.5–223.5	213.9

June 1968 on St. George Island by Max C. Thompson, is much paler on the back and is identical in that feature to birds from Europe and Japan. I consider this bird a representative of the Eurasian population, *A. m. marila*. Despite the date, this bird had small testes, and the species apparently does not breed on the Pribilofs. This appears to be the only record of the Eurasian subspecies in North America. The pale color of this individual, incidentally, supports the rejection of the concept of a darker east Asian subspecies; it is unlikely that a European bird would have reached the Pribilofs.

Greater Scaup from North America occasionally migrate, or wander, to Asia. One such bird was banded on 17 September 1977 on Amchitka Island in the Aleutians and recovered on 21 October 1977 on the island of Hokkaido, Japan. This bird was a female that was banded in the year it hatched and probably was a locally hatched bird although it was capable of flight and may have reached Amchitka from another area (C. F. Zeilemaker, pers. comm.). This is the only record of *A. m. nearctica* in Japan or elsewhere in Asia.

ACKNOWLEDGMENTS

M. B. Hays prepared Fig. 1 and helped in the preparation of this report in many ways. K. Klimkiewicz of the Bird Banding Laboratory of the Fish and Wildlife Service provided the initial information on the banding recovery in Japan, and C. F. Zeilemaker of the Aleutian Islands Unit of the Alaska Maritime National Wildlife Refuge provided the detailed information and permission to report it here. J. W. Aldrich and D. W. Steadman read the manuscript in an early form and offered helpful suggestions. Authorities at the American Museum of Natural History, the Academy of Natural Sciences of Philadelphia, and the Museum of Natural History at the University of Kansas allowed me to study birds in their collections. I particularly appreciate the time and effort spent by I. C. J. Galbraith of the British Museum (Natural History) in attempting, unsuccessfully, to locate a specimen that might be the type of *Fuligula mariloides* Vigors.

LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION. 1899. Ninth supplement to the American Ornithologists' Union check-list of North American birds. *Auk* 16:97-133.
- . 1957. Check-list of North American birds. 5th ed. American Ornithologists' Union, Baltimore, Maryland.
- AUDUBON, J. J. 1844. *The birds of America*. Vol. 7. J. J. Audubon, Philadelphia, Pennsylvania.
- BAIRD, S. F., T. M. BREWER, AND R. RIDGWAY. 1884. *The water birds of North America*. Vol. 2. Little, Brown, and Co., Boston, Massachusetts.
- , J. CASSIN, AND G. N. LAWRENCE. 1858. General report upon the zoology of the several Pacific railroad routes. *Birds. Reports of explorations and surveys*. Vol. 9, Pt. 2. Washington, D.C.
- BAUER, K. M. AND U. N. GLUTZ VON BLOTZHEIM. 1969. *Handbuch der Vögel Mitteleuropas*. Vol. 3. Akademische Verlagsgesellschaft, Frankfurt am Main, West Germany.
- BELLROSE, F. C. 1976. *Ducks, geese, and swans of North America*. Stackpole Books, Harrisburg, Pennsylvania.
- BISHOP, L. B. 1895. *Aythya marila* or *A. m. nearctica*? *Auk* 12:293-295.
- CRAMP, D. AND K. E. L. SIMMONS (EDS.). 1977. *The birds of the western Palearctic*. Vol. 1. Oxford Univ. Press, Oxford, England.
- DELACOUR, J. 1959. *The waterfowl of the world*. Vol. 3. Country Life Ltd., London, England.
- DEMENT'EV, G. P. AND N. A. GLADKOV (EDS.). 1952. *Birds of the Soviet Union*. Vol. 4. (Translated from Russian. 1967. Israel Program for Scientific Translations, Jerusalem, Israel.)
- DRESSER, H. E. 1903. *A manual of Palearctic birds*. Pt. 2. H. E. Dresser, London, England.
- EYTON, T. C. 1838. *A monograph on the Anatidae, or duck tribe*. Longman, Orme, Brown, Green, and Longman, London, England.
- GRAY, G. R. 1871. *Hand-list of genera and species of birds*. Pt. 3. British Museum (Nat. Hist.), London, England.
- HARTERT, E. 1920. *The birds of the Commander Islands*. *Novitates Zoologicae* 27:128-158.
- HELLMAYR, C. E. AND B. CONOVER. 1948. *Catalogue of birds of the Americas and the adjacent islands*. *Field Mus. Nat. Hist., Zool. Ser.*, Vol. 13, Pt. 1, No. 2.
- JOHNSGARD, P. A. 1975. *Waterfowl of North America*. Indiana Univ. Press, Bloomington, Indiana.
- . 1979. *Order Anseriformes in Check-list of birds of the world*. Vol. 1, 2nd ed. (E. Mayr and G. W. Cottrell, eds.). Harvard Mus. Comp. Zool., Cambridge, Massachusetts.
- LINNAEUS, C. 1761. *Fauna Svecica*. Ed. 2.
- MACGILLIVRAY, W. 1852. *A history of British birds*. Vol. 5. William S. Orr and Co., London, England.
- MILLAIS, J. G. 1913. *British diving ducks*. Vol. 1. Longmans, Green and Co., London, England.
- OBERHOLSER, H. C. 1974. *The bird life of Texas*. Vol. 1. Univ. Texas Press, Austin, Texas.
- PALLAS, P. S. 1831. *Zoographia Rosso-Asiatica*. Vol. 2. Academiae Scientiarum Impress, Petropoli, Russia.
- PALMER, R. S. (ED.). 1976. *Handbook of North American birds*. Vol. 3. Yale Univ. Press, New Haven, Connecticut.
- PARKES, K. C. 1958. Systematic notes on North American birds. 2. The waterfowl (Anatidae). *Ann. Carnegie Mus.* 35:117-125.

- PENNANT, T. 1785. Arctic zoology. Vol. 2. Class 2. Birds. Henry Hughs, London, England.
- PETERS, J. L. 1931. Check-list of birds of the world. Vol. 1. Harvard Univ. Press, Cambridge, Massachusetts.
- PORTENKO, L. A. 1972. Birds of the Chukchi Peninsula and Wrangel Island. Vol. 1. Nauka Publishers, Leningrad Section, Leningrad, U.S.S.R. (Translated from Russian. 1981. Amerind Publ. Co. Pvt. Ltd., New Delhi, India.)
- ROSEWATER, J. 1968. Itinerary of the voyage of the H.M.S. *Blossom*, 1825–1828. *Veliger* 10:350–352.
- SALVADORI, T. 1895. Catalogue of the birds in the British Museum. Vol. 27. London, England.
- SCHLEGEL, H. 1866, 1867. *Museum d'Histoire Naturelle des Pays-Bas. Anseres*. Vol. 6, No. 31.
- SEEBOHM, H. 1890. The birds of the Japanese Empire. Porter, London, England.
- STEJNEGER, L. 1885. Results of ornithological explorations in the Commander Islands and in Kamtschatka. *U.S. Natl. Mus. Bull.* 29:1–382.
- SWAINSON, W. AND J. RICHARDSON. 1831. *Fauna Boreali-Americana*. Pt. 2, The birds. John Murray, London, England.
- SWINHOE, R. 1873. On a scaup duck found in China. *Proc. Zool. Soc. London*. Pp. 411–413.
- VAURIE, C. 1965. The birds of the Palearctic fauna. Vol. 1. Non-Passeriformes. Witherby, London, England.
- VIGORS, N. A. 1839. Ornithology. Pp. 13–40 in *The zoology of Captain Beechey's voyage . . . to the Pacific and Behring's Straits performed in his Majesty's Ship Blossom . . . in the years 1825, 26, 27, and 28*. Bohn, London, England.
- WARREN, R. L. M. 1966. Type-specimens of birds in the British Museum (Natural History). Vol. 1. Non-passerines. *British Museum (Natural History) Publ.* 651.
- WITHERBY, H. F., F. C. R. JOURDAIN, N. F. TICEHURST, AND B. W. TUCKER. 1939. *The handbook of British birds*. Vol. 3. Witherby, London, England.
- WILSON, A. 1814. *American ornithology*. Vol. 8. Bradford and Inskeep, Philadelphia, Pennsylvania.
- YARRELL, W. 1843. *A history of British birds*. Vol. 3. Van Voorst, London, England.