Texas; and since the two clutches were in heronries not far apart (100 km) possibly the two females were related (Charles G. Sibley, pers. comm.). Olive-buff colored eggs are much less conspicuous in nests than are normally colored eggs and, perhaps, would be less subject to predation by sight-oriented predators. I suggest that other persons interested in ardeid eggs may find atypically colored eggs for other species. If so a study of the significance of atypical egg coloration among ardeids could be undertaken.

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Eye-color changes in Barrow's Goldeneye and Common Goldeneye ducklings.—At hatching, the irides of Barrow's Goldeneye (*Bucephala islandica*) and Common Goldeneye (*Bucephala clangula americana*) ducklings may be brown, gray-brown, gray, or even blue-gray; irides of adults of both species are yellow, irides of juveniles are brown (Palmer, ed., Handbook of North American Birds, Vol. 3, Yale Univ. Press, New Haven, Connecticut, 1976). Given the close relationship of brown colors to yellow, one might expect the transition from natal to adult iris color to proceed in a simple sequence such as: gray-brown, brown, light brown, brownish yellow, yellow. This is not the case. In 1964, casual observation of half-grown ducklings of each species, which I had earlier examined as day-old young, disclosed a seemingly unusual eye-color: an intense ultramarine blue. The color, apparently undescribed in any waterfowl species, seemed equally unrelated to the natal gray-brown, the juvenile brown described in the literature, and the adult yellow. Each duckling had also a dark, brownish ring around the pupil, evidently similar to the brown "Innenring" noted by Bauer and Glutz von Blotzheim (Handbuch der Vögel Mitteleuropas, Vol. 3, Akademische Verlagsgesellschaft, Frankfurt am Main, 1969) in eyes of juvenile *B. c. clangula* females. The purpose of this note is to describe the appearance and development of the two eye-color components in known-age ducklings of both goldeneye species. Note: It is not known whether the blue eye-color appears in half-grown young of the congeneric Bufflehead (*Bucephala albeola*). Presumably, the detection of a lighter transitional color in this species would be made more difficult by the large amount of dark pigment in the irides of both hatchlings and adults; the natal iris color is dark brown or dark gray-brown, the adult iris is "dark brownish" (Palmer 1976).

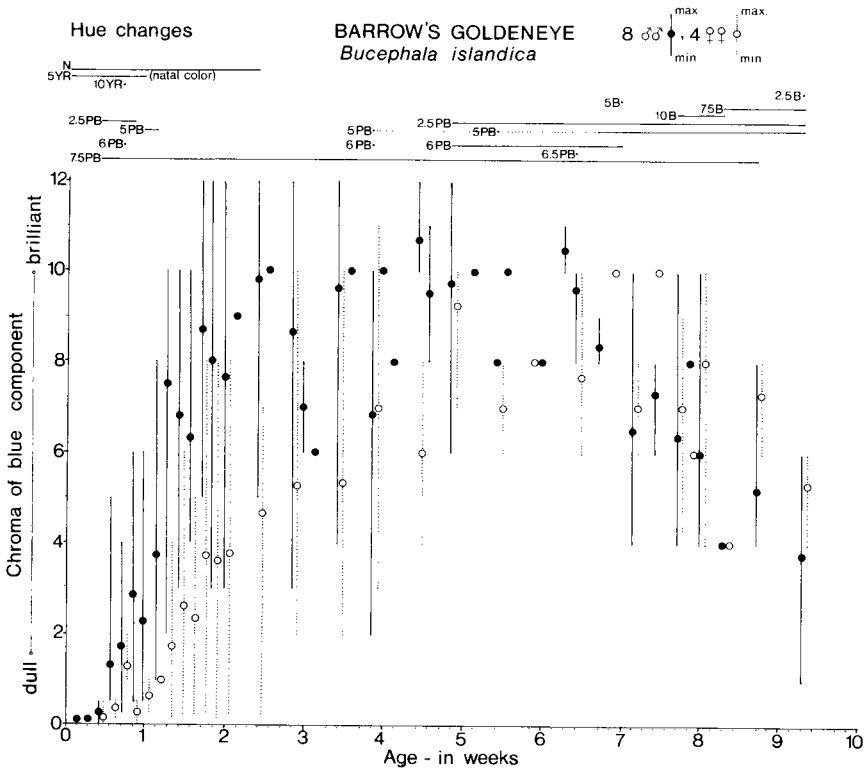

FIG. 1. Changes in hue and chroma of the first color component (natal color) of the irides of Barrow's Goldeneye ducklings. The duration of the appearance of each hue in the developmental eye-color sequence is indicated by a horizontal line parallel to the time line. For example, in Fig. 1, hue 2.5PB was continuously present in one or more Barrow's ducklings from day 3–day 6, and again from day 34 until the end of the study. Note that in Figs. 1 and 2, the solid horizontal lines refer to hues displayed by both sexes; elsewhere, solid lines indicated hues or chromas of males, dotted lines those of females.

Methods.—In 1976, while conducting a morphometric study of Barrow's and Common goldeneye ducklings at the Delta Waterfowl Research Station, I made regular measurements of the eye-color of each species as the ducklings grew. Measurements were taken outdoors in north daylight, using first the Atlas de los Colores (Villalobos-Dominguez and Villalobos, El Ateneo, Buenos Aires, 1947) and later, the Munsell Soil Color Charts (Munsell Color Company, Baltimore, Maryland, 1973), with the addition of charts 5PB and 7.5PB. Matte samples from the Munsell Book of Color (Munsell Color Company, Baltimore, Maryland, 1929) were used to evaluate colors not contained in the augmented soils collection. Color attributes measured were hue (e.g., purple-blue [PB], blue [B], yellow-red [YR]), value (e.g., dark [2/, 3/], light [6/, 7/]), and chroma (e.g., dull [/1, /2], bright [/8], brilliant [/12]). Color notations used in this note follow the Munsell system; a synonymy of these colors with three other color systems is provided in the Appendix.

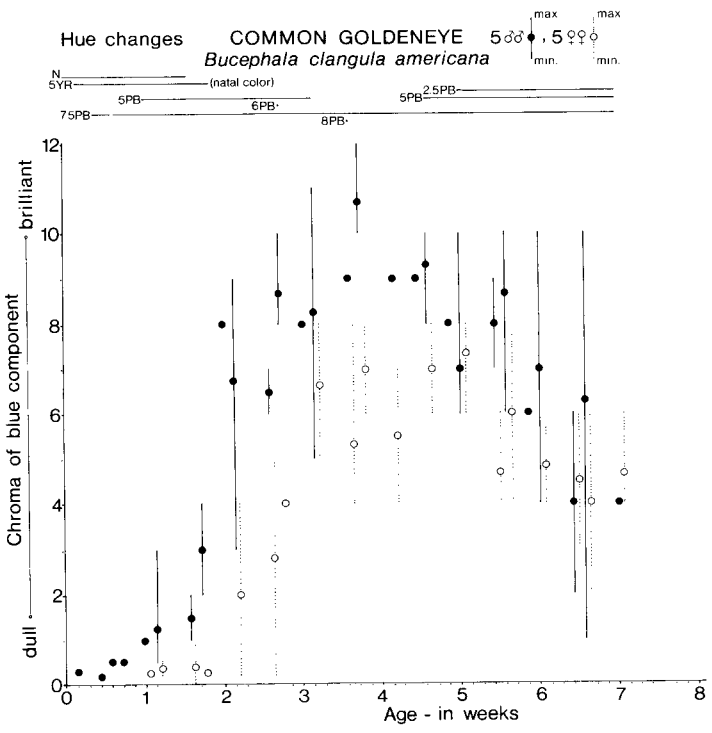

FIG. 2. Changes in hue and chroma of the first color component (natal color) of the irides of Common Goldeneye ducklings.

Sixteen Barrow's and 15 Common goldeneyes, representing two broods of each species, were hatched in incubators from wild-gathered eggs. At approximately 24 h of age, they were numbered, sexed by cloacal examination, and placed in rearing pens, where they were undisturbed except during the few hours required for measurements. I observed the Barrow's ducklings over a period of 65 days (and again at 5 months of age, without a color standard) and the Common Goldeneye ducklings during their first 7 weeks of life. Color measurements were taken daily for the first 10 days and twice weekly thereafter. Only first-day data were used from four Barrow's and five Common goldeneye ducklings that died during the study. Although the remaining 22 individuals were examined on every measuring day, the age difference of 1–3 days among individuals within a brood meant that the sample size for any given day of age was often small, averaging 2.2 for Common Goldeneye males, 3.9 for Barrow's males, and 2.6 for females of both species.

Results and discussion.—All 31 goldeneye ducklings had gray-brown or dark gray-brown irides at hatching. The blue eye-color appeared (time of first appearance, day 3–day 20) in all individuals of both species, replacing the natal colors, and became, successively, purple-blue, blue, and green-blue. As well, M. Jackson (pers. comm.) confirmed the existence of blue eye-color in half-grown wild Barrow's Goldeneye ducklings on her study area in British Columbia, W. R. Miller (pers. comm.) observed blue eyes in wild Common Goldeneye duck-

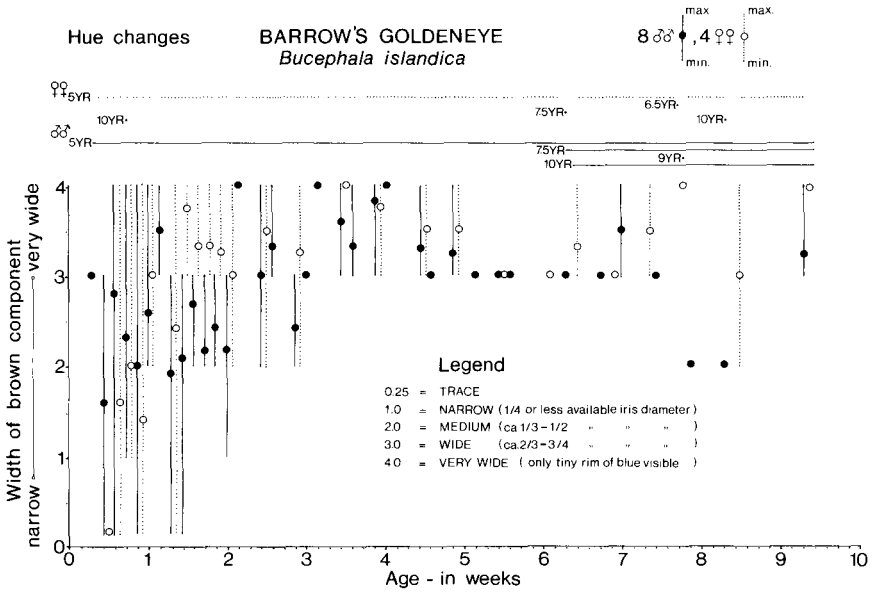

FIG. 3. Changes in hue, chroma, and area of the second color component (brown ring) of the irides of Barrow's Goldeneye ducklings.

lings in Vermont, and C. J. Guiget noted "iris blue" on the label of a young male Barrow's duckling (BCPM 14393, ca. 10 days old) that he collected in 1940 near Barkerville, British Columbia. The brownish ring around the pupil appeared a few days after hatching.

Changes in the hue and chroma of the first component, the natal color, were most marked (Figs. 1, 2). As early as the third day of life, certain individuals of both species displayed traces of gray (N) or dull purple-blue (5PB, 7.5 PB) at the periphery of the iris. The color remained, increasing in area (some individuals) and rising to a peak of brilliance (Munsell /12) on day 26 in a Common Goldeneye male and more rapidly, on day 12, in two Barrow's males. Irides of two Common Goldeneye males sustained a brilliance of /10 until day 46; irides of one Barrow's male remained at /12 until day 34. Although individual color differences in both sexes were obvious, chroma in the irides of females of both species appeared to increase more slowly, and to reach a lower level of brilliance than in those of males. At about 5 weeks of age, in a few individuals of both species (two males, one female), the hue of the irides began to appear less purple, more blue (2.5PB), the chroma to decrease slightly, and the value, heretofore medium (4/ or 5/), to measure 6/. By 8 weeks of age, the iris hue of three Barrow's Goldeneyes (two males, one female) was 10B 8/4 (a pale, rather dull blue), and at 65 days, the hue of the three birds' irides measured 2.5B 8/4—a clear, pale turquoise blue.

In the 10 Barrow's ducklings examined at 5 months of age, irides of the six males were all some tint of clear, pale green-yellow, with little or no cloudy light brown area around the pupils. Eye-colors of the four females were less uniform: irides of three were various tints of light, dull green-yellow with irregular areas of cloudy golden brown, but the irides of the fourth were quite gray, with a cloudy light brownish area around the pupils.

Changes in the brown component of the iris color were less dramatic (Figs. 3, 4). The

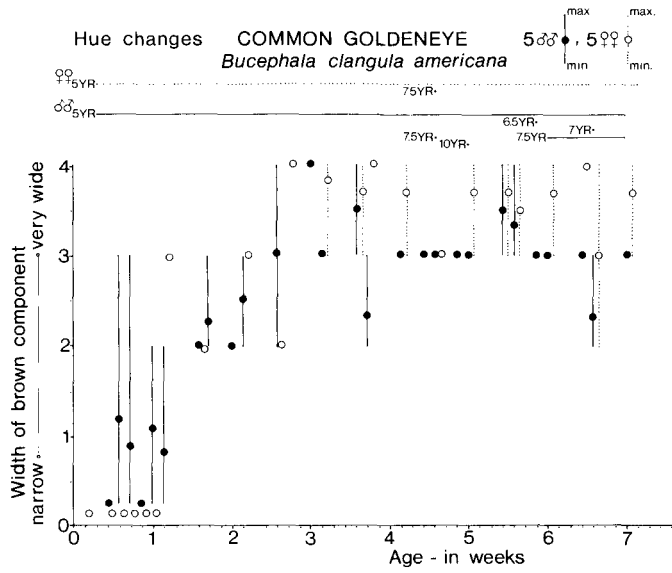

FIG. 4. Changes in hue, chroma, and area of the second color component (brown ring) of the irides of Common Goldeneye ducklings.

dark ring contrasted well with the lighter natal colors (gray, gray-brown, blue-gray), but poorly with the darker ones (dark gray-brown, brown). It was evaluated initially as a dark (2.5/ to 3/), very dull (/0.5 to /1.5) orange-brown (5YR), which became somewhat yellower (7.5YR, 10YR) and lighter (3.5/ to 4/) at about 6 weeks in a few males of both species. The brown iris-rings of the females did not turn lighter and yellower, but remained dark orange-brown (5YR), although the chroma in nearly all ducklings of both species increased to /3 or /4 by 7 weeks.

The rapid increase in area of the brown color paralleled almost exactly the increase in brilliance of the blue color in both species. At times, the brown color seemed to take on a purplish hue of its own, although this proved to be an illusion. Repeated color evaluations produced no evidence of a true purple tint. The area of brown iris increased more rapidly in Barrow's than in Common goldeneye ducklings and, after about 5 weeks, seemed larger in females of both species than in males. Once enlarged, the size of the area remained more or less stable throughout the study, although there were small, irregular size fluctuations in individual birds. It is not surprising that the blue color should have gone undescribed until now, as it is most often reduced to a narrow rim on a predominantly brown iris, and as such, is quite inconspicuous.

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gestions. Finally I am grateful to my husband, C. Nelson, who drew Figs. 1–4 and provided essential transportation facilities. The research was funded in part by a grant from the Explorations Program of the Canada Council.—COLLEEN HELGESON NELSON, *Manitoba Museum of Man and Nature, 190 Rupert Avenue, Winnipeg, Manitoba R3B 0N2, Canada.* *Accepted 22 Feb. 1983.*

APPENDIX

A SYNONYMY OF REPRESENTATIVE EYE-COLORS OF GOLDENEYE DUCKLINGS IN FOUR COLOR NOTATION SYSTEMS[a]

Munsell	Villalobos	Ridgway	Smithe
		Blues and Neutrals	
N4/	N–6	LIII [NG] Deep Neutral Gray × Dark Neutral Gray	83—Dark Neutral Gray
2.5 PB 4/1	(N/UUC) 7–1°	LII [BLUE] Dark Plumbeous	87—Medium Plumbeous
5PB 3.5/1	U–5–1°	LIII [CG] Blackish Slate × Slate Color	78—Plumbeous
7.5PB 4/1	UUV–5 (1°/2°)	XLIX [V–B] Violet-Slate	
5PB 4/4	(UUC/U) 6–6°	XLII [BG–B] Deep Delft Blue	73—Indigo
7.5PB 5/6	(U/UUV) 8–7°	XXIV [V–B] Grayish Violet-Blue	
7.5PB 5/8	(U/UUV) 8 (9°/10°)	XXIV [V–B] Dull Violet-Blue	
7.5PB 6/10	U–10–12°	XXI [V–B] Deep Lavender Blue	170B—Dull Violaceous Blue
7.5PB 4/12	U–6 (11°/12°)	XXI [BV–B] Diva Blue	170A—Ultramarine Blue
7.5PB 5/12	U–8–13°	XXI [V–B] Cornflower Blue	
*2.5PB 7/8	(CCU/C) 15–12°	VIII [G–BB] Pale Methyl Blue	
*2.5PB 8/4	CCU–17–8°	XX [BG–B] Persian Blue × XXII [G–BB] Pale King's Blue	
*10B 8/4	(C/CU) 16–10°	VIII [BG-B] Pale Blue (Ethyl Blue) × XX [BG–B] Persian Blue	168D—Light Sky Blue
*7.5PB 8/4	C (16/17) 8°	VIII [G-BB] Pallid Methyl Blue × XX [BG–B] Persian Blue	
*2.5B 8/4	(TC/T) 17–8°	VIII [G–B] Beryl Blue × XX [G–B] Etain Blue	93—Robin's Egg Blue

APPENDIX
CONTINUED

Munsell	Villalobos	Ridgway	Smithe
		Browns	
5YR 3/1 (natal color)	(SSO/SO) 3–2°	XLVI [OY–O] Fuscous Black	21—Fuscous *or* 121—Van Dyke Brown
5YR 4/1 (natal color)	OOS (6/7) (1°/2°)	XLVI [OY–O] Fuscous × XLV [OR–O] Dusky Drab	
*5 YR 3/2	(SO/OOS) 2–2°	XL [OY–O] Bone Brown	21—Fuscous
*7.5YR 3/4	(SO/OOS) 4–4°	XXIX [OY–O] Verona Brown × [Y–O] Snuff Brown	121A—Prout's Brown
10YR 4/4	(OOS/O) (5/6) 6°	XXIX [O–Y] Saccardo's Umber	123—Raw Umber
*5YR 3/6	SO–4–5°	XV [OY–O] Russet	223A—Mars Brown

[a] Most Ridgway equivalents of the Munsell notations were taken from an unpublished reference index prepared by the author and a second observer, using the augmented Munsell Soil Color Charts (1973), the Munsell Book of Color, matte samples (1929), and a good copy of Color Standards and Color Nomenclature (R. Ridgway, by the author, Washington, 1912). Villalobos equivalents and synonymies of starred (*) notations were prepared by the author alone. All synonymies were made either in north daylight or under 7500K lamps in the booth described by Nelson (Wilson Bulletin 94:225–229, 1982). Synonymies made by other observers under the same or other conditions may be expected to differ slightly from those presented here. Components of Munsell and Villalobos colors are listed by hue, value, and chroma in that order; the Ridgway notation is represented only by plate number, verbal name, and hue components in brackets [ ]. Intermediate Villalobos and Ridgway equivalents are expressed in this way: 5YR 4/1 = OOS (6/7) (1°/2°) = XLVI [OY–O] Fuscous × XLV [OR–O] Dusky Drab; near-equivalents selected by the author from the Naturalist's Color Guide, Pt. 1 (Smithe, Am. Mus. Nat. Hist., New York, New York, 1975 and 1981), are listed by number and name. The order of the notations approximates that of their appearance in the developmental eye-color sequence.

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Unusual bathing behavior of the Fork-tailed Flycatcher in Colombia.—On 8 March 1978, while conducting a crocodile (*Crocodylus* sp.) census along the Tomo River, Vichada, Colombia, I observed Fork-tailed Flycatchers (*Tyrannus savana*) engaged in unusual group behavior. Six birds were perched 10 m up in a dead tree at water's edge on the south bank of the river. The birds were flying in an ellipsoidal pattern from the perch-site to the water, hovering briefly, and immersing themselves, in turn, before returning to the tree.

In 75 days on the Tomo River I saw both Fork-tailed Flycatchers and Tropical Kingbirds (*Tyrannus melancholicus*) using a similar flight routine to drink from the river. However, in each instance only the beak touched the water in an attenuated skimming motion. My observations of the Fork-tailed Flycatchers were made from 10 m and I saw no food or water taken and no skimming behavior. The site of entry into the water was approximately the same for each bird.

The Social Flycatcher (*Myiozetetes similis*) has been reported to occasionally enter water up to thigh depth to capture tadpoles, and also to perch above deeper water, flying down to